Applied EARTHWORKS Inc.

133 N. San Gabriel Blvd., Suite 201
Pasadena, CA 91107-3414
O: (626) 578-0119 | F: (626) 204-5500

July 26, 2021

Ms. Theresa Dickerson
Supervising Planner
WSP USA
1100 W. Town and Country Road, Suite 200
Orange, CA 92868
Transmitted via email to Theresa.Dickerson@wsp.com

RE: Paleontological Technical Memorandum for the Replacement of Four Timber Bridges on Chuckwalla Valley Road, Riverside County, California

Dear Ms. Dickerson,

At the request of WSP USA, Inc., Applied EarthWorks, Inc. (Æ) completed a paleontological resource assessment for the Replacement of Four Timber Bridges on Chuckwalla Valley Road (Project) in Riverside County (County), California. The California Department of Transportation (Caltrans) is the lead agency for compliance with the National Environmental Policy Act (NEPA) and the County is the lead agency for compliance with the California Environmental Quality Act (CEQA).

Æ's scope of work included desktop review of geologic maps, paleontological literature, museum records searches, and preparation of this technical memorandum (memo). This memo, which serves as a summary of our findings, was written in accordance with guidelines set forth by Caltrans (2020) and satisfies the requirements of NEPA and CEQA.

PROJECT DESCRIPTION AND BACKGROUND

The County, in cooperation with Caltrans, proposes to replace four existing structurally deficient bridges along Chuckwalla Valley Road near Desert Center in Riverside County, California. The four Chuckwalla Valley Road bridges are:

- Bridge Number 56C0102 over Aztec Ditch (Federal Aid Project Number [FPN] BRLO-5956 [239])
- Bridge Number 56C0103 over Tarantula Ditch (FPN BRLO-5956 [227])
- Bridge Number 56C0104 over Sutro Ditch (FPN BRLO-5956 [226]) and
- Bridge Number 56C0108 over Acari Ditch (FPN BRLO-5956 [225]).

The four bridges are south of Interstate 10 (I-10) between Post mile (PM) R115.2 and PM R120.7. The Project area includes four discontiguous segments centered around each individual bridge, which together total approximately 13.84 acres. The first three bridges (over Aztec, Tarantula, and Sutro ditches), spaced roughly 1 and 1.25 miles apart, are mapped in Sections 5, 9, and 15, respectively, within Township 6 South, Range 17 East. The fourth bridge (over Acari Ditch), approximately 2.5 miles to the southeast of the bridge over Sutro Ditch, is mapped in Section 30 of Township 6 South, Range 18 East.

The first three bridges and the northwest portion of the fourth bridge are shown on the Sidewinder Well, California 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map; the southeast portion of the fourth bridge is on the Aztec Mines, California 7.5-minute USGS topographic quadrangle map.

The Project will replace the four existing 2-lane timber bridges with 2-lane concrete bridges, each with a curb-to-curb roadway width of 32 feet. The proposed roadway will consist of two 12-foot-wide travel lanes with one lane in each direction and a 4-foot-wide shoulder on each side. Modern traffic barriers/railings that meet current Caltrans safety design standards will be installed. The proposed bridges will be approximately 60 to 80 feet long depending on the hydraulic capacity and water surface freeboard requirements of the individual channels. Additionally, approach roadway improvements will be provided, and channel improvements will be administered to avoid future scour problems. It is envisioned that the channel bottom will remain earthen.

All proposed Project construction will occur within the existing roadway right-of-way (ROW), with construction staging and material laydown areas on the roadway itself. Project-related ground disturbance will reach a maximum depth of 20 feet below ground surface (bgs) for excavations associated with bridge construction.

REGULATORY CONTEXT

Paleontological resources are protected under federal and state laws as well as local goals and policies. The *Caltrans Standard Environmental Reference (SER) Environmental Handbook*, Volume 1, Chapter 8 on Paleontology (Caltrans, 2020) provides an overview of relevant laws and regulations and explains the Caltrans policies and procedures used to identify, and, if necessary, mitigate paleontological resources.

