

## 3.12 PALEONTOLOGICAL RESOURCES

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This section provides an overview of the paleontological resources in the project area, and identifies potential impacts associated with the Proposed Project and alternatives. Specifically, this section describes the area of analysis and regulatory setting; defines paleontological resources; and analyzes potential project impacts and mitigation measures.

### 3.12.1 Affected Environment

#### 3.12.1.1 Environmental Setting

The project area contains surface exposures of numerous geologic units including (from oldest to youngest): Precambrian rocks (undifferentiated granitic and metamorphic rocks); Mesozoic granitics; Tertiary volcanics; Tertiary intrusive andesite; Eocene marine rocks; Miocene fanglomerate; Plio-Pleistocene terrestrial outcrops; Pleistocene older alluvium (Ocotillo Conglomerate); the Lake Cahuilla beds; recent alluvium; and dune sands (Dibblee 1954; Jennings 1967; Rogers 1965; Morton 1999). Many of these rock units have high potential to contain significant paleontologic resources. The following sections discuss general geologic formations and the potential for paleontological resources to occur along the Proposed Project and alternative transmission line alignments. Due to the proximity of the Proposed Project and Alternatives A and C transmission line alignments, geologic formations and paleontological resources along these alignments are similar and are discussed collectively, followed by a discussion of the Alternative B alignment.

##### 3.12.1.1.1 Proposed Project and Alternatives A and C

The Proposed Project and Alternatives A and C transmission line alignments extend west from the proposed substation/switchyard location (see Figure ES-1) past Ford Dry Lake through the Chuckwalla Valley south of Desert Center, Hayfield, and Chiriaco Summit. After passing through the Orocopia Valley south of the Eagle Mountains the route veers west-northwest into the Coachella Valley north of the Mecca Hills and south of the Indio Hills to the Devers substation.

Small outcrops of the Eocene Maniobra Formation (marine siltstone/sandstone) crossed in the northern Orocopia Mountains have yielded fossil mollusks (Jennings 1967). In the southern Mecca Hills, the alignment crosses exposures of Plio-Pleistocene nonmarine sediments of the fossiliferous Palm Springs Formation, and the Canebrake and Ocotillo Conglomerates. In the Mecca Hills/Indio Hills area, the Palm Springs Formation has yielded fossils of extinct vertebrates including *Sigmodon* sp. (extinct cotton rat; pre-*Sigmodon hispidus* in its anatomical configuration) and *Equus* sp. [resembling *Equus scotti*; as defined by Scott 1998] (Rymer 1989). Exposures of the Bishop Ash have also been identified from the Mecca Hills (Rymer 1990, 1994). This volcanic ash has been radiometrically dated to " 758,000 years before present (Pajak et al. 1996). The fossils and the presence of the Bishop Ash confirm that the Palm Springs Formation was deposited, at least in part, during the early Pleistocene Epoch (i.e., Irvingtonian North American Land Mammal Age). The Palm Springs Formation has high potential to produce significant nonrenewable paleontologic resources of the early Pleistocene age.

### **3.12.1.1.2 Alternative B**

The Alternative B transmission line alignment extends southwards from the proposed substation/switchyard location through Palo Verde and the Palo Verde Mountains, passing between Mount Barrow and Quartz Peak, and on to Glamis, where the alignment turns sharply to the northwest and passes through Acolita and Amos to the Midway Substation west of Iris (see Figure ES-1). Along this route, the alignment crosses surface exposures of Pleistocene older alluvial sediments, including the above-mentioned Brawley Formation. These formations have high paleontologic sensitivity.

The transmission line alignments also cross extensive surface exposures of middle Pleistocene lacustrine sediments and the Brawley Formation, a fluvial/lacustrine unit exposed primarily west of the Chocolate Mountains. Surface exposures of Precambrian and Mesozoic granitic rocks, recent dune sands, and recent alluvium encountered along the alignment of the transmission line have low potential to contain significant fossil resources. Therefore, they are assigned low paleontologic sensitivity. However, recent alluvial sediments and dune sands at the surface may overlie older fossil-bearing strata in some cases.

Near the Midway Substation, the Alternative B alignment crosses surface exposures of Lake Cahuilla sediments. These early Holocene lacustrine and fluvial deposits have high paleontologic sensitivity and have previously yielded fossil remains representing a diversity of freshwater diatoms, land plants, sponges, ostracods, molluscs, fish, and small terrestrial vertebrates (Van de Kamp 1973; Waters 1983; Whistler et al 1995). Precambrian and Mesozoic granitic rocks, Tertiary volcanics, and recent alluvium encountered by the proposed alignment have low potential to contain fossil resources. However, recent alluvial sediments at the surface may overlie older fossil-bearing strata in some cases (Scott 2001).

