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5.8 PALEONTOLOGICAL RESOURCES

5.8.1 Introduction

This Application for Certification (AFC) for the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF or Project) has been prepared in accordance with the California Energy Commission's (CEC) Power Plant Site Certification Regulations (CEC-140-2008-001-REV1, current as of July 2008). In addition, this AFC includes elements necessary for the United States (U.S.) Bureau of Land Management (BLM) to permit the Project through the National Environmental Policy Act (NEPA). The "Applicant" for purposes of this AFC comprises Rio Mesa Solar I, LLC, Rio Mesa Solar II, LLC, and Rio Mesa Solar III, LLC, owners of the three separate solar plants and certain shared facilities being proposed. These three Delaware limited liability companies will hold equal one-third shares in the ownership of shared facilities and will separately own their respective plants. They are wholly owned by Rio Mesa Solar Holdings, LLC (a Delaware limited liability company) which is in turn wholly owned by BrightSource Energy, Inc. (BrightSource) a Delaware corporation and the ultimate parent company. The Applicant will use BrightSource's solar thermal technology for the Rio Mesa SEGF.

The proposed project site is situated on the Palo Verde Mesa in Riverside County, California, 13 miles southwest of the City of Blythe, and is located partially on private land and partially on public land administered by BLM. The project will include three solar concentrating thermal power plants and a shared common area to include shared systems. The first plant, a 250 megawatt (MW) (nominal) facility known as Rio Mesa I, will be constructed at the south end of the project and owned by Rio Mesa Solar I, LLC. The second plant, another 250 MW (nominal) facility known as Rio Mesa II, will be located in the central portion of the project site and owned by Rio Mesa Solar II, LLC. Rio Mesa III, a third 250 MW (nominal) facility, will be constructed in the northern portion of the project site and owned by Rio Mesa Solar III, LLC.

Each plant will utilize a solar power boiler (referred to as a solar receiver steam generator or SRSG), located on top of a dedicated concrete tower, and solar field based on proprietary heliostat mirror technology developed by BrightSource. The reflecting area of an individual heliostat (which includes two mirrors) is about 19 square meters (205 square feet [sq. ft.]). The heliostat (mirror) fields will focus solar energy onto the SRSG which converts the solar energy to superheated steam. In each plant, a Rankine cycle non-reheat steam turbine receiving this superheated steam will be directly connected to a rotating generator that generates and pushes the electricity onto the transmission system steam. Each plant will generate electricity using solar energy as its primary fuel source. However, auxiliary boilers will be used to operate in parallel with the solar field during partial load conditions and occasionally in the afternoon when power is needed after the solar energy has diminished to a level that no longer will support solar generation of electricity. These auxiliary boilers will also assist with daily start-up of the power generation equipment and night time preservation.

For the purposes of both the California Environmental Quality Act (CEQA) and NEPA, fossils are defined as the remains or other indications (trace fossils) of prehistoric organisms such as animals and plants. Together with the data pertinent to the fossils (e.g., locality, stratum, orientation, radiometric dates, collector, date of collection) they constitute paleontological resources. Paleontological resources facilitate three areas of scientific investigation: (1) establishing the relative ages of geologic horizons that

contain them, (2) reconstructing the ancient environments which these organisms inhabited, and (3) detecting the existence, distribution, and evolutionary trends of diverse types of organisms, many of which are now extinct. Investigation of the geologic events that deposited the fossils cannot adequately proceed without an understanding of the fossils.

The potential environmental impacts on paleontological resources that may result from construction and operation of the Project are summarized in this section. Section 5.8.1 provides a description of the Project. Section 5.8.2 describes federal, state, and local LORS as well as the professional standards that protect paleontological resources. Section 5.8.3 discusses the affected environment. Section 5.8.4 presents a resource inventory. An environmental analysis is presented in section 5.8.5. Section 5.8.6 addresses cumulative effects. Section 5.8.7 discusses proposed mitigation measures. Section 5.8.8 discusses involved agencies and agency contacts. Section 5.8.9 discusses permits that may be required. The references cited in this section are listed in Section 5.8.10.

The analysis in this Section is consistent with the standard measures for mitigating adverse construction-related environmental impacts on significant paleontological resources established by the Society of Vertebrate Paleontology (SVP 1995, 1996). The complete technical report from which the information contained in this section was taken, titled *Paleontological Resources Assessment: Rio Mesa SEGF*, is included as Appendix 5.8A and has been submitted separately under rules of confidentiality. With the proposed conditions of certification outlined in this section, the Project will have no significant adverse impacts on paleontological resources and will comply with all applicable LORS.

5.8.2 Laws, Ordinances, Regulations, and Standards

Paleontological resources are included among nonrenewable scientific resources by governmental agencies. Protections of such resources are provided under federal and state legislation and by some local ordinances. As mentioned in Section 5.8.3, the SVP has developed guidelines and professional standards for assessing the impact of projects on paleontological resources and for mitigation of adverse impacts (SVP 1995, 1996). The Applicant intends for construction and operation of the proposed Project to take place in a manner consistent with the SVP guidelines and all LORS relevant to paleontological resources. Table 5.8-1 summarizes the LORS that are applicable to the proposed Project.

Table 5.8-1
Laws, Ordinances, Regulations, and Standards (LORS)

LORS	Summary	AFC Section Explaining Conformance
Federal		
National Environmental Policy Act (NEPA) of 1969	NEPA establishes a public, interdisciplinary framework for federal decision-making and ensures that Federal agencies take environmental factors into account when considering federal actions.	Section 5.8.2.1
Antiquities Act of 1906	Protects paleontological resources on federal lands; requires inventory of effects and mitigation if appropriate	Section 5.8.2.1

Table 5.8-1
Laws, Ordinances, Regulations, and Standards (LORS)

LORS	Summary	AFC Section Explaining Conformance
Federal Land Policy and Management Act (FLMPA) of 1976	Recognizes significant paleontological resources as scientific resources, and requires Federal agencies to manage public lands in a manner that protects the quality of scientific resources and, where appropriate, preserves and protects certain public lands in their natural condition. Permits on Bureau of Land Management (BLM) lands that authorize the collection of significant fossils are authorized under FLPMA	Section 5.8.2.1
Paleontological Resources Preservation Act of 2009	Explicitly protects paleontological resources on federal lands.	Section 5.8.2.1
State		
Warren-Alquist State Energy Resources Conservation and Development Act, California Public Resources Code, §§ 25000, et seq.	Gives the California Energy Commission (CEC) licensing authority in lieu of state, regional, and local permits and requirements.	Section 5.8.2.2
California Environmental Quality Act (CEQA) California Public Resources Code, Division 13, §§21000-21177, as amended 2010.	Requires all agencies of State government that regulate activities of private individuals, corporations, and public agencies, which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage.	Section 5.8.2.2
Public Resources Code §§ 5097.5-5097.9	Designates unauthorized removal or disturbance of fossil remains or fossil site on publically owned lands	Section 5.8.2.2
Local		
Riverside County General Plan	Emphasizes the conservation of plan resources having the potential to provide information important in history and prehistory	Section 5.8.2.3

