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4.6 GEOLOGY AND SOILS

Would the project:		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Expose people or structures to 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 landslide, 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 risks to life or property?	☐	☐	☒	☐
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

4.6.1 Introduction

This section of the PEA describes the existing conditions and potential project-related impacts to geology and soils in the vicinity of the Proposed Project. The analysis concludes that less than significant impacts will occur to geology and soils. The Proposed Project's potential effects on this resource were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in the checklist above, and discussed in more detail in Section 4.6.6.

4.6.2 Regulatory Setting

4.6.2.1 Federal

Marine Corps Order P5090.2A, Environmental Compliance and Protection Manual

Marine Corps Order P5090.2A (Headquarters, Marine Corps 2013), provides instruction and guidance to Marine Corps installations to support compliance with applicable environmental regulations. Chapter 11, Natural Resources Management, includes the following requirements:

> The Marine Corps shall manage its lands and waters to control and prevent soil erosion, soil loss, and aquatic sedimentation and to preserve natural resources by conducting surveys and implementing soil conservation measures. Construction projects shall be designed to eliminate post construction soil erosion, and altered or degraded landscapes and associated habitats shall be restored and rehabilitated whenever practicable.

MCB Camp Pendleton Integrated Natural Resources Management Plan (INRMP)

In recognition of the fact that military lands contain significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The Sikes Act (16 U.S. Code Section 670-670f), as amended, requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agencies. The 1997 amendments to the Sikes Act require the Department of Defense to develop and implement an INRMP for each military installation with significant natural resources. INRMPs are prepared in cooperation with the USFWS and state fish and wildlife agencies, and reflect the mutual agreement of these parties concerning conservation, protection, and management of fish and wildlife resources on military lands.

The MCB Camp Pendleton INRMP (MCB Camp Pendleton 2012) is a planning document that guides the management and conservation of natural resources on MCB Camp Pendleton property. The INRMP was developed to ensure lands remain available and in good condition with "no net loss" to the military mission of MCB Camp Pendleton. The MCB Camp Pendleton INRMP was developed as an "umbrella" document that encompasses all elements of natural resources management applicable to MCB Camp Pendleton, including compliance with the terms and conditions of relevant USFWS Biological Opinions and ongoing stewardship activities. Geology and Soil resources on MCB Camp Pendleton are discussed in Chapter 3, Natural Resources of the INRMP and soil retention is included in MCB Camp Pendleton vegetation management plans.

4.6.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

California enacted the Alquist-Priolo Special Studies Zones Act in 1972. This legislation was renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994, and is now commonly known as the Alquist-Priolo Act. This legislation requires the establishment of "earthquake fault zones" along known active faults in California. Regulations on development within these zones are enforced to reduce the potential for damage resulting from fault displacement.

Seismic Hazards Mapping Act (SHMA)

The SHMA of 1990 addresses earthquake hazards other than fault rupture, including liquefaction and seismically induced landslides. Seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The SHMA states that "it is necessary to identify and map seismic hazard zones in order for cities and counties to adequately prepare the safety element of their general plans and to encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety."

4.6.2.3 Local

As provided in CPUC General Order 131-D, the CPUC preempts local discretionary authority over the location and construction of electrical utility facilities. The following discussion of relevant local land use plans and policies that pertain to geology and soils is provided below for informational purposes.

City of San Clemente

The City of San Clemente Centennial General Plan (City of San Clemente 2014) is the comprehensive planning document for the City of San Clemente. The General Plan establishes policies to manage new development, foster economic vitality, conserve natural resources, and to generally guide the City's growth in accordance with an established vision. The Centennial General Plan provides the framework by which the City of San Clemente would change and grow, identifying how physical and economic resources are to be managed and used into the future. The City of San Clemente Centennial General Plan discusses geology and soils in the Safety Element in the Geologic, Seismic and Soil Hazards section. The Plan notes there are no active faults in the City of San Clemente, but there are a few areas in the county that have landslide and liquefaction potential. The established goal is to, "Minimize risk to life, property, economic and social dislocation and disruption of vital services that could result from geologic and seismic hazards."

