

5.5 Geology, Soils and Seismicity

5.5.1 Introduction

Information and recommendations presented in this section were taken from the original East Lake Specific Plan Environmental Impact Report (EIR) [State Clearinghouse No. 92092027], and where appropriate, updated and/or augmented with information provided in the City's General Plan Update Program EIR and General Plan that are herein incorporated by reference. These base documents were utilized to analyze the proposed Project land use changes and proposed backbone infrastructure improvements within the Infrastructure Improvements Areas (IIAs) at a programmatic level. Future development proposed as part of a future implementing development project would require additional analysis for consistency with the findings and determinations made in this EIR and may require additional project-level CEQA review, consistent with ELSPA No. 11 Section 10.7.

5.5.2 Environmental Setting

The topography of the Project site is generally flat, dropping off to the west at gradients of one percent or less. The elevation of the site along Corydon Street is generally around 1,270 feet, this elevation falls gently towards the north and then to the west towards the Lake (Lake Elsinore) where the Lake line elevation around the levee ranges from 1,230 to 1,240 feet. Rome Hill lies southwest within the Project site. A smaller hill, southeast of Rome Hill, rises approximately 60 feet from the old Lake bed elevation. The San Jacinto River enters the site along the northeastern corner, crosses the northern portion of the site in the inlet channel, and empties into the Lake to the west.

A 17,800-foot-long earthen levee exists along the northwestern border of proposed Planning Area 5. The levee was constructed to an elevation of approximately 1,262 feet. The current course of the San Jacinto River is diverted through an east-west inlet channel which was constructed with the levee near the northern portion of the site. A small island/peninsula and connector road were constructed west of the levee to provide an operations platform for three existing groundwater wells supplying water for the Lake. A man-made, 356-acre preservation area lies along the western portion of the site.

5.5.3 Existing Conditions

Regional Geology

The Project site is located within the Elsinore Trough, which in turn is located within a larger structural block of land known as the Perris Block. The Perris Block, which is part of the Peninsular Ranges Geomorphic Province, is bounded on the northeast by the San Jacinto fault, on the north by the Cucamonga fault, and on the southwest by the Santa Ana Mountains.

The Elsinore Trough is essentially a complex geologic structural formation that has formed by extensional faulting along the Elsinore Fault Zone. In the Project vicinity, the Elsinore Trough is bounded by the Glen Ivy North fault on the northeast, and the Willard and Wildomar faults on the southwest (Figure 5.5-1 Seismic Hazards).

Site Geology

The Elsinore Trough has been filled with up to 2,300 feet of geologically recent alluvial materials consisting of sand, silty sand, silt, and clay at depths. The alluvial materials on the Project site are reportedly underlain by an older, non-marine, slightly consolidated sand, silty sand, and gravel unit of late Pleistocene age, which has been assigned the name of Pauba Formation.

Surface exposures of bedrock on the site are found only at Rome Hill along the southwestern portion of the site. Coarse gravelly sandstones exposed there are remnants of the Pauba Formation. The Pauba Formation generally consists of a succession of late Pleistocene siltstone, sandstone, and conglomerate. The gravelly sandstone members of the Pauba Formation found onsite are partially cemented and well consolidated. The Pauba Formation reportedly underlies much of the site at depths however, the Pauba Formation is only exposed at or near the surface on less than one percent of the Project site.