AFC = Application for Certification
BLM = Bureau of Land Management
CEC = California Energy Commission
CEQA = California Environmental Quality Act
FLMPA = Federal Land Management Policy Act
NEPA = National Environmental Policy Act

5.8.2.1 Federal

National Environmental Policy Act of 1969

NEPA establishes a public, interdisciplinary framework for Federal agencies reviewing projects under their jurisdiction to consider environmental impacts. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

The BLM, as lead Federal agency for the Project, is responsible for preparation of an Environmental Impact Statement (EIS) in compliance with NEPA to evaluate the environmental impacts of the portions of the Rio Mesa SEGF on federal lands. The Rio Mesa Solar III plant and the Project gen-tie line are located on lands administered and managed by the BLM. NEPA compliance is required for these portions of the Project through preparation of a Draft and Final EIS. BLM is also responsible for Native American consultation, including government to government consultation.

Antiquities Act of 1906

The Antiquities Act of 1906 is used as the basis for federal protection of paleontological resources on federal lands. The act authorizes the government to regulate the disturbance of objects of antiquity on federal lands through the responsible managing agency and to prosecute individuals responsible for the unauthorized damage or removal of such objects.

Federal Land Policy Management Act of 1976

The Federal Land Policy Management Act of 1976 (P.L. 94-579; 90 Stat. 2743, U.S.C. §§ 1701-1782) requires that public lands be managed in a manner that protects the quality of their scientific values.

Paleontological Resources Preservation Act of 2009

Paleontological resources are also afforded federal protection under 40 CFR § 1508.27 as a subset of scientific resources. The most explicit federal protection for paleontological resources, enacted in 2009, is the Paleontological Resources Preservation Act. This act regulates who may collect fossils on public lands and where such fossils must be curated. It also provides for prosecution of violators.

5.8.2.2 State

Warren-Alquist Act

The California Public Resources Code (PRC) establishes the CEC as the decision-making authority over land use decisions and environmental determinations during the AFC process. This is in accordance with the Warren-Alquist Act, codified in §§ 25000 et seq. of the PRC. The CEC has exclusive jurisdiction over thermal power plant siting (50 MW or greater), including CEQA implementation. The Project will demonstrate conformity with state, regional, and local laws, including land use laws.

Under the Warren-Alquist Act, the CEC's licensing process is legally equivalent to CEQA and is guided by CEQA regulations.

California Environmental Quality Act

The CEC will be the lead agency enforcing CEQA for the Project. Under California law, the CEC is responsible for reviewing the AFCs filed for projects, and also has the role of lead agency for the environmental review of these projects under CEQA (PRC, §§ 25500 et seq.; PRC, §§21000 et seq.). The CEC conducts this review in accordance with the administrative adjudication provisions of the Administrative Procedure Act (5 United States Code, §§ 500 et. seq.) and its own regulations governing

site certification proceedings (CCR, Title 20, §§ 1701 et seq.). These provisions require the staff to conduct an independent analysis of AFCs and prepare an independent assessment of a project's potential environmental impacts, feasible mitigation measures, and alternatives as part of this process.

The CEC considers the Staff Assessment(s), along with the environmental analysis provided by the Applicant, as well as input from interested local, regional, State, and Federal agencies, intervenors, and interested Native American tribes, in developing its final decision on whether to issue a license for a proposed project. The CEC has a certified regulatory program under CEQA that exempts the agency from having to draft an Environmental Impact Report (EIR) and, instead, requires a Final Staff Assessment (FSA), evidentiary hearings, and a decision based on the hearing record, which includes the staff's and other parties' assessments.

Public Resources Code §§ 5097.5-5097.9

State requirements for paleontological resources management exist within Public Resources Code Chapter 1.7, entitled *Archaeological, Paleontological, and Historical Sites*. This statute defines any unauthorized disturbance or removal of a fossil site or fossil remains on public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. This statute would apply to the proposed Project if the Project were to be built on local or state lands.

5.8.2.3 Local

Riverside County General Plan

Paleontological resources are addressed in the Multipurpose Open Space Element of the *County of the Riverside General Plan*. The Open Space Element (adopted October 7, 2003) includes the policies identified below concerning paleontological resources.

OS 19.8. "Whenever existing information indicates that a site proposed for development may contain biological, paleontological, or other scientific resources, a report shall be filed stating the extent and potential significance of the resource that may exist within the proposed development and appropriate measures through which the impacts of development may be mitigated."

OS 19.9. "This policy requires that when existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor 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 documenting and paleontological resources that are found during the course of site grading."

5.8.3 Affected Environment

This section discusses the existing paleontological resources environment of the Rio Mesa SEGF. The geographic, physiographic and geologic setting, and resources inventory and results are discussed.

5.8.3.1 Geographic & Physiographic Setting

The Project is located in the Palo Verde Mesa, above and east of the Palo Verde Valley, an area on the west bank of the Colorado River in eastern California (see Figure 5.8-1). The Mule Mountains are to the west and the Palo Verde Mountains are to the south and southwest. Some references consider the Palo Verde Mesa to lie within the Colorado Desert physiographic province; others consider it to lie within the Mojave Desert physiographic province. The salient difference between the two is that the Mojave Desert is high desert, whereas the Colorado Desert is low desert (Norris and Webb 1990). Given that the elevation of the Project varies from 310 to 660 feet above mean sea level (amsl), for the purposes of this document, the Project is considered part of the Colorado Desert physiographic province.

The Palo Verde Mesa is a nearly continuous terrace on the north and west sides of the Colorado River between the southern limit of the Big Maria Mountains and the east piedmont of the Palo Verde Mountains. The Project lies in T8S, R21E, Sections 2, 3, 10, 11, 14–17, 19-23, 26-29, and 33-35. The power transmission line proposed as part of the Project crosses parts of Sections 7-9, 15-17, 22, 23, 26, and 35, T7S, R 21E. The Project footprint lies on the Roosevelt Mine, Ripley, Thumb Peak, and Palo Verde 7.5' USGS topographic quadrangles (see Figure 5.8-2).

