

SAN DIEGO NATURAL HISTORY MUSEUM

24 September 2025 (revised 16 January 2026)

David Brunzell
BCR Consulting LLC
505 West 8th Street
Claremont, California 91711

RE: Paleontological Resources Investigation Report – Woodcrest Retail Center Study (Case Number PPT240018)

Dear Mr. Brunzell,

This letter presents the results of an assessment of paleontological resource potential for the Woodcrest Retail Center project (“Project”; Case Number PPT240018) site, located in Woodcrest, Riverside County, California (Figure 1). The approximately 8.1-acre Project site is bounded to the east by Washington Street, to the south by Van Buren Boulevard, and on all other sides by existing commercial/retail development. The Project proposes to construct a new retail development that will include a market, a building with shops, and three satellite buildings. The buildings will be single-story structures. The market will cover a footprint of approximately 46,500 square feet (sf) and the footprints of the other buildings range from 3,000 to 5,000 sf. The satellite building at the southeast corner of the site will house a convenience store and gas station. New paved and landscaped parking areas are also planned.

Definition of Paleontological Resources

As defined here, paleontological resources (i.e., fossils) are the buried remains and/or traces of prehistoric organisms (i.e., animals, plants, and microbes). Body fossils such as bones, teeth, shells, leaves, and wood, as well as trace fossils such as tracks, trails, burrows, and footprints, are found in the geologic units/formations within which they were originally buried. The primary factor determining whether an object is a fossil is not how the organic remain or trace is preserved (e.g., “petrified”), but rather the age of the organic remain or trace. Although typically it is assumed that fossils must be older than ~11,700 years (i.e., the generally accepted end of the last glacial period of the Pleistocene Epoch), organic remains older than recorded human history and/or older than middle Holocene (about 5,000 radiocarbon years) can also be considered to represent fossils (Society of Vertebrate Paleontology [SVP], 2010).

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of prehistoric life and are used to understand the history of life on Earth, the nature of past environments and climates, the membership and structure of ancient ecosystems, and the pattern and process of organic evolution and extinction. In addition, fossils are considered to be non-renewable resources because typically the organisms they represent no longer exist. Thus, once destroyed, a particular fossil can never be replaced.



Figure 1. Overview map of the Project site, Woodcrest, Riverside County, California.

Finally, paleontological resources can be thought of as including not only the actual fossil remains and traces, but also the fossil collecting localities and the geologic units containing those localities. The locality includes both the geographic and stratigraphic context of fossils—the place on the earth and stratum (deposited during a particular time in Earth’s history) from which the fossils were collected. Localities themselves may persist for decades, in the case of a fossil-bearing outcrop that is protected from natural or human impacts, or may be temporarily exposed and ultimately destroyed, as is the case for fossil-bearing strata uncovered by erosion or construction. Localities are documented with a set of coordinates and a measured stratigraphic section tied to elevation detailing the lithology of the fossil-bearing stratum as well as overlying and underlying strata. This information provides essential context for any future scientific study of the recovered fossils.

Methods

A review of published geological maps covering the Project site and surrounding area was conducted to determine the specific geologic units reported to underlie the Project site. Relevant published and unpublished geological and paleontological reports were also reviewed. In addition, searches of the paleontological collection records housed at the Western Science Center (WSC) and the San Diego Natural History Museum (SDNHM) were conducted in order to determine if any documented fossil collection localities occur at the Project site or within the immediate surrounding area. A field survey was conducted on 14 January 2026 by SDNHM paleontologist Bradford O. Riney to field-check the mapped geology. Each geologic unit present within the Project site was subsequently assigned a paleontological resource potential utilizing resource assessment criteria developed by the County of Riverside that are based, in part, on the standards set forth by SVP (SVP, 2010), and that also take into account the possibility for adverse impacts due to human influence. The County recognizes a tripartite scale of paleontological potential: High Potential (High A and High B subcategories), Low Potential, and Undetermined Potential (County of Riverside, 2015).