San Clemente's Municipal Code includes Title 17, Zoning. Title 17 was established to provide a uniform basis for regulating land use, buildings and structures; to promote the orderly growth and development of the various unique areas of the City of San Clemente; to establish minimum site development regulations and performance standards applicable to sites within the City of San Clemente, and to preserve the public health, safety and welfare. Section 17.56.050 Coastal Zone Overlay District specifies that City Planners can apply setbacks for development based on "the geology, soil, topography, existing vegetation, public views, adjacent development and other site characteristics" in this overlay district.

4.6.3 Existing Conditions

4.6.3.1 Topographic Setting

The Proposed Project traverses variable terrain ranging from relatively flat-lying valley floors to steep rocky slopes. Elevations range from a low of approximately 25 feet above mean sea level (amsl) near the western crossings of both San Onofre Creek and San Mateo Creek, to a high of approximately 565 feet amsl on a peak near the Basilone Road entry to MCB Camp Pendleton.

4.6.3.2 Geologic Setting

Regional Setting

The Proposed Project area is located within the southern Peninsular Ranges Physiographic Province, which is characterized by northwest-trending fault-bounded mountain ranges, broad intervening valleys, and low-lying coastal plains. The province has a long and active geologic history. In general, the Peninsular Ranges Physiographic Province is underlain by Jurassic metavolcanic and metasedimentary rocks and by Cretaceous igneous rocks of the southern California batholith (California Geologic Survey [CGS] 2007a, 2007b, 2007c).

The Proposed Project occurs on a block of igneous basement rock bounded by the Elsinore Fault Zone to the east and by the Newport-Inglewood-Rose Canyon fault zone to the west. The Proposed Project alignment is mapped as both igneous and sedimentary rock types overlying the igneous basement rock (CGS 2007a, 2007b, 2007c).

Proposed Project Geologic Setting

Geologic units that occur along the Proposed Project alignment are summarized in Table 4.6-1 and presented in Figure 4.6-1. The majority of the Proposed Project alignment occurs in geology consisting of sedimentary rocks, alluvial floodplains, and historical landslides.

Table 4.6-1. Geologic Units Along the Proposed Project Alignment

Symbol	Unit Name	Age	Description
Tm	Monterey Formation	Middle and Late Miocene	Siltstone and Sandstone
Tcs	Capistrano Formation	Early Pliocene and Late Miocene	Siltstone, Mudstone, and Shale
Tsm	San Mateo Formation	Early Pliocene and Late Miocene	Siltstone and Sandstone
Tsa	Santiago Formation	Middle Eocene	Sandstone and Conglomerate with Claystone and Siltstone lenses
Qya	Young Alluvial flood-plain deposits	Holocene and Late Pleistocene	Poorly consolidated, poorly sorted, permeable flood-plain deposits of sandy, silty, or clay-bearing alluvium. High liquefaction potential where groundwater is close to the surface
Qoa2-6	Old Alluvial flood-plain deposits, units 2-6	Late to Middle Pleistocene	Well consolidated, poorly sorted, permeable gravel, sand, silt, and clay-bearing alluvium
Qoa6	Old Alluvial flood-plain deposits, unit 6	Late to Middle Pleistocene	Well consolidated, poorly sorted, permeable gravel, sand, silt, and clay-bearing alluvium
Qoa7	Old Alluvial flood-plain deposits, unit 7	Late to Middle Pleistocene	Well consolidated, poorly sorted, permeable gravel, sand, silt, and clay-bearing alluvium
Qop1-2	Old Paralic deposits, units 1-2	Late to Middle Pleistocene	Poorly sorted, moderately permeable, beach, estuarine, and colluvial deposits composed of siltstone, sandstone, and conglomerate
Qop2-6	Old Paralic deposits, unit 2	Late to Middle Pleistocene	Poorly sorted, moderately permeable, beach, estuarine, and colluvial deposits composed of siltstone, sandstone, and conglomerate
Qop4	Old Paralic deposits, unit 4	Late to Middle Pleistocene	Poorly sorted, moderately permeable, beach, estuarine, and colluvial deposits composed of siltstone, sandstone, and conglomerate
Qop7	Old Paralic deposits, undivided, unit 7	Late to middle Pleistocene	Poorly sorted, moderately permeable, reddish-brown, interfingered strandline, beach, estuarine and colluvial deposits composed of siltstone, sandstone and conglomerate
Qvop10-13	Very Old Paralic deposits, units 10-13	Middle to Early Pleistocene	Poorly sorted, moderately permeable, beach, estuarine, and colluvial deposits composed of siltstone, sandstone, and conglomerate
Qls	Landslide deposits, undivided	Holocene and Pleistocene	Fragmented to coherent, unconsolidated to consolidated deposits