5.8.3.2 Geologic Setting

The project site lies on the Palo Verde Mesa which lies above the north and west side of the current Colorado River Valley. Whereas the geology of most areas in the Mojave Desert and some parts of the Colorado Desert are dominated by mountains, alluvial fans, and basins, the project area also has a major geological component from the Colorado River. Shlemon (1980) characterized the Quaternary history of the region as epochs of alluviation preceded and followed by relative landscape stability and soil formation.

5.8.4 Resource Inventory

The following sections describe the resource inventory methods used for the paleontological assessment, the resource assessment criteria applied to the assessment, and the results of the resource inventory.

5.8.4.1 Resource Inventory Methods

The methods used to develop the paleontological resource inventory of the proposed project site and surrounding area are described below. These procedures follow guidelines from the CEC (2007) and the SVP (1995) and include both a literature search and field investigation.

Published and unpublished literature concerning area paleontological and geological topics was also consulted. It is possible to define the surface distribution of the formations involved to estimate their subsurface distribution and gain some estimate of the paleontological productivity of these units from the literature. Another important source of data concerning area distribution of known paleontological localities and productivity of various rock units is the records of pertinent paleontological collections. An archival database search was executed by staff at the San Bernardino County Museum (SBCM) to determine whether any of the stratigraphic units found within the project area had previously yielded significant paleontological resources and whether any known localities lie within or near the project site.

URS paleontologists surveyed the Project footprint and regulatory buffer, searching for fossils and insights into the local geology. Professional geologists and paleontologists with experience in the area were also interviewed.

5.8.4.2 Paleontological Resource Assessment Criteria

It is the position of the SVP (1995) that a vertebrate fossil is considered scientifically important unless otherwise demonstrated. This position is based on the relative rarity of vertebrate fossils. Vertebrate fossils are so uncommon that, in many cases, each recovered specimen will provide additional important information about the morphological variation or the geographic distribution of its species. The SVP recommendations (1995) also mention that certain invertebrate or botanical fossils are considered important paleontological resources.

A rock unit is considered "sensitive" to adverse impacts if there is a high probability that grading, excavation, or other earth-moving activities will jeopardize important fossil remains. Using criteria published by the SVP (1995), the paleontological importance or sensitivity (high, low, or undetermined) of each rock unit exposed in a project site or surrounding area is the measure most amenable to assessing the significance of paleontological resources because the area distribution of each rock unit can be delineated on a topographic or geologic map. The paleontological sensitivity of a stratigraphic unit reflects its potential paleontological productivity and sensitivity as well as the scientific significance of the fossils it has produced. This method of paleontological resource assessment is the most appropriate because discrete levels of paleontological importance can be delineated on a topographic or geologic map.

Reasons for considering an individual fossil specimen scientifically important include:

- if it is well preserved;
- if it can be identified;
- if it is more complete than most specimens for that species;
- if it preserves one or more elements not known in most specimens of that species;
- if it is indicative of a particular time period;
- if it has not been recorded from that sedimentary unit;
- if it provides information concerning the environment in which it lived;
- if it could be the basis for description of a new species or comes from a site that produced the type (definitive) specimen of its species; and/or
- if it belongs to a species rarely encountered.

For specimens meeting the above, the following criteria were considered in establishing the importance and paleontological sensitivity of each rock unit exposed in the project site or within the one-mile buffer zone.

1. Estimation of the potential paleontological productivity of each rock unit on the evidence of fossil localities in or near the proposed Project on the basis of published and unpublished sources.

2. Consideration of the scientific significance of fossils from each of the rock units exposed within the proposed project area.

Categories of Sensitivity

The SVP (1995) established three categories of sensitivity for paleontological resources in its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources. The three categories are low, high, and undetermined.

- Low sensitivity paleontological resources are categorized as rock units that are not sedimentary in origin. Likewise, sedimentary rock units that have been well examined and have not produced paleontological resources are considered to have low sensitivity. Monitoring is not usually recommended or needed during excavation in a rock unit with low sensitivity.
- High sensitivity paleontological resources are categorized as rock units older than recent for which vertebrate or significant invertebrate fossils or a significant suite of plant fossils have been recovered. In areas of high sensitivity, full-time monitoring is recommended during any project-related ground disturbance.
- Paleontological resources with undetermined sensitivity are categorized as sedimentary rock units for which little information is available. It is often possible for an experienced paleontologist to determine whether such a rock unit should be assigned a high or low sensitivity after he or she has performed a pedestrian survey and has made detailed observations of both natural and artificial exposures of the rock unit.

The BLM adopted a different paleontological resource assessment system in 2008. It is known as the Potential Fossil Yield Classification system (PFYC). As discussed in Section 5.8.5 the classes applicable to the Project are:

Class 1 – **Very Low**. Geologic units not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units.
- Units that are Precambrian in age or older.

    1) Management concern for paleontological resources in Class 1 units is usually negligible or not applicable.

    2) Assessment or mitigation is usually unnecessary except in very rare or isolated circumstances.

The probability for impacting any fossils is negligible. Assessment or mitigation of paleontological resources is usually unnecessary. The occurrence of significant fossils is non-existent or extremely rare.

Class 2 – **Low**. Sedimentary geologic units not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare.

- Units that are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

  1) Management concern for paleontological resources is generally low.

  2) Assessment or mitigation is usually unnecessary except in rare or isolated circumstances.

The probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Assessment or mitigation of paleontological resources is not likely to be necessary. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.

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.

- Often marine in origin with sporadic known occurrences of vertebrate fossils.
- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low.

(or)

- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Class 3a – **Moderate Potential**. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – **Unknown Potential**. Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this class may eventually be placed in another class when sufficient survey and research is performed. The unknown potential of the units in this class should be carefully considered when developing any mitigation or management actions.

1) Management concern for paleontological resources is moderate or cannot be determined from existing data.
2) Surface-disturbing activities may require field assessment to determine appropriate course of action.

This classification includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units having a moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options as well, and could include pre-disturbance

surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. These units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.

Class 4 – **High**. Geologic units containing a high occurrence of scientifically important 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 4a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.

Class 4b – These are areas underlain by geologic units with high potential but that have a reduced risk of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than two contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

    1) Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action.
    2) A field survey by a qualified paleontologist is often needed to assess local conditions.
    3) Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered.
    4) Class 4 and Class 5 units may be combined as Class 5 for broad applications, such as planning efforts or preliminary assessments, when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations are similar at this level of analysis, and impacts and alternatives can be addressed at a level appropriate to the application.

