D.14 Paleontological Resources

This section provides contextual information on the Paleontological Resources located within the Proposed Project area and analyzes the potential impacts that project-related ground-disturbing activities may have on those resources. In addition, appropriate measures to avoid or reduce significant impacts on paleontological resources are identified. The information presented in this section is largely based on a paleontological resources assessment and survey of the Proposed Project area conducted by Paleo Solutions, Inc. (2013).

The affected environment for paleontological resources is described in Section D.14.1 and relevant regulations and standards are presented in Section D.14.2. Impacts and significance criteria of the Proposed Project and the alternatives are described in Sections D.14.3 through D.14.5. Section D.14.6 presents the mitigation measures and mitigation monitoring requirements, and Section D.14.7 lists references cited.

D.14.1 Environmental Setting / Affected Environment

The study area encompasses the northern Peninsular Ranges, the southeastern Transverse Ranges, and the westernmost portions of the Colorado Desert geomorphic provinces of California. The Peninsular Ranges are composed of a northwest-southwest oriented complex of blocks separated by similarly trending faults that extend approximately 125 miles from the Los Angeles Basin to the tip of Baja California (Norris and Webb, 1990). The Peninsular Ranges are bounded on the east by the Elsinore fault zone and the Colorado Desert and on the west by the Pacific Coast (Morton and Miller, 2006). The geology in the northern reaches of the range, including the San Jacinto Mountains, consists of Paleozoic banded gneiss, schist, and other older metamorphic rocks; Mesozoic granitic rocks of the southern California batholith; and Cenozoic marine, terrestrial, and Quaternary alluvium deposits. The highest point in the range is San Jacinto Peak at 10,805 feet (ft) above mean sea level (amsl) (Norris and Webb, 1990).

The San Bernardino Mountains rise 11,502 ft amsl at the highest peak and extend 65 miles from the Cajon Pass and the San Andreas fault on the west and southwest, to Twentynine Palms and the Morongo Valley in the east and southeast (Norris and Webb, 1990). The San Bernardino Mountains, are part of the Transverse Ranges, which extend 325 miles west-east from the Santa Ynez Mountains in Santa Barbara County, to the San Gabriel Mountains in Los Angeles County, and to the San Bernardino Mountains in San Bernardino County (Norris and Webb, 1990). The San Bernardino Mountains began forming 2 to 3 million years ago (Ma) due to uplift of the structural block(s) that are bounded on the north by a system of reverse faults and to the south by the San Andreas fault system, which forms the western border of the mountain range (Miller, 1987; Spotila et al., 2008; Wallace, 1990). The geology of the San Bernardino Mountains consists of Mesozoic and Cretaceous quartz monzonite and granitic rocks overlain by Late Cenozoic sedimentary deposits, with local exposures of fossiliferous Precambrian and Paleozoic limestone and quartzite. Faults of the region are predominantly right-lateral strike-slip faults, including the San Andreas, San Jacinto, and Elsinore fault zones.

The Proposed Project area extends east to the Coachella Valley within the westernmost portions of the Colorado Desert (Dibblee and Minch, 2004c). The Colorado Desert is a low-lying geomorphic region that extends from the Mojave Desert to the north, the Colorado River on the east, the Peninsular Ranges on the west, and south into Mexico. The Coachella Valley is located north of the Imperial Valley, within the Salton Trough; a large structural depression that extends from the San Gorgonio Pass in the north to the Gulf of Mexico in the south (Norris and Webb, 1990).

D.14.1.1 Regional Setting and Approach to Data Collection

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the ~~rock~~ geologic record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). In general, fossils are considered to be greater than 5,000 years old (Middle Holocene) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (SVP, 2010). Paleontological resources can provide important taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, or biochronological data (Scott and Springer, 2003).

Data Collection Methodology

Paleontological resources are not found in soil but are contained within the geologic deposits or bedrock that underlies the soil layer. Therefore, in order to ascertain whether or not a particular study area has the potential to contain significant fossil resources at the subsurface, it is necessary to review relevant scientific literature and geologic mapping to determine the geology and stratigraphy of the area. Further, to delineate the boundaries of an area of paleontological sensitivity, it is necessary to determine the extent of the entire geologic unit because paleontological sensitivity is not limited to surface exposures of fossil material.

To determine whether fossil localities have been previously discovered within the Proposed Project area or within a particular rock unit, a search of pertinent local and regional museum repositories was performed. In addition, relevant scientific literature and published geologic maps were reviewed, and a preconstruction paleontological reconnaissance survey was conducted by PaleoSolutions in 2013.

Geologic units underlying the Proposed Project were identified using the following published maps:

- Geologic map of the Beaumont quadrangle, Riverside County, California 1:24,000 (Dibblee and Minch, 2003a)
- Geologic map of the El Casco quadrangle, Riverside County, California 1:24,000 (Dibblee and Minch, 2003b)
- Geologic map of the Cabazon quadrangle, Riverside County, California 1:24,000 (Dibblee and Minch, 2004a)
- Geologic map of the Desert Hot Springs quadrangle, Riverside County, California 1:24,000 (Dibblee and Minch, 2004b)
- Geologic map of the Whitewater quadrangle, Riverside County, California 1:24,000 (Dibblee and Minch, 2004c)
- Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California 1:100,000 (Morton and Miller, 2006)

For the Proposed Project, paleontological collections records searches were conducted at the following museum repositories:

- The San Bernardino County Museum (SBCM), Division of Geological Sciences, Regional Paleontological Locality Inventory
- The Los Angeles County Museum of Natural History (LACM), Vertebrate Paleontology Section

A detailed review of museum collections records was performed for the purposes of determining whether any museum fossil localities occur within or adjacent to the Proposed Project, and ascertain the abundance and taxonomic diversity of fossils collected from the same geologic formations elsewhere in this part of the San Bernardino and Riverside Counties. This led to identification of the units underlying the Proposed Project area and a determination of the paleontological sensitivity ratings of those geologic units in order to assess the Proposed Project's potential impacts to nonrenewable paleontological resources.

Areas of Direct Impact

The areas of direct impacts for paleontological resources is defined as all areas that would be subject to ground disturbing activity associated with development of the Proposed Project. This includes all proposed tower locations, access roads, staging yards, pull sites, substations, subtransmission lines, and telecommunications lines.

This analysis used the Bureau of Land Management's (BLM) Potential Fossil Yield Classification (PFYC) as the criteria for establishing the paleontological sensitivity of a given geologic unit within the area(s) of direct impact. The PFYC is generally only used on Federal lands, but for consistency with the NEPA document, the classifications were applied to all geologic units with the Proposed Project area. The PFYC sensitivity guidelines are provided below, as excerpted from BLM Instructional Memorandum 2008-009 (2007):

- **Class 1 – Very Low.** Typically, these are igneous or high-grade metamorphic geologic units, which are not likely to contain recognizable fossil remains due to the high heat and/or pressure of their formation.
- **Class 2 – Low.** Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils because the deposits are generally younger than 10,000 years before present, are aeolian deposits, exhibit significant diagenetic alteration,[1] or are known to lack or have only rare significant fossils.
- **Class 3 – Moderate or Unknown.** Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.
- **Class 4 – High.** Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface-disturbing activities may adversely affect paleontological resources in many cases.
- **Class 5 – Very High.** Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Findings Summary

The results of the paleontological resources records searches revealed 8 previously recorded fossil localities within the Proposed Project area and at least 50 additional fossil localities within approximately 1 mile of the Proposed Project area. In addition, the paleontological field reconnaissance survey identified 12 additional fossil localities in the vicinity of the Proposed Project area. All previously recorded localities are in the highly sensitive San Timoteo Formation and the moderately sensitive Quaternary Older Alluvium within or near Sections 2, 3, and 4. Table D.14-1 summarizes the geologic units within the Proposed Project area and their PFYC (paleontological sensitivity), which ranges from very low to very high (Classes 1-5).

[1] The process of chemical and physical change in deposited sediment during its conversion to rock.

Table D.14-1. Paleontologically Sensitive Units Within the Proposed Project Area

Geologic Unit	Age	PFYC/Paleontological Sensitivity	Link
Granodiorite and Tonalite	Cretaceous	Class 1 – Very Low	Segment 2
Vesicular olivine basalt	Miocene	Class 1 – Very Low	Segment 6
Coachella Fanglomerate	Miocene	Class 3a/3b – Moderate/Unknown	Segment 5 to Segment 6
San Timoteo Formation	Pliocene – Pleistocene	Class 5 – Very high	Segment 1 to Segment 5
Quaternary very old sediments, including alluvial fan, axial channel, and regolith	Pleistocene	Class 3a – Moderate	Segment 2 to Segment 4
Quaternary older fan, alluvium/axial channel, and gravel deposits	Pleistocene	Class 3a – Moderate	Segment 2 to Segment 6
Quaternary younger alluvial and landslide units	Holocene	Class 2 – Low	Segment 1 to Segment 6

D.14.1.2 Environmental Setting by Segment

This section discusses the geologic and depositional history of the rock formations that underlie each segment of the Proposed Project area and provides an overview of their paleontological sensitivity. The geologic descriptions and paleontological resources potential ratings are after Albright (1999), Dibblee (2003a, 2003b, 2004a, 2004b, 2004c), McLeod (2011, 2013), PaleoSolutions (2013), and Scott (2012).

D.14.1.2.1 Segment 1: San Bernardino

Segment 1 of the Proposed Project extends approximately 3.5 miles from the southern San Bernardino basin near the Santa Ana River, to the northern foothills of the San Timoteo Badlands and San Timoteo Creek, within San Bernardino County (Albright, 1999). In addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW, Segment 1 includes staging yards, telecommunication lines, distribution lines, subtransmission lines, and the San Bernardino and Timoteo Substations.

