
Appendix H

Paleontological Resources Technical Report

MEMORANDUM

To: AES Clean Energy Development, LLC (AES)
From: Michael Williams, PhD Paleontologist, Dudek
Subject: Double Butte Storage Project – Paleontological Resources Assessment
Date: February 2, 2024
cc: Cindi Hoover, Keith Carwana, Sarah Siren, Dudek
Attachments: A – Figures
B – Confidential NHMLA and WSC Paleontological Records Search Results

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA) and guidelines of the Society of Vertebrate Paleontology ([SVP] 2010) guidelines to determine the presence of and potential impacts related to paleontological resources associated with construction and operation of the proposed Double Butte Storage Project (project or proposed project), located in the City of Menifee, Riverside County, California (Figure 1 - Regional Map). This technical memorandum provides the results of the paleontological resources investigation and was prepared by Michael Williams, PhD with editorial comments by Sarah Siren, MSc. Dr. Williams and Ms. Siren are qualified paleontological principal investigators and are approved paleontologists within Riverside County.

To determine the paleontological sensitivity of the project site, Dudek performed a paleontological resources inventory and preconstruction survey in compliance with the CEQA and SVP (2010) guidelines. The inventory consisted of Natural History Museum of Los Angeles County (NHMLA) and Western Science Center (WSC) paleontological records searches, an intensive paleontological survey, and a review of geological mapping and geological and paleontological literature. The results of the paleontological records searches were negative for paleontological resources within the project site and the one-mile radius buffer; however, the NHMLA and WSC reported fossil localities in the vicinity of the project site from the same sediments that underlie the project site on the surface and/or at depth.

1 Project Description and Location

The project proposes to construct and operate a 500-MW Battery Energy Storage System (BESS) facility, with construction occurring in phases as needed. It will interconnect with the Southern California Edison (SCE) Valley Substation through overhead generation-tie (gen-tie) lines. The BESS facility will utilize various battery technologies, such as lithium-ion and flow batteries, to store electrical energy from the grid, ensuring reliability during periods of high customer demand and contributing to California's renewable energy goals. Key components include battery modules and power conversion equipment, with external access-only containers housing the battery modules. These containers will be equipped with robust heating, ventilation and air conditioning (HVAC) systems to maintain proper operating temperatures and monitored via a Supervisory Control and Data Acquisition (SCADA) platform. Safety measures include a six-foot wall and fencing around the perimeter of the site for security.

The project aims to support California's Renewable Portfolio Standard and energy storage objectives while making efficient use of vacant land near existing infrastructure. Battery technology, thermal management, and fire protection are integral to the system's design, ensuring safety and reliability. Interconnection involves the construction of a 500/34.5/13/8kV substation on-site and overhead gen-tie lines to connect with the SCE Valley Substation. The gen-tie line design and structures are adaptable to meet final engineering and SCE's requirements. SCADA systems will enable remote monitoring and control of the facility, with an emphasis on safety. Site access is provided by driveways on Palomar Road and San Jacinto Road, with on-site parking for operational and maintenance personnel. The project will include perimeter walls, landscaping, signage, and lighting to enhance security and safety, pursuant to city requirements. Utilities, public services, and infrastructure needs will be met by SCE, with no on-site water or sewer services required. The project's construction is anticipated to begin in February 2024, with commercial operation expected in 2025. Roadway improvements along Palomar Road and San Jacinto Road will provide adequate site access for workers and emergency services.

Daily operations, monitoring, and dispatching will be conducted remotely, eliminating the need for permanent on-site personnel. Routine inspections and maintenance will involve visits by 8 to 12 staff members. Hazardous materials may be stored on-site for maintenance, managed in compliance with state regulations. At the project's end of life, equipment will be removed and recycled, concluding a lifespan of approximately 30 years. The project represents a significant contribution to California's energy infrastructure, combining state-of-the-art technology with rigorous safety and environmental standards, and aligns with AES's mission to advance clean energy solutions.

The project site encompasses 27 acres of vacant land within the City of Menifee (City). Located along the western portion of Riverside County. The project site is located to the west of the intersection of Case Road and Palomar Road. Situated within an industrial landscape, the project's surroundings include a mix of commercial properties, industrial facilities, and vacant land, with notable neighbors such as the decommissioned IEEC and the SCE Valley Substation.

Located within Riverside County, the project's geographical coordinates are 33.7412 latitude and -117.1563 longitude. This Project is proposed to be constructed across several Assessor's Parcel Numbers (APNs), namely: 331-190-010, 331-190-011, 331-190-014, 331-190-017, 331-190-047, 331-190-056. A temporary construction laydown yard would be located on APN 331-190-060.

