

GEOLOGY AND SOILS

SUMMARY

Implementation of 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, 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.

Implementation of the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.

Implementation of 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.

Implementation of the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Implementation of the proposed project would not result in substantial soil erosion or the loss of topsoil during project construction and/or operations.

Implementation of the proposed project would not 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.

The proposed project may 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. Implementation of the soils report recommendations as required by the City would reduce the potential impact of the project to a less than significant level.

The existing golf course operation also does not currently use a septic tank and the proposed project would not require the use of septic tanks.

The proposed project may directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Mitigation is identified to ensure that any impacts to previously undiscovered paleontological resources would be reduced to a less than significant level.

INTRODUCTION

The following analysis is based upon the *Geotechnical Hazards Evaluation and Input for the Environmental Impact Report, Proposed Golf Course Redevelopment, Portion of Tract No. 3651-01, Camarillo Springs, City of Camarillo, California* (Geotechnical Hazards Evaluation) prepared by Geolabs-Westlake Village, April 6, 2020 and the City of Camarillo Safety Element 2013. The City of Camarillo has independently reviewed and allowed for public review the information presented in the Geotechnical Hazards Evaluation. A copy of the Geotechnical Hazards Evaluation is provided as Appendix L to this EIR.

ENVIRONMENTAL SETTING

Geologic Setting

Regionally, the City of Camarillo is located in the western portion of the Transverse Ranges geomorphic province of Southern California. The Transverse Ranges are essentially east-west trending elongated mountain ranges and valleys that are geologically complex. Structurally, the province reflects the north-south compressional forces that are the result of a bend in the San Andreas Fault. As the Pacific Plate (westerly side of the fault) and the North American Plate (easterly side) move past one another along the fault, the bend allows for large accumulations of compressional energy. Some of these forces are spent in deforming the crust into roughly east-west trending folds and secondary faults. The most significant of these faults are typically reverse or thrust faults, which help accommodate the crustal shortening taking place regionally.

Earth Materials

The Geotechnical Hazards Evaluation identifies three geologic units on the site: engineered fill, alluvium and bedrock. Detailed descriptions of these units are provided below.

Engineered Fill

Engineered fill presently covers the entire pad area. The depth of fill is unknown, but probably ranges from three to ten feet. It is important to note that the fill was placed under grading ordinances in force at the time (mid-1980s) and may not meet today's standards.

Alluvial Deposits

Alluvial deposits occur at depth beneath the artificial fill. These sediments generally consist of admixtures of sand and silt with occasional horizons of sandy clay. These deposits are characteristically in a moderately compact condition, but become more compact with depth.

Bedrock

Bedrock will likely be encountered during excavation in the golf course - south area of the project site. It will consist of basalt and basaltic agglomerate assigned to the Miocene-age Conejo Volcanics. These deposits are commonly dense to hard and well-fractured.

Geologic Structure

Geologic structure of the on-site alluvial deposits is commonly sub-horizontal, while the Conejo Volcanics bedrock is inclined to the northwest at moderate angles (15°-30°).

Faulting

To assist cities and counties in avoiding the hazard of surface fault rupture, the Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to establish Earthquake Fault Zones around the surface traces of active faults. The State has identified three Alquist-Priolo Earthquake Fault Zones within Camarillo. These zones are located along and just north of Las Posas Road, south of U.S. 101 just to the east of the airport, and north of U.S. 101 in the vicinity of Adolfo Road. To supplement the State-designated fault-rupture zones, the City of Camarillo has established several additional fault-rupture zones that also require fault investigations.

The closest State-defined Alquist-Priolo Earthquake Fault Zone to the project site is along the Santa Rosa-Camarillo section of the Simi-Santa Rosa fault, approximately 1.25 miles to the northwest. However, the City of Camarillo has designated a "Fault of Concern" postulated through the area east of the existing driving range. This fault zone is not illustrated in the Camarillo Fault Map of the City of Camarillo Safety Element 2013.

Groundwater

Groundwater was encountered in a previous, adjacent geotechnical investigation at an elevation of about 107 feet. The golf course is irrigated by private water from two existing wells located adjacent to Calleguas Creek along the westerly edge of the golf course - south area of the project site. As a result of irrigation pumping for the golf course, groundwater may actually be at a depth lower than anticipated.

Liquefaction Potential

Liquefaction is a condition in which relatively weak soil undergoes continued deformation at a constant low residual stress due to the build-up of high porewater pressures. The possibility of liquefaction occurring at a given site is dependent upon the occurrence of a significant earthquake in the vicinity; sufficient groundwater to cause high pore pressures; and on the grain size, relative density, and confining pressures of the soil at the site.