Results

Published geological mapping covering the Project area (e.g., Morton and Miller, 2006; Dibblee and Minch, 2003) depicts the Project site as mostly underlain at the surface by the Cretaceous-age (about 106 million years old) Val Verde Tonalite (a type of felsic plutonic igneous rock), which is overlapped in the southeastern corner of the Project site underlain by middle to late Pleistocene-age (129,000 to 11,700 years old) old alluvial-fan deposits, unit 3 (Figure 2). Morton and Miller (2006) describe the old alluvial-fan deposits as “moderately dissected interstratified sand and gravel.” Dibblee and Minch (2003) do not distinguish units of old alluvial-fan deposits in their mapping, but also map old alluvial fan deposits as occurring in the southeastern corner of the Project site. The geotechnical investigation encountered the Val Verde Tonalite, as well as residual soils and artificial fill, in test pits located in areas of the site not covered by existing development (Geotechnical Professionals Inc., 2020). The geotechnical investigation did not excavate any test pits in the southeastern corner of the Project site, which is currently occupied by retail development and an existing 7-Eleven convenience store and gas station, and did not report the occurrence of alluvial-fan deposits elsewhere on the Project site (Geotechnical Professionals Inc., 2020).

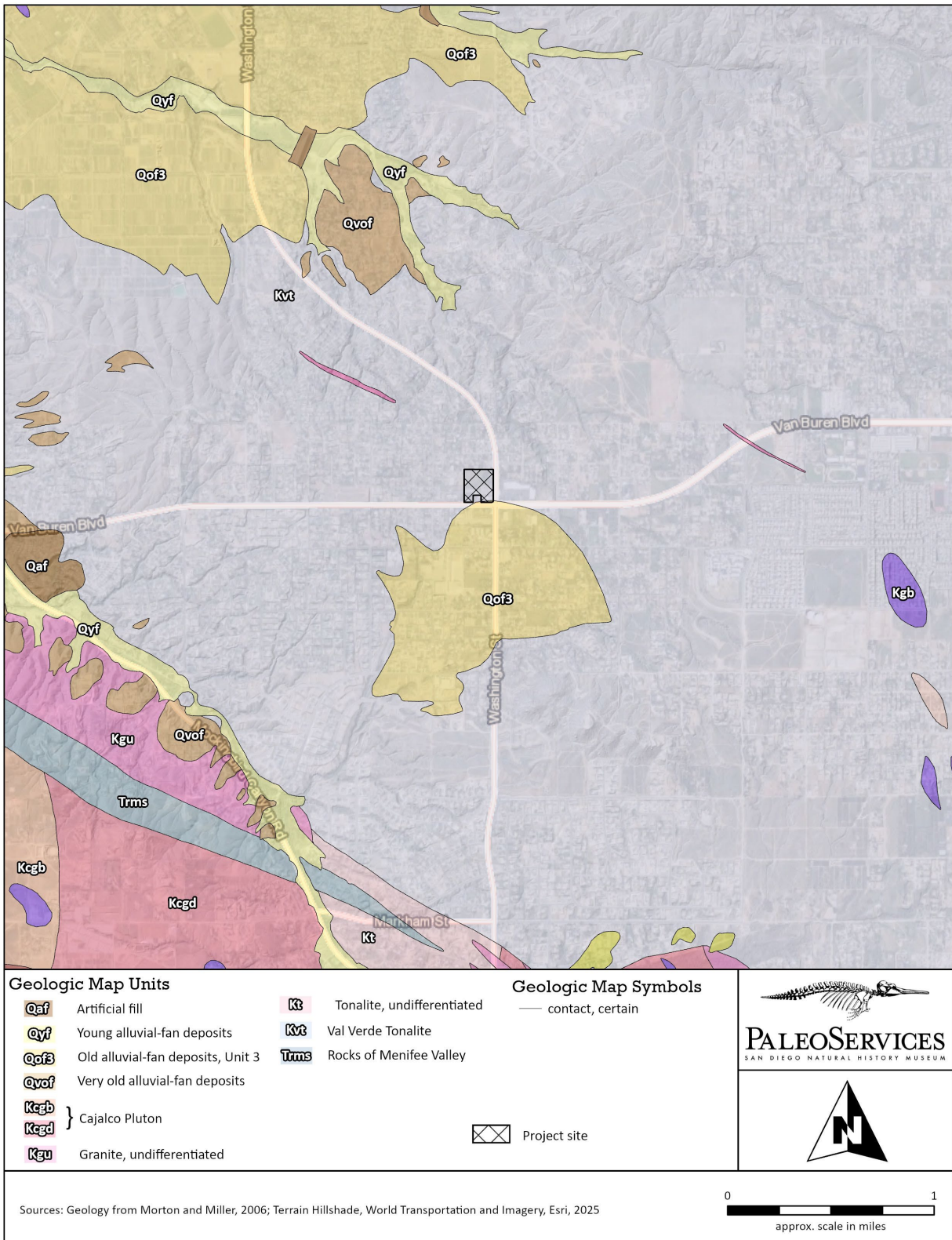


Figure 2. Geologic map of the Project site, Woodcrest, Riverside County, California.

