

Appendix G

Paleontological Resources Technical Report

The logo for SWCA (Soil Water Conservation Agency) is positioned vertically on the left side of the page. It consists of the letters 'S', 'W', 'C', and 'A' in a large, stylized, light blue font, stacked one above the other.

Paleontological Resources Technical Report for the Sunset and Vine Project, Los Angeles, California

JULY 2023

PREPARED FOR

Eyestone Environmental

PREPARED BY

SWCA Environmental Consultants

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE SUNSET AND VINE PROJECT, LOS ANGELES, CALIFORNIA

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EXECUTIVE SUMMARY

Purpose and Scope: Eyestone Environmental, LLC (Eyestone) retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment in support of the proposed Sunset and Vine Project (Project) in the Hollywood Community Plan area of the city of Los Angeles, California. As the lead agency under the California Environmental Quality Act (CEQA), the City of Los Angeles Department of City Planning (City Planning) requires the assessment of potentially significant impacts to the environment caused by construction or implementation of the Project. Therefore, SWCA has prepared this paleontological resources assessment to summarize the results of a review of geologic maps, subsurface geotechnical information, scientific literature and online fossil locality databases, and confidential fossil locality records from the Natural History Museum of Los Angeles County (NHMLA). This technical report also includes a discussion of potential impacts to scientifically significant paleontological resources and mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to CEQA.

Date of Investigation: SWCA reviewed the relevant maps and literature in April and May 2023, and received the results of a museum records search from the NHMLA on May 14, 2023.

Summary of Findings: According to geologic mapping, the surface of the Project Site is mapped as late Pleistocene old fan deposits, Unit 4 (Qof₄); however, based on previous development during construction of the existing structures within the Project Site, unmapped Recent artificial fill is likely present at the surface and extending to unknown depths, presumably partially replacing the uppermost “native” or natural sediments of Qof₄. Additionally, late Pleistocene old fan deposits, Unit 2 (Qof₂) are mapped at the surface approximately 0.40-mile to the south and may also be present at unknown depths within the Project Site. Furthermore, the early Pleistocene to Pliocene Fernando Formation and/or the early Pliocene to late Miocene Puente Formation may also be present at unknown depths (underlying artificial fill, Qof₄, and Qof₂) within the Project Site. Therefore, artificial fill, Qof₄, Qof₂, Fernando Formation, and Puente Formation are given paleontological potential considerations in this report. The results of the geotechnical investigation indicate that artificial fill likely extends to depths of 10 to 15 feet below ground surface (bgs). Artificial fill has a low paleontological sensitivity but may be underlain by geologic units of relatively higher paleontological sensitivity. Qof₄, Qof₂, Fernando Formation, and Puente Formation that may be present below the artificial fill all have a high paleontological sensitivity, based on a review of scientific literature and online fossil locality databases. The NHMLA records search results did not note the presence of fossils previously recorded from within the Project Site; however, several fossil localities have been found in the Project’s vicinity from the same or comparable geologic units as those underlying the Project Site.

Because the paleontological sensitivity of the geologic units increases to high sensitivity at a conservative estimate of 10 feet bgs, ground-disturbing activities associated with the Project, anticipated to reach approximately 36 feet bgs, have the potential to impact geologic units that may yield scientifically significant or “unique” paleontological resources. Any significant fossils encountered during ground disturbances in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA.

Recommendations: SWCA recommends the following mitigation measures to reduce potential significant impacts to less-than-significant levels, pursuant to CEQA. These recommended mitigation measures have been developed in accordance with and incorporate the performance standards of the Society of Vertebrate Paleontology (SVP), state and local regulations, and published best practices in mitigation paleontology: 1) retain a qualified professional paleontologist who meets or exceeds the SVP qualification standards and who will obtain a curation agreement with an accredited repository before the start of construction activities; 2) conduct a worker training to educate the construction crew on the legal

requirements and procedures to follow in the event of a fossil discovery; 3) have an SVP-qualified paleontological monitor conduct full-time paleontological monitoring during ground-disturbing activities greater than or equal to 10 feet bgs that have the potential to impact previously undisturbed sediments of high paleontological sensitivity (earthwork less than 10 feet bgs or impacting only previously disturbed sediments or Recent artificial fill should not be monitored regardless of depth); and 4) prepare a paleontological resources monitoring report upon the conclusion of ground-disturbing activities to document the paleontological monitoring efforts for the Project and describe any paleontological resources discoveries observed and/or recorded during the monitoring. If paleontological resources are curated, the final monitoring report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final monitoring report should be filed with City Planning.

Disposition of Data: This report will remain on file with Eyestone, City Planning, and SWCA's Pasadena, California office.

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INTRODUCTION

Eyestone Environmental, LLC (Eyestone) retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment for a proposed development in the Hollywood neighborhood of Los Angeles, California (Project). The Project would include one new eight-story, mixed-use building within a Project Site that collectively measures 1.74 acres. As the lead agency under the California Environmental Quality Act (CEQA), the City of Los Angeles Department of City Planning (City Planning) requires the assessment of potentially significant impacts to the environment caused by construction or implementation of the Project. This report documents the methods and results of a geologic map review, a geotechnical investigation report review, scientific literature and online database review, and museum records search from the Natural History Museum of Los Angeles County (NHMLA) to evaluate the potential for significant impacts to scientifically significant or “unique” paleontological resources. This technical report also includes a discussion of potential impacts and mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to CEQA. This study follows the guidelines of the Society of Vertebrate Paleontology (SVP) and published best practices in mitigation paleontology (Murphey et al. 2019; SVP 2010).

SWCA paleontology team lead Mathew Carson, M.S., and SWCA staff paleontologist Jasmyn Nolasco, M.S., conducted the research presented herein and authored this technical report. SWCA archaeologist Erica Nicolay, M.A., managed the overall project. Figures were generated by SWCA geographic information systems (GIS) specialist Marty Kooistra, M.A. Copies of the report are on file with SWCA’s Pasadena, California, office.

