

Appendix E.2

Revised
April 30, 2024

Ms. Stephanie Standerfer
Vice President
Albert A. Webb Associates
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Riverside, CA 92506
Transmitted via email to stephanie.standerfer@webbassociates.com

RE: Paleontological Memorandum: Constraints Analysis for Sun Lakes Boulevard Realignment Project in the City of Banning, Riverside County, California

Dear Ms. Standerfer,

At the request of Webb Associates, Applied EarthWorks, Inc. (Æ) completed a paleontological constraints analysis for the Sun Lakes Boulevard Realignment Project (Project), City of Banning (City), Riverside County (County), California. The City proposes to extend Sun Lakes Boulevard eastward from its current eastern termination point at South Highland Home Road along the existing Right-of-Way of Westward Avenue to the anticipated connection point at Sunset Avenue.

Written by Æ's paleontology staff who meet Society of Vertebrate Paleontology (SVP, 2010) qualifications standards, this memo follows guidelines set forth by the County of Riverside (2015a, 2015b). Æ's scope of work included desktop review of geologic maps, paleontological literature, museum record searches, and preparation of this technical memorandum (memo), and, as such, this memo satisfies the requirements of the California Environmental Quality Act (CEQA). The Project may impact a U.S. Army Corps of Engineers (USACE) jurisdictional aquatic feature and/or utilize funds with a federal nexus; and if so, the Project or portions of the Project, may be considered a federal undertaking. The City is the lead agency for compliance with CEQA and the USACE is the lead agency under National Environmental Policy Act (NEPA).

PROJECT DESCRIPTION AND BACKGROUND

The Project area is south of Interstate 10 along Westward Avenue in Sections 7 and 18 of Township 3 South, Range 1 East, as shown on the Beaumont, California 7.5' U.S. Geological Survey (USGS) topographic quadrangle maps.

The proposed Project is approximately 1 mile long with a direct footprint width of approximately 200-feet and an additional 50 feet of temporary construction disturbance buffer around the footprint for a maximum disturbance width of approximately 300-feet wide. The Project encompasses approximately 20 acres of direct footprint and an additional approximately 9 acres of temporary construction disturbance area. Project staging and stockpiling will occur within the City's rights-of-way (ROW). Sun Lakes Boulevard will be constructed according to the City's General Plan Typical Section for an



Arterial Highway. Sun Lakes Boulevard will have two eastbound and two westbound lanes, a raised median, bike lanes, sidewalks, associated road striping, drainage, and street light improvements. The proposed maximum depth of ground disturbance for roadway construction is 8 feet below ground surface (bgs).

REGULATORY CONTEXT

Federal laws and regulations apply only when projects are located on federal lands or federally managed lands, or when they are federally funded. Paleontological resources are protected under numerous federal laws and regulations, including the NEPA of 1969, the Federal Land Policy and Management Act of 1976, Statute 23 USC 305 Archaeological and Paleontological Salvage, and the Antiquities Act of 1906. Additionally, the Paleontological Resources Protection Act (PRPA) was recently enacted as a result of the passage of the Omnibus Public Lands Management Act of 2009. The PRPA requires federal land management agencies to manage and protect paleontological resources and affirms the authority of existing policies already in place. This Project is also subject to state laws and regulations in addition to local goals and policies. The City follows the County's regulations and does not have additional city-level codes that reference paleontological resources. The following sections provide an overview of the laws and regulations relevant to the Project.

State

Paleontological resources are protected under CEQA, which requires detailed studies that analyze the environmental effects of a proposed project. If a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. Specifically, in Section VII(f) of Appendix G of the CEQA Guidelines, the Environmental Checklist Form, the question is posed, "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" If paleontological resources are identified as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

Local

There are several policies covering paleontological resources within the County's *General Plan, Multipurpose Open Space (OS) Element* (County of Riverside, 2015a:OS-51):

- **OS 19.6:** Whenever existing information indicates that a site proposed for development has high paleontological sensitivity as shown on Figure OS-8, paleontological resource impact mitigation program (PRIMP) shall be filed with the Riverside County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.
- **OS 19.7:** Whenever existing information indicates that a site proposed for development has low paleontological sensitivity as shown on Figure OS-8, no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the Riverside 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.



- **OS 19.8:** Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity as shown on Figure OS-8, a report shall be filed with the Riverside 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.
- **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.

