3.5 Geology, Soils, and Paleontological Resources

This section describes the existing geologic, soils, and paleontological conditions within the Project site and vicinity, identifies regulatory requirements and industry standards associated with geologic and soils issues, and evaluates potential impacts and attenuation measures (as applicable) related to implementation of the Project. A geotechnical investigation was prepared for the Project site in 2016 (AGS, 2016) and an addendum to the geotechnical investigation was prepared in 2020 (AGS, 2020) by AGS. Relevant portions of the Project geotechnical investigations are summarized below along with other pertinent information, with the complete geotechnical report and addendum included in Appendices F1 and F2, respectively, of this EIR. Refer to *Appendix F1* for a map showing the location of test pits, which are locations on the Project site where geotechnical boring samples were taken during geotechnical investigations of the site. The potential impacts of the Project related to paleontological resources are evaluated in a report titled "Paleontological Resource Assessment for the Questhaven 64 Project" prepared by Brian F. Smith and Associates in February 2021, and appended to this EIR as *Appendix F4*. An NOP for the Project was released for public review on September 1, 2022 and an EIR Scoping Meeting was held on September 20, 2022. No comment letters regarding geology, soils, and paleontological resources were received.

3.5.1 Existing Conditions

3.5.1.1 Regional Geology/Topography

The Project site is situated within the western portion of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges province occupies the southwestern portion of California, extending southward from the Transverse Ranges and Los Angeles Basin to the southern tip of Baja California. In general, the province consists of young, steeply sloped, northwest trending mountain ranges underlain by Late Jurassic to Early Cretaceous-age metavolcanic and metasedimentary rock and Cretaceous-age igneous plutonic rock of the Peninsular Ranges Batholith. The westernmost portion of the province is predominantly underlain by younger marine and non-marine sedimentary rocks. The Peninsular Ranges 'dominant structural feature is northwest-southeast trending crustal blocks bounded by active faults of the San Andreas transform system.

3.5.1.2 Site Geology/Topography

Published regional geologic maps indicate that the Project site is underlain by metamorphic Santiago Peak Volcanics. However, based on information gathered during previous and recent subsurface explorations, AGS determined that the Project site is underlain by metamorphic Santiago Peak Volcanics, and a sedimentary unit likely associated with the Santiago Formation. These units are mantled by relatively thin veneers of surficial soils including undocumented artificial fill, colluvium and residual soil. The following section contains a summary of the soil and bedrock units encountered on the site. Description of these geologic units, as observed during the geotechnical investigation, are presented below. Test pit logs are presented in Appendix B of *Appendix F1.*

- Artificial Fill-undocumented (afu)
  Undocumented artificial fill soils were locally encountered in test pit TP-6 to a depth of eight (8) feet. As encountered these materials can generally be described as brown to gray, silty clay in a dry to moist and loose/soft to stiff condition. Based on a review of historical satellite imagery of the Project site, it appears that minor grading/mining operations were conducted during the mid-1990's in the lower, central and southeasterly portions of the site.

- Alluvium
  Alluvium was encountered in several test pits at the southeasterly boundary of the site. As encountered, these materials can generally be described as brown, silty to clayey sand with gravel in a moist and loose condition. The alluvium ranged from 3 to 9 feet in thickness. Alluvium is also anticipated to exist within the northwesterly drainage onsite. Subsurface exploration within this area was precluded to avoid testing in the drainage.

- Colluvium (Qcol)
  A relatively thin veneer colluvium mantles a majority of the Project site and was encountered the majority of the test pits. The colluvium can generally be described as grayish brown/brown to reddish brown, silty to sandy clay in a dry to moist and loose to stiff condition. The colluvium ranged from 3 to 8 feet in thickness.

- Santiago Formation (Map Symbol Tsa)
  Sedimentary bedrock materials which appear to be related to the Tertiary-aged Santiago Formation were encountered across the site below the surficial units and were observed to non-conformably overlie the Santiago Peak Volcanics. These materials ranged from 3 to 23 feet in thickness. As encountered, these materials can generally be described as gray to greenish gray to light brown, soft to hard, clayey sandstone and claystone.

