

4.4 Geology and Soils

This section provides an overview of geology and soils and evaluates the impacts associated with the proposed project. Topics addressed include suitability of soil for development; geologic faults; seismic hazards such as floods, erosion, subsidence, liquefaction, and landslides; and paleontological resources. This section was prepared utilizing documents and maps published by the United States Geological Survey (USGS); California Department of Conservation, California Geological Survey (CGS); and the City of Los Angeles, as well as the site-specific Preliminary Geotechnical Reports prepared by Group Delta Consultants, Inc. (Group Delta) in 2022 for the proposed project (see Appendix D).

4.4.1 Environmental Setting

a. Geology and Soils

Regional Geologic Setting

The landforms and topography of Los Angeles consist of mountains and hills that trend east to west (Traverse Ranges province) or north-northwest to south-southeast (Peninsular Ranges province) that meet at the southern slopes of the Santa Monica and San Gabriel Mountains (CGS 2002). The east to west ranges include the Santa Monica, San Gabriel, and Santa Susana Mountains, and the north-northwest to south-southeast ranges and hills include the Palos Verde Hills, Baldwin Hills, and Beverly Hills. Gently sloping valleys are located between and along the slopes of these mountains and hills. The San Fernando Valley lies between the Santa Monica, Santa Susana, and Verdugo Mountains and is a closed basin within the Traverse Ranges. The broad Los Angeles Basin extends south from the Santa Monica Mountains, west from the Elysian-Repetto Hills, north from the Palos Verdes Hills and east from the Pacific Ocean. The Beverly and Baldwin Hills separate the Los Angeles Basin into inland and coastal plains.

Local Geologic Setting

The project site is located in the community of San Pedro within the city of Los Angeles, within the USGS San Pedro, CA 7.5-minute quadrangle (USGS 2015). The project site lies between the Port of Los Angeles to the east and the Palos Verdes Hills to the west at the southeastern end of the Palos Verdes Peninsula. The Palos Verdes Peninsula is geographically characterized by the Port of Long Beach Main Channel to the east and wave-cut terraces to the west. The project site is within an east-facing, marine terrace about 20 feet above the Port of Los Angeles waterfront. Marine terraces represent bedrock surfaces, flatted by wave erosion that currently lie above sea level due to sea level drop and/or land uplift. San Pedro Sands are exposed below the older marine terrace surface. The terrace had been incised to a channel that descends east toward the Main Channel of the Port, and during the Holocene, marine clays were deposited in the channel. The channel was partially filled (as much as 25 feet) after 1925 and before 1953 (based on review of historical topographic maps), which raised the channel bottom to its current grade. The Port area to the east of the project site and Harbor Boulevard consists of human-made artificial fill (Group Delta 2022a).

327 Harbor Site

Geologic Setting

The 327 Harbor Site is an undeveloped lot that contains ruderal vegetation, concrete pads, and asphalt. The 327 Harbor Site slopes down slightly from west to east, with an elevation of 28 and 21 feet above mean sea level in the western and eastern portions of the site, respectively. A field investigation of the site was completed in April 2021, which included two cone penetration tests to evaluate subsurface soil conditions (Group Delta 2022b).

Subsurface Conditions

The 327 Harbor Site is underlain by a single mapped geologic unit: Holocene-age alluvium (Qa). Qa consists of loamy clay and fine sand. The 327 Harbor Site is immediately adjacent to areas mapped as San Pedro Sand (Qsp), which is light gray to reddish tan sand and pebble gravel deposited in terrestrial to shallow marine settings during the Pleistocene, and Pleistocene-age alluvium (Qoa), which consists of sandy loam and loamy clay (Dibblee et al. 1999).

Based on the field exploration, the upper 10 feet below ground surface (bgs) of the 327 Harbor Site is uncertified fill and consists of medium dense sands and silty sands with some sandy clay. The uncertified fill layer is underlain by an approximately 5- to 6-foot-deep layer of medium dense to dense silty sand overlying a variably thick (10 to 12 feet deep) silty clay to clayey silt layer. Below these layers are generally medium dense sands and silty sands with dense to very dense sands at approximately 42 feet bgs (Group Delta 2022b).

Groundwater

Groundwater was encountered at depths of 22 to 24 feet bgs during the April 2021 field exploration. However, the historic high groundwater level at the site has been mapped at a depth of 10 feet bgs. Groundwater levels are subject to change due to seasonal and tidal fluctuations, due to the proximity of the 327 Harbor Site to the waterfront.

Expansive Soils

Expansive soils are soils that swell when subjected to moisture and shrink when dried. Expansive soils are typically associated with clayey soils. Based on the results of the site-specific Preliminary Geotechnical Report, the top 15 feet bgs of soils on site consist of sands and silty sands that are non-plastic and have very low expansion potential (Group Delta 2022b).

Subsidence

Ground subsidence is the gradual settlement or rapid sinking of the ground surface as a result of aquifer-system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and/or thawing of permafrost. The 327 Harbor Site is not associated with long-term dewatering or mining activities, or prone to permafrost. Additionally, present subsurface material is not anticipated to contain soluble rocks, and the soils are not prone to hydrocompaction. Therefore, the potential for subsidence on the 327 Harbor Site is considered low (Group Delta 2022b).

OSP Specific Plan Site

Geologic Setting

The OSP Specific Plan Site is developed with the Rancho San Pedro housing complex, including multi-family residential buildings, paved surface parking areas, landscaped areas, and community amenity buildings. The OSP Specific Plan Site slopes down from west to east and ranges from 80 to 20 feet above mean sea level in the western and eastern portions of the OSP Specific Plan Site, respectively (Group Delta 2022a). Field investigations of the OSP Specific Plan Site were conducted in June and December 2019, which included 11 cone penetration tests, four hollow stem auger borings, one mud-rotary boring, and two percolation tests to evaluate subsurface soil conditions, which are discussed further below (Group Delta 2022a).

Subsurface Conditions

The OSP Specific Plan Site is underlain by three distinct geologic units. The western end is mapped as Pleistocene-age alluvium consisting of sandy loam and loamy clay (Qoa). Portions of the southeastern and western areas of the OSP Specific Plan Site are mapped as San Pedro Sand (Qsp). This unit consists of light gray to reddish tan sand and pebble gravel deposited in terrestrial to shallow marine settings during the Pleistocene. The center and easternmost edge of the OSP Specific Plan Site are mapped as Holocene-age alluvium (Qa). The Timms Point Silt (Qtp) is mapped less than one block west of the OSP Specific Plan Site and is a Pleistocene unit consisting of yellowish gray to gray sandy siltstone (Dibblee et al. 1999).

Group Delta identified three distinct zones (A, B, and C) in the subsurface geology of the OSP Specific Plan Site, as shown in Figure 4.4-1. Zone A (the westernmost zone) generally contains less than 5 feet of fill (but up to 10 feet in some areas) before transitioning to native sediment. Zone A soils in the upper 10 feet bgs generally consist of medium dense native sands and silty sands with dense silty sands and poorly-graded sands with hard silt and some interbedded clays at depths below 10 feet bgs. The upper 5 to 25 feet bgs within Zone B (which is an old channel), in the center of the OSP Specific Plan Site that roughly corresponds to the area mapped as Qa, contains fill; below 25 feet bgs include undisturbed marine clays consisting of medium stiff to stiff marine clays. Zone C, in the southeastern corner of the OSP Specific Plan Site, was previously cut and contains no fill. The soils in Zone C consist of native dense to very dense sands and silt sands (Group Delta 2022a).

