5.6 GEOLOGY AND SOILS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the proposed La Puerta School Site Specific Plan (Specific Plan) to impact geological and soil resources, paleontological resources, or unique geologic features in the City of Claremont. The analysis in this section is based in part on the following technical report:

- *Cultural Resources Assessment*, BCR Consulting, LLC, August 26, 2022
- *Preliminary Soils and Engineering Geologic Investigation,* GeoSystems, February 14, 2002

Complete copies of these technical reports are included in the Appendices D and E, respectively, of this DEIR.

5.6.1 Environmental Setting

Federal, state, and local laws, regulations, plans, or guidelines that are related to protection and preservation of geologic and paleontological resources and applicable to the Specific Plan are summarized below.

5.6.1.1 REGULATORY BACKGROUND

Federal

There are no federal regulations directly applicable to the geotechnical conditions of the Project Area. Nonetheless, installations of any underground utility lines are required to comply with industry standards specific to the type of utility (National Clay Pipe Institute for sewers; American Water Works Association for water lines, etc.), and the discharge of contaminants is required to be controlled through the National Pollutant Discharge Elimination System (NPDES) permitting program for management of construction and municipal stormwater runoff. These standards contain specifications for installation, design, and maintenance to reflect site-specific geotechnical conditions.

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and nonregulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the EPA to implement water quality regulations. Please see Chapter 5.9, *Hydrology and Water Quality*, of this DEIR for more detail regarding the CWA.

National Pollution Discharge Elimination System

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States from their municipal separate storm sewer systems.

Paleontological Resources Preservation Act

The federal Paleontological Resources Preservation Act of 2002 limits the collection of vertebrate fossils and other rare and scientifically significant fossils to qualified researchers who have obtained a permit from the appropriate state or federal agency. These researchers must agree to donate any materials recovered to recognized public institutions where they will remain accessible to the public and other researchers. The act incorporates key findings of a report, "Fossils on Federal Land and Indian Lands," issued by the Secretary of the Interior in 2000, which establishes that most vertebrate fossils and some invertebrate and plant fossils are considered rare resources.

State

California Alquist-Priolo Earthquake Fault Zoning Act

The California Alquist-Priolo Earthquake Fault Zoning Act was signed into state law in 1972, and amended, with its primary purpose being to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The act requires the State Geologist of the California Geologic Survey to delineate regulatory zones known as "earthquake fault zones" along faults that are "sufficiently active" and "well defined" and to issue and distribute appropriate maps to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Pursuant to this act and as stipulated in the California Code of Regulations (CCR), Title 14, Section 3603(a), structures for human occupancy are not permitted to be placed across the trace of an active fault. The act also prohibits structures for human occupancy within 50 feet of the trace of an active fault, unless proven by an appropriate geotechnical investigation and report that the development site is not underlain by active branches of the active fault, as stipulated in 14 CCR Section 3603(a). The act requires that cities and counties withhold development permits for sites within an earthquake fault zone until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting, as stipulated in 14 CCR Section 3603(d).

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act was adopted by the state in 1990 to protect the public from the effects of earthquake hazards other than surface fault rupture, such as strong ground shaking, liquefaction, seismically induced landslides, or other ground failure. The goal of the act is to minimize loss of life and property by identifying and mitigating seismic hazards. The California Geologic Survey prepares and provides local governments with seismic hazard zone maps that identify areas susceptible to amplified shaking, liquefaction, earthquake-induced landslides, and other ground failures. Section 2697(a) of the Act states that "cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard."

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act was adopted by the state in 2014 to a establish a statewide framework to help protect groundwater resources over the long term. The act established a priority framework for all 515 groundwater basins in California, categorizing them into very low, low, medium, and high priority based on eight components. The act requires local agencies to form groundwater sustainability agencies for the high and medium priority basins. These agencies develop and implement groundwater sustainability plans to avoid undesirable results and mitigate overdraft within 20 years. The Project Area is within the Coastal Basin of Los Angeles Groundwater Basin, Central Subbasin, which is classified as a very low priority basin.