2 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing paleontological conditions have been informed by reviewing published geological maps and published and unpublished reports to identify geological units located on the project site and determine their paleontological sensitivity.

Paleontological records search requests were sent to the NHMLA and WSC on September 26, 2022. The records search area included the project site and a one-mile radius buffer. The purpose of the records search was to determine whether there are any known fossil localities in or near the project site to aide in determining whether a paleontological mitigation program is warranted to avoid or minimize potential adverse effects of construction on paleontological resources.

In addition to the records search, Dudek staff will conduct an intensive level pedestrian survey of the project site to confirm geological mapping and determine if fossils are present on the surface of the project site.

3 Paleontological Resources

Paleontological resources are the remains or traces of plants and animals that are preserved in the Earth’s crust, and per SVP (2010) guidelines, are older than written history or older than approximately 5,000 years, which approximates the middle Holocene of Cohen et al. (2023). They are limited, nonrenewable resources of scientific and educational value and are afforded protection under state laws and regulations. This analysis complies with guidelines and significance criteria specified by CEQA and SVP (2010). Table 1, Paleontological Resource Sensitivity Criteria, provides definitions for high, undetermined, low, and no paleontological resource potential, or sensitivity, as set forth in and by the SVP (2010) Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.

Table 1. Paleontological Resource Sensitivity Criteria

Resource Sensitivity / Potential	Definition
High	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. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e. g., ashes or tephtras), 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 sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, 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.

Table 1. Paleontological Resource Sensitivity Criteria

Resource Sensitivity / Potential	Definition
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 (see “definitions” section in this document) 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 located excavations into subsurface stratigraphy.
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.
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 nor impact mitigation measures relative to paleontological resources.

Source: SVP (2010)

3.1 Regulatory Framework

The California Environmental Quality Act

This paleontological resources evaluation was completed to satisfy the requirements of the California Environmental Quality Act (CEQA). The CEQA Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental impacts, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This study satisfies project requirements in accordance with CEQA (13 PRC [Public Resources Code], 15000 et seq.).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the “Environmental Checklist Form,” which addresses the potential for adverse impacts to “unique paleontological resource[s] or site[s] or ... unique geological feature[s].” This provision covers fossils of significant importance, which include the remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth.

California Public Resources Code Section 5097.5

In addition to CEQA's requirements, Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792) regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.

The City of Menifee General Plan

The Open Space and Conservation Element of the City of Menifee General Plan discusses the importance of non-renewable paleontological resources and outlines policies to mitigate negative impacts (City of Menifee 2013). While the goal and policies do not specifically mention paleontological resources, it is assumed they are lumped under cultural resources. The goal and policies are outlined below:

Goal

- **OSC-5:** Archaeological, historical, and cultural resources are protected and integrated into the city's built environment.

Policies

- **OCS-5.1:** Preserve and protect archaeological and historic resources and cultural sites, places, districts, structures, landforms, objects and native burial sites, traditional cultural landscapes and other features, consistent with state law and any laws, regulations or policies which may be adopted by the city to implement this goal and associated policies.
- **OCS-5.2:** Work with local schools, organizations, appropriate Native American tribes with ancestral territories located within the city and other agencies to educate the public about the rich archaeological, historic, and cultural resources found in the city.
- **OCS-5.4:** Establish clear and responsible policies and best practices to identify, evaluate, and protect previously unknown archaeological, historic, and cultural resources, following applicable CEQA and NEPA procedures and in consultation with the appropriate Native American tribes who have ancestral lands within the city.
- **OCS-5.5:** Develop clear policies regarding the preservation and avoidance of cultural resources located within the city, in consultation with the appropriate Native American tribes who have ancestral lands within the city.

3.2 Environmental Setting

Geological Literature, Map, and Geotechnical Report Review

The project site lies within the northern Peninsular Ranges Geomorphic Province, which extends from the tip of the Baja California Peninsula to the Transverse Ranges (the San Gabriel and San Bernardino Mountains) and includes the Los Angeles Basin, offshore islands (Santa Catalina, Santa Barbara, San Nicholas, and San Clemente), and continental shelf. The eastern boundary is the Colorado Desert Geomorphic Province (California Geological Survey 2002; Morton

and Miller 2006a). The ancestral Peninsular Ranges were formed by uplift of plutonic igneous rock resulting from the subduction of the Farallon Plate underneath the North American Plate during the latter portion of the Mesozoic era approximately 90 to 125 million years ago (Abbott 1999).