A large portion of the City of Camarillo, primarily the western half, lies within a liquefaction hazard zone per the State of California. The process of liquefaction may also produce lateral spreading of soils on properties adjacent to creeks and drainages, such as Calleguas Creek and Conejo Creek. The areas of the project site west of Camarillo Springs Drive are also located within a liquefaction hazard zone as identified in the Liquefaction Susceptibility Map of the City of Camarillo Safety Element 2013. However, the Geotechnical Hazards Evaluation has determined that the potential for liquefaction at the site is minor. No other hazard phenomena such as lateral spreading, subsidence, and hydrocollapse have been observed at the project site.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G to the State CEQA Guidelines, a project could have a potentially significant impact on geology and soils if it would:

- 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.
- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.
- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.
- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.
- Result in substantial soil erosion or the loss of topsoil during project construction and/or operation.
- 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- 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.
- 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.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

PROJECT IMPACTS AND MITIGATION MEASURES

Earthquake Fault Zoning

Threshold: Would the proposed 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: Implementation of 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, 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 Analysis

The proposed project site is not situated within a State-defined Alquist-Priolo Earthquake Fault Zone assigned by the State Geologist to Active Faults. As discussed previously, the closest State-defined Alquist-Priolo Earthquake Fault Zone to the project site is along the Santa Rosa-Camarillo section of the Simi-Santa Rosa fault, approximately 1.25 miles to the northwest. The City of Camarillo, however, has designated a "Fault of Concern" postulated through the area east of the existing driving range which is designated as a recreational area. As illustrated in Figure 5.6-1, all of the new structures proposed for human habitation are located outside of the fault zone for this fault. Therefore, development of the proposed project would not directly or indirectly cause potential substantial adverse effects associated with 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. The potential impact to the project structures and residents associated with the potential rupture of a local fault would be less than significant.

Seismic Ground Shaking

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

Impact: Implementation of the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.

Impact Analysis

As with all properties in the seismically active Southern California region, the project site is susceptible to ground shaking during seismic events produced by local faults. While it is likely that the project site will

be shaken by future earthquakes produced in Southern California, modern, well-constructed buildings are designed to resist ground shaking through the use of shear panels and reinforcement. As stated in the City of Camarillo Safety Element 2013, the effects of seismic shaking on future structures and land development projects within the City may be mitigated by adhering to adopted building codes. The California Building Standards Code regulates the design and construction of foundations, building frames, retaining walls, excavations, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. Compliance with the standards as required by the City would ensure that the potential impact to project properties and residents associated with strong seismic ground shaking would be less than significant.

