SECTION 4.6

GEOLOGY AND SOILS

This section describes federal, state and local regulations applicable to geology and soils and paleontological resources. It also describes the environmental setting regarding the soils, seismicity, geologic and paleontological conditions on and near the Project site. A discussion of geology and soil and paleontological impacts is also provided, and mitigation measures are identified to address potential impacts as pertinent to the Project site.

The information and analysis in this section is based on the *Soil Survey of Imperial County, California, Imperial Valley Area* (USDA 1981) and the *Preliminary Geotechnical and GeoHazards Report: Drew Solar Site NWC Pulliam Road and Hwy 98, Calexico, California*, prepared by LandMark Consultants, Inc. (LandMark 2018). The Project-specific geotechnical report is provided as **Appendix E** on the attached CD of Technical Appendices to this EIR. Information regarding paleontological resources from the neighboring Centinela Solar Energy Project EIR (Imperial County 2011) was consulted for the analysis in this section.

For the purposes of analyzing geology and soils impacts, the Full-Buildout Scenario represents the greatest amount of construction activity resulting in the greatest potential for geology and soils impacts to occur over the Project site (e.g. erosion) over a period of 18 months.

4.6.1 REGULATORY FRAMEWORK

A. STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Zoning Act (Chapter 7.5, Division 2, Public Resources Code, State of California, effective May 4, 1975) (Act) provides a statewide mechanism for reducing losses from surface fault rupture. The Act promotes public safety by prohibiting siting of most structures for human occupancy across traces of active faults that constitute a hazard to structures from surface faulting or fault creep. In accordance with the Act, the Office of State Geologist delineated Special Study Zones that encompass potentially and recently active traces of four major faults: San Andreas, Calaveras, Hayward and San Jacinto. The County of Imperial is responsible for enforcing the Act by ensuring that homes, offices, hospitals, public buildings, and other structures for human occupancy that are built on or near active faults or within a special study zone, are designed and constructed in compliance with the County of Imperial Codified Ordinance (Imperial County 2007). The southwest corner of the Project site (APN 052-170-067) lies within a State of California Alquist-Priolo Earthquake Fault Zone (LandMark 2018, p. 6).

California Building Code

Title 24 of the California Code of Regulations (CCR), commonly referred to as the California Building Code (CBC), is published and updated by the California Building Standards Commission. The most recent version of the CBC (2016) went into effect as of January 1, 2017. Cities and counties are required by state law to enforce the CBC. The CBC applies to all building occupancies, and related features and equipment throughout the State of California, and contains requirements related to the structural, mechanical, electrical, and plumbing systems, and requires measures for energy conservation, green design, construction and maintenance, fire and life safety, and accessibility. Among other elements, Chapter 16 of the CBC dictates the design and construction standards applicable to resist seismic shaking on structures. The Project must be designed in compliance with the 2016 CBC.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (SHMA), set forth at Public Resources Code section 2690 *et seq*., was enacted to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, or other hazards caused by earthquakes. Pursuant to the SHMA, the California

Department of Conservation, California Geological Survey (CGS) has delineated seismic hazard zones. Imperial County has not yet been mapped by the CGS. Therefore, the Project site is not within a designated seismic hazard zone.

Seismic Hazards Mapping Regulations (Seismic Regulations) have also been adopted requiring preparation of a project-specific geotechnical report evaluating seismic hazards and recommending appropriate mitigation. (California Code of Regulations, title 14, §3720 *et seq.*). The State Mining and Geology Board adopted Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (adopted September 11, 2008) ("Special Publication 117A"), which establishes standards for the evaluation of seismic hazards other than surface fault rupture and also provides recommended mitigation measures. Special Publication 117A provides that the minimum level of mitigation for a project should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy. Special Publication 117A expressly contemplates that a site-specific geotechnical report might be prepared before or after CEQA approval.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act of 1975 (SMARA) acknowledges that mineral extraction is essential to California's economy and that the reclamation of mined lands after extraction is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety. The SMRA also classifies mineral resources in the State and provides information to local governments. Local governments are responsible for designating lands that contain regionally significant mineral resources in their local General Plans for preserving such areas from encroachment or conversion to other uses. The law has resulted in the preparation of Mineral Land Classification Maps delineating Mineral Resource Zones (MRZ) for aggregate resources (sand, gravel, and stone). Mining occurs throughout the County of Imperial as shown on the Imperial County Existing Mineral Resources map (Imperial County 2015e). None of the solar field site parcels are located in an area with any MRZ zones.

Paleontological Significance Criteria

Paleontological resources are the fossil remains of animals and plants from the past. CEQA Guidelines Appendix G provides a checklist of questions that a lead agency should typically address if relevant to a project's environmental impacts. Appendix G Section VII. f) asks if the project will directly or indirectly destroy a unique paleontological resource, site, or unique geological feature.

The Society of Vertebrate Paleontology (SVP), a national organization, has established a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources (Imperial County 2014, p. 4.7-3).

B. LOCAL

County Land Use Ordinance

Title 9 Division 15 (Geological Hazards) of the County Land Use Ordinance has established procedures and standards for development within earthquake fault zones. Per County regulations, construction of buildings intended for human occupancy which are located across the trace of an active fault are prohibited. An exception exists when such buildings located near the fault or within a designated Special Studies Zone are demonstrated through a geotechnical analysis and report not to expose a person to undue hazard created by construction of the building. The proposed Project does not include any residential structures.

Imperial County General Plan

The Imperial County General Plan Seismic and Public Safety Element (Imperial County n.d.) contains goals, objectives, policies and programs to minimize the risks associated with natural and human-made hazards including seismic/geological hazards, flood hazards, and Imperial Irrigation District Lifelines.

Table 4.6-1 analyzes the consistency of the Project with the applicable goals and objectives relating to seismic hazards and soil conditions in the Imperial County General Plan. While this EIR analyzes the Project's consistency with the General Plan pursuant to CEQA Guidelines section 15125(d), the Imperial County Board of Supervisors ultimately determines consistency with the General Plan.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals and Objectives	Consistent with General Plan?	Analysis
SEISMIC AND PUBLIC SAFETY ELEMENT		
Land Use Planning and Public Safety		
Goal 1: Include public health and safety considerations in land use planning.	Yes	The proposed Project is located in a rural area of Imperial County characterized by agricultural fields with very few nearby residences. Public health and safety would not be affected in association with development of a solar generation facility in this area based on its location away from population centers. Therefore, the proposed Project is consistent with this goal under both the Full Build-Out Scenario and the Phased CUP Scenario.
Objective 1.1 Ensure that data on geological hazards is incorporated into the land use review process, and future development process.	Yes	The proposed Project has prepared a Preliminary Geotechnical and GeoHazards Report identifying potential geologic hazards. Mitigation measures MM 4.6.2 requires preparation of a Final Geotechnical and GeoHazards Report that will identify site-specific design provisions for mitigating on-site geologic conditions including liquefaction, expansive soils and corrosive soils. All measures and design specifications identified in the Final Geotechnical and GeoHazards Report shall be incorporated into and reflected on the Project design and building plans. Therefore, the proposed Project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals and Objectives	Consistent with General Plan?	Analysis
Objective 1.4 Require, where possessing the authority, that avoidable seismic risks be avoided; and that measures, commensurate with risks, be taken to reduce injury, loss of life, destruction of property, and disruption of service.	Yes	The proposed solar field site parcels are located in an area subject to moderate to strong ground motion from earthquakes in the region. The nearest mapped Earthquake Fault Zone is an unnamed fault that extends into the southwest corner of CUP 17-0035 and potential for surface fault rupture is low to moderate (LandMark 2018, p. 6). Liquefaction settlement and ground fissures were noted along the Westside Main Canal in the area of the Project site (LandMark 2018, p. 4). However, the Project would be designed in accordance with all applicable federal, State and local building codes. Any potential damage to proposed structures (i.e. O&M buildings, PV or CPV modules) can be mitigated through engineering and compliance with building standards (refer to mitigation measure MM 4.6.1 and MM 4.6.2). Therefore, the proposed Project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.
Objective 1.7 Require developers to provide information related to geologic and seismic hazards when siting a proposed project.	Yes	A Preliminary Geological and Geotechnical Hazard Report was prepared for the proposed Project (LandMark 2018). The Report was used in the analysis of solar field site parcels and regional geology and soils conditions. The Report included recommendations to address potential geologic or seismic hazards that may be associated with the solar field site parcels. These recommendations have been included in this EIR as mitigation measures MM 4.6.1, MM 4.6.2 MM 4.6.7a and MM 4.6.7b. Therefore, the proposed Project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals and Objectives	Consistent with General Plan?	Analysis
Emergency Preparedness		
Goal 2: Minimize potential hazards to public health, safety, and welfare and prevent the loss of life and damage to health and property resulting from both natural and human-related phenomena.	Yes	The Project is subject to compliance with the 2016 CBC in regard to potential for seismic ground shaking and engineering design. The Phased CUP Scenario would also be required to incorporate design parameters and recommendations of the Final Geological and Geotechnical Report into the final Project design to address seismic and soil conditions at the solar field site parcels (MM 4.6.2). Therefore, the proposed Project is consistent with this goal under both the Full Build-Out Scenario and the Phased CUP Scenario.
Objective 2.2 Reduce risk and damage due to seismic hazards by appropriate regulation.	Yes	The proposed Project would be constructed in accordance with the 2016 CBC, the Seismic Regulations, Special Publication 117A, and the County of Imperial building requirements. Therefore, the proposed project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.
Objective 2.6 Maintain, utilize, and provide geologic and seismic information as furnished by the State Geologist as required.	Yes	The Preliminary Geological and Geotechnical Hazard Report prepared for the proposed Project utilized information provided by the State Geologist including Alquist-Priolo Earthquake Fault Zone maps and the 2010 Fault Activity Map of California. Therefore, the proposed Project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals and Objectives	Consistent with General Plan?	Analysis
Objective 2.8 Prevent and reduce death, injuries, property damage, and economic and social dislocation resulting from natural hazards including flooding, land subsidence, earthquakes, other geologic phenomena, levee or dam failure, urban and wildland fires and building collapse by appropriate planning and emergency measures.	Yes	The Project is located in a seismically active area. The Preliminary Geological and Geotechnical Hazard report prepared for the Project includes recommendations that all structures be designed in accordance with the 2016 CBC. Recommendations of the Investigation have been included in this EIR as mitigation measures MM 4.6.1 and MM 4.6.2 to reduce risks associated with geologic and seismic hazards. Therefore, the proposed Project is consistent with this objective under both the Full Build-Out Scenario and the Phased CUP Scenario.
Seismic/Geologic Hazards		
Policy 4 Ensure that no structure for human occupancy, other than one-story wood frame structures, shall be permitted within fifty feet of an active fault trace as designated under the Alquist-Priolo Geologic Hazards Zone Act.	Yes	The O&M Buildings are the proposed Project's only habitable structures. The proposed locations for the O&M building(s) have not been identified however the nearest mapped Earthquake Fault Zone is an unnamed fault that extends into the southwest corner of CUP17-0035 (LandMark 2018, p. 5). O&M buildings should avoid this area. Further, the proposed Project would be constructed in accordance with the 2016 CBC, the Seismic Regulations, Special Publication 117A, and the County of Imperial building requirements. Therefore, the proposed Project is consistent with this policy under both the Full Build-Out Scenario and the Phased CUP Scenario.