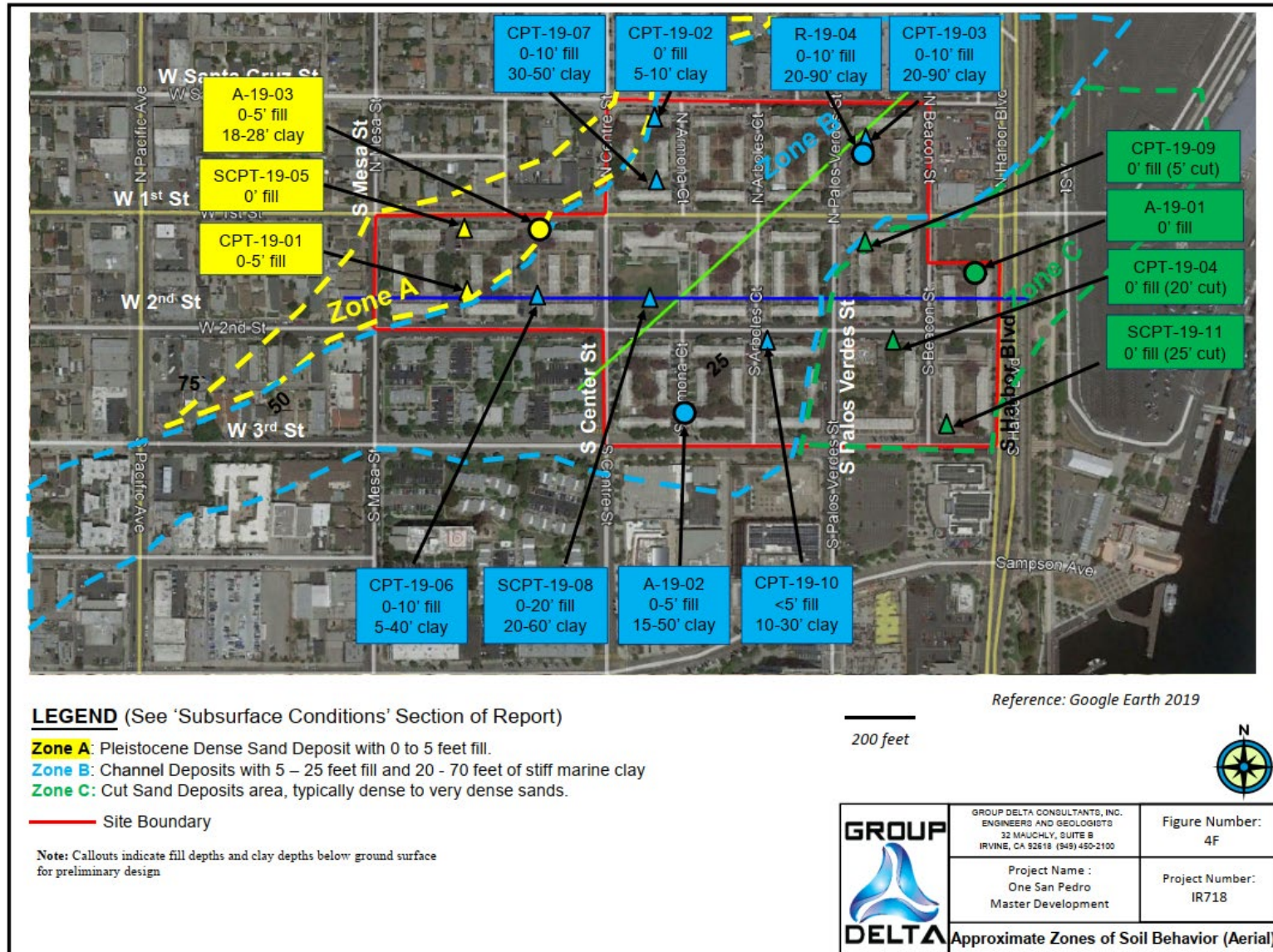
Groundwater

Groundwater was encountered at 20 to 60 feet bgs in field explorations on the OSP Specific Plan Site. However, based on the California Division of Mines and Geology Seismic Hazard Zone Report 033, the historic high groundwater level at the OSP Specific Plan Site is mapped at 10 feet bgs. Groundwater levels are subject to change due to seasonal and tidal fluctuations, as the OSP Specific Plan Site is near the waterfront (Group Delta 2022a).

Expansive Soils

Based on the results of the Preliminary Geotechnical Report, the OSP Specific Plan Site contains a mix of soil types, some of which have very low potential for expansion (e.g., silty soils) and others have high potential for expansion (e.g., clayey soils). Zone A contains predominantly non-expansive material. However, expansive soil may be encountered in Zone A approximately 15 feet bgs near the boundary with Zone B. Zone B contains shallow clayey materials that may be expansive.

Figure 4.4-1 OSP Specific Plan Site Subsurface Soil Conditions



Zone C contains predominantly non-expansive soils, although some expansive soils may be encountered near the boundary with Zone B. Investigation of extent and severity of expansive soils will be required during the final geotechnical investigation (Group Delta 2022c).

Subsidence

The OSP Specific Plan Site is not associated with long term dewatering or mining activities, or prone to permafrost. Additionally, the subsurface material is not anticipated to contain soluble rocks, and the soils are not prone to hydrocompaction. Therefore, the potential for subsidence on the OSP Specific Plan Site is considered low (Group Delta 2022a).

b. Faulting and Seismicity

Active Faults

Los Angeles is located in a seismically active region of southern California and is generally bounded by fault systems. Numerous faults in the Los Angeles area are categorized as active, potentially active, and inactive. A fault is classified as active if it has moved during Holocene time (during the last 11,000 years). A fault is classified as potentially active if it has experienced movement within Quaternary time (during the last 1.6 million years). Faults that have not moved in the last 1.6 million years are generally considered inactive.

The Alquist-Priolo Earthquake Fault Zoning Act, discussed below in Section 4.4.2, *Regulatory Setting*, requires the mapping and zoning of faults that have direct evidence of movement within the last 11,000 years and have elevated risk of ground rupture. The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to establish earthquake fault zones generally extending 200 to 500 feet around the surface traces of active faults and to issue maps identifying areas where potential surface fault rupture could prove hazardous. If a site lies within an Earthquake Fault Zone on an official CGS map, a geologic fault rupture investigation must be performed to demonstrate the proposed development is not threatened by fault rupture. The project site is not located within a mapped Alquist-Priolo Fault Zone.

Major active faults in the Los Angeles region include the San Andreas, Whittier-Elsinore, Newport-Inglewood, Hollywood, and Raymond Faults. The San Andreas Fault, located approximately 60 miles east of the project site, is the most seismically active fault in the region and is capable of producing up to a 7.9-magnitude earthquake (Group Delta 2022a). In addition to these known faults, movement along buried blind thrust faults that have no obvious surface features can also occur. No known active faults are located in the project site. Active and potentially active faults in the vicinity of the project site are illustrated in Figure 4.4-2 and described below.

Cabrillo Fault

This fault is located approximately 1.9 miles southwest of the project site at its closest point. The fault extends from the middle of the Palos Verdes Peninsula to the Pacific Ocean to the southeast, where it meets with the Palos Verdes Fault (CGS 2022). The active portion of the fault is located offshore approximately 2.4 miles south of the project site. According to the Southern California Earthquake Data Center, this fault could generate a 6.0- to 6.8-magnitude earthquake (Southern California Earthquake Data Center 2022).

Newport-Inglewood Fault Zone

At its closest point, this fault is located approximately 7.3 miles northeast of the project site. This active fault zone could generate up to a 7.2-magnitude earthquake (Group Delta 2022a). This fault zone is reflected at the surface by a line of geomorphically young hills and mesas formed by the folding and faulting of a thick sequence of Pleistocene age sediments and Tertiary age sedimentary rocks. This zone also contains the Overland Fault, which extends from the northwest flank of the Baldwin Hills to North Santa Monica Boulevard in the vicinity of Overland Avenue.

Palos Verdes Fault Zone

This fault is located approximately 0.5 mile north of the project site at its closest point (CGS 2022). The fault extends from the Pacific Ocean, and curves around the base of the Palos Verdes peninsula and into the Los Angeles Harbor (City of Los Angeles 2018). Only the offshore portion of the fault is classified as active, while the onshore portion is poorly defined in its location and activity. This fault has the potential to generate up to a 7.2-magnitude earthquake (Group Delta 2022a).

Compton Blind Thrust Fault

The Compton Blind Thrust Fault surface projection is approximately 2.6 miles east of the project site. It is capable of producing a 6.9-magnitude earthquake with an estimated slip-rate of 0.9. Blind thrust faults are buried below the surface and are not considered having Alquist-Priolo Zoning (Group Delta 2022a).

While no known active faults have been mapped across the project site and the site is not located within an Alquist-Priolo Earthquake Fault Zone, the project site is located within a seismically active region of southern California and could be subject to strong seismic ground shaking if a moderate to strong earthquake occurs on a local or regional fault.

Recent Seismic Activity

Historically, earthquakes have caused substantial ground shaking in the southern California region and include the following: the 1933 Long Beach earthquake (6.4-magnitude on Richter scale) along the Newport-Inglewood Fault Zone; the 1971 San Fernando earthquake (6.7-magnitude) along the San Fernando-Sierra Madre Fault; the 1987 Whittier Narrows earthquake (5.9-magnitude) along the Elysian Park Thrust Fault; the 1988 Pasadena earthquake (5.0-magnitude); the 1990 earthquake north of Pomona (5.3-magnitude); the 1991 Sierra Madre earthquake (5.8-magnitude); the 1992 Landers area earthquake (7.4-magnitude); and the 1994 Northridge earthquake (6.7-magnitude) along the Oakridge Fault. In addition, the 2008 Chino Hills earthquake (5.5-magnitude) was the strongest earthquake felt in the greater Los Angeles region since the 1994 Northridge earthquake.

Seismic Hazards

Hazards associated with earthquakes include primary hazards, such as surface rupture and ground shaking, as well as secondary hazards, such as liquefaction, lateral spreading, ground lurching, tsunamis, and dam inundation. These hazards are described in more detail below.

Surface Rupture

Surface rupture represents the breakage of ground along the surface trace of a fault, which is caused by the intersection of the fault surface area ruptured in an earthquake with the Earth's surface. Fault

displacement occurs when material on one side of a fault moves relative to the material on the other side of the fault. This can have particularly adverse consequences when buildings are located within the rupture zone.

The Alquist-Priolo Earthquake Fault Zoning Act regulates development near active faults to minimize the hazard of surface fault rupture. Essentially, the Act prohibits locating most structures for human occupancy across the trace of active faults, establishes Earthquake Fault Zones, and requires geologic/seismic studies of all proposed developments within a delineated zone. The Earthquake Fault Zones are delineated and defined by the State Geologist and identify areas where potential surface rupture along a fault could occur.

As previously discussed, no Alquist-Priolo Earthquake Fault Zones are located within or adjacent to the project site. The nearest Alquist-Priolo Earthquake Fault Zone is the Newport-Inglewood Fault Zone, which is located approximately 7 miles northeast of the project site at its nearest point (CGS 2022a).

Ground Shaking

The major cause of structural damage from earthquakes is ground shaking. The intensity of ground motion expected at a particular site depends upon the magnitude of the earthquake, the distance to the epicenter, and the geology of the area between the epicenter and the property. Greater movement can be expected at sites located on poorly consolidated material, such as alluvium, within close proximity to the causative fault, or in response to a seismic event of great magnitude.

