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Description:	This section describes the paleontological resources and geologic units present in the vicinity of the Darden Clean Energy Project site, as well as the potential impacts that may result from construction and operation of the Project related to the destruction of a unique paleontological resource or site, or unique geologic feature.
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5.15 Paleontological Resources

This section describes the paleontological resources and geologic units present in the vicinity of the Darden Clean Energy Project (Project) site, as well as the potential impacts that may result from construction and operation of the Project related to the destruction of a unique paleontological resource or site, or unique geologic feature. Paleontological resources (i.e., fossils) are the remains or traces of prehistoric life. Fossils are typically preserved in layered sedimentary rocks, and the distribution of fossils across the landscape is controlled by the distribution and exposure of the fossiliferous sedimentary rock units at and near the surface. This section relies on information from the Paleontological Resources Assessment prepared for the Project (Rincon 2023; Appendix T). Section 5.15.1 describes the existing environmental setting, including the physiographic and geologic setting. Section 5.15.2 provides an overview of the regulatory setting related to paleontological resources. Section 5.15.3 identifies potential impacts that may result from Project construction and operation (including maintenance), as well as mitigation measures that should be considered during Project construction and operation. Section 5.15.4 discusses cumulative impacts. Section 5.15.5 presents laws, ordinances, regulations, and standards (LORS) applicable to paleontological resources. Section 5.15.6 identifies regulatory agency contacts and Section 5.15.7 describes permits required for the Project related to paleontological resources. Section 5.15.8 provides references for this section.

5.15.1 Environmental Setting

5.15.1.1 Physiographic and Geologic Setting

The Project site is located in the Great Valley geomorphic province, one of the eleven geomorphic provinces of California. The Great Valley is an elongated lowland approximately 50 miles wide and 400 miles long. It is bounded to the east by the Sierra Nevada Range and to the west by the Coast Range (California Geological Survey 2002). A relatively undeformed basin, the Great Valley rises from about sea level to approximately 400 feet in elevation at the north and south ends. The northern portion of the valley, referred to as the Sacramento Valley, is drained by the Sacramento River, while the southern portion of the valley, referred to as the San Joaquin Valley, is drained by the San Joaquin River. Both rivers converge in the Central Valley and drain into San Francisco Bay. The Great Valley is predominantly alluvial, flood, and delta plains formed by these two major river systems.

The sedimentary record in the Great Valley includes typically shallow water marine units from the late Jurassic and Cretaceous, thick units of marine sediments from the Miocene, and brackish and freshwater lake deposits from the late Cenozoic. The San Joaquin Valley was likely an open deepwater marine embayment throughout the Oligocene and Miocene (Addicott 1970), and the thickest sequences of Miocene marine sediments were likely deposited in narrow, deep seaways extending into the Pacific Ocean across the current area of the Coast Ranges in the southern portion of the San Joaquin Valley (Norris and Webb 1976). By the Pliocene, the southern connection to the Pacific Ocean had closed and uplift had drained the San Joaquin Valley to the north through the Carquinez Strait. Pliocene-Pleistocene deposits consist of alluvial sediments including those associated with a number of ancient lake systems, Tulare Lake in the central San Joaquin Valley being the most recent of the ancient systems.

Locally, the Project site is in the western San Joaquin Valley on the Cantua alluvial fan, which is deposited by Cantua Creek as it flows northeastward out of the Diablo Range toward the San Joaquin River, though under modern climatic conditions Cantua Creek very rarely reaches the river. The utility switchyard and alternate green hydrogen component locations would border the foothills of the Ciervo Hills, which form the eastern border of the Coast Ranges. The Project site is located on the Lillis Ranch, Tres Picos Farms, Westside, and San Joaquin, United States Geological Survey 7.5-minute quadrangles.

5.15.1.2 Geology of the Project Site

The geology of the region around the Project site was mapped by Dibblee and Minch (2007), Jennings and Strand (1958), and Miller et al. (1971), who identified three geologic units directly underlying the Project site, Quaternary basin deposits, Quaternary fan deposits, and Quaternary older alluvium, and two additional geologic units, the Tulare Formation and Oro Loma Formation within a one-mile radius of the Project site (Figure 5.15-1).

Quaternary Basin Deposits

Quaternary basin deposits underlie much of the eastern part of the solar facility. Quaternary basin deposits consist of fine-grained sediments that are deposited during flooding events of the major streams and rivers of the San Joaquin Valley (Jennings and Strand 1958). These sediments are late Holocene in age and, therefore, too young (i.e., less than 5,000 years old) to preserve paleontological resources. As a result, Quaternary basin deposits have low paleontological sensitivity from the surface to a depth of 5 feet.