4.6.2 ENVIRONMENTAL SETTING

A. PROJECT SITE

Regional Geology

The solar field site parcels are located in the Imperial Valley portion of the Salton Trough physiographic province. The Salton Trough is a topographic and geologic structural depression resulting from large scale regional faulting. The trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton

Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments since the Miocene Epoch. Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity (LandMark 2018, p. 2).

The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a freshwater lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 to 20,000 feet (LandMark 2018, pp. 2-3).

Project Site Geological Conditions

Groundwater

The groundwater in the Project vicinity is brackish and typically encountered at a depth of 5 to 10 feet below ground surface. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. Groundwater levels may fluctuate with water elevation in the Westside Main Canal, precipitation, irrigation of adjacent properties, drainage, and grading. The groundwater level noted should not be interpreted to represent an accurate or permanent condition (LandMark 2018, p. 3).

Geologic Hazards

Landslides

According to the Preliminary Geotechnical and Geohazards Report, no ancient landslides are shown on geologic maps of the region and no indications of landslides were observed during the site investigation. The hazard of landslide is unlikely due to the relatively planar topography of the Project site (LandMark 2018, p. 3).

Volcanic Hazards

The Project site is not located near a known volcanically active area. The risk of volcanic hazards is considered very low (LandMark 2018, p. 3).

Tsunamis and Seiches

The Project site is not located near any large bodies of water. As a result, the threat of tsunamis, seiches, or other seismically-induced flooding is considered unlikely (LandMark 2018, p. 3).

Flooding

The Project site is located in FEMA Flood Zone X, an area determined to be outside the 0.2% annual chance of floodplain (FIRM Panels 06025C2050C) (LandMark 2018, p. 3).

Expansive Soils

Much of the near surface soils within the Project site consist of silty clays and clay having a moderate to high expansion potential. (LandMark 2018, p. 4).

Corrosive Soils

The lacustrine site soils within the ancient lake bed in which the Imperial Valley is formed are moderately to highly corrosive to steel and concrete (LandMark 2018, p. 4).

Liquefaction/Seismic Settlements

Liquefaction settlement and ground fissures were noted along the Westside Main Canal in the area of the Project site after the April 4, 2010 magnitude 7.2Mw El Mayor-Cucapah Earthquake. Several liquefaction related failures to the embankment of the Westside Main Canal west of the Project site have been noted (LandMark 2018, p. 4).

Seismic Hazards

Ground Shaking

The Project site is located in the seismically active Imperial Valley of Southern California with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinor Fault Zones in southern California. The Imperial Fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (LandMark 2018, p. 5).

As a part of the Preliminary Geotechnical and GeoHazards Report, a search was conducted of known active faults or seismic zones within a 44-mile (70 kilometer) radius of the Project site (LandMark 2018). **Table 4.6-2** summarizes the faults. **Figure 4.6-1**, Regional Fault Map, shows the location of the Project site in relation to regional faults. **Figure 4.6-2**, Map of Local Faults, shows the solar field site parcels in relation to local faults. The primary seismic hazard at the Project site is the potential for strong groundshaking during earthquakes along the Superstition Hills, Imperial, Cerro Prieto and Laguna Salada faults.

TABLE 4.6-2
SUMMARY OF CHARACTERISTICS OF CLOSEST KNOWN ACTIVE FAULTS TO THE PROJECT SITE

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Unnamed 2*	0.3	0.4			
Unnamed 1*	4.6	7.4			
Yuha*	5.7	9.1			
Laguna Salada	7.9	12.7	7	67 $\pm$ 7	3.5 $\pm$ 1.5
Borrego (Mexico) *	8.7	13.9			
Shell Beds	10.2	16.3			
Superstition Hills	10.6	17.0	6.6	23 $\pm$ 2	4 $\pm$ 2
Yuha Well*	11.1	17.7			
Vista de Anza*	12.6	20.1			
Superstition Mountain	14.1	22.5	6.6	24 $\pm$ 2	5 $\pm$ 3
Imperial	14.5	23.2	7	62 $\pm$ 6	20 $\pm$ 5
Brawley	15.5	24.8			
Pescadores (Mexico)*	16.3	26.0			
Cerro Prieto*	17.8	28.4			
Rico*	17.8	28.6			
Panted Gorge Wash*	17.9	28.7			
Ocotillo*	18.1	29.0			

TABLE 4.6-2
SUMMARY OF CHARACTERISTICS OF CLOSEST KNOWN ACTIVE FAULTS TO THE PROJECT SITE

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Cucapha (Mexico) *	18.6	29.7			
Elsinore – Coyote Mountain	2.0	35.2	6.8	39 ± 4	4 ± 2
Elmore Ranch	26.2	41.9	6.6	29 ± 3	1 ± 0.5
San Jacinto - Borrego	29.6	47.4	6.6	29 ± 3	4 ± 2
Algodones*	43.9	70.2			

*Source: LandMark 2018. *Faults not included in CGS database.*

Surface Rupture

The southwest corner of the Project site lies within a State of California, Alquist-Priolo Earthquake Fault Zone (**Figure 4.6-2**). This is an unnamed fault that was mapped after the 7.2 Mw El Mayor-Cucapah Earthquake (LandMark 2018, p. 6).

Other Hazards

Hydrocollapse

The Project site is are dominantly underlain by clays that are not expected to collapse with the addition of water. The risk of hydrocollapse in these soil types is considered very low (LandMark 2018 p. 7).

Subsidence

Subsidence is the gradual, local settling or sinking of the Earth's surface with little or no horizontal motion. Subsidence is usually the result of gas, oil, or water extraction, hydro-compaction, or peat oxidation, and not the result of a landslide or slope failure. Ground surface effects related to subsidence are generally restricted to long surface structures such as canals, drains, and sewers, which are sensitive to slight changes in elevation. According to the Imperial County Seismic and Public Safety Element, subsidence from earthquakes and other activities can disrupt drainage systems and cause localized flooding. Regional subsidence has not been documented in the area west of the New River. Thus, risk of regional subsidence at any of the solar field site parcels is considered low (LandMark 2018, p. 7).

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Soil Map Units

Table 4.6-3 summarizes the soils within the solar field site parcels and associated characteristics. **Figure 4.6-3** depicts the five soil map units within the boundaries of the solar field site parcels. A brief description of the soils is provided below.

TABLE 4.6-3
SUMMARY OF PROJECT SITE SOIL MAP UNITS

Soil Name/ Map Symbol	Texture[1]	Depth of Surface Layer[1]	Wind Erodability Group[2]	Erosion (K) Factor[3]	Erosion Hazard Paths and Trails[4]	Permeability Inches Per Hour[3]
110 - Holtville	Silty Clay	0-17	4	0.32	Moderate: Too clayey	0.06 - 0.20
114 - Imperial	Silty Clay Loam	0-12	4	0.43	Moderate: Too clayey	0.06 - 0.20
115 – Imperial Glenbar	Silty Clay Loam	0-13	4L	0.37	Slight	0.2-0.6
122 - Meloland	Loamy Very Fine Sandy Loam	0-12	4L	0.43	Moderate: Wetness	0.6-2.0
135 - Rositas Fine Sand, wet, 0 to 2 percent slopes	Fine Sand	0-9	1	0.20	Severe: Too Sandy	6.0-20

Source: USDA 1981, LandMark 2018, Plate A-3 *Notes: N/A = not applicable or not available.*

[1] Taken from Table 11, Engineering Index Properties.

[2] Wind erodibility groups range from 1 to 8, with 1 being highly erodible and 8 having low erodibility. Taken from Table 12, Physical and Chemical Properties of Soils.

[3] This is an index of erodibility for standard condition and includes susceptibility of soil to erosion and rate of runoff. Low K values (below 0.15) indicate low erosion potential. High K values (above 0.4) are highly erodible. Taken from Table 12, Physical and Chemical Properties of Soils

[4] Qualitative descriptors of erosion hazard: Slight = little or no erosion is anticipated, Moderate = some erosion anticipated, Severe = significant erosion potential exists. Taken from Table 9, Recreational Development (Paths and Trails).