The San Bernardino segment is primarily underlain by low-sensitivity Quaternary alluvial deposits within the San Bernardino Basin, with subordinate exposures of the very highly sensitive San Timoteo Formation in the foothills of the San Timoteo Badlands; an area characterized by gently rolling hills, steep canyons, and erosive washes (Morton and Miller, 2006). The badland topography is a result of extensive gully erosion within a thick accumulation (9,000 ft) of Miocene to Pleistocene non-marine sediments (Albright, 1999; Hehn, 1996). The sediment within the San Timoteo Badlands consists of the Mount Eden Formation, the San Timoteo Formation and surficial Quaternary deposits derived from erosion of badlands and sedimentation along San Timoteo Creek (Morton and Miller, 2006). The San Timoteo Badlands are bounded on the west by the San Jacinto fault and on the east by San Timoteo Canyon, which contains San Timoteo Creek, a tributary of the Santa Ana River (USGS, 2012). The San Timoteo Badlands represent an important geological and paleontological resource because they record significant tectonic events associated with the San Jacinto and San Andreas Fault Zones and contain a continuous exposure of non-marine deposits from the Miocene to the Middle Pleistocene (Albright, 1999).

San Timoteo Formation

The San Timoteo Formation was named by Frick (1921) after its type locality in San Timoteo Canyon in the vicinity of the Proposed Project area (Morton and Miller, 2006). According to magnetostratigraphic studies by Albright (1999), coupled with the published ages of recovered vertebrate fossils, the lithologically diverse sandstone of the San Timoteo Formation was likely deposited between 4.3 to 0.7 Ma, during the Pliocene to Middle Pleistocene. The geologic unit is nearly 6,000 ft thick locally, and is exposed for approximately 20 miles along the San Jacinto fault.

The San Timoteo Formation consists of a basal deposit of dark gray-green, fissile mudrock and interbedded pale brown sandstone. The pale-brown sandstone is a fine- to medium-grained, well sorted, well-bedded deposit that is well indurated and displays climbing ripples, convolute bedding, and crossbed structures (Albright, 1999; Morton and Miller, 2006). The overlying majority of the San Timoteo Formation consists of well bedded, fine- to coarse-grained, moderately to poorly indurated and sorted, tan-brown to gray-yellow lithic arkose with subordinate pebble and cobble conglomerate deposits composed of subangular to subrounded lithics. The localized conglomerate is deposited in thin lenses and thick horizontal beds up to 30 ft thick. According to Morton and Miller (2006), the lithology includes "common reddish-brown stratigraphic intervals consisting of oxidized sandstone, which are not paleosols,[2] and reddish-brown clay-rich intervals, which may be paleosols." The Upper member is predominantly composed of medium-grained arkose; the Middle member consists of approximately 70 percent arkose and 30 percent conglomerate; and the Lower member is characterized by fine-grained gray sandstone with thin pebble conglomerate lenses (Albright, 1999; Morton and Miller, 2006). According to Albright (1999), the lithology of the San Timoteo Formation is consistent with an ephemeral braided stream environment.

Paleontology of the San Timoteo Formation. The San Timoteo Formation has yielded an abundant and diverse fauna that includes at least 30 mammalian and reptilian species. More than 1,700 fossils have been recovered from the deposits, including at least 1,450 specimens recovered during excavations related to the construction of SCE's El Casco Substation near Calimesa, California (LSA, 2012). Over 75 taxa have been recovered, including plants, mollusks, fish, amphibians, reptiles, birds, insectivores, rodents, deer, camels, horses, sloths and two different saber cats (Albright, 1999b).

Two local faunas have been described from within the San Timoteo Formation and include the El Casco Local Fauna [LF] (Late Blancan/Irvingtonian North American Land Mammal Age [NALMA]) and Shutt Ranch LF (Irvingtonian NALMA) (Albright, 1999; Woodburne, 2013). The fossils recovered from within the San Timoteo Formation are important because they not only provide a more complete fossil record for a tectonically active California during the Late Cenozoic, they constrain dates and assist with magnetostratigraphy, paleogeography, paleoclimate reconstructions, and timing of pre-historic faunal migrations (e.g., immigration through the Bering Strait and the Isthmus of Panama) (Albright, 1999).

The El Casco LF is estimated between 1.4 Ma and 1.2 Ma in age and consists of approximately 15 taxa recovered from within the Lower member that include species of cottontail rabbit, pack rat, kangaroo rat, deer mouse, pocket mouse, vole, lemming, dog, rhinoceros, numerous artiodactyls as well as mollusks, lizards, and a snake (Albright, 1999; Repenning, 1987). All of the Shutt Ranch LF is between 1 Ma and 0.78 Ma and is contained in one locality in the Upper Member of the San Timoteo Formation. The Shutt Ranch LF is represented by rodent taxa, including species of vole and pack rat. In addition to the El Casco LF and Shutt LF, fossils from more than 20 mammal species have been recovered from within the Lower member of the San Timoteo Formation (Albright, 1999). These include horse, rabbit, rodent, and new species of *Baiomys* and *Peromyscus* (Blancan). Further, a *Mammuthus* tooth was recovered from the Upper member (Irvington) (Albright, 1999). Moreover, during his initial investigation of the San Timoteo Badlands, Frick (1921) discovered 17 localities from within the San Timoteo Formation that yielded specimens from six different species, including deer, camel, ground sloth, horse, and turtle. Frick's (1921) fossils were recovered within deposits later identified by Morton and Miller (2006) as the Middle member of the San Timoteo Formation. The San Timoteo Formation has consistently yielded scientifically important fossils and has been determined to have a very high potential for paleontological resources (PFYC Class 5).

[2] A paleosol is a fossil soil preserved within a sequence of geological deposits, indicative of past conditions.

Quaternary Sedimentary Deposits

Quaternary younger and very young sedimentary deposits underlie the western portions of Segment 2. Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.2.2 Segment 2: Colton and Loma Linda

Segment 2 extends approximately 5 miles from the San Jacinto basin across the San Jacinto Fault Zone, and into the northern foothills of the San Timoteo Badlands in San Bernardino County. In addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW, Segment 2 includes the Vista Substation.

The western portion of Segment 2, from the Vista Substation to the vicinity of Barton Road, is underlain by Quaternary fan and alluvial deposits of Pleistocene to Holocene age, as well as local exposures of Cretaceous granodiorite and tonalite bedrock. This portion of the segment has been extensively disturbed by urban development. The eastern portion of Segment 2 is located in the San Timoteo Badlands and is underlain by the Pliocene-Pleistocene San Timoteo Formation. As described above, the San Timoteo Badlands and the San Bernardino Basin are located in a region that has been tectonically active since at least the Late Miocene, during which the right-lateral strike-slip San Gabriel–Banning fault was active and erosion of the Peninsular Range basement provided a clast source for the non-marine San Timoteo deposits (Albright, 1999). Later, during the Pliocene and Pleistocene, the San Gabriel fault activated and the provenance for the San Timoteo Badlands shifted to the ancestral San Gabriel Mountains in the Transverse Ranges. As a result of the local faulting and regional tectonic activity, the deposits in the San Timoteo badlands are exposed in an anticline that trends northwest along the southwestern edge of the badlands and dips gently to the northeast (Hehn, 1996).

Cretaceous Granodiorite and Tonalite

Cretaceous (145 to 66 Ma) age plutonic igneous bedrock is exposed within the central portion of Segment 2. Plutonic igneous rocks do not contain fossils due to their high heat of formation deep below the surface of the Earth; therefore, this unit has a very low paleontological sensitivity (PFYC Class 1).

San Timoteo Formation

The San Timoteo Formation is described above under "Segment 1: San Bernardino" and is determined to have a very high potential for paleontological resources (PFYC Class 5). In addition to the paleontological resources described above, the paleontological field reconnaissance survey yielded a vertebrate locality near Segment 2 (see Table D.14-2).

Table D.14-2. Paleontological Localities in the San Timoteo Formation Within or Near Segment 2

Geologic Formation	Locality Number	Taxa
San Timoteo	20130306MER.01	Unspecified vertebrates

Source: Paleo Solutions (2013)

Quaternary Older and Very Old Sedimentary Deposits

Quaternary older and very old sedimentary deposits underlie portions of Segment 2. These units typically display soil development and moderate dissection, and are composed of unconsolidated to moderately indurated coarse sand to fine sand, silt, and gravel (Morton and Miller, 2006). Although there are no

previously recorded vertebrate fossil localities reported directly within the Segment 2 boundaries, similar Pleistocene age alluvial, fluvial and lacustrine deposits have proven to yield scientifically significant paleontological resources in the vicinity of the Proposed Project area, (Albright, 1999; Springer et al., 1999). Southwest of the Proposed Project area, in the vicinity of Lakeview, a diverse assemblage of fossil resources have been recovered including *Mammuthus* (mammoth), *Smilodon* (sabre-toothed cat), *Equus* (extinct horse), cf. *Bison antiquus* (bison), and numerous small mammals, reptiles, invertebrates, and plant remains (Springer et al., 2009). These Quaternary alluvial units of Early to Late Pleistocene age have been determined to have moderate paleontological sensitivity (PFYC Class 3a).

Quaternary Sedimentary Deposits

Quaternary sedimentary deposits are described above under "Segment 1: San Bernardino." Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.2.3 Segment 3: San Timoteo Canyon

Segment 3 extends approximately 10 miles through San Bernardino and Riverside Counties, within the San Timoteo Badlands; a region described in detail under Segments 1 and Segment 2 above. The northern border of Segment 3 is generally bound by the east-west trending San Timoteo Creek within San Timoteo Canyon. In addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW, Segment 3 includes staging yards, telecommunication lines, and the El Casco Substation. The majority of Segment 3 is underlain by the very highly sensitive San Timoteo Formation, with subordinate Early Pleistocene to Holocene alluvium and landslide deposits within the washes, canyons, and gullies. Road cuts and steep canyon walls within Segment 3 expose the characteristic dipping beds of the folded and faulted San Timoteo Formation (Albright, 1999).

San Timoteo Formation

The San Timoteo Formation is described above under Segment 1 and is determined to have a very high potential for paleontological resources (PFYC Class 5). In addition to the paleontological resources described above, museum paleontological collections records maintained by the SBCM and LACM yielded four previously recorded vertebrate fossil localities from within the San Timoteo Formation within the Proposed Project area; an additional 35 vertebrate localities were recorded nearby. Furthermore, the paleontological field reconnaissance survey identified seven more vertebrate localities near Segment 3 (see Table D.14-3).