California Building Code

Current law states that every local agency enforcing building regulations, such as cities and counties, must adopt the provisions of the California Building Code (CBC) within 180 days of its publication. The publication date of the CBC is established by the California Building Standards Commission, and the code is under Title 24, Part 2, of the CCR. The CBC, which is adopted by reference in Chapter 15.04, Building Code, of the Claremont Municipal Code, provides minimum standards to protect property and public safety by regulating the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The CBC contains provisions for earthquake safety based on factors including occupancy type, the types of soil and rock on-site, and the strength of ground shaking with a specified probability at a site.

Chapter 16 and 16A of the CBC deal with structural design requirements governing seismically resistant construction (Section 1604), including factors and coefficients used to establish seismic site class and seismic occupancy category for the soil/rock at the building location and the proposed building design (Sections 1610). Chapter 18 and 18A include the requirements for foundation and soil investigations (Section 1803); excavation, grading, and fill (Section 1804); allowable load-bearing values of soils (Section 1806); retaining walls (Section 1807); the design of footings, foundations, and slope clearances (Sections 1808); and pier, pile, driven, and cast-in-place foundation support systems (Section 1810). Chapter 33 includes requirements for safeguards at work sites to ensure stable excavations and cut or fill slopes (Section 3304). Appendix J of the CBC includes grading requirements for the design of excavations and fills (Sections J106 and J107) and for erosion control (Sections J110). Construction activities are subject to occupational safety standards for excavation, shoring, and trenching as specified in the California Division of Occupational Safety and Health regulations (CCR Title 8). The CBC is revised every three years. The 2019 CBC took effect on January 1, 2020.

Soils Investigation Requirements

Requirements for soils investigations for new construction are in California Health and Safety Code Sections 17953 to 17955, and in Section 1803 of the CBC. Testing of samples from subsurface investigations is required, such as from borings or test pits. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness which are included as part of the geotechnical evaluation required by the CBC.

California Public Resources Code

Paleontological sites are protected under a wide variety of state policies and regulations in the California Public Resources Code (PRC). In addition, paleontological resources are recognized as nonrenewable resources and receive protection under the PRC and CEQA. PRC Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244 states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

This statute prohibits the removal, without permission, of any paleontological site or feature from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. As a result, local agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) lands.

Statewide General Construction Permit

Construction projects of one acre or more are regulated under the General Construction Permit, Order No. 2012-0006-DWQ, issued by the State Water Resources Control Board in 2012. Projects obtain coverage by developing and implementing a Stormwater Pollution Prevention Plan estimating sediment risk from construction activities to receiving waters and specifying best management practices (BMPs) that would be used by the project to minimize pollution of stormwater.

Regional

Los Angeles County All-Hazard Mitigation Plan

The Disaster Mitigation Act of 2000, Public Law 106-390 (Section 322(a–d)) requires that local governments, as a condition of receiving federal disaster mitigation funds, adopt a mitigation plan that describes the process for identifying hazards, vulnerabilities, and risks; identifies and prioritizes mitigation actions; encourages the development of local mitigation; and provides technical support for those efforts. In response to this and the requirements of the California Office of Emergency Services, the County of Los Angeles prepared the Los Angeles County All-Hazard Mitigation Plan to reduce and/or eliminate the effects of hazards through well-organized public education and awareness efforts, preparedness, and mitigation.

Local

City of Claremont Municipal Code

The City of Claremont Municipal Code Title 8, Chapter 8.28, and Title 15, Chapter 15.04, are relevant to potential geological impacts of development accommodated by the Specific Plan. Chapter 8.28, Stormwater and Runoff Pollution Control, provides minimum requirements to control the discharge of pollutants into the City's municipal storm drain system and to ensure that discharges from the municipal storm drain system comply with the current NPDES Permit No. CAS004001, including amendments and California Regional Water Quality Control Board approvals. Chapter 15.04, Building Code, establishes the adoption of the California Building Code for the City of Claremont with amendments.

City of Claremont General Plan

The Public Safety and Noise Element of the City of Claremont General Plan (Claremont 2009) identifies policies pertaining to minimizing the exposure to geologic hazards, and the following goals and policies are applicable to the Specific Plan:

Goal 6-2: Minimize the risk of injury, loss of life, and damage to property resulting from natural and human-caused disasters and conditions.