PROJECT DESCRIPTION AND LOCATION

The Project proposes to develop a new, eight-story, mixed-use building in the Hollywood Community Plan area (Figure 1). The Project Site includes an existing 19-story tower which would remain and four commercial buildings fronting on West Sunset Boulevard, a one-story commercial building fronting on North Vine Street, a one-story commercial building fronting on West Leland Way, and a one-story duplex on West Leland Way, all of which would be demolished. Additionally, the Project would include a parking structure with two above grade parking levels and two subterranean parking levels. Ground disturbance is expected to extend to a maximum depth of 36 feet below ground surface (bgs). The Project consists of nine adjoining parcels located at 6260–6290 West Sunset Boulevard, 1460–1480 North Vine Street, and 6251–6165 West Leland Way and is bounded by West Sunset Boulevard to the north, West Leland Way to the south, North Vine Street to the west, and a multi-family residential apartment building that is currently under construction to the east of the Project Site. The Project Site encompasses Assessor’s Parcel Numbers (APNs) 5546-025-017, 5546-025-020, 5546-025-029, 5546-025-030, and 5546-025-031 (Figure 2). The Project Site is in Section 11, Township 1 South, Range 14 West, as depicted on the U.S. Geological Survey (USGS) Hollywood, California, 7.5-minute quadrangle (Figure 3).



Figure 1. Project vicinity.

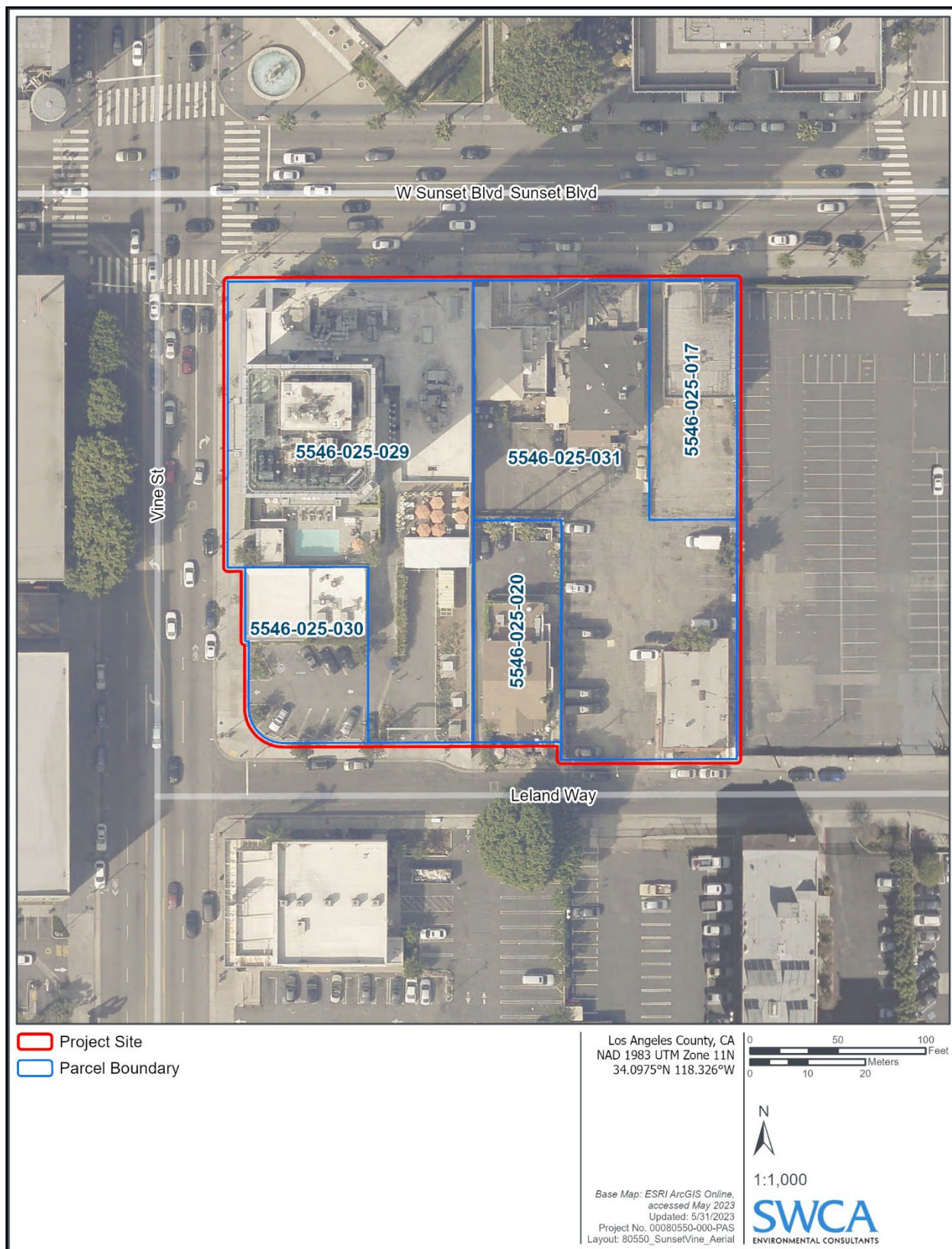


Figure 2. Aerial photograph of Project Site and parcels labeled with APNs.