4.6.3.3 Faulting and Seismicity

The Alquist-Priolo Act required the California Division of Mines and Geology (now the CGS) to compile maps of the surface traces of all known active faults in the state. By definition, an active fault is one that is "sufficiently active and well-defined," with evidence of surface displacement within Holocene time (about the last 11,000 years). Active fault zones are the locations in the state with the most potential for surface fault rupture. A potentially active fault is one that has evidence of displacement within the Quaternary Period (last 1.6 million years). Potentially active faults are considered to also represent possible surface rupture hazards, although to a lesser degree than active faults. In contrast to active or potentially active faults, faults considered inactive have not moved in the last 1.6 million years.

The Proposed Project occurs within the area of two U.S. Geological Survey (USGS) 7.5 minute quadrangle maps: (1) San Clemente Quadrangle; and (2) San Onofre Bluffs Quadrangle. There are no known active faults or Alquist-Priolo Act earthquake fault zones in these quadrangles. The closest known active faults are those associated with the Newport-Inglewood-Rose Canyon and Elsinore Fault Zones.

The Dana Point section of the Newport-Inglewood-Rose Canyon Zone is located approximately 4 miles to the southwest of the Proposed Project area, and the Temecula section of the Elsinore Fault Zone is located approximately 20 miles to the northeast of the Proposed Project area. The Newport-Inglewood-Rose Canyon Fault Zone is a major structural element within the offshore border of the Peninsular Ranges, and the Elsinore Fault Zone is a major dextral strike-slip fault zone that is part of the overall San Andreas Fault System. Both fault zones accommodate up to 5 millimeters per year of boundary slip (USGS 2012).

The San Jacinto and San Andreas Fault zones occur further to the northeast, approximately 45 miles and 80 miles, respectively. These and the Elsinore Fault Zone are regional faults that have the potential to produce high-magnitude earthquakes in the Proposed Project region. Fault type and average slip rates for these faults are shown in Table 4.6-2, Key Active Faults within the Region.

The USGS estimates that the maximum peak horizontal ground acceleration in the Proposed Project area with a probability of occurrence of 10 percent in 50 years (recurrence interval of approximately 500 years) is between 0.3g and 0.4g where "g" is equal to the acceleration of gravity (USGS 2014).

Table 4.6-2. Key Active Faults within the Region

Fault Name	Type of Fault	Slip Rate (mm/yr)
Newport-Inglewood-Rose Canyon (Dana Point Section)	Dextral	1-5
Elsinore (Temecula Section)	Dextral	1-5
San Jacinto (San Jacinto Valley Section)	Dextral-Reverse	>5
San Andreas (San Bernardino Mountain Section)	Dextral	>5

Note: mm/yr = millimeters per year.
Source: USGS 2015.

Fault Rupture

There are no known active faults or recognized Alquist-Priolo Act Earthquake Fault Zones mapped within the Proposed Project footprint. However, the vast majority of the Proposed Project route occurs on federally owned land that has not been evaluated for state-level fault zone determinations. The one potentially active fault, the Cristianitos fault, has a visible fault rupture in the profile of the beach bluffs through which it passes. The displacement does not extend to the surface as it is constrained by approximately 45 feet of younger, overlying, unbroken Quaternary marine sediments and fluvial terrace deposits (San Diego Association of Geologists [SDAG] 2010). Therefore, there are no locations within the Proposed Project footprint area that are prone to surface fault rupture.

Strong Seismic Shaking

Strong ground motion or intensity of seismic shaking during an earthquake is dependent on the distance from the epicenter (and hypocenter) of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the area. All of southern California is considered to be a seismically active region. The San Diego County area is subject to strong seismic shaking from regional earthquakes that may take place on active faults that occur in the region. Active faults close enough to the Proposed Project route to cause strong seismic ground shaking are listed in Table 4.6-2.