- **Policy 6-2.1.** Practice proactive planning and development approaches that require developers to identify potential hazards that might affect a development and mitigate the potential hazards as needed to the satisfaction of the City.
- **Policy 6-2.2.** Enforce Uniform Building Code standards for grading.
- **Policy 6-2.7.** Require that development of major facilities and high-occupancy buildings in the hazardous zone submit design analysis, soils, geologic, and seismic reports to the City to indicate that an undue hazard does not exist or would not result from construction on the property.

Goal 6-4: Minimize risks to public safety from seismic events.

- **Policy 6-4.1.** Enforce the most recent building codes governing seismic safety and structural design to minimize damage from earthquakes.
- **Policy 6-4.2.** Continue to support efforts to identify location, potential activity, and dangers associated with faults under investigation, and implement recommendations (setbacks, foundation/building design methods, etc.) contained in geotechnical reports.

Goal 6-5: Minimize risks to public safety from geologic events.

- **Policy 6-5.1.** Require geotechnical evaluation and recommendations prior to new development, as appropriate. Such geotechnical evaluation shall analyze the potential hazards from:

- Landslides
- Liquefaction
- Expansive soils
- Mud and debris flow

Recommendations shall include mitigation to avoid or minimize the identified hazards.

5.6.1.2 EXISTING CONDITIONS

Geologic Setting

Regional Geology

Based on a review of the United States Geological Survey 7.5-minute Topographic Series, Mount Baldy, California Quadrangle Map, the Project Area is located near the northeastern edge of the San Gabriel Valley within the southern margin of the Transverse Ranges Geomorphic Province (USGS 2015). The Transverse Ranges Geomorphic Province extends approximately 320 miles eastward from Point Arguello and San Miguel Island to the mountains of Joshua Tree National Park and is characterized by predominantly east-west trending mountains, faults and folds ranging in age from Cretaceous to Recent (Norris and Webb 1990). The Project Area is located atop middle Holocene alluvial fan deposits (Morton and Miller 2003). Underlying soils at the Project Area are mapped as Urban Land-Soboba complex, with 0 to 5 percent slopes (USDA 2022). Based on the lithologic observations conducted for the Project Area by GeoSystems (2002), alluvium in the Project Area mostly consists of sandy gravel and gravelly sand. The Project Area lies at an approximate elevation of 1,480 feet above sea level (USGS 2015).

Groundwater

The Project Area is in the Canyon Basin subarea of the Six Basins Area aquifer system. Based on groundwater data from well 4477K located about 0.3 miles southwest of the Project Area, groundwater was observed at a depth of approximately 191 feet below ground surface in October 2020 (LACDPW 2022). Based on the California Geological Survey seismic hazard report for the Mount Baldy quadrangle, historical groundwater was greater than 50 feet below ground surface in the vicinity of the Project Area.

Seismic Setting

Regional Faulting

The Project Area is located within a seismically active region adjacent to major geologic structures (active faults) and affected by historic large earthquakes. Because the Project Area is in a seismically active region adjacent to active faults, it is reasonable to assume that it will be subjected to future severe seismic shaking that may occur along one or more of these local or regional faults. The earthquake characteristics of the most significant active faults within 20 miles of the Project Area are listed in Table 5.6-1. The State of California (Hart and Bryant 2007) defines an "active fault" as one that has had surface displacement within Holocene time (approximately

the last 11,000 years). "Potentially Active" faults are defined as faults that show evidence of surface displacement during Quaternary time (within the last 1.6 million years).

Table 5.6-1 Estimated Maximum Earthquake Magnitude and Distance to Faults Near Project Area

Fault	Distance to Project Area (miles)	Magnitude (Mmax)
Sierra Madre	0.1	7.0
Cucamonga	0.4	7.0
San Jose	0.5	6.5
Chino-Central Avenue	7	6.7
San Jacinto	14	6.7
Clamshell-Sawpit	15	6.5
San Andreas, Mojave and San Bernardino segments	16	7.8

Source: GeoSystems 2002; USGS 2022.