The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or

increased ease of access resulting in greater looting potential. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.

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.

Class 5a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Class 5b – These are areas underlain by geologic units with very high potential but that have a reduced risk of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than two contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

5.8.4.3 Resource Inventory Results

Geologic mapping of the project area has not been performed in great detail. Jennings (1977) mapped the entire state of California at a scale of 1:250,000. Metzger et al. (1973) mapped the geology of the Palo Verde Mesa at a scale of 1:125,000. Jennings (1967) mapped the Needles 30’ by 60’ quadrangle at a scale of 1:100,000. Stone (1990) mapped the Blythe 30’ x 60’ quadrangle at a scale of 1:100,000, and Stone (2006) mapped the west half of the Blythe 30’ by 60’ quadrangle at the same scale.

Jennings (1967) mapped the sediments of the Palo Verde Mesa as Qc and Qal (Pleistocene nonmarine deposits and Quaternary alluvium). Metzger et al. (1973) mapped them as QTa and Qa (older alluviums and younger alluvium). Jennings (1977) mapped them as Qoa and Qal (older Quaternary alluvium and Quaternary alluvium). Stone (1990) mapped them as QTa (alluvial fan and fluvial deposits) and Stone (2006) mapped them as Qpv (alluvial deposits of Palo Verde Mesa).

According to Metzger et al. (1973), the Palo Verde Mesa consists of five alluviums (units A through E). Unit B (subsurface) has Pliocene roundstone gravels of exotic provenance. The rounded pebbles and cobbles of the Pliocene unit B are polymineralic. They are composed of various sedimentary, metamorphic, and igneous rock types.

Literature on the geology of the mesa indicates that the part at and near the surface has been treated differently by various authors. All, however, agree that the lower Colorado River underwent an atypical period of deposition of fine-grained sediments at that time (late Pleistocene). Metzger et al (1973) divided the uppermost (aboveground) strata of the Palo Verde Mesa into units D and E. They considered units D and E to be roughly equivalent to the Chemehuevi Formation, although not of lacustrine origin. Unit D they defined to include a basal gravel layer overlain by characteristic muds. They designated very late Pleistocene terraces incised into unit D as unit E.

Howard and Malmon (2008) recognized the Chemehuevi Formation (in their usage, equivalent to unit D of Metzger et al. 1973) and late Pleistocene terrace gravels that formed when the river re-incised into the Chemehuevi Formation (presumably equivalent to unit E of Metzger et al. 1973) include elements from the nearby Pliocene conglomerate. Their term for these is young terrace gravels. In the Applicant's analysis, they are designated young terrace sediments, because they are not always comprised of gravel.

Lundstrom et al. (2008) studied the fine grained sediments of the lower Colorado River and did not use the term "Chemehuevi Formation" to describe any of those sediments because of the variety of meanings that have accompanied that term. They found that up to 15 meters of coarse sand, rounded exotic gravel, and angular, locally derived gravel disconformably overlie more than 15 meters of finely bedded reddish mud, clay and silt. This is consistent with the observations of URS paleontologist on the Palo Verde Mesa.

A records search obtained from SBCM (contained within Appendix 5.8B) indicated that no vertebrate paleontology localities were known within several miles of the Project footprint. A search of the database of the University of California Museum of Paleontology (UCMP) produced two records of Pleistocene tortoise specimens recovered from the site of the Blythe Energy Center west of Blythe and northeast of the project area. The geologic unit that produced them is listed as Chemehuevi Formation.

A field survey for any visible fossil remains within the proposed project site and a one-mile radius was conducted from March 1 to June 17, 2011, by Joe D. Stewart (URS paleontologist), Michael Williams (URS paleontologist), Scott Musick (URS paleontologist) and Marjorie Hakel (Manpower paleontologist). See Appendix 5.8C for resumes. A search was performed for exposures of sediment appropriate for producing fossils. During the field survey, attempts were made to detect the presence and nature of subsurface native sediments. Areas of younger alluvium were not surveyed [it has low sensitivity for paleontological resources according to SVP Guidelines (1995)]. A separate field program to recover the specimens and associated data began on July 6, 2011, and is ongoing.

During the paleontological field survey of the project site, a widely distributed paleosol (fossil soil) developed on Colorado River silts, sands, and gravels was encountered. Some horizons of the paleosol produced hundreds of vertebrate fossils. The surface of the paleosol usually shows polygonal joints (Figure 5.8-3). These are the surface manifestation of the prismatic soil structure. Near the top of the paleosol, the joints are irregular, sporadic, or absent. The paleosol is sandy and less consolidated near the top, but more consolidated lower down. It consists of silt, sand, slight amounts of clay, and scattered gravel and cobbles. Calcium carbonate nodules occur near the base of the paleosol. The current mesa surface, where not covered by desert pavement, is deflating through this paleosol. The sediments beneath the paleosol are usually uncemented alluvium, often quite loose, and erode quite quickly when not protected by carbonate horizons.

Also present in the western part of the project site are alluvial fans issuing from the Mule Mountains. Where post-Pleistocene erosion has developed washes on the Mesa surface, modern (Holocene) wash sediments are present. Holocene eolian sands form irregular drifts on the paleosol surface.

The Colorado River abandoned the Palo Verde Mesa by early Holocene times. Up to 40 m of Holocene alluvium underlie the historic floodplain of the Lower Colorado River (Lundstrom et al. 2008). These sediments make up most of the cultivated land in the area between Palo Verde Mesa and the Colorado River. Three radiocarbon dates from these sediments are 8,610, 6,250, and 5,380 yr before present (BP) (Metzger et al. 1973). This recent alluvium is the sediment on which most agriculture land use along the lower Colorado River takes place.

A geologic map of the project area is provided in Section 5.4 of this AFC (see Figure 5.4-1).

5.8.5 Environmental Analysis

This analysis recognizes seven geological units in the area of the proposed Project. These are Chemeuevi Formation equivalents; late Pleistocene sands, silts, and gravels; Palo Verde Mesa paleosol; alluvial fans; Holocene alluvium of the mesa; eolian sediments of the mesa; and alluvium of the current Colorado River floodplain. The following paragraphs provide the foundation for this determination.

