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5.8 Paleontological Resources

This section presents the potential effects on paleontological resources (fossils) from the construction and operation of the Stanton Energy Reliability Center (SERC). Section 5.8.1 discusses the affected environment, including the resource inventory and its results. Section 5.8.2 presents the environmental analysis and impact assessment. Section 5.8.3 considers cumulative effects on paleontological resources, and 5.8.4 presents SERC-proposed mitigation measures. Section 5.8.5 discusses applicable laws, ordinances, regulations, and standards (LORS). Section 5.8.6 lists involved agencies, Section 5.8.7 lists permits, and Section 5.8.8 provides the references consulted.

This section of the Application for Certification meets all siting regulations of the California Energy Commission (CEC) (CEC, 2000; CEC, 2007) and conforms to the recommendations of the Society of Vertebrate Paleontology (SVP) (SVP, 2010) that address the assessment of and mitigating impacts on paleontological resources resulting from earthmoving activities. This paleontological resources inventory and impact assessment was prepared by Dr. W. Geoffrey Spaulding, Paleontological Resources Specialist (PRS). Dr. Spaulding has conducted assessments, as well as planned and implemented prescribed paleontological mitigation measures, for a wide range of electrical generation and transportation projects in Southern and central California.

5.8.1 Affected Environment

This section describes the affected environment for paleontological resources. It begins by describing the physiographic and geological context of the project area, and then continues by describing the nature and types of fossil resources that have been recorded in the area. It concludes by providing an assessment of the scientific importance of the fossils that may be encountered during the construction of SERC.

5.8.1.1 Physiographic and Geologic Setting

The SERC site is located within the southeastern portion of the Los Angeles Basin, one of a number of tectonically distinct depositional basins along the western margin of Southern California (Harden, 1998). These basins hold sediments (mostly marine, with some terrestrial units) that record local transgressions and regressions of the Pacific Ocean, a process that has been ongoing on the western margin of the continent for at least 40 million years. However, most of the sediments exposed on the margins of the Los Angeles Basin are quite young, dating from the Pliocene to Recent (the last 5 million years) (Yerkes et al., 1965). The SERC site itself lies on the vast Los Angeles coastal plain, floored by sediments of Quaternary age. The closest bedrock are outcrops of the Coyote Hills, about 2 miles to the north, although the “bedrock” consists of relatively unconsolidated marine sediments, also of Quaternary age (Morton, 2004).

The geological history of this region is complex, owing to intense tectonic deformation associated with the San Andreas Fault, the rotation of the Transverse Ranges, and the uplift or subsidence of individual depositional basins, and smaller portions of basins along the coast. This tectonic activity and deformation continues to present (Yeats and Rockwell, 1991). The Los Angeles Basin began as a deep-sea depositional basin during the middle Tertiary, as early as 35 million years ago, and its oldest sediments consist of relatively deep-sea marine turbidities and mudstones unconformably overlying older beds (Yeats and Rockwell, 1991). During the last glacial age, when sea level was hundreds of feet lower than it is now, the coastal plain extended far out to sea (LaJoie et al., 1991), and areas nearer the hills experienced increased sedimentation as easily eroded hills shed their sediment load onto the plain.

5.8.1.2 Physiographic and Geologic Setting

5.8.1.2.1 Resource Inventory Methods

To develop a baseline paleontological resources inventory of the SERC site area and surrounding lands, published and available unpublished geological and paleontological literature was reviewed. Sources included geological maps, satellite photography, technical and scientific reports, and electronic databases. The potential paleontological productivity of stratigraphic units that may be affected by project implementation was then initially developed through a paleontological resources records search. For this project, a paleontological resources records review was conducted using the online database maintained by the University of California Museum of Paleontology at Berkeley (UCMP).

The project PRS is familiar with the paleontology of Orange County and the project area, having prepared paleontological resources assessments and implemented paleontological resources mitigation measures on this part of the Coastal Plain. The area is entirely developed, and it is covered with the concrete and asphalt composing the buildings and roads of metropolitan Orange County. Because the project area is on a coastal plain, a region devoid of outcrops and consisting of younger Quaternary (Holocene) sediments, no fossils or fossiliferous sediments are expected at or near the surface. Where bare ground is visible, its origin (native or fill) is uncertain. Based on a review of historical aerial photography performed for a Phase I Environmental Site Assessment, the currently undeveloped eastern portion of the site has been previously disturbed with grading and agricultural activities (Advantage Environmental Consultants, LLC, 2016). Therefore, no paleontological resources field survey of the project area was conducted.