Based on a review of the readily available geologic literature (Jennings and Bryant 2010), there are no known active or potentially active faults passing through or immediately adjacent to the Project Area, and the Project Area is not within or immediately adjacent to a fault-rupture hazard zone (Alquist-Priolo Earthquake Fault Zone). The Sierra Madre Fault is located approximately 0.1 mile northwest of the Project Area. Cucamonga Fault is located approximately 0.4 miles southeast of the Project Area. The San Jose Fault is located approximately 0.5 miles southeast of the Project Area.

The most important structural features in the area from a seismic shaking standpoint are the San Andreas fault zone to the northeast, and the Cucamonga fault to the southeast (Jennings and Bryant 2010).

Fault Rupture

Alquist-Priolo earthquake fault zones are regulatory zones surrounding the surface traces of active faults in California. Wherever an active fault exists, if it has the potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally 50 feet). An active fault, for the purposes of the Alquist-Priolo Act, is one that has ruptured in the last 11,000 years.

The Project Area is not within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone (CGS 2016). Based on a review of the readily available geologic literature, there are no known active or potentially active faults on or immediately adjacent to the Project Area (Jennings and Bryant 2010; Morton and Miller 2003).

Earthquake Ground Shaking

Southern California is a seismically active region. Impacts from ground shaking could occur many miles from an earthquake epicenter. The potential severity of ground shaking depends on many factors, including the size and type of the earthquake, the distance of the site from the earthquake epicenter, and the nature of the earth materials beneath a given site. The San Gabriel Valley region has experienced several large earthquakes through

recorded history, with the last most sizable event being the magnitude 6.7 Northridge Earthquake in 1994. The earthquake occurred on a blind thrust fault centered in the San Fernando Valley community of Northridge.

Liquefaction and Related Ground Failure

Liquefaction happens when loose, saturated sand or gravel deposits lose their load-supporting capability when subjected to intense shaking. Liquefaction potential varies based upon three main contributing factors: 1) cohesionless, granular soils having relatively low densities (usually of Holocene age); 2) shallow groundwater (generally less than 50 feet); and 3) moderate to high seismic ground shaking. Cohesionless and granular soils are sand or gravel, typically with little or no clay content. Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking.

The Seismic Hazards Mapping Act (1990) directed the State Geologist to delineate regulatory "zones of required investigation" to reduce the threat to public health and safety and to minimize the loss of life and property posed by earthquake-triggered ground failures. Zones of required investigation, referred to as "Seismic Hazard Zones" in CCR Article 10, § 3722, are areas shown on Seismic Hazard Zone Maps where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide ground displacements. The Project Area is not located within any seismic hazard zones (CGS 2016).

Lateral spreading involves lateral ground movements caused by seismic shaking. These lateral ground movements are often associated with a weakening or failure of an embankment or soil mass overlying a layer of liquefied sands or weak soils. Shallow groundwater, liquefiable, cohesionless soils and the presence of a free-face such as a stream bank are all contributing factors in determining the likelihood of lateral spreading.

Geologic Hazards

Landslides

Natural landslides occur when soils or bedrock lose strength in a sloping area (often during heavy rains or an earthquake), and gravity causes the materials to slide downhill. Human activities can also cause landslides; these activities include undercutting a hill, placing a heavy weight like fill at the top of a slope, or substantially increasing the amount of water in a hillside. However, since the Project Area and surrounding properties are nearly flat, these areas are not subject to landslides.

Expansive Soils

Expansive soils are silts and clays that swell and shrink as the amount of water in the soil increases and decreases, respectively. This change in water content primarily occurs in the near-surface environment, and deeper soils may undergo much less change in water content; also, the weight of overlying soils minimizes swelling uplift. Based on testing on the Project Area, on-site soils have a very low expansion potential.

Erosion

Erosion is a normal and inevitable geologic process whereby earthen materials are loosened, worn away, decomposed, or dissolved; removed from one place and transported to another. Precipitation, running water, and wind are all agents of erosion. Ordinarily, erosion proceeds imperceptibly, but when the natural equilibrium of the environment is changed, the rate of erosion can be greatly accelerated. Accelerated erosion in a developed area can cause damage by undermining structures; blocking storm drains; and depositing silt, sand, or mud on roads and in tunnels. Eroded materials can eventually be deposited in local waters, where the carried silt remains suspended in the water for some time, constituting a pollutant and altering the normal balance of plant and animal life.