Earthquake scenario maps have been developed that depict the expected ground motions and effects of large earthquakes in the city. Ground shaking faults were developed for the Newport-Inglewood Fault, Palos Verde Fault, Puente Hills Fault, San Andreas Fault, and Santa Monica Fault using different scenarios of magnitude, depth, and epicenter locations (City of Los Angeles 2018). The fault scenarios involved a variation of magnitudes from 6.8 to 7.8. All were expected to produce a range of ground shaking at sites throughout the region from moderate to severe, depending on the distance from the earthquake, as well as rock and soil conditions. Earthquakes on the nearby Palos Verdes Fault Zone, Cabrillo Fault, and Newport-Inglewood Fault Zone would be anticipated to produce the strongest ground shaking at the project site.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading. Liquefaction occurs in saturated soils, in which the water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. This is caused by a sudden temporary increase in pore water pressure due to seismic densification or other displacement of submerged granular soils. Substantial factors that affect liquefaction include water level, soil type, particle size and gradation, relative density, confining pressure, and the intensity and duration of shaking. Liquefaction more often occurs in earthquake-prone areas underlain by young alluvium where the groundwater table is within 30 feet of the ground surface. In addition to the necessary soil conditions, the ground acceleration and duration of the earthquake must also be of a sufficient level to induce liquefaction.

The 327 Harbor Site is within a mapped liquefaction area (CGS 2022b). The site-specific Preliminary Geotechnical Report assessed liquefaction potential and determined that liquefaction-induced settlement on the 327 Harbor Site would be between 5.0 and 5.5 inches (Group Delta 2022b). The majority of the OSP Specific Plan Site is not within a mapped liquefaction area. One portion of the OSP

Specific Plan Site (the block located at the northwest intersection of 2nd Street and Harbor Boulevard) is within a mapped liquefaction zone (CGS 2021) (Figure 4.4-3). However, according to the results of the Preliminary Geotechnical Report, the OSP Specific Plan Site consists of three zones with distinct geotechnical conditions and liquefaction potential, as described above under *Geology and Soils* (see to Figure 4.4-1). Zones A and C have low potential for liquefaction, whereas Zone B has higher potential for liquefaction (Group Delta 2022a).

Lateral Spreading

Lateral spreading refers to seismically induced, permanent deformation of sloped ground toward a feature of vertical relief (free face) like a hillslope, retaining wall, or river channel. Lateral spreading may occur in soils with gentle to steep slopes, and with or without liquefiable soils, depending on the level of shaking. In general, slopes that are about 2:1 or flatter are stable in the absence of liquefaction. If liquefaction occurs near sloped ground, even gently-sloping ground has the potential for substantial lateral spreading (on the order of a few inches to a few feet). If liquefaction potential is particularly severe, catastrophic lateral spreading on the order of several feet can occur (i.e., flow failure), where the liquefied soil profile can no longer support the self-weight of the soil, and the ground subsequently deforms toward the free face (Group Delta 2022a).

The 327 Harbor Site is generally level and no post-construction slopes are planned. According to the Preliminary Geotechnical Investigation, slope instability and lateral spreading are not a hazard at the 327 Harbor Site (Group Delta 2022b). The risk of lateral spreading on the OSP Specific Plan Site varies. Based on the Preliminary Geotechnical Report, the risk of lateral spreading occurring for buildings founded on the native slopes or native Pleistocene deposits (predominantly in Zones A and C) are expected to be low. However, there is potential for lateral spreading in the Holocene-aged alluvium that are predominantly found in Zone B and a small section in the northeast portion of Zone C.

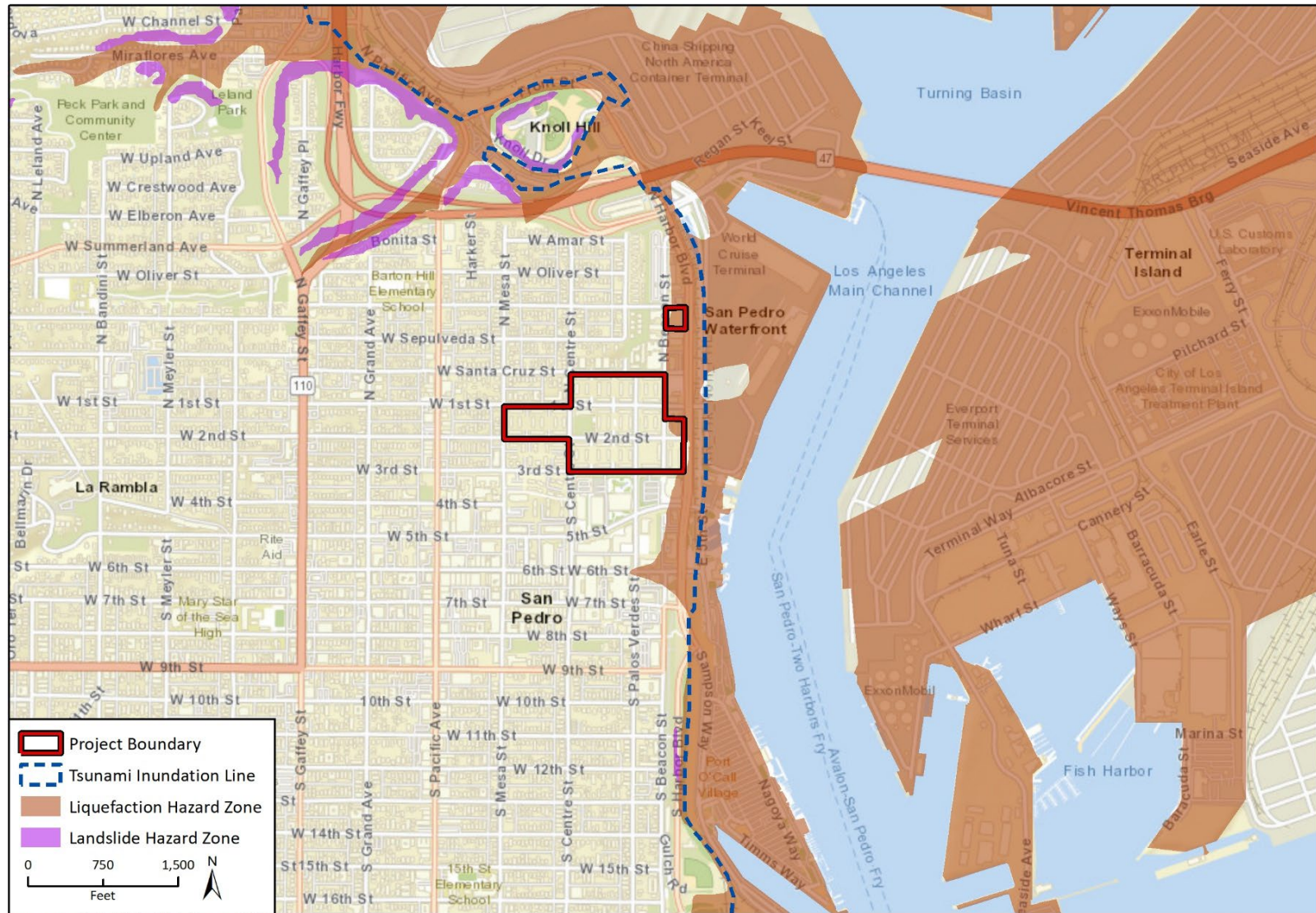
Landslides

The project site is not within a State of California Earthquake-Induced Landslide Hazard Zone (CGS 2021b). The project site is located on top of a relatively narrow shoreline channel, filled to a relatively level landscape, with gentle slopes down to the southeast. Landslide hazard potential for the project site is considered low.

c. Paleontological Resources

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals, as well as the traces thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in “soil” but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society for Vertebrate Paleontology 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors.

Figure 4.4-3 Seismic Hazards in the Vicinity of the Project Site



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 Additional data provided by California Department of Conservation, California Geological Survey, 2021.

Fig 4.4-3 Seismic Hazards

It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources, and therefore, evaluate the potential for impacts to those resources and provide mitigation, if required, for paleontological resources if they are discovered during construction of a development project.

A fossil locality records request with the Natural History Museum of Los Angeles (NHMLA) identified six previously recorded fossil localities within the limits of the project site, as well as an additional five previously recorded localities near the project site from the same geologic units as those found in the project site (Bell 2021).