Soil Series Descriptions

Glenbar Soils – The Glenbar series consists of very deep, well drained soils that formed in stratified stream alluvium. Glenbar soils are on floodplains and alluvial fans and have slopes of 0 to 3 percent. These soils are well-drained; have medium to slow runoff; and have moderately slow permeability (USDA 1981, pp. 52-23).

Holtville Soils – The Holtville Series consists of very deep, well drained soils formed in mixed and stratified alluvium. Holtville soils are on floodplains and basins and have slopes of 0 to 3 percent. Holtville soils are well drained; have low runoff; and have slow permeability (USDA 1981, p.53).

Imperial Soils – The Imperial soils are nearly level to gently sloping and are on floodplains and in old lake beds at elevations of 235 feet below sea level to 300 feet above sea level. Imperial soils are well and moderately well drained; slow or very slow runoff except on low scarps; and have very slow permeability (USDA 1981, p. 54).

Meloland soils – The Meloland series is a member of the coarse-loamy over clayey, mixed (calcareous), hyperthermic family of Typic Torrifluvents. Meloland soils are naturally well drained, but commonly have perched water tables under irrigation. Surface runoff is low or medium; permeability is slow (USDA 1981, pp. 55-56).

Rositas soils – The Rositas unit consists of very deep calcareous soils formed in alluvial and eolian deposits. Slopes are 0 to 30 percent. Elevation is 300 above sea level to 230 feet below sea level (USDA 1981, p. 56).

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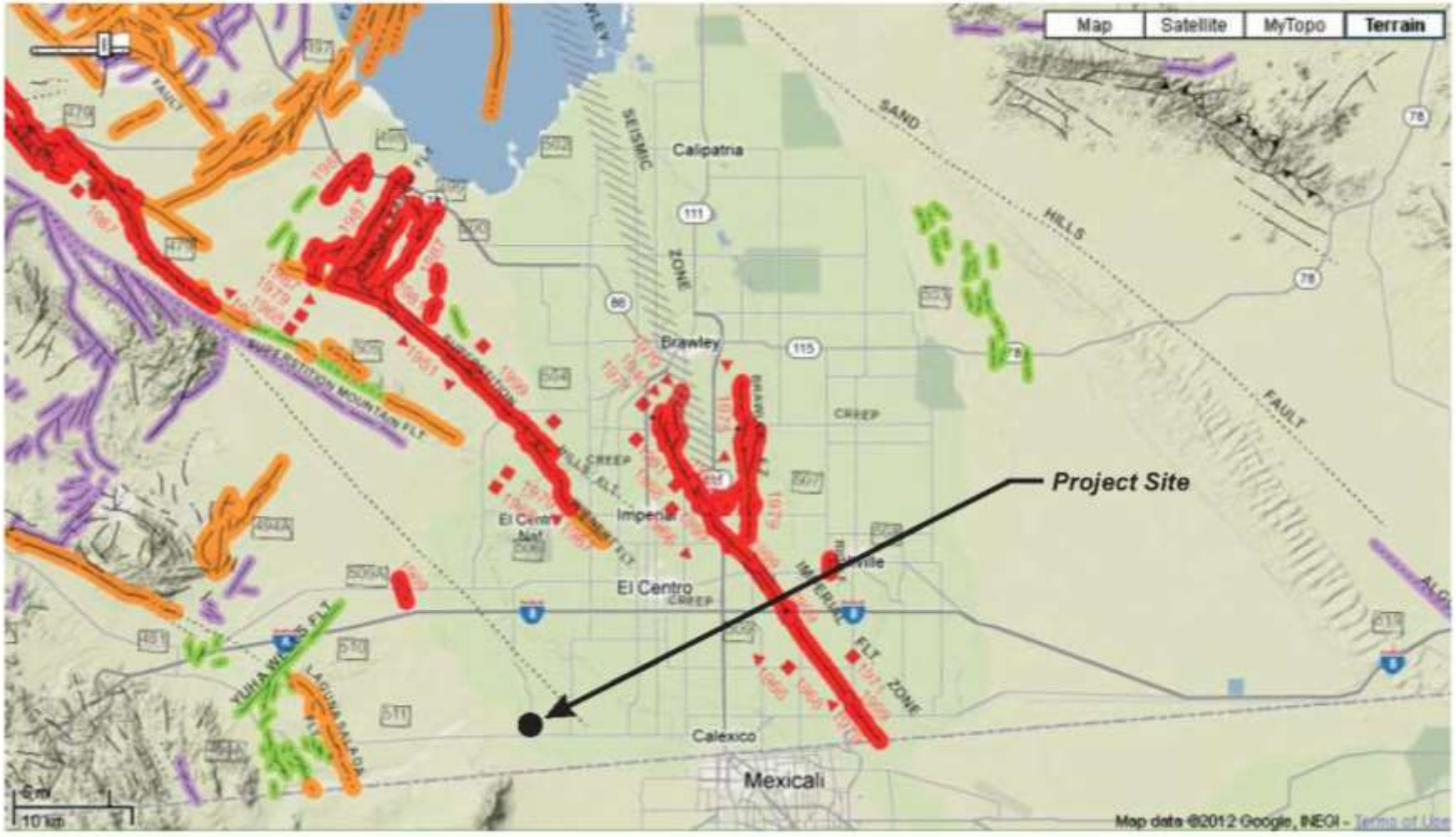


Source: California Geological Survey 2010 Fault Activity Map of California.
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

FIGURE 4.6-1
LOCAL FAULT MAP

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

(c) displaced survey lines.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

Source: California Geological Survey 2010 Fault Activity Map of California. http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

FIGURE 4.6-1A
LOCAL FAULT MAP LEGEND

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

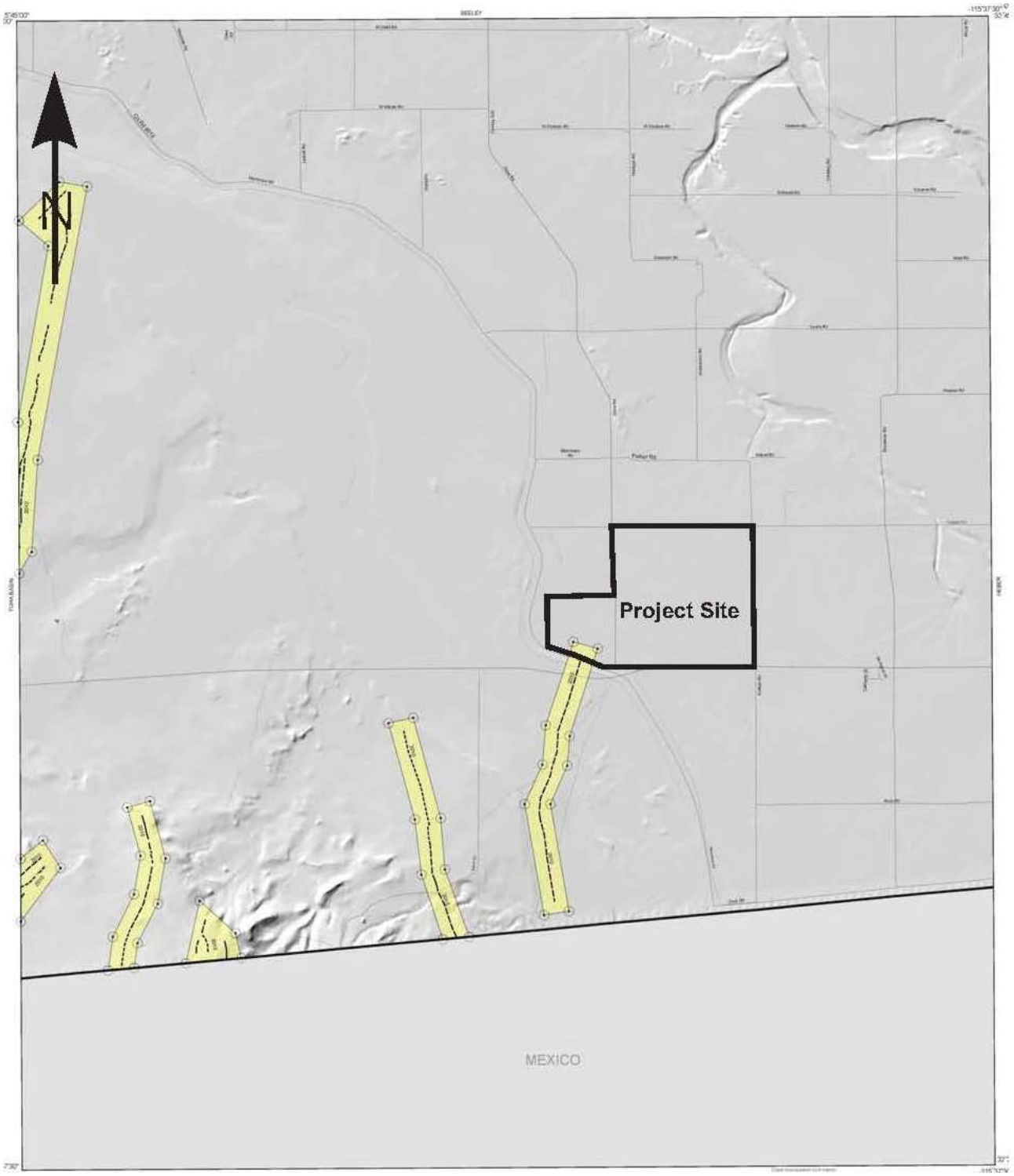
Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