5.8.1.2.2 Resource Inventory Results

The SERC project area, including both offsite linear alternatives, is typified by dense urban development. There are no natural geological outcrops anywhere in the area. However, surficial geological maps of the area do exist (Morton, 2004), and the area does possess a paleontological resources record, albeit a meager one.

5.8.1.2.3 Geological Units in the Valley

The SERC lies on the relatively flat coastal plain of the Los Angeles Basin, about 6.5 miles west of the course of the Santa Ana River and 2 miles south of the fault zone running along the base of the Coyote Hills. The project site is currently used for commercial and light-industrial purposes or undeveloped, and a layer of disturbed sediment and fill covers the entire area proposed for the generation station. Below this fill, late Holocene age alluvial fan deposits have been mapped (Qyf_a and Qyf_{sa}) (Morton, 2004) (see Figures 5.4-1a and 5.4-1b in Section 5.4, Geological Hazards and Resources). These sediments are the product of subaerial debris flows issuing from the Coyote Hills to the north, often as a result of catastrophic events flowing hill-slope denudation and heavy winter rains. This alluvium is only marginally distinguishable from younger axial channel deposits (Qy_{as}) that have been mapped in the area, although not within the project's area of potential effect to paleontological resources (Morton, 2004). Other geological units lie well over 1 mile from the project area and its two alternative linears.

5.8.1.2.4 Results of the Records Search and Literature Review

Geologic names such as "overbank deposits" and "Quaternary alluvial fans" do not lend themselves to database searches. A search of the UCMP database on September 7, 2016, queried for fossil site records within the potentially impacted formations. The results can be used as a general guide to the paleontological potential (i.e., the likelihood of yielding scientifically significant fossils) of the sediments in the vicinity of the project, with allowance for the nature of the data. In particular, the complex history of the geologic names complicated this search because historic locality records often retain their original stratigraphic designations despite later revisions to the nomenclature. Fortunately, the UCMP is aware of these issues, and many of the records indicate the history of the formation name.

Queries of the UCMP database yielded 36 vertebrate fossil records, but from only four sites (UCMP, 2016). These sites are all in the hills more than 2 miles to the north and east, or are from near the ocean shore more than 10 miles to the south. In these areas, uplift and erosion have produced geological cross sections of older sediments, particularly exposures of the fossiliferous early to middle Pleistocene Palos Verdes Sand. There are more than 4,000 other records of microfossil and invertebrate collections. While microfossils are not considered individually significant because of their abundance in the geologic record, their records provide good information on the location of potentially fossiliferous sediments. The records search (UCMP, 2016) produced no records indicating that the alluvial sediments upon which the project, and its two linear alternatives, are sited possess paleontological sensitivity. The low paleontological sensitivity indicated by the records search is consistent with its young age and its manner of deposition. Alluvial fan lobes extending out of the hills and mountains surrounding the greater Los Angeles basin were deposited subaerially, in a context that would promote the rapid decomposition of any organic remains. Throughout the American southwest, including the arid Southern California coast, alluvial fans generally do not yield fossils absent special conditions. This is not necessarily the case for localities closer to major streams. Prior experience (Verhoff and Spaulding, 2011) has shown that overbank deposits and sediments laid down by relict fluvial channels tend to occur at depth within about 1 mile of major streams such as the Santa Ana River, and can yield late Pleistocene fossil remains. However, this project site is not located on or near such a geomorphic setting.

A review of records from the greater Los Angeles basin reveals that three circumstances have the potential to yield fossiliferous sediments at depth, including below a capping stratum of younger alluvium. The potential for fluvial deposits in the project area has been discussed and dismissed, which leaves two possibilities: either shallow outcrops of older marine sediment or buried geologic or topographic irregularities, the most famous of which in this area are the artesian pools and tar pits of Rancho La Brea. A remote possibility exists that such geological contexts may be found at depth in the project area. Nevertheless, the lack of records and context are evidence chiefly pointing to low paleontological sensitivity of sediments at depth in this project area. Sediment near the surface, within the top 3 feet, possesses no paleontological sensitivity.