A records search of paleontological collections data held at the WSC returned the result that no fossil localities are known within one mile of the Project site (Appendix A). The closest SDNHM fossil locality from similar Pleistocene-age alluvial deposits is located approximately 27 miles to the southeast in the San Jacinto Valley within the City of San Jacinto, where fossil remains of bladder snails, frogs, colubrid snakes, lizards, and rodents (including the pocket gopher *Thomomys* sp.) were discovered at a depth of 10 feet below ground surface (bgs) during paleontological monitoring of mass grading for a new middle school (SDNHM unpublished paleontological collections data).

More broadly, fossils have been documented in similar Pleistocene-age alluvial deposits at numerous sites elsewhere within western Riverside County. For example, multiple fossil localities were discovered in Pleistocene-age alluvial deposits during construction of the Aldi Distribution Center in the City of Moreno Valley, located approximately 15 miles northeast of the Project site (LSA, 2014). These localities produced isolated fossil remains of giant ground sloth (*Megalonyx jeffersonii* or *Nothrotheriops shastensis*), camelid (*Hemiauchenia*), and extinct horse (*Equus*) (LSA, 2014). The fossil-bearing deposits were exposed at depths of 11 and 13 feet bgs in an area where young alluvial-fan deposits are mapped at the surface (LSA, 2014). Additionally, significant fossils were discovered approximately 25 miles to the southeast of the Project site in Pleistocene-age braided stream and lake deposits exposed during construction of the Diamond Valley Lake project. Recovered fossils consist of large-bodied “Ice Age” mammals (e.g., ground sloth, weasel, skunk, badger, wolf, saber-toothed cat, American lion, puma, peccary, camel, pronghorn antelope, deer, bison, mastodon, and mammoth) (Springer et al., 2009; 2010).

As observed during the paleontological field survey, the Project site is generally flat-lying with the exception of a large elevated fill pad located just north of the existing 7-Eleven and other retail shops (Figures 3 and 4). The site is almost entirely covered with vegetation where it is not developed (Figure 5). Along the slopes of the fill pad, artificial fill was observed to consist of tan-brown poorly sorted sand. Patches of artificial fill were also observed across the Project site. The southeast margin of the Project site, which is the only area where alluvial deposits are mapped, is covered by existing paved parking and retail development (Figure 6). Alluvial deposits and intrusive igneous rocks were not observed during the survey on the Project site. In addition, no fossils were observed during the paleontological field survey.

The Val Verde Tonalite is assigned a low paleontological potential based on its intrusive igneous origin, which involved high temperatures and pressures not conducive to life or fossil preservation. Old alluvial fan deposits are assigned a high paleontological potential based on the recovery of scientifically significant fossils remains from similar deposits elsewhere in Riverside County. Residual soils are assigned a low paleontological potential based on their relatively young geologic age and the weathering processes associated with their formation. Finally, previously placed artificial fill is present within the Project site, as observed during the field survey and documented in the site-specific geotechnical report (Geotechnical Professionals Inc., 2020). Because the geographic and stratigraphic origins of artificial fill deposits are unknown, any fossils contained within fill deposits lack the necessary contextual data to enable their scientific study. Therefore, artificial fill is considered to have low paleontological potential. These site conditions are depicted in Figure 7.



Figure 3. Overview of the southeastern portion of the Project site as seen from the top of the fill pad facing southeast, showing grass and patches of exposed artificial fill.



Figure 4. View of a manmade fill pad located in the east-central portion of the Project site. Photo taken looking northwest.



Figure 5. Overview of the northwestern portion of the Project site, looking northwest from the fill pad, showing dense vegetation covering this portion of the site.