- Santiago Peak Volcanics (Map Symbol Jsp)
  Santiago Peak Volcanics were encountered at depth in many of the test pits across the site and are anticipated to underlie the remaining portions of the site beneath the Santiago Formation. The Santiago Peak Volcanics are generally comprised of meta volcaniclastic and metasedimentary bedrock. As encountered, these materials are completely to slightly weathered and moderately hard to very hard, generally reducing to 8-inch minus rock fragments in the highly weathered zones and 12-inch minus in the moderately weathered zones. Some rock fragments greater than 12-inches were encountered. A residual soil horizon on the order of two (2) feet thick locally mantled the intact bedrock in several test pits. Jointing observed within the unit typically ranged from tight to blocky and widened with depth. The excavator encountered refusal in the Santiago Peak Volcanics at depths between 6.5 feet and 19 feet during the due diligence investigation.

Paleontological Resource Context

The Project site contains two geologic units, Santiago Peak Volcanics and Quarternary young alluvial deposits. Section 5 of the County's guidelines for paleontology, igneous rocks, which, by definition, include volcanic rocks, are indicated as having "no potential" for significant fossils. Quaternary (Holocene and late Pleistocene-aged) young alluvial deposits have been assigned a "Low" paleontological sensitivity by the County of San Diego (Stephenson et al. 2009).

Definitions of the sensitivity ratings related to the Project site are below.

- No Sensitivity – This designation is assigned to geologic formations that are composed entirely of volcanic or plutonic igneous rocks formed from molten material, such as basalt or granite, and therefore do not have any potential for producing fossil remains.

- Low Sensitivity – Low resource sensitivity is assigned to geologic formations that, based on their relatively young age and/or high-energy depositional history, are judged unlikely to produce unique fossil remains (although important paleontological resources have occurred infrequently in local low sensitivity deposits). When fossils are found in these formations, however, they are often very significant additions to the geologic understanding of the area.

Groundwater

Groundwater was not encountered in exploratory excavations. No natural groundwater condition is known to exist at the site that would impact the proposed site development. Intermittent surface water within the onsite drainages is anticipated during heavy and/or prolonged rain events. It should be noted that localized perched groundwater may develop at a later date, most likely at or near fill/bedrock contacts, due to fluctuations in precipitation, irrigation practices, or factors not evident at the time of the field explorations conducted for the Project.

3.5.1.3 Geologic Hazards

Landslides

No landslides have been mapped at the site. No topographic features were observed at the site that would indicate existing landslides. In addition, given the hard, relatively massive nature of the metavolcanic rock, the potential for land sliding is considered very low.

Flooding

According to available Federal Emergency Management Agency (FEMA) maps, the Project site is not in a FEMA identified flood hazard area.

Subsidence/Ground Fissuring

Due to the presence of the hard underlying metavolcanic rock, the potential for subsidence and ground fissuring due to settlement is very low.

3.5.1.4 Seismic Hazards

The site is located in the tectonically active Southern California area and will therefore likely experience shaking effects from earthquakes. The type and severity of seismic hazards affecting the site are to a large degree dependent upon the distance to the causative fault, the intensity of the seismic event, and the underlying soil characteristics. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary, such as liquefaction or dynamic settlement. The following is a site-specific discussion of ground motion parameters, earthquake induced landslide hazards, settlement, and liquefaction. The purpose of this analysis is to identify potential seismic hazards present at the Project site.

Surface Fault Rupture

No faults have been mapped within the Project site. The nearest known active fault to the site is the Newport-Inglewood-Rose Canyon fault zone which is approximately 9 miles west of the Project site. Accordingly, the potential for fault surface rupture on the subject site is very low. This conclusion is based on literature review and aerial photographic analysis.

Seismicity

As noted, the site is within the tectonically active southern California area and is approximately 9 miles from the Newport-Inglewood-Rose Canyon fault zone. The potential exists for strong ground motion that may affect future improvements.