Erosion can occur when rainfall or other sources result in the placement of a significant amount of water on a sloping, bare-earth surface. Eroded soils can cause damage if they enter a waterway or a storm drain facility that deposits the collected water and entrained sediment into local waterways and ultimately the Pacific Ocean.

Topsoil is the thin, rich layer of soil where most nutrients for plants are found and where most land-based biological activity takes place. The loss of topsoil through erosion is a major agricultural and water quality problem.

Subsidence

Subsidence of the ground surface has been reported in alluvial basins where significant amounts of groundwater (often in an overdraft condition) or petroleum are withdrawn over long periods. The primary cause of nontectonic subsidence has been the alluvial compaction by closing of porosity due to removal of large quantities of groundwater or petroleum and a significant lowering of the groundwater levels.

Ground cracking from subsidence in the future would be expected to occur along the boundaries of groundwater basins, such as a contact between alluvium and bedrock, or overprominent geologic structures, i.e., faults.

Paleontological Setting

Paleontological resources are fossils—that is, organisms or fragments, impressions, or traces of organisms preserved in rock. The Project Area is located near the northeastern edge of the San Gabriel Valley. It is situated east of Los Angeles on the southern margin of the Transverse Ranges Geomorphic Province. As noted earlier under "Regional Geology," the Project Area is situated on an alluvial plain, and surface deposits consist of Holocene-age alluvium. Based on the high infiltration capacity of the gravelly and sandy lithology of on-site soils, the potential for significant fossil discoveries in shallow soils at the Project Area is low.

5.6.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

G-1 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

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

ii) Strong seismic ground shaking.

iii) Seismic-related ground failure, including liquefaction.

iv) Landslides.

G-2 Result in substantial soil erosion or the loss of topsoil.

G-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.

G-4 Be located on expansive soil, as defined in Table 18-1B of the Uniform building Code (1994), creating substantial direct or indirect risks to life or property.

G-5 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

G-6 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

5.6.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Notice of Preparation disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.6-1: Future project residents [or occupants, visitors, etc.] would be subject to potential seismic-related hazards. [Threshold G-1i through G-1iv])

Impact Analysis: Southern California is a seismically active region. Impacts from ground shaking could occur many miles from an earthquake epicenter. The potential severity of ground shaking depends on many factors, including the distance from the originating fault, the earthquake magnitude, and the nature of the earth materials beneath a given site.

There are no identified fault-rupture hazard zones as defined by the Alquist-Priolo Special Studies Zones Act within the City of Claremont, including the Project Area (CGS 2016). Based on a review of the onsite study by GeoSystems (2002) and a geologic map (Morton and Miller 2003), impacts from fault rupture on the Project Area are unlikely.

Any future development within the Project Area is required to be designed in compliance with seismic requirements of the CBC and Title 24 CCR criteria for seismic safety. Any future development accommodated by the Specific Plan is required to comply with established Claremont Municipal Code and CBC standards regulating grading and building construction for seismic safety. This includes preparation of a project- and site-specific geotechnical evaluation prior to any construction activity that would identify seismic and other geotechnical hazards and how to avoid them. Any recommendations provided within the geotechnical evaluation to ensure compliance with the Claremont Municipal Code and CBC standards would be implemented during project construction and design. Compliance with established standards would ensure impacts related to structural collapse or other shaking related hazards are less than significant.

The Project Area is within the Mount Baldy 7.5 Minute Quadrangle Seismic Hazard Zone map and is not in an area designated as susceptible to liquefaction or earthquake-induced landslides (CGS 2016). Liquefaction is dependent, in part, on the groundwater table since it requires saturated soil. Susceptibility to liquefaction is considered low when depth to groundwater is greater than 50 feet. The current and historical high groundwater level contours are both greater than 50 feet below the ground surface (LACDPW 2022; CGS 2000). Based on the most recent groundwater data for the area (LACDPW 2022), liquefaction at the Project Area is not likely to occur. Additionally, development accommodated by the Specific Plan is required to comply with established Claremont Municipal Code and CBC building codes and standards regulating grading and building construction for seismic safety, including a required geotechnical evaluation prior to site development as referenced above. The geotechnical evaluation, required by the CBC prior to construction, would include depth to groundwater within the Project Area and any standard practices to address potential related liquefaction. Therefore, implementation of the Specific Plan would not subject people or structures to substantial liquefaction hazards, and impacts would be less than significant.