The geology of the project site was mapped at a scale of 1:24,000 by Dibblee et al. (1999), who identified three geologic units underlying the OSP Specific Plan Site: Quaternary (Holocene) alluvium (Qa), Quaternary older (Pleistocene) alluvium (Qoa), and San Pedro Sand (Qsp). One geologic unit was identified under the 327 Harbor Site, Quaternary Alluvium (Qa) (see Figure 4.4-4). A description of these units is provided below:

- **Quaternary (Holocene) Alluvium (Qa):** Quaternary (Holocene) alluvium (Qa) covers much of the central part of the OSP Specific Plan site and all of the 327 Harbor Site (see Figure 4.4-4). Qa consists of loamy clay and fine sand (Dibblee et al. 1999). Young Holocene sediments (i.e., less than 5,000 years old) are too young to preserve paleontological resources. However, as these units transition to older sediments exceeding 5,000 years old, they can preserve scientifically important fossils. Published cross sections (Dibblee et al. 1999) indicate sediments older than 5,000 years are a maximum of 50 feet deep become shallower near the edges of their surficial exposures. Additionally, the presence of older units mapped at the surface in and near the project site indicates young Holocene units are relatively thin in the project site. All Holocene alluvium (Qa) within the project site is considered to have high paleontological sensitivity, based on the potential to impact units greater than 5,000 years old at or near the surface in previously undisturbed areas.
- **Quaternary Older (Pleistocene) Alluvium (Qoa):** Quaternary older (Pleistocene) alluvium (Qoa) is found in the northwestern portion of the OSP Specific Plan Site (see Figure 4.4-4). Qoa consists of sandy loam and loamy clay (Dibblee et al. 1999). Qoa includes deposits referred to as the Palos Verdes Sand by Jefferson (2010) and Long (1993). The Palos Verdes Sand and unnamed Pleistocene alluvial deposits have produced scientifically significant paleontological resources throughout the Los Angeles Basin (Jefferson 2010; Long 1993; Paleobiology Database [PBDB] 2022; University of California Museum of Paleontology [UCMP] 2022). The NHMLA paleontological records contain three previously recorded localities from the Palos Verdes Sand within the OSP Specific Plan Site (Bell 2021). These localities preserve invertebrates, which were recovered near ground surface. Outside the project area, a locality from the Palos Verdes Sand produced bison (*Bison*), rodent (*Neotoma*, *Thomomys*), rabbit (*Sylvilagus*), ray-finned fish (*Actinopterygii*), and shark and ray (*Chondrichthyes*) fossils (Bell 2021).
- **San Pedro Sand (Qsp):** The San Pedro Sand (Qsp) is found the northwestern and southeastern parts of the OSP Specific Plan Site (see Figure 4.4-4). The San Pedro Sand is a light gray to reddish-tan, massive to cross-bedded unit composed of sand, pebbles, and gravel and is Pleistocene in age (Dibblee et al. 1999). The San Pedro Sand has produced scientifically significant paleontological resources throughout the Los Angeles Basin, including mammoth (*Mammuthus*), horse (*Equus*), crustaceans, and mollusks (Jefferson 2010; Paleobiology Database [PBDB] 2022; UCMP 2022). The NHMLA paleontological records contain three localities from the San Pedro Sand within the OSP Specific Plan Site (Bell 2021). These localities preserve invertebrates (*Mollusca* and *Bryozoa*), which were recovered near ground surface.

Figure 4.4-4 Geologic Units and Paleontological Sensitivity of Project Site



Geologic map provided by Dibblee, T.W., H.E. Ehrenspeck, P.L. Ehling, and W.L. Bartlett. 1999. "Geologic map of the Palos Verdes Peninsula and vicinity, Redondo Beach, Torrance, and San Pedro quadrangles, Los Angeles County, California." Dibblee Geological Foundation. (https://ngmdb.usgs.gov/Prodesc/proddesc_71706.htm).

4.4.2 Regulatory Setting

a. Federal Laws and Regulations

International Building Code

The International Building Code is published by the International Code Council. The scope of this code covers major aspects of construction and design of structures and buildings. The International Building Code has replaced the Uniform Building Code as the basis for the California Building Code (CBC) and contains provisions for structural engineering design. The International Building Code addresses the design and installation of structures and building systems through requirements that emphasize performance. The International Building Code includes codes governing structural, as well as fire- and life-safety provisions, covering seismic, wind, accessibility, egress, occupancy, and roofs.

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was enacted in 1977 to “reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program.” To accomplish this, the Earthquake Hazards Reduction Act established the National Earthquake Hazards Reduction Program. This program was substantially amended by the National Earthquake Hazards Reduction Program Reauthorization Act of 2004 (Public Law 108-360).

The National Earthquake Hazards Reduction Program’s mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research results. The National Earthquake Hazards Reduction Program designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns FEMA several planning, coordinating, and reporting responsibilities. Programs under the National Earthquake Hazards Reduction Program help inform and guide local planning and building code requirements such as emergency evacuation responsibilities and seismic code standards such as those to which a proposed project would be required to adhere.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) Program has been responsible for substantial improvements to our nation’s and state’s water quality since 1972. The NPDES permit sets erosion control standards and requires implementation of nonpoint source control of surface drainage through the application of a number of best management practices (BMPs). NPDES permits are required by Section 402 of the Clean Water Act.

Society for Vertebrate Paleontology Standard Guidelines

The Society for Vertebrate Paleontology (SVP) has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys; monitoring and mitigation (if required); data and fossil recovery; sampling procedures; and specimen preparation, identification, analysis, and curation (SVP 2010). The Paleontological Resources Preservation Act of 2009 calls for uniform policies and standards that apply to fossils on all federal public lands. All federal land management agencies are required to develop regulations that

satisfy the stipulations of the Paleontological Resources Preservation Act. As defined by the SVP, “significant nonrenewable paleontological resources” are:

Fossils and fossiliferous deposits...restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments (SVP 1995).

As defined by the SVP, “significant fossiliferous deposits” are:

A rock unit or formation which contains significant nonrenewable paleontologic resources, [herein] defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years BP [before present] (SVP 1995).

Based on the definitions by SVP of significant nonrenewable paleontological resources and significant fossiliferous deposits, all identifiable vertebrate fossils are considered to have significant scientific value (SVP 1995). This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered “significant” if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

b. State Laws and Regulations

California Building Code

The CBC, which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress facilities, and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or those standards are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2022 edition of the CBC is based on the 2021 International Building Code published by the International Code Council. The code is updated triennially, and the 2022 edition of the CBC was published by the California Building Standards Commission on July 1, 2022 and will become effective January 1, 2023. Every three years, the state adopts new codes (known collectively as the “California Building Standards Code”) to establish uniform standards for the construction and maintenance of

buildings, electrical systems, plumbing systems, mechanical systems, and fire and life safety systems. Sections 17922, 17958, and 18941.5 of the California Health and Safety Code require the latest edition of the California Building Standards Code apply to local construction 180 days after publication. The substantial changes to Title 24 in the 2022 edition can be found at California Department of General Services website¹.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act) was signed into law December 22, 1972 (revised in 1994) and codified into State law in the Public Resources Code as Division 2, Chapter 7.5 to address hazards from earthquake fault zones. The purpose of this law is to minimize the hazard of surface fault rupture by regulating development near active faults. As required by the Act, the State has delineated Earthquake Fault Zones (formerly Special Studies Zones) along known active faults in California that vary in width around the fault trace from about 200 to 500 feet on either side of the fault trace. Cities and counties affected by the zones must regulate certain development projects within the zones. The State Geologist is also required to issue appropriate maps to assist cities and counties in planning, zoning, and building regulation functions. Local agencies enforce the Alquist-Priolo Earthquake Fault Zoning Act in the development permit process, where applicable, and may be more restrictive than State law requires. According to the Alquist-Priolo Earthquake Fault Zoning Act, before a project that is within an Alquist-Priolo Earthquake Fault Zone can be permitted, cities and counties must require a geologic investigation, prepared by a licensed geologist, to demonstrate that buildings would not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back a distance to be established by a California Certified Engineering Geologist. Although setback distances may vary, a minimum 50-foot setback is typically required.

Seismic Hazards Mapping Act

To address the effects of strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events, the State of California passed the Seismic Hazards Mapping Act of 1990 (Public Resources Code Sections 2690-2699.6). Under the Seismic Hazards Mapping Act, the State Geologist is required to delineate “seismic hazard zones.” Cities and counties must regulate certain development projects within these zones until the geologic and soil conditions of the project sites have been investigated and appropriate mitigation measures, if required, have been incorporated into development plans. The State Mining and Geology Board provides additional regulations and policies to assist municipalities in preparing the Safety Element of their General Plans and to encourage the adaptation of land use management policies and regulations to reduce and mitigate seismic hazards to protect public health and safety. Under Public Resources Code Section 2697, cities and counties must require, prior to the approval of a project located in a seismic hazard zone, submission of a geotechnical report defining and delineating any seismic hazard.

California Code of Regulations, Title 14, Section 4307

Title 14, Section 4307 of the California Code of Regulations states that “no person shall remove, injure, deface or destroy any object of paleontological, archaeological, or historical interest or value.”

¹ <https://www.dgs.ca.gov/BSC/Codes#@ViewBag.JumpTo/>

California Penal Code Section 622.5

California Penal Code Section 622.5 states the following, “Every person, not the owner thereof, who willfully injures, disfigures, defaces, or destroys any object or thing of archeological or historical interest or value, whether situated on private lands or within any public park or place, is guilty of a misdemeanor.”

c. Local Laws and Regulations

City of Los Angeles General Plan

Safety Element

The City’s General Plan Safety Element, which was adopted in 1996, addresses public safety risks due to natural disasters, including seismic events and geologic conditions, and sets forth guidance for emergency response during such disasters. The Safety Element also provides maps of designated areas within Los Angeles that are considered susceptible to earthquake-induced hazards, such as fault rupture and liquefaction (City of Los Angeles 1996).

Conservation Element

Section 3 of the City’s General Plan Conservation Element, adopted in September 2001, includes policies for the protection of paleontological resources. As stated therein, it is the City’s objective that paleontological resources be protected for historical, cultural research, and/or educational purposes. Section 3 identifies site protection as important, stating, “Pursuant to CEQA, if a land development project is within a potentially significant paleontological area, the developer is required to contact a bonafide paleontologist to arrange for assessment of the potential impact and mitigation of potential disruption of or damage to the site.” Section 3 sets as a policy to continue the identification and protection of significant paleontological sites and/or resources known to exist or that are identified during land development, demolition, or property modification activities (City of Los Angeles 2001).