4.6.3.4 Geologic Hazards

Subsidence

The primary causes of most subsidence are human activities, including groundwater or petroleum withdrawal from large alluvial basins with thick accumulations of unconsolidated sediments, and drainage of organic soils. Subsidence is not a significant risk for the Proposed Project because it does not occur over any large-scale alluvial basins subject to the withdrawal of fluid, nor does it occur over geologic rock types (e.g., limestone) that are subject to subterranean voids and collapse.

Landslides

Landslide potential can be high in steeply sloped areas. The principal natural factors contributing to landslides are topography, geology and precipitation. The Proposed Project area is comprised primarily of steeply angled sedimentary rock that is susceptible to landslides. The Proposed Project area crosses terrain with numerous previously identified landslides (Figure 4.6-1), and as a result has very high landslide potential (CGS 2007a, USGS 1982; Figure 4.6-2).

There are multiple pole structure locations currently existing within the Proposed Project area that are located on documented Quaternary landslides (Qls) (Figure 4.6-1). In areas of locally steep terrain, there is significant potential for rock falls and other mass wasting. Pole structure foundations at these locations have been designed to account for the possibility of erosion, slumps and slope failures and would reduce the risk of damage to constructed facilities from rockfalls or other mass wasting.

Liquefaction and Lateral Spreading

Liquefaction is a seismic phenomenon in which loose, saturated, cohesionless soils behave similar to a fluid when subjected to high-intensity ground shaking. An increase in pore pressure occurs as the soil attempts to compact in response to the shaking, resulting in less grain-to-grain soil contact and therefore, loss of strength. Liquefaction occurs when three general conditions exist: shallow groundwater (40 feet below ground surface or less); low-density, fine-grained sandy soils; and high-intensity ground motion. Effects of liquefaction on level ground can include sand boils, settlement, and weight-bearing capacity failures below structural foundations.