Liquefaction

Due to the hard metavolcanic rock that underlies the site, and given the lack of shallow groundwater at the site, the potential for liquefaction at the site is very low.

Dynamic Settlement

Dynamic settlement occurs in response to an earthquake event in loose sandy earth materials. Given the fact that hard metavolcanic rock underlies the site, the potential for dynamic settlement is considered to be remote.

Seismically Induced Land sliding

Evidence of land sliding at the site was not observed during the site-specific field explorations, nor were any geomorphic features indicative of landslides noted during review of aerial photos and

published geologic maps. metavolcanic rock at the site is not usually susceptible to seismically induced land sliding. Therefore, the potential for landslides to impact the Project site is low.

3.5.1.5 Regulatory Setting

Development of the Project is subject to a number of regulatory requirements and industry standards related to potential geologic hazards. These requirements and standards typically involve measures to evaluate risk and mitigate potential hazards through design and construction techniques. Specific guidelines encompassing geologic criteria that may be applicable to the design and construction of the Project include: (1) the San Diego County General Plan Safety Element (2011a); (2) the County Guidelines for Determining Significance – Geologic Hazards (County of San Diego, 2007d); (3) Title 8, Division 4 (Design Standards and Performance Requirements) and Division 7 (Excavation and Grading), and Title 5, Division 1 (Amendments to the State Building Standards Code) of the County Code of Regulatory Ordinances; and (4) the International Code Council, Inc. (ICC) IBC (2021 or most recent update), and the related CBC (California Code of Regulations, Title 24, Part 2, Volumes 1 and 2, 2022 or most recent update). Regulatory requirements related to potential erosion and sedimentation effects (e.g., under the NPDES Construction General Permit) are discussed in Section 3.7, *Hydrology/Water Quality*, of this EIR, due to their relationship to water quality issues. Summary descriptions of the listed geologic standards are provided below.

Local

The San Diego County General Plan Safety Element is intended to identify and evaluate seismic hazards in the County, and to provide policies to reduce the loss of life and property damage related to seismic hazards. Associated policies in the Safety Element applicable to the Project include requirements to minimize risk resulting from seismic hazards and to minimize personal injury and property damage by mudslides, landslides, or rockfalls. The Safety Element requires conformance with applicable laws and standards such as the referenced County Guidelines for Determining Significance – Geologic Hazards, the Alquist-Priolo Act (for Fault Rupture Hazard Zones), the CBC/IBC, and the Greenbook.

The County Guidelines for Determining Significance – Geologic Hazards provide direction for evaluating environmental effects related to geologic hazards. Specifically, these guidelines address potential adverse effects to life and property (pursuant to applicable CEQA standards) from hazards including fault rupture, ground shaking, liquefaction, landslides, rockfalls, and expansive soils. Significance guidelines are identified for the noted issues, as well as related regulatory standards, impact analysis methodologies, potential attenuation/design strategies, and reporting requirements.

The County Excavation and Grading requirements are implemented through issuance of grading permits, which apply to most projects involving more than 200 cubic yards of material movement (e.g., grading and excavation). Specific requirements for such “Major Grading” efforts include, among other criteria, use of qualified engineering and geotechnical consultants to design and implement grading plans, implementation of appropriate measures related to issues such as manufactured slope design and

construction, and conformance with requirements related to issues including erosion and storm water controls.

County Building Code standards related to geotechnical concerns include applicable portions of the CBC and IBC, along with specific County amendments. The County Building Code is implemented through the issuance of building permits, which may encompass requirements related to preparation of soils reports and implementation of structural loading and drainage criteria.