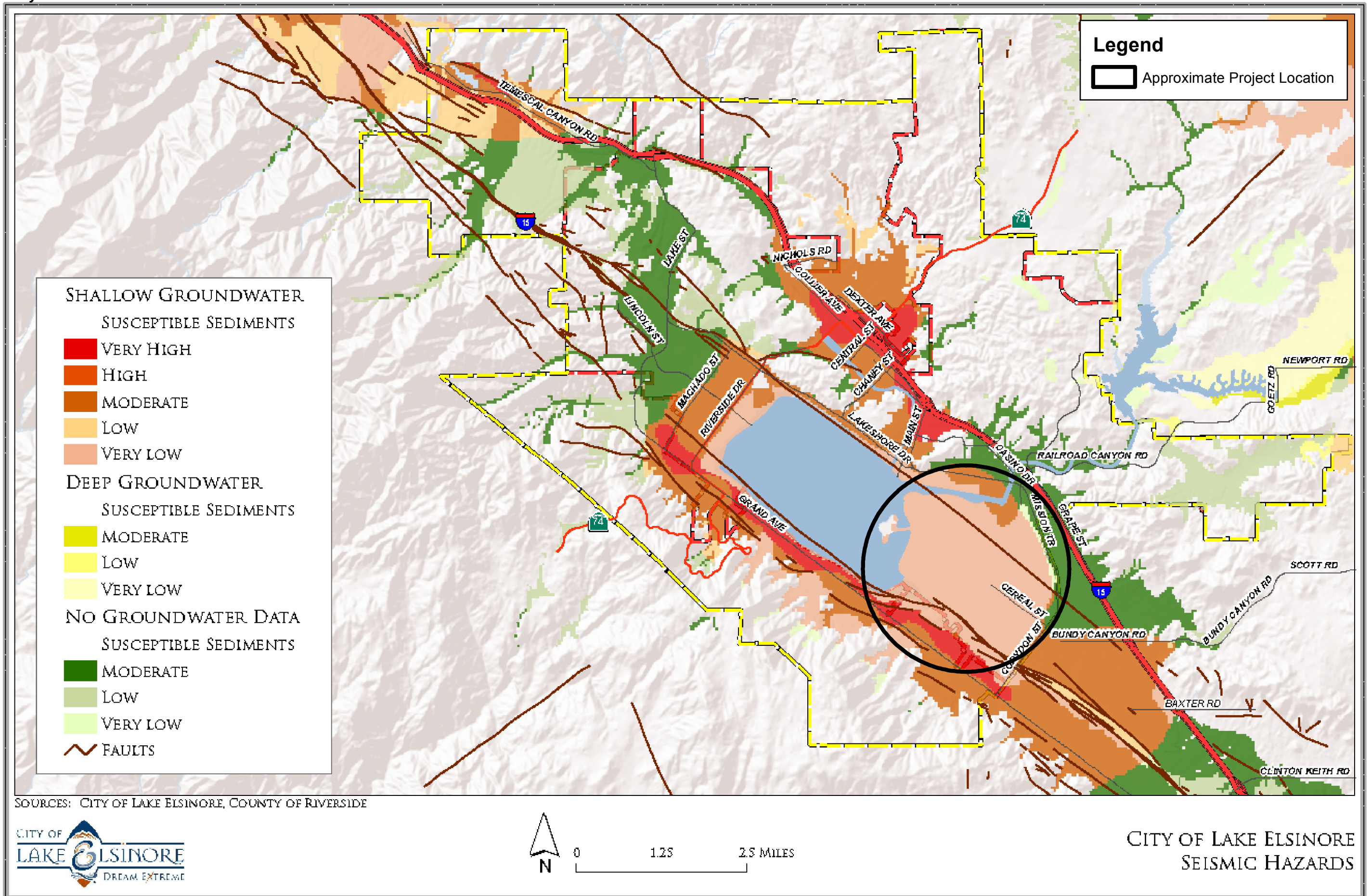
Surficial sediments on the site have been summarized within two general categories as follows:

Lacustrine and Ponded Alluvial Deposits

The overall majority of the site is covered with materials ranging in composition from silty fine sand to clayey sand. These units are reportedly light brownish gray in color and contain high amounts of saline and alkali minerals associated with high evaporation rates. Deposits located near the Lake reportedly contain a high organic content and typically become finer grained toward the northwest. The geologically young, lacustrine, and ponded alluvial deposits cover up to 95 percent of the site.