Federal

When a proposed project is on federal land or land under federal jurisdiction, Section 101(b)(4) of the Regulations for Implementing the Procedural Provisions of the NEPA directs federal agencies to use all practicable means to "preserve important historic, cultural, and natural aspects of our national heritage." Paleontological resources are "natural aspects of our national heritage." Although funding from the Federal Highway Administration (FHWA) is anticipated, the Project is local and is not subject to federal compliance for paleontological resources. Consequently, paleontological resources are strictly covered under CEQA for this Project.

State

At the state level, 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, 2015: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

As stipulated in the Project's services agreement, this assessment follows guidelines outlined in the *Caltrans SER Environmental Handbook*, Volume 1, Chapter 8 (Caltrans, 2020), which provides specific criteria for determining paleontological significance and assessing paleontological sensitivity. Following their guidelines, two types of paleontological significance are recognized: (1) resources that are eligible for National Natural Landmark status, as defined under 36 CFR 62, and (2) scientifically significant paleontological resources. Because fossil resources with National Natural Landmark status are relatively rare, the scientific significance of paleontological resources is typically evaluated. Significance also may be attributed to a rock unit as a whole, predicated on the research potential of its resources. The preservation potential of a geologic unit for significant paleontological resources is described as sensitivity.

Baseline information gathered during a paleontological resource assessment is used to assign the paleontological sensitivity of a geologic unit(s) (or members thereof) to one of three categories—High Potential, Low Potential, and No Potential (Caltrans, 2020). Geologic units are considered to be sensitive for paleontological resources and have a High Potential if significant vertebrate, invertebrate, plant, or trace fossils have been recovered anywhere in their extent, even if outside the Project area; or if the units are sedimentary rocks that are temporally or lithologically suitable for the preservation of significant fossils. Caltrans considers significant fossils as those that contribute new and useful taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Areas with geologic units considered to have High Potential require monitoring and mitigation.

Geologic units are considered to have a Low Potential if they are sedimentary rocks that have not yielded significant fossils in the past, but may possess the potential for containing fossil remains; or they yield common and widespread invertebrate fossils that do not provide new and useful data. Areas with these units generally do not require monitoring and mitigation. However, as excavation for construction gets underway, it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order (CCO) must be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation is required.

Geologic units with No Potential are intrusive igneous rocks, most extrusive igneous rocks, and moderately to highly metamorphosed rocks that do not preserve fossils. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern.

The County's *General Plan* also includes sensitivity criteria and guidelines for mitigation of paleontological resources (County of Riverside, 2015). Their sensitivity categories include High A (Ha), High B (Hb) Potential, Low, and Undetermined. For comparison, High Potential is split into two categories—Ha and Hb, which area roughly equivalent to High Potential for Caltrans (2020). The County's distinction between Ha and Hb is based on the potential for fossils to occur at the ground surface or to occur at or below 4 feet bgs, respectively. The Low Potential category for the County is roughly equivalent to No Potential and Low Potential for Caltrans (2020). Caltrans (2020) does not include an Undetermined Potential category, for which the sensitivity of a rock unit cannot be determined without additional investigation. The County has assessed the paleontological sensitivity of geologic units on a countywide scale and includes a paleontological sensitivity map in the *General Plan* (County of Riverside, 2015:Figure OS-8, OS-55).

METHODOLOGY

To assess the paleontological sensitivity of geologic units exposed at the ground surface and those likely to occur in the subsurface of the Project area, Æ reviewed published geologic maps and paleontological literature, and conducted museum records searches. For the records searches, Æ retained the Natural History Museum of Los Angeles County (NHMLAC) and the Western Science Center of Hemet (WSC) to conduct a search of fossil localities recorded in their collections (McLeod, 2020; Radford, 2020). Since the NHMLAC collections are divided by fossil type, Æ requested a search for vertebrate fossil localities as the geologic units in and near the Project area are more conducive to the preservation of vertebrate fossils than significant invertebrate, plant, and trace fossils.