Industry Standards

The IBC (which encompasses the former Uniform Building Code [UBC]) is produced by the ICC (formerly the International Conference of Building Officials) to provide standard specifications for engineering and construction activities. Publication of the Greenbook, the Standard Plans for Public Works Construction, is under the oversight of Public Works Standards, Inc. (PWSI), a nonprofit mutual benefit corporation whose members include the American Public Works Association, Associated General Contractors of California, and Engineering Contractors Association. The IBC and Greenbook provide standard specifications for engineering and construction activities, including measures to address geologic and soil concerns. Specifically, these measures encompass issues such as seismic loading (e.g., classifying seismic zones and faults), ground motion, engineered fill specifications (e.g., compaction and moisture content), expansive soil characteristics, and pavement design. The referenced guidelines, while not comprising formal regulatory requirements per se, are widely accepted by regulatory authorities and are routinely included in related standards such as municipal grading codes. The IBC and Greenbook guidelines are regularly updated to reflect current industry standards and practices, including criteria such as the American Society of Civil Engineers (ASCE) and ASTM International.

The CBC standards encompass a number of requirements related to geologic issues. Specifically, these include general provisions (Chapter 1); structural design, including soil and seismic loading (Chapters 16/16A); structural tests and special inspections, including seismic resistance (Chapters 17/17A); soils and foundations (Chapters 18/18A); concrete (Chapters 19/19A); masonry (Chapters 21/21A); steel (Chapters 22/22A), wood, including consideration of seismic design categories (Chapter 23); construction safeguards (Chapter 33); and grading, including excavation, fill, drainage, and erosion control criteria (Appendix J of the CBC). The CBC encompasses standards from other applicable sources, including the IBC and ASTM International, with appropriate amendments and modifications to reflect site-specific conditions and requirements in California.

3.5.2 Analysis of Project Effects and Determinations as to Significance

Guideline for the Determination of Significance

The Project would result in a significant impact to geology and soils if it would:

- Propose any building or structure to be used for human occupancy to be within 50 feet of the trace of an Alquist-Priolo fault or County Special Study Zone fault.

- Propose the following uses within an Alquist-Priolo Zone, which are prohibited by the County:
    - Uses containing structures with a capacity of 300 people or more. Any use having the capacity to serve, house, entertain, or otherwise accommodate 300 or more persons at any one time.
    - Uses with the potential to severely damage the environment or cause major loss of life. Any use having the potential to severely damage the environment or cause major loss of life if destroyed, such as dams, reservoirs, petroleum storage facilities, and electrical power plants powered by nuclear reactors.
    - Specific civic uses. Police and fire stations, schools, hospitals, rest homes, nursing homes, and emergency communication facilities.

Guidelines Source

These guidelines are based on the County Guidelines for Determining Significance – Geologic Hazards (County of San Diego, 2007d).

Analysis

Seismic fault (or ground) rupture is the physical surface or near surface displacement resulting from earthquake-induced movement (typically along a fault structure). No known active or potentially active faults, or associated Alquist-Priolo/County Special Study Zones, are mapped or known to occur within or adjacent to the Project site. The nearest known active fault to the Project site is the Newport-Inglewood-Rose Canyon fault zone which is approximately nine miles west of the Project site. Accordingly, Project-related impacts associated with seismic ground rupture or the placement of prohibited uses within an Alquist-Priolo Earthquake Fault Zone or County Special Study Zone would be less than significant.

3.5.2.1 Ground Shaking

Guideline for the Determination of Significance

A significant geology and soils impact would occur if the Project would do the following:

- Be located within a County Near-Source Shaking Zone or within Seismic Zone 4 and the Project does not conform to the UBC.

Guidelines Source

This guideline is based on the County Guidelines for Determining Significance – Geologic Hazards (County of San Diego, 2007d).

Analysis

The Project site is not located within any areas identified as a County Near-Source Shaking Zone, which are predominately located along the Elsinore and San Jacinto fault zones in the eastern portions of the County, approximately 25 miles east of the Project site. The entire San Diego County geographic region, including the Project site, is within Seismic Zone 4 and is subject to ground shaking. Construction in conformance to the UBC (which was replaced by the International Building Code, most recently updated in 2021) and compliance with the additional site-specific requirements described in the Project's Geotechnical Report (Appendices F1 and F2), and summarized in Table 3.5-1, *Seismic Design Criteria*, would result in less than significant impacts due to ground shaking. Compliance with the site-specific requirements in the Project's Geotechnical Reports (Appendices F1 and F2) are required as a standard County condition of approval.