5.8.1.2.5 Paleontological Sensitivity of the SERC Right-of-Way

Paleontological sensitivity is the qualitative assessment made by a professional paleontologist taking into account the paleontological potential of the stratigraphic units present, the local geology and geomorphology, and any other local factors that may be germane. According to the SVP standard guidelines (2010), sensitivity comprises the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or paleobotanical remains, and the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data (Table 5.8-1).

Table 5.8-1. Paleontological Sensitivity Ratings Employed

Rating	Definition
High	Assigned to geological formations known to contain paleontological resources that include rare, well-preserved, and/or fossil materials important to ongoing paleoclimatic, paleobiological, and/or evolutionary studies. They have the potential to produce, or have produced, vertebrate remains that are the particular research focus of many paleontologists, and can represent important educational resources.
Moderate	Stratigraphic units that have yielded fossils that are but moderately well preserved, are common elsewhere, and/or that are stratigraphically long ranging would be assigned a moderate rating. This evaluation also can be applied to strata that have an unproven but strong potential to yield fossil remains based on the stratigraphy and/or geomorphologic setting. Fossil assemblages from paleontologically moderately sensitive rock units may still retain scientific importance for their data potential.

Table 5.8-1. Paleontological Sensitivity Ratings Employed

Rating	Definition
Unknown	This rating is usually applied to sediments that exist at depth and that are not extensively exposed by erosion or uplift. Until these sediments have been exposed and investigated, they are treated as if they possess moderate to high paleontological sensitivity.
Low	Sediment that is relatively recent, or that represents a high-energy subaerial depositional environment where fossils are unlikely to be preserved. A low abundance of invertebrate fossil remains, or reworked marine shell from other units, can occur; however, the paleontological sensitivity would remain low because of their lack of potential to serve as significant scientific or educational purposes. This evaluation also can be applied to strata that have been monitored and that have failed to yield scientifically significant fossil remains.
Marginal and Zero	Stratigraphic units with marginal potential include pyroclastic flows and soils that might preserve traces or casts of plants or animals. Most igneous rocks, however, have zero paleontological potential. Other stratigraphic units deposited subaerially in a high energy environment (such as alluvium) also may be assigned a marginal or zero sensitivity rating. Manmade fill is also considered to possess zero (no) paleontological potential.

Fill and construction debris immediately below the surface possesses no paleontological sensitivity. The younger Quaternary alluvium of the alluvial fans extending into the valley from the hills to the north possesses no paleontological sensitivity; it is too young, the subaerial deposition regime of alluvium usually precludes fossil preservation, and no records have been found of fossil sites in similar settings. The older Quaternary alluvium that can be expected at depth possesses unknown paleontological sensitivity in the absence of special geological circumstances. These special circumstances include the nearby presence of a river or major stream, unusual paleo-topographic or geological circumstances at depth, or shallow outcrops of older sedimentary formations. There is no basis to suspect that any of these circumstances apply to the area in the vicinity of the SERC, but the actual conditions at depth (less than 10 feet) are unknown and, therefore, the paleontological sensitivity of sediments at depth is also unknown.

5.8.2 Environmental Analysis

The subsurface of the SERC area consists of Holocene alluvial deposits overlain by disturbed sediments and artificial fill. Offsite linear components of the project cross the same types of geological contexts. The environmental effects on paleontological resources from construction and operation of the SERC are presented in the following subsections.

5.8.2.1 Paleontological Resource Significance Criteria

Guidelines for the implementation of the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Sections 15000 et seq.) include, among the other questions to be answered in the Environmental Checklist (Section 15023, Appendix G), the following: “Would the project directly or indirectly destroy a unique paleontological resource or site?” and “Does the project have the potential to …eliminate important examples of the major periods of California…pre-history?” These questions are answered in the affirmative based on the data and considerations provided above.