As discussed in Section 2, in addition to construction of a new transmission line, Alternative B would also require upgrading segments of existing transmission lines between the Coachella and Devers Substations. These segments comprise a corridor that is generally located along the west face of the Mecca Hills and south and west of the Indio Hills. These segments may encounter recent and Pleistocene Alluvium, Ocotillo Formation, Palm Spring Formation, and possibly Imperial Formation. Due to the unknown depth of the older sediments, all of these formations have high paleontological sensitivity except the recent Alluvium. Upgrade Segment 2 is within one mile of fossil localities known from the Imperial Formation.

### **3.12.1.2 Previously Identified Paleontological Resources**

A review of the Regional Paleontologic Locality Inventory (RPLI) at the San Bernardino County Museum (SBCM) was conducted by the staff of the Section of Geological Sciences to determine the presence of known paleontological sites in proximity to the Proposed Project and alternatives. The results of this review indicate that 66 previously recorded paleontologic resource localities are present within areas in proximity to the Proposed Project or alternative transmission line alignments. Many of these localities are outside of the areas potentially effected by the Proposed Project and alternatives. Table 3.12-1 summarizes the paleontological resource localities along or near the alignments (to facilitate discussion of potential impacts in Section 3.12.3, the table also identifies if the resource could potentially be impacted during construction activities).

**Table 3.12-1  
Paleontological Resource Localities and Potential Impact Assessment Near the  
Proposed Project and Alternative Transmission Line Alignments**

Localities	Location	Paleontological Formation	Project Impact	Paleontologic Sensitivity
SBCM 11.010.005 - 11.010.008	Northeast of Flowing Wells, and the Midway Substation	Pleistocene invertebrates and vertebrates, including large and small mammal bones, from exposures of the Brawley Formation.	Potential for impacts associated with construction of <b>Alternative B</b> transmission line near the Midway Substation.	High
SBCM 11.010.032 - 11.010.038	Northeast of Flowing Wells the Midway Substation	Pleistocene invertebrates and vertebrates, including large and small mammal bones from exposures of the Brawley Formation.	Potential for impacts associated with construction of <b>Alternative B</b> transmission line near the Midway Substation.	High
SBCM 05.008.007 - 05.008.015	Approximately 10 miles northwest of Indio	Fossil remains of freshwater invertebrates and vertebrates including fish, gophers and deer from exposures of the Lake Cahuilla beds.	Potential for impacts associated with the <b>Proposed Project</b> and <b>Alternatives A and C</b> transmission lines.	This region demonstrates the paleontologic sensitivity of the Lake Cahuilla beds.
SBCM 05.009.001 - 05.009.003	Near Thermal Canyon, east of the Coachella Canal near 58 <sup>th</sup> Avenue	Fossils of freshwater invertebrates, fish, rodents and extinct elephants from exposures of the Palm Springs Formation.	None. No Proposed Project or alternative facilities would be located in proximity to the sites.	High
SBCM 05.009.004 - 05.009.006	Northwest of the northern end of Johnson Street	Freshwater mollusk fossils from exposures of the Palm Springs Formation.	Potential impact from the <b>Proposed Project</b> and <b>Alternatives A</b> and <b>C</b> transmission line construction.	High
SBCM 05.012.001 - 05.012.004	Between east of Desert Beach and the Riverside/Imperial County line	Fossil remains of freshwater mollusks and bony fish from older lacustrine sediments.	None. No Proposed Project or alternative facilities would be located in proximity to the sites.	High
SBCM 05.012.013 - 05.012.023 and 05.012.038 - 05.012.042	Between east of Desert Beach and the Riverside/Imperial County line	Fossil remains of freshwater mollusks and bony fish from older lacustrine sediments.	None. No Proposed Project or alternative facilities would be located in proximity to the sites.	High
SBCM 05.012.006 - 05.012.012 and SBCM 05.012.024 - 05.012.028	South of the Riverside/Imperial County line and north of Frink	Fossil remains of freshwater mollusks, bony fish, turtles, and terrestrial mammals including bighorn sheep from older lacustrine sediments.	None. No Proposed Project or alternative facilities would be located in proximity to the sites.	High
SBCM 11.010.009 - 11.010.014	Near Alternative B transmission line.	Fossil remains of freshwater mollusks from the Brawley Formation and from older lacustrine beds.	Potential impact.	High