More specifically, the project site lies within the southern Perris Valley, with Menifee Valley situated just to the south. Perris Valley rests on the Perris Block, which is a relatively flat, rectangular shaped block that is defined by the Elsinore Fault Zone to the west and the San Jacinto Fault Zone to the east (Morton and Miller 2006a). The southern portion of the Perris Block, within which the project site lies, is characterized by extensive exposures of plutonic igneous rocks, punctuated by valleys underlain by younger and older alluvium.

According to surficial geological mapping by Morton (2003) at a 1:24,000 scale and Morton and Miller (2006b) at a 1:100,000 scale, the project site is underlain by late to middle Pleistocene (approximately 129,000 years ago to 774,000 years ago; Cohen et al. [2022]) old alluvial fan deposits (map unit Qof). Lithologically, these deposits are characterized by their reddish-brown coloration, moderate degree of induration, and containing variable amounts of gravel, sand, and silt (Morton 2003; Morton and Miller 2006a).

A review of the geotechnical report for the project (Bruin Geotechnical Services, Inc. 2022) indicated that ten exploratory boreholes were drilled to a maximum depth of 20 feet below the ground surface (bgs). The subsurface geology consisted of moderately to very indurated silty sands with occasional sandy silts and sandy clays. Some observed sediments were slightly cemented (Bruin Geotechnical Services, Inc. 2022).

Paleontological Literature Review

Abundant fossil remains have been recovered from this portion of Perris Valley. Most notably, The Diamond Valley Lake Local Fauna (DVLLF), which was recovered from older lacustrine and fluvial deposits near the city of Hemet in Riverside County, approximately six miles southeast of the project site, yielded over 100,000 fossil specimens including plants, invertebrates, and vertebrates (Springer et al. 2009). With the exclusion of asphaltic localities such as the La Brea Tar Pits, the DVLLF represents the largest late Pleistocene vertebrate fauna in the southwest and continues to yield important scientific data (Springer et al. 2009).

In addition to the DVLLF localities, Jefferson (1991) reported mammoth (*Mammuthus* sp.) from Winchester; and frogs (Anura), turtles (*Clemmys* sp.), snakes (Colubridae, *Crotalus* sp.), birds (Aves), and small and large mammals (Sciuridae, *Dipodomys* sp., *Thomomys bottae*, *Microtus* sp., *Smilodon* sp., *Mammuthus* sp., *Equus* sp. cf. *E. occidentalis*, and *Odocoileus* sp.) from Lakeview Hot Springs (Jefferson 1991).

Paleontological Records Searches

The NHMLA paleontological records search results were received on October 22, 2023 (Confidential Attachment B), and the WSC results are pending. The NHMLA did not report any fossil localities from within the project site; however, they did report six fossil localities in the vicinity of the project from the same or similar Pleistocene deposits underlying the project site. The nearest fossil locality, LACM (Los Angeles County Museum) VP (Vertebrate Paleontology) 5168, produced a fossil horse (*Equus*) from Pleistocene clay deposits at an unknown depth bgs, near Canyon Lake, southwest of the project site (NHMLA 2023; Confidential Attachment B). LACM VP CIT (California Institute of Technology) 571 and 572 yielded horse (*Equus*), peccary (*Platygonus*), and camel (*Camelops*) from an unknown depth bgs south of Lake Elsinore while LACM VP 6059 produced a fossil camel (Camelidae) from an unknown depth bgs east-southeast of Lake Elsinore. Another Pleistocene locality, LACM VP 7261, yielded a fossil

elephant (Proboscidea) and ungulate (Ungulata) from a sandy silt in Auld Valley at an unknown depth bgs (NHMLA 2023; Confidential Attachment B). Finally, LACM VP 4540 produced a fossil horse (*Equus*) from a gravel pit in San Jacinto Valley. This fossil was also collected from an unknown depth bgs.

The WSC paleontological records search results were received on October 31, 2023 (Confidential Attachment B). No fossil localities were reported from within the project site or the one-mile radius buffer; however, the WSC has numerous fossil localities from similar mapped geological units in California. The museum recommended a paleontological resource mitigation program for the project to minimize impacts to scientifically significant fossil resources (Confidential Attachment B).

Intensive Pedestrian Survey

Dudek staff conducted an intensive level pedestrian survey of the proposed project site to verify geological mapping and determine if any fossils are visible on the project site surface. The paleontological surveyor used fifteen-meter interval survey transects in a north-south direction. Both parcels had surface disturbance from agricultural disking, ostensibly for weed management, and were fairly level. Exposed ground surface areas such as dirt tracks, drainage furrows, and rodent burrows/spoils were inspected for potential subsurface fossils and sediment types.