Los Angeles Municipal Code

Chapter IX of the Los Angeles Municipal Code (LAMC) contains the City’s Building Code, which incorporates by reference the CBC, with City amendments for additional requirements. The Los Angeles Department of Building and Safety (LADBS) is responsible for implementing the provisions of the LAMC. To that end, LADBS issues building and grading permits for construction projects. Building permits are required for any building or structure that is erected, constructed, enlarged, altered, repaired, moved, improved, removed, converted, or demolished. Grading permits are required for all grading projects other than those specifically exempted by the LAMC. LADBS has the authority to withhold building permit issuance if a project cannot mitigate potential hazards to the project or which are associated with the project. Throughout the permitting, design, and construction stages of a building project, LADBS engineers and inspectors confirm the requirements of the LAMC pertaining specifically to geoseismic and soils conditions are being implemented by project architects, engineers, and contractors.

The function of the City’s Building Code is to protect life safety and ensure compliance with the LAMC. Chapter IX of the City’s Building Code addresses numerous topics, including earthwork and grading activities, import and export of soils, erosion and drainage control, and general construction requirements that address flood and mudflow protection, landslides, and unstable soils. Additionally,

the LAMC includes specific requirements addressing seismic design, grading, foundation design, geologic investigations and reports, soil and rock testing, and groundwater.

Specifically, LAMC Section 91.1803 requires a Final Geotechnical Report with final design recommendations be prepared by a California-registered geotechnical engineer and submitted to the LADBS for review prior to issuance of a grading permit. Final foundation design recommendations must be developed during final project design, and other deep foundation systems that may be suitable would be addressed in the Final Geotechnical Report. All earthwork (i.e., excavation, site preparation, any fill backfill placement, etc.) must be conducted with engineering control under observation and testing by a Geotechnical Engineer and in accordance with LADBS.

4.4.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

In accordance with Appendix G of the CEQA Guidelines, a project would result in a significant impact related to geology and soils if it would:

1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - a. 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);
 - b. Strong seismic ground shaking;
 - c. Seismic-related ground failure, including liquefaction; and/or
 - d. Landslides;
2. Result in substantial soil erosion or the loss of topsoil;
3. 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;
4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
5. 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; and/or
6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

For this analysis, the CEQA Guidelines Appendix G thresholds listed above are relied upon. The analysis also utilizes factors and considerations identified in the City's 2006 L.A. CEQA Thresholds Guide (Thresholds Guide), as appropriate, to assist in answering the Appendix G threshold questions.

The Thresholds Guide identifies the following criteria to evaluate impacts related to geology and soils impacts:

Geologic Hazards

- Would the project cause or accelerate geologic hazards, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury?

Sedimentation and Erosion

- Would the project constitute a geologic hazard to other properties by causing or accelerating instability from erosion?
- Would the project accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site?

Paleontological Resources

- Would the project result in the permanent loss of, or loss of access to, a paleontological resource? If so, is the resource of regional or statewide significance?

Methodology

Geology and Soils

The evaluation of geological hazards is based on the Preliminary Geotechnical Reports prepared by Group Delta (2022a and 2022b) provided as Appendix D of this EIR/EIS. The Preliminary Geotechnical Reports included a review of published geologic data, field and laboratory testing of soil borings, and engineering analysis to assess the geotechnical feasibility of the proposed project.

Paleontological Resources

SVP SENSITIVITY GUIDELINES

The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units. The SVP (2010) has defined paleontological sensitivity and developed a system for assessing paleontological sensitivity. Paleontological sensitivities of the geologic units underlying the project site were assessed consistent with the guidelines of the SVP, as discussed below.

Significant paleontological resources are fossils or assemblages of fossils that are unique, unusual, rare, diagnostically important, or are common but have the potential to provide valuable scientific information for evaluating evolutionary patterns and processes, or which could improve our understanding of paleochronology, paleoecology, or depositional histories. New or unique specimens can provide new insights into evolutionary history; however, additional specimens of even well represented lineages can be equally important for studying evolutionary pattern and process, and evolutionary rates. Even unidentifiable material can provide useful data for dating geologic units if radiometric dating is possible. As such, common fossils (especially vertebrates) may be scientifically important, and therefore, considered highly significant.

The SVP (2010) describes sedimentary rock units as having high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources. This criterion is based on rock units in which significant fossils have been determined by previous studies to be present or likely to be present. While these standards were written specifically to protect vertebrate paleontological resources, all fields of paleontology have adopted these guidelines, which are given here verbatim:

- I. High Potential (Sensitivity).** Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered have a high potential for containing significant non-renewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations which contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas which contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas which may contain new vertebrate deposits, traces, or trackways are also classified as significant.
- II. Low Potential (Sensitivity).** Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well documented and understood taphonomic, phylogenetic species and habitat ecology. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils prior to the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations. However, as excavation for construction gets underway it is possible that significant and unanticipated paleontological resources might be encountered and require a change of classification from Low to High Potential and, thus, require monitoring and mitigation if the resources are found to be significant.
- III. Undetermined Potential (Sensitivity).** Specific areas underlain by sedimentary rock units for which little information is available have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may be developed.
- IV. No Potential.** Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources (SVP 2010).

PROJECT IMPACT EVALUATION

To evaluate potential impacts to paleontological resources, Rincon paleontologists requested and reviewed a paleontological records search from the NHMLA, as well as reviewed geologic maps and primary literature. Based on reviewed information, paleontological sensitivities pursuant to the guidelines of the SVP were assigned to the geologic units present at the surface or in the subsurface of the project site that would be impacted by ground-disturbing activities associated with project construction.

b. Project Design Features

No specific project design features related to geology and soils, including paleontological resources, are proposed by the project.

c. Project Impacts and Mitigation Measures

Threshold 1.a: Would the project directly or indirectly cause 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?

Impact GEO-1 THE PROJECT SITE IS NOT WITHIN OR IMMEDIATELY ADJACENT TO AN ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE AND THE RISK OF FAULT RUPTURE ON THE SITE IS LOW. THUS, THE PROPOSED PROJECT WOULD NOT BE SUBJECT TO GROUND RUPTURE AND IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 square feet (sf) of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction on the OSP Specific Plan Site in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cubic yards (cy) of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

As discussed above in Section 4.4.1, *Environmental Setting*, the project site is not located within a designated Alquist-Priolo Earthquake Fault Zone. No active or potentially active faults with the potential for surface fault rupture are known to pass directly beneath the project site. The closest major active fault near the project site is the Palos Verdes Fault, located approximately 0.5 mile to the east of the OSP Specific Plan Site and 0.9 mile to the east of the 327 Harbor Site. According to the Preliminary Geotechnical Report, the potential for surface rupture due to faulting occurring beneath the project site during the design life of the proposed development is considered low, and the project would not directly or indirectly cause potential substantial adverse effects related to fault rupture (Group Delta 2022a and 2022b). Therefore, the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault. Potential impacts associated with rupture of the ground surface within the vicinity of the project site would be less than significant.

Mitigation Measures

Project-level impacts related to fault rupture within an Alquist-Priolo Earthquake Fault Zone would be less than significant. Therefore, mitigation is not required.

Significance After Mitigation

Project impacts would be less than significant without mitigation.

Threshold 1.b: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

Impact GEO-2 THE PROPOSED DEVELOPMENT MAY RESULT IN EXPOSURE OF PEOPLE OR STRUCTURES TO GEOLOGIC HAZARDS, INCLUDING SEISMIC GROUND SHAKING, WHICH COULD RESULT IN A SIGNIFICANT IMPACT. POTENTIAL SEISMIC HAZARDS WOULD BE MITIGATED THROUGH COMPLIANCE WITH THE LOS ANGELES BUILDING CODE AND THE DESIGN RECOMMENDATIONS OF THE FINAL GEOTECHNICAL REPORTS AS REQUIRED BY MITIGATION MEASURES GEO-1 AND GEO-2. IN ADDITION, THE PROPOSED PROJECT WOULD REPLACE EXISTING OLDER STRUCTURES WITH NEW STRUCTURES THAT COMPLY WITH APPLICABLE SEISMIC REGULATIONS AND BUILDING STANDARDS, THEREBY IMPROVING SEISMIC SAFETY ON THE OSP SPECIFIC PLAN SITE. MOREOVER, ALTHOUGH THE PROPOSED PROJECT WOULD BE EXPOSED TO EXISTING GEOLOGIC HAZARDS, IT WOULD NOT INCREASE THE POTENTIAL FOR SUCH HAZARDS OR CREATE NEW HAZARDS. THEREFORE, WITH IMPLEMENTATION OF MITIGATION MEASURES GEO-1 AND GEO-2, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

Although the project site is not subject to fault rupture, the site is within a seismically active region and could be subject to strong ground shaking in the event of an earthquake at one of the local or regional faults. This hazard is common in southern California and the effects of ground shaking and ground failure can be minimized if the proposed structures are designed and constructed in conformance with current building codes and engineering practices. The Preliminary Geotechnical Reports concluded that a 7.3-magnitude earthquake should be considered for the seismic design of the proposed structures to minimize potential adverse effects (Group Delta 2022a and 2022b).