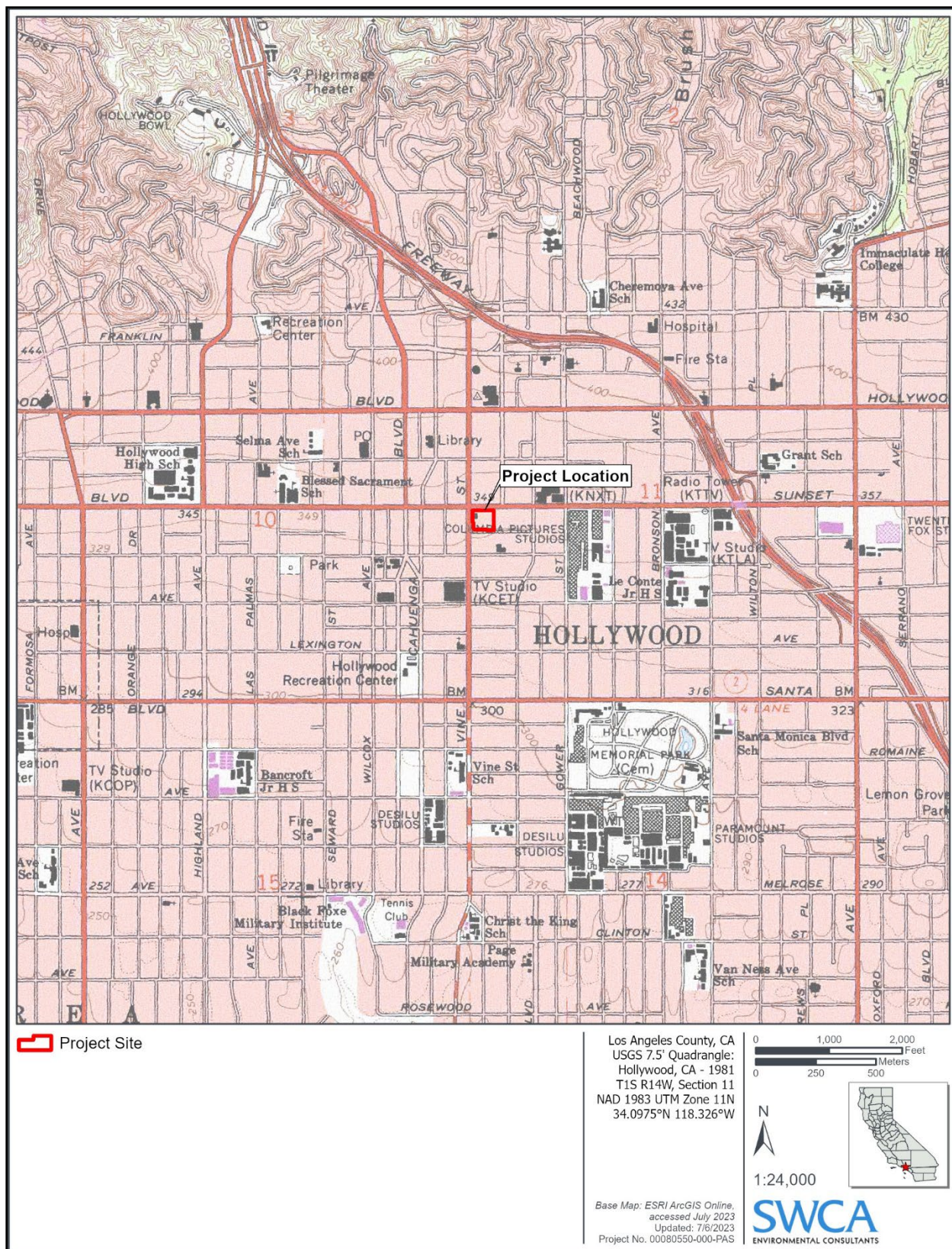


Figure 3. Project Site plotted on the USGS Hollywood, California, 7.5-minute quadrangle.

PROFESSIONAL STANDARDS

The SVP has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys; monitoring and mitigation; data and fossil recovery; sampling procedures; and specimen preparation, identification, analysis, and curation (SVP 1995, 2010). Most practicing professional mitigation paleontologists in California adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the SVP.

As defined by the SVP, significant paleontological resources are

fossils and fossiliferous deposits, here defined as 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)

Numerous paleontological studies have developed criteria for the assessment of significance for fossil discoveries (e.g., Eisentraut and Cooper 2002; Murphey et al. 2019; Scott and Springer 2003). In general, these studies assess fossils as significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct.
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein.
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas.
4. The fossils demonstrate unusual or spectacular circumstances in the history of life.
5. The fossils are in short supply and/or are in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and are not found in other geographic locations.

Geologic units known to preserve significant fossils or fossil localities are likely to contain additional undiscovered and potentially significant fossils and are generally considered sensitive for paleontological resources throughout their areal and stratigraphic extent. The extent of sensitivity differs from that defined for archaeological resource sites as follows:

It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontological sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case. (SVP 1995:23)

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils may be present at the surface or at depth within sediments or bedrock. Subsurface fossils would not be observable or detectable unless exposed by erosion or human activity. In the case of human activity, such

as project-related ground disturbances within geologic units with a high probability to yield significant fossils, direct or indirect adverse impacts to significant fossils may occur.

In summary, paleontologists cannot know either the quality or quantity of fossils before natural erosion or anthropogenic exposure. As a result, even in the absence of fossils on the surface, it is necessary to assess the sensitivity of geologic units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside the study area), a similar geologic unit, and whether the unit in question was deposited in a type of environment known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and, if such fossils are determined to be potentially significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under state and local laws and regulations.

State Regulations

California Environmental Quality Act

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at California Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine whether a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA, as amended December 28, 2018 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.) (CEQA Guidelines), defines procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist (CEQA Guidelines: Appendix G) asks whether a project would directly or indirectly destroy a unique paleontological resource and result in impacts to the environment.

Public Resources Code Section 5097.5

Requirements for paleontological resource management are included in PRC Division 5, Chapter 1.7, Section 5097.5, which 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.

These statutes prohibit the removal, without permission, of any paleontological site or feature from land under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC Section 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 also establishes the removal of paleontological

resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) land.

Local Regulations

City of Los Angeles General Plan

Section 3 (Archaeological and Paleontological) of the *City of Los Angeles General Plan Conservation Element* (Conservation Element) recognizes paleontological resources (page II-3) and contains an objective (page II-5) to protect the City's archaeological and paleontological resources for historical, cultural, research, and/or educational purposes (City of Los Angeles 2001). The Conservation Element includes the policy to "continue to identify and protect significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities." The Conservation Element also states the following:

Pursuant to CEQA, if a land development project is within a potentially significant paleontological area, the developer is required to contact a bona fide paleontologist to arrange for assessment of the potential impact and mitigation of potential disruption of or damage to the site. If significant paleontological resources are uncovered during project execution, authorities are to be notified and the designated paleontologist may order excavations stopped, within reasonable time limits, to enable assessment, removal or protection of the resources. (City of Los Angeles 2001:II-5)

Section D:1 of the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) specifies that the determination of significance for paleontological resources shall be made on a case-by-case basis, taking into consideration the following factors:

- Whether or the degree to which the project might result in the permanent loss of or loss of access to a paleontological resource.
- Whether the paleontological resource is of regional or statewide significance.