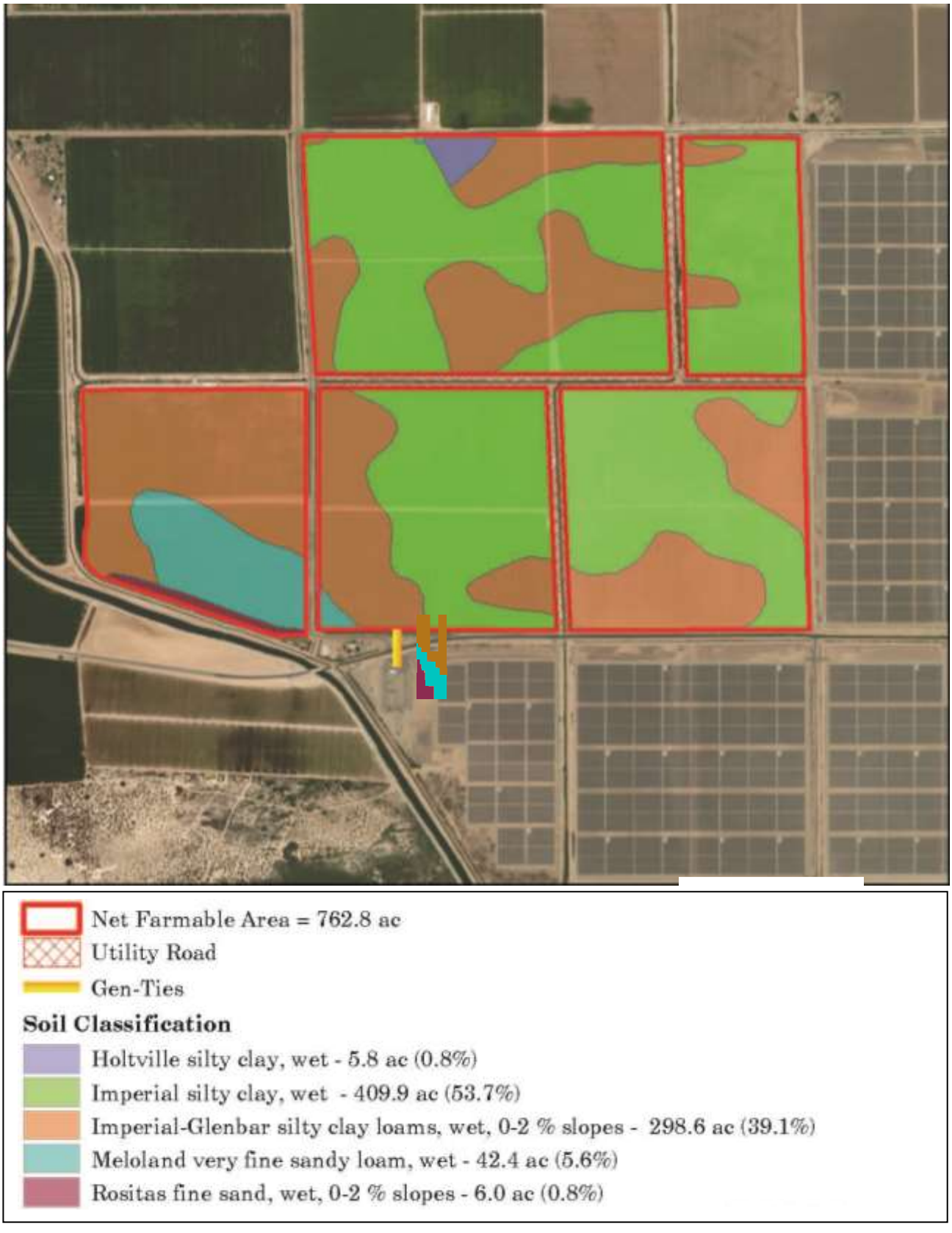
Source: California Geological Survey 2010 Fault Activity Map of California. http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

FIGURE 4.6-1A
LOCAL FAULT MAP LEGEND



Source: LandMark 2018.

FIGURE 4.6-2
ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE MAP



Source: Recon 2018c.

FIGURE 4.6-3
PROJECT SITE SOILS MAP

Paleontology

Paleontological resources (fossil or fossils) are the remains of prehistoric life, excluding any human remains that are characterized by geologic age (i.e. typically 10,000 years older or older). Paleontological resources also include the areas where fossils were collected and the sedimentary rock formations in which they were found as well as the impressions and casts created by organisms. Examples of fossil remains include marine shells: bones and teeth of fish, reptiles and mammals; leaf collections and fossilized wood (Imperial County 2014, p. 4.7-4).

The Project Site is located in the Imperial Valley portion of the Salton Trough physiographic province of Southern California. The Project Site and surrounding Imperial Valley is directly underlain by geologic units comprised of quaternary lake deposits of the ancient Lake Cahuilla. Lakebed deposits of ancient Lake Cahuilla have yielded fossil remains from numerous localities in Imperial Valley. These include extensive freshwater shell beds, fish, seeds, pollen, diatoms, foraminifera, sponges, and wood. Lake Cahuilla deposits have also yielded vertebrate fossils, including teeth and bones of birds, horses, bighorn sheep, and reptiles. The oldest sedimentary rocks in the vicinity of the Project Site consist of fossil-rich marine mudstones and siltstones of the Imperial Group that formed on the submerged marine portions of the ancestral Colorado River delta (Imperial County 2011, p. 3.13-3).

B. Drew Switchyard and Gen-Tie Lines

The description of Geologic Conditions, Geologic Hazards, Seismic Hazards, Other Hazards and Paleontology described for the Project Site also apply to the Drew Switchyard and the two Gen-Tie Lines.

Soil Map Units

As shown in **Figure 4.6-3**, the two Gen-Tie lines will extend south across SR 98 and Drew Road and into the existing Drew Switchyard. The Gen-Tie lines will align through Imperial-Glenbar soils. The Gen-Tie transmission structures will require drilling to a maximum depth of 10 feet for pole foundations (Dudek 2018a, p. 35).

The southwest corner of the Drew Switchyard is sited on Rositas Fine Sand, wet, 0 to 2 percent slopes; the mid-portion on Meloland Soil and the northeast corner on Imperial Glenbar Soil.

4.6.3 Impacts and Mitigation Measures

A. Standards of Significance

The impact analysis provided below is based on the following CEQA Guidelines, as listed in Appendix G. The Project would result in a significant impact to geology and soils if it would result in any of the following:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

   ii) Strong Seismic ground shaking.

   iii) Seismic-related ground failure, including liquefaction.

   iv) Landslides.

b) Result in substantial soil erosion or the loss of topsoil.

c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risk to life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

B. Issues Scoped Out as Part of the Initial Study

Criterion a iv) was scoped out because the Project site exhibits a generally flat topography and no landslides exist within or near the site. Based on the topography across the Project site, the potential for landsliding is considered negligible (LandMark 2018, p. 3). Thus, no impact is identified for this issue area and it will not be discussed in the EIR.

C. Methodology

Potential impacts to existing conditions were evaluated based on potential to be affected by construction, operation and maintenance activities, and decommissioning of the Project. Construction, operation, and maintenance activities were identified based on information provided by the Phased CUP Scenario (Drew Solar 2018). Impacts to geology and soil resources were formulated based on the findings of the *Preliminary Geotechnical and GeoHazards Report: Drew Solar Site NWC Pulliam Road and Hwy 98, Calexico, California*, prepared by LandMark Consultants, Inc. (LandMark 2018). The Preliminary Geotechnical and GeoHazards Report is provided as **Appendix E** on the attached CD of Technical Appendices to this EIR.

D. Project Impacts and Mitigation Measures

Alquist-Priolo Earthquake Fault Rupture

Impact 4.6.1 An unnamed fault mapped as an Alquist-Priolo Earthquake Fault Zone extends into CUP #17-0035. Surface rupture is considered low to moderate. This is considered a **potentially significant impact**.

CUP#17-0035 and CUP#18-0001

The 2017 Alquist-Priolo Earthquake Fault Zone maps depicts an unnamed fault extending in the southwestern portion of the Project site, specifically at CUP#17-0035 and slightly into CUP#18-0001 (**see Figure 4.6-2**). Geologic mapping of the Imperial Valley by the United States Geological Survey (USGS) following magnitude 7.2 Mw El Mayor-Cucapah Earthquake also indicates movement along several known and unknown faults west of the Project site. Surface rupture on these faults is possible from future seismic events in the area (LandMark 2018, p. 5).

Construction

According to the Preliminary Geotechnical and Geohazards Report prepared for the proposed Project, the potential for surface rupture at CUP#17-0035 and CUP#18-0001 is considered to be low to moderate (LandMark 2018, p. 6). During construction, Project components could be damaged if a surface rupture were to occur. This is considered a **potentially significant impact** during Project construction for both the Full Build-out Scenario and the Phased Build-out Scenario.

Operations

CUP#17-0035 is proposed to be developed with solar panels and supporting infrastructure as well energy storage as a component of solar on CUP#18-0001. O&M structures may also be developed on CUP#17-0035. The O&M structures would be occupied by staff during operations which could put staff safety at risk if a rupture were to occur. The energy storage components would be housed in a warehouse type building or alternatively in smaller modular structures such as cargo shipping containers (refer to Figure 2.0-12 and Figure 2.0-13 in Chapter 2.0, Project Description). This is considered a **potentially significant impact** during Project operation for both the Full Build-out Scenario and the Phased Build-out Scenario**.**

Decommissioning/Reclamation

During decommissioning, all solar panels, supporting infrastructure and energy storage components would be removed from CUP#17-0035 and CUP#18-0001. Following decommissioning/reclamation, no structures for human occupancy would remain. Therefore, **no impact** would occur with regard to surface rupture following decommissioning and reclamation.

Mitigation Measures

MM 4.6.1 A Fault Hazard Study including fault trenching shall be prepared for CUP#17-0035 and CUP#18-0001 to address any issues associated with the presence of an Alquist-Priolo Earthquake Fault Zone.