PALEONTOLOGICAL RESOURCE POTENTIAL

Most professional paleontologists in California adhere to the guidelines set forth by the Society of Vertebrate Paleontology (SVP, 2010) to determine the course of paleontological mitigation for a given project unless specific city, county, state, or federal guidelines are available. The County has developed its own guidelines that establish detailed protocols for the assessment of the paleontological sensitivity of a project area and outline measures to follow in order to mitigate adverse impacts to known or unknown fossil resources during project development (County of Riverside, 2015b).

Following the County's established process, baseline information is used to assign the paleontological sensitivity of a geologic unit(s) (or members thereof) to one of four categories—Low, Undetermined, High A (Ha), and High B (Hb) potential (County of Riverside, 2015b). Geologic units are considered to be “sensitive” for paleontological resources and have a High paleontological resource potential if they are known to contain significant fossils anywhere in their extent, even if outside the Project area. High A (Ha) sensitivity is based on the occurrence of fossils that may be present at the ground surface of the Project area, while High B (Hb) sensitivity is based on the occurrence of fossils at or below 4 feet of depth, which may be impacted during construction activities (County of Riverside, 2015b). A coarse-grained paleontological sensitivity map of Riverside County indicates the sensitivity rankings across the ground surface based on the County's established process (County of Riverside, 2015a: Figure OS-8, OS-55).

Methodology

Æ's scope of work required only desktop research and no fieldwork. The desktop investigation began by Æ overlaying the Project area on the County's (2015a) paleontological sensitivity map, which shows the project area as “Undetermined” and surrounded by areas of “High A (Ha)” ranking. To refine the paleontological sensitivity presented in the countywide map, Æ reviewed published geologic maps and paleontological literature for geologic units exposed at the ground surface and those likely to occur in the subsurface of the Project area. Æ also retained the Western Science Center of Hemet (WSC) to conduct a record search for fossil localities recorded in their collections (Radford, 2019). To augment these results, Æ also conducted searches of the University of California Museum of Paleontology (UCMP) and the Raymond Alf Paleontological Museum (ALF) online databases.

RESOURCE CONTEXT

The Project area is in the San Geronio Pass, an area of semi-arid badlands and alluvial plains (Rewis et al., 2006) at the boundary between the Transverse Ranges and Peninsular Ranges Geomorphic Provinces



(California Geological Survey, 2002). A geomorphic province is a region of unique topography and geology that is distinguished from other regions based on its landforms and tectonic history (American Geological Institute, 1976). The San Gorgonio Pass is bordered by the San Bernardino Mountains of the Transverse Ranges to the north, the San Jacinto Mountains of the Peninsular Ranges to the south, the San Timoteo Badlands to the southwest, and the Salton Trough to the east. The Transverse Ranges shape the local topography of roughly east-west trending mountain ranges and basins (Rewis et al., 2006). The San Bernardino Mountains are being displaced south along one trace of the San Andreas Fault in this geomorphic province, resulting in a high rate of uplift and a thickening of the crust (California Geological Survey, 2002).

Extensive previous work was conducted during surveys of the geology of the San Gorgonio Pass, starting with paleontological exploration of the Cenozoic valley fill units by Frick (1921) in the late 1910s to early 1920s, who concentrated on the Timoteo Badlands southwest of the Project area. Vaughan (1922) was the first to map the Banning Fault, an important trace of the San Andreas just south of the Project area. The most recent extensive geologic mapping was conducted by Dibblee (1982) based on earlier work, with Cenozoic stratigraphy, geochronology, and paleontology most recently updated by Albright (1999).

The entire valley base forming the San Gorgonio Pass is composed of Late Cenozoic sedimentary rocks unconformably overlying crystalline basement rocks (Rewis et al., 2006). The crystalline basement rocks are composed primarily of Mesozoic granites and some older metasedimentary rocks, and are presumed to completely underlie the basin. However, as the Banning Fault runs roughly east-west, many units are only exposed on a single side of the fault zone (Rewis et al., 2006). Previous studies found some parts of the San Gorgonio Pass to have upwards of 4,500 feet of Cenozoic sedimentary fill above the older basement rocks (Langenheim et al., 2005); however, only younger sedimentary sequences play a role in the geology within the City of Banning.