Figure 6. View of the southeastern margin of the Project site from across Van Buren Boulevard facing north, showing a paved parking lot, retail shops, and 7-Eleven convenience store and gas pumps.

Impact Analysis

Direct impacts to paleontological resources occur when earthwork activities, such as grading and trenching, cut into the geologic units within which fossils are buried (i.e., geologic units assigned a high paleontological potential). These direct impacts are in the form of physical destruction of fossil remains and loss of original stratigraphic context.

Ground disturbance (such as mass grading to produce level building pads and trenching for subgrade utilities) is anticipated to be required for site development. Based on a review of the current site plan, ground disturbing activities located in areas of high paleontological potential are limited to the southern margins of the southeastern lot, where construction of a convenience store and gas station is planned. Anticipated ground disturbance in this area includes remedial grading, relocation of the existing driveway, and trenching for storm drains and sewer lines. Because this portion of the Project site has been previously developed, it is assumed that the vast majority of this work will impact previously disturbed deposits associated with prior development of the site.

Significance of Impacts

Paleontological resources are considered scientifically and educationally significant nonrenewable resources; they are protected under a variety of laws, regulations, and ordinances. The Project site is located within the County of Riverside. As such, state and local regulations are applicable to the Project.

The **California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.)** protects paleontological resources on both state and private lands in California. This act requires the identification of environmental impacts of a proposed project, the determination of significance of the impacts, and the identification of alternative and/or mitigation measures to reduce adverse environmental impacts. The Guidelines for the Implementation of CEQA (Title 14, Chapter 3, California Code of Regulations: 15000 et seq.) outlines these necessary procedures for complying with CEQA. Paleontological resources are specifically included as a question in the CEQA Environmental Checklist (Section 15023, Appendix G): “Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.” Most CEQA lead agencies follow the definitions and guidelines provided by SVP (2010), which are in line with industry standards (e.g., Murphey et al., 2019). SVP (2010) provides criteria for determining the significance of paleontological resources and for appropriate measures to minimize impacts to paleontological resources. As advised by SVP (2010), impacts to paleontological resources can be minimized to a level below the threshold of significance through: 1.) the permanent preservation of a fossil locality and its contained fossil resources; or 2.) the implementation of a paleontological mitigation program that would reduce any adverse impacts to a level below the threshold of significance through the salvage and permanent storage of any salvaged fossils in an established scientific institution.

The Multipurpose Open Space Element of the **Riverside County General Plan** identifies the occurrence of important historical, archaeological, and paleontological resources within the County. Several policies of the County’s General Plan Multipurpose Open Space Element address paleontological resources directly, and provide the following recommendations:

- **Policy OS 19.6:** Whenever existing information indicates that a site proposed for development has high paleontological sensitivity ... a paleontological resource impact mitigation program

(PRIMP) shall be filed with the County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.

- Policy OS 19.7: Whenever existing information indicates that a site proposed for development has low paleontological sensitivity ... no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the County Geologist shall be notified and a paleontologist shall be retained by the project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.
- Policy OS 19.8: Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity ... a report shall be filed with the County Geologist documenting the extent and potential significance of the paleontological resources on site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.
- Policy OS 19.9: Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the City of Hemet.

Summary and Recommendations

The vast majority of the Project site is underlain by fill, residual soils, and the Val Verde Tonalite, which are all assigned a low paleontological potential, while the southeastern margin of the Project site is underlain by old alluvial fan deposits assigned a high paleontological potential. Earthwork in areas of low paleontological potential will not result in impacts to paleontological resources and will not require any form of paleontological mitigation. Earthwork in the area of high paleontological potential has the potential to impact significant paleontological resources; however, because this area has been previously developed (i.e., the underlying deposits are likely disturbed) and the earthwork proposed for this area is minimal, it is suggested that earthwork in this area has a low potential to impact significant paleontological resources. Mitigation of these potential impacts can be ensured by implementing the following proposed mitigation measure:

PALEO-1. In the case of an inadvertent discovery of paleontological resources, work at the location of the discovery shall cease and a 50-foot-radius buffer around the discovery site shall be established. Earthwork shall be diverted from the buffered area and the property owner and Riverside County Geologist shall be notified. A qualified Project Paleontologist approved by the County of Riverside shall be retained. The discovery site shall not be disturbed until the Project Paleontologist evaluates the find. If the Project Paleontologist assesses the paleontological resources to be significant, subsequent earthwork shall be monitored by a qualified paleontological monitor as deemed necessary by the Project Paleontologist. Any recovered significant fossil remains shall be prepared, identified, and curated into the designated fossil repository (by preference, the Western Science Center), and a final summary report shall be prepared.