Table D.14-3. Paleontological Localities in the San Timoteo Formation Within or Near Segment 3

Geologic Formation	Locality Number	Taxa
San Timoteo Formation	LACM (CIT) 133, 155; and LACM 7618-7622	*Equus* and Camelidae
San Timoteo Formation	SBCM 5.35, 5.340-5.341, and 5.3.257*	*Equus* and Camelidae
San Timoteo Formation	SBCM 5.3.34–5.3.38, 5.3.40–5.3.41, 5.3.52–5.3.53, 5.3.112, 5.3.114, 5.3.160–5.3.165, 5.3.228–5.3.245, and 5.3.257–5.3.269	Anura, cf. Phrynosoma, cf. Masticophis, Crotalus, Callipepla, Zenedia asiatica, Icteridae, Corvidae, Mammut americanum, Mammuthus, Soricidae, Sylvilagus, Lepus, Spermophilus, Thomomys bottae, cf. T. gidleyi, Dipodomys, Prodipodomy Perognathus, Peromyscus, Microtus, Neotoma, Equus, Hemiauchenia, Odocoileus

Table D.14-3. Paleontological Localities in the San Timoteo Formation Within or Near Segment 3

Geologic Formation	Locality Number	Taxa
San Timoteo Formation	20130310MER.01, 20130311MER.01,20130319MER.02, 20130319MER.04, 20130319MER.06, 20130325MER.01, 20130325JTR.01	*Antilocapra*, *Equus* and other unspecified mammals

Source: McLeod (2011, 2013); Paleo Solutions (2013); and Scott (2003, 2012)
*Localities are within the Proposed Project area.

Quaternary Older and Very Old Sedimentary Deposits

Quaternary older sedimentary deposits are described above in Section D.14.1.2.2 (Segment 2: Colton and Loma Linda). Early to late Pleistocene age alluvium has been determined to have a moderate paleontological sensitivity (PFYC Class 3a).

Quaternary Sedimentary Deposits

Quaternary sedimentary deposits are described above in Section D.14.1.2.1 (Segment 1: San Bernardino). Younger, Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.2.4 Segment 4: Beaumont and Banning

Segment 4 extends 12 miles from the San Timoteo Badlands towards the western slopes of the San Gorgonio Pass in Riverside County. The San Gorgonio Pass is an east-west trending lowland between the San Bernardino Mountains of the Transverse Ranges on the north, and the San Jacinto Mountains of the Peninsular Ranges on the south. The mountain pass is a geologically complex area, due to the interaction of the San Andreas Fault Zone with other faults, including the Banning Fault Zone and the Pinto Mountain Fault (SCEDC, 2013). Segment 4 is underlain by the San Timoteo Formation, Quaternary very old and older alluvium, and Quaternary younger alluvium. Significant portions of the segment have been previously disturbed by urban development (Morton, 1999). In addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW, Segment 4 includes proposed telecommunication lines.

San Timoteo Formation

The San Timoteo Formation is described above in D.14.1.2.1 (Segment 1: San Bernardino) and is determined to have a very high potential for paleontological resources (PFYC Class 5). In addition to the paleontological resources described above, the paleontological field reconnaissance survey identified four additional localities near Segment 4 (see Table D.14-4).

Quaternary Older and Very Old Sedimentary Deposits

In addition to the lithology and paleontology described above in D.14.1.2.2 (Segment 2: Colton and Loma Linda), LACM records indicate that Quaternary older alluvium deposits yielded one paleontological locality within the Segment 4 boundaries (McLeod, 2011, 2013). Locality LACM 4540 yielded vertebrate fossil remains of Equidae[3] near the intersection of Gilman Springs Road and Jack Rabbit Trail, along the

[3] Equidae is the taxonomic family of horses and related animals.

southern margin of the San Timoteo Badlands, approximately 5 miles south of Segment 4. These Quaternary alluvial units of early to late Pleistocene age have been determined to have moderate paleontological sensitivity (PFYC Class 3a).

Table D.14-4. Paleontological Localities in the San Timoteo Formation and Quaternary Older Alluvium Within or Near Segment 4

Geologic Formation or Unit	Locality Number	Taxa
Quaternary Older Alluvium	LACM 4540	Equidae
San Timoteo Formation	20130311JTR.01, 20130319MER.01, 20130319MER.03, 20130319MER.05	*Thomomys*, rodent, and unspecified mammals

Source: McLeod (2011, 2013); and Paleo Solutions (2013).

Quaternary Sedimentary Deposits

Quaternary sedimentary deposits are described above in D.14.1.2.1 (Segment 1: San Bernardino). Younger, Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.2.5 Segment 5: Morongo Tribal Lands and Surrounding Areas

The majority of Segment 5 is located within the Morongo Tribal Lands on the San Gorgonio Pass in Riverside County. Segment 5 is approximately 9 miles long and includes staging yards, telecommunication lines, proposed transmission line ROWs, and the Banning Substation, in addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW. The lithology in the Segment 5 is dominated by low- to moderately sensitive older and younger Quaternary alluvial fan deposits, the moderately sensitive Coachella Fanglomerate, and the highly sensitive San Timoteo Formation (Dibblee, 2004a; Morton, 1999).

Coachella Fanglomerate

The Coachella Fanglomerate of early Miocene age was first named and described by Vaughan (1922) as a thick alluvial unit with a basal breccia derived from the San Bernardino Mountains to the north. No fossils have been reported within this unit; however, during the paleontological reconnaissance survey for this project, numerous paleosols and root casts were observed within this formation in finer beds. These conditions illustrate the possibility that fossils may be found in this unit. As a result, these deposits are determined to have a Moderate/Unknown PFYC ranking (PFYC Class 3a/3b) (Dibblee, 2004a).

San Timoteo Formation

The San Timoteo Formation is described above in D.14.1.2.1 (Segment 1: San Bernardino) and is determined to have a very high potential for paleontological resources (PFYC Class 5).

Quaternary Older Sedimentary Deposits

In addition to Quaternary older sedimentary deposits described above under Segment 2: Colton and Loma Linda, portions of Segment 5 are also underlain by the middle Pleistocene age alluvial fan deposits informally known as the Cabazon Fanglomerate (Dibblee, 2004a, 2004b, 2004c). Middle to late Pleistocene age alluvium has been determined to have a moderate paleontological sensitivity (PFYC Class 3a).

Quaternary Sedimentary Deposits

Quaternary sedimentary deposits are described above in D.14.1.2.1 (Segment 1: San Bernardino). Younger, Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.2.6 Segment 6: Whitewater and Devers

Segment 6 extends 8 miles from the eastern side of the San Gorgonio Pass into the northwestern Coachella Valley within Riverside County. The Coachella Valley is located within the Colorado Desert geologic province of California (Dibblee and Minch, 2004b; Norris and Webb, 1990). The Colorado Desert is a low-lying geomorphic region that extends from the Mojave Desert to the north, the Colorado River on the east, the Peninsular Ranges on the west, and south into Mexico. The majority of Segment 6 is underlain by low sensitivity Quaternary fan, gravel, and alluvial deposits, as well as deposits of the Coachella Fanglomerate and the San Timoteo Formation. In addition to the proposed temporary disturbance areas and access roads along the existing SCE ROW, Segment 6 includes staging yards and the Devers Substation.

Vesicular Olivine Basalt

Miocene age basalt is restricted to a small area in the vicinity of Banning, adjacent to both the San Timoteo Formation and the Coachella Fanglomerate. Basalt is a volcanic rock that has a PFYC ranking of 1 (very low) because it is was formed under high temperatures, which are unsuitable for the preservation of organic remains (Dibblee, 2004a).

Coachella Fanglomerate

The Coachella Fanglomerate is described above under Segment 5 and is determined to have a Moderate/Unknown PFYC ranking (PFYC Class 3a/3b).

Quaternary Older Sedimentary Deposits

In addition to the lithology and paleontology described above under Segment 2 and Segment 5, the Quaternary older alluvium in Segment 6 contains deposits characteristic of the Coachella Valley deposits. Pleistocene age units with the Coachella Valley in Segment 6 are dominated by alluvial fan sediments, with minor wash, alluvial, and eolian deposits. Middle to late Pleistocene age alluvium has been determined to have a moderate paleontological sensitivity (PFYC Class 3a).

Quaternary Sedimentary Deposits

Quaternary sedimentary deposits are described above under Segment 1. Younger, Holocene age alluvial deposits are typically too young to contain fossilized remains and have low paleontological sensitivity (PFYC Class 2); however, they may shallowly overlie geologic units with higher paleontological sensitivity.

D.14.1.3 Environmental Setting for Connected Actions

This section discusses the regional geologic setting for the connected actions for the Proposed Project and provides the general paleontological sensitivity for each geographic area. Section B.7 lists the connected actions for the project, including two known projects with interconnection agreements (Palen Solar Power Project and EDF Desert Harvest) and five confidential projects requesting interconnection. The specific locations of the confidential projects are unreported; however, it is known that they are planned for the general geographic areas of Desert Center and Blythe.

Desert Center Area. The regional geology and existing paleontological resources within the Desert Center area are summarized below, as derived from the Desert Harvest Solar Project EIS (BLM, 2012b).

Regional Geology. The Desert Center area is located in the Chuckwalla Valley within the transition zone between the Mojave and Colorado Deserts in Riverside County, California. The area is bordered to the north and northwest by Joshua Tree National Park and the Coxcomb and Eagle Mountains, to the east by the Palen Mountains, and to the south by the Chuckwalla Mountains. The Mojave Desert averages 2,500 ft amsl and extends from the San Andreas and Garlock Faults towards the Basin and Range Province and Colorado Desert in eastern California (Dibblee and Hewett, 1966). The Mojave Desert was formed as a result of Proterozoic and Paleozoic subsidence and sediment accumulation; Mesozoic volcanism, plutonic intrusion, regional uplift, and metamorphism; and ongoing Cenozoic uplift, depression, erosion, volcanism, and crustal deformation associated with faulting (Dibblee, 1967). The Colorado Desert shares a similar geologic history with the neighboring Mojave Desert, but is generally much lower in elevation. The Colorado Desert extends from the Mojave Desert to the north, the Colorado River on the east, the Peninsular Ranges on the west, and south into Mexico. Dominant features within the Colorado Desert include the Salton Trough, the Colorado River, the Orocopia Mountains, and the Chocolate Mountains (Norris and Webb, 1976). In general, the Mojave and Colorado Deserts are dominated by broad alluvial basins wherein sedimentary deposition has been controlled by the geography of uplifted and unroofed basement rock, late Cenozoic basaltic and rhyolitic volcanic activity, and Quaternary hydrological processes (Garfunkel, 1974).