- **Chemehuevi Formation equivalents**. The finely bedded reddish mud, clay and silt assigned to the Chemehuevi Formation by some authors are visible on the lower parts of the bluffs of the Palo Verde Mesa, but rarely occur at the surface within the Project footprint. A few exposures thought to be Chemehuevi Formation equivalents were encountered. They are probably present in the subsurface over much of the project site. Metzger et al. (1973) mention fossils of turtle, snake, lizard, bird, and proboscidian tusk from their Unit D near Ehrenberg, Arizona, about 25 miles from the project area. Bell et al. (1978) published uranium-thorium dates of 96,000 to 102,000 thousand years (ka) on proboscidean tusk for the Chemehuevi Formation. Lundstrom et al. (2008) reported dates of infrared stimulated luminescence dates of 41-59 (ka) for Chemehuevi equivalents in the Cottonwood Landing area of the Colorado River in southern Nevada. They also reported thermoluminescence dates of 56-79 ka for the same section. URS paleontologists found a large fin spine of a ray-fined fish in a wash below an area where the Chemehuevi Formation outcrops; it is assumed that the fossil comes from the Chemehuevi Formation equivalents. This is the first reported fish fossil found on the Palo Verde Mesa. Sensitivity rating in terms of the system proposed by SVP (1995): High. Sensitivity in terms of the PFYC system: 4b.
- **Late Pleistocene silts, sands and gravels.** Late Pleistocene silts, sands and gravels (overlying the Chemehuevi Formation equivalent) were laid down by the Colorado River over an erosional surface of the Chemehuevi Formation equivalent. They include exotic rounded cobbles reworked from a Pliocene conglomerate. Apparently aquatic ichnofossils occur in the lower parts; just below the paleosol terrestrial ichnofossils may be seen. These sediments are of appropriate age and lithology to have significant paleontological resources, but there are, as of yet, no records of such. Sensitivity rating in terms of the system proposed by (SVP 1995): High. Sensitivity in terms of the PFYC system: 3b.

- **Palo Verde Mesa paleosol**. This paleosol is developed on sediments that were laid down by the Colorado River. It is an aridosol; there is no concentration of humic material in its upper horizon. The total depth is at least 12 feet. Within the paleosol are scattered clasts of local rocks as well as exotic rounded cobbles from the Colorado River. The middle part of the paleosol is characterized by prismatic structure because of desiccation cracks. This prismatic structure gives rise to a polygonal pattern on weathering surfaces of the paleosol (Figure 5.8-3). The prismatic part of the paleosol is ranges from approximately five and one half to seven feet thick where not reduced by erosion or deflation. Carbonate can be dispersed flecks, small hard carbonate clumps, even large hard carbonate clumps, or even plates. The carbonate deposition is usually heavier toward the base of the paleosol (Bk horizon). This more heavily calichified basal part has an approximate thickness of five feet. At the base of the paleosol in some localities, rhizoliths (former roots now preserved as carbonate sleeves) and invertebrate trace fossils extend into the unconsolidated sands. More than 650 vertebrate fossils have been recovered from this unit. The fossils usually have at least a thin coating of caliche, as do the pebbles, clasts, and cobbles. To date, fossil birds, snakes, lizards, *Gopherus* sp. (desert tortoises), *Sylvilagus* (cottontail), *Lepus* (jackrabbit), rodents, *Taxidea* (badger), probable bighorn sheep, deer, *Equus* (horse), and *Mammuthus* (mammoth) have been recovered from this paleosol. It should be mentioned that the only way that fossils of large vertebrates can be found in paleosols is if rodents or carnivores drag pieces of the skeleton into their burrows. The mammoth is represented only by ivory fragments (Figure 5.8-4). The deer is represented only by antler fragments. The horse is represented only by tooth fragments. The only organisms represented by associated remains are tortoises (Figure 5.8-5), rabbits, rodents, and a badger (Figure 5.8-6). Multiple partial eggs also have been found; one occurrence is a presumed clutch with multiple eggs. One of the *Gopherus* partial skeletons appears to be in a burrow filled with silt and sand. The burrow is dug into a much harder carbonate horizon. This occurrence demonstrates that that carbonate horizon predates the tortoise and its burrow. It should be noted that the paleosol is exposed at the desert floor over large areas of the Project. It is found on both sides of the road that parallels the southern border of the project, both sides of the road that parallels the Western Area Power Administration (WAPA) power line along the eastern part of the project, and along both sides of the proposed transmission line. It also underlies the entire "common area". Csliche horizons are quite visible in the roads at many points. The paleosol will be impacted by construction. Sensitivity rating in terms of SVP 1995: High. Sensitivity in terms of the PFYC system: 4a .

- **Alluvial fans.** This geologic unit consists of clasts of Precambrian granitic rocks from the Mule Mountains. Near the west edge of the project site, these can be cemented by heavy caliche. Sensitivity rating in terms of SVP 1995: Low. Sensitivity in terms of the PFYC system: 2.

- **Holocene alluvium of the mesa**. Large eastward-draining arroyos have cut through the paleosol and at least some of the late Pleistocene silts, sands, and gravels. These carry sediments reworked from the various geologic units upstream. There can be reworked fossils in this alluvium, but they are of little significance. Sensitivity rating in terms of SVP 1995: low. Sensitivity in terms of the PFYC system: 2.

- **Eolian sediments of the mesa.** In many areas, the paleosol is obscured by drifting sand. This sand is reworked from Pleistocene sediments. The only fossils found in these drifting sands are reworked. Near the northwestern terminus of the proposed power transmission line are large

areas covered by dunes. Sensitivity rating in terms of SVP 1995: low. Sensitivity in terms of the PFYC system: 2.

- **Alluvium of the current Colorado River floodplain**. The current flood plain of the Colorado River near the Project is used for agriculture. There are no reports of paleontological resources from these sediments, and they are generally too young to produce significant paleontological resources. Sensitivity rating in terms of SVP 1995: low. Sensitivity in terms of the PFYC system: 2.

5.8.5.1 Potential Impacts of Proposed Project Construction

Potential direct impacts on paleontological resources resulting from construction of the proposed Project primarily involve clearing of vegetation, grading, excavating for structure foundations, trenching for pipelines or utilities, and building of access roads. Paleontological resources that could be adversely affected by ground disturbance and earth moving are not restricted to fossil remains. They include associated specimen data and corresponding geologic and geographic site data, and the fossil-bearing strata. Direct impacts associated with the construction activities described above could disturb previously undisturbed fossiliferous sediments (fine grained sediments identified as Chemehuevi Formation by some authors, late Pleistocene silts, sands and gravels, and the Palo Verde Mesa paleosol), making those sediments and their paleontological resources unavailable for future scientific investigation. Direct impacts to alluvial fans, Holocene alluvium of the mesa, eolian sediments of the mesa, and alluvium of the current Colorado River floodplain would not result in significant impacts to paleontological resources. The construction of supporting facilities, such as temporary construction offices, roads, laydown areas, and parking areas, could also cause adverse impacts to significant paleontological resources.