<b>Table 3.12-1 Paleontological Resource Localities and Potential Impact Assessment Near the Proposed Project and Alternative Transmission Line Alignments</b>				
<b>Localities</b>	<b>Location</b>	<b>Paleontological Formation</b>	<b>Project Impact</b>	<b>Paleontologic Sensitivity</b>
SBCM 11.010.044	Four miles south of Alternative B in Mammoth Wash, southwest of the Coachella Canal	Fossils of freshwater mollusks, bony fish and possible terrestrial rodents from the Brawley Formation.	No impact. Construction of the <b>Alternative B</b> transmission line would not occur in proximity to this site.	High
SBCM 11.010.041	Two miles south of the Midway Substation	Fossils of freshwater mollusks, bony fish and possible terrestrial rodent from the Brawley Formation.	No impact. No construction on the <b>Alternative B</b> transmission line would occur south of the Midway Substation.	High
Localities SBCM 11.010.042 - 11.010.043	South of the East Highline Canal, three miles south of the Alternative B transmission line	Fossils of freshwater mollusks, bony fish and possible terrestrial rodent from the Brawley Formation.	No impact. Construction of the <b>Alternative B</b> transmission line would not occur in proximity to this site.	High

### **3.12.2 Regulatory Setting**

#### **3.12.2.1 Federal**

##### **3.12.2.1.1 Code of Federal Regulations**

The BLM manages paleontological resources under a number of federal regulations. Principally, paleontological resources on BLM land are protected under Title 43, Subpart 8365.1-5 of the CFR which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects. Subpart 8360.0-7 identifies the penalties for such violations.

##### **3.12.2.1.2 Federal Land Policy and Management Act**

The FLPMA of 1976 (P.L. 94-579) requires that public land be managed in a manner that protects the ". . . scientific qualities . . ." and other values of resources under BLM management.

##### **3.12.2.1.3 BLM Paleontological Resource Management Program**

This program is intended to provide a consistent and comprehensive approach to the management of paleontological resources including identification, evaluation, protection, and use. It is described in the BLM Manual 8720. Specific objectives of this program are to:

- Locate, evaluate, manage, and protect, where appropriate, paleontological resources on public land.
- Facilitate the appropriate scientific, educational, and recreational uses of paleontologic resources, such as research and interpretation.

- Ensure that proposed land uses, initiated or authorized by BLM, do not inadvertently damage or destroy important paleontologic resources on public land.
- Foster public awareness and appreciation of our nation's rich paleontological heritage.

Paleontological resources found on public land are recognized by the BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth, and so represent an important and critical component of America's natural heritage. It is the BLM's policy, therefore, to manage paleontological resources for these values, and to mitigate adverse impacts to them.

### **3.12.2.2 Local**

#### **3.12.2.2.1 Imperial County General Plan**

Goals from the Imperial County General Plan include preserving important prehistoric and historic resources to advance scientific knowledge and maintain the traditional historic element of the Imperial Valley landscape. An objective for cultural resources in the County includes protecting and preserving sites of archaeological, ecological, historical, and scientific value, and/or cultural significance (Imperial County 1996).

#### **3.12.2.2.2 Riverside County General Plan**

Objectives of the Riverside County General Plan include: 1) identifying and documenting significant historic and prehistoric resources, and providing for the preservation of representative and worthy examples, and 2) recognizing the value of historic and prehistoric resources, and assessing current and proposed land uses for impacts upon those resources (Riverside County 1984).

### **3.12.3 Environmental Consequences**

#### **3.12.3.1 Methodology**

A paleontological record search was conducted by staff of the Section of Geological Sciences, SBCM. Existing literature on the geology and paleontology of the project area was reviewed to identify the existence of known fossils or areas with a high potential for the existence of fossils based on geologic conditions that could potentially be impacted by project alternatives.

Potential impacts identified for this analysis are based upon the "paleontological sensitivity" of geologic formations that would be encountered during construction of alternative project alignments. Paleontological sensitivity is an estimate of the likelihood that fossils will be discovered during excavations in a given area. However, this estimate does not measure the significance of individual fossils that may be present or discovered in an area. Individual fossils that may be discovered must be examined to determine the nature, age, and value of the fossil.

The sensitivity standards of the Society of Vertebrate Paleontology are used here. These national standards provide four classification levels of sensitivity as follows:

*High Sensitivity:* Rock units from which vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered are considered to have a high potential for containing significant nonrenewable fossiliferous resources.

*Low Sensitivity:* Reports in the paleontologic literature of field survey by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant nonrenewable fossiliferous resources.

*Undetermined Sensitivity:* Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potential.

*No Sensitivity:* Metamorphic and granitic rock units do not yield fossils and therefore have no potential to yield significant nonrenewable fossiliferous resources.

### **3.12.3.2 Significance Criteria**

Project construction and operation activities would have a significant impact on paleontological resources if they substantially compromise a significant paleontological site's scientific and educational values.

Unless otherwise noted, all identified impacts are considered to be potentially significant adverse impacts. Corresponding mitigation measures, unless otherwise noted, are expected to be sufficient to reduce impacts to a less than significant level.