In its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources, the SVP (1995) notes that an individual fossil specimen is considered scientifically important and significant if it meets any of the following criteria:

- Identifiable
- Complete
- Well preserved
- Age-diagnostic
- Useful in paleoenvironmental reconstruction

- A member of a rare species
- A species that is part of a diverse assemblage
- A skeletal element different from, or a specimen more complete than, those now available for that species

For example, identifiable land mammal or terrestrial plant fossils are considered scientifically important because of their potential use in determining the age and paleoenvironment of the sediments in which they occur. Moreover, vertebrate and plant remains are comparatively rare in the fossil record. Fossil plants are particularly important in this regard and, as sessile (anchored in place) organisms, are actually more sensitive indicators of their paleoenvironment and are therefore more important than mobile mammals for paleoenvironmental reconstructions.

For marine and shoreline sediments, invertebrate mega-fossils (e.g., mollusks and cephalopods) are scientifically important for the same reasons that land mammal and/or land plant fossils are valuable in terrestrial deposits. Marine microfossils such as foraminifera or radiolaria are much more common, and consequently they are usually not considered for resource protection because of their relative abundance. The value or importance of different fossil groups varies depending on the age and depositional environment of the stratigraphic unit that contains the fossils, their abundance in the record, and their degree of preservation.

Using these criteria and the sensitivity ratings provided above, the significance of potentially adverse impacts of earthmoving associated with implementation of this project on paleontological resources was assessed. Any unmitigated impact on a fossil site, or on a fossil-bearing rock unit of high or moderate paleontological sensitivity, would be considered significant.

5.8.2.2 Paleontological Resource Impact Assessment

The significance of impacts of SERC-related activities on the paleontological resources of each stratigraphic unit found at the SERC site and along the linear appurtenances is presented in this section. All SERC components will impact younger Quaternary alluvium at shallow depth (within 10 feet of the surface). Excavations for foundations and other components of the power generation facility itself will extend deeper than 10 feet, and may encounter older alluvial deposits. The offsite lateral alternatives will not extend below 10 feet depth, and are expected to encounter only younger Quaternary alluvium.

5.8.2.2.1 Younger Quaternary Alluvium

Geological mapping of the project area (Morton, 2004) shows that within 2 miles of the laterals and plant site, only younger Quaternary alluvium is found. Therefore, construction-related excavations within the zone of previous disturbance and to depths of less than 10 feet will affect sediments of no paleontological sensitivity and will result in no adverse impacts on paleontological resources. Reworked and disturbed fossil material can be present in previously disturbed sediment or fill, but lack of reliable provenience and absence of stratigraphic context would compromise all scientific values. This would apply to all excavations within 10 feet of current ground surface for the SERC project, including the alternative offsite corridors. No impacts to paleontological resources will occur during excavations within these shallower sediments.

5.8.2.2.2 Older Quaternary Alluvium

Below the artificial fill and younger Quaternary alluvium, it is assumed that older Quaternary alluvium can be found. These sediments at depth possess unknown paleontological sensitivity, and deeper excavations (greater than 10 feet) at the SERC project site may encounter these sediments. If this occurs, implementation of the recommended mitigation measures will reduce the potential impacts to a level below significance.

Because no excavations in paleontologically sensitive sediments are anticipated from the operation or the maintenance of the project, no impacts on paleontological resources are expected from the operations and maintenance of the SERC.

5.8.3 Cumulative Effects

Reasonably foreseeable projects within or near the project area, as well as those permitted or in a permitting process but not constructed at this time, do not involve major excavations in geological formations with a high potential for containing significant fossils. Although the SERC has some potential to encounter sediments of unknown paleontological sensitivity during construction of the facility, the mitigation measures proposed in the following subsections will reduce potential impacts below the level of significance. Therefore, potential for impacts on paleontological resources from the SERC to combine with those of other projects to reach a cumulatively considerable impact is very low.

5.8.4 Mitigation Measures

Even though there are no significant adverse paleontological impacts, the mitigation measures proposed below are in compliance with CEC environmental guidelines (CEC, 2000; CEC, 2007) and conform to SVP standard guidelines for mitigating adverse construction-related impacts on paleontological resources (SVP, 2010). Implementation of these mitigation measures will further assure that the potential impacts from project-related ground disturbance on paleontological resources will be insignificant.