In general, Project-related ground disturbance could have adverse impacts on significant paleontological resources. A properly designed and implemented mitigation program, however, would reduce these impacts to a less-than-significant level. In fact, two aspects of this certification process will produce beneficial impacts on significant paleontological resources. One is the discovery and preservation of hundreds of vertebrate fossils in an area where none had been known. The other is the identification of a geologic unit (Palo Verde paleosol) that was previously unrecognized and is a unit of high sensitivity for paleontological resources. If paleontological finds were to be encountered during construction of the proposed Project, the potential cumulative impacts would be low, as long as mitigation measures were implemented to salvage the resources. Section 5.8.7 provides mitigation measures that would effectively preserve the value to science of any significant fossils uncovered during project-related excavations.

5.8.5.2 Potential Impacts of Proposed Project Operation

It is anticipated that operation of the proposed Project and its related facilities will have no impacts on paleontological resources if the access roads between heliostats are paved. If the access roads are on the bare surface of the mesa, there will be significant impacts. Mitigation measures for Project operation could reduce such impacts to a less than significant level.

5.8.6 Cumulative Effects

It is not known how widely the newly-identified paleosol is distributed on the Palo Verde Mesa. Likewise, it is not known if the paleosol is less, equally, or more fossiliferous outside of the project site.

Other reasonably foreseeable projects in the vicinity of the project include Rice Solar Energy Project (RSEP), Blythe Solar Power Project (BSPP), Palen Solar Power Project (PSPP), and Genesis Solar Energy Project (GSEP). The recently-identified paleosol has not been reported from any of these projects, but it cannot be said with certainty that it does not occur on these projects. If these other projects apply the same mitigation measures as set forth below, the construction of the Project in combination with other reasonably foreseeable project will not have a significant cumulative adverse impact on the paleontological resources of the area.

5.8.7 Mitigation Measures

Mitigation measures designed to minimize the impact of construction activities of the proposed Project to paleontological resources are discussed in this section. The known and unknown sensitivity of some of the formations for paleontological resources necessitates these measures. Implementation of these measures would reduce the Project's impact to significant paleontological resources to a less-than-significant level. These measures conform to the standard guidelines developed by the SVP for the purpose of mitigating the impact of such construction activity to significant paleontological resources (SVP 1995, 1996).

Monitoring and Mitigation Program

A Paleontological Resources Monitoring and Mitigation Program (PRMMP) will be developed for review and approval prior to implementation. The PRMMP will include: construction monitoring and coordination; emergency discovery procedures; procedures for sampling and data recovery, if needed; appropriate levels of analysis of specimens; museum storage coordination for any specimens and data recovered; preconstruction coordination; and reporting. Reporting requirements will include monthly monitoring reports as well as a final report. Monitoring procedures will include measures to suspend monitoring if construction activities are restricted to previously disturbed fill, and to adjust monitoring protocols based on updated evaluations of sensitivity subsequent to initial excavations. Prior to construction, a qualified paleontologist will be retained as project PRS to design and implement a monitoring program during project-related construction activities. Prior to construction, the paleontologist will review excavation plans to determine where sensitive stratigraphic units will be disturbed by project-related earth movement.

Monitoring for paleontological resources shall be performed for earth moving construction activities that disturb previously undisturbed sediment with high or unknown sensitivity for paleontological resources. Monitoring is not required in areas where sediments have been previously disturbed, in areas where only fill or sediment of low to moderate paleontological sensitivity is affected or in areas where exposed sediments will be buried but not otherwise disturbed.

Pre-Construction Meetings

Pre-construction meetings shall be held with key construction personnel to provide instructions on paleontological resource significance, visual identification, and fossil discovery notification procedures. The qualified paleontologist shall consult with the project geologist and project engineer on a periodic basis regarding the scheduling and extent of subsurface excavations, particularly where undisturbed areas may be encountered.

Construction Personnel Education

Before the start of construction, personnel involved with earth-moving activities shall be informed of fossils that may be encountered during excavation, the legal protections for these fossils, the form of common fossils, and proper notification procedures. This worker training program shall be prepared and presented by a qualified paleontologist.

Implementation of these mitigation measures will reduce the potentially significant adverse environmental impact of proposed Project-related ground disturbance and earth-moving on paleontological resources to an insignificant level by allowing for the salvage of fossil remains and associated specimen data. Corresponding geologic and geographic site data that otherwise might be lost to earth moving and to unauthorized fossil collecting will be retained.

5.8.8 Involved Agencies and Agency Contacts

No state or local agencies have specific jurisdiction over paleontological resources. In Riverside County, David L. Jones administers paleontological matters. Other agency contacts who will be involved in the Project are listed in Table 5.8-2.

Table 5.8-2
Agency Contacts

Agency Contact	Phone/E-mail	Permit/Issue
Sherrie Landonr BLM Regional Paleontologist, Arizona, California and New Mexico 435 Montano NE Albuquerque, NM 87107	(505) 7661-8786 slandon@blm.gov	Preservation of Paleontological Resources
Dr. Charlotte Hunter BLM, California State Office State Lead, Archaeology, Paleontology, and Tribal Relations 2800 Cottage Way, W-1928 Sacramento, CA 95825	(916) 978-4648 cahunter@BLM.GOV	Fieldwork Authorization
Cheryl Martinez Lands, Minerals, and Recreation Supervisor BLM Palm Springs-South Coast Field Office 1201 Bird Center Drive Palm Springs, CA 92262	(760-833-7147) cmartine@blm.gov	Fieldwork Authorization

Table 5.8-2
Agency Contacts

Agency Contact	Phone/E-mail	Permit/Issue
Rolla Queen District Archaeologist BLM California Desert District 22835 Calle San Juan de Los Lagos Moreno Valley, CA 92553	(909) 697-5386 rolla.queen@blm.gov	Fieldwork Authorization
Paul Marshall Senior Engineering Geologist California Energy Commission 1516 Ninth Street Sacramento, CA 95814	(916) 654-4059 pmarshal@energy.state.ca.us	Evaluation of Application for Certification Paleontological Resources Section
Kathleen Springer Senior Curator San Bernardino County Museum 2024 Orange Tree Lane Redlands, CA 92374	(909) 307.2669, Ext. 242 kspringer@sbccounty.gov	Curation Agreement
Eric Scott Curator San Bernardino County Museum 2024 Orange Tree Lane Redlands, CA 92374	(909) 307-2669, Ext. 241 escott@sbcounty.gov	Paleontological Records Search
David L. Jones Chief Engineering Geologist Planning Department Geology Division Riverside County 4080 Lemon Street Riverside, CA 92502	(951)-955-4004 djones@rctlma.org	Riverside County laws, ordinances, regulations and standards

5.8.9 Permits Required and Permit Schedule

A permit for the survey, recordation, and limited collection of paleontological resources, issued by the U.S. Department of Interior (DOI), is required for Project construction. All paleontological aspects of the permitting work are being completed under BLM Permit No. CA-08-00-009P.