Paleontological Resources. The Desert Center area is primarily underlain by Quaternary alluvial deposits with low paleontological sensitivity, Quaternary alluvial and playa deposits with moderate to high paleontological sensitivity, and Mesozoic granitic units with very low paleontological sensitivity. According to the BLM's (2012b) review of published literature and a museum records search at the Natural History Museum of Los Angeles County (LACM) and at the University of California Museum of Paleontology (UCMP), paleontological resources have not been previously recorded within in the Desert Center area; however, vertebrate fossil localities have been identified in the vicinity within the same or similar sedimentary deposits elsewhere. According to the BLM (2012b), the LACM reports the occurrence of at least three vertebrate localities in the immediate vicinity of the Desert Center area, which yielded fossil specimens of a *Perognathus* (pocket mouse), *Gopherus* (tortoise), *Equus* (horse), *Camelops*, *and Tanupolama stevensi* (camel) from within older Quaternary deposits (BLM, 2012b). In addition, numerous paleontological vertebrate localities have been recorded during ground-disturbing activities associated with construction of several large energy projects in the region. For example, during construction of the Genesis Solar Energy project, paleontological monitors have found multiple vertebrate fossils, including a Pleistocene age tortoise carapace and bones. Further, during construction of the Desert Sunlight Solar Farm, paleontological monitors identified several significant Pleistocene age vertebrate fossils, including tortoise (*Gopherus*), horse (*Equus*), and camel.

Blythe Area. The regional geology and existing paleontological resources within the Blythe Area have been summarized below, as derived from the Blythe Mesa Solar Project EIR/EA (BLM and Riverside County, 2014).

Regional Geology. The Blythe area is near the California/Arizona border in the Colorado Desert, a geomorphic region described above for the Desert Center area. Specifically, the Blythe area is located in the Colorado River floodplain in the Palo Verde Valley. The area is bordered by Palo Verde Mesa to the west, Big Maria Mountains to the northwest, Palo Verde Mountains to the southwest, and Trigo and Dome Rock Mountains to the east. The surrounding mountains rise approximately 3,000 feet above Palo Verde Valley, averaging about 3,350 feet amsl. The Palo Verde Valley contains thick deposits of Quaternary age

alluvial deposits derived from erosion of the surrounding mountains, as well as fluvial deposits that accumulated due to sedimentation along the Colorado River (BLM and Riverside County, 2014).

Paleontological Resources. The Blythe area is primarily underlain by Middle to Late Pleistocene age alluvial and fluvial deposits with moderate to high paleontological sensitivity, and Holocene alluvial and eolian deposits with low paleontological sensitivity. According to the BLM and Riverside County's (2014) review of published literature and museum records at the San Bernardino County Museum (SBCM) and UCMP, vertebrate fossils have been recovered from Pleistocene age alluvial deposits throughout the Colorado Desert region. The UCMP online database contains at least one record for an unspecified vertebrate of the Rancholabrean NALMA identified within Pleistocene age deposits near the Blythe area. In addition, Quaternary older alluvium elsewhere in the Colorado Desert, similar in age and lithology to the deposits in the Blythe area, have yielded significant fossils of extinct Ice Age mammals, including specimens of mammoths, mastodons, ground sloths, dire wolves, short-faced bears, saber-toothed cats, large and small horses, large and small camels, and bison, as well as plant fossils.

D.14.2 Applicable Regulations, Plans, and Standards

Paleontological resources (i.e., fossils) are considered nonrenewable scientific resources because once destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under the various federal, state, and local laws and regulations.

D.14.2.1 Federal

Federal protections for scientifically significant paleontological resources include the National Environmental Policy Act (NEPA) of 1969, the Antiquities Act of 1906, the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA) of 1969, the Federal Land Policy and Management Act (FLPMA) of 1976, and Title 43 of the Code of Federal Regulations, among others.

The Paleontological Resources Protection Act (PRPA). This law was recently enacted as a result of the passage of the Omnibus Public Lands Management Act of 2009. The PRPA requires federal land management agencies to manage and protect paleontological resources and affirms the authority of existing policies already in place (16 United States Code [U.S.C.] 470aaa et seq. [BLM, 2012]).

The National Environmental Policy Act of 1969. This law requires that all federal agencies "utilize a systematic, interdisciplinary approach" to make informed, publicly supported decisions regarding environmental issues (Section 102 [2] [A]). NEPA was enacted to promote "efforts which will prevent or eliminate damage to the environment…. and will preserve important historic, cultural, and natural aspects of our national heritage" (42 U.S.C. 4321 and 4331-4335 [National Park Service, 2013a]).

Antiquities Act of 1906. This law establishes a penalty for the unlawful appropriation, excavation, or injury to any "historic or prehistoric ruin or monument, or any object of antiquity" that is situated on federal lands or federally controlled lands (16 U.S.C. 431-433 [National Park Service, 2013b]).

The National Historic Preservation Act of 1966. This law provides leadership and financial and technical assistance to foster prehistoric and historic preservation of the resources of the United States and of the international community in partnership with States, Indian tribes, Native Hawaiians, and local governments. Specifically, the Section 106 of the NHPA is relevant because it provides for the survey, recovery, and preservation of paleontological resources when they are found in culturally related contexts and when they may be destroyed or lost due to a federal, federally licensed, or federally funded project (Public Law 89-665; 80 Stat. 915; 16 United States Code 470 et seq. [Caltrans, 2012; National Park Service, 2013c]).

Federal Land Policy and Management Act of 1976. This law (P.L. 94-579; 90 Statute 2743, U.S.C. 1701-1782) requires that public lands be managed in a manner that will protect the quality of their scientific values. Specifically, FLPMA was established as a public land policy to "provide for the management, protection, development, and enhancement of the public lands." FLPMA requires federal agencies to manage public lands so that environmental, historic, archeological, and scientific resources are preserved and protected, where appropriate. Though FLPMA does not refer specifically to fossils, the law does protect scientific resources, which includes significant fossils, including vertebrate remains. FLPMA regulates the "use and development of public lands and resources through easements, licenses, and permits." The law requires the public lands to be inventoried so that the data can be used to make informed land-use decisions, and requires permits for the use, occupancy and development of the certain public lands, including the collection of significant fossils for scientific purposes (43 U.S.C. 1701 Section 102, 302 [U.S. Department of the Interior et al., 2001]).

Code of Federal Regulations, Title 43. Under the Title 43, Code of Federal Regulations, Section 8365.1-5, the collection of scientific and paleontological resources, including vertebrate fossils, on federal land is prohibited. The collection of a "reasonable amount" of common invertebrate or plant fossils for non-commercial purposes is permissible (43 CFR 8365.1-5 [United States Government Printing Office, 2014]).

D.14.2.2 State

The California Environmental Quality Act (CEQA). This law encourages the protection of all aspects of the environment by requiring state and local agencies to prepare multidisciplinary analyses of the environmental impacts of a proposed project, and to make decisions based on the findings of those analyses. CEQA also takes into account the laws and procedures of local California jurisdictions.

CEQA includes in its definition of historical resources, "any object [or] site …that has yielded or may be likely to yield information important in prehistory" (14 CCR 15064.5[3]), which is typically interpreted as including fossil materials and other paleontological resources. More specifically, destruction of a "unique paleontological resource or site or unique geologic feature constitutes a significant impact under CEQA" (State CEQA Guidelines Appendix G). CEQA does not provide an explicit definition of a "unique paleontological resource," but a definition is implied by comparable language within the act relating to archaeological resources: "The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in: Guidelines for the Implementation of CEQA, as amended March 29, 1999" (Title 14, Chapter 3, California Code of Regulations: 15000 et seq.) (Association of Environmental Professionals, 2012).

Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in the project; assessment of potential impacts on significant or unique resources; and development of mitigation measures for potentially significant impacts, which may include avoidance, monitoring, or data recovery excavation.

The California Public Resources Code 5097.5. This law affirms that no person shall willingly or knowingly excavate, remove, or otherwise destroy a vertebrate paleontological site or paleontological feature without the express permission of the overseeing public land agency. It further states under Code 30244 that any development that would adversely impact paleontological resources shall require reasonable mitigation. These regulations apply to projects located on land owned by or under the jurisdiction of the state or any city, county, district, or other public agency (Cal. Pub. Res. Code § 5097.5 [California Office of Historic Preservation, 2005]).

D.14.2.3 Local

Conservation Element of the County of San Bernardino General Plan (2012). Paleontological resources are addressed under the Conservation Element of the County of San Bernardino General Plan (2007). Section V-C2, Cultural/Paleontological Resources, addresses the treatment of paleontological resources for which the following objective and policy are set forth:

> *GOAL CO 3. The County will preserve and promote its historic and prehistoric cultural heritage.*
>
> *Programs.*
>
> 4. *In areas of potential but unknown sensitivity, field surveys prior to grading will be required to establish the need for paleontologic monitoring.*
> 5. *Projects requiring grading plans that are located in areas of known fossil occurrences, or demonstrated in a field survey to have fossils present, will have all rough grading (cuts greater than 3 feet) monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. Fossils include large and small vertebrate fossils, the latter recovered by screen washing of bulk samples.*
> 6. *A report of findings with an itemized accession inventory will be prepared as evidence that monitoring has been successfully completed. A preliminary report will be submitted and approved prior to granting of building permits, and a final report will be submitted and approved prior to granting of occupancy permits. The adequacy of paleontologic reports will be determined in consultation with the Curator of Earth Science, San Bernardino County Museum [V-18–V-19].*

Multipurpose Open Space Element of the Riverside County General Plan (2008). Paleontological resources are addressed under the Multipurpose Open Space Element of the Riverside County General Plan (2008), policy OS 19.9, which states the following:

> *This policy requires that when existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities, with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate repository, and file a report with the Planning Department* [p. OS-43].