Ground Failure

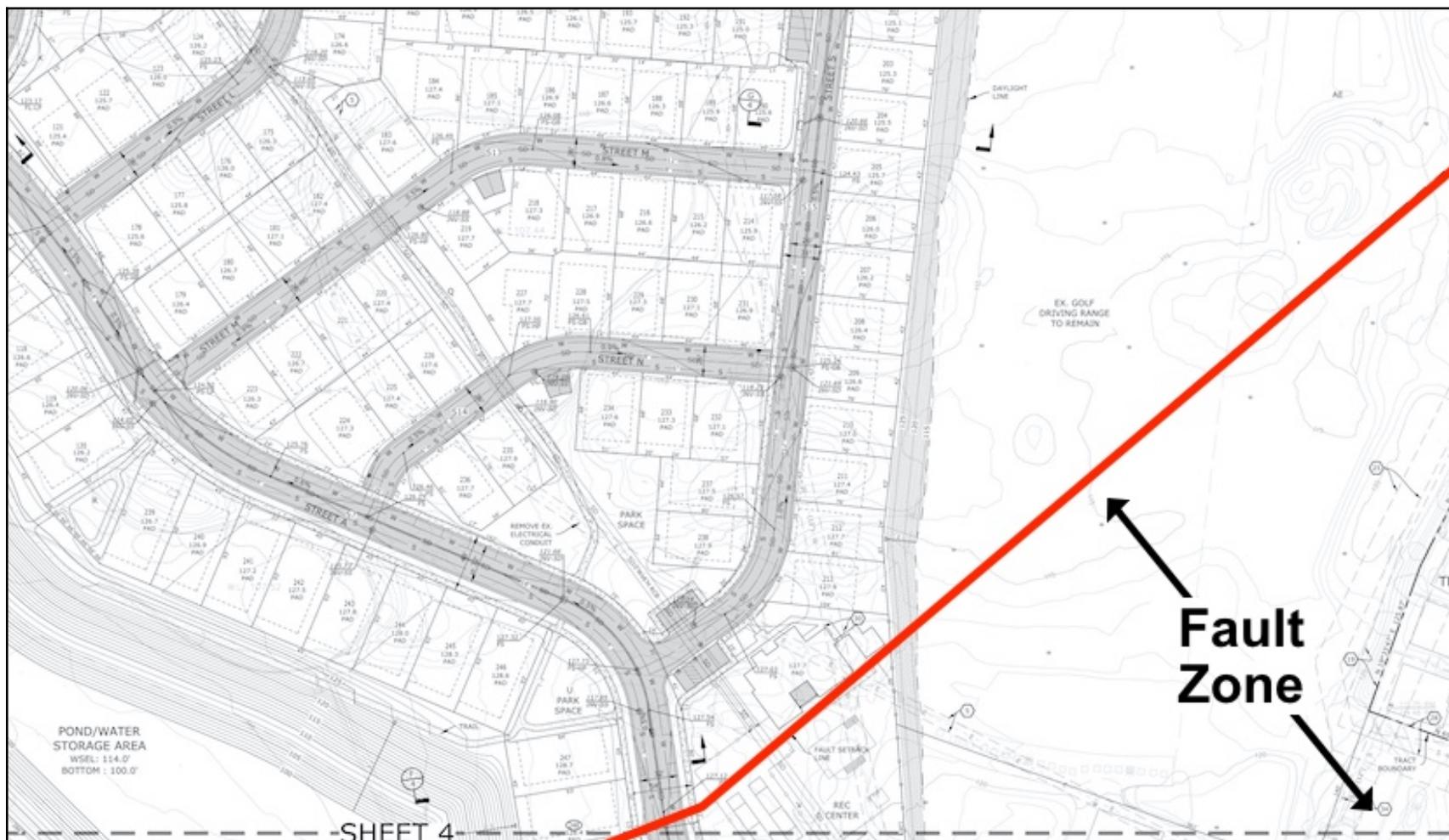
Threshold: Would the proposed project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Impact: Implementation of 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.

Impact Analysis

Ground shaking can induce secondary seismic hazards such as liquefaction, lateral spreading, subsidence, ground fissuring, and landslides. According to the City of Camarillo Safety Element 2013, the proposed project site and surrounding area is located within an area of the City deemed to have a potential for liquefaction. However, the Geotechnical Hazards Evaluation has determined that the potential for liquefaction at the site is minor and that the potential for for liquefaction can be mitigated by appropriate earthmoving procedures. No other hazard phenomena such as lateral spreading, subsidence, and hydrocollapse have been observed at the project site. The recommendations for the soils at the project site will be specified in the soils report that is required to be submitted at the time of review of the project grading plan. Such a report cannot be completed until final design and final grading. Implementation of the appropriate earthmoving procedures as required by the City would reduce the potential impact of the project to a less than significant level.

FIGURE 5.6-1 - LOCAL FAULT ZONE



This page intentionally left blank.

Landslides

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

Impact: Implementation of the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Impact Analysis

According to the City of Camarillo Safety Element 2013, the proposed project site is not located within an earthquake induced landslide hazards zone. The Geotechnical Hazards Evaluation confirms that no landslides are present at or adjacent to the project site. Therefore, the proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including landslides.

Soil Erosion

Threshold: Would the proposed project result in substantial soil erosion or the loss of topsoil during project construction and/or operation?

Impact: Implementation of the proposed project would not result in substantial soil erosion or the loss of topsoil during project construction and/or operations.

Impact Analysis

The project site presently has minimal soil erosion since it is almost completely landscaped and maintained as an active golf course. Project implementation would cover the residential portion of the site with impermeable surfaces, further reducing the area of soil exposed to potential soil erosion. However, project site preparation and construction activities have the potential to result in minor erosion of soils during heavy rain storms. This potential for erosion would be controlled by obtaining coverage under the State General Construction NPDES Permit and preparation and implementation of the required Stormwater Pollution Prevention Plan (SWPPP). Implementation of the SWPPP, as well as grading and building permit regulations, will ensure that stringent erosion and sediment controls are imposed during construction activities. Due to the relatively level nature of the existing site and the abundance of non-erodible surfaces associated with the proposed project, soil erosion is expected to be insignificant once landscaping has matured and appropriate drainage structures are in place.

Soil Stability

Threshold: Would the proposed 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Impact: Implementation of the proposed project would not 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.