5.8.10 References

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Stone, P. 2006. Geological map of the west half of the Blythe 30’ x 60’ quadrangle, Riverside County, California and La Paz County, Arizona. U.S. Geological Survey, Scientific Investigations Map SIM-2922, scale 1:100,000.

SVP (Society of Vertebrate Paleontology). 1995. Assessment and mitigation of adverse impacts to nonrenewable paleontological resources: standard guidelines: Society of Vertebrate Paleontology News Bulletin, No. 163. pp. 22-27.

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Adequacy Issue: Adequate _____ Inadequate _____ **DATA ADEQUACY WORKSHEET** Revision No.: _____ Date: _____

Technical Area: Paleontology Project: _____ Technical Staff: _____
Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.8.3, page 5.8-5 Section 5.8.4.3, page 5.8-11 Section 5.8.5, page 5.8-13 Section 5.8.7, page 5.8-16		
Appendix B (g) (16) (A)	Identification of the physiographic province and a brief summary of the geologic setting, formations, and stratigraphy of the project area. The size of the paleonotological study area may vary depending on the depositional history of the region.	Section 5.8.3.1, page 5.8-6 Section 5.8.3.2, page 5.8-6 Section 5.8.4.3, page 5.8-11		
Appendix B (g) (16) (B)	A discussion of the sensitivity of the project area described in subsection (g)(16)(A) and the presence and significance of any known paleontologic localities or other paleontologic resources within or adjacent to the project. Include a discussion of sensitivity for each geologic unit identified on the most recent geologic map at a scale of 1:24,000. Provide rationale as to why the sensitivity was assigned.	Sections 5.8.4.3, page 5.8-11 5.8.5, page 5.8-13 Confidential Appendix 5.8A, Appendix 5.8B		
Appendix B (g) (16) (C)	A summary of all local museums, literature searches and field surveys used to provide information about paleontologic resources in the project area described in subsection (g)(16)(A). Identify the dates of the surveys, methods used in completing the surveys, and the names and qualifications of the individuals conducting the surveys.	Section 5.8.4.3, page 5.8-11		

Adequacy Issue: Adequate _____ Inadequate _____ **DATA ADEQUACY WORKSHEET** Revision No.: _____ Date: _____

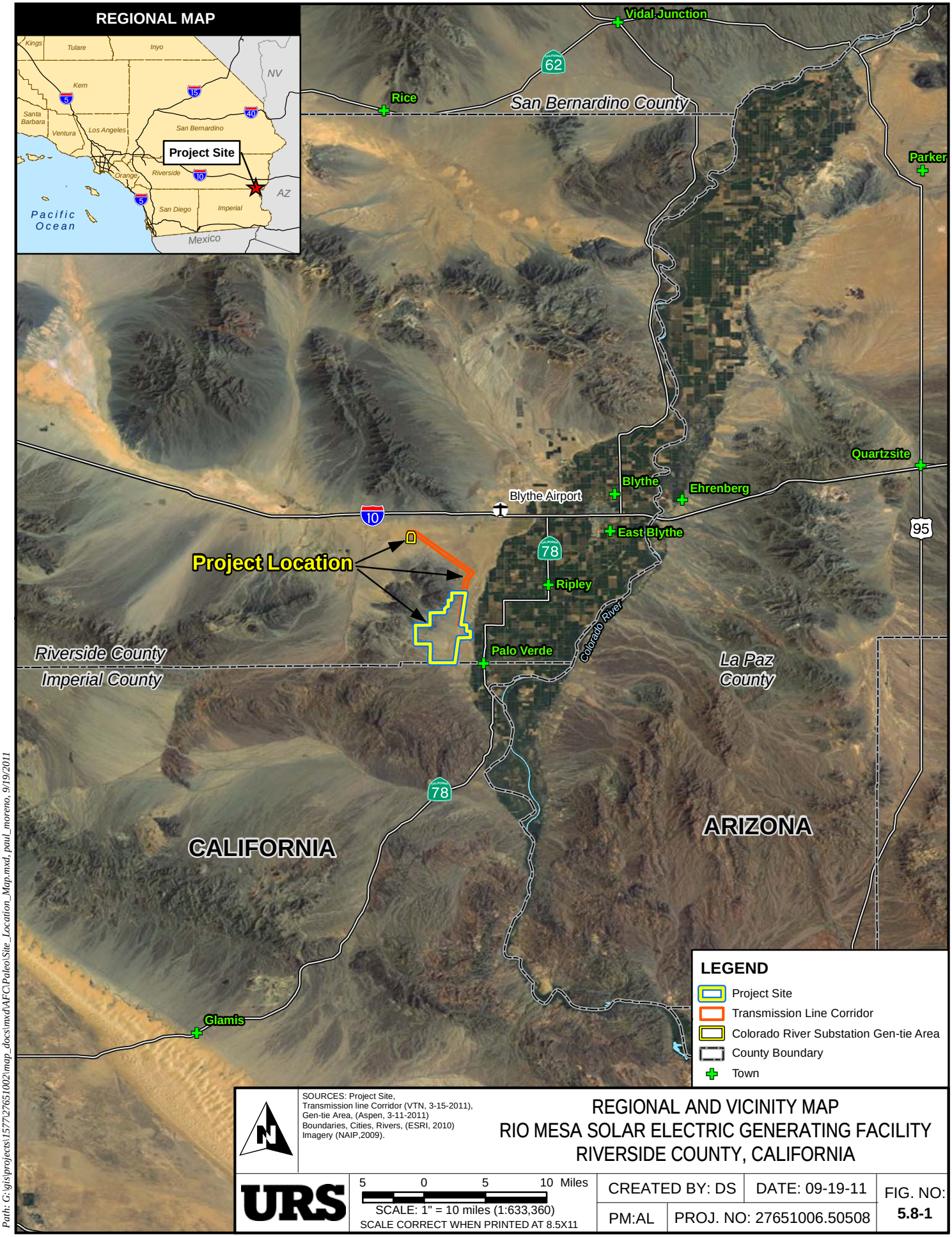
Technical Area: Paleontology Project: _____ Technical Staff: _____
Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (16) (D)	Information on the specific location of known paleontologic resources, survey reports, locality records, and maps at a scale of 1:24,000, showing occurrences of fossil, finds if known, within a one-mile radius of the project and related facilities shall be included in a separate appendix to the Application and submitted to the Commission under a request for confidentiality, pursuant to Title 20, California Code of Regulations, s 2501 et seq.	Confidential Appendix 5.8A		
Appendix B (g) (16) (E)	A discussion of any educational programs proposed to enhance awareness of potential impacts to paleontological resources by employees, measures proposed for mitigation of impacts to known paleontologic resources, and a set of contingency measures for mitigation of potential impacts to currently unknown paleontologic resources.	Section 5.8.7, page 5.8-16		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.8.2, page 5.8-2 Table 5.8-1		Should include reference to paleontological guidelines developed by the City of San Diego in 1998.
v (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.8.8, page 5.8-17 Table 5.8-2		