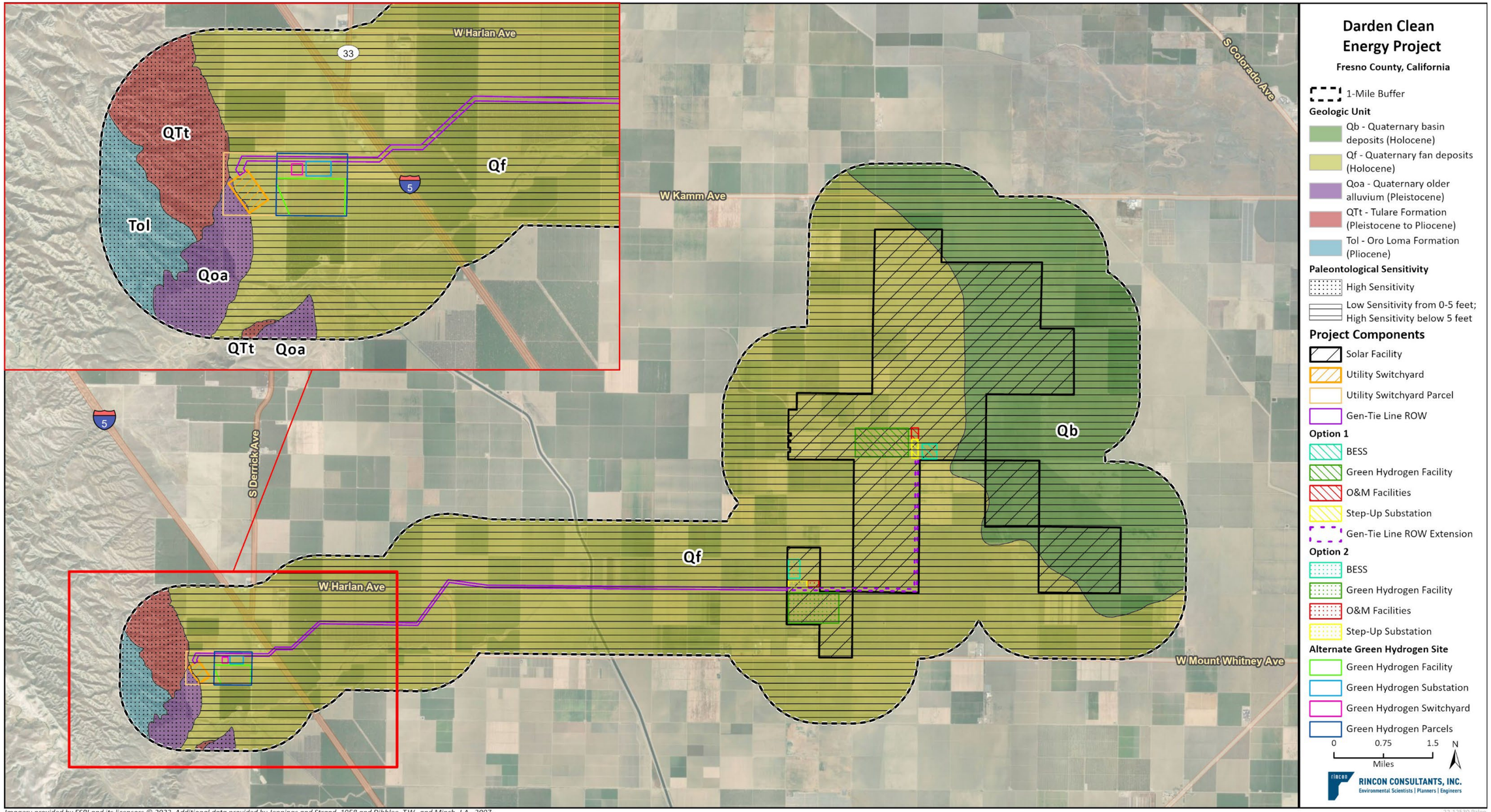
Quaternary Fan Deposits

Quaternary fan deposits underlie the majority of the Project site, including much of the solar facility site, and all of the gen-tie line corridor, Options 1 and 2 step-up substation, BESS, and green hydrogen components, as well as the alternate green hydrogen site. In this region, Quaternary fan deposits consist of a variety of sediments ranging from coarse- to fine-grained and represent alluvial fan sediments deposited by ephemeral streams and mudslides/debris flows originating from the Coast Ranges that form the western border of the San Joaquin Valley (Jennings and Strand 1958; Miller et al. 1971). These sediments are late Holocene in age and, therefore, too young (i.e., less than 5,000 years old) to preserve paleontological resources. As a result, Quaternary fan deposits have low paleontological sensitivity from the surface to a depth of 5 feet.