5.8.4.1 Project Paleontological Resources Specialist

Before the start of construction, SERC project management will submit the name and resume of a qualified PRS to the CEC for review and approval. This individual will prepare the paleontological resources awareness module (PRAM) of the worker education program, and will be available during the course of ground-disturbing construction in case there is an unanticipated paleontological discovery. The name and contact information of the PRS will be provided to construction management personnel, the compliance manager, and the cultural resource monitors.

5.8.4.2 Construction Personnel Education

Before working on the SERC site for the first time, all construction personnel (including supervisory personnel) involved in earthmoving activities will be provided with paleontological resources awareness training via the PRAM. For efficiency's sake, the PRAM may be included as a module in the larger Worker Health & Safety Awareness training. Workers will be informed that fossils may be encountered, and they will be provided with information on the appearance of fossils, the role of paleontological monitors, and proper notification procedures. This worker training will be presented by the PRS. Subsequent training may be conducted via video presentation and hard-copy training materials.

5.8.4.3 Develop and Implement a Paleontological Resources Monitoring and Mitigation Plan

Before the start of construction, the SERC proponent will submit for review a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). This plan will outline monitoring procedures and protocols to be followed in the event that paleontological resources are discovered. At minimum, the PRMMP will stipulate that when paleontological resources are encountered, all work in the immediate area of the find will halt immediately and the paleontological resources monitor(s) will be notified. Construction will not resume in the area of the find until the PRS releases the area.

The PRMMP will also outline protocols to be followed during monitoring and in the case of discovery of paleontological resources, and it will outline reporting requirements. The PRMMP will stipulate that monitoring requirements are to be determined by the PRS, and they will be based solely on the PRS's judgement of the paleontological sensitivity of the sediments disturbed by construction and the PRS's professional assessment regarding the ongoing potential of impacts to this resource.

5.8.4.4 Develop a Final Paleontological Resources Report

At the conclusion of the SERC construction, a final Paleontological Resources Report will be prepared. In the event that no paleontological resources are discovered, this report will note the monitoring activities that occurred and that no fossils were discovered. In the event that fossils are discovered, the nature of these fossils, tentative identifications (if possible), and the name of the repository they were deposited in will be identified as well. The report will be submitted to the CEC and Orange County.

5.8.5 Laws, Ordinances, Regulations, and Standards

Paleontological resources are nonrenewable scientific resources and are protected by several federal and state statutes (California Office of Historic Preservation, 1983; Scott and Springer, 2003; Fisk and Spencer, 1994), most notably the 1906 Federal Antiquities Act and other subsequent federal legislation and policies, and by State of California environmental regulations (CEQA, Section 15064.5). Professional standards for assessment and mitigation of adverse impacts on paleontological resources have been established by the SVP (2010). Design, construction, and operation of the SERC will be conducted in accordance with all LORS applicable to paleontological resources. Federal, state, and local LORS applicable to paleontological resources are summarized in Table 5.8-2 and are discussed briefly in the subsections that follow, along with professional standards for paleontological resources assessment and impact mitigation.

Table 5.8-2. LORS Applicable to Paleontological Resources

LORS	Applicability	Application for Certification Reference	Project Conformity
Omnibus Public Land Management Act of 2009 (H.R. 146), Title 6, Subtitle D	Not applicable – Applies only to federal land managed by the Secretaries of the Interior and Agriculture	—	—
Antiquities Act of 1906	Not applicable – No federal land involved, or federal entitlement required	—	—
National Environmental Policy Act of 1969	Not applicable – No federal land involved, or federal entitlement required	—	—
CEQA, Appendix G	Applicable – Requires assessment of the potential to affect paleontological resources during earthmoving activities	Sections 5.8.2, 5.8.3, and 5.8.5	Yes
PRC, Sections 5097.5/5097.9	Not applicable – Applies to state-owned land	—	—
County of Orange General Plan 2015	Applicable to natural gas pipeline – Requires assessment and mitigation of affected resources	-	Yes