Adequacy Issue: Adequate _____ Inadequate _____ **DATA ADEQUACY WORKSHEET** Revision No.: _____ Date: _____

Technical Area: Paleontology Project: _____ Technical Staff: _____
Project Manager: _____ Docket: _____ Technical Senior: _____

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.8.8, page 5.8-17 Tables 5.8-2		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.8.9, page 5.8-18		



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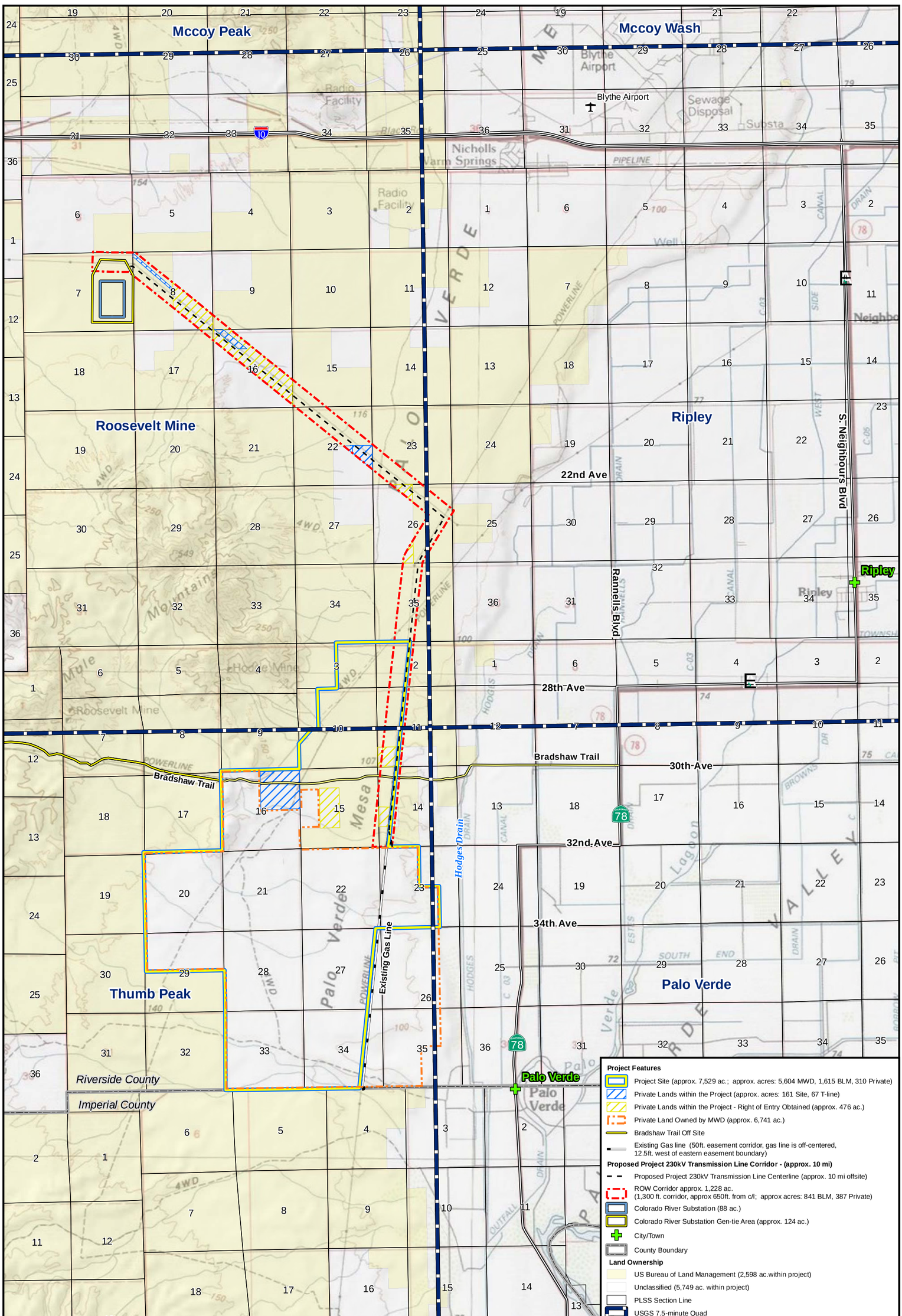

SOURCES: Project Site, Transmission Line Centerline, Transmission Line Corridor, MWD Land, Private Lands, Existing Gasline (VTN, 3-15-2011). CRS Substation, Potential Gen-tie Area (Aspen, 3-11-2011). County, State Boundaries, Roads, Bradshaw Trail (ESRI, 2007). Land Ownership (BLM, 3-03-2011). PLSS Sections (BLM, 12-11-2007). USGS 7.5-Minute Quadrangles (ESRI, 2007). USGS Quadrangle Boundaries (CDFG, 2000).

PROJECT FEATURES MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

3000 0 3000 6000 Feet

SCALE: 1" = 6000' (1:72,000)
SCALE CORRECT WHEN PRINTED AT 11X17

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EXPOSURE OF PALEOSOL SHOWING POLYGONAL PATTERN

URS

PROJ. NO: 27651006

FIG. NO: **5.8-3**

ABRADED FRAGMENT OF MAMMOTH IVORY

URS

PROJ. NO: 27651006

FIG. NO: **5.8-4**

PARTIAL TORTOISE SHELL

URS

PROJ. NO: 27651006

FIG. NO: **5.8-5**

BADGER SKULL AND MANDIBLES

URS

PROJ. NO: 27651006

FIG. NO: **5.8-6**