METHODS

The following sections present an overview of the methodology used to analyze the potential for paleontological resources within the Project Site. This report conforms to industry standards as developed by the SVP (1995, 2010) and published best practices in mitigation paleontology (Murphey et al. 2019). The purpose of this analysis is to: 1) determine whether any previously recorded fossil localities occur in the Project Site at the surface or at depth; 2) if so, assess the potential for disturbance of these localities during construction; 3) evaluate the paleontological potential of the Project Site; and 4) evaluate the potential for adverse impacts to previously undiscovered significant paleontological resources that could be present within the Project Site and adversely impacted by implementation of the Project.

Existing Data Analysis

SWCA conducted an analysis of available existing data pertinent to paleontological resources. This analysis included a review of geologic mapping, the results of a geotechnical investigation, the results of scientific literature and online fossil locality database searches, and the museum records search results. The geologic mapping used in this analysis is from Campbell and others (2014) at a scale of 1:100,000, and subsurface geologic information is from the 2020 geotechnical investigation report prepared by

Geotechnical Professionals, Inc. (GPI). A museum records search request was submitted to the NHMLA on May 04, 2023, and the results of the museum records search were received on May 14, 2023, which are incorporated into the Results section of this report. Appendix A (confidential) provides a copy of the museum records search results.

Paleontological Potential Classification

Paleontological potential (“sensitivity”) is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP 2010:1–2), the SVP defines four categories of paleontological sensitivity for rock units: high, low, undetermined, and no potential:

High Potential. Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcanoclastic formations (e.g., ash or tephra), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstone, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstone, fine-grained marine sandstone, etc.). Paleontological potential consists of both a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

Low Potential. Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g., basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

Undetermined Potential. Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically excavations into subsurface stratigraphy.

No Potential. Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous

rocks (such as granites and diorites). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources. (SVP 2010:1–2)

RESULTS

Regional Geology

The Project Site is within the Los Angeles Basin between the northernmost portion of the Peninsular Ranges and the southern end of the Transverse Ranges. The Project Site is within the northernmost Central Block of the Los Angeles Basin, which includes the low portions of the Los Angeles coastal plain from Beverly Hills to the Downey Plain within central Orange County (Norris and Webb 1990; Yerkes et al. 1965). More specifically, the Central Block is bounded by the Hollywood, Santa Monica, and Whittier faults on the north; the Whittier and Elsinore faults and Elysian Hills and Repetto Hills on the east; the San Joaquin Hills and Huntington and Newport mesas on the south; and the Newport-Inglewood Fault Zone and Dominguez Hills and Baldwin Hills on the west (Yerkes et al. 1965).

Within the Central Block, sedimentary strata overlying basement rocks consist of mostly marine and nonmarine sedimentary rocks, with the geologic history of the strata spanning from the Cretaceous to the Pleistocene (Norris and Webb 1990; Yerkes et al. 1965). Beginning in the Cretaceous and early Paleogene, west North America was the site of a convergent margin where the Farallon Plate was actively subducting eastward beneath the North American Plate. Subduction continued throughout the Paleogene, but by the late Oligocene (i.e., latest Paleogene), a portion of the East Pacific Rise collided with the subduction zone initiating the development of the San Andreas Fault system (Saucedo et al. 2016). The Los Angeles Basin formed when fault-bound blocks of the Transverse Ranges were translated and rotated away from the Peninsular Ranges because of movement along the San Andreas Fault system, with subsidence within the early Los Angeles Basin occurring during the middle to late Miocene (Critelli et al. 1995). Transtensional rifting that resulted in the formation of the Los Angeles Basin continued to enlarge the basin through the Pliocene, allowing the deposition of thick shallow marine strata (Olson 2007). By the Pleistocene, changes in global sea level, tectonic subsidence, and rates of sedimentation resulted in the deposition of thick accumulations (maximum thickness of 35,000 feet thick) of coastal and terrestrial alluvial deposits within the Los Angeles Basin (Yerkes et al. 1965). Erosion and transportation of sediments away from the surrounding uplifted blocks (i.e., the San Gabriel Mountains and Santa Ana Mountains) resulted in continued basin infilling during the late Pleistocene and Holocene with thick alluvial deposits in the present-day Los Angeles Basin that has yielded some of the best fossil sites in North America.

Local Geology and Paleontology

According to geologic mapping by Campbell and others (2014), the surface of the Project Site is mapped as late Pleistocene old fan deposits, Unit 4 (Qof₄) (Figure 4); however, based on previous development during construction of the existing structures within the Project Site (see Figure 2), unmapped Recent artificial fill is likely present at the surface and extending to unknown depths (GPI 2020), presumably partially replacing the uppermost “native” or natural sediments of Qof₄. Additionally, late Pleistocene old fan deposits, Unit 2 (Qof₂) are mapped at the surface by Campbell and others (2014) approximately 0.40-mile to the south and may also be present at unknown depths within the Project Site. Furthermore, although unmapped at the surface in the immediate vicinity of the Project Site (i.e., within the 0.5-mile buffer), the early Pleistocene to Pliocene Fernando Formation and/or the early Pliocene to late Miocene Puente Formation are also mapped along the uplifted hills east of the Project Site on the westside of the Los Angeles River (Campbell et al. 2014). These two geologic units are known to directly underlie

Holocene and Pleistocene alluvial deposits in the northern and eastern portions of the Los Angeles Basin, becoming shallower to the east. Based on the regional geology, early Pleistocene to Pliocene Fernando Formation and/or early Pliocene to late Miocene Puente Formation may also be present at unknown depths within the Project Site. Therefore, artificial fill, Qof₄, Qof₂, Fernando Formation, and Puente Formation are given paleontological potential considerations in this report. These geologic units are described in geochronological order (youngest to oldest) in the following subsections.