The project site shows signs of having been routinely previously disturbed and partially developed. The northwestern portion of the parcel had the remnants of an asphalt paved lot, with gravel and concrete pavement in the southwestern portion. The northern edge closely parallels the alignment for the Atchison Topeka and Santa Fe Railroad alignment. This railroad segment is not in use and does not intersect the project site. The southern edge of the parcel appears to parallel a large, paved drainage culvert. The offset earth from the construction of this culvert was spread out along the length of the culver and was inspected for resources. The vegetation throughout both parcels was heavy, making ground visibility approximately 10%. Underneath the vegetation were small windows of soil from disking, as well as heavy rodent disturbance. Modern refuse is present, a result of illegal dumping, littering, and homeless encampments.

The southern parcel for the laydown yard showed similar disking surface disturbance with modern refuse and natural alluvial drainage.

No fossils were identified during this survey.

4 Impact Analysis and Conclusions

4.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to paleontological resources are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. A significant impact under CEQA would occur if the proposed project would:

- a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.2 Impact Analysis

a) *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

No paleontological resources were identified within the project site or a one-mile radius buffer as a result of the institutional records searches, paleontological survey, or desktop geological and paleontological review. Additionally, the project site is not anticipated to be underlain by a unique geological feature. The late to middle Pleistocene old alluvial fan deposits underlying the entirety of the project site have high paleontological resource sensitivity or potential. Based on the records search results and map and literature review, the project site has high potential to produce paleontological resources during planned construction activities. In the event that intact paleontological resources are discovered on the project site, ground-disturbing activities associated with construction of the project, such as grading and large diameter drilling during site preparation and trenching for utilities, have the potential to destroy a unique paleontological resource or site. The potential for project activities to damage paleontological resources during construction would result in a potentially significant impact. Mitigation Measure GEO-1, presented below, would reduce potentially significant impacts to a **less-than-significant** level by requiring preparation of a Paleontological Resources Impact Mitigation Program which would involve pre-construction worker awareness training as well as paleontological monitoring and discovery protocol, treatment, reporting, and collection management.

GEO-1: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring. Prior to commencement of any grading activity on site, the project applicant shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) 2010 guidelines to prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the project. The PRIMP shall be consistent with the SVP (2010) guidelines and outline requirements for: preconstruction meeting attendance and worker environmental awareness training; where paleontological monitoring is required within the project site based on construction plans and/or geotechnical reports; and, procedures for adequate paleontological monitoring and discoveries treatment, including paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. The PRIMP shall also include a statement that any fossil lab or curation costs (if necessary due to fossil recovery) are the responsibility of the project applicant.

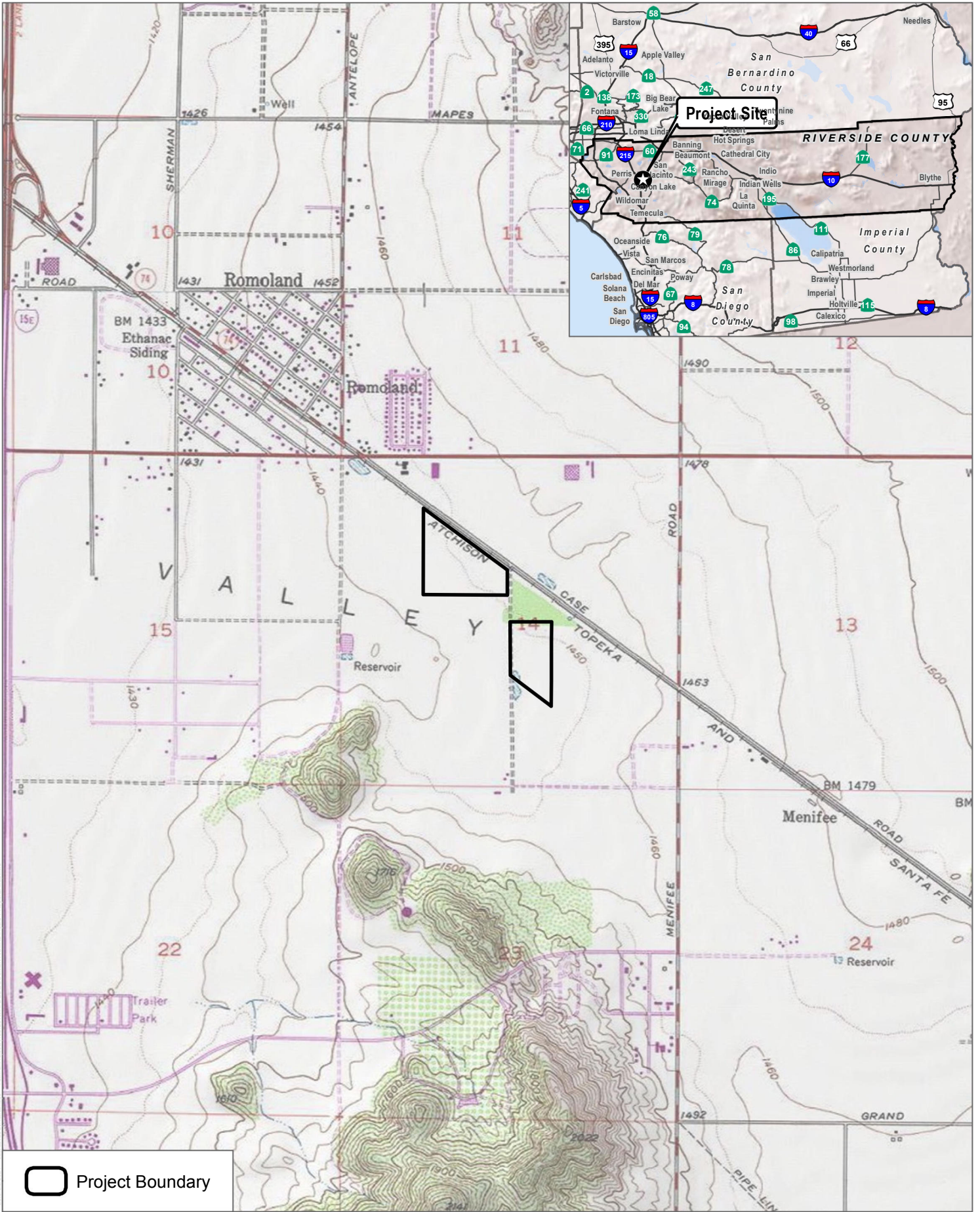
In addition, a qualified paleontological monitor shall be on site during initial rough grading and other significant ground-disturbing activities (including augering) in areas underlain by old alluvial fan deposits. No paleontological monitoring is necessary during ground disturbance within artificial fill, if determined to be present. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