The Cenozoic geologic units can be separated into Late Miocene-Pliocene, Pleistocene, and Holocene deposits (Rewis et al., 2006). These geologic units are all terrestrial, and record local history of uplift along the fault zone, which resulted in erosion of the basins. Ongoing uplift and rotation along the Banning Fault have deformed the Miocene-Pleistocene sedimentary sequences into a broad anticline, plunging gently toward the northwest (Morton, 1999). The structural geology in the area also places the older sedimentary rocks of the Mt. Eden Formation and the San Timoteo beds (Frick, 1921) at a shallow subsurface depth under much of Banning, and exposed at the surface just north of the City on the Banning Shelf (Rewis et al., 2006). Both the Mt. Eden Formation and San Timoteo Formation are fossiliferous (Albright, 1999, 2000; Reynolds and Reeder, 1986).

The younger sedimentary rocks (Qsu, Qsl) are represented by the upper parts of the San Timoteo beds. Unit Qsl is only exposed farther north on the Banning Shelf; however, unit Qsu is locally exposed throughout much of Banning, with shallow overlying alluvial deposits of Holocene age (Rewis et al., 2006). Many of the younger deposits from the Middle Pleistocene and later are exposed within a one-mile-long radius of the Project area, and are capped only by the thinnest of the Holocene deposits (Rewis et al., 2006).

Holocene-age deposits, particularly those less than 5,000 years old, are typically too young for the fossilization process to occur (SVP, 2010). Therefore, the Holocene-age alluvial deposits across the ground surface of the Project area are unlikely to preserve fossils. These deposits are underlain by older



Holocene- and Pleistocene-age alluvial deposits. The older deposits have yielded significant fossils throughout Southern California from the coastal areas to the inland valleys (Reynolds and Reynolds, 1991; Springer et al., 2009).

RECORDS SEARCH RESULTS

Radford (2019) reports no fossil localities from the WSC collections within the Project area or within a 1-mile-wide buffer zone. However numerous localities are within 10 miles of the Project area. Such localities include subsurface geologic units likely in the Project area at unknown depths. According to Radford, the subsurface lithology of the Project area likely consists of Middle to Late Pleistocene alluvial deposits with high fossil preservation value. For instance, the El Casco Project, which is within 10 miles of the Project area and mapped with the same surficial geology, produced over 16,000 fossils from numerous localities, demonstrating the high likelihood of fossil preservation in the units underlying the Project area. As such, Radford (2019) notes development for the Project even a few feet in depth may encounter Pleistocene deposits with scientifically significant fossils. The vertebrate taxa represented by fossils from these localities include:

- The genus *Equus*, widespread in the Pleistocene and extinct by 10,000 years ago.
- The scimitar-toothed cat *Homotherium* sp., possibly extinct by the Middle Pleistocene in the Western Hemisphere.
- One of the largest Pleistocene giant ground sloths, *Paramylodon* sp., which became extinct about 11,000 years ago.

Æ's search of the UCMP online paleontological database search resulted in over 2,000 fossil specimen listings in Riverside County. However, there are no specimens or localities listed within 10 miles of the Project area (UCMP, 2019). Likewise, the ALF online database also does not include fossil specimen listings within 10 miles of the Project area, although several hundred are within 25 miles (ALF, 2019).

FINDINGS AND RECOMMENDATIONS

Æ used the County's (2015b) sensitivity criteria to determine the paleontological potential of the Project area. When placed over the County's (2015a) paleontological sensitivity map, the entire surface area of the Project area is mapped as High A (Ha). Æ's desktop efforts and the museum record searches support this ranking, as the surficial Holocene-age alluvial deposits overlie very shallow Pleistocene deposits with recorded vertebrate fossils.

Excavations to a maximum depth of 8 feet bgs for the Project, especially at the dry gully crossings, have a high likelihood of encountering these resources in previously undisturbed sediments (i.e., native sediments) of Middle to Late Pleistocene ages. In accordance with the County's (2015a) guidelines for an area with "Ha" ranking, further paleontological resource management, including construction monitoring and Worker Environmental Awareness Program (WEAP) training, will be required prior to issuance of the grading permits.

It has been a pleasure assisting you with this Project. If you have any questions, please do not hesitate to contact me at (541) 852-0150.

Sincerely,



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Edited and Approved By:

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