In general, geologic units mapped at the surface near the Project Site (i.e., within a 0.5-mile buffer) can be a good indicator of the geologic units that may be present in the subsurface, provided that structural deformation has not altered or displaced the vertical or lateral continuity of the units and that the geologic units are in their original geochronological order (relatively younger deposits overlying relatively older deposits based on the principles of stratigraphy). Regarding the Project, late Pleistocene young alluvium, Unit 1 (Qya₁) is mapped at the surface by Campbell and others (2014) approximately 0.25-mile south of the Project Site. It is geochronologically younger than Qof₄ and, if originally present at the surface of the Project Site, would have overlain Qof₄ deposits; therefore, Qya₁ is unlikely to be present at the surface or subsurface within the Project Site based on its geochronology, stratigraphy, and level of previous site disturbance. Additionally, approximately 0.40-mile north of the Project Site, the middle and early Miocene Topanga Group, undivided (Tts) is mapped at the surface by Campbell and others (2014). These deposits have been uplifted and exposed on the northern foothills located on the footwall block on the northside of the Hollywood Fault, where younger Holocene and Pleistocene deposits and Fernando and Puente formation rocks are not present. Because of the structural deformation of the region that resulted in the Project Site being located on the hanging wall block on the southside of the Hollywood Fault, Tt is likely only present at very deep depths within the Project Site, underlying Fernando and Puente formations deep below the surface, and would not be impacted by implementation of the Project. Therefore, Qya₁ and Tts are not discussed further in this assessment despite being mapped at the surface within proximity to the Project Site.

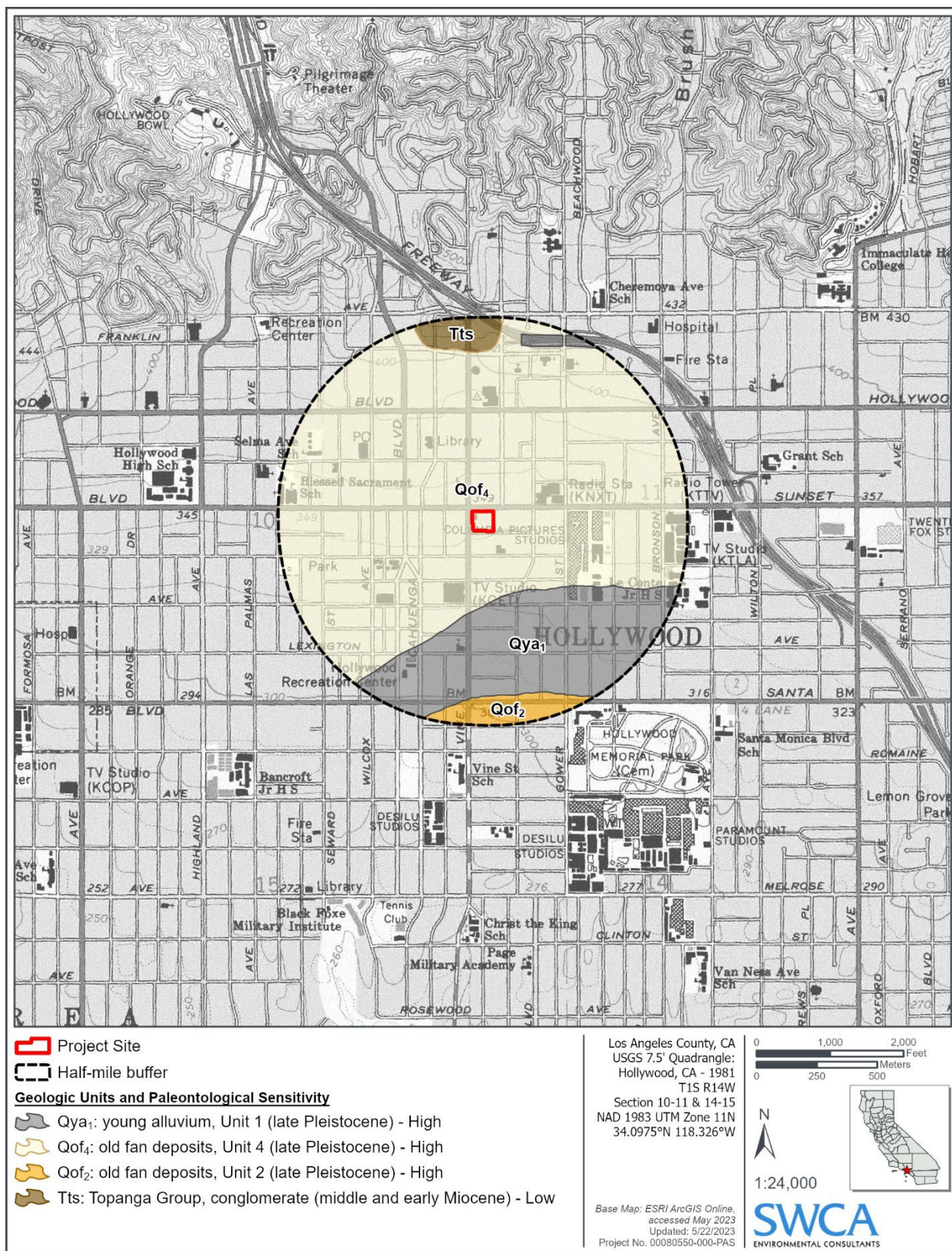


Figure 4. Geologic units and paleontological sensitivity within the project site and 0.5-mile buffer.

Recent Artificial Fill

Based on previous site development, Recent artificial fill is likely present and partially replaces the uppermost strata of “native” or natural sediments of Qof₄ mapped at the surface by Campbell and others (2014). However, the maximum depth of the artificial fill may vary within the Project Site at unknown depths. According to the geotechnical investigation report, subsurface sediments generally consist of loose to medium dense silty sand and firm sandy silt to depths of 10 to 15 feet bgs, underlain by interbedded layers of very stiff to hard clays and silts that extend to the maximum depth explored (i.e., 75 feet bgs) (GPI 2020). Although GPI (2020) does not state the depth of artificial fill (nor connects geologic observations noted in the geotechnical borehole logs to mappable geologic units identified by Campbell and others [2014] or some other geologic mapping), the contact between the two dominant sediment types is consistently present at depths of approximately 10 to 15 feet bgs and is underlain by densely bedded layers of sediment. Therefore, the contact between artificial fill and “native” or natural sediments may be 10 to 15 feet bgs.

Artificial fill sediments typically consist of reworked and recompacted sediments originating either from within the Project Site during construction of existing structures, or from outside the Project Site as imported sediments that are delivered from other regions and recompacted on site. Previously disturbed sediments or artificial fill may contain fossils, but any such fossil from these deposits has been removed from its original stratigraphic, taphonomic, or paleoenvironmental context (provenance), making it have less scientific value. Therefore, unmapped Recent artificial fill is unlikely to yield significant paleontological resources and has low paleontological sensitivity (SVP 2010); however, artificial fill deposits are underlain by undisturbed “native” sediments that may have the potential to contain significant paleontological resources (see below).