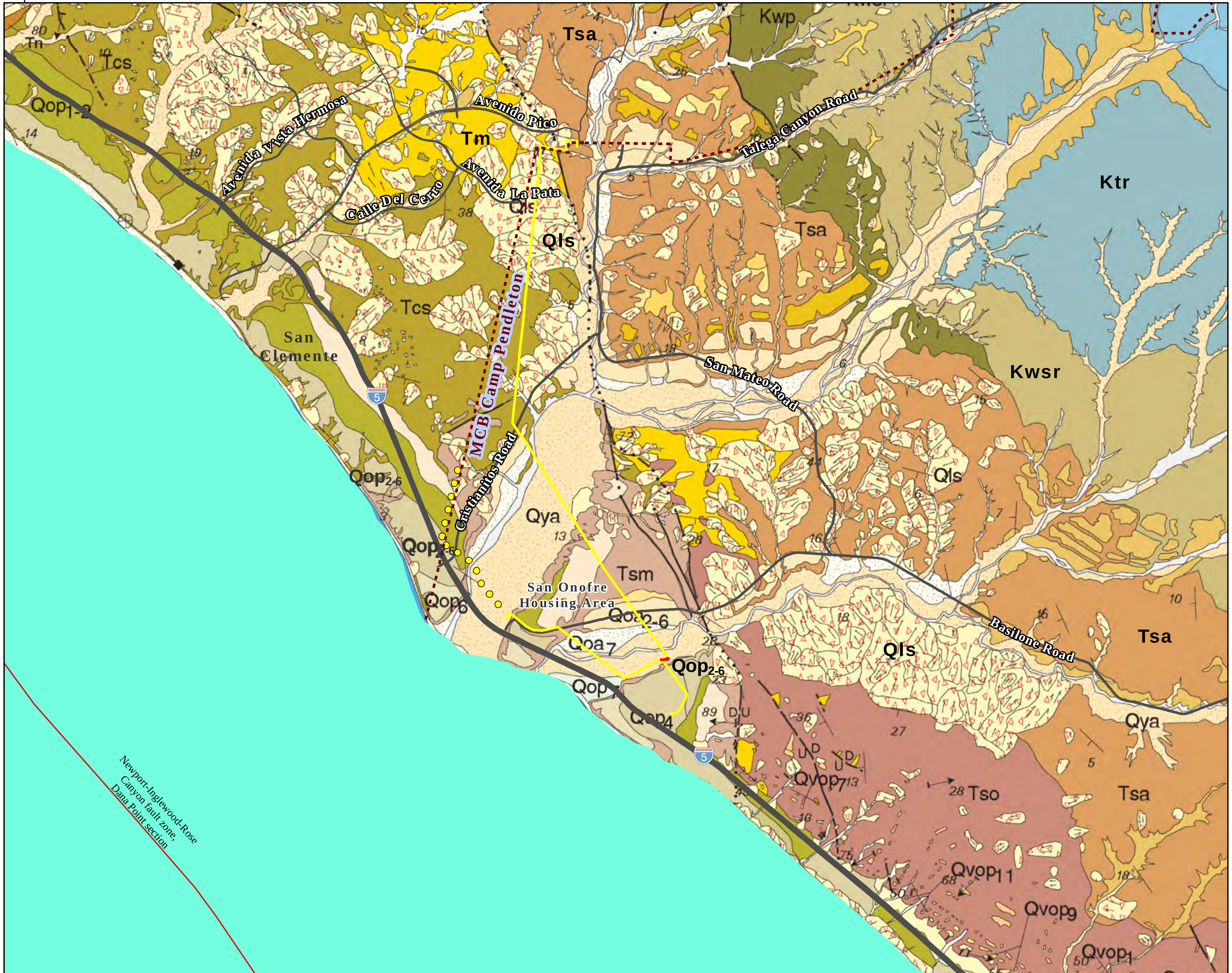
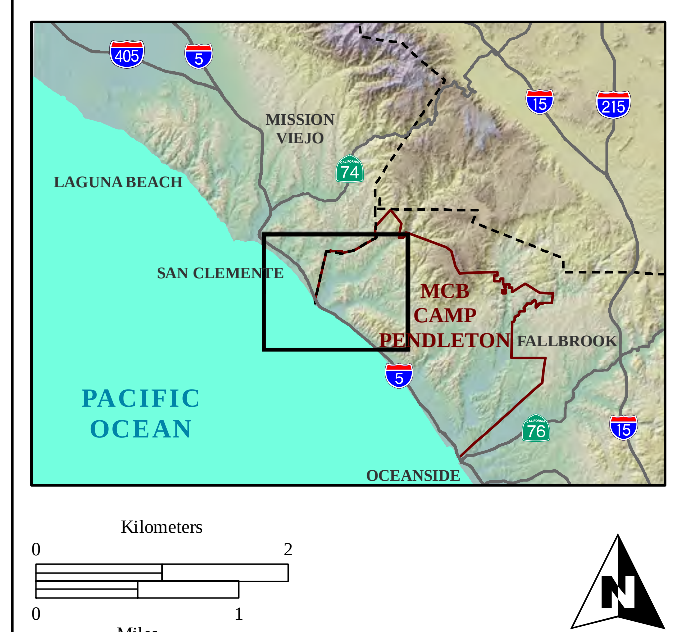


Figure 4.6-1
Geology and Faults near the Proposed Project Alignment

LEGEND

- MCB Camp Pendleton Boundary
- Proposed Project Reconductor Route
- Proposed Project Underground Route
- Proposed Project Power Line Removal Segment
- Active Fault Zone (Newport-Inglewood-Rose Canyon)
- Potentially Active Fault (Cristianitos Fault)

Note: Bold text indicates geologic units. Refer to Table 4.6-1 for a list and explanation of the geologic units.