3.5.2.2 Liquefaction

Guideline for the Determination of Significance

A significant geology and soils impact would occur if the Project would do the following:

- Have the potential to expose people or structures to substantial adverse effects because:
  - The Project site has potentially liquefiable soils; and
  - the potentially liquefiable soils are saturated or have the potential to become saturated; and
  - in-situ soil densities are not sufficiently high to preclude liquefaction.

Guideline Source

The guideline is based on the County Guidelines for Determining Significance – Geologic Hazards (County of San Diego, 2007d).

Analysis

Liquefaction and related effects such as dynamic settlement can be caused by strong vibratory motion and are most commonly associated with seismic ground shaking. Loose (cohesionless), saturated, and granular (low clay/silt content) soils with relative densities of less than approximately 70 percent are the most susceptible to these effects. Liquefaction results in a rapid pore-water pressure increase and a corresponding loss of shear strength, with affected soils behaving as a viscous liquid. Surface and near-surface manifestations from these events can include loss of support for structures/foundations, excessive (dynamic) settlement, the occurrence of sand boils (i.e., sand and water ejected at the surface), and other related effects such as lateral spreading (horizontal displacement on sloped surfaces as a result of underlying liquefaction).

The Project site is not located within or adjacent to a County Potential Liquefaction Area (County of San Diego, 2007d). Liquefaction potential for the site is characterized as low due to the high density

and grain-size distribution of local fill and formational materials, as well as the absence of a permanent water table in most development areas. Implementation of standard engineering and construction practices would avoid or reduce potential Project-related impacts associated with seismically induced liquefaction and related hazards to less than significant levels.

3.5.2.3 Landslides

Guidelines for the Determination of Significance

A significant geology and soils impact would occur if the Project would do the following:

- Expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving landslides.
- Be located on a geologic unit or soil that is unstable or would become unstable as a result of the Project, potentially resulting in an on- or off-site landslide.
- Be located directly below or on a known area subject to rock fall that could result in collapse of structures.

Guidelines Source

These guidelines are based on the County Guidelines for Determining the Significance – Geologic Hazards (County of San Diego, 2007d).

Analysis

The Project site is not located within or adjacent to any County Landslide Susceptibility Areas (County of San Diego, 2007d), and as stated in the Project geotechnical report (*Appendix F1*), evidence of land sliding was not observed during field exploration, nor were any geomorphic features indicative of landslides noted during review of aerial photos and published geologic maps. Metavolcanic rock at the site is not usually susceptible to seismically induced land sliding. Therefore, the potential for landslides to impact the proposed development is low and not reasonably foreseeable.

Additionally, geotechnical investigations conducted on the Project site included a stability analysis for manufactured fill slopes, which concludes that the highest proposed cut slope is approximately 80 feet high, designed at a slope ratio of 2:1 (horizontal: vertical). Slope stability analyses for proposed cut slopes are presented in Appendix D of *Appendix F1.* Surficial Stability calculations for the 2:1 cut slopes are presented in Appendix D of *Appendix F1*. Based upon this analysis, AGS determined that proposed cut slopes graded at slope ratios of 2:1 in Santiago Peak Volcanics would be grossly stable as designed.

A number of additional design and construction measures related to cut and fill slope stability are also identified in the geotechnical report (*Appendix F1*), including standard requirements for proper compaction and surface treatment of fill slopes, height limitations, over-excavation or -blasting for cut slopes in granitic rock (to reach unweathered and stable rock exposures), field observation and

design/construction modification where applicable, and use of drought-tolerant landscaping and irrigation controls. Implementation of standard engineering and construction practices, as well as conformance with County guidelines and other applicable regulatory/industry standards, would avoid or reduce potential Project-related impacts associated with landslides and slope stability to less than significant levels.