### **3.12.3.3 Proposed Project Impacts and Mitigation Measures**

**Paleontological Resources Impact 1:** *Excavation in conjunction with development of the Proposed Project has a high potential to adversely impact significant paleontologic resources.*

The results of the literature review demonstrate that the alignment of the Proposed Project would traverse a variety of fossiliferous geologic units with high potential to contain significant nonrenewable paleontologic resources. Table 3.12-1 summarizes the paleontological resource localities along or near the alignments and identifies if the resource could potentially be impacted during construction activities. Although a limited number of known paleontological resource sites are located within or in proximity to Proposed Project facilities, the review demonstrates that abundant paleontological resource localities may exist along or near the Proposed Project alignment. These resources include those known to be present, and an unknown number of undiscovered resources that may also be present. Ground disturbance associated with tower footing excavation and other construction activities would, therefore, have a high potential to adversely impact significant paleontological resources during construction of the Proposed Project.

**Paleontological Resources Impact 1 Mitigation:** *A qualified vertebrate paleontologist will develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program will be consistent with provisions of CEQA, regulations currently implemented by Riverside County, and proposed guidelines of the Society of Vertebrate Paleontology. This program will include, but will not be limited to:*

- (1) Pre-construction survey of the length of the Proposed Project alignment to confirm and/or augment geologic mapping, to further assess the paleontologic potential of the geologic formations described herein (particularly those having undetermined paleontologic

sensitivity), to recover exposed paleontologic resources as necessary, and to determine where historic or recent disturbances might have reduced or eliminated the paleontologic sensitivity of a given rock unit.

- (2) Monitoring, by a qualified paleontologic monitor, of excavation in areas identified as having high or undetermined potential to contain paleontologic resources. The monitor should be equipped to salvage fossils as they are unearthed, to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced if the potentially fossiliferous units described herein are not present at the surface or in the subsurface, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.
- (3) Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
- (4) Identification and curation of specimens into a museum repository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities.
- (5) Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency, would signify completion of the program to mitigate impacts to paleontologic resources.

#### **3.12.3.4 Alternative A Impacts and Mitigation Measures**

Similar to the Proposed Project, the results of the literature review demonstrate that the alignment of the Alternative A transmission line would traverse a variety of fossiliferous geologic units with high potential to contain significant nonrenewable paleontologic resources. Table 3.12-1 summarizes the paleontological resource localities along or near the alignments and identifies if the resource could potentially be impacted during construction activities. Although a limited number of known paleontological resources sites are located within or in proximity to the Alternative A transmission line alignment which include those known to be present and an unknown number of undiscovered resources that may also be present. Ground disturbance associated with tower footing excavation and other construction activities would, therefore, have a high potential to adversely impact significant paleontological resources during construction of the Alternative A transmission line. Mitigation identified for the Proposed Project could also be implemented for Alternative A, and would reduce potential impacts associated with Alternative A to less than significant.

#### **3.12.3.5 Alternative B Impacts and Mitigation Measures**

Similar to the Proposed Project, the results of the literature review demonstrate that the alignment of the Alternative B transmission line would traverse a variety of fossiliferous geologic units with high potential to contain significant nonrenewable paleontologic resources. Table 3.12-1 summarizes the paleontological resource localities along or near the alignments and identifies if the resource could potentially be impacted during construction activities. A limited number of known paleontological resource sites are located within or in proximity to the

Alternative B transmission line alignment, which include those known to be present and an unknown number of undiscovered resources that may also be present. Ground disturbance associated with tower footing excavation and other construction activities would, therefore, have a high potential to adversely impact significant paleontological resources during construction of the Alternative B transmission line. Mitigation identified for the Proposed Project could also be implemented for Alternative B, and would reduce potential impacts associated with Alternative B to less than significant.

### **3.12.3.6 Alternative C Impacts and Mitigation Measures**

Similar to the Proposed Project, the results of the literature review demonstrate that the alignment of the Alternative C transmission line would traverse a variety of fossiliferous geologic units with high potential to contain significant nonrenewable paleontologic resources. Table 3.12-1 summarizes the paleontological resource localities along or near the alignments and identifies if the resource could potentially be impacted during construction activities. Although a limited number of known paleontological resources sites are located within or in proximity to the Alternative C transmission line alignment which include those known to be present and an unknown number of undiscovered resources that may also be present. Ground disturbance associated with tower footing excavation and other construction activities would, therefore, have a high potential to adversely impact significant paleontological resources during construction of the Alternative C transmission line. Mitigation identified for the Proposed Project could also be implemented for Alternative C, and would reduce potential impacts associated with Alternative C to less than significant.

### **3.12.3.7 No Project Alternative**

Under the No Project Alternative, no facilities would be constructed and no disturbance or activities would occur that would have the potential to impact paleontological resources.