Late Pleistocene Old Fan Deposits, Unit 4 (Qof₄) and Unit 2 (Qof₂)

According to geologic mapping by Campbell and others (2014), Qof₄ are mapped at the surface of the Project Site (see Figure 4). Additionally, Qof₂ are mapped at the surface outside of the Project Site to the south, but could extend northward as a subsurface unit into the bounds of the Project Site, underlying Qof₄ (Campbell et al. 2014) (see Figure 4). In general, old fan deposits are late Pleistocene in age and consist of at least four subunits, which are distinguished by relative ages based on geomorphic relationships, relative degree of dissection, and overburden soil formation (Campbell et al. 2014). Here, Qof₄ is relatively younger than the underlying Qof₂ (and Unit 3 [Qof₃] and Unit 1 [Qof₁] are not mapped locally and not discussed further here). Both Qof₄ and Qof₂ consist of slightly to moderately consolidated silt, sand, and gravel deposits on alluvial fans that have been uplifted or otherwise removed from the locus of recent sedimentation (Campbell et al. 2014).

The results of the geotechnical investigation indicate that interbedded layers of very stiff to hard clays and silts are present at depths of 10 to 15 feet bgs and extend to the maximum depth explored (i.e., 75 feet bgs) (GPI 2020). Although GPI (2020) does not connect geologic observations noted in the geotechnical borehole logs to mappable geologic units identified by Campbell and others (2014) or some other published geologic map, the lithology observed is indicative of the presence of Qof₄ or Qof₂ at 10 to 15 feet bgs, extending to some unknown depth within the subsurface. The presence of Pleistocene fossils from 5 to 80 feet bgs in developed urban areas in the Project’s vicinity (NHMLA 2023; see Museum Records Search Results below) indicates that Pleistocene sediments were not only likely present at the surface prior to site development, but also may be as much as 80 feet thick. Note that the lithology of the Fernando and Puente formations, which are known to underlie alluvial deposits throughout the Los Angeles Basin often at moderate depths, are similar to sediments observed and described by GPI (2020) at depths greater than 10 to 15 feet bgs. It is possible that Qof₄ and/or Qof₂ may transition gradually or

abruptly into the Fernando and Puente formations at unknown depths (see the next sections for an expanded discussion).

Pleistocene alluvial deposits, such as the silty sands and clayey silts observed during the geotechnical investigation of the Project Site, have a rich fossil history in Southern California, especially in the Los Angeles Basin (Jefferson 1991a, 1991b; McDonald and Jefferson 2008; Miller 1971; Reynolds and Reynolds 1991; Springer et al. 2009). The most common Pleistocene terrestrial fossils include the bones of mammoth, mastodon, giant ground sloth, horse, bison, camel, antelope, peccary, deer, capybara and other small rodents, lion, cheetah, wolf, snakes and other reptiles, frogs, and salamanders (Graham and Lundelius 1994; Hudson and Brattstrom 1977). In addition to illuminating the striking differences between the Pleistocene and today in south California, this abundant fossil record has been vital in studies of extinction (e.g., Barnosky et al. 2004; Sandom et al. 2014; Scott 2010), ecology (e.g., Connin et al. 1998), and climate change (e.g., Roy et al. 1996). Therefore, Qof₄ and Qof₂ both have a high paleontological sensitivity, based on SVP (2010) guidelines.

Early Pleistocene to Pliocene Fernando Formation

Although not mapped at the surface within the Project Site or its immediate vicinity, the early Pleistocene to Pliocene Fernando Formation is mapped at the surface near downtown Los Angeles (Campbell et al. 2014; Dibblee and Ehrenspeck 1991) and is present at variable depths throughout the Los Angeles Basin. The Fernando Formation consists of light olive brown and light yellowish brown to dark yellowish brown, clayey siltstone, fine- to medium-grained sandstone, and pebbly conglomerate of marine origin that is massive, highly weathered, and oxidized, becoming darker in color, more massive, unoxidized, and more lithified with depth (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Lamar 1970; Yerkes 1997). Although not mapped at the surface of the Project Site, SWCA (2021) observed the Fernando Formation underlying older alluvial deposits at depths of 15 to 38 feet bgs during paleontological monitoring of a mixed-use development in the Koreatown neighborhood of Los Angeles, approximately 3.0 miles southeast of the Project Site. Moreover, the results of the geotechnical investigation indicate that interbedded layers of very stiff to hard clays and silts are present at depths of 10 to 15 feet bgs extending to 75 feet bgs (GPI 2020), which may consist of Qof₄ and/or Qof₂ that gradually transition to Fernando Formation (see above). Conversely, the NHMLA (2023) records search results do not indicate the presence of fossil localities recorded at the surface or at depth in the immediate vicinity of the Project Site from the Fernando Formation. It is possible that the Fernando Formation may “pinch out” or interfinger with the similarly aged Puente Formation in this portion of the Los Angeles Basin. Nonetheless, the maximum depth of excavation for the Project is anticipated to be 36 feet bgs, and the early Pleistocene to Pliocene Fernando Formation, if present, may be impacted by the earthwork activities during construction or implementation of the Project.

The Fernando Formation has yielded marine and nonmarine fossils and is generally regarded as fossiliferous. Fossil localities from this unit have yielded foraminiferans, sponges, corals, brachiopods, bryozoans, scaphopods, gastropods, bivalves, cephalopods, fiddler crabs, sea urchins, sharks, bony fish, bird, unidentifiable mammals, and plants (Clarke et al. 1980; Groves 1992; Huddleston and Takeuchi 2006; Morris 1976; Paleobiology Database 2023; Schoellhamer et al. 1981; University of California Museum of Paleontology 2023; Woodring 1938). Therefore, the early Pleistocene to Pliocene Fernando Formation has a high paleontological sensitivity, based on SVP (2010) guidelines.