Sources: CGS 2007a, ESRI 2015

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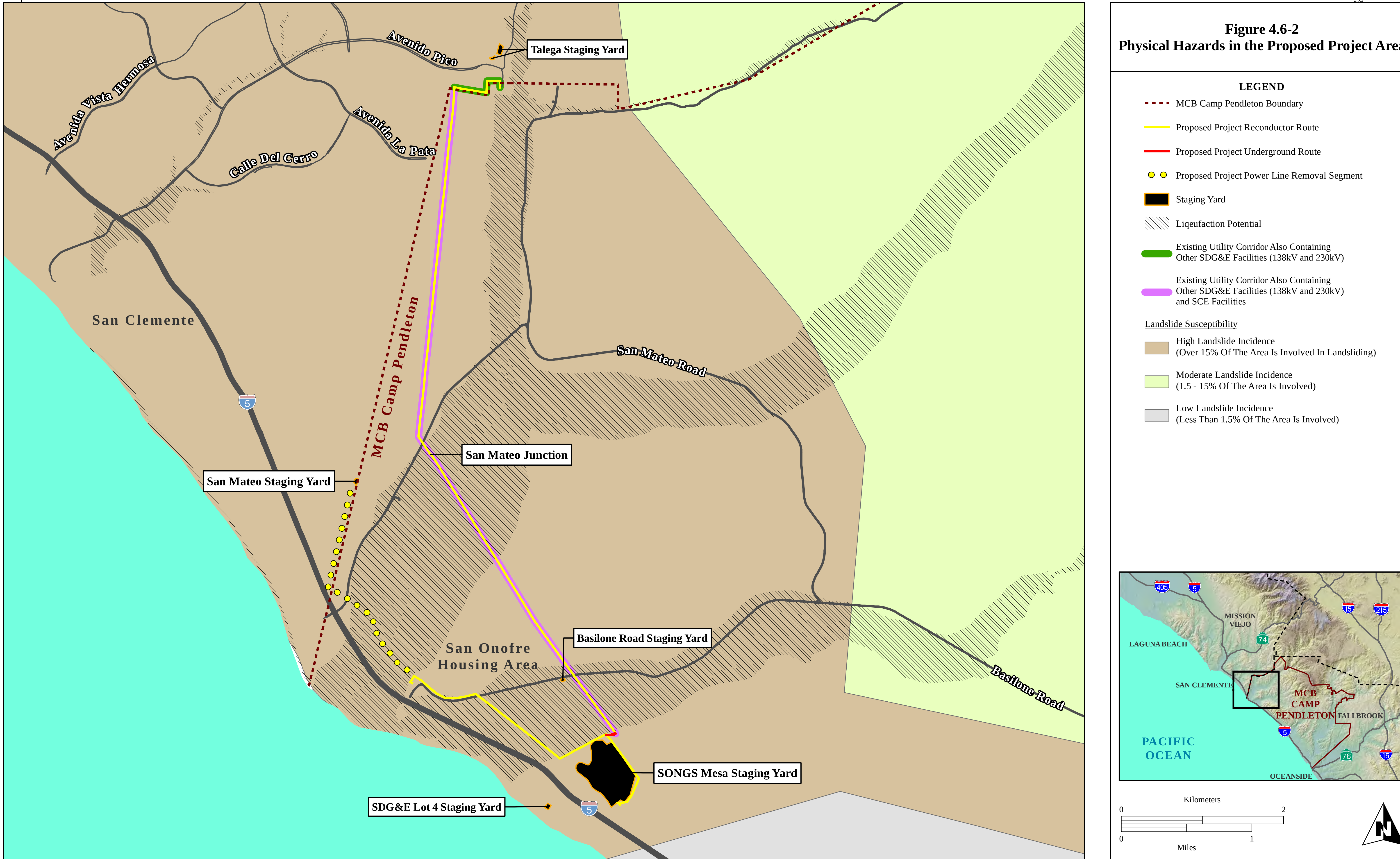
Figure 4.6-2
Physical Hazards in the Proposed Project Area



Source: USGS 1982, ESRI 2015, SanGIS/SANDAG 2015

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Portions of the Proposed Project are located within a San Diego County-designated liquefaction hazard zone (Geocon 2015; refer to Appendix 4.6-A). Approximately three existing pole structures are located within potential liquefiable areas; however, based on the elevation, boring information, and laboratory test results, these pole structures are not subject to liquefaction. Moreover, the liquefaction maps were created on a very large scale, and therefore the limits of the liquefaction hazard zones should be considered approximate. The geotechnical investigation identified approximately four existing pole structures that are prone to liquefaction. The effects of liquefaction could include the loss of bearing capacity within portions of the foundations and corresponding settlement; as well as sand boils. Changing from a wood to steel structure, or leaving the existing structures in place would not change the liquefaction potential at these locations (Geocon 2015).