The SABER Policy (Safeguard Artifacts Being Excavated in Riverside County) enacted in October 2011 by the Riverside County Board of Supervisors mandates that any paleontological resources found or unearthed in the County of Riverside be curated at the Western Science Center in the City of Hemet. This new policy will be included as an amendment to the Multi-purpose Element of the General Plan Update.

Resource Management Chapter of the Calimesa General Plan (2014). Paleontological resources are addressed under the Resource Management Chapter of the Calimesa General Plan (2014). The following Action Items have been set forth under Goal RM-4, Policy RM-16, which aims to "preserve the City's historical, cultural, archaeological, paleontological, and architectural resources":

> Action Item RM-16.3. *Review all proposed development for the possibility of cultural/ archaeological/paleontological sensitivity. When existing information indicates that a site proposed for development may contain paleontological resources, a report stating the extent and potential significance of the resources that may exist within the proposed development shall be prepared and include mitigation measures as appropriate.*

> Action Item RM-16.4. *The City will work with the Native American community and others to adopt an appropriate process and procedure for the monitoring of excavation in cultural and paleontological sensitive areas and adopt a process for ensuring the appropriate curation of any cultural or paleontological resources discovered* [City of Calimesa, 2014, p. 6-13–6.14].

Open Space Element of the City of Grand Terrace General Plan (2010). Paleontological resources are addressed under the Open Space Element of the City of Grand Terrace General Plan (2010). The following policies have been set forth under Goal 4.9, which aims to "comply with state and federal regulations to ensure the protection of historical, archaeological, and paleontological resources":

> Policy 4.9.1.b. *For areas with documented or inferred resource presence, applicants shall provide studies to document the presence or absences of cultural resources. Such studies shall provide a detailed mitigation plan, including and monitoring program and recovery or preservation plan, based on the recommendations of a qualified archaeologist and/or paleontologist.*

> Policy 4.9.1.c. *In the event that a paleontological or archaeological resource is uncovered during the course of construction, ground-disturbing activities in the vicinity of the suspected resource shall be redirected until the nature and extent of the find can be evaluated by a qualified archaeologist and/or paleontologist (as determined by the City). As deemed appropriate by the City, any such resource uncovered during the course of project-related grading or construction shall be recorded and/or removed per applicable City and/or State regulations* [City of Grand Terrace, 2010, p. IV-19].

Conservation and Open Space Element of the Loma Linda General Plan (2009). Paleontological resources are addressed under the Conservation and Open Space Element of the Loma Linda General Plan (2009). The following Implementing Policy has been set forth under Guiding Policy 9.7.5, which aims to "…identify and preserve the archaeological and paleontological resources in Loma Linda":

> Implementing Policy 9.7.5.f. *As a standard condition of approval for new development projects, require that, if cultural or paleontological resources are encountered during grading, alteration of earth materials in the vicinity of the find be halted until a qualified expert has evaluated the find and recorded identified cultural resources* [City of Loma Linda, 2009, p. 9-28].

Open Space and Conservation Element of the Redlands General Plan (1995). Paleontological resources are addressed under the Open Space and Conservation Element of the Redlands General Plan (1995). The following Implementing Policy has been set forth under Guiding Policy 7.30a, which aims to "protect archaeological and paleontological resources for their aesthetic, scientific, educational, and cultural values":

> Implementing Policy 7.30f. *Work with the San Bernardino County Museum to identify and protect Redlands' significant nonrenewable paleontologic resources* [City of Redlands, 1995, p. Open Space 25–26].

Cities of Banning, Beaumont, and Colton. The Cities of Banning, Beaumont, and Colton do not have mitigation requirements that specifically address potential adverse impacts to paleontological resources.

D.14.3 Environmental Impacts of the Proposed Project

Significant paleontological resources are defined as "identifiable" vertebrate fossils, uncommon invertebrates and plants, and trace fossils that provide a critical piece of paleobiological or geologic data, illustrate a geological principle, or occupy a unique stratigraphic position (SVP, 2010). The loss of any ~~identifiable fossil~~significant paleontological resource ~~that could~~which yields information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact. Direct impacts on paleontological resources primarily concern the potential destruction of non-renewable paleontological resources and the loss of information associated with these resources. This includes the unauthorized collection of fossil remains. If potentially fossiliferous bedrock or surficial sediments are disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information (significant impact). At the project-specific level, direct impacts can be mitigated to below a significant level through the implementation of paleontological mitigation.

Surface disturbance may result in the exposure of fossils that may never have been unearthed via natural processes. If mitigation measures are implemented, these newly exposed fossils become available for salvage, data recovery, scientific analysis, and preservation into perpetuity at a public museum (beneficial impact). The positive impacts of the results of mitigation include advances in scientific knowledge by both field researchers and paleontologists who study fossils in museum collections, contributions to public education and interpretation, and community involvement and partnerships.

D.14.3.1 Approach to Impact Assessment

In general, for Proposed Project areas which are underlain by paleontologically sensitive geologic units, greater amounts of ground disturbance increase the potential for significant impacts to paleontological resources. For Proposed Project areas that are directly underlain by geologic units with no paleontological sensitivity, there is no potential for impacts on paleontological resources unless sensitive geologic units which underlie the non-sensitive unit are also impacted.

Direct impacts result from activities related to construction, and occur at the same time and place as the surface disturbing action. The potential for direct impacts on scientifically significant surface and subsurface fossils in fossiliferous sedimentary deposits is controlled by two factors:

1. The depth and lateral extent of disturbance of fossiliferous bedrock and/or surficial sediments; and
2. The depth and lateral extent of occurrence of fossiliferous bedrock and/or surficial sediments beneath the surface.

Ground disturbance has the potential to adversely impact an unknown quantity of fossils which may occur on or underneath the surface in areas containing paleontologically sensitive geologic units. Without mitigation, these fossils, as well as the paleontological data they could provide if properly salvaged and documented, could be adversely impacted (destroyed), rendering them permanently unavailable for future scientific research.

Indirect impacts occur later in time or further away in distance than direct impacts, but are still reasonably foreseeable. They typically include those impacts which result from the normal ongoing operations of facilities constructed within a project area. An example of an indirect adverse impact on paleontological resources would be the construction of a new road that increases public access to a previously inaccessible area, and results in unauthorized fossil collecting and vandalism. Mitigation strategies could include surveys by qualified paleontologists to collect significant surface fossils, transfer them to a public

museum, and identify locations of fossil localities in the nearby area which have the potential to yield additional fossils as erosion occurs; and the construction of protective fencing or other barriers around known paleontological sites.

Geologic units are considered "sensitive" if they are known to contain scientifically significant paleontological resources anywhere in their extent. The area of sensitivity is typically defined as the entire rock unit (formation or member thereof) and not limited to areas where surface fossils may be exposed. Using baseline information gathered during a paleontological resource assessment, the sensitivity of the geologic unit(s) underlying a project area can be assigned to one of five classifications (Classes 1 through 5) defined by the BLM (2007). These categories include very high, high, moderate or unknown, low, and very low potential for fossilized remains. The criteria for each sensitivity classification are presented in Section D.14.1.1.

The significance of fossils is directly related to their scientific importance. Significant paleontological resources are defined as "identifiable" vertebrate fossils, uncommon invertebrates and plants, and trace fossils that provide a critical piece of paleobiological or geologic data, illustrate a geological principle, or occupy a unique stratigraphic position (SVP, 2010). Well-preserved and identifiable individual fossils are considered significant if they are a type specimen, rare, a complete specimen, or part of an important diverse fossil assemblage (BLM, 2008). These data are important because they are used to examine evolutionary relationships, provide insight on the development of and interaction between biological communities, establish time scales for geologic studies, and for many other scientific purposes (Scott and Springer, 2003; SVP, 2010).

D.14.3.1.1 Applicant Proposed Measures

SCE has committed to implementing one measure to reduce project impacts to paleontological resources, as shown in Table D.14-5. This Applicant Proposed Measure (APM) and others were outlined in the PEA (SCE, 2013) for reducing the potential impacts of construction and operation of the Proposed Project. In the following analysis of the project's potential to impact paleontological resources, it is assumed that the APM would be implemented as elements of project development, planning, and construction. This APM is incorporated into additional more specific mitigation measures that would be implemented to ensure that all impacts would be reduced to a less than significant level (see Section D.14.3.3).

Table D.14-5. Applicant Proposed Measures – Paleontological Resources

APM #	Text
APM PAL-1	Potential effects of the Proposed Project to sensitive paleontological resources may be mitigated or reduced to a less-than-significant level by implementing a Paleontological Resource Mitigation and Monitoring Plan, which would identify monitoring and treatment requirements for sensitive paleontological resources of significance.

D.14.3.2 CEQA Significance Criteria

One of the questions listed in the CEQA Environmental Checklist (Section 15023, Appendix G, Section XIV, Part A) is: "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" Examples of project-related activities that could "directly" disturb or destroy paleontological resources include excavation, trenching, boring, or any other activity that disturbs the subsurface geologic formation. "Indirect" disturbances or destruction refers to activities where the disturbance or destruction of paleontological resources is reasonably foreseeable, such as where they lead to increased erosion, or unauthorized surface collection or subsurface excavation.

D.14.3.3 Impacts and Mitigation Measures

This section describes the environmental impacts and mitigation measures for the Proposed Project for paleontology. No operational impacts have been identified for paleontological resources; therefore, all impacts addressed here are construction-related. During operation, access roads would not be open to the public; therefore, public access to the project area and the potential for looting would be limited during operation and maintenance activities. Grading of all access roads would be conducted during the construction phase and all environmental impacts for road-building activities are considered under that phase. In addition, vehicular access to the project would be limited to the access roads; therefore, erosion would be negligible during operational activities. The following sections provide a detailed discussion of the impacts, the locations of those impacts, and measures to reduce the impacts to less than significant levels.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

The potential to discover paleontological resources during construction within the Proposed Project area ranges from very low to very high, depending on the location of ground disturbance. Portions of all 6 segments would be impacted by construction-related ground disturbances such as the excavating, grading, substation building, improvement of access roads, and vegetation removal. The results of the paleontological resources records search and field reconnaissance survey revealed 4 vertebrate localities within the Proposed Project area. In addition, 48 other vertebrate fossil localities have been recorded in the vicinity of the Proposed Project area. All localities yielded fossils within the highly sensitive San Timoteo Formation and the moderately sensitive Quaternary Older Alluvium within or near Segments 2, 3, and 4. Construction within these segments has the potential to destroy ~~valuable~~ or disturb significant paleontological resources, and mitigation is required. Mitigation Measures PAL-1a through PAL-1e are recommended to minimize or avoid impacts to paleontological resources.