Timing/Implementation: *As a Condition of Approval/ Prior to approval of final building plans*

Enforcement/Monitoring: *Imperial County Department of Planning and Development Services, Division of Building & Safety*

Significance After Mitigation

Implementation of mitigation measure MM 4.6.1 would require that a Fault Hazard Study be prepared for CUP#17-0035 and CUP#18-0001 to assess the potential for fault rupture and assist with determining the location for an O&M building and suitability for energy storage components. Specifications for proper building practices should also be identified and followed to ensure any localized geological event would not damage or cause failure of the O&M building or structures housing energy storage components. Following implementation of mitigation measure MM 4.6.1 impacts associated with damage from a fault rupture on structures for human occupancy would be reduced to **less than significant** for both the Full Build-out Scenario and the Phased Build-out Scenario.

Strong Seismic Ground Shaking

Impact 4.6.2 The Project site is located in a seismically active region and would be subject to strong seismic ground shaking in the event of an earthquake. This is considered a **potentially significant impact**.

FULL BUILD-OUT SCENARIO/PHASED BUILD-OUT SCENARIO

Construction

As discussed above, the Project site is located in the seismically active Imperial Valley in Southern California and could experience moderate to strong ground motion during earthquakes in the region. Imperial County is classified as Seismic Zone 4 by the Uniform Building Code (UBC 1997) (Sections 1626 through 1635). Developments within in Seismic Zone 4 (highest risk on a scale of 0 to 4) are required to incorporate the most stringent earthquake resistant measures. The amount of ground shaking in an area during an earthquake depends on several factors: 1) proximity of the area to the fault; 2) the depth of

focus; 3) the location of the epicenter; and 4) the size (magnitude) of the earthquake. Soil type also plays a role in the intensity of shaking. Bedrock or other dense or consolidated materials are less prone to intense ground shaking than alluvial soils.

The solar field site parcels are primarily underlain by lacustrine deposits which consist of interbedded lenticular and tabular silt, sand and clay. Thus, the Project site is prone to strong groundshaking during earthquakes along the Superstition Hills, Imperial, Cerro Prieto and Laguna Salada faults (**Figure 4.6-1**) (Land Mark 2017, p. 5). The proposed O&M building(s), PV panels, substations, etc. could be damaged by strong seismic shaking. Therefore, impacts associated with strong seismic shaking during construction are considered **potentially significant** for both the Full Build-out and Phased Build-out scenarios.

The Project must comply with the engineering and design standards contained in the 2016 CBC. Project compliance with 2016 CBC requirements would be subject to review and approval by the Imperial County Planning and Development Services Department and Public Works Department prior to issuing building permits. The proposed Project would be designed in accordance with the engineering and design standards contained in the 2016 CBC, the Seismic Regulations and the County of Imperial building requirements.

Operation

Potential issues related to seismic ground shaking would be addressed during Project design and construction in compliance with the mandatory requirements of the 2016 CBC. Therefore, a **less than significant** impact related to seismic ground shaking would occur during Project operation for both the Full Build-out and Phased Build-out Scenarios.

Decommissioning/Reclamation

Decommissioning would result in the dismantling and removal of infrastructure constructed as part of the Project. No structures would remain to be potentially disturbed during an earthquake event. Thus, following reclamation, **no impacts** resulting from exposure to ground shaking would occur for both the Full Build-out and Phased Build-out Scenarios.

Mitigation Measures

MM 4.6.2 Prior to approval of final building plans, a registered civil engineer or certified engineering geologist, having at least five years of experience in the field of seismic hazard evaluation and mitigation, shall prepare a Final Geotechnical and GeoHazards Report containing site-specific evaluations of the ground shaking hazards affecting the Project, identify the portions of the Project site containing ground shaking hazards, and identify appropriate Project design measures pursuant to the established and proven methodologies (e.g. Special Publication 117A). The Report shall also include site-specific evaluations of potential for liquefaction, expansive soils and corrosive soils for all solar field site parcels, energy storage components and Gen-Tie foundations. The Report shall identify appropriate Project design measures pursuant to the established and proven methodologies set forth in the 2016 CBC. All recommended Project design measures as set forth in the Final Geotechnical and GeoHazards Report shall be incorporated into and reflected on the final design and building plans for each CUP. All recommended Project design measures as set forth in the Final Geotechnical and GeoHazards Report shall be incorporated into and reflected on the final design and building plans. The Final Geotechnical and GeoHazards Report and Project plans shall be submitted for review and approval by the Imperial County Planning and Development Services Department, Division of Building & Safety prior to approval of the final building plans.

Timing/Implementation: *Prior to approval of final building plans/As part of Project design.*

Enforcement/Monitoring: *Imperial County Department of Planning and Development Services, Division of Building & Safety.*

Significance After Mitigation

Pursuant to the Seismic Hazards Mapping Act, Seismic Regulations and Special Publication 117A, the minimum level of mitigation for a project should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but not to a level of no ground failure at all. Implementation of mitigation measure MM 4.6.2 reduces the risk of ground failure to this level for both habitable O&M building(s) as well as the other non-habitable project facilities (e.g., solar panels). Implementation of mitigation measure MM 4.6.2 avoids exposing people or structures to potential substantial adverse effects due to ground failure resulting from strong seismic ground shaking through adherence to the appropriate codes and standards of care and therefore mitigates impacts to a **less than significant** level for both the Full Build-out Scenario and the Phased Build-out Scenario.

Liquefaction

Impact 4.6.3 Soils throughout the solar field site parcels have characteristics prone to liquefaction. Evidence of liquefaction was also noted in the area of the Project site. Therefore, a **potentially significant** impact could occur with regard to liquefaction.

FULL BUILDOUT SCENARIO/PHASED BUILD-OUT SCENARIO

Liquefaction occurs when granular soil below the water table is subjected to vibratory motions, such as produced by earthquakes. With strong ground-shaking, an increase in pore water pressure develops as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

1) The soil must be saturated (relatively shallow groundwater) Note: groundwater in the area of the Project site is typically encountered at a depth of 5 to 10 feet (LandMark 2018, p. 3);
2) The soil must be loosely packed (low to medium relative density);
3) The soil must be relatively cohesionless (not clayey); and
4) Groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions may exist to some degree at this site (LandMark 2018, p. 4). Furthermore, the following the April 4, 2010 magnitude 7.2Mw El Mayor-Cucapah Earthquake, liquefaction settlement and ground fissures were noted along the Westside Main Canal in the area of the Project site. In addition, several liquefaction related failures to the embankment of the Westside Main Canal west of the Project site have been noted (LandMark 2018, p. 4). Distance from the canal to the Project site is as close as approximately 150 feet to the south and approximately 1,100 feet to the west. Therefore, potential for liquefaction at the Project site is considered **potentially significant**.

Construction

According to the Preliminary Geotechnical and GeoHazards Report prepared for the proposed Project, liquefaction is a potential design consideration because of possible saturated sandy substrata underlying the Project site (LandMark 2018, p. 4). Therefore, a **potentially significant** impact related to liquefaction settlement and ground fissures could occur during the Project's construction of both the Full Build-out and Phased Build-out Scenarios.

Operation

As noted above, the Project proposes to install solar facilities throughout the Project site. These areas are vulnerable to liquefaction settlement and ground fissures during a strong seismic event. Any such facilities would likely be damaged during a strong seismic event without proper soil and foundation engineering. Potential issues related to liquefaction settlement and ground fissures would be addressed during Project design and construction, in compliance with the recommendations of the Final Geotechnical and GeoHazards Report. With proper engineering and construction, potential for impacts resulting from liquefaction settlement and ground fissures would be reduced to **less than significant** levels during Project operation for both the Full Build-out and Phased Build-out Scenarios.

Decommissioning/Reclamation

Decommissioning would result in the dismantling and removal of solar facilities and infrastructure constructed as part of the Project. No structures would remain to be potentially disturbed by exposure to liquefiable soils. Thus, following reclamation, **no impacts** resulting from exposure to liquefiable soils would occur for both the Full Build-out and Phased Build-out Scenarios.

Mitigation Measures

Implement mitigation measure MM 4.6.2.

Significance After Mitigation

Implementation of mitigation measure MM 4.6.2 would reduce exposure of Project structures to potential damage caused by soil liquefaction, ground failure, or ground fissures through adherence to design recommendations identified in the Final Geotechnical and GeoHazards Report. Thus, impacts associated with soil liquefaction would be **less than significant** after mitigation for both the Full Build-out and Phased Build-out Scenarios.

Soil Erosion

Impact 4.6.4 Construction, maintenance, and decommissioning activities would result in earth moving and potential for erosion and loss of top soil. The Project is subject to mandatory compliance with several regulatory requirements established to address erosion. Therefore, soil erosion impacts are considered **less than significant**.

FULL BUILD-OUT SCENARIO/PHASED BUILD-OUT SCENARIO

Construction

Soil erosion could result during construction of the proposed Project in association with grading and earth moving activities. The solar field site parcels and individual CUPs consist of agricultural land void of structures with the primary exception of IID irrigation facilities. A majority of the land is actively being farmed. It may be necessary to remove, relocate and/or fill in portions of the existing drainage ditches or delivery canals to accommodate the final panel layout for the Project. The final engineering design for these facilities will be reviewed by IID and the County to be sure that the purpose for the facilities (if still needed) will be met. There are no large structures or other facilities that would need to be removed.