There is also potential for lateral spreading in the Proposed Project area due to the predominantly sedimentary and surficial deposits, relative proximity to surface and groundwater, and the presence of topographic features susceptible to lateral spreading.

Soil Collapse

Soil collapse occurs when added moisture causes bonds between soil particles to weaken, which allows the soil structure to collapse and the ground surface to subside. Collapsible soils are generally low-density, fine-grained combinations of clay and sand left by mudflows that have dried, resulting in the formation of small air pockets in the subsurface. The addition of moisture increases the weight and reduces the strength of the soil, resulting in collapse or subsidence. Field observations identified multiple small (generally less than 3 feet in diameter) soil collapses, typically associated with the graded access roads and graded tower support areas within the Ql areas, both in and adjacent to the Proposed Project area. In former landslide areas where grading was conducted or is necessary, the potential exists for soil collapse.

4.6.4 Applicant Proposed Measures

The Proposed Project will not have significant impacts to geology and soils; therefore, no APMs are proposed.

4.6.5 Potential Impacts

The Proposed Project includes reconductoring, removal of existing wood pole structures, and installation of new steel pole structures for the existing TL 695 and TL 6971 power lines. The operation and maintenance activities required for the power line will not change from those currently required for the existing system; thus, no additional operation-related impacts related to geology and soils will occur. Furthermore, maintenance will decrease slightly due to the removal of wood pole structures and the installation of steel pole structures. Therefore, the impact analysis is focused on construction activities that are required to install the new conductor, remove the existing wood pole structures, install the new steel pole structures, and establish required access and temporary work areas, as described in Chapter 3.0, Proposed Project Description.

4.6.5.1 Methodology

Preparation of this section was primarily based on a geotechnical investigation prepared for the Proposed Project (Geocon 2015; contained in Appendix 4.6-A), and a review of other geologic literature and documents that cover the Proposed Project area. These included publications from the USGS, U.S. Department of Agriculture, CGS, and SDAG related to the Proposed Project. Maps and aerial photographs were also reviewed. The Proposed Project description was reviewed and potential for impacts related to geologic resources and hazards was evaluated based on the existing geologic and soil conditions as determined by the data review.

4.6.5.2 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. The potential significance of project-related impacts on geology and soils were evaluated for each of the criteria listed in the checklist, as discussed below.

ai) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving 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? *No Impact*

No portion of the Proposed Project is located in an Alquist-Priolo Act Earthquake Fault Zone. There are no active faults crossing the Proposed Project route; however, there is one potentially active fault, the Cristianitos Fault, which passes through the Proposed Project area. The closest known active fault is the Newport-Inglewood-Rose Canyon Zone located approximately 4 miles to the southwest of the Proposed Project area. No known active faults underlie the Proposed Project area; therefore, no impacts from fault rupture will occur.

aii) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking? *Less than Significant*

As noted above, no portion of the Proposed Project is located in an Alquist-Priolo Act Earthquake Fault Zone and no known active faults cross the Proposed Project alignment. Nonetheless, all of southern California is considered to be a seismically active region, and the San Diego County area is subject to strong seismic shaking from regional earthquakes that may take place on active faults that occur outside of the Proposed Project area. The incorporation of the engineering practices required by GO 95 and other industry standards will ensure that people and structures are not exposed to hazards associated with strong seismic ground shaking. Furthermore, because of the short construction period and the low likelihood of a moderate-to-large earthquake occurring during this time, the potential for construction personnel to experience strong seismic ground shaking is low. Therefore, the risk of exposure of people or structures to strong seismic ground shaking during the construction period is less than significant.

aiii) Would the project expose people or structures to potential substantial adverse effects, including seismic-related ground failure, including Liquefaction? *Less than Significant*