Five mitigation measures are presented to reduce or avoid impacts to paleontological resources.

Mitigation Measures for Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

PAL-1a **Inventory and evaluate paleontological resources.** Prior to construction and all other surface-disturbing activities, the Applicant shall have conducted and submitted an inventory of significant paleontological resources within the Proposed Project area. The report shall be based on the paleontological field reconnaissance surveys (conducted by PaleoSolutions, February 2012 to April 2013).

If any changes are made to the extent or alignment of the Proposed Project subsequent to the completed field surveys, then additional field surveys shall be conducted within new project areas. The additional field surveys shall be conducted in areas identified as having moderate, undetermined, or high paleontological resource potential. The purpose of the field survey is to visually inspect the ground surface for exposed fossils and to evaluate geologic exposures for their potential to contain preserved fossil material at the subsurface. Field surveys shall be conducted in all areas of potential ground disturbance, outside of the previously surveyed potential impact areas.

As part of the inventory report, the paleontological sensitivity rankings of geologic units examined in the field shall be evaluated using the BLM's (2008) PFYC System and refined based on the results of the pedestrian surveys. The report shall be submitted to the CPUC

and BLM for review at least 60 days before the start of construction, and shall be modified in response to agency comments, with the final report completed at least 30 days before the first ground disturbance.

PAL-1b **Develop Paleontological Resource Mitigation and Monitoring Plan.** Following completion and approval of the Paleontological Resources Report (required in Mitigation Measure PAL-1a) and prior to the start of ground-disturbing construction, the Applicant shall prepare and submit to CPUC and BLM for review and approval, a Paleontological Resources Mitigation and Monitoring Plan (Plan), consistent with the following requirements:

- The Plan shall be prepared by a Qualified Paleontologist and shall be based on Society of Vertebrate Paleontology (SVP) guidelines and meet all regulatory requirements. The qualified paleontologist shall have a Master's Degree or Ph.D. in paleontology, shall have knowledge of the local paleontology, and shall be familiar with paleontological procedures and techniques.
- The Plan shall include a site-specific investigation to identify construction impact areas of moderate (PFYC 3a) to very high (PFYC 5) sensitivity for encountering significant resources and the approximate depths at which those resources are likely to be encountered for each component of each segment of the Proposed Project.
- The Plan shall require the qualified paleontological monitor to monitor all construction-related ground disturbance in sediments determined to have a moderate (PFYC 3a) to very high (PFYC 5) sensitivity.
- The Plan shall define monitoring procedures and methodology, and shall specify that sediments of undetermined sensitivity shall be monitored on a part-time basis (as determined by the Qualified Paleontologist). Sediments with very low or low sensitivity will not require paleontological monitoring. ~~The Qualified Paleontological Monitor shall have at least a B.S. in Geology or Paleontology, and demonstrated field experience in the collection and identification of fossil material.~~
- The Plan shall state which resources will be avoided and which shall be recovered for their data potential. Where possible, recovery is preferred over avoidance in order to mitigate the potential for looting of paleontological resources. The Plan shall also detail methods of recovery, preparation and analysis of specimens, final curation of specimens at a federally accredited repository, data analysis, and reporting.
- The Plan shall specify that all paleontological work undertaken by the Applicant on public lands administered by BLM shall be carried out by qualified, permitted paleontologists with the appropriate current Paleontological Resources Use Permit.

PAL-1c **Train construction personnel.** Prior to the initiation of construction, all construction personnel shall be trained regarding the recognition of possible subsurface paleontological resources and protection of all paleontological resources during construction. The Applicant shall complete training for all construction personnel. Training shall inform all construction personnel of the procedures to be followed upon the discovery of paleontological materials. Training shall inform all construction personnel that Environmentally Sensitive Areas (ESAs) may include areas determined to be paleontologically sensitive ~~as defined on the paleontological sensitivity maps for the project~~. The ESAs~~, and~~ must be avoided and ~~that~~ travel and construction activity must be confined to designated roads and areas. All personnel shall be instructed that unauthorized collection or disturbance of protected fossils on or off the

right-of-way by the Applicant, his representatives, or employees will not be allowed. Violators will be subject to prosecution under the appropriate State and federal laws and violations will be grounds for removal from the project. Unauthorized resource collection or disturbance may constitute grounds for the issuance of a stop work order. The following issues shall be addressed in training or in preparation for construction:

- ~~All construction contracts shall include clauses that require construction personnel to attend training so they are aware of the potential for inadvertently exposing subsurface paleontological resources, their responsibility to avoid and protect all such resources, and the penalties for collection, vandalism, or inadvertent destruction of paleontological resources.~~
- The Applicant shall provide a background briefing for supervisory personnel describing the potential for exposing paleontological resources, the location of any potential ESAs, and procedures and notifications required in the event of discoveries by project personnel or paleontological monitors. Supervisory personnel shall enforce restrictions on collection or disturbance of fossils.
- Upon discovery of paleontological resources by paleontologists or construction personnel, work in the immediate area of the find shall be halted and the Applicant's paleontologist notified. Once the find has been inspected and a preliminary assessment made, the Applicant's paleontologist will notify the BLM and CPUC and proceed with data recovery in accordance with the approved Plan consistent with Mitigation Measure PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan).

PAL-1d **Monitor construction for paleontological resources.** Based on the paleontological sensitivity assessment and Paleontological Resource Mitigation and Monitoring Plan consistent with Mitigation Measure PAL-1b (Develop Paleontological Mitigation and Monitoring Plan), the Applicant shall conduct full-time construction monitoring through its qualified paleontological monitor in areas determined to have moderate (PFYC 3a) to very high (PFYC 5) sensitivity. Sediments of ~~very low (PFYC 1), low (PFYC 2), or~~ unknown (PFYC 3b) sensitivity shall be monitored by a qualified paleontological monitor on a part-time basis (as ~~determined by the Qualified Paleontologist~~outlined in the Plan). Geologic Units with very low (PFYC 1) or low (PFYC 2) sensitivity shall not be monitored. Monitoring will entail the visual inspection of excavated or graded areas and trench sidewalls. ~~The monitor will also screen sediments to check for the presence of microvertebrates if they are believed to be present.~~ In the event that a paleontological resource is discovered, the monitor will have the authority to temporarily halt the construction equipment around the find until it is assessed for scientific significance, and collected. A temporary construction exclusion zone (i.e., environmentally sensitive area [ESA]) of at least 50 feet, consisting at a minimum of lath and flagging tape, will be erected around the discovery. The exclusion zone acts as a buffer around the discovery and is maintained for safety. ~~The monitor~~ SCE will ~~immediately (within 24 hours)~~ report the discovery to the CPUC and BLM within 24 hours and/or as outlined in the Plan. Construction activities can occur outside the buffer if it is safe to do so. The size of the buffer may be increased or decreased once the monitor adequately explores the discovery to determine its size and significance. If indicators of potential microvertebrate fossils are found, screening of a test sample shall be carried out as outlined in SVP 2010. This procedure will be outlined in the Plan.

Paleontological resource monitors per SVP (2010) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year experience monitoring in the state or geologic province of the specific project. An associate degree and/or demonstrated experience showing ability to recognize fossils in a biostratigraphic context and recover vertebrate fossils in the field may be substituted for a degree. An undergraduate degree in geology or paleontology is preferable, but is less important than documented experience performing paleontological monitoring, or
- AS or AA in geology, paleontology, or biology and demonstrated two years of experience collecting and salvaging fossil materials in the state or geologic province of the specific project, or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in the state or geologic province of the specific project.
- Monitors must demonstrate proficiency in recognizing various types of fossils, in collection methods, and in other paleontological field techniques

Copies of Monitoring Reports shall be submitted to the CPUC/BLM on a weekly basis.

PAL-1e **Final reporting and curation.** At the conclusion of laboratory work and museum curation, a final report will be prepared describing the results of the paleontological monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the Proposed Project area geology and paleontology, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to the designated museum repository.

All significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation no more than 60 days after all ~~fieldwork~~ analyses ~~is~~ are completed. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Following laboratory work, all fossils specimens will be identified to the lowest taxonomic level, cataloged, analyzed, and delivered to an accredited museum repository for permanent curation and storage. The cost of curation is assessed by the repository and is the responsibility of the Applicant.

D.14.3.4 Impacts of Connected Actions

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

Common to All Areas. The potential to discover paleontological resources during construction of connected action projects varies, depending on the location of ground disturbance. For the Blythe area it ranges from low to high; for the Desert Center area is ranges from very low to high. In general, the potential for a given project to result in adverse impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project. Ground disturbance is required for construction of all of the solar projects. Ground-disturbing activities typically associated with this type of project include excavation, grading, ancillary facilities construction, improvement of access roads, and vegetation removal.

Previously unrecorded or unknown fossils may be identified at nearly any development site that is underlain by geologic deposits that are conducive to the preservation of paleontological resources. When paleontological resources are discovered during project construction, federal and State laws and regulations impose specific handling, reporting and recovery protocols to avoid or minimize impacts to such resources as discussed in Section D.14.2 above. The exact number of paleontological resources, if any, that might be adversely affected by connected action projects cannot be determined without a comprehensive inventory and assessment of the paleontological resource potential of each project. However, based on the regional geology and known fossil localities for the areas, it is reasonable to assume that buried resources exist and may be uncovered during ground-disturbing activities. Should resources be discovered during construction of the connected action projects, they would be subject to federal and State legal requirements designed to protect them, thereby reducing the effect of impacts. As a result, resource protection measures similar to Mitigation Measures PAL-1a through PAL-1e, as described in Section D.14.3.3, would minimize or avoid impacts to paleontological resources encountered during construction of the connected action projects.