Early Pliocene to Late Miocene Puente Formation

Although not mapped at the surface within the Project Site or its immediate vicinity, the early Pliocene to late Miocene Puente Formation is mapped at the surface approximately 1.0 mile to 1.5 miles east of the Project Site (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Yerkes 1997). The Puente Formation

consists of four members: Sycamore Canyon (referred to by Dibblee and Ehrenspeck [1991] as “unnamed shale”), Yorba, Soquel, and La Vida; however, the mapped geologic units of the Puente Formation in central Los Angeles are not assigned to any of these members, and therefore, are not discussed further here. Within central Los Angeles, the Puente Formation consists of an early Pliocene siltstone unit, consisting of light gray siltstone that is well bedded with thick beds that progressively thin at depth, and a late Miocene sandstone unit, consisting of medium to light brown and light gray, very fine-grained to very coarse-grained sand, well bedded and well cemented, with discoidal concretions in the lower extent of the geologic unit (Campbell et al. 2014; Yerkes 1997). The Puente Formation is widespread within the subsurface near downtown Los Angeles, where it mostly underlies (and sometimes interfingers with) the Fernando Formation at depth (see above). The results of the geotechnical investigation indicate that interbedded layers of very stiff to hard clays and silts are present at depths of 10 to 15 feet bgs extending to 75 feet bgs (GPI 2020), which may consist of Qof₄ and/or Qof₂ that gradually transition to Fernando Formation (if present) and/or the Puente Formation (see above). The NHMLA (2023) reports several co-located fossil localities from the Puente Formation in the Project’s vicinity recovered at depth of at least 91 feet bgs, suggesting that the Puente Formation may only be present at deep depths (deeper than 75 feet bgs). Conversely, SWCA (2021) observed the Puente Formation at 38 feet bgs during paleontological monitoring of a mixed-use development in the Koreatown neighborhood of Los Angeles, approximately 3.0 miles southeast of the Project Site. Nonetheless, the maximum depth of excavation for the Project is anticipated to be 36 feet bgs, and the early Pliocene to late Miocene Puente Formation, if present, may be impacted by the earthwork activities during construction or implementation of the Project.

The Puente Formation has a history of preserving terrestrial fossil taxa, such as rhinoceros, mastodons, rabbits, rodents, and insects, and marine fossil taxa, such as pinnipeds, desmostylids, whales, sharks, bony fish, crustaceans, cephalopods, bivalves, sponges, and foraminifers (Barboza et al. 2017; Carnevale et al. 2008; David 1943; Feldmann 2003; Fritzsche 1980; Hilton and Grande 2006; Huddleston and Takeuchi 2006; Leatham and North 2017; Pajak 1992; Pierce 1945; Pimiento 2014; Rigby and Albi 1996; Santos et al. 2016; Saul and Stadum 2005; Scherzer 2017). Therefore, the early Pliocene to late Miocene Puente Formation has a high paleontological sensitivity, based on SVP (2010) guidelines.

Museum Records Search

The NHMLA (2023) performed a museum records search for fossil localities within the Project Site. The NHMLA (2023) does not possess records of paleontological resources from within the Project Site; however, several fossil localities have been recorded in its vicinity from the same or similar geologic units. Several fossil localities were recovered from unnamed Pleistocene deposits that vary in depth from 5 to 6 feet bgs to depths of at least 80 feet bgs. Additionally, several co-located fossil localities were recovered from the Puente Formation from depths of at least 91 feet bgs. Table 1 summarizes the results of the NHMLA (2023) museum records search. Appendix A (confidential) provides the results of the museum records search.

Table 1. NHMLA Fossil Localities near the Project Site

Locality Number	Approximate Distance (miles) from the Project Site	Formation	Taxa	Approximate Depth (ft bgs)
LACM VP 6297 – 6300	1.40 miles	Older alluvium (Pleistocene; pebble-gravel; sand; sand and clay).	Horse (<i>Equus</i>), mastodon (<i>Mammuth americanum</i>), bison (<i>Bison</i>), camel (<i>Camelops</i>).	47–80 feet bgs

Locality Number	Approximate Distance (miles) from the Project Site	Formation	Taxa	Approximate Depth (ft bgs)
LACM VP 5845	1.50 miles	Unknown formation (Pleistocene, unconsolidated yellow sediments).	Mastodon (<i>Mammutidae</i>).	5–6 feet bgs
LACM VP 3371	1.60 miles	Unknown formation (Pleistocene; green clay).	Bison (<i>Bison</i>).	12 feet bgs (sewer replacement project)
LACM VP 6205-6207; LACM IP 16847	1.80 miles	Puente Formation (dark brown to brown laminated siltstone).	Herring (<i>Xyne grex</i>), sardine (<i>Ganolytes cameo</i>), ridgehead (<i>Scopelogadus</i>), lanternfish (<i>Diaphus</i>), drumfish (<i>Lompoquia</i>), bristlemouth (<i>Cyclothone</i>), bottlefish (<i>Danaphos</i>), rayfinned fish (<i>Gadoidei</i>), needlefish (<i>Belonidae</i>), cod-like fish (<i>Moridae</i>), tuna/mackerel/bonito family (<i>Scombridae</i>), slickhead (<i>Aleopcephalidae</i>), deepsea smelt (<i>Bathylagidae</i>).	91 feet bgs
LACM VP 7495	2.15 miles	Older alluvium (Pleistocene; siltstone & claystone that overlies unconsolidated sand).	Camel (<i>Camelops hesternus</i>), bison (<i>Bison antiquus</i>), horse (<i>Equus occidentalis</i>), mammoth (<i>Mammuthus columbi</i>), rabbit (<i>Sylvilagus</i>), kangaroo rat (<i>Dipodomys</i>), vole (<i>Microtus</i>), pocket gopher (<i>Thomomys</i>), turtle (<i>Clemmys</i>).	Unrecorded; 171-174 feet above mean sea level (collected during construction of Bldg. A for the Grove at Farmers Market)
LACM VP 3261	2.80 miles	Unknown formation (pebbly silt medium to coarse grained).	Elephant family (<i>Proboscidea</i>).	Unknown (collected during construction of the North Outfall Sewer)

Source: NHMLA (2023)

IMPACT ASSESSMENT

SWCA conducted this assessment to analyze the potential for significant impacts to paleontological resources resulting from implementation or construction of the Project. SWCA analyzed the existing data to estimate the depth of artificial fill and to determine the geologic units likely to be present in the subsurface at relevant depths that may be impacted by ground-disturbing activities.