3.5.2.4 Expansive Soils

Guideline for the Determination of Significance

A significant geology and soils impact would occur if the Project would do the following:

- Be located on expansive soil, as defined in Table 18-1-B of the UBC (1994) and does not conform with the UBC.

Guidelines Source

This guideline is based on the County Guidelines for Determining the Significance – Geologic Hazards (County of San Diego, 2007d).

Analysis

Expansive (or shrink-swell) behavior in soils is attributable to the water-holding capacity of clay minerals and can adversely affect the integrity of facilities such as foundations, pavement, and underground utilities. As part of the Project's geotechnical investigation, representative bulk samples of near surface soils were collected and tested to evaluate their potential for expansion. Testing was performed in general accordance with ASTM D 4829. Test results by AGS indicate that the soils tested possess an expansion index (EI) within the range of 3 to 187, which corresponds to a "Very Low" to "Very High" expansion potential. As required by the 2021 IBC Section 1803.6, post-grading testing of soils is required to be conducted to define as-graded expansive soil characteristics. The results of those tests and the final as-graded conditions will govern design of building foundations and street pavement sections, overseen by a licensed geotechnical engineer.

Accordingly, a number of standard measures are required to address the potential for soil expansion. Specifically, expansive soils encountered during grading would be removed and replaced with engineered fill exhibiting very low or low expansion potential (per IBC/CBC or other applicable regulatory/industry criteria). In addition, appropriate foundation design is required, including post-tensioned slabs and reinforcement and footing depths as detailed in Appendix I of *Appendix F1*. During grading and construction, the geotechnical engineer would direct the implementation of appropriate concrete placement methodology and design, including proper installation/curing and moisture conditioning, doweling (anchoring) of exterior flatwork and driveways to building foundations, and use of crack-control joints. Also, subdrains will be installed in appropriate areas also directed by the geotechnical engineer to avoid near-surface saturation. All requirements to ensure that soil expansion potential is properly attenuated would be verified through plan review and site-specific geotechnical

observations and testing during Project excavation, grading, and construction activities. Implementation of such design and construction characteristics, as well as conformance with applicable County, IBC/CBC, Greenbook or other pertinent guidelines, would avoid or reduce impacts from expansive soils to a less than significant level.

3.5.2.5 Paleontological Resources

Guideline for the Determination of Significance

For the purposes of this EIR, a significant impact to paleontological resources would occur if the Project would:

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or

- Include activities, such as project-related grading or excavation, that disturbs the substratum or parent material below the major soil horizons in any paleontologically sensitive area of the County, as shown on the San Diego County Paleontological Resources Potential and Sensitivity Map.

Guideline Source

This guideline is based on the County's Guidelines for Determining Significance– Paleontological Resources (County 2009c). Per County Guidelines, a unique paleontological resource is any fossil or assemblage of fossils, or paleontological resource site or formation that meets any one of the following criteria:

- The best example of its kind locally or regionally;
- Illustrates a paleontological or evolutionary principle (e.g., faunal succession; plant or animal relationships);
- Provides a critical piece of paleobiological data (illustrates a portion of geologic history or provides evolutionary, paleoclimatic, paleoecological, paleoenvironmental or biochronological data);
- Encompasses any part of a "type locality" of a fossil or formation;
- Contains a unique or particularly unusual assemblage of fossils;
- Occupies a unique position stratigraphically within a formation; or
- Occupies a unique position, proximally, distally, or laterally within a formation's extent or distribution.

Analysis

Grading associated with the Project's construction would result in physical disturbance to 31.35 acres of the Project site and an additional 1.0 acre of off-site disturbance would occur to implement Project-related infrastructure, outside of the Project site boundary. In the areas that would be physically

disturbed by the Project's grading, approximately 167,100 cubic yards (c.y.) of cut and fill would occur, with no net import or export of earthwork materials. Also, as part of the Project's grading operation, blasting would be required in several areas of the Project site consisting of shallow blasting (<30 feet below existing grade) and moderate depth blasting (30–40 feet below existing grade).