5.8.5.1 Federal LORS

Federal protection for significant paleontological resources would apply to the SERC only if any construction or other related project impacts occur on federally owned or managed lands, or if a federal entitlement or other permit were required. On March 31, 2009, President Obama signed into law the Omnibus Public Land Management Act of 2009 (OPLMA; H.R. 146). Implementing regulations for this law have yet to be developed by the affected agencies. Title 6, Subtitle D of the OPLMA, *Paleontological Resources Preservation*, requires the secretaries of the Department of the Interior (exclusive of Indian trust lands) and the Department of Agriculture (insofar as U.S. Forest System lands are concerned) to "…manage and protect paleontological resources on Federal land using scientific principals and expertise… (and) develop appropriate plans for inventory, monitoring, and the scientific and educational use of paleontological resources…". The OPLMA further excludes casual collection from restrictions

under the law, and then describes the requirements for permitting collection on federal lands, stipulations regarding their use in education, continued federal ownership of recovered paleontological resources, and standards for acceptable repositories of collected specimens and associated data (Sections 6303-6305). The OPLMA also provides for criminal and civil penalties for unauthorized removal of paleontological resources from federal land, and rewards for reporting the theft of fossils (Sections 6306-6309).

Additional federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 USC 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. In addition, the National Environmental Policy Act of 1969 (USC, Section 4321 et seq.; 40 CFR, Section 1502.25) as amended requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage. Because no federally owned or managed lands will be affected by this project, and because no federal entitlement or other permit is required, these statutes do not extend to paleontological resources (see Table 5.8-2).

5.8.5.2 State LORS

The CEC environmental review process under the Warren-Alquist Act is considered functionally equivalent to that of CEQA (PRC Sections 21000 et seq.). CEQA requires that public agencies and private interests identify the environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California (Division I, California PRC: 5020.1 [b]). The CEQA Guidelines (PRC Sections 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G in Section 15023 provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. One of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section V, Part c) is "Would the project directly or indirectly destroy a unique paleontological resource or site…?"

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes. The lead agency with the responsibility to ensure that fossils are protected during construction of the proposed SERC is the CEC. PRC Section 21081.6, entitled Mitigation Monitoring Compliance and Reporting, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

Section XVII, Part a of the CEQA Environmental Checklist asks a second question equally applicable to paleontological resources: "Does the project have the potential to …eliminate important examples of the major periods of California history or pre-history?" To be in compliance with CEQA, impact assessments must answer both these questions in the Environmental Checklist. If the answer to either question is "yes" or "possibly," a mitigation and monitoring plan must be designed and implemented to protect significant paleontological resources. However, for the SERC the answer to these questions is "unlikely" if not "no"; therefore, a mitigation and monitoring plan is not warranted for this project at this time.

Other state requirements for paleontological resource management are in California PRC Chapter 1.7, Section 5097.5/5097.9 (Stats. 1965, c. 1136, p. 2792) entitled Archaeological, Paleontological, and Historical Sites. This statute defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor, and it specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. PRC Section 5097.5/5097.9 does not apply to SERC because construction or other related project impacts will not occur on state-owned or managed lands and because no state agency is intended to obtain ownership of project lands during the term of the project license (Table 5.8-2).

5.8.5.3 Local LORS

The SERC site is within the City of Stanton, and its natural gas pipeline is entirely within Orange County. The City of Stanton does not have any LORS applicable to paleontological resources, but rather incorporates Orange County LORS. The County of Orange requires that a professional paleontologist conduct paleontological resources assessments for discretionary developments, and that discretionary developments be assessed for paleontological resources (County of Orange, 2005). Chapter VI of the County of Orange General Plan (General Plan) (County of Orange, 2005) requires and provides a map of the areas within Orange County that possess paleontological sensitivity. Neither the SERC project site nor its proposed offsite linears are within any of these high-sensitivity areas (County of Orange, 2005).

5.8.5.4 Professional Standards

The SVP, an international organization of professional paleontologists, has established standard guidelines (SVP, 2010) that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing paleontologists in the nation follow the SVP's guidelines, and extend those to address other types of fossils of scientific significance such as invertebrate fossils and paleobotanical specimens.