Landslides are a type of erosion in which masses of earth and rock move down slope as a single unit. Susceptibility of slopes to landslides and lurching (earth movement at right angles to a cliff or steep slope during ground shaking) depend on several factors that are usually present in combination—steep slopes, condition of rock and soil materials, presence of water, formational contacts, geologic shear zones, and seismic activity. The Project Area and adjacent properties are nearly flat and exhibit no substantial elevation changes or unusual geographic features. In the absence of significant ground slopes, the potential for landslides is considered negligible. No impact would occur.

Impact 5.6-2: Unstable geologic unit or soils conditions, including soil erosion, would not result from development accommodated by the Specific Plan. [Thresholds G-2 and G-3]

Impact Analysis: Soils are particularly prone to erosion during the grading phase of development, especially during heavy rains. Construction projects of one acre or more are regulated under the General Construction Permit, Order No. 2012-0006-DWQ, issued by the State Water Resources Control Board in 2012. Projects obtain coverage by developing and implementing a Stormwater Pollution Prevention Plan estimating sediment risk from construction activities to receiving waters and specifying BMPs that would be used by the project to minimize pollution of stormwater. The use of a Storm Water Pollution Prevention Plan (SWPPP), which specifies BMPs for temporary erosion controls, reduces the potential for erosion during construction period activities. Standard erosion control measures would be implemented as part of a SWPPP for proposed

development within the Project Area to minimize the risk of erosion or sedimentation during construction. The SWPPP must include an erosion control plan that prescribes measures such as phasing grading, limiting areas of disturbance, designating restricted-entry zones, diverting runoff from disturbed areas, protective measures for sensitive areas, outlet protection, and provisions for revegetation or mulching.

Any future development within the Project Area accommodated by the Specific Plan would be required to be designed in compliance with existing regulations, including the preparation and submittal of a SWPPP and a geotechnical evaluation, would identify project- and site-specific requirements to ensure compliance with stablished Claremont Municipal Code and CBC standards regulating grading, building construction, and erosion. Therefore, impacts would be less than significant.

A comprehensive discussion of erosion and water quality from rain events can be found in Section 5.9, *Hydrology and Water Quality*.

Impact 5.6-3: Soil conditions within the Project Area would not result in risks to life or property. [Thresholds G-3 and G-4]

Impact Analysis: Landslides are a type of erosion in which masses of earth and rock move down slope as a single unit. Susceptibility of slopes to landslides and lurching (earth movement at right angles to a cliff or steep slope during ground shaking) depend on several factors that are usually present in combination—steep slopes, condition of rock and soil materials, presence of water, formational contacts, geologic shear zones, and seismic activity. The Project Area and adjacent properties are nearly flat and exhibit no substantial elevation changes or unusual geographic features. In the absence of significant ground slopes, the potential for landslides is considered negligible. No impact would occur.

Expansive soils swell when they become wet and shrink when they dry out, resulting in the potential for cracked building foundations and, in some cases, structural distress of the buildings themselves. Based on a review of the onsite study by GeoSystems (2002) and a review of the geologic map by Morton and Miller (2003), the Project Area is located on alluvial fan deposits predominantly composed of gravel and sand. Therefore, expansive soils conditions are not expected to occur on the Project Area. Standard grading technologies and compliance with current grading requirements in accordance with the seismic requirements of the CBC would reduce impacts from expansive soils. The potential expansive soil impacts would be evaluated during the appropriate phases of construction and reduced through standard soil engineering techniques. Therefore, impacts would be less than significant.