Quaternary Older Alluvium

Quaternary older alluvium underlies the northwestern part of the utility switchyard. Quaternary older alluvium consists of Pleistocene-aged, dissected gravel and sand (Dibblee and Minch 2007). Pleistocene alluvial sediments have produced scientifically significant paleontological resources throughout California, including in Fresno County, yielding taxa such as bison (*Bison*), horse (*Equus*), deer (*Cervus*, *Odocoileus*), coyote (*Canis latrans*), jackrabbit (*Lepus*), rodents, reptiles, and fish (Jefferson 2010; Paleobiology Database [PBDB] 2023; University of California Museum of Paleontology [UCMP] 2023). Given this fossil-producing history, Quaternary older alluvium has high paleontological sensitivity.

Figure 5.15-1 Geologic Map and Paleontological Sensitivity of Project Site



Imagery provided by ESRI and its licensors © 2023. Additional data provided by Jennings and Strand, 1958 and Dibblee, T.W., and Minch, J.A., 2007.

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Fig X Geologic Units and Paleosensitivity 20230905

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Tulare Formation

The Tulare Formation is located immediately west of the westernmost part of the utility switchyard. The Tulare Formation consists of weakly lithified, gravel, sand, and clay beds that are late Pliocene and Pleistocene in age (Dibblee and Minch 2007). The Tulare Formation has produced several scientifically significant fossils in the San Joaquin Valley, including taxa such as river dolphin (*Parapontoporia*), horse (*Equus*), camel (*Hemiauchenia*), rodents, turtle, birds, fish, and invertebrates (Jefferson 2010; PBDB 2023; UCMP 2023). Given this fossil-producing history, the Tulare Formation has high paleontological sensitivity.

Subsurface Geology

Holocene-aged sediments are generally considered to have low paleontological sensitivity due to their young age. However, at a certain depth in the subsurface, these sediments become old enough to preserve paleontological resources (i.e., 5,000 years old; SVP 2010). It is difficult to estimate absolute age from test borings or well logs because there is no expected change in sediment type across this 5,000-year boundary. However, there are deeper geologic units in this region with known absolute ages that can be used to estimate the relationship of age to depth. Miller et al. (1971) reported the Corcoran Clay Member of the Tulare Formation at a depth of approximately 600 feet near the community of Cantua Creek, which is less than 5 miles north and northwest of the Project site and approximately the same distance from the Ciervo Hills as the southwestern edge of the solar facility. The Friant Pumice Member of the Turlock Lake Formation, which conformably overlies the Corcoran Clay Member has been radiometrically (K-Ar) dated to 615,000 +/- 22,000 years old (Dalrymple 1980) giving a minimum age for the Corcoran Clay Member. Assuming a constant rate of deposition since that time yields an estimate that sediments in this area will reach 5,000 years old at a depth of approximately 4.9 feet. Moving northeast (i.e., further from the Ciervo Hills), the depth of the Corcoran Clay Member does not notably change (Miller et al. 1971), so it is assumed that this 4.9-foot depth is relatively consistent throughout the Project site.

Below this 5-foot-depth, these sediments would be considered Quaternary older alluvium or, potentially, the Tulare Formation (Miller et al. 1971), both of which have high paleontological sensitivity. Given this age-depth estimate, Holocene-aged sediments in the Project site (i.e., Quaternary fan deposits and Quaternary basin deposits) are considered to have low paleontological sensitivity from the surface to a depth of 5 feet and high paleontological sensitivity below 5 feet.

The entire Project site was previously used for agriculture, and it is assumed that prior agricultural activities have disturbed the uppermost 18 inches of sediment.

Unique Geologic Features

Geological features are the result of geological processes, or actions that occur above and below the Earth's surface. Geological features that are unusual or out of the ordinary would be considered unique. For example, many of the rock formations found in Joshua Tree National Park would be considered unique geological features. The Project site is not characterized by any unique geologic features.

5.15.1.3 Paleontology of the Project Site

A formal fossil locality search of the UCMP identified no confirmed fossil localities inside or within a one-mile radius of the Project site (Holroyd 2023).

UCMP invertebrate locality 3074 is labeled as “reef beds north of Cantua Creek”. Cantua Creek runs through the Project site, meaning it is possible that this locality could occur near the Project Site. However, the fossils recovered from this locality represent the marine echinoid (sea urchin) *Scutella merriami*. Per Holroyd, the presence of *S. merriami* makes it unlikely that this locality originates from any of the geologic units underlying the Project site and that the site “more likely occurs on the west side of the highway in what we could now call the Temblor or Santa Margarita formations” (2023).