To augment these results, Æ also conducted a search of the online database of the University of California Museum of Paleontology (UCMP) and the Raymond M. Alf Museum of Paleontology (RAM), with paleontological collections from across California. Lastly, Æ determined the paleontological sensitivity of the Project area in accordance with Caltrans (2020) guidelines and compared the results to the County's (2015) paleontological sensitivity map.

RESOURCE CONTEXT

The Project is in the Chuckwalla Valley of the Mojave Desert geomorphic province near the boundary with the Colorado Desert geomorphic province (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 Mojave Desert is a broad interior region of isolated mountain ranges separated by expanses of desert plains, bound between the Garlock Fault to the north and the San Andreas Fault to the south (California Geological Survey, 2002). Topography within the province is primarily controlled by two prominent fault trends—a northwest-southeast fault series and an east-west fault series.

The Colorado Desert is a low-lying desert basin approximately 245 feet below sea level dominated in part, by the Salton Trough (California Geological Survey, 2002). It is bounded by active branches of the San Andreas Fault on the west and east, which also delineate the boundaries with the Peninsular Ranges and Mojave Desert provinces, respectively. The Chuckwalla Valley represents a low elevation transitional region from the Mojave Desert to the Colorado Desert that is notable for ephemeral lake basins (playa) and intermittent sand dunes. The playa lakes are thought to have been created during periods of high precipitation throughout the Holocene Epoch (Sutton et al., 2007). It is thought that some of these playa lakes, including the ancient Palen and Ford dry lakes, may also have been remnants of larger perennial (pluvial) lakes in the region created from glacial melting during the Late Pleistocene (Harvey et al., 1999; Kenney, 2010).

From oldest to youngest, the regional geology of the Chuckwalla Valley includes Proterozoic igneous and metamorphic rocks of the Chuckwalla Complex such as the Pinto Gneiss; Paleozoic metasedimentary rocks of the McCoy Mountains Formation and Orocopia Schist; a mélange of Mesozoic plutonic rocks; Paleogene volcanic rocks; and Neogene and Quaternary lacustrine and alluvial deposits, as well as recent eolian deposits (Jennings, 1967a). In the Project area, the surficial geology consists of Pleistocene nonmarine sedimentary deposits (Qc) and Recent (Holocene) alluvium (Qal) derived as alluvial fan deposits from the Chuckwalla Mountains to the southwest via Corn Springs Wash or Ship Creek (McLeod, 2020).

The Pleistocene nonmarine sedimentary deposits (Qc) include alluvium and fanglomerate, and the Brawley Formation. The alluvium and fanglomerate are mostly dissected or with well-developed desert pavement and desert varnish (Jennings, 1967b). The Brawley Formation consists of red-gray clay, siltstone, sandstone, and pebble gravel of partly lacustrine and partly terrestrial origin (Jennings, 1967b).

The Holocene alluvium includes sands, silts, clays, and gravels derived from the Colorado River (Jennings, 1967b). Some of these deposits also locally include some older alluvium (Jennings, 1967b). Approximately 3 miles northeast of the Project area, Quaternary lake deposits (Ql) are exposed at the surface. These include Pleistocene- to Holocene-age playa lake deposits, such as clays and silts of the Palen and Ford dry lakes, and the Pinto Formation of Scharf (1935), which consists of coarse boulder fanglomerate and lacustrine clays with vertebrate fossils of probable Pleistocene age underlying basalt flows in the Eagle and Pinto mountains (Jennings, 1967b). According to Jennings (1967b), the playa lake deposits are claystones, sands, and beach gravels with abundant nonmarine fossils deposited in former extensive Lake Cahuilla within the Salt Trough.