D.14.3.5 CEQA Significance Determination for Proposed Project and Connected Actions

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources (Class II)

For the Proposed Project, Mitigation Measures PAL-1a through PAL-1e (presented in Section D.14.3.3) require a paleontological inventory, pre-construction worker's environmental awareness training, preparation and implementation of a Paleontological Resource Mitigation and Monitoring Plan by a qualified professional paleontologist, curatorial instructions, and preparation of a final report outlining the paleontological mitigation monitoring efforts associated with the project. Implementation of these mitigation measures would reduce any adverse impacts to paleontological resources to less than significant levels by ensuring that significant fossils and paleontological resource are preserved, catalogued, and inventoried for future scientific purposes (Class II).

For the connected actions, construction-related ground disturbance resulting from development of connected action projects in Desert Center and Blythe areas could result in adverse impacts to paleontological resources, including disturbance, damage, or destruction of a significant fossil; destruction of a unique geologic feature associated with a paleontological site; or disturbance or destruction of a paleontological site, which results in the loss of scientific context of fossil remains. Should paleontological resources be discovered during construction-related activities associated with the projects, they would be subject to federal and State legal requirements discussed in Section D.14.2 above and would be required to implement mitigation measures similar to Mitigation Measures PAL-1a through PAL-1e to reduce any adverse impacts to paleontological resources to less than significant levels (Class II).

D.14.4 Environmental Impacts of Project Alternatives

Three alternatives are considered in this section; all of these alternatives would be located within the existing WOD ROW. The No Project Alternative is evaluated in Section D.14.5. Alternatives are described in detail in Appendix 5 (Alternatives Screening Report) and are summarized in Section C.

Paleontological resources within the ROW are described by segment in Section D.14.1.2 above; the description of the environmental setting would apply equally to the alternatives.

D.14.4.1 Tower Relocation Alternative

The Tower Relocation Alternative would locate certain transmission structures in Segments 4, 5, and 6 farther from existing homes than would be the case under the Proposed Project.

~~One impact related to paleontological resources was identified for the~~The Proposed Project identified that the loss of any significant paleontological resource, which yields information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact. This impact also would apply to the Tower Relocation Alternative, which overall would be the same as the Proposed Project, with the exception of the relocated transmission towers that are described above and in Appendix 5. The full text of all mitigation measures referenced in this section is presented in Section D.14.3.3, except where otherwise noted.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

The minor adjustment to the location of certain Segment 4, 5, and 6 towers would not change the risk of disturbance or destruction of significant paleontological resources compared to the Proposed Project. Construction has the potential to destroy valuable resources, and mitigation is required. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would minimize or avoid adverse effects to paleontological resources.

CEQA Significance Determination for Tower Relocation Alternative

The CEQA significance determination for the paleontological impact in this alternative is presented below.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources (Class II)

Construction of this alternative has the potential to destroy valuable paleontological resources, and mitigation is required. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would ensure that impacts to paleontological resources would be less than significant (Class II).

D.14.4.2 Iowa Street 66 kV Underground Alternative

The Iowa Street 66 kV Underground Alternative would place a 1,600-foot segment of subtransmission line underground, rather than overhead.

The Proposed Project identified that the loss of any significant paleontological resource, which yields information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact~~One impact was identified under the Proposed Project for paleontological resources~~. This impact also would apply to the Iowa Street 66 kV Underground Alternative, which overall would be the same as the Proposed Project, with the exception of the underground portion of the subtransmission line that is

described above and in Appendix 5. The full text of all mitigation measures referenced in this section is presented in Section D.14.3.3, except where otherwise noted.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

This alternative would increase the amount of subsurface disturbance compared to the Proposed Project, which would increase the risk of disturbance or destruction of significant paleontological resources. This alternative is not located in an area of high paleontological sensitivity, but there remains that potential for resource disturbance. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would minimize adverse effects to paleontological resources.

CEQA Significance Determination for Iowa Street 66 kV Underground Alternative

The CEQA significance determination for the paleontological impact in this alternative is presented below.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources (Class II)

Construction of this alternative has the potential to destroy valuable paleontological resources, and mitigation is required. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would ensure that impacts to paleontological resources would be less than significant (Class II).

D.14.4.3 Phased Build Alternative

The Phased Build Alternative would retain existing double-circuit 220 kV transmission structures to the extent feasible, remove single-circuit structures, add new double-circuit 220 kV structures, and string all structures with higher-capacity conductors.

The Proposed Project identified that the loss of any significant paleontological resource, which yields information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact~~One impact was identified under the Proposed Project for paleontological resources~~. This impact also would apply to the Phased Build Alternative, which would be located in the same corridor as the Proposed Project and would involve similar although less intense construction activities. The full text of all mitigation measures referenced in this section is presented in Section D.14.3.3, except where otherwise noted.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources

This alternative would reduce the amount of construction activity compared to the Proposed Project, and consequently would reduce the risk of disturbance or destruction of significant paleontological resources compared to the Proposed Project. Similar to the Proposed Project, the potential to discover

paleontological resources during construction within the project area ranges from very low to very high, depending on the location of ground disturbance. Portions of all 6 segments would be impacted by construction-related ground disturbances, though this alternative would have less ground disturbance than the Proposed Project.

Construction within areas of moderate to high fossil yield has the potential to destroy valuable resources, and mitigation is required. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would minimize or avoid adverse effects to paleontological resources.

CEQA Significance Determination for Phased Build Alternative

The CEQA significance determination for each paleontological impact in this alternative is presented below.

Impact PAL-1: Construction of the project ~~would~~ could destroy or disturb significant paleontological resources (Class II)

Construction of this alternative has the potential to destroy valuable paleontological resources, and mitigation is required. Implementation of Mitigation Measures PAL-1a (Inventory and evaluate paleontological resources), PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan), PAL-1c (Train construction personnel), PAL-1d (Monitor construction for paleontological resources), and PAL-1e (Final reporting and curation) would ensure that impacts to paleontological resources would be less than significant (Class II).

D.14.5 Environmental Impacts of No Project Alternative

D.14.5.1 No Project Alternative Option 1

No Project Alternative Option 1 is described in Section C.6.3.1. It would consist of a new 500 kV circuit, primarily following the Devers-Valley transmission corridor and extending 26 miles between Devers Substation. It would also require a new 40-acre substation south of Beaumont, and 4 new 220 kV circuits extending 7 miles from the new Beaumont Substation to El Casco Substation, primarily following the existing El Casco 115 kV ROW. The remainder of the No Project Alternative, from El Casco Substation to the San Bernardino and Vista Substations, would be identical to the Proposed Project. Information on environmental resources and project impacts is derived from the Devers–Palo Verde 500 kV No. 2 Project EIR/EIS (CPUC and BLM, 2006) and the El Casco System Project Draft EIR (CPUC, 2007); which include nearly all of the No Project alignment.

Devers to Beaumont Substation. Portions of the 500 kV alignment (from MP 20.0 to MP 22.2) are within areas of high paleontological sensitivity. These areas consist of Holocene alluvium over Pleistocene alluvium and have the potential for yielding undiscovered fossil remains. Other areas of high (at depth) paleontological sensitivity occur from MP 22.6 to MP 22.9 and MP 24.2 to MP 28.8. These are in the San Timoteo Formation and have a high potential to contain significant paleontological resources. The area between MP 22.2 to MP 22.6 contains Pleistocene older alluvium and has the potential for yielding undiscovered fossil remains. Lastly, the area between MP 24.0 to MP 24.2 contains Holocene alluvium possibly over San Timoteo Formation and may also yield undiscovered fossil remains.

Ground disturbance and installation of foundations in these are other areas could encounter undiscovered paleontological resources. Provisions for discovery and treatment of significant fossil remains will reduce project effects to these resources through implementation of mitigation measures requiring inventory of paleontological resources in the Final APE, developing and implementing a Paleontological Monitoring and Treatment Plan, monitoring construction for paleontology, conducting paleontological data recovery, and training construction personnel to be aware of resources. This would ensure discovery, evaluation, and treatment of significant paleontological resources.

Beaumont Substation and Beaumont to El Casco Substation. The Beaumont Substation area and the land between the substation and El Casco Substation is primarily alluvium and the San Timoteo Formation. The alluvium and terrace deposits here consist of flat-lying sediments, soil horizons, fine grained fluviatile sediments, and older alluvium of Late Pleistocene age. These deposits were laid down approximately 50,000 years ago and may contain significant paleontological resources. The San Timoteo Formation consists of siltstones, sandstones, and gravel fanglomerates and was deposited between 2.5 to 0.5 million years ago. The formation is considered to have high potential to contain significant nonrenewable paleontological resources. Mitigation such as that described above for the 500 kV segment would be required to ensure discover, evaluation, and treatment of significant paleontological resources occurs.

D.14.5.2 No Project Alternative Option 2

No Project Alternative Option 2 would require the construction of over 40 miles of new 500 kV transmission line, following the existing Valley-Serrano 500 kV line. The alternative is described in Section C.6.3.2, and illustrated on Figure C-6b. The route for No Project Alternative Option 2 passes through several paleontologically sensitive areas, including the Perris Valley and the alluvium surrounding Temescal Wash. Ground disturbance, such as installation of transmission tower foundations in paleontologically sensitive areas, could encounter undiscovered paleontological resources. Provisions for discovery and treatment of significant fossil remains would reduce project adverse effects to these resources through implementation of mitigation measures requiring inventory of paleontological resources in the area of potential effects, development and implementation of a Paleontological Monitoring and Treatment Plan, conducting paleontological data recovery, and training of construction personnel in identification and awareness of paleontological resources. These measures would reduce the potential for adverse effects to paleontological resources by ensuring that discovery, evaluation, and treatment of significant paleontological resources is properly planned and implemented.

D.14.6 Mitigation Monitoring, Compliance, and Reporting

Table D.14-6 presents the mitigation monitoring, compliance, and reporting actions for paleontological resources.