There are no known paleontological resources found inside or within a one-mile radius of the Project site. Therefore, no map depicting known fossil localities is included in this section.

5.15.1.4 Paleontological Sensitivity of Project Site

Paleontological Sensitivity

Paleontological sensitivity refers to the potential for a geologic unit to produce scientifically significant fossils. Direct impacts to paleontological resources occur when earthwork activities, such as grading or trenching, cut into the geologic deposits within which fossils are buried and physically destroy the fossils. Because fossils are the remains of prehistoric animal and plant life, they are considered to be nonrenewable. These activities may constitute significant impacts under the California Environmental Quality Act (CEQA) or adverse effects under federal environmental protection laws and may require mitigation. Sensitivity is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey.

The discovery of a vertebrate fossil locality is of greater significance than that of an invertebrate fossil locality, especially if it contains a microvertebrate assemblage. The recognition of new vertebrate fossil locations could provide important information on the geographical range of the taxa, their radiometric age, evolutionary characteristics, depositional environment, and other important scientific research questions. Vertebrate fossils are almost always significant because they occur more rarely than invertebrates or plants. Thus, geologic units having the potential to contain vertebrate fossils are considered the most sensitive.

Resource Assessment Criteria

In its Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, the SVP outlines guidelines for categorizing paleontological sensitivity of geologic units within a project site. The SVP describes sedimentary rock units as having a high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources. This criterion is based on rock units within which vertebrates or significant invertebrate fossils have been determined by previous studies to be present or likely to be present. Significant paleontological resources are fossils or assemblages of fossils that are unique, unusual, rare, or uncommon diagnostically, stratigraphically, taxonomically, or regionally (SVP 2010). The paleontological sensitivity of the Project site has been evaluated according to the following SVP (2010) categories:

- **High Potential (Sensitivity).** Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered are considered to have a high potential for containing significant non-renewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontological resources anywhere within their geographical

extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant. Full-time monitoring is typically recommended during any project-related ground disturbance in geologic units with high sensitivity.

- **Low Potential (Sensitivity).** Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well-documented and understood taphonomic processes (those affecting an organism following death, burial, and removal from the ground), phylogenetic species (evolutionary relationships among organisms), and habitat ecology. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potential for yielding significant fossils prior to the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations.
- **Undetermined Potential (Sensitivity).** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potential of the rock units are required before programs of impact mitigation for such areas may be developed.
- **No Potential.** Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

Paleontological Sensitivity Evaluation

The Project site is directly underlain by three geologic units: Quaternary basin deposits, Quaternary fan deposits, and Quaternary older alluvium (Figure 5.15-1). A fourth geologic unit, the Tulare Formation, is not found at the surface directly beneath any Project components but may be impacted by subsurface excavations. Of these geologic units, Quaternary older alluvium and Tulare Formation have high paleontological sensitivity. Quaternary basin deposits and Quaternary fan deposits have low sensitivity from 0 to 5 feet in depth. However, these geologic units have high paleontological sensitivity below 5 feet because it is estimated that at this depth the sediments are old enough (i.e., 5,000 years old; SVP 2010) to preserve paleontological resources based on the depth of the reliably dated Corcoran Clay Member and Friant Pumice Member of the Tulare Formation in this region (Dalrymple 1980; Miller et al. 1971).

SOLAR FACILITY, STEP-UP SUBSTATION, AND GEN-TIE

The eastern portion of the solar facility would be located on Quaternary basin deposits, whereas the western portion would be underlain by Quaternary fan deposits. These geologic units have low paleontological sensitivity from the surface to 5 feet below the surface and high paleontological sensitivity below 5 feet in depth.

The Options 1 and 2 step-up substation and gen-tie line components would be located on Quaternary fan deposits. This geologic unit has low paleontological sensitivity from the surface to 5 feet below the surface and high paleontological sensitivity below 5 feet in depth.

BESS

The Options 1 and 2 BESS component would be located on Quaternary fan deposits. This geologic unit has low paleontological sensitivity from the surface to 5 feet below the surface and high paleontological sensitivity below 5 feet in depth.

GREEN HYDROGEN

The Options 1 and 2 green hydrogen component, and the alternate component site would be located on Quaternary fan deposits. This geologic unit has low paleontological sensitivity from the surface to 5 feet below the surface and high paleontological sensitivity below 5 feet in depth.