At full build-out, most of the proposed solar field site parcels would be disturbed by construction. To the extent feasible, site preparation would be planned and designed to minimize the amount of earth movement. Compaction of the soil to support building and traffic loads as well as the PV module supports may be required and is dependent on final engineering design. During construction, erosion would be controlled in accordance with County standards including preparation, review and approval of a grading plan by the County Engineer; compliance with Rule 800 and compliance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (discussed further in Section 4.11,

Hydrology and Water Quality). Phased CUP Scenario-Proposed Measures (refer to Table 2.0-6 in Chapter 2.0, Project Description) would also include stabilizing all disturbed areas with water, tarps, dust suppressants, or soil binders, and capping construction vehicle speeds at a maximum of 15 miles per hour (mph) on any unpaved surface at the Project site. Therefore, potential soil erosion impacts would be reduced to **less than significant** levels with implementation of state and local construction requirements as well as Phased CUP Scenario-Proposed Measures related to dust and erosion control for both the Full Build-out Scenario and Phased Build-out Scenario.

Operation

The generally flat topography of the solar field site parcels and the low average annual precipitation for the area would reduce the likelihood of substantial erosion and loss of topsoil. Daily operations and routine maintenance (such as occasional PV panel washing) are not anticipated to increase erosion. Therefore, potential soil erosion impacts occurring during Project operations are considered **less than significant** for both the Full Build-out Scenario and Phased Build-out Scenario.

Decommissioning/Reclamation

Decommissioning activities would require earth-moving activities that could contribute to soil erosion. Earth-moving activities occurring during decommissioning would be typical of most construction sites and temporary in nature. During decommissioning, soil erosion and would be controlled in accordance with NPDES CGP(s) and Project-specific SWPPP(s). Further, it is anticipated that regulatory compliance and Best Available Control Technologies (BACTs) at the time of decommissioning would be similar to or more stringent than those currently required. Therefore, a **less than significant impact** regarding soil erosion and sedimentation would occur during decommissioning of both the Full Build-out Scenario and Phased Build-out Scenario. Following reclamation to the Project site's original condition, no soil erosion would occur.

Mitigation Measures

None required beyond compliance with state and local construction requirements as well as Phased CUP Scenario-Proposed Measures related to dust and erosion control.

Significance After Mitigation

Compliance with state and local construction requirements as well as Phased CUP Scenario-Proposed Measures related to dust and erosion control would reduce erosion to less than significant levels for both the Full Build-out Scenario and Phased Build-out Scenario.

Expansive Soils

Impact 4.6.5 Near surface soils within the Project site consist of silty clay and clay having a moderate to high expansion potential. Therefore, expansive soils impacts are considered **less than significant**.

FULL BUILD-OUT SCENARIO/PHASED BUILD-OUT SCENARIO

Construction

Soils on the Project site predominately consist of clays with imbedded silts and sandy silts. Structures (building/inverter foundations, concrete flatwork, O&M building(s), energy storage components, etc.) proposed on the solar field site parcels could be subject to some potential swelling forces and reduction in soil strength resulting from saturation of the soil. This is considered a **potentially significant impact** during construction for both the Full Build-out Scenario and the Phased Build-out Scenario.

In contrast, expansive soils are not anticipated to have any effect on Gen-Tie structures as the foundations would consist of deep drilled piers reinforced with rebar similar to those constructed as part of the neighboring Centinela Solar Project (LandMark 2014a, p. 4). Therefore, the Gen-Tie structures are not expected to be subject to direct impacts resulting from the presence of expansive soils, and **no impact** would occur during construction of the Gen-Tie for both the Full Build-out Scenario and the Phased Build-out Scenario.

Operation

Potential issues related to expansive soils would be addressed during Project design and construction in compliance with the requirements of the 2016 CBC and recommendations of the Final Geotechnical and GeoHazards Report. Therefore, a **less than significant** impact related to expansive soils is anticipated to occur during the operation of both the Full Build-out Scenario and Phased Build-out Scenario.

Decommissioning/Reclamation

Decommissioning would result in the dismantling and removal of all structures constructed as part of the Project. The solar facilities on each CUP would be removed and no longer be subject to potential swelling forces and reduction in soil strength resulting from saturation of the soil. Thus, following reclamation, **no impact** resulting from exposure to expansive soils would occur for both the Full Build-out Scenario and Phased Build-out Scenario.

Mitigation Measure

Implement mitigation measure MM 4.6.2.

Significance After Mitigation

Implementation of mitigation measure MM 4.6.2 would fulfill the recommendations of the Final Geotechnical and GeoHazards Report and 2016 CBC regarding expansive soils. Thus, impacts associated with expansive soils within the solar field site parcels, energy storage components and Gen-Tie foundation locations would be reduced to **less than significant** for both the Full Build-out Scenario and the Phased Build-out Scenario.

Soil Capability to Support On-site Wastewater Treatment System

Impact 4.6.6 The Project would generate wastewater from sanitary facilities such as sinks and toilets in the O&M building(s). The Project proposes to construct an on-site sanitary waste septic system. Project site soils are capable of supporting an on-site wastewater treatment system. Therefore, impacts with regard to supporting an on-site wastewater treatment system are considered **less than significant**.

ALL CUPs WHERE AN O&M BUILDING IS PROPOSED

Construction

The solar field site parcels and surrounding areas are agricultural with industrial solar developments. Rural residents in the area are not served by municipal wastewater. During construction, waste streams would be generated by on-site construction workers. Temporary septic systems or holding tanks and portable toilets would be used during construction of the Project to provide needed sanitary facilities. These facilities may be located on CUPs where O&M buildings are proposed as needed based upon the location of construction activities. Portable facilities would be self-contained and would not release wastewater or require soils capable of supporting septic systems. Therefore, **no impact** would occur during the construction of the Project in regard to soil capability to support septic systems for both the Full Build-out Scenario and the Phased Build-out Scenario.

Operation

The solar field site parcels and surrounding areas are agricultural and not served by municipal wastewater. During operations and maintenance activities, the Project proposes to collect wastewater from sinks and toilets located in the O&M building(s) and send the waste stream to an on-site sanitary waste septic system and leach field to be installed in compliance with standards established by Imperial County Environmental Health Services (EHS). Alternatively, the Project may be designed to direct these waste streams to an underground tank for storage until it is pumped out, on a periodic or as-needed basis, and transported for disposal at a licensed waste treatment facility.

Use of on-site wastewater treatment systems are governed by the State Water Resources Control Board's On-Site Wastewater Treatment System Policy, Water Quality Control Policy for Siting, Design, Operation and Maintenance of On-site Wastewater Treatment Systems ("OWTS Policy"). The OWTS Policy establishes a statewide, risk-based, tiered approach for the regulation and management of on-site wastewater treatment systems and sets the level of performance and protection required from on-site wastewater treatment systems. The OWTS Policy only authorizes subsurface disposal of wastewater and establishes minimum requirements for the permitting, monitoring and operation of on-site wastewater treatment systems for protecting beneficial uses of Waters of the State and preventing conditions of pollution and nuisance.

The OWTS Policy requires that an on-site wastewater treatment system be supported by soils that provide minimum separation from groundwater (5-feet for the Project); percolation tests demonstrate the effluent dispersal area shall not be faster than one minute per inch or slower than one hundred twenty minutes per inch; minimum horizontal setbacks be maintained from specified land uses (5-feet from property lines and structures, 100-feet from water and monitoring wells, and other specified setbacks for other water sources and public water systems); and that the natural ground slope shall not exceed 25%, among other things. If the wastewater from the O&M buildings is treated by a pressure distribution system, it will also be required to meet the standards established by the Imperial County Division of Environmental Health in Pressure Distribution (2012): Standards and Guidance for Performance, Application, Design and Operation and Maintenance ("Pressure Distribution Guidelines").

According to the Preliminary Geotechnical and GeoHazards Report prepared for the proposed Project, near-surface soils generally consist of silty clays and clays having a low infiltration rate. The near-surface soils are considered good in supporting an on-site septic systems and leach fields for wastewater disposal (LandMark 2018, p. 3). Groundwater in the Project vicinity is typically encountered at a depth of 5 to 10 feet below ground surface (LandMark 2018, p. 3).

Site-specific studies will be required during the final design phase and prior to the issuance of building permits for each O&M building proposing the use of an on-site wastewater treatment system to determine that County Environmental Health Standards are met with regard to soil percolation rates and separation of leach fields from groundwater (LandMark 2018, p. 3).

Site-specific studies will be required during the final design phase and prior to the issuance of building permits for each O&M building proposing the use of an on-site wastewater treatment system to determine whether compliance with OWTS Policy can be achieved with regard to soil percolation rates, vertical separation from groundwater, and other siting requirements (LandMark 2014a, p. 3). In addition, any on-site wastewater treatment system must be designed and installed in compliance with all applicable provisions of the Imperial County Code, including the Plumbing Code and ordinances governing Regulation of Sewage Disposal Systems and Sanitation Permits, as set forth in Title 9, Division 10, Chapters 4, 12 and 13, and the Imperial County Uniform Policy and Method for Soils Evaluation, Testing and Reporting (Relative to Applications for Private Sewage System Permits). Following compliance with the findings of

the site-specific study and local and state requirements, impacts with regard to supporting an on-site wastewater treatment system during Project operation are considered **less than significant** on all CUPs where an O&M Building is proposed for both the Full Build-out Scenario and the Phased Build-out Scenario.

Decommissioning/Reclamation

Temporary septic systems or holding tanks and portable toilets may be used at O&M building(s) during decommissioning to provide needed sanitary facilities for on-site workers. However, temporary and portable restroom facilities would be self-contained and would not release wastewater or require soils capable of supporting on-site wastewater treatment systems. Therefore, **no impact** would occur during decommissioning of the O&M buildings in regard to soil capability to support septic systems. Likewise, no impacts would occur following reclamation for both the Full Build-out Scenario and the Phased Build-out Scenario.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.

Soil Corrosivity

Impact 4.6.7 Soils within the Project Area are known to be corrosive. Steel and concrete structures could be damaged through contact with corrosive soils. This is considered a **potentially significant impact**.