Impact Analysis

As discussed above, the proposed project site is not located within an earthquake induced landslide hazards zone and the Geotechnical Hazards Evaluation confirms that no landslides are present at or adjacent to the project site. The Geotechnical Hazards Evaluation has also determined that the potential for liquefaction at the site is minor. No other hazard phenomena such as lateral spreading, subsidence, and hydrocollapse have been observed at the project site. The existing development surrounding the project site demonstrates that new buildings can be constructed in this area of the City provided that the soils are properly prepared during grading. The recommendations for the soils at the project site will be specified in the soils report that is required to be submitted at the time of review of the project grading plan. Implementation of the soils report recommendations as required by the City would reduce the potential impact of the project to a less than significant level.

Expansive Soil

Threshold: Would the proposed project 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?

Impact: The proposed project may 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. Implementation of the soils report recommendations as required by the City would reduce the potential impact of the project to a less than significant level.

Impact Analysis

Swelling clay soils can cause distress to construction - generally as uplift. Expansive soils may be located at the project site. The recommendations for the preparation of soils at the project site will be specified in the soils report that is required to be submitted at the time of review of the project grading plan. Implementation of the soils report recommendations as required by the City would reduce the potential impact of the project to a less than significant level.

Expansive Soil

Threshold: Would the proposed project 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?

Impact: The existing golf course operation also does not currently use a septic tank and the proposed project would not require the use of septic tanks.

Impact Analysis

The project site is located in an area of the City of Camarillo, which is served by a wastewater collection, conveyance, and treatment system operated by the Camrosa Water District. No septic tanks or alternative disposal systems are necessary, nor are they proposed. No impact would occur.

Paleontological Resources

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

Impact: The proposed project may directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Mitigation is identified to ensure that any impacts to previously undiscovered paleontological resources would be reduced to a less than significant level.

Impact Analysis

The project site and the City of Camarillo in general are not located in an area that is conducive to the identification of paleontological resources. As such, no impacts to known paleontological resources are expected to occur with the proposed project. However, there is a very remote possibility that paleontological resources exist below the ground surface, and that these resources could be encountered during site preparation. While no further evaluation of this issue is recommended, implementation of mitigation measure GS-1 would ensure that any impacts to previously undiscovered paleontological resources would be reduced to a less than significant level.

Mitigation

GS-1 The project developer must include in construction contracts the requirement that project grading be halted, temporarily diverted, or redirected if any paleontological materials are encountered during project construction. The services of a qualified paleontologist must be secured by contacting the Center for Public Paleontology, which can be found at the following universities; USC, UCLA, California State University at Los Angeles, or California State University at Long Beach, to develop an acceptable monitoring and fossil remains treatment plan if resources are uncovered. If resources are uncovered, they shall be prepared to the point of identification and

catalogued before they are donated to their final repository. All resources collected shall be donated to a public, nonprofit institution with a research interest in the materials. A report detailing the results of these efforts, identifying all resources collected, and naming the repository shall be submitted to the Department of Community Development at the completion of project construction, if resources had been found.

Mitigation Monitoring

The Department of Community Development shall review project construction contracts prior to issuance of grading permits to ensure that the contracts include the mitigation measure requirements.

Impact After Mitigation

Less than significant impacts to previously undiscovered paleontological resources would occur with the implementation of mitigation measure GS-1. This measure reduces impacts to a less than significant level by ensuring that, in the unlikely event that paleontological resources and fossils are uncovered, grading that could damage the resources will be halted, and a qualified paleontologist retained to develop an appropriate treatment plan. The measure also ensures that resources will be removed, protected, and donated to an appropriate repository.

CUMULATIVE IMPACTS

Geotechnical hazards are site-specific and there is little, if any, cumulative geological relationship between the proposed project and any related projects in Camarillo. Similar to the proposed project, potential impacts related to geology and soils would be assessed on a case-by-case basis and, if necessary, the applicants of other projects throughout Camarillo would be required to implement the appropriate soils preparation measures. Furthermore, the analysis of the proposed project's geology and soils impacts concluded that project impacts would be less than significant with implementation of the soils report recommendations as required by the City and the implementation of mitigation measure GS-1. Therefore, the proposed project would not contribute to any potential cumulative impacts, and cumulative geology and soil impacts would be less than significant. At the present time, the only other related project within the Camarillo Springs area is the request to modify the conditional of approval for the Village Greens Market located at 795 Camarillo Springs Road. No other new development is proposed or approved within the Camarillo Springs area.

UNAVOIDABLE SIGNIFICANT IMPACTS

The proposed project would not create any unavoidable significant impacts to geology and soils.