Deposits similar to the Pleistocene nonmarine deposits (Qc) have been demonstrated to be highly fossiliferous throughout inland valleys of Riverside and San Bernardino counties (Reynolds and Reynolds, 1991). Fossils reported from these deposits include a wide variety of megafauna such as mammoths, ground sloths, dire wolves, sabre-tooth cats, horses, camels, and bison, as well as numerous invertebrate and plant taxa (Scott, 2007; Springer et al., 2009). Additionally, fieldwork conducted for the Desert Sunlight Project near Desert Center yielded several specimens of Pleistocene megafauna from surface deposits mapped as unit Qc (Aron et al., 2015).

In contrast to the Pleistocene deposits, Holocene alluvium, such as the Qal unit mapped in the Project area, is typically too young for the fossilization process to occur (Scott and Springer, 2003; Society of Vertebrate Paleontology [SVP], 2010). However, these may form only thin layers above the Pleistocene deposits where present, particularly where contacts between the two units are mapped, such as near Road Bridges 56C0102 and 56C0103 over Aztec Ditch and Tarantula Ditch, respectively. A few petrified wood and nondiagnostic vertebrate specimens were reported from the ground surface of unconsolidated deposits mapped as unit Qal from the nearby Palen Solar Power Project, although these were considered "ex situ" fossils transported an unknown distance from their original geologic contexts, possibly from nearby Pleistocene deposits (DeBusk and Corsetti, 2009). Another nondiagnostic vertebrate specimen also considered to have been redeposited was encountered ex situ on the ground surface also mapped as unit Qal within the nearby Athos Solar Project (Ollendorf et al., 2018; Ollendorf and Shi, 2019).

Jennings (1967b) considers the lake deposits (Ql) near the Project area may be locally undifferentiated from the Holocene alluvium (Qal). Survey results for the nearby Desert Harvest Project support this interpretation since they include similar fossil taxa from both Ql- and Qal-mapped areas, such as tortoise (*Gopherus*), rodent (Rodentia), rabbit (Leporidae), and bird (Aves) (Roeder, 2012). Jennings (1967b) also categorizes the Pinto Formation of Scharf (1935), which has yielded horse and camel fossils, within the unit Ql. While the type section for the Pinto Formation is described several miles west of the Project area, reddish, lacustrine clays in near-surface contexts were uncovered during geotechnical investigations for the nearby Athos Solar Project, and these clays may be lithologically associated with the Pinto Formation (Ollendorf et al., 2018; Ollendorf and Shi, 2019). Alternatively, they may be associated with the reddish clays of the Brawley Formation, which is partly lacustrine in origin and included within unit Qc by Jennings (1967b). Therefore, potentially fossiliferous lake deposits may be present near the ground surface or at shallow depths within the Project area.

Stewart et al. (2012) propose an alternative hypothesis for the occurrence of certain fossils that have been recorded as *ex situ* in the Mojave Desert. Many paleontological studies in the region indicate transport as a likely explanation for fossils found at the ground surface in sediments often believed too young to bear fossils. However, the authors found certain burrowing taxa (i.e., *Gopherus* sp., Leporidae) may instead have died and fossilized within their burrows, and were later exhumed along with the surrounding sediments by the eolian process of sandblasting. For instance, surface finds of tortoise eggshell fragments west of the City of Blythe were radiocarbon dated to 13,620 to 13,790 years before present (Stewart et al., 2012). These fossils are encased in caliche nodules, which typically require a similar length of time or greater to form. Also, the dense concentration and close proximity of these fragile specimens to one another suggest they could not have been transported considerable lateral distances without becoming separated or completely disintegrated. These processes would explain how older fossils can be present on the ground surface without being ex situ. Fossils of burrowing taxa also could be exposed on similarly eroded surfaces throughout the Project area.

RECORDS SEARCH RESULTS

McLeod (2020) reports no fossil localities from the NHMLAC vertebrate collections within the Project area. However, he lists a couple fossil localities in the general vicinity. The closest vertebrate fossil locality from deposits similar to those in the Project area (LACM 5977) is reported from lacustrine deposits east of Bridge Number 56C0108 over Acari Ditch and north of I-10, on the southwest side of Ford Dry Lake. This locality yielded a specimen of pocket mouse (*Perognathus*). The closest localities from the Pinto Formation are LACM (CIT) 208 and LACM 3414 between the Eagle Mountains and the Coxcomb Mountains, also north of I-10 and north-northwest of the Project area. These two localities yielded specimens of tortoise (*Gopherus* sp.), horse (*Equus* sp.), and camel (*Camelops* sp., *Tanupolama stevensi*).