Stream Channel Deposits

Coarse-grained stream channel sediments of gravel and sand, with secondary amounts of silt and clay, can be found within the drainage course of the San Jacinto River. These units are reportedly light gray to light brownish gray in color, loose and unconsolidated. The geologically young, lacustrine, and ponded alluvial deposits cover up to five (5) percent of the site.



Source: Figure 3.3, City of Lake Elsinore General Plan

Seismic Hazards, Figure 5.5-1

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Groundwater

During periods of drought, the depth to the most-shallow groundwater under the Project site is up to 200 feet and during periods of increased inflow into the basin depths to groundwater have been within several feet of the ground surface. Heavy precipitation during the late 1970s and early 1980s led to the flooding of approximately 95 percent of the Project site by 1980. Since that time, the water boundary/Lake level has fluctuated with heavy rains received in the mid 1990s and slowly receded westward to its present position.

Seismicity

Fault Rupture

The California Geological Survey places active faults with surface expression within a zone referred to as an Alquist-Priolo Earthquake Fault Zone. Earthquake Fault Zones are regulatory zones around active faults. The delineation of the Earthquake Fault Zones is intended to prohibit construction of new habitable structures near or on active faults within California, for the purposes of protecting human health and safety. The zone is mapped from the northern boundary of the City and continues south of the City boundary over the Project site. The Elsinore fault is assumed active within the Project's boundaries.

Seismic Ground Shaking

The Project site is located within a seismically active region of California. Geologic studies conducted for the region indicate that seismic activity greater than Magnitude 5.0 on the Richter scale in the Project vicinity is associated with known active faults in the region. Accordingly, the possibility of moderate to high ground acceleration or shaking in the Project site would be similar to those across the Southern California region.