Although unmapped at the surface by Campbell and others (2014), Recent artificial fill is present at the surface, extending to unknown depths. For the purposes of this assessment, SWCA assumes that the artificial fill extends to 10 to 15 feet bgs, based on the changes in lithology noted by GPI (2020) during the geotechnical investigation. Campbell and others (2014) map the surface of the Project Site as Qof₄, with the uppermost “native” or natural strata of Qof₄ likely partially replaced by artificial fill. At unknown depth, Qof₄ likely transitions into Qof₂, which subsequently is underlain by Fernando and Puente formations at unknown. Based on the results of this assessment, unmapped Recent artificial fill has a low paleontological sensitivity (but is underlain by geologic units of high paleontological sensitivity), and Qof₄, Qof₂, Fernando Formation, and Puente Formation all have high paleontological sensitivity. Therefore, the uppermost 10 to 15 feet bgs have a low paleontological sensitivity, and the sediments greater than 10 to 15 feet bgs have a high paleontological sensitivity.

The Project would include a parking structure with two above grade parking levels and two subterranean parking levels. Ground disturbance is expected to extend to a maximum depth of 36 feet bgs.

Construction of the two subterranean parking levels would require excavations in both low and high paleontological sensitivities. *Using the more conservative estimate for the maximum depth of artificial fill*, earthwork activities greater than or equal to 10 feet bgs may disturb previously undisturbed “native” or natural sediments or rocks with the potential to contain scientifically significant or “unique” paleontological resources.

Any significant fossils encountered during ground disturbances greater than 10 feet bgs in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA.

CONCLUSIONS AND RECOMMENDATIONS

SWCA conducted an analysis of existing data, including a review of geologic maps, geotechnical subsurface information, scientific literature and online fossil locality databases, and museum records search results to classify the paleontological sensitivity of the geologic units present at the surface and subsurface and to determine the potential for significant impacts to scientifically significant or “unique” paleontological resources because of implementation or construction of the Project.

Although unmapped at the surface by Campbell and others (2014), Recent artificial fill is present at the surface, extending to unknown depths. For the purposes of this assessment, SWCA assumes that the artificial fill extends to 10 to 15 feet bgs, based on the changes in lithology noted by GPI (2020) during the geotechnical investigation. Using a conservative estimate of the maximum depth of artificial fill, we assume “native” or natural strata may be present as shallow as 10 feet bgs. Campbell and others (2014) map the surface of the Project Site as Qof₄, with the uppermost “native” or natural strata of Qof₄ likely partially replaced by artificial fill. At unknown depth, Qof₄ likely transitions into Qof₂, which subsequently is underlain by Fernando and Puente formations at unknown. Based on the results of this assessment, unmapped Recent artificial fill has a low paleontological sensitivity (but is underlain by geologic units of high paleontological sensitivity), and Qof₄, Qof₂, Fernando Formation, and Puente Formation all have high paleontological sensitivity.

Earthwork activities greater than 10 feet bgs may disturb previously undisturbed “native” or natural sediments or rocks with the potential to contain scientifically significant or “unique” paleontological resources. Any significant fossils encountered during ground disturbances greater than 10 feet bgs in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA. However, implementation of appropriate mitigation measures will ensure that paleontological resources, if encountered, are assessed for significance and, if deemed significant, are salvaged and curated with an accredited repository. These actions will reduce impacts to paleontological resources to less-than-significant levels, pursuant to CEQA. Accordingly, SWCA recommends the following mitigation measures, which have been developed in accordance with and incorporate the performance standards of the SVP (1995, 2010), state and local regulations, and published best practices in mitigation paleontology (Murphey et al. 2019).

1. **Retain a Qualified Professional Paleontologist:** The project applicant should retain a qualified professional paleontologist (qualified paleontologist/project paleontologist/principal paleontologist), who meets or exceeds the SVP definition, to carry out all regulatory compliance measures and protocols related to paleontological resources. The qualified professional paleontologist should obtain a curatorial arrangement with a qualified repository (e.g., NHMLA)

before construction in the event of significant paleontological resource discoveries during construction.

2. **Conduct Worker Training:** The qualified professional paleontologist should develop worker environmental awareness program training to educate the construction crew on the legal requirements for preserving fossil resources, as well as the procedures to follow in the event of a fossil discovery. This training program should be given to the crew before ground-disturbing work commences and should include handouts to be given to new workers as needed.
3. **Monitor for Paleontological Resources:** Full-time paleontological monitoring should occur during ground-disturbing activities greater than or equal to 10 feet bgs that have the potential to impact previously undisturbed deposits of late Pleistocene old fan deposits, Unit 4 (Qof₄), late Pleistocene old fan deposits, Unit 2 (Qof₂), early Pleistocene to Pliocene Fernando Formation, and/or early Pliocene to late Miocene Puente Formation. Monitoring should not be required when ground-disturbing activities are less than 10 feet bgs, or when impacting only previously disturbed sediments and/or Recent artificial fill regardless of depth. Monitoring should be conducted by a qualified paleontological monitor who meets the standards of the SVP (2010) and who should be supervised by the qualified professional paleontologist. The qualified professional paleontologist may periodically inspect construction activities to adjust the level of monitoring in response to subsurface conditions. Monitoring efforts can be increased, reduced, or ceased entirely if determined adequate by the qualified professional paleontologist. Paleontological monitoring should include inspection of exposed sedimentary units during active excavations within sensitive geologic sediments. The monitor should have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, should the fossils be determined significant, professionally and efficiently recover the fossil specimens and collect associated data. The monitor should record pertinent geologic data and collect appropriate sediment samples from any fossil localities. Recovered fossils should be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological repository (e.g., NHMLA).
4. **Prepare a Paleontological Resources Monitoring Report:** Upon conclusion of ground-disturbing activities, the qualified professional paleontologist overseeing paleontological monitoring should prepare a final paleontological resources monitoring report that documents the paleontological monitoring efforts and describes any paleontological resources discoveries observed and/or recorded during earthwork activities associated with construction or implementation of the Project. If paleontological resources are curated, the final monitoring report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final monitoring report should be filed with City Planning.

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APPENDIX A

Natural History Museum of Los Angeles County Paleontological Records Search

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

This confidential report is on file with
the Department of City Planning.