Table D.14-6. Mitigation Monitoring Program – Paleontological Resources

MITIGATION MEASURE	PAL-1a: Inventory and evaluate paleontological resources. Prior to construction and all other surface-disturbing activities, the Applicant shall have conducted and submitted an inventory of significant paleontological resources within the Proposed Project area. The report shall be based on the paleontological field reconnaissance surveys (conducted by PaleoSolutions, February 2012 to April 2013). If any changes are made to the extent or alignment of the Proposed Project subsequent to the completed field surveys, then additional field surveys shall be conducted within new project areas. The additional field surveys shall be conducted in areas identified as having moderate, undetermined, or high paleontological resource potential. The purpose of the field survey is to visually inspect the ground surface for exposed fossils and to evaluate geologic exposures for their potential to contain preserved fossil material at the subsurface. Field surveys shall be conducted in all areas of potential ground disturbance, outside of the previously surveyed potential impact areas. As part of the inventory report, the paleontological sensitivity rankings of geologic units examined in the field shall be evaluated using the BLM's (2008) PFYC System and refined based on the results of the pedestrian surveys. The report shall be submitted to the CPUC and BLM for review at least 60 days before the start of construction, and shall be modified in response to agency comments, with the final report completed at least 30 days before the first ground disturbance.
Location	All areas disturbed in project area
Monitoring / Reporting Action	Receive reports; review and provide comments
Effectiveness Criteria	Significant paleontological resources are inventoried; areas of potential finds are identified.
Responsible Agency	CPUC/BLM
Timing	At least 60 days before construction, draft report. At least 30 days before ground disturbance, final report.

Table D.14-6. Mitigation Monitoring Program – Paleontological Resources

MITIGATION MEASURE	PAL-1b: Develop Paleontological Resource Mitigation and Monitoring Plan. Following completion and approval of the Paleontological Resources Report (required in Mitigation Measure PAL-1a) and prior to the start of ground-disturbing construction, the Applicant shall prepare and submit to CPUC and BLM for review and approval, a Paleontological Resources Mitigation and Monitoring Plan (Plan), consistent with the following requirements: ▪ The Plan shall be prepared by a Qualified Paleontologist and shall be based on Society of Vertebrate Paleontology (SVP) guidelines and meet all regulatory requirements. The qualified paleontologist shall have a Master's Degree or Ph.D. in paleontology, shall have knowledge of the local paleontology, and shall be familiar with paleontological procedures and techniques. ▪ The Plan shall include a site-specific investigation to identify construction impact areas of moderate (PFYC 3a) to very high (PFYC 5) sensitivity for encountering significant resources and the approximate depths at which those resources are likely to be encountered for each component of each segment of the Proposed Project. ▪ The Plan shall require the qualified paleontological monitor to monitor all construction-related ground disturbance in sediments determined to have a moderate (PFYC 3a) to very high (PFYC 5) sensitivity. ▪ The Plan shall define monitoring procedures and methodology, and shall specify that sediments of undetermined sensitivity shall be monitored on a part-time basis (as determined by the Qualified Paleontologist). Sediments with very low or low sensitivity will not require paleontological monitoring. ~~The Qualified Paleontological Monitor shall have at least a B.S. in Geology or Paleontology, and demonstrated field experience in the collection and identification of fossil material.~~ ▪ The Plan shall state which resources will be avoided and which shall be recovered for their data potential. Where possible, recovery is preferred over avoidance in order to mitigate the potential for looting of paleontological resources. The Plan shall also detail methods of recovery, preparation and analysis of specimens, final curation of specimens at a federally accredited repository, data analysis, and reporting. ▪ The Plan shall specify that all paleontological work undertaken by the Applicant on public lands administered by BLM shall be carried out by qualified, permitted paleontologists with the appropriate current Paleontological Resources Use Permit.
Location	Entire project area
Monitoring / Reporting Action	Receive plan; review and approve
Effectiveness Criteria	Plan meets mitigation measure requirement; appropriate strategies and monitoring methods are defined and followed.
Responsible Agency	CPUC/BLM
Timing	Following completion and approval of Paleontological Resources Report and prior to ground-disturbing construction.

Table D.14-6. Mitigation Monitoring Program – Paleontological Resources

MITIGATION MEASURE	PAL-1c: Train construction personnel. Prior to the initiation of construction, all construction personnel shall be trained regarding the recognition of possible subsurface paleontological resources and protection of all paleontological resources during construction. The Applicant shall complete training for all construction personnel. Training shall inform all construction personnel of the procedures to be followed upon the discovery of paleontological materials. Training shall inform all construction personnel that Environmentally Sensitive Areas (ESAs) may include areas determined to be paleontologically sensitive ~~as defined on the paleontological sensitivity maps for the project~~. The ESAs~~, and~~ must be avoided and ~~that~~ travel and construction activity must be confined to designated roads and areas. All personnel shall be instructed that unauthorized collection or disturbance of protected fossils on or off the right-of-way by the Applicant, his representatives, or employees will not be allowed. Violators will be subject to prosecution under the appropriate State and federal laws and violations will be grounds for removal from the project. Unauthorized resource collection or disturbance may constitute grounds for the issuance of a stop work order. The following issues shall be addressed in training or in preparation for construction: ~~▪ All construction contracts shall include clauses that require construction personnel to attend training so they are aware of the potential for inadvertently exposing subsurface paleontological resources, their responsibility to avoid and protect all such resources, and the penalties for collection, vandalism, or inadvertent destruction of paleontological resources.~~ ▪ The Applicant shall provide a background briefing for supervisory personnel describing the potential for exposing paleontological resources, the location of any potential ESAs, and procedures and notifications required in the event of discoveries by project personnel or paleontological monitors. Supervisory personnel shall enforce restrictions on collection or disturbance of fossils. ▪ Upon discovery of paleontological resources by paleontologists or construction personnel, work in the immediate area of the find shall be halted and the Applicant's paleontologist notified. Once the find has been inspected and a preliminary assessment made, the Applicant's paleontologist will notify the BLM and CPUC and proceed with data recovery in accordance with the approved Plan consistent with Mitigation Measure PAL-1b (Develop Paleontological Resource Mitigation and Monitoring Plan).
Location	All areas disturbed in project area
Monitoring / Reporting Action	Review training materials; confirm training occurs
Effectiveness Criteria	All construction personnel are properly trained before working on project
Responsible Agency	CPUC/BLM
Timing	Prior to construction.

Table D.14-6. Mitigation Monitoring Program – Paleontological Resources

MITIGATION MEASURE	PAL-1d: Monitor construction for paleontological resources. Based on the paleontological sensitivity assessment and Paleontological Resource Mitigation and Monitoring Plan consistent with Mitigation Measure PAL-1b (Develop Paleontological Mitigation and Monitoring Plan), the Applicant shall conduct full-time construction monitoring through its qualified paleontological monitor in areas determined to have moderate (PFYC 3a) to very high (PFYC 5) sensitivity. Sediments of ~~very low (PFYC 1), low (PFYC 2), or~~ unknown (PFYC 3b) sensitivity shall be monitored by a qualified paleontological monitor on a part-time basis (as ~~determined by the Qualified Paleontologist~~outlined in the Plan). Geologic Units with very low (PFYC 1) or low (PFYC 2) sensitivity shall not be monitored. Monitoring will entail the visual inspection of excavated or graded areas and trench sidewalls. ~~The monitor will also screen sediments to check for the presence of microvertebrates if they are believed to be present.~~ In the event that a paleontological resource is discovered, the monitor will have the authority to temporarily halt the construction equipment around the find until it is assessed for scientific significance, and collected. A temporary construction exclusion zone (i.e., environmentally sensitive area [ESA]) of at least 50 feet, consisting at a minimum of lath and flagging tape, will be erected around the discovery. The exclusion zone acts as a buffer around the discovery and is maintained for safety. ~~The monitor~~SCE will ~~immediately (within 24 hours)~~ report the discovery to the CPUC and BLM within 24 hours and/or as outlined in the Plan. Construction activities can occur outside the buffer if it is safe to do so. The size of the buffer may be increased or decreased once the monitor adequately explores the discovery to determine its size and significance. If indicators of potential microvertebrate fossils are found, screening of a test sample shall be carried out as outlined in SVP 2010. This procedure will be outlined in the Plan. Paleontological resource monitors per SVP (2010) shall have the equivalent of the following qualifications: ▪ BS or BA degree in geology or paleontology and one year experience monitoring in the state or geologic province of the specific project. An associate degree and/or demonstrated experience showing ability to recognize fossils in a biostratigraphic context and recover vertebrate fossils in the field may be substituted for a degree. An undergraduate degree in geology or paleontology is preferable, but is less important than documented experience performing paleontological monitoring, or ▪ AS or AA in geology, paleontology, or biology and demonstrated two years of experience collecting and salvaging fossil materials in the state or geologic province of the specific project, or ▪ Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in the state or geologic province of the specific project. ▪ Monitors must demonstrate proficiency in recognizing various types of fossils, in collection methods, and in other paleontological field techniques Copies of Monitoring Reports shall be submitted to the CPUC/BLM on a weekly basis.
Location	Entire project area
Monitoring / Reporting Action	CPUC/BLM monitors confirm that SCE monitors are present during construction as required and perform duties as outlined; exclusion zones are established as required; appropriate reporting occurs.
Effectiveness Criteria	Monitors are present during construction as required and perform duties as outlined; exclusion zones are established as required; appropriate reporting occurs.
Responsible Agency	CPUC/BLM
Timing	When construction occurs in areas to have moderate to very high sensitivity for paleontological resources.

Table D.14-6. Mitigation Monitoring Program – Paleontological Resources

MITIGATION MEASURE	PAL-1e: Final reporting and curation. At the conclusion of laboratory work and museum curation, a final report will be prepared describing the results of the paleontological monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the Proposed Project area geology and paleontology, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to the designated museum repository. All significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation no more than 60 days after all ~~fieldwork~~ analyses are~~is~~ completed. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Following laboratory work, all fossils specimens will be identified to the lowest taxonomic level, cataloged, analyzed, and delivered to an accredited museum repository for permanent curation and storage. The cost of curation is assessed by the repository and is the responsibility of the Applicant.
Location	Entire project area
Monitoring / Reporting Action	CPUC/BLM monitor confirms that curation has occurred consistent with mitigation measures requirements and report is prepared.
Effectiveness Criteria	A final report is prepared and curation has occurred
Responsible Agency	CPUC/BLM
Timing	No more than 60 days after all fieldwork is completed

D.14.7 References

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