

4.4 GEOLOGY AND SOILS

Based on the analysis in the Initial Study (see Appendix A of this Draft EIR) it was determined that construction and operation of the proposed project would not result in significant environmental impacts related to fault ruptures, liquefaction, lateral spreading, soil erosion, soil expansion, or soil instability. Therefore, this chapter includes an evaluation of the potential environmental consequences associated with paleontological resources. This chapter also describes the environmental setting, including regulatory framework and existing paleontological resources on the project site, and identifies mitigation measures that would avoid or reduce significant impacts.

4.4.1 ENVIRONMENTAL SETTING

4.4.1.1 REGULATORY FRAMEWORK

This section summarizes the existing State regulations that apply to paleontological resources. There are no federal, regional, or local policies or regulations regarding this subject.

California Environmental Quality Act

Paleontological resources are afforded protection under CEQA. The Society of Vertebrate Paleontology has set significance criteria for paleontological resources.¹ Most practicing professional vertebrate paleontologists adhere closely to the Society of Vertebrate Paleontology's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most State regulatory agencies with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the Society of Vertebrate Paleontology.

Public Resources Code Section 5097

Public Resources Code (PRC) Section 5097.5 prohibits the removal of any paleontological site or feature from public lands without the permission of the jurisdictional agency.

Penal Code Section 622.5

The California Penal Code Section 622.5 establishes the penalties for damage or removal of paleontological resources.

¹ Society of Vertebrate Paleontology, 2010, Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology. Impact Mitigation Guidelines Revision Committee.

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4.4.1.2 ENVIRONMENTAL SETTING

Geological Setting

As described in the Initial Study prepared for the proposed project and included in Appendix A of this Draft EIR, a Preliminary Geotechnical Investigation dated January 1, 2014 was prepared for the proposed project by Langan Treadwell Rollo.² The following describes the existing conditions on the project site with respect to geology and soil.

- **Geology.** The City of Cupertino lies in the west-central part of the Santa Clara Valley, a broad, mostly flat alluvial plain that extends southward from San Francisco Bay. These alluvial fan deposits are typically coarse grained with large amounts of gravel deposits. The surficial geology is described as young, unconsolidated Quaternary alluvium. The site is generally flat with elevation ranging from 290 to 300 feet above mean sea level.
- **Soils.** This analysis uses web-accessible soil mapping data compiled by the United States Department of Agriculture's Soil Conservation Survey and the California Soil Resource Laboratory hosted by University of California at Davis to identify the major soil types on the project site. The predominant soil types for the project site are soils of the Urban Land-Flaskan and Urban Land-Botella complexes generally formed on slopes of 0 to 2 percent. In almost all instances, these soils are reportedly deep and well drained, and are typified by low runoff. Additionally, surface material encountered in the borings conducted as part of the Preliminary Geotechnical Investigation consists of 3.5 to 6 inches of asphalt concrete (AC) and aggregate base (AB). Beneath the pavement section, the upper 2.5 to 6.5 feet consists of very dense sand with clay and gravel and hard sandy clay with varying amounts of gravel. Below these depths are medium dense to very dense sand and gravel layers with varying amounts of silt and clay interbedded with 3.5 to 7 feet thick layers of very stiff to hard sandy clay, sandy clay with gravel, and clay with gravel to the maximum explored depth of 46.5 feet.

Unique geologic features are those that are unique to the field of geology. Each rock unit tells a story of the natural processes operating at the time it was formed. The rocks and geologic formations exposed at the earth's surface or revealed by drilling and excavation are our only record of that geologic history. What makes a geologic unit or feature unique can vary considerably. For example, a geologic feature may be considered unique if it is the best example of its kind and has distinctive characteristics of a geologic principle that is exclusive locally or regionally, is a key piece of geologic information important to geologic history, contains a mineral that is not known to occur elsewhere in the County, or is used as a teaching tool.

Unique geological features are not common in Cupertino. The geologic processes are generally the same as those in other parts of the state, country, and even the world. The geology and soils on the project site are common throughout the city and region and are not considered to be unique.

² Langan Treadwell Rollo, 2014, Preliminary Geotechnical Investigation, The Oaks 21255 Stevens Creek Boulevard Cupertino, California, January 1, 2014.