FULL BUILD-OUT SCENARIO/PHASED BUILD-OUT SCENARIO

Construction

All soils within the ancient lake bed in which the Imperial Valley is formed are moderately to highly corrosive to steel and concrete. These soils present a potential corrosion threat to substations/switchgear where bare steel or concrete is in contact with soil. Corrosive soils are present throughout the Project Area. Damage to proposed concrete features of the Project as a result of soil chemistry during construction is considered a **potentially significant** impact under both the Full Build-out Scenario and Phased Build-out Scenario.

Operation

Potential issues related to corrosive soils would be addressed during Project design and construction through use of materials and coatings to remediate and protect concrete and steel coming in contact with site soils. Therefore, a **less than significant** impact related to corrosive soils is anticipated to occur during operation of the Project under both the Full Build-out Scenario and Phased Build-out Scenario.

Decommissioning/Reclamation

As part of decommissioning, all solar structures and infrastructure would be removed and the solar field site parcels would be reclaimed to pre-Project soil conditions. The Gen-Tie structure locations would be reclaimed to their pre-Project condition. Therefore, **no impacts** associated with corrosive soils are anticipated to occur during decommissioning or following reclamation under both the Full Build-out Scenario and Phased Build-out Scenario.

Mitigation Measures

MM 4.6.7a Concrete mixed with higher cement contents (6 sacks Type V Portland Cement) and low water-cement ratios (0.45 w/c ratio) shall be used for all concrete structures proposed as part of the Project subject to approval by the County Engineer and Planning Director.

Timing/Implementation: *During Project construction.*
Enforcement/Monitoring: *Imperial County Engineer/Imperial County Department of Planning and Development Service*s, *Division of Building & Safety.*

MM 4.6.7b Zinc coatings (galvanizing) or increased structural sections shall be used to protect all steel posts and to compensate for metal loss due to corrosion subject to approval by the County Engineer and Planning Director.

Timing/Implementation: *During Project construction.*
Enforcement/Monitoring: *Imperial County Engineer/Imperial County Department of Planning and Development Service*s, *Division of Building & Safety.*

Significance After Mitigation

Implementation of mitigation measure MM 4.6.7a and MM 4.6.7b would ensure that concrete and steel structures coming in contact with corrosive soils are properly protected using Type V Portland Cement and zinc coatings. Upon implementation of these measures, impacts resulting from soil corrosivity throughout would be reduced to **less than significant** under both the Full Build-out Scenario and Phased Build-out Scenario.

Impacts to Paleontological Resources

Impact 4.6.8 The Project Site and surrounding areas are underlain by geologic units comprised of quaternary lake deposits of the ancient Lake Cahuilla. As such, the potential exists for fossils to be impacted during construction. Thus, impacts to paleontological resources are considered **potentially significant** for both the Full Build-out Scenario and the Phased CUP Scenario.

A Paleontological Assessment was not prepared for the Drew Solar Project. However, such an assessment was undertaken for the neighboring CSE Project to the east. Both the proposed Project and the CSE Project are located in the Imperial Valley portion of the Salton Trough physiographic province of Southern California. Likewise, both Projects and the surrounding Imperial Valley are directly underlain by geologic units comprised of quaternary lake deposits of the ancient Lake Cahuilla. Lakebed deposits of ancient Lake Cahuilla have yielded fossil remains from numerous localities in Imperial Valley. These include extensive freshwater shell beds, fish, seeds, pollen, diatoms, foraminifera, sponges, and wood. Lake Cahuilla deposits have also yielded vertebrate fossils, including teeth and bones of birds, horses, bighorn sheep, and reptiles. The oldest sedimentary rocks in the vicinity of the CSE Project included fossil-rich marine mudstones and siltstones of the Imperial Group that formed on the submerged marine portions of the ancestral Colorado River delta (Imperial County 2011, p. 3.13-3).

FULL BUILD-OUT/PHASED CUP SCENARIO

Construction

While the potential for fossil resources to be discovered during construction is unknown, the likelihood of discovering any such resources during grading or other shallow excavations is considered low given the

historic and on-going farming activities on the Project Site. However, the potential exists for the inadvertent discovery fossils during excavations and or drilling activities related to the construction of the Project's Gen-Tie poles. The Gen-Tie poles will be located at the south end of the Project site and extend south across Drew Road and State Route 98 into the existing Drew Switchyard. The location of the poles to support the two Gen-Tie lines are located outside of the agricultural fields (i.e. the proposed solar field parcels) and have not been subject to the same extensive agricultural disturbances. The alignment of the Gen-Tie poles will extend approximately 400 feet south of the southern limits of the net farmable area of the Project APE. The Gen-Tie transmission structures will require drilling to a maximum depth of 10 feet for pole foundations (Dudek 2018a, p. 35). At this depth, it is possible that fossils may be encountered. However, it is acknowledged that drilling operations for the Sempra-Intergen transmission line encountered fossil-bearing lake sediments from the surface to depths of at least 25 feet. Additional information from monitoring of the Sempra-Intergen transmission line suggests that the Quaternary alluvium in the central portion of the north-south Gen-Tie lines alignment through BLM land is only 8- to 10-feet thick. Drilling operations through the alluvium would likely encounter underlying fossil-bearing beds of the Lake Cahuilla deposits (Imperial County 2011, p. 3.13-3). Therefore, the potential to damage non-renewable fossil remains during construction is considered a **potentially significant impact** for both the Full Build-out Scenario and the Phased CUP Scenario.

Operation

During operations and maintenance of the Project, no additional impacts to nonrenewable fossil remains would be anticipated because the soil disturbance would have already occurred and been mitigated during construction. Therefore, impacts to nonrenewable fossil remains during operation of for both the Full Build-out Scenario and Phased CUP Scenario are considered **less than significant**.

Decommissioning/Reclamation

Decommissioning activities will consist of the removal of solar panels and related utility equipment. During Project decommissioning, no additional impacts to fossil remains would be anticipated because the area of ground disturbance will be the same as the locations of disturbance that occurred during construction. As such, no further disturbance of potential paleontological resources is expected to take place during decommissioning. Therefore, impacts related to fossil remains during decommissioning/reclamation of the Full Build-out Scenario and Phased CUP Scenario are considered **less than significant**.

Mitigation Measures

MM 4.6.8 Qualified Paleontological monitor(s) shall be hired to oversee excavations or drilling activities greater than 10 feet in depth. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Fossil specimens shall be curated by accessioning into an established, accredited museum repository with permanent retrievable paleontological storage. A report of findings with an appended itemized inventory of specimens shall be prepared. Submittal of the report and inventory to the Imperial County Planning and Development Services Department, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, shall signify completion of the program to mitigate impacts to paleontological resources.

Timing/Implementation: *During construction involving drilling or excavations to depths of 10 feet or more.*

Enforcement/Monitoring: *Paleontological Monitor and Imperial County Planning and Development Services Department.*

Significance After Mitigation

Implementation of mitigation measure MM 4.7.4 (identified in Section 4.7 Cultural Resources & Tribal Cultural Resources), would employ paleontological monitoring during excavations or drilling that would be at depths of 10 feet or more. The paleontologist would be empowered to determine the level of monitoring necessary; to halt or divert construction away from large specimens; and to curate fossil specimens. In addition, paleontological monitoring shall be required if decommissioning activities reach a certain depth. Implementation of mitigation measure MM 4.7.4 would reduce impacts to paleontological resources to **less than significant** for both the Full Build-out Scenario and Phased CUP Scenario.

4.6.4 CUMULATIVE SETTING, IMPACTS AND MITIGATION MEASURES

A. CUMULATIVE SETTING

The geographic scope for the cumulative geology and soils setting is the Imperial Valley portion of the Salton Trough physiographic province of Southern California. In general, geology and soils impacts are site-specific and limited to the boundaries of a proposed project rather than cumulative in nature. Project-specific impacts within the geographic scope are based on the soil characteristics and topography of each solar field site parcel. A list of proposed, approved and reasonably foreseeable projects in the region is identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. All of these are located in the geologic scope for geology and soils and paleontological resources.

B. CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Exposure to Geologic and Seismic Impacts

Impact 4.6.9 Implementation of the proposed Project, in combination with proposed, approved and reasonably foreseeable projects in the region, may result in cumulative exposure to geologic and seismic hazards. However, geologic and seismic hazards are analyzed and mitigated on a project-by-project basis. Therefore, cumulative exposure to geologic and seismic impacts is considered **less than cumulatively considerable**.

FULL BUILD-OUT SCENARIO/PHASED BUILD-OUT SCENARIO

Construction

Potential exposure to ground-shaking impacts occurring during construction would be addressed at the Project-specific level through compliance with the 2016 CBC as specified in MM 4.6.1. Potential soil liquefaction, expansive soils and corrosive soils occurring during construction would be addressed at the Project-specific level through preparation of a Final Geotechnical and Geohazards Report as specified in MM 4.6.2. Soil erosion would be controlled on-site with site-specific measures, a grading plan approved by the County Engineer; implementation of a Dust Control Plan for control of fugitive dust during construction as required by ICAPCD Regulation VIII, Fugitive Dust Rules (refer to Section 4.4, Air Quality); and compliance with the NPDES Construction General Permit and compliance with the required Storm Water Pollution Prevention Plan (SWPPP) (refer to Section 4.11, Hydrology and Water Quality). Soil corrosivity issues would be controlled through at the Project-level through implementation of mitigation measures MM 4.6.7a and MM 4.6.7b.

Geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. Therefore, geology and soils impacts occurring during construction are not expected to combine with similar impacts of the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Analysis and Assumptions Used. Therefore, Project construction would have a **less than cumulatively considerable contribution** to geology and soils impacts. Likewise, cumulative impacts associated with geology and soils occurring during Project construction would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased Build-out Scenario.