As discussed in Section 4.4.2, *Regulatory Setting*, the proposed project would be required to comply with State and local seismic safety regulations to ensure that development is constructed in a manner that would minimize risk of damage from earthquakes. These regulations include the Alquist-Priolo Earthquake Fault Zoning Act, Seismic Safety Act, the CBC, and the Los Angeles Building Code. In particular, the proposed project would be required to demonstrate compliance with the Los Angeles Building Code, which incorporates current seismic design provisions of the current CBC, with City amendments, to minimize seismic impacts. The Los Angeles Building Code, through the current CBC, incorporates the latest seismic design standards for structural loads and materials, as well as provisions from the National Earthquake Hazards Reduction Program to minimize losses from an earthquake and maximize earthquake safety.

LADBS is responsible for implementing the provisions of the Los Angeles Building Code, and the proposed project would be required to comply with the plan review and permitting requirements of LADBS, including the recommendations provided in final site-specific geotechnical reports subject to review and approval by LADBS.

The proposed project would not involve mining operations, deep excavation into the earth, or boring of large areas creating unstable seismic conditions or stresses in the earth's crust that could exacerbate seismic hazards. In addition, the existing buildings on the OSP Specific Plan Site were constructed in the 1940s and 1950s, pre-dating modern seismic design, and the replacement of older structures with new structures that comply with current CBC seismic standards would generally improve seismic safety on the project site. Nonetheless, the proposed project would increase development density on the project site, thereby increasing the number of people and structures exposed to seismic ground shaking and resulting in potentially significant impacts.

Mitigation Measures

Mitigation Measures GEO-1 and GEO-2, provided below, would be required to minimize the potential for impacts related to seismic ground shaking and geologic hazards.

GEO-1 Final Geotechnical Report

Prior to issuance of grading permits, the Applicant shall submit final design plans and a final design-level geotechnical report for the OSP Specific Plan Site and 327 Harbor Site to LADBS for review and approval. The final design-level geotechnical reports shall be used for final design of the foundation systems for the structures and shall take into consideration the engineering properties beneath the proposed structures and the projected loads. The final reports shall specify geotechnical design parameters that are needed by structural engineers to determine the type and sizing of structural building materials. The final reports shall be subject to the specific performance criteria imposed by applicable State and local codes and standards. The final geotechnical reports shall be prepared by a registered civil engineer or certified engineering geologist and include appropriate measures to address seismic hazards and ensure structural safety of the proposed structures and future residents and employees. The proposed structures shall be designed and constructed in accordance with all applicable provisions of the CBC and the Los Angeles Building Code. The final design-level geotechnical reports shall address the recommendations provided in the Preliminary Geotechnical Reports prepared by Group Delta, including the following:

- Construction and operation of the proposed project shall be implemented in accordance with the applicable regulatory and code requirements.
- The subsurface geotechnical profile on the OSP Specific Plan Site is complex and variable. The transitions between native materials, fill, and groundwater conditions shall be considered in conjunction with the proposed site plans and building layouts in order to develop the most suitable foundation option for each proposed structure. All recommendations regarding the foundation options for Zones A, B, and C and Transition Zones shall be considered and implemented.
- Mat foundations, deep foundations, and pile types shall be designed and implemented in accordance with the recommendations of the geotechnical reports. The contour of the foundation pressure shall be provided during the structural design phase.

- Floor slabs may be supported on grade if the existing soils on site can be removed and replaced with properly compacted fill soils. If expansive soils are present at the slab-on-grade elevation, floor slabs shall be structurally supported.
- Temporary excavation shall be implemented using conventional heavy-duty grading equipment such as scrapers, loaders, dozers, and excavators. Temporary excavations up to 5 feet deep may stand in vertical cuts, and deeper excavations shall be sloped according to the recommendations of the final geotechnical reports. Temporary shoring shall be designed and implemented according to the guidelines set forth in the Preliminary Geotechnical Reports.
- If unstable or wet subgrade material is encountered during project design and construction, stabilization shall consist of the placement of granular working mats consisting of coarse gravel and geogrid, or subexcavation and replacement with dried soil.
- Basement walls shall be in compliance with the Los Angeles Building Code to resist at-rest earth pressures. The recommended pressure shall be confirmed during the design-level geotechnical investigations and shall consider the presence of expansive soils, which may require the use of higher design earth pressures.
- Final design-level geotechnical investigations shall assess the corrosion potential of on-site soils and the extent and severity of expansive soils.
- Sandy soils, after clearing, grubbing, and removal of deleterious material, are generally suitable for reuse as compacted fills. However, not all on-site sandy soils will be suitable for specific purposes, and selective grading and testing may be required if on-site soils are to be used as select materials. Import fill sources, if any, shall be observed and tested prior to hauling onto the site to evaluate the suitability for use. Imported fill shall comply with the guidance outlined in the Preliminary Geotechnical Reports.
- Further study is required to accurately characterize the complex subsurface conditions on the OSP Specific Plan Site. Design-level geotechnical investigations shall be conducted, and the installation of monitoring wells, borings, and cone penetration tests shall be completed to narrow down the location of uncertified fill transitions zones and further characterize the subsurface materials.

GEO-2 Geotechnical Professional Observation

A certified geotechnical professional shall be retained to observe and test all grading operations for shallow foundations and pile installation for deep foundations during the construction stage of the project. Furnishing of pile load test results shall be required. Evidence of the observations of the certified geotechnical professional at the project site shall be provided to the City Engineer in the form of weekly logs during all grading operations for foundations and pile installation activities.

Significance After Mitigation

With implementation of Mitigation Measures GEO-1 and GEO-2, project-specific Final Geotechnical Reports would be prepared that would include design criteria to minimize the potential for geologic hazards at the site, and project design and construction would be implemented based on the recommendations contained in the Preliminary Geotechnical Reports under the oversight of a certified geotechnical professional. With compliance with existing regulatory requirements and implementation of Mitigation Measures GEO-1 and GEO-2, potential impacts related to ground shaking would be less than significant.

Threshold 1.c: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Impact GEO-3 BASED ON THE RESULTS OF THE PRELIMINARY GEOTECHNICAL REPORTS, PORTIONS OF THE PROJECT SITE SOILS MAY BE SUBJECT TO RISK OF LIQUEFACTION DUE TO UNDERLYING SOIL PROPERTIES. THEREFORE, THE PROJECT HAS THE POTENTIAL TO RESULT IN SIGNIFICANT IMPACTS RELATED TO GROUND FAILURE AND LIQUEFACTION. HOWEVER, PROJECT CONSTRUCTION WOULD INCLUDE THE REPLACEMENT OF UNCERTIFIED FILL ON THE PROJECT SITE WITH STABLE SOILS EXHIBITING LOW LIQUEFACTION POTENTIAL. IN ADDITION, MITIGATION MEASURES GEO-1 AND GEO-2 WOULD REQUIRE THE PREPARATION OF FINAL GEOTECHNICAL REPORTS AND IMPLEMENTATION OF THE RECOMMENDATIONS CONTAINED THEREIN TO ENSURE THE PROJECT WOULD NOT RESULT IN SIGNIFICANT IMPACTS RELATED TO SEISMIC HAZARDS AND UNSTABLE SOILS. WITH IMPLEMENTATION OF MITIGATION MEASURES GEO-1 AND GEO-2, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3 whereas under Scenario B, development would be densest in Phases 1 and 2I. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

The 327 Harbor Site and a portion of the OSP Specific Plan Site (the block located at the northwestern corner of the intersection at 2nd Street and Harbor Boulevard) are within a mapped liquefaction zone (CGS 2021). Based on the results of the Preliminary Geotechnical Reports, the 327 Harbor Site is at risk of liquefaction, while the majority of the OSP Specific Plan Site is at low risk for liquefaction (Group Delta 2022a and 2022b). In particular, soils in Zone B of the OSP Specific Plan Site may be liquefiable. The proposed project would be required to replace all uncertified fill underlying the project site with soils suitable for development pursuant to City requirements established in Chapter 18, Soils and Foundations, of the Los Angeles Building Code. Replacement of the upper uncertified soils on the project site would reduce the risk of liquefaction; however, liquefiable soils may remain at depth beneath the project site and the project could potentially result in substantial adverse effects, including the risk of loss, injury, or death involving liquefaction.

Mitigation Measures

As required by Mitigation Measures GEO-1 and GEO-2 under Impact GEO-2 above, unstable soils across the project site would be replaced by certified fill materials and building foundations would be designed to withstand and minimize hazards related to liquefaction, with oversight by a certified geotechnical professional during foundation construction activities.

Significance After Mitigation

With implementation of Mitigation Measures GEO-1 and GEO-2 and compliance with existing regulatory requirements, the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. Therefore, potential impacts from seismic-related ground failure, including liquefaction and lateral spreading, would be less than significant.

Threshold 1.d: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Impact GEO-4 THE PROJECT SITE IS NOT WITHIN OR IMMEDIATELY ADJACENT TO A MAPPED LANDSLIDE HAZARD AREA AND THE RISK OF SEISMIC-INDUCED LANDSLIDES ON SITE IS LOW. THUS, IMPACTS RELATED TO THE RISK OF LOSS, INJURY, OR DEATH INVOLVING LANDSLIDES WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3 whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

As discussed above in Section 4.4.1, *Environmental Setting*, the project site is not located within or adjacent to a landslide hazard area. The project site is relatively flat, and the potential for seismic-induced landslides on the project site is considered low. Therefore, the project would not directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death, involving landslides. Potential impacts related to landslides would be less than significant.

Mitigation Measures

Because impacts would be less than significant, mitigation is not required.