McLeod (2020) suggests older and perhaps finer-grained deposits potentially including some lacustrine deposits from an ancient expanded Palen Lake may be shallowly buried within the Project area. He therefore concludes very shallow excavations in the soil and Quaternary alluvial deposits generally will not uncover significant in situ vertebrate fossils, but deeper excavations encounter them “at modest depth” into older deposits. Consequently, he recommends close construction monitoring of substantial excavations in the Project area to quickly and professionally recover any fossil remains discovered while not impeding development. He also recommends the collection and processing of sediment samples to determine the small-fossil potential of the Project area. Any fossils uncovered during mitigation activities should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

Radford (2020) reports no fossil localities from the WSC collections within the Project area but lists several within 5 to 10 miles northwest of the Project area. These localities are associated with the Desert Harvest Solar Project, just north of Desert Center. The WSC’s collections from these localities include megafauna specimens of rabbit (*Lepus sp.*), deer (*Odocoileus hemionus*), and unidentified large artiodactyla within Late Pleistocene to Early Holocene alluvial deposits. Radford (pers. comm.) notes the deer and unidentified artiodactyla specimens were not reported in Roeder (2012) and may have been reported during a later survey. As a result of these nearby fossil localities, Radford (2020), like McLeod (2020), advises that excavations associated with the current Project could potentially impact paleontologically sensitive Pleistocene and older Holocene alluvial deposits in the Project area. She also recommends a paleontological resource mitigation program to monitor, salvage, and curate any recovered fossils (Radford, 2020).

The UCMP online database lists several dozen microfossil and plant, invertebrate, and vertebrate fossil localities from various deposits to the west of the Orocopia Mountains, approximately 20 miles southwest of Desert Center, but none within a 10-mile radius of the Project area (UCMP, 2020). The vast majority of the specimens from these localities are macrofossils, although some are microfossils, such as foraminifera.

The RAM online database lists 60 results for vertebrate fossils from Riverside County, mostly within the Salton Trough (RAM, 2020). Like the UCMP database, none of the localities in the RAM database are within a 10-mile radius of the Project area. The closest locality (VI-2010005) is a Pleistocene ore deposit with bones from camels, bison, horses, and mammoth found approximately 25 miles southwest of the Project area.

FINDINGS AND RECOMMENDATIONS

Æ reviewed geologic maps, paleontological literature, and records search results to determine the paleontological sensitivity of the Project area. Based on the results of desktop analysis for the Project and Caltrans (2020) guidelines, Æ assigns the entire ground surface of the Project area to High Potential. This finding contrasts with the County's (2015) paleontological sensitivity map, which roughly delineates the portions of the Project area covered by unit Qc as Undetermined Potential (Bridges over Aztec and Sutro ditches) while the portions mapped as unit Qal are Low Potential (Bridges over Tarantula and Acari ditches). The difference between Æ's desktop findings and the County's map suggests the Project area may require additional investigation, such as a pre-construction survey, to ground-truth the desktop results.

For construction monitoring, Æ recommends a paleontological resource impact mitigation program (PRIMP) be prepared by a qualified professional paleontologist who meets the SVP's (2010) standards (Project Paleontologist). The PRIMP must be completed prior to issuance of grading permits. The purpose of the document is to establish mitigation monitoring procedures and discovery protocols based on industrywide best practices (Murphey et al., 2019), for any paleontological resources encountered as a result of earth-disturbing activities during construction of the Project. For instance, Worker's Environmental Awareness Program (WEAP) training should be prepared prior to the start of Project-related ground disturbance and presented in-person to all field personnel to describe the types of fossils that may be found and the procedures to follow if any are encountered. A PRIMP also will indicate where construction monitoring will be required for the Project and the frequency of required monitoring (i.e., full-time, spot-checks, etc.).