Operation

Alquist-Priolo Earthquake Fault/Strong Seismic Ground Shaking

As discussed above, the solar field site parcels are located in a seismically active area and are susceptible to seismic ground shaking in the event of an earthquake. Specifically, CUP#17-0035 and CUP#18-0001 are impacted by an Alquist-Priolo Earthquake Fault. Mitigation measure MM 4.6.1 requires that a Fault Hazard Study be prepared to address potential impacts from the fault. Mitigation measure MM 4.6.2 requires structures to be designed and built in conformance with the 2016 CBC. Both measures would be implemented prior to Project construction. As such ground shaking impacts are anticipated to be less than significant during the Project operations. Further, geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. As such, ground shaking impacts associated with Project operations are not expected to combine with the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to ground shaking impacts. Likewise, cumulative impacts associated with ground shaking during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario.

Liquefaction

As discussed above, the Project is located in an area potentially subject to liquefaction and ground failure. Mitigation measure MM 4.6.2, which requires that the Project be designed in accordance with a Final Geologic and GeoHazards Report, would be implemented prior to and during the construction phase of the proposed Project. As such liquefaction impacts would be reduced to less than significant levels during the Project operations as a result of soil and foundation engineering. Geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA which are addressed on a project-by-project basis through engineering or avoidance. As such, operation-phase liquefaction and ground failure related impacts are not expected to combine with the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to exposure to liquefiable soils. Likewise, cumulative impacts associated with liquefaction during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario.

Soil Erosion

Operation-phase soil erosion would be controlled on site with site-specific measures incorporated into a Project-specific SWPPP, implementation of a Dust Control Plan (Rule 801), and mandatory on-going BMP maintenance activities by each CUP owner, subject to monitoring by the County Further, soil erosion impacts are considered potentially significant short-term, site-specific impacts under CEQA. Therefore, operation-phase soil erosion impacts are not expected to combine with the proposed, approved, and

reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to exposure to soil erosion. Likewise, cumulative impacts associated with soil erosion during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario.

Expansive Soils

As discussed above, much of the near surface soils within the Project site consist of silty clays and clay having a moderate to high expansion potential. Mitigation measure MM 4.6.2, which requires that all CUPs be designed in accordance with a Final Geologic and GeoHazards Report, would be implemented prior to and during the construction phase of the proposed Project. As such ground shaking impacts are anticipated to be less than significant during the operation phase of the Project. Further, geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. As such, Project operation-phase expansive soils impacts are not expected to combine with the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to exposure to expansive soils. Likewise, cumulative impacts associated with expansive soils during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario.

Soil Capability to Support Septic Systems

As discussed above, development of all CUPs (CUP#17-0031 thru CUP#17-0035 and CUP#18-0001) where an O&M building is proposed requiring an on-site wastewater treatment system would be governed by the State Water Resources Control Board's OWTS Policy as well as all applicable provisions of the Imperial County Code. As compliance with these requirements is mandatory, impacts related to septic-capable soils are anticipated to be less than significant during the Project's operation phase. Further, geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. As such, operation-phase septic-capable soils impacts are not expected to combine with the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to soil capability with regard to supporting septic systems. Likewise, cumulative impacts associated with soil capability supporting septic systems during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario.

Corrosive Soils

As discussed above, all CUPs (CUP#17-0031 thru CUP#17-0035 and CUP#18-0001) are located in areas containing corrosive soils. Mitigation measures MM 4.6.7a and MM 4.6.7b, which requires that Type V Portland Cement and zinc coating be applied to steel, would be implemented prior to and during the construction phase of the proposed Project. As such corrosive soils impacts are anticipated to be less than significant during the operation phase of the Project. Further, geology and soils impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. As such, Project operation-phase corrosive soils impacts are not expected to combine with similar impacts of the proposed, approved, and reasonably foreseeable projects in the region identified in Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to soil corrosivity. Likewise, cumulative impacts associated with soil corrosivity during Project operations would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario**.**

Decommissioning/Reclamation

Decommissioning would entail removal of all structures from the proposed Project site (all solar site parcels/all CUPs#17-0031 thru CUP#17-0035 and CUP#18-0001), and implementation of a Reclamation Plan to return the solar site parcels their original condition. Decommissioning of the solar field site parcels would not contribute to ground shaking, liquefaction, expansive soils, septic-capable soils, or corrosive soils impacts. Soil erosion would occur during decommissioning activities as a result of earth-moving activities. Reestablishment of the solar field site parcels as active farmland could result in dust and soil disturbance similar to levels occurring under the existing active farmland conditions. Soil erosion impacts are primarily considered potentially significant short-term, site-specific impacts under CEQA. All decommissioning activities would be required to implement appropriate fugitive dust control measures consistent with applicable ICAPCD requirements in effect at the time of site closure (i.e. at the end of each CUP or 30 years, whichever is later). Similarly, all decommissioning activities would implement appropriate BMPs and other measures consistent with applicable County and RWQCB requirements in effect at the time of site closure. Therefore, the proposed Project would have a **less than cumulatively considerable contribution** to soil erosion during Project decommissioning activities. Likewise, cumulative impacts associated with soil erosion during Project decommissioning would be **less than cumulatively considerable** for both the Full Build-out Scenario and Phased CUP Scenario. Soil erosion impacts would be greatly reduced following reclamation.

Mitigation Measures

As discussed throughout this analysis, the proposed Project would be subject to a Fault Hazard Study (MM 4.6.1), all applicable building codes and standards including the 2016 CBC, as well as any further engineering requirements set forth in the Final Geotechnical and GeoHazards Report (MM 4.6.2). Likewise, the Project would be subject to further engineering with regard to liquefaction, expansive soils as well as soil corrosivity (MM 4.6.7a and MM 4.6.7b). Finally, the Project would be required to implement a Dust Control Plan, comply with the requirements of the SWRCB's General Construction Stormwater Permit (refer to Section 4.11, Hydrology and Water Quality), and prepare and implement a Project-specific SWPPP with BMPs incorporated to address potential soil erosion impacts (refer to Section 4.11, Hydrology and Water Quality). Therefore, following mitigation, cumulative geologic and seismic impacts would be reduced to **less than cumulatively considerable**.

Significance After Mitigation

Project-specific impacts are mitigated on a project-by-project basis. Upon compliance with mandatory state and local requirements (i.e. OWTS Policy, EHS Standards), and following implementation of mitigation measures MM 4.6.1, MM 4.6.2, MM 4.6.7a, and MM 4.6.7b at the Project-level, geology and soils impacts would be reduced to **less than cumulatively considerable** levels.

Cumulative Impacts to Paleontological Resources

Impact 4.6.10 Implementation of the proposed Project in combination with proposed, approved and reasonably foreseeable projects in the region identified in the cumulative setting, has the potential to result in impacts to paleontological resources including fossil remains and fossil bearing geological formations. However, such impacts are addressed on a project-by-project basis through the CEQA process. Therefore, impacts to paleontological resources are considered **less than cumulatively considerable** or both the Full Build-out Scenario and the Phased CUP Scenario.

Construction

There is a potential for paleontological resources beneath the solar field site parcels (including areas where Gen-Tie structures would be placed) and others in the geographic scope to be impacted during

construction. A cumulative impact would occur if either the Full Build-out Scenario or Phased CUP Scenario, in combination with cumulative projects, would damage or destroy paleontological resources. However, with the implementation of mitigation measures MM 4.7.4 (identified if Section 4.7 Cultural Resources & Tribal Cultural Resources), both the Full Build-out Scenario and Phased CUP Scenario would have a less than significant impact on paleontological resources on a project-level and a **less than cumulatively considerable contribution** to cumulative impacts to paleontological resources during Project construction. Likewise, other cumulative projects would be required to comply with existing regulations and undergo CEQA review to assure that any impacts are appropriately evaluated and, if necessary, mitigated. Therefore, through compliance with regulatory requirements, standard conditions of approval, and mitigation measures MM 4.7.4, both the Full Build-out Scenario and Phased CUP Scenario would have a **less than cumulatively considerable impact** on paleontological resources during Project construction.

Operation

During Project operation, no additional cumulative impacts to paleontological resources would be anticipated because the soil disturbance would have already occurred and been mitigated during construction. Therefore, a **less than cumulatively considerable contribution** to cumulative impacts to paleontological resources would occur during Project operations for both the Full Build-out Scenario and Phased CUP Scenario. Likewise, both the Full Build-out Scenario and the Phased CUP Scenario would result in **less than cumulatively considerable impacts** to paleontological resources during operation.

Decommissioning/Reclamation

Decommissioning activities will consist of the removal of solar panels and related infrastructure. Additional impacts to paleontological resources are not likely because the ground disturbance that will occur as a result of decommissioning will be in the same locations disturbed during construction. As such, no further disturbance of potential paleontological resources is expected to take place during decommissioning. Therefore, a **less than cumulatively considerable contribution** to cumulative impacts to paleontological resources would occur during decommissioning for both the Full Build-out Scenario and Phased CUP Scenario. Likewise, a **less than cumulatively considerable impact** related to paleontological resources would occur during decommissioning of both the Full Build-out Scenario and the Phased CUP Scenario.

Mitigation Measures

Implement mitigation measure MM 4.6.8.

Significance After Mitigation

Implementation of mitigation measure MM 4.6.8 requires that a qualified paleontologist be present to oversee excavations or drilling activities greater than 10 feet in depth. The qualified paleontologist would be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Therefore, implementation of mitigation measure MM 4.6.8 would reduce impacts to paleontological resources to **less than cumulative considerable** for both the Full Build-out Scenario and the Phased CUP Scenario.