UTILITY SWITCHYARD

The central and eastern parts of the utility switchyard would be located on Quaternary fan deposits, whereas the western part would be underlain by Quaternary older alluvium in the north and Tulare Formation in the south. Quaternary fan deposits have low paleontological sensitivity from the surface to 5 feet below the surface and high paleontological sensitivity below 5 feet in depth. Quaternary older alluvium and the Tulare Formation have high paleontological sensitivity.

5.15.2 Regulatory Setting

Federal, state, and local LORS related to paleontological resources were reviewed for applicability to the Project. These are detailed in Section 5.15.5, below.

5.15.3 Impact Analysis

The following subsections discuss the potential direct and indirect impacts related to paleontological resources from construction and operation (including maintenance) of the Project based on the findings of the Paleontological Resources Assessment (Rincon 2023). The Paleontological Resources Assessment satisfies California Energy Commission (CEC) requirements for Opt-In Applications (Title 20, California Code of Regulations, Section 1704, Appendix B) and was prepared consistent with the professional standards of the SVP (SVP 2010).

5.15.3.1 Methodology

Rincon reviewed published geologic maps to identify the geologic units present at and below the surface within the Project site (Dibblee and Minch 2007; Jennings and Strand 1958; Miller et al. 1971). Rincon requested a records search of the UCMP on April 18, 2023, to identify any fossil localities known from within the Project site or nearby fossil localities known from the same geologic units as those underlying the Project site. Rincon reviewed the online paleontological collections database of the UCMP (2023) and Paleobiology Database (PBDB; 2023) and consulted primary literature to assess the paleontological sensitivity of the Project site.

Based on a review of historical and modern aerial imagery, the Project site contains no bedrock exposures and has been extensively disturbed with grading and agricultural activities. Therefore, a paleontological resources field survey was not conducted.

Paleontological sensitivity ratings of the geological formations were assigned based on the findings of the records search and literature review and based on the potential effects to nonrenewable paleontological resources from Project construction and operation following SVP (2010) guidelines. Construction-related impacts that typically affect or have the potential to affect paleontological

resources include mass excavation operations, drilling/borehole excavations, trenching/tunneling, and grading. Ground-disturbing construction activities associated with the Project would mainly consist of grading, boring, trenching, and excavation.

5.15.3.2 Impact Evaluation Criteria

The potential for impacts to paleontological resources were evaluated using the criteria described in the California Environmental Quality Act (CEQA) Environmental Checklist (Appendix G of the CEQA Guidelines). Specific to paleontological resources, the CEQA Checklist asks, would the project:

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

Impact PAL-1

Threshold:	Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

There are no known unique geologic features associated with the Project site; therefore, construction and operation of the Project would not directly or indirectly impact a unique geologic feature and this topic is not discussed further below.

Solar Facility, Step-Up Substation, and Gen-Tie

Construction

Less than Significant Impact with Mitigation. The eastern portion of the solar facility would be located on Quaternary basin deposits, whereas the western portion would be underlain by Quaternary fan deposits. The Options 1 and 2 step-up substation and gen-tie line components would be located on Quaternary fan.

Ground-disturbing activities associated with construction of the solar facility would consist of driving piles for solar panels using pneumatic techniques, extending between 6 and 15 feet below the surface. The Operations and Maintenance (O&M) building for the solar facility would be a one-story building with a concrete foundation, which would require grading of the site to make it level. Additionally, medium voltage collection cables, which would connect the solar panels to the Options 1 and 2 step-up substation component, would be installed underground in a trench that would typically be 4 feet deep, but could be up to 6 feet deep. Some collection cable segments would be installed in areas where multiple circuits must cross over each other. These segments would be supported by wooden poles between 12 and 20 inches in diameter and require excavations up to 15 feet below the surface.

The Options 1 and 2 step-up substation site would be graded and would require dead-end structures to connect the substation to the grid. Each dead-end structure would require foundations excavated to a depth of 20 feet or more. Up to two microwave towers would be constructed in the substation. These towers would require foundations excavated to a depth of 20 feet or more.

Ground-disturbing activities for the gen-tie line would include drilling foundation holes for approximately 80 gen-tie poles. These foundations would be drilled to an average of 40 feet deep.

Ground-disturbing activities described above for the solar facility, Options 1 and 2 step-up substation, and gen-tie line could result in significant impacts to paleontological resources due to

the depth of proposed ground-disturbing activities and location within high-sensitivity sediments. However, incorporation of Mitigation Measures PAL-1 through PAL-5 would reduce potentially significant impacts to these resources to a less than significant level. Mitigation Measure PAL-1 requires the identification of an individual who meets the CEC's qualifications for a Paleontological Resources Specialist (PRS) be provided to the CEC for review and approval. Mitigation Measure PAL-2 requires paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils, as well as the notification procedures should fossils be discovered. Mitigation Measure PAL-3 requires paleontological monitoring and outlines procedures in the event of discovery of a previously unknown paleontological resource by the paleontological monitor or construction personnel. If a discovered paleontological resource is determined to be potentially scientifically significant, Mitigation Measure PAL-4 outlines procedures for salvage and curation of the resource. Mitigation Measure PAL-5 requires the preparation of a final report describing the results of the paleontological monitoring efforts upon conclusion of ground-disturbing activities. Therefore, with implementation of Mitigation Measures PAL-1 though PAL-5, impacts to paleontological resources would be less than significant.