5.8.6 Agencies and Agency Contacts

There are no agencies having blanket jurisdiction over paleontological resources. The CEC has jurisdiction over paleontological resources for this project. The General Plan (County of Orange, 2005) requires that paleontological resources assessments and mitigation be performed by a professional paleontologist. If encountered, scientifically significant fossil specimens and associated site records will be submitted to the closest regional repository in operation, which is the Natural History Museum of Los Angeles County (Table 5.8-3).

Table 5.8-3. Agency Contacts for Paleontological Resources

Issue	Agency	Contact
Paleontological Resources Documentation and Specimen Repository	Natural History Museum of Los Angeles County	Dr. Sam McLeod Collections Manager 900 Exposition Blvd. Los Angeles, CA 90007 Phone: (213) 763-3325 E-mail: smcleod@nhm.org

5.8.7 Permits and Permit Schedule

No state, county, or city agency requires a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related earthmoving on this project site.

5.8.8 References

Advantage Environmental Consultants, LLC. 2016. *Phase I Environmental Site Assessment – 10711 Dale Avenue and 8230 Pacific Street, Stanton, California*.

California Energy Commission (CEC). 2000. "Paleontological Resources." *Regulations Pertaining to the Rules of Practice and Procedure & Power Plant Site Certification*.

California Energy Commission (CEC). 2007. "Paleontologic Resources." *Complete Text of the Energy Commission's Proposed Amendments to the Power Plant Siting Regulations*.

California Office of Historic Preservation. 1983. Summary of State/Federal Laws Protecting Cultural Resources.

County of Orange, 2005. *County of Orange General Plan Chapter VI Resources.* Available online: http://ocplanning.net/ planning/generalplan2005.

Fisk, L.H., and L.A. Spencer. 1994. "Highway Construction Projects Have Legal Mandates Requiring Protection of Paleontological Resources (fossils)." p. 213-225, in Scott F. Burns (editor), *Proceedings of the 45th Highway Geology Symposium, Portland, Oregon*.

Harden, Deborah R. 1998. *California Geology.* Prentice-Hall, Inc., Upper Saddle River, NJ. 479 p.

Lajoie, K.R., D.J. Ponti, C.L. Powell, S.A. Mathieson, and A.M. Sarna-Wjcicki. 1991. "Emergent Marine Strandlines and Associated Sediments, Coastal California; A Record of Sea-Level Fluctuations, Vertical Tectonic Movements, Climatic Changes and Coastal Processes." *The Geology of North America, Volume K-2, Quaternary Non-Glacial Geology: Conterminous U.S.* R.B. Morrison, ed. Pp. 190-213. Geological Society of America, Boulder, CO.

Morton, D.M. 2004. Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California. U.S. Geological Survey Open-File Report 99-172. Lakewood, CO.

Scott, E. and K. Springer. 2003. "CEQA and Fossil Preservation in Southern California." *The Environmental Monitor*. Winter: 4-10, 17.

Society of Vertebrate Paleontology (SVP). 1995. "Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources B Standard Guidelines." *Society of Vertebrate Paleontology News Bulletin.* 163: 22–27.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Available online: http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx.

University of California, Berkeley, Museum of Paleontology (UCMP). 2016. Collections catalog database. Accessed on September 6. Available online: http://ucmpdb.berkeley.edu/about.shtml.

Verhoff, J.A., and W.G. Spaulding. 2011. *Final Paleontological Resources Report COC PAL-7*. Prepared on behalf of the Southern California Public Power Authority, Canyon Power Plant Project, Orange County. 07-AFC-09. Prepared for The California Energy Commission. Sacramento, CA. August.

Yerkes, R.F., T.H. McCulloh, J.E. Schoellhammer, and J.D. Vedder. 1965. *The Geology of the Los Angeles Basin California – An Introduction.* U.S. Geological Survey Professional Paper 420-A. Washington, DC.

Yeats, R.S. and T.K. Rockwell. 1991. "Quaternary Geology of the Ventura and Los Angeles Basins, California." *Quaternary Nonglacial Geology: Conterminous U.S.* Geological Society of America, DNAG v. K-2, p. 185-189.