The Project Area is underlain by alluvial fan deposits predominantly composed of gravel and sand. Settlement and collapse are likely to exist in areas with alluvial soils. Areas of large settlement can damage or, in extreme cases, destroy structures. The presence of compressible soils in the city represents a hazard to structures and people. CBC design code has been adopted by the Claremont Municipal Code and requires that structures be designed to mitigate compressible soils. A geotechnical evaluation is required to be prepared and any recommendations within the report would be followed. Methods that could be used to reduce the impact of compressible soils include in-situ (in place) densification, transferring the load to underlying non-compressible layers with piles, and over-excavation of compressible soil and recompaction with engineered fill. Mandatory

compliance with the recommendations of the statutorily required geotechnical evaluation would reduce the impact of compressible soils to less than significant.

As stated in Impact 5.6-1, it is unlikely that liquefaction would occur at the Project Area, and a geotechnical evaluation will evaluate the on-site underlying geotechnical conditions, as required by the CBC. In a similar fashion, lateral spreading susceptibility which is dependent on shallow groundwater and liquefiable, cohesionless soils will be evaluated during the geotechnical evaluation of the site. The geotechnical evaluation, required by the CBC prior to the start of construction, would identify recommendations to incorporate into the construction of development accommodated by the Specific Plan. Compliance with the recommendations outlined in the geotechnical evaluation would ensure that impacts related to unstable soils would be less than significant.

As discussed in Section 5.16.2, *Water Supply and Distribution Systems*, of Chapter 5.16, *Utilities and Service Systems*, development accommodated by the Specific Plan would be served by the existing water systems and would not directly pump groundwater. As such, implementation of the Specific Plan would not substantially increase the amount of groundwater pumped from beneath the Project Area and thus would not exacerbate potential hazard from subsidence. The statutorily required sustainable groundwater management practices of the Six Basins Watermaster pursuant to the Sustainable Groundwater Management Act of 2014 would ensure that the impact of subsidence would be less than significant.

Impact 5.6-4: Development accommodated by the Specific Plan would not require the use of septic tanks. [Threshold G-5]

Impact Analysis: Implementation of the Specific Plan would not involve the use of septic tanks or alternative wastewater disposal systems. Development accommodated by the Specific Plan would utilize the existing local sewer system in the surrounding roadways. Therefore, no impact related to septic tanks would result from project implementation.

Impact 5.6-5: Implementation of the Specific Plan would not result in the destruction of a unique paleontological resource or site or unique geologic feature. [Threshold G-6]

Impact Analysis: A paleontological resource is a natural resource characterized as faunal or floral fossilized remains but may also include specimens of nonfossil material dating to any period preceding human occupation. These resources are valued for the information they yield about the history of the earth and its past ecological settings. The resources are found in geologic strata conducive to their preservation, typically sedimentary formations. Often, they appear as simply small outcroppings visible on the surface; other times they are below the ground surface and may be encountered during grading.

The Project Area is underlain by gravelly and sandy alluvial fan deposits, which are considered middle Holocene in age at the surface. Shallow excavations are not likely to contain fossil specimens and the gravelly and sandy alluvial soils are not conducive to the optimal conditions for fossils to be preserved. Project-related site preparation would include removal of existing soil to a maximum depth of about six feet. Paleontological

resource impacts would be less than significant based on the soil lithology and the expected maximum depth of disturbance.

5.6.4 Cumulative Impacts

The cumulative setting for geologic resources is typically site specific. As discussed previously, implementation of the Specific Plan would not result in significant impacts related to geology and soils. Although the Project Area may be subject to potentially significant hazards of strong ground shaking, settlement and collapse, mandatory compliance with State and City regulations would ensure these impacts would be less than significant.

The identified cumulative development listed in Chapter 4, *Environmental Setting*, Table 4-2, would be subject to the same federal, state, and local regulations that are applicable to the Specific Plan. Since impacts associated with geology and soils are by their nature focused on specific sites or areas, the less-than-significant impacts within the Project Area to avoid impacts to geologic and paleontological resources from development accommodated by the Specific Plan, would not contribute to a cumulative increase in hazards in the immediate vicinity of the Project Area. Therefore, cumulative impacts associated with geology and soils would be less than significant.

5.6.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.6-1 through 5.6-5.

5.6.6 Mitigation Measures

No significant adverse impacts related to geology and soils were identified and no mitigation measures are necessary.

5.6.7 Level of Significance After Mitigation

No significant adverse impacts related to geology and soils were identified.

5.6.8 References

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5. Environmental Analysis
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