Operation

No Impact. O&M activities associated with the solar facility, Options 1 and 2 step-up substation, and gen-tie line components would not involve ground-disturbing activities that would have the potential to destroy a unique paleontological resource or site. Therefore, no operational impacts to paleontological resources would occur as a result of these Project components. No mitigation is required.

BESS

Construction

Less than Significant Impact with Mitigation. The Options 1 and 2 BESS component would be located on Quaternary fan deposits. This Project component site would be graded to be level. Additionally, drainage components would be excavated to capture and direct stormwater around the BESS.

Since Quaternary fan deposits have low paleontological sensitivity from the surface to 5 feet below the surface, construction of the BESS is not anticipated to disturb paleontological resources. However, ground-disturbing activities for the BESS still could have the potential to result in significant impacts to paleontological resources due to the location within high-sensitivity sediments. However, incorporation of Mitigation Measures PAL-1 through PAL-5 would reduce potentially significant impacts to these resources to a less than significant level. As described above under "*Solar Facility, Step-Up Substation, and Gen-Tie,*" Mitigation Measures PAL-1 though PAL-5 would require identification of a PRS, paleontological WEAP training, paleontological monitoring, salvage and curation of resources if any are discovered, and preparation of a paleontological monitoring report. Therefore, with implementation of Mitigation Measures PAL-1 though PAL-5, impacts to paleontological resources would be less than significant.

Operation

No Impact. O&M activities associated with the BESS would not involve ground-disturbing activities that would have the potential to destroy a unique paleontological resource or site. Therefore, no

operational impacts to paleontological resources would occur as a result of this Project component. No mitigation is required.

Green Hydrogen

Construction

Less than Significant Impact with Mitigation. The Options 1 and 2 green hydrogen component, and the alternate component site would be located on Quaternary fan deposits. The site for this Project component would be graded to be level. Additionally, drainage components would be excavated to capture and direct stormwater around the green hydrogen facilities.

Ground-disturbing activities for this Project component could result in significant impacts to paleontological resources due to the depth of proposed ground-disturbing activities and location within high-sensitivity sediments. However, incorporation of Mitigation Measures PAL-1 through PAL-5 would reduce potentially significant impacts to these resources to a less than significant level. As described above under "*Solar Facility, Step-Up Substation, and Gen-Tie*", Mitigation Measures PAL-1 though PAL-5 would require identification of a PRS, paleontological WEAP training, paleontological monitoring, salvage and curation of resources if any are discovered, and preparation of a paleontological monitoring report. Therefore, with implementation of Mitigation Measures PAL-1 though PAL-5, impacts to paleontological resources would be less than significant.

Operation

No Impact. O&M activities for the Project would not involve ground-disturbing activities that would have the potential to destroy a unique paleontological resource or site. Therefore, no operational impacts to paleontological resources would occur as a result of the Project. No mitigation is required.

Utility Switchyard

Construction

Less than Significant Impact with Mitigation. The central and eastern parts of the utility switchyard would be located on Quaternary fan deposits, whereas the western part would be underlain by Quaternary older alluvium in the north and Tulare Formation in the south. Ground-disturbing activities associated with construction of the utility switchyard would include site grading and excavation of a 1,000-foot by 100-foot stormwater retention pond. The utility switchyard would also require 20 dead-end structures to connect the substation to the grid. Each dead-end structure would require foundations that are excavated to a depth of 20 feet or more. A microwave tower would be constructed in the switchyard and would require foundations excavated to a depth of 20 feet or more.

Ground-disturbing activities for the utility switchyard could result in significant impacts to paleontological resources due to the depth of proposed ground-disturbing activities and location within high-sensitivity sediments. However, incorporation of Mitigation Measures PAL-1 through PAL-5 would reduce potentially significant impacts to these resources to a less than significant level. As described above under "*Solar Facility, Step-Up Substation, and Gen-Tie*", Mitigation Measures PAL-1 though PAL-5 would require identification of a PRS, paleontological WEAP training, paleontological monitoring, salvage and curation of resources if any are discovered, and preparation

of a paleontological monitoring report. Therefore, with implementation of Mitigation Measures PAL-1 though PAL-5, impacts to paleontological resources would be less than significant.