Significance After Mitigation

Project impacts would be less than significant without mitigation.

Threshold 2: Would the project result in substantial soil erosion or the loss of topsoil?
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Impact GEO-5 CONSTRUCTION OF THE PROPOSED PROJECT COULD RESULT IN SOIL EROSION OR LOSS OF TOPSOIL. HOWEVER, COMPLIANCE WITH EXISTING REGULATIONS, INCLUDING NPDES AND THE LAMC EROSION CONTROL REQUIREMENTS, WOULD REDUCE IMPACTS TO A LESS THAN SIGNIFICANT LEVEL.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

Construction of the proposed project would require grading and excavation. Grading and excavation activities would temporarily expose bare soils, which could potentially be removed from the project site and transported through wind shearing or stormwater runoff. Construction would disturb more than 1.0 acre of land, which mandates implementation of a NPDES-compliant Stormwater Pollution Prevention Plan (SWPPP), as discussed in Section 4.7, *Hydrology and Water Quality*. The SWPPP would include BMPs to reduce soil erosion and sedimentation, including measures such as the regular wetting of exposed soils and the covering of stockpiled soils. Additionally, the project would be required to comply with LAMC Section 64.72, Stormwater Pollution Control Measures for Development Planning and Construction Activities, to minimize erosion during construction. With the implementation of the SWPPP and erosion control measures and BMPs required by the LAMC, project construction would not result in substantial soil erosion or loss of topsoil. Upon completion of construction activities, project site soils would be stabilized and landscaped, and the potential for erosion during project operation would be minimal. Therefore, potential impacts related to soil erosion and topsoil would be less than significant.

Mitigation Measures

Because impacts would be less than significant, mitigation is not required.

Significance After Mitigation

Project impacts would be less than significant without mitigation.

Threshold 3: Would the project 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?
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Impact GEO-6 UNSTABLE SOILS UNDERLY PORTIONS OF THE PROJECT SITE, WHICH COULD RESULT IN SIGNIFICANT GEOLOGIC HAZARDS ON THE PROJECT SITE, INCLUDING LIQUEFACTION. HOWEVER, MITIGATION MEASURES GEO-1 AND GEO-2 WOULD REQUIRE IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FINAL GEOTECHNICAL REPORTS TO MINIMIZE ON-SITE UNSTABLE SOIL CONDITIONS AND ENSURE THE SAFETY OF THE PROPOSED STRUCTURES AND PROJECT INHABITANTS. WITH IMPLEMENTATION OF MITIGATION MEASURES GEO-1 AND GEO-2, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

The 327 Harbor Site and its surroundings are relatively flat. The 327 Harbor Site slopes downward gently to the east, with an elevation of 28 feet above mean sea level in the western portion of the site, sloping downward to an elevation of 21 feet above mean sea level in the eastern portion of the site. The 327 Harbor Site is not within a mapped State of California Earthquake-Induced Landslide Hazard Zone and is not subject to risk of landslides (Group Delta 2022b). The OSP Specific Plan Site slopes downward to the east, with elevations ranging from approximately 80 feet above mean sea level in the western portion of the site and 20 feet above mean sea level in the eastern portion of the site. The OSP Specific Plan Site is not within a mapped State of California Earthquake-Induced Landslide Hazard Zone. Nonetheless, the site is within an area identified by the City of Los Angeles to have the local occurrence of small shallow surficial landslides (Group Delta 2022a). Therefore, there is the potential for significant impacts associated with potential slope instability of deep excavations during project construction at the site. Subsidence is the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal movement. Subsidence is caused by a variety of activities, which include, but are not limited to, withdrawal of groundwater, pumping of oil and gas from underground, the collapse of underground mines, liquefaction, and hydrocompaction. The proposed project would not include installation of new groundwater wells or use of groundwater from existing wells. Additionally, the project site is not associated with long-term dewatering or mining activities and is not prone to permafrost. The subsurface material is not anticipated to contain soluble rocks, and the soils encountered during the geotechnical investigation were not prone to hydrocompaction (Group Delta 2022a and 2022b). Therefore, the potential for subsidence on the project site is considered low.

As discussed above in Section 4.4.1 *Environmental Setting*, and under Impact GEO-3, the majority of the project site is not subject to liquefaction. As part of the Preliminary Geotechnical Reports, the project site was assessed for liquefaction potential under worst-case ground water conditions using historic high groundwater levels. The 327 Harbor Site contains liquefiable soils, and liquefaction-induced settlement on the site would be between 5.0 to 5.5 inches based on the Preliminary Geotechnical Report for the site (Group Delta 2022b). Due to the varying subsurface materials on the OSP Specific Plan Site, the potential of liquefaction-induced settlements varies (Delta Group 2022a). The OSP Specific Plan Site consists of three zones with distinct geotechnical conditions and liquefaction potential (refer to Figure 4.4-1). Zones A and C have low potential for liquefaction, whereas Zone B has higher potential for liquefaction. Therefore, there is the potential for significant impacts related to liquefaction.

Lateral spreading is the horizontal movement or spreading of soil toward an open face. The potential for failure from subsidence and lateral spreading is highest in areas where the groundwater table is high and where relatively soft and recent alluvial deposits exist. The 327 Harbor Site is generally level and no post-construction slopes are planned. According to the site-specific Preliminary Geotechnical Investigation, slope instability and lateral spreading are not a hazard at the 327 Harbor Site (Group Delta 2022b). On the OSP Specific Plan Site, the risk of lateral spreading on site is expected to be low for buildings erected on native slopes or native Pleistocene deposits (predominantly in Zone A and Zone C of the OSP Specific Plan Site). The potential for lateral spreading would be associated with young Holocene-aged alluvium that are predominantly within Zone B, and a small zone mapped at the northeast portion of Zone C (see Figure 4.4-1). Buildings erected on liquefiable soils and/or fill soils on the OSP Specific Plan site would be at risk of impacts due to lateral spreading. Therefore, portions of the project site includes soils that are susceptible to liquefaction and lateral spreading and there is the potential for significant impacts.

Mitigation Measures

The risk for liquefaction and lateral spreading would be assessed during final design in accordance with Mitigation Measure GEO-1, and recommendations for foundation design from the Final Geotechnical Reports would be implemented under the oversight of a certified professional as required by Mitigation Measure GEO-2 under Impact GEO-2.

Significance After Mitigation

With replacement of uncertified fill on the site as required by the LAMC and with implementation of Mitigation Measures GEO-1 and GEO-2, the project site would not subject to unstable soils and impacts related to lateral spreading, subsidence, liquefaction, shallow surficial landslides, slope instability, and collapse would be less than significant.

Threshold 4: Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Impact GEO-7 EXPANSIVE SOIL OCCURS WITHIN PORTIONS OF THE PROJECT SITE AND CONSTRUCTION ATOP THIS SOIL COULD RESULT IN DAMAGE TO PROJECT INFRASTRUCTURE AND BUILDINGS. THEREFORE, THE PROJECT HAS THE POTENTIAL TO RESULT IN SIGNIFICANT IMPACTS RELATED TO EXPANSIVE SOILS. HOWEVER, MITIGATION MEASURES GEO-1 AND GEO-2 WOULD REQUIRE IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FINAL GEOTECHNICAL REPORTS TO MINIMIZE THE POTENTIAL FOR DAMAGE DUE TO EXPANSIVE SOILS AND ENSURE THE SAFETY OF THE PROPOSED STRUCTURES AND PROJECT INHABITANTS. WITH IMPLEMENTATION OF MITIGATION MEASURES GEO-1 AND GEO-2, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

Expansive soils contain clay particles that experience cyclic drying and wetting as the dry and wet seasons pass. Expansive soils experience volumetric changes (shrink/swell) as the moisture content of the clayey soils fluctuate, these shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade when not designed for the anticipated expansive soil pressures. According to the Preliminary Geotechnical Report for the 327 Harbor Site, the upper 15 feet of the project site soils consist of sands and silty sands that are non-plastic and have very low expansion potential (Group Delta 2022b). Therefore, the proposed building on the 327 Harbor Site would not be subject to risks of life and property due to expansive soils.

Soil expansion tests were performed as part of the Preliminary Geotechnical Report on a representative soil sample obtained from the OSP Specific Plan Site. Results indicate the silty subsurface soil material has a low expansion potential. However, clayey soils encountered on the OSP Specific Plan Site (see Figure 4.4-1) are likely expansive based on observations of nearby pavement distress. Zone A contains predominantly non-expansive material. However, expansive soil may be encountered in Zone A approximately 15 feet bgs near its boundary with Zone B. Zone B contains shallow clayey materials that may be expansive. Zone C contains predominantly non-expansive soils, although some expansive soils may be encountered near its boundary with Zone B (Group Delta 2022a). Therefore, the proposed project has the potential to result in significant impacts due to the presence of expansive soils on the OSP Specific Plan Site.

Mitigation Measures

Implementation of Mitigation Measures GEO-1 and GEO-2 from Impact GEO-2 during final project design would be required and would include the assessment and delineation of expansive soils across the project site and the implementation of all recommendations contained in the Final Geotechnical Reports under the oversight of a geotechnical professional.

Significance After Mitigation

With implementation of Mitigation Measures GEO-1 and GEO-2, impacts related to expansive soils would be less than significant.

Threshold 5: 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?