Grading and blasting activities associated with the Project's construction would encounter the on-site surficial and geologic units, which are younger Santiago Peak Volcanics and Quaternary (Holocene and late Pleistocene-aged) young alluvial deposits. There is no potential for discovery of fossils in Santiago Peak Volcanics. There is a low potential for discovery of fossils in the Quarternary young alluvial deposits. based on the described "low" sensitivity rating for Quaternary alluvial deposits, implementation of the Project could potentially result in mpacts to paleontological resources from grading and blasting activities in previously undisturbed deposits. However, with conformance with the San Diego Grading Ordinance Section 87.430, Project impacts would be reduced to less than significant levels.

3.5.3 Cumulative Impact Analysis

As noted above, all potential Project-specific geotechnical impacts would be avoided or reduced below identified significance guidelines through implementation of geotechnical recommendations and conformance with established regulatory requirements as part of the Project design and/or construction efforts. Most potential geologic and soils effects are site specific (inherently restricted to the areas proposed for development) and would not contribute to cumulative impacts associated with other planned or proposed development. That is, issues including seismic ground acceleration and liquefaction, as well as landslide/slope stability, expansive soils and construction-related hazards would involve effects to (and not from) the proposed development and/or are specific to on-site conditions.

Addressing these potential hazards for the proposed development would involve using standard geotechnical measures to comply with regulatory requirements, and/or implementing site-specific design and construction efforts that have no relationship to, or impact on, off-site areas. Based on the described nature of potential geologic hazards and the measures to address them, there would be no connection to similar potential issues or cumulative effects to or from other properties. Accordingly, the Project's contribution to potential cumulative geologic hazard impacts would be less than considerable and therefore less than significant.

The Quarternary young alluvial deposits that underlie a portion of the Project site and have a low potential for containing paleontological resources also are present in many other areas of the San Diego region, as are other deposits with low, marginal, moderate, high potential to contain fossils. Development across San Diego County and the cities therein has disturbed fossil bearing geologic units and the fossils that they contain. Development has also, however, led to the discovery of many fossil sites that have been documented and which have added to the natural history record of the region. As described above, the Project's construction activities in Quarternary young alluvial deposits have the potential to significantly impact paleontological resources if such resources are encountered during grading, but would be mitigated through conformance with applicable regulatory requirements that are

part of the Section 87.430 of the County's Grading Ordinance, which requires that if fossils greater than 12 inches in any dimension are encountered, then all grading operations in the area of discovery must be suspended immediately and not resumed until authorized by the County official. The County official must determine the appropriate resource recovery operation, which the permittee must carry out prior to the County official's authorization to resume normal grading operations. Other development projects in the San Diego region would be subject to similar requirements for paleontological resources, pursuant to CEQA and County requirements. Regardless, the Project's potential impact is considered cumulatively considerable when considered in context with the potential impacts to paleontological resources that could occur from other development projects in the region.

3.5.4 Significance of Impacts

Based on the analysis provided above, the Project would have less-than-significant impacts related to geologic and soils hazards as well as paleontological resources. Accordingly, no additional attenuation measures are required or proposed.

3.5.5 Conclusion

Based on the analysis provided above, no significant Project-specific or cumulative impacts related to geology, soils, and paleontological resources would result from implementation of the Project.

Table 3.5-1 Seismic Design Criteria

Seismic Design Criteria	
Mapped Spectral Acceleration (0.2 sec Period), S_S	1.002g
Mapped Spectral Acceleration (1.0 sec Period), S_1	0.391g
Site Coefficient, F_a (CBC, 2013, Table 1613.3.3(1))	1.099
Site Coefficient, F_v (CBC, 2013, Table 1613.3.3(2))	1.618
MCE_R Spectral Response Acceleration (0.2 sec Period), S_{MS}	1.102g
MCE_R Spectral Response Acceleration (1.0 sec Period), S_{M1}	0.632g
Design Spectral Response Acceleration (0.2 sec Period), S_{DS}	0.734g
Design Spectral Response Acceleration (1.0 sec Period), S_{D1}	0.426g

(AGS, 2016)