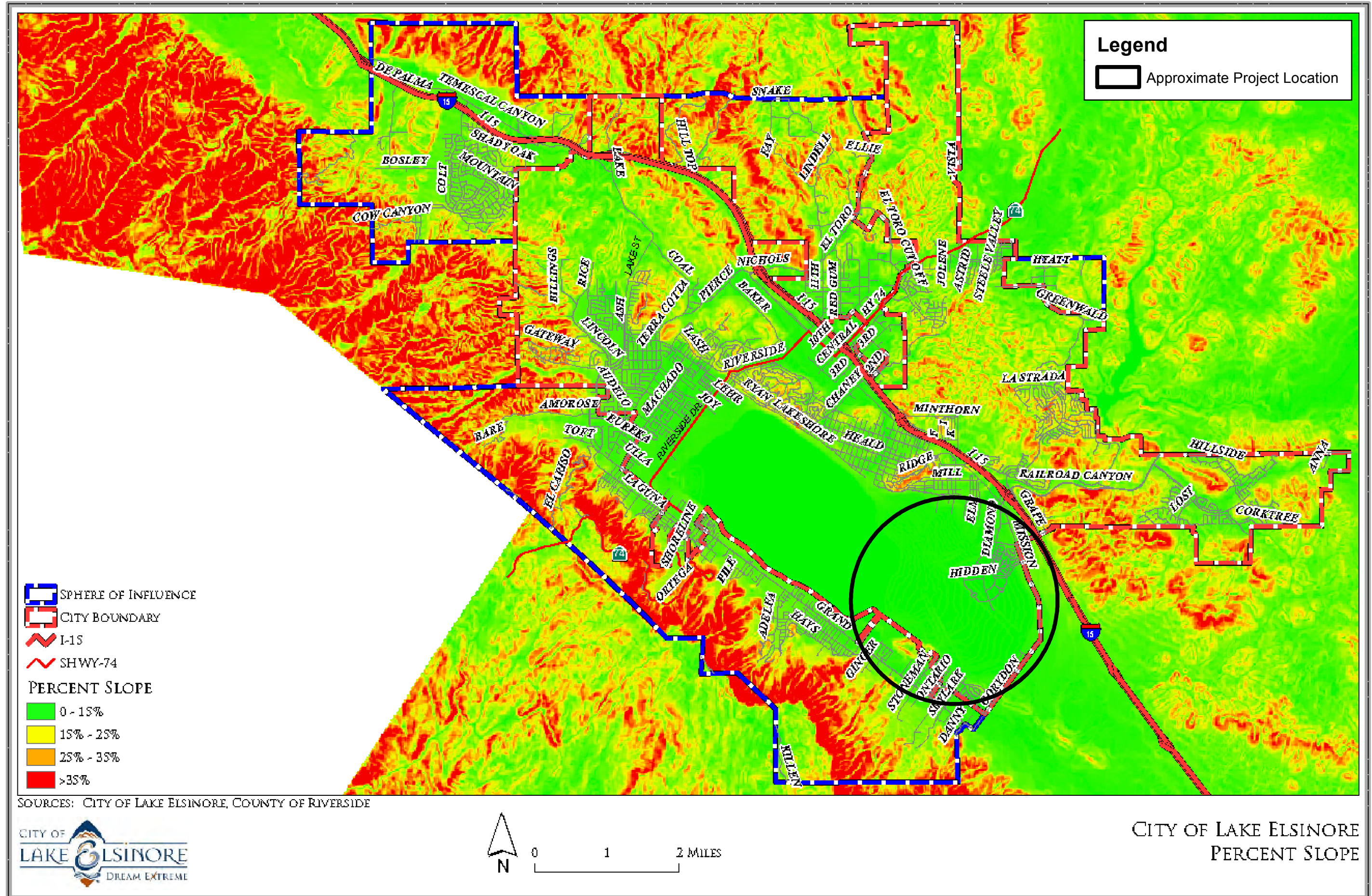
Ground Lurching

Lurching typically results where loose to poorly consolidated soil deposits on or adjacent to steep slopes move laterally as the result of strong ground shaking during a seismic event. The Project site is not characteristic of these conditions because the site is predominantly flat with slopes ranging from zero (0) percent to fifteen (15) percent grade as shown on Figure 5.5-2 Percent Slope. Past soil sampling found site soils to consist of random and generally discontinuous deposits of sand, silty sand, silt, and clay with medium dense/medium stiff to dense/very stiff levels of compaction.

Liquefaction

Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause underlying soils to liquefy and temporarily behave as a dense fluid. For liquefaction to occur, intense seismic shaking, the presence of loose granular soils prone to liquefaction, and the saturation of soils due to shallow groundwater need to occur simultaneously. Most of the Project site is identified as having low potential for liquefaction with some areas along Corydon Street and Mission Trail Road identified as having moderate potential for liquefaction as shown in Figure 5.5-3 Liquefaction Susceptibility.