Paleontological Setting

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), microscopic plants and animals (microfossils), and trace fossils (footprints, burrows, etc.). Fossils are preserved in sedimentary rocks, which are the most abundant rock type exposed at the surface of the earth. Despite the abundance of these rocks, and the vast numbers of organisms that have lived through time, preservation of plant or animal remains as fossils is a rare occurrence. In many cases, fossils of animals and plants occur only in limited areas and in small numbers relative to the distribution of the living organisms they represent. The Society of Vertebrate Paleontology defines a significant fossil resource as, “identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).”³

A review of the University of California’s Museum of Paleontology’s fossil locality database was conducted for the City of Cupertino during the General Plan update process for the current Community Vision 2015-2040.⁴ No paleontological resources have been identified on the project site; however, the presence of Pleistocene deposits that are known to contain fossils indicates that overall the city could contain paleontological resources.

4.4.2 THRESHOLDS OF SIGNIFICANCE

An Initial Study was prepared for the proposed project (see Appendix A of this Draft EIR). Based on the analysis contained in the Initial Study and comments received, it was determined that development of the proposed project would not result in significant environmental impacts related to the following significance standards and therefore, are not discussed in this chapter.

- 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.
 - Strong seismic ground shaking.
 - Seismic-related ground failure, including liquefaction.
 - Landslides, mudslides or other similar hazards.
- Result in substantial soil erosion or the loss of topsoil.

³ Society of Vertebrate Paleontology, 2010, *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*, page 11. Society of Vertebrate Paleontology. Impact Mitigation Guidelines Revision Committee.

⁴ City of Cupertino, certified General Plan Amendment, Housing Element Update, and Associated Rezoning EIR, (December 2014) and approved General Plan Amendment, Housing Element Update, and Associated Rezoning EIR Final Addendum, State Clearinghouse Number 2014032007 (October 2015).

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

Based on the Initial Study it was determined that the proposed project could result in a potentially significant impact related to geology and soils if it would:

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

4.4.3 IMPACT DISCUSSION

GEO-1	The proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
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As discussed above in existing conditions, the geology and soils on the project site are common throughout the city and region and are not considered to be unique. While no paleontological resources have been identified within the project location, because the proposed project requires substantial excavation that could reach significant depths below the ground surface where no such excavation has previously occurred, there could be fossils of potential scientific significance that have not been recorded. Such ground-disturbing construction associated with development of the proposed project, specifically the excavation of the subterranean parking facilities, could cause damage to, or destruction of, unique paleontological resources. This is considered a *potentially significant* impact.

Impact GEO-1: Construction of the proposed project would have the potential to directly or indirectly affect an unknown unique paleontological resource.

Mitigation Measure GEO-1: The construction contractor shall incorporate the following in all grading, demolition, and construction plans:

- In the event that fossils or fossil-bearing deposits are discovered during grading, demolition, or building, excavations within 50 feet of the find shall be temporarily halted or diverted.
- The contractor shall notify the City of Cupertino Building Department and a City-approved qualified paleontologist to examine the discovery.
- The paleontologist shall document the discovery as needed, in accordance with Society of Vertebrate Paleontology standards (Society of Vertebrate Paleontology 1995), evaluate the potential resource, and assess the significance of the finding under the criteria set forth in CEQA Guidelines Section 15064.5.
- The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find.

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- If the project applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of the proposed project based on the qualities that make the resource important. The excavation plan shall be submitted to the City for review and approval prior to implementation.

Significance With Mitigation: Less than significant.

4.4.4 CUMULATIVE IMPACTS

GEO-2 The proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less than significant cumulative impacts with respect to geology and soils.

Development under the proposed project, in conjunction with buildout of the city and the region, has the potential to adversely affect unique paleontological resources through their destruction or disturbance during ground-disturbing activities. Impacts to paleontological resources tend to be site specific and are assessed on a site-by-site basis. The significance of the impacts would depend largely on what, if any, paleontological resources occur on or near the sites of the related projects that are developed in the cumulative setting. Similar to the proposed project, such determinations would be made on a case-by-case basis and, if necessary, the applicants of the related projects would be required to comply with applicable federal, State, and local regulations and implement appropriate mitigation measures. Development of the proposed project would comply with federal and State laws protecting paleontological resources. Implementation of Mitigation Measures GEO-1 identified above would ensure that paleontological resources, if discovered on the project site, are protected. Thus, given that the proposed project's paleontological resources impacts are less than significant with mitigation, the proposed project's impacts to geology and soils would not be cumulatively considerable. Therefore, cumulative impacts to geology and soils would be *less than significant*.

Significance With Mitigation: Less than significant.

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