Operation

No Impact. O&M activities for the Project would not involve ground-disturbing activities that would have the potential to destroy a unique paleontological resource or site. Therefore, no operational impacts to paleontological resources would occur as a result of the Project. No mitigation is required.

Overall Project

Less than Significant Impact with Mitigation. There are no known paleontological resources within the Project site (Holroyd 2023). During construction, ground-disturbing activities (i.e., grading, excavating, trenching, boring) in previously undisturbed sediments with high paleontological sensitivity may result in significant impacts to previously unknown paleontological resources. If construction activities result in the destruction, damage, or loss of scientifically important paleontological resources and associated stratigraphic and paleontological data, they would be considered as having a significant impact or adverse effect on paleontological resources. For this Project, high-sensitivity sediments include all sediments in areas mapped as Quaternary older alluvium or the Tulare Formation and sediments greater than 5 feet below the surface in areas mapped as Quaternary basin deposits or Quaternary fan deposits. However, incorporation of Mitigation Measures PAL-1 through PAL-5 would reduce potentially significant impacts to these resources to a less than significant level. As described further above under "*Solar Facility, Step-Up Substation, and Gen-Tie*", Mitigation Measures PAL-1 though PAL-5 would require identification of a PRS, paleontological WEAP training, paleontological monitoring, salvage and curation of resources if any are discovered, and preparation of a paleontological monitoring report. Operation of the Project would not involve ground-disturbing activities that would have the potential to destroy a unique paleontological resource or site. With implementation of Mitigation Measures PAL-1 though PAL-5, overall Project impacts to paleontological resources would be less than significant.

Mitigation Measures

The following mitigation measures would address potentially significant impacts to paleontological resources. Implementation of Mitigation Measures PAL-1 through PAL-5 would effectively reduce potential Project impacts to paleontological resources to a less than significant level through the recovery, identification, and curation of previously unrecovered fossils.

PAL-1 Paleontological Resources Specialist

Prior to the start of construction, the Project Applicant shall submit the name and resume of an individual to the CEC for review and approval as the Project's Paleontological Resources Specialist. The PRS shall be an individual with a degree in paleontology or geology and at least three years of paleontological resource mitigation and field experience in California, including at least one year of leading paleontological resource mitigation and field activities. The PRS shall be responsible for directing all paleontological mitigation efforts for the Project.

PAL-2 Paleontological Worker Environmental Awareness Program

The PRS or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the

procedures for notifying paleontological staff should fossils be discovered by construction personnel.

PAL-3 Paleontological Monitoring

Full-time paleontological monitoring shall be conducted during trenching, excavation, grading, and drilling (if borehole is 2 feet or more in diameter) when ground disturbing depths exceed 18 inches, within previously undisturbed sediments with high paleontological sensitivity (i.e., Quaternary older alluvium) to mitigate for potential impacts to currently unknown paleontological resources. Full-time paleontological monitoring shall also be conducted during trenching, excavation, grading, and drilling (if borehole is 2 feet or more in diameter) activities reaching deeper than 5 feet below current grade in sediments assigned a low paleontological sensitivity from 0 to 5 feet and high paleontological sensitivity below 5 feet (i.e., Quaternary basin deposits and Quaternary fan deposits). Pile driving and drilling for boreholes less than 2 feet in diameter do not require paleontological monitoring as the data required to accompany scientifically valuable paleontological resources cannot be collected under the conditions of typical drilling and pile driving activity.

Monitoring shall be conducted by a paleontological monitor with experience with collection and salvage of paleontological resources and who meets the minimum standards of the Society of Vertebrate Paleontology (2010) for a Paleontological Resources Monitor. The PRS in coordination with the CEC may recommend that monitoring be reduced in frequency or ceased entirely based on geologic observations.

In the event of the discovery of a previously unknown paleontological resource by the paleontological monitor or construction personnel, all construction activity within 50 feet of the find shall cease, and the PRS shall evaluate the find. If the fossil(s) is (are) not scientifically significant, then construction activity may resume. If it is determined that the fossil(s) is (are) scientifically significant, Mitigation Measure PAL-4 shall be enacted.

PAL-4 Paleontological Resource Salvage and Curation

If a paleontological resource is determined to be potentially scientifically significant, the paleontological monitor shall salvage (i.e., excavate and recover) the fossil to protect it from damage/destruction. Typically, fossils can be safely salvaged quickly by a single paleontological monitor with minimal disruption to construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. Bulk matrix sampling may be necessary to recover small invertebrates or microvertebrates from within paleontologically sensitive deposits. After the fossil(s) is (are) salvaged, construction activity may resume.