5 References

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- Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 11 p. Available; https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.
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Attachment A

Figures



SOURCE: USGS 7.5-minute Series Romoland Quadrangle

FIGURE 1

Regional Map

Double Butte Battery Storage Project

Confidential Attachment B

NHMLA and WSC Paleontological Records Search
Results

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

October 22, 2023

Dudek
Attn: Michael Williams

re: Paleontological resources for the Double Butte Battery Energy Storage Project (PN: 15342)

Dear Michael:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Double Butte Battery Energy Storage project area as outlined on the portion of the Perris USGS topographic quadrangle map that you sent to me via e-mail on September 26, 2023. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM VP 5168	Point Marina Drive in East Bay Section of Canyon Lake	Unknown formation (Pleistocene; clay)	Horse (<i>Equus</i>)	Unknown
LACM VP CIT571, CIT572	South of Lake Elsinore	Unknown Formation (Pleistocene)	Horse (<i>Equus</i>); peccary (<i>Platygonus</i>); camel (<i>Camelops</i>)	Unknown
LACM VP 6059	Overflow area just east-southeast of Lake Elsinore	unknown formation (Pleistocene)	Camel family (Camelidae)	Unknown
LACM VP 7261	Skinner Reservoir, Auld Valley	Unknown formation (Pleistocene, arenaceous silt)	Elephant clade (Proboscidea); ungulate (Ungulata)	Unknown
LACM VP 4540	junction of Jackrabbit Trail & Gilman Springs Road; San Jacinto Valley	Unnamed Formation (Pleistocene, gravel pit)	Horse Family (Equidae)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a

paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,

A handwritten signature in black ink that reads "Alyssa Bell". The signature is written in a cursive style and is centered below the word "Sincerely,".

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice



October 31st, 2023

Dudek
Michael Williams
605 Third Street
Encinitas, CA 92024

Dear Dr. Williams,

This letter presents the results of a record search conducted for Double Butte Battery Energy Storage Project in the census-designated place of Romoland, Riverside County, California. The project site is located in two portions along the south side of Matthews Road; the northern portion of the project area lies north of McLaughlin Road and west of Palomar Rd, while the southern portion lies south of McLaughlin Road and east of Palomar Road in Township 5S, Range 3W, Section 14 on the *Perris and Romo, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped entirely as alluvial fan deposits from the late to middle Pleistocene epoch (Morton, Bovard, and Morton 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, but does have numerous fossil localities in similarly mapped units throughout California.

Any fossil specimen from the Double Butte Battery Energy Storage 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', written in a cursive style.

Brittney Elizabeth Stoneburg, MSc
Collections Manager