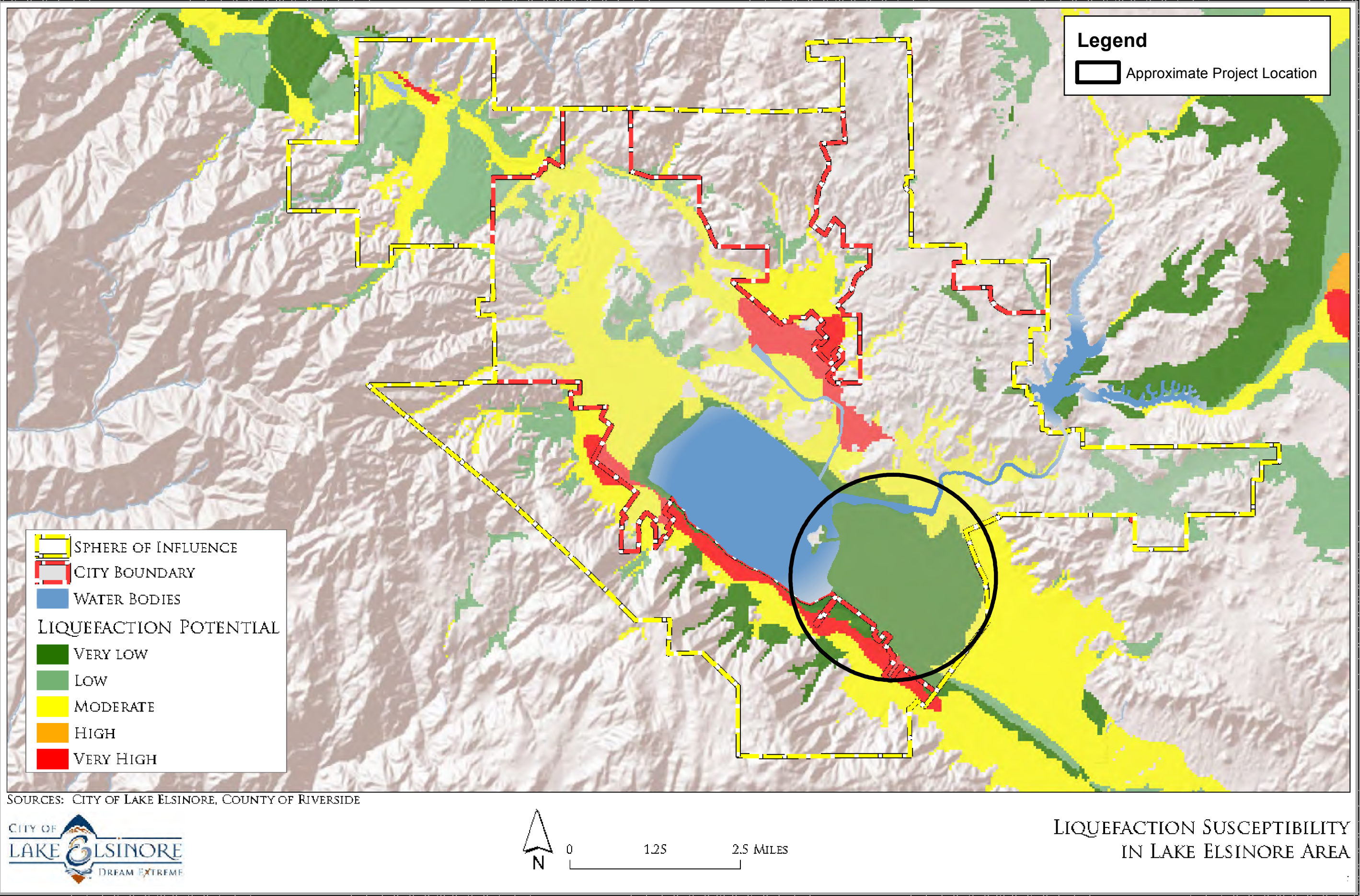
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Source: Figure 3.5, City of Lake Elsinore General Plan

Percent Slope, Figure 5.5-2

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Source: City of Lake Elsinore- Figure 3.4, General Plan / Figure 3.11-3 General Plan EIR

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Landslides and Slope Stability

Landslides are large movements of the underlying ground that include rock falls, shallow slumping and sliding of soil, and deep rotational or transitional movement of soil or rock. Development along hillsides is particularly susceptible to landslides, as they are a basic geologic hazard for such development. Project site topography is generally flat, with slope steepness ranging between (0) percent to fifteen (15) percent grade, as shown in Figure 5.5-2 Percent Slope. Generally flat sites have little to no risk for potential landslides.

Seismically-Induced Ground Settlement

Ground shaking can result in ground settlement as sediment particles become more tightly packed, thereby reducing pore space. Such unconsolidated, loosely packed alluvial deposits are especially susceptible to seismically-induced ground shaking. In addition, artificial fills that are poorly compacted may also be subject to seismically-induced settlement. Past soil sampling found site soils to consist of random and generally discontinuous deposits of sand, silty sand, silt, and clay with medium dense/medium stiff to dense/very stiff levels of compaction.