Fossils shall be identified to the lowest (i.e., most-specific) possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the PRS.

PAL-5 Paleontological Mitigation Report

Upon completion of ground-disturbing activities (or laboratory preparation and curation of fossils, if necessary), the PRS shall prepare a final report describing the results of the paleontological monitoring efforts. The report shall include a summary of the field and laboratory methods employed; an overview of Project geology; and, if fossils were discovered, an analysis of the fossils,

including physical description, taxonomic identification, and scientific significance. The report shall be submitted to the CEC and, if fossil curation is required, the designated scientific institution.

5.15.4 Cumulative Impacts

Impacts of the Project would be considered cumulatively considerable if they would have the potential to combine with other past, present, or reasonably foreseeable projects to become significant.

Overall Project

The geographic scope of potential cumulative paleontological resource impacts is limited to the immediate vicinity of ground-disturbing activities that would occur during construction. As is required for the Project, cumulative projects in the area would be required to undergo the appropriate level of project-specific environmental review and proponents would be expected to comply with local, state and federal laws relating to paleontological resources. Adherence to all local, state and federal programs, requirements and policies pertaining to paleontological resources would limit cumulative impacts to a less than significant level. Moreover, with implementation of Mitigation Measures PAL-1 through PAL-5, the Project's contribution to any cumulative impacts would not be cumulatively considerable.

Utility Switchyard

Construction and operation of the utility switchyard is considered in the cumulative impact analysis of the overall Project discussed above; therefore, similar to the overall Project, cumulative impacts related to paleontological resources would be less than significant and the Project's contribution to any cumulative impacts would not be cumulatively considerable.

5.15.5 Laws, Ordinances, Regulations, and Standards

Paleontological resources are nonrenewable scientific resources. Several state and local LORS govern their preservation. Such LORS include the CEQA, California Public Resources Code, and Fresno County's General Plan. In addition to legislative actions, the SVP have established professional standards for assessment and mitigation of adverse impacts to paleontological resources.

The LORS that may apply to the Project related to paleontological resources are summarized in Table 5.15-1. The local LORS discussed in this section are ordinances, plans, or policies of Fresno County.

Table 5.15-1 LORS Applicable to Paleontological Resources

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
State	California Environmental Quality Act (CEQA)	Requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible.	Throughout this Opt-In Application	The approval of the Project would comply with CEQA, as required by the California Energy Commission's Opt-In Application process.
Local	2000 Fresno County General Plan, Goal OS-J and Policy OS-J.1	Requires identification, protection, and enhancement of Fresno County's important paleontological sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible	Impact PAL-1	If discovered during Project construction, the Project would comply with this goal and policy through implementation of Mitigation Measures PAL-1 through PAL-5.

Source: California Code of Regulations, CEQA, California Public Resources Code, Fresno County 2000

5.15.5.1 Federal LORS

Federal regulatory protection for paleontological resources would apply if a specific project involves federally owned or managed lands, a federal license, permit, approval or funding, and/or crosses federal lands. The Project site does not cross federally owned or managed lands, thus, there are no applicable federal LORS related to paleontological resources.

5.15.5.2 State LORS

California Environmental Quality Act

CEQA requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible. Appendix G of the CEQA Guidelines includes criteria for evaluating potential impacts related to paleontological resources. The Project would comply with CEQA, as required by the California Energy Commission's Opt-In Application process.

5.15.5.3 Local LORS

2000 Fresno County General Plan

Fresno County addresses paleontological resources within the Fresno County General Plan, Open Space and Conservation Element, Section J, Historical, Cultural, and Geologic Resources (County of Fresno 2000). In areas of known paleontological resources, the County is to identify and protect these resources when feasible. The specific Open Space and Conservation Element goals and policies related to paleontological resources are:

- **Goal OS-J.** To identify, protect, and enhance Fresno County's important historical, archeological, paleontological, geological, and cultural sites and their contributing environment.
- **Policy OS-J.1.** The County shall require that discretionary development Projects, as part of any required CEQA review, identify and protect important historical, archeological, paleontological, and cultural sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of Project alternatives to preserve archeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

The Project would comply with Goal OS-J and Policy OS-J.1 through implementation of Mitigation Measures PAL-1 through PAL-5.

5.15.6 Agencies and Agency Contact

There are no agencies with jurisdiction to issue permits or approvals, or to enforce identified LORS related to paleontological resources.

5.15.7 Permits and Permit Schedule

No federal, state, or county agency requires a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related ground-disturbance on the Project site.

5.15.8 References

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