This report was prepared by Paleontological Report Writer Zev Brook, Senior Paleontologist Katie M. McComas, and Principal Paleontologist Thomas A. Deméré of the San Diego Natural History

Museum. If you have any questions concerning these findings, please feel free to contact Zev Brook at 619-255-0250 or zbrook@sdnhm.org.

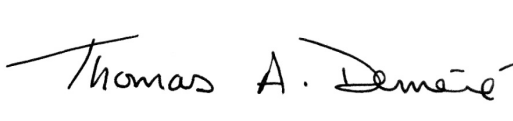
Sincerely,



Zev Brook, M.S.
Report Writer
SDNHM



Katie M. McComas, M.S.
Senior Paleontologist
SDNHM



Thomas A. Demere, Ph.D.
Principal Paleontologist
SDNHM

Literature Cited

- County of Riverside. 2015. County of Riverside General Plan. Prepared by the Planning Department, Riverside County. Adopted 8 December 2015.
- Dibblee, T.W., and Minch, J.A. 2003. Geologic map of the Riverside East / south 1/2 of San Bernardino South quadrangles, San Bernardino and Riverside County, California. Dibblee Geological Foundation, Map DF-109. Scale 1:24,000.
- Geotechnical Professionals, Inc. 2020. Geotechnical Feasibility Investigation, Excavation Characteristics of Weathered Bedrock, Proposed Woodcrest Retail Center. Unpublished report prepared for VBSB, LLC. Dated 6 November 2020.
- LSA. 2014. Paleontological Mitigation Monitoring Report for the Aldi Distribution Center Project, City of Moreno Valley, Riverside County, California. Prepared by Sarah Rieboldt.
- Morton, D.M., and F.K. Miller. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California. U.S. Geological Survey Open-File Report 2006-1217. Scale 1:100,000.
- Murphey, P.C., G.E. Knauss, L. H. Fisk, T.A. Deméré, and R.E. Reynolds. 2019. Best practices in mitigation paleontology. San Diego Society of Natural History, Proceedings 47: 1-43.
- Springer, K., E. Scott, J.C. Sagebiel, and L.K. Murray. 2009. The Diamond Valley Lake local fauna: late Pleistocene vertebrates from inland southern California. In: L.B. Albright III (ed.) Papers on Geology, Vertebrate Paleontology, and Biostratigraphy in honor of Michael O. Woodburne. Museum of Northern Arizona, Bulletin 65:217-235.
- Springer, K., E. Scott, J.C. Sagebiel, and L.K. Murray. 2010. Late Pleistocene large mammal faunal dynamics from inland southern California: The Diamond Valley Lake local fauna. Quaternary International 217: 256–265.
- SVP. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology: 1–11.

Appendix A (Confidential)

Paleontological records search results, Western Science Center.



September 22nd, 2025

San Diego Natural History Museum
Katie McComas
P.O. Box 121390
San Diego, CA 92101

Hello,

This letter presents the results of a record search conducted for the Woodcrest Retail Center Project located in the census-designated place of Woodcrest, Riverside County, CA. The project area is located north of Van Buren Blvd and west of Washington Street on Township 3 South, Range 5 West, Section 26 of the *Steele Peak, CA* USGS 7.5 quadrangle.

The geologic units underlying this project are mapped almost entirely as quartz diorite from the Cretaceous, while the southeastern edge of the project is underlain by Pleistocene-aged alluvial fan deposits (Dibblee and Minch 2003). Pleistocene alluvial units are considered to be of high paleontological sensitivity. The Western Science Center does not have localities within the project area or within a 1 mile radius.

Any fossil specimen from the Woodcrest Retail Center 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

Sincerely,

A handwritten signature in black ink, appearing to read 'Brittney Stoneburg', with a stylized, flowing script.

Brittney Elizabeth Stoneburg
Collections Manager