Erosion

Erosion generally occurs because of a combination of processes in which surficial materials are loosened, dissolved, or worn away, and transported from one place to another by natural agents, including wind and water. Erosion potential in soils is influenced primarily by loose soil texture and steep slopes. Loose soils can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible only to water erosion. The potential for erosion generally increases because of human activity, primarily through the development of structures and impervious surfaces and the removal of vegetative cover.

Geologic Unit

Lateral Spreading

Lateral spreading is caused by the lateral displacement of surficial blocks of sediment, as a result of liquefaction in subsurface layers. Lateral spreading is associated with areas prone to liquefaction. As described above, most of the Project site is identified as having low potential for liquefaction with some areas along Corydon Street and Mission Trail Road identified as having moderate potential for liquefaction.

Subsidence

A decline in Lake water levels can increase the risk for land subsidence particularly in the Back Basin area, but generally, subsidence occurs in areas subject to liquefaction and/or lateral spreading. As described above, most of the Project site is identified as having low potential for liquefaction with some areas along Corydon Street and Mission Trail Road identified as having moderate potential for liquefaction.

Soils

Expansive Soils

Expansive soils are composed of a significant amount of clay particles, which can expand (absorb water) or contract (release water). These shrink and swell characteristics can result in structural stress and place other loads on these soils. While there is currently no soil mapping that identifies specific areas within the City that are subject to expansive soils, such soils are known to exist in the City. Past soil sampling done in the Project site demonstrated very low to medium soil expansion potential.

Corrosive Soils

Soil corrosion is a complex phenomenon, with several variables involved. Variations in soil properties and characteristics across three dimensions can have a major impact on corrosion of buried structures. Other factors such as soil organic content, soil porosity, and texture indirectly affect corrosion of metals in soil by affecting the other factors listed above. Previous soil samples taken at the Project site found very low to high near-surface corrosive soils due to soluble sulfate content. The City requires testing for corrosive soils as part of the soils and geotechnical reporting required of all new construction projects.

5.5.4 Regulatory Setting

Federal

There are no federal regulations pertaining to geology, soils or seismicity relevant to the proposed Project.

State

California Building Code (2016)

The California Health and Safety Code, Section 17958 mandates that the California Building Standards Commission adopt and publish the California Building Standards Code (California Code of Regulation, Title 24) every three years. The 2016 California Building Code (CBC) contains administrative regulations for the California Building Standards Commission and for all state agencies that implement or enforce building standards. All development within the State must demonstrate conformance with the requirements of the CBC, subject to review by the local agencies. Cities and counties can modify or amend building standards beyond those given in the CBC to address building standards on a local level.

Alquist-Priolo Earthquake Fault Zoning Act (1972)

The Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code Section 2621 et seq.) was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed 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 from the fault (typically 50 feet set backs are required).

Seismic Hazards Mapping Act (1990)

The Seismic Hazards Mapping Act (SHMA) of 1990 (Public Resources Code Section 2690 et seq.) directs the Department of Conservation, California Geological Survey to identify and map areas prone to liquefaction, earthquake-induced landslides, amplified ground shaking and other ground failure. The purpose of the SHMA is to minimize loss of life and property through the identification, evaluation and mitigation of seismic hazards. The State requires: (1) local governments to incorporate site-specific geotechnical hazard investigations and associated hazard mitigation, as part of the local construction permit approval process; and (2) the agent for a property seller or the seller if acting without an agent, must disclose to any prospective buyer if the property is located within a Seismic Hazard Zone.

Local

Riverside County Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan

Riverside Operational Area (OA) developed the Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) to create a safer community. The Riverside OA LHMP is the representation of Riverside OA's commitment to reduce risks from natural and other hazards, and serves as a guide for decision-makers as they commit resources to reducing the effects of natural and other hazards.

City of Lake Elsinore Municipal Code - Title 15 (Building Code)

The California Building Code has been amended and adopted as Title 15 (Building Code) of the Lake Elsinore Municipal Code. Title 15 regulates all building and construction projects within the City limits. Through its implementation of the California Building Code, Title 15 provides a minimum standard for building design and