Shaking from a moderate to large regional earthquake can potentially result in liquefaction where groundwater is shallow (i.e., within 40 feet of ground surface) and soils consist of uncompacted, granular materials. Existing soil and geological conditions suggest that multiple pole structure locations could potentially be subject to liquefaction in the event of a high-intensity ground motion earthquake. However, removing existing wood pole structures, installing new steel pole structures, and/or leaving existing structures in place, would not change the liquefaction potential at these locations (Geocon 2015). Further, because of the short construction period and the low likelihood of a high-intensity ground motion earthquake occurring during this time, the risk of construction personnel and/or other nearby pole structures, lattice towers, or substations being exposed to earthquake-induced liquefaction is less than significant.

aiv) Would the project expose people or structures to potential substantial adverse effects, including landslides? *Less than Significant*

The Proposed Project area is susceptible to landslides due to the sedimentary rocks and erodible soils that make up the steeper slopes in the region. Rock falls, rock slides or other mass wasting all have the potential to occur at steeper slopes in the Proposed Project area. Approximately fifteen pole structures are currently located on documented Qls. Pole structure foundations at these locations have been designed to account for the possibility of erosion, slumps and slope failures and will minimize the risk of damage to constructed facilities from rockfalls or other mass wasting. The design of the Proposed Project will ensure that the risk of damage to Proposed Project structures will remain less than significant. As noted in the geotechnical investigation, modification of pole structures from wood to steel in this area is anticipated to have no impact on landslide stability. Therefore, the risk of exposure of people or structures to mass movements during construction will be less than significant.

b) Would the project result in substantial soil erosion or the loss of topsoil? *Less than Significant*

Construction will occur within areas that are currently devoted to electric utilities and a proposed new 500-foot long utility corridor, and will use existing access roads. Soil erosion or loss of topsoil could result from minor ground disturbing activities at pole structure sites. Also, installation of wire underground within a proposed new 500-foot long utility corridor may also have the potential to cause erosion and/or topsoil loss. However, soil erosion and topsoil loss will be controlled by implementing SDG&E's BMP Manual during construction of the Proposed Project. In addition, the Proposed Project will comply with the General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (Construction General Permit) which will include the preparation of a Stormwater Pollution Prevention Plan (see Section 4.9, Hydrology and Water Quality for additional information on the Construction General Permit). Surface disturbance will be minimized to the extent consistent with safe and efficient completion of the Proposed Project. Once temporary surface disturbances are complete, temporary construction impact areas will be stabilized. Therefore, impacts to soil erosion and loss of topsoil will be less than significant.

c) Would the project be located on a geologic unit that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or offsite landsliding, lateral spreading, subsidence, liquefaction, or collapse? *Less than Significant*

The Proposed Project area is located in an area that contains numerous documented Qls. Additionally, the presence of alluvium and young sedimentary soil types and relatively shallow water table (the Proposed Project area ranges from approximately 15 to 460 feet amsl) in many parts of the Proposed Project area suggests the potential exists for liquefaction, collapse, lateral spreading, or landslide related impacts.

Construction will create no subsidence impact because the Proposed Project does not involve the withdrawal of subsurface fluids that can cause subsidence, nor will construction impact sedimentary materials that are particularly prone to subsidence.

Due to the short construction period and the design of the pole structures, it is expected that the risk of initiating instability during construction will be less than significant. Therefore, the Proposed Project will have a less than significant impact relative to location on a geologic unit that is unstable.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risk to life or property? *<u>Less than Significant</u>*

Expansive soils are clayey soils that have a high plasticity index. Typical shallow reinforced concrete spread footing foundations, such as those for buildings and other foundations covering a considerable area of ground, can be affected by expansive soils if such soils are present close to the ground surface. The Proposed Project does not include any spread footing foundations that could be adversely affected by expansive soils. Considering that the Proposed Project does not include any foundations susceptible to damage from expansive soils, the limited expansive soils that are present do not create a substantial risk to life or property and impacts will be less than significant. Moreover, as noted in the geotechnical investigation, because the proposed structures would have relatively deep foundations, where the moisture content is relatively consistent and the confining pressures are greater, so that the potential for expansive soil to impact the project is considered to be low. Therefore, the Proposed Project will have a less than significant impact relative to location of expansive soil.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? *<u>No Impact</u>*

The Proposed Project will not involve the installation of a septic tank or alternative wastewater disposal system; therefore, no impact will occur.

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