If no pre-construction paleontology survey is conducted for this Project, Æ recommends initial full-time monitoring for all ground-disturbing activities in the Project area. Monitoring may be reduced to spot-checks or discontinued at the discretion of the Project Paleontologist if no intact and significant paleontological resources are encountered after the initial period of full-time monitoring. In addition to monitoring procedures, a PRIMP also will provide details about fossil collection, analysis, and preparation for permanent curation at an approved repository such as the WSC. Lastly, the PRIMP describes the different reporting standards to be used—monitoring with negative findings versus monitoring resulting in fossil discoveries.

It has been a pleasure assisting you with this Project. If you have any questions, please do not hesitate to contact me at (626) 578-0119 x407.

Sincerely,

Chris Shi
Project Paleontologist
Applied EarthWorks, Inc.

Edited and Approved By:

Amy Ollendorf, Ph.D., M.S., RPA 12588
Paleontology Program Manager
Applied EarthWorks, Inc.

Encl. References

REFERENCES CITED

American Geological Institute. 1976. Dictionary of Geological Terms. Anchor Press, 472 pp.

Aron, G. L., J. Raum, and C. Richards. 2015. Final Paleontological Monitoring Report: Desert Sunlight Solar Farm, near the community of Desert Center, Riverside County, California. Paleo Solutions, Inc. Prepared for Bureau of Land Management, Palm Springs-South Coast Field Office, Palm Springs, California.

California Department of Transportation (Caltrans). 2020. Standard Environmental Reference Environmental Handbook Chapter 8 – Paleontology. Available at https://dot.ca.gov/programs/environmental-analysis/standard-environmental-reference-ser/volume-1-guidance-for-compliance/ch-8-paleontology. Accessed February 14, 2020.

California Geological Survey. 2002. California Geomorphic Provinces. California Department of Conservation, California Geological Survey Note 36. Available at: https://www.contracosta.ca.gov/DocumentCenter/View/34134/CGS-2002-California-Geomorphic-ProvincesNote-36-PDF. Accessed February 14, 2020.

County of Riverside. 2015. Multipurpose Open Space Element, General Plan Revised, December 8, 2015. Riverside County Planning Department. Available at https://planning.rctlma.org/Portals/14/genplan/general_Plan_2017/elements/OCT17/Ch05_MOSE_120815.pdf?ver=2017-10-11-102103-833. Accessed February 14, 2020.

DeBusk, J., and C. Corsetti. 2009. Paleontological Resources Assessment for the Palen Solar Power Project, Riverside County, California. SWCA Environmental Consultants. Unpublished document prepared for AECOM Environment, Camarillo, California.

Harvey, A. M., P. E. Wigand, and S. G. Wells. 1999. Response of Alluvial Fan Systems to the Late Pleistocene to Holocene Climatic Transition: Contrasts Between the Margins of Pluvial Lakes Lahontan and Mojave, Nevada and California, USA. Catena 36(1999):255-281.

Jennings, C. W. 1967a. Geologic map of California: Salton Sea sheet. 1:250,000. Division of Mines and Geology.

Jennings, C. W. 1967b. Index to Geologic Mapping Used in the Compilation of the Salton Sea Sheet. Division of Mines and Geology.

Kenney, M. 2010. Preliminary Report of Ancient shorelines in Ford Dry Lake for Genesis Solar Energy Project. Tetra Tech EC, Inc. report on file in Docket No. 09-AFC-8 at the California Energy Commission, Sacramento, California.

McLeod, S. A. 2020. Paleontological resources for the proposed RCTD 6 Timber Bridges Project, Æ Project # 3998, in Chuckwalla Valley and San Gorgonio Pass, Riverside County, project area. Natural History Museum of Los Angeles County report submitted February 11, 2020 to Applied EarthWorks.