Impact GEO-8 THE PROPOSED PROJECT WOULD BE SERVED BY EXISTING SEWER INFRASTRUCTURE AND WOULD NOT UTILIZE SEPTIC TANKS OR ALTERNATIVE WASTEWATER DISPOSAL SYSTEMS. THEREFORE, NO IMPACT WOULD OCCUR.

The project site is currently served by existing sewer infrastructure as described in Section 2, *Project Description*. Under both Scenario A and Scenario B, the proposed project would continue to utilize the City's sewer system for wastewater disposal. No septic tanks or alternative wastewater disposal systems would be constructed or utilized as part of the proposed project. Therefore, no impact would occur.

Mitigation Measures

Because impacts would be less than significant, mitigation is not required.

Significance After Mitigation

Project impacts would be less than significant without mitigation.

Threshold 6: Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Impact GEO-9 DEVELOPMENT FACILITATED BY THE PROPOSED SPECIFIC PLAN HAS THE POTENTIAL TO DESTROY PREVIOUSLY UNDISCOVERED PALEONTOLOGICAL RESOURCES AND RESULT IN SIGNIFICANT IMPACTS. IMPLEMENTATION OF MITIGATION MEASURE GEO-3 WOULD REQUIRE PALEONTOLOGICAL RESOURCES MONITORING BY A QUALIFIED PROFESSIONAL DURING GROUND-DISTURBING ACTIVITIES TO MINIMIZE THE POTENTIAL FOR IMPACTS. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

The proposed project would involve the phased demolition of existing structures on the OSP Specific Plan Site and the construction of up to 1,553 multi-family residential units, 85,000 sf of services, amenities and administration uses, and 45,000 sf of local-serving commercial/retail uses. The proposed project also includes the construction of 47 housing units on the 327 Harbor Site. Two project development scenarios are proposed (see Section 2, *Project Description*) that would involve phasing the construction in different ways. Under Scenario A, the densest development would be located in Phases 2 and 3, whereas under Scenario B, development would be densest in Phases 1 and 2. Under both scenarios, the footprint of development, construction grading, and number of

residential units and square footage of non-residential uses would be identical. The maximum depth of excavation on the OSP Specific Plan Site would be 25 feet bgs for the removal of uncertified fill and the construction of the two-level below ground parking structures. A total of 378,645 cy of soil would be exported from the OSP Specific Plan Site during construction for the removal of uncertified fill. On the 327 Harbor Site, the maximum depth of excavation would be 5 feet bgs for removal of uncertified fill and 45 feet bgs for the placement of 24-inch piles. Approximately 4,300 cy of soil would be exported from the 327 Harbor Site. Therefore, this analysis applies to both Scenario A and Scenario B.

Based on a paleontological literature review and online database results, the paleontological sensitivity of the geologic units underlying the project site were determined in accordance with criteria set forth by the SVP (2010). One geologic unit underlies the 327 Harbor Site, Quaternary alluvium (Qa), while three geologic units underlie the OSP Specific Plan Site, Quaternary alluvium (Qa), Quaternary older alluvium (Qoa), and San Pedro Sand (Qsp) (see Figure 4.4-4). In most of the OSP Specific Plan Site, the San Pedro Sand directly underlies Quaternary alluvium but in the western part of the OSP Specific Plan Site, the fossiliferous Timms Point Silt may occur (Dibblee et al. 1999; Jefferson 2010; PBDB 2022; UCMP 2022).

Quaternary older alluvium and the San Pedro Sand have high paleontological sensitivity due to their extensive fossil producing history, including within the OSP Specific Plan Site (Bell 2021; Jefferson 2010; Long 1993; PBDB 2022; UCMP 2022). Young Holocene-aged Quaternary alluvium is generally too young to preserve scientifically significant paleontological resources (SVP 2010). However, these units likely occur at the project site as older Holocene (i.e., greater than 500 years old) or as a thin veneer of younger sediments, with older sediments at or near the surface. Therefore, young Holocene-aged Quaternary alluvium at the project site also has high paleontological sensitivity.

As proposed, project ground disturbance would reach depths of up to 25 feet bgs and 45 bgs for excavations at the OSP Specific Plan Site and 327 Harbor Site, respectively. Ground disturbance to this extent would directly disturb geologic units of high paleontological sensitivity and has the potential to damage or destroy scientifically important fossils. As such, project construction could potentially result in significant impacts to paleontological resources.

Mitigation Measures

Mitigation Measure GEO-3, provided below, would be required to minimize the potential for impacts to paleontological resources during project ground-disturbing activities.

GEO-3 Paleontological Resources Monitoring and Mitigation

1. **Qualified Paleontologist.** The project applicant shall retain a Qualified Paleontologist to direct all mitigation measures related to paleontological resources. A qualified professional paleontologist is defined by the Society of Vertebrate Paleontology (SVP) standards (SVP 2010) as an individual preferably with an M.S. or Ph.D. in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology of California, and who has worked as a paleontological mitigation project supervisor for a least two years (SVP 2010).
2. **Paleontological Worker Environmental Awareness Program.** Prior to the start of construction, the Qualified Paleontologist or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction staff.

3. **Paleontological Monitoring.** Full-time paleontological monitoring shall be conducted during ground-disturbing construction activities (i.e., grading, trenching, foundation work) within native (i.e., previously undisturbed) sediments of any depth in all project areas. Ground-disturbing activities that only impact artificial fill (i.e., previously disturbed) sediments do not require paleontological monitoring. Paleontological monitoring shall be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources and meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The duration and timing of the monitoring will be determined by the Qualified Paleontologist based on the observation of the geologic setting from initial ground disturbance, and subject to the review and approval by the City of Los Angeles. If the Qualified Paleontologist determines full-time monitoring is no longer warranted, based on the specific geologic conditions once the full depth of excavations has been reached, they may recommend monitoring be reduced to periodic spot-checking or ceased entirely. Monitoring shall be reinstated if any new ground disturbances are required, and reduction or suspension shall be reconsidered by the Qualified Paleontologist at that time. In the event of a fossil discovery by the paleontological monitor, all work within a 50-foot radius of the find shall cease. The Qualified Paleontologist shall evaluate the find before restarting construction activity in the area. If it is determined that the fossil(s) is (are) scientifically significant, the Qualified Paleontologist shall complete the following conditions to mitigate impacts to significant fossil resources:
 - a. **Salvage of Fossils.** If fossils are discovered, the paleontological monitor shall have the authority to halt or temporarily divert construction equipment within 50 feet of the find until the monitor and/or lead paleontologist evaluate the discovery and determine if the fossil may be considered significant. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. Bulk matrix sampling may be necessary to recover small invertebrates or microvertebrates from within paleontologically sensitive deposits.
 - b. **Preparation and Curation of Recovered Fossils.** Once salvaged, significant fossils shall be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection (such as the Natural History Museum of Los Angeles County), along with all pertinent field notes, photographs, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Qualified Paleontologist.
4. **Final Paleontological Mitigation Report.** Upon completion of ground-disturbing activity (and curation of fossils, if necessary), the Qualified Paleontologist shall prepare a final report describing the results of the paleontological monitoring efforts associated with the project. The report shall include a summary of the field and laboratory methods, an overview of the project geology and paleontology, a list of taxa recovered (if any), an analysis of fossils recovered (if any), and the scientific significance, and recommendations. The report shall be submitted to the City of Los Angeles. If the monitoring efforts produced fossils, then a copy of the report shall also be submitted to the designated museum repository.

Significance After Mitigation

With implementation of Mitigation Measure GEO-3, potential impacts to paleontological resources would be less than significant.

4.4.4 Cumulative Impacts

As discussed above, the proposed project is anticipated to result in less than significant impacts to geology and soils with implementation of Mitigation Measures GEO-1 through GEO-3. There are 12 projects in the cumulative projects list, including adaptive reuse of an existing building and construction of new mixed-use, hotel, restaurant, and residential developments, as listed in Section 3.4, *Cumulative Development*. In total, cumulative projects in the vicinity would add 1,508 dwelling units to the area, as well as 80 hotel rooms and a variety of new commercial and retail opportunities.

a. Geologic and Seismic Hazards

Cumulative development in the project site vicinity would gradually increase population and jobs in San Pedro, and therefore, gradually increase the number of people exposed to potential geological hazards, including effects associated with seismic events, such as ground rupture, seismic shaking, liquefaction, and landslides, as well as unstable soils. However, geologic hazards are site-specific, and individual developments would not create compounding impacts that would affect geologic conditions on other sites. Moreover, other development projects would be subject to CEQA review on a case-by-case basis and would be required to comply with applicable provisions of the City of Los Angeles General Plan, LAMC, and CBC to minimize seismic and soils risks. The City also requires all new structures comply with seismic and geologic hazard safety standards, including design and construction standards that regulate land use in areas known to have or to potentially have significant seismic and/or other geologic hazards. Therefore, cumulative impacts related to geologic and seismic hazards would be less than significant.

b. Paleontological Resources

Cumulative development in the project site vicinity would increase the potential for impacts to buried paleontological resources through ground-disturbing construction activities. However, the potential for the presence of paleontological resources is site-specific, and individual developments would not create compounding impacts that would affect paleontological resources on other sites. Similar to the proposed project, individual development proposals are reviewed separately by the City and would undergo environmental review when it is determined that the potential for significant impacts exists. In the event future cumulative development could result in impacts to paleontological resources, impacts to such resources would be addressed on a case-by-case basis. Cumulative development projects would be expected to implement similar measures as the proposed project to reduce impacts to paleontological resources. Therefore, cumulative impacts to paleontological resources would be less than significant.

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