Murphey, P. C., G. E. Knauss, L. H. Fisk, T. A. Deméré, and R. E. Reynolds. 2019. Best practices in mitigation paleontology. Proceedings of the San Diego Society of Natural History 47:43 pp.

Ollendorf, A., C. Shi, C. Shea, and S. Rohlf. 2018. Paleontological Identification Report for the Athos Renewable Energy Project, Riverside County, California. Applied EarthWorks, Inc. Unpublished document prepared for Aspen Environmental Group, Agoura Hills, California.

Ollendorf, A., and C. Shi. 2019. Paleontological Resource Assessment for the Athos Renewable Energy Project, Riverside County, California. Applied EarthWorks, Inc. Unpublished document prepared for Aspen Environmental Group, Agoura Hills, California.

Radford, D. 2020. Paleontological record search results for the RCTD Bridges Project (AE#3998) in Riverside County, California. Western Science Center report submitted February 13, 2020 to Applied EarthWorks.

Raymond M. Alf Museum (RAM). 2020. Unpublished online museum records search. Raymond J. Alf Museum of Paleontology, The Webb Schools, Riverside, CA. Available at http://69.75.238.120:8080/specify-solr/Specify/. Accessed February 20, 2020.

Reynolds, R. E., and R. L. Reynolds. 1991. The Pleistocene beneath our feet: near-surface Pleistocene fossils in inland southern California basins; pp. 41–43 in M. O. Woodburne, R. E. Reynolds, and D. P. Whistler (eds.), Inland Southern California: the last 70 million years. San Bernardino County Museum Association, Redlands, California.

Roeder, M. A. 2012. A BLM Paleontological Resources Assessment for the Desert Harvest Solar Project and Gen-Tie Lines, Desert Center, Riverside County, California. Chambers Group, Inc. Unpublished document (September) prepared for Bureau of Land Management, Palm Springs-South Coast Field Office, Palm Springs, CA, and enXco Development Corporation, San Ramon, California.

Scharf, D. 1935. The Quaternary history of the Pinto Basin; pp. 11–20 in E. W. C. Campbell and W. H. Campbell (eds.), The Pinto Basin Site: An Ancient Aboriginal Camping Ground in the California Desert. Southwest Museum Papers 9.

Scott, E. 2007. Paleontology review, Yucaipa Freeway Corridor Specific Plan, Calimesa and Yucaipa, San Bernardino County, California. San Bernardino County Museum report submitted April 30, 2007 to P&D Consultants.

Scott, E., and K. Springer. 2003. CEQA and Fossil Preservation in California. The Environmental Monitor, Fall 2003. Association of Environmental Professionals. Available at www.co.contra-costa.ca.us/DocumentCenter/View/34165/ScottandSpringer-2003_CEQA-and-Fossil-Preservation. Accessed March 2, 2020.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee. Available at http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx. Accessed February 19, 2020.

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; pp. 217–235 in L. B. I. Albright (ed.), Papers on Geology, Vertebrate Paleontology, and Biostratigraphy in Honor of Michael O. Woodburne: Flagstaff, Arizona. Museum of Northern Arizona Bulletin 65.

Stewart, J. D., M. Williams, M. Hakel, and S. Musick. 2012. Was it washed in? New evidence for the genesis of Pleistocene fossil vertebrate remains in the Mojave Desert of southern California; pp. 140–143 in R. E. Reynolds (ed.), Searching for the Pliocene: Southern exposures. The 2012 Desert Research Symposium, California State University Desert Studies Center, Zzyzx, California.

Sutton, M. Q., M. E. Basgall, J. K. Gardner, and M. W. Allen. 2007. Advances in Understanding the Mojave Desert Prehistory; pp. 229–245 in T. L. Jones and K. A. Klar (eds.), California Prehistory Colonization, Culture and Complexity. Altamira Press, Lanham, Maryland.

University of California Museum of Paleontology (UCMP). 2020. Unpublished online museum records search. University of California, Berkeley, CA. Available at https://ucmpdb.berkeley.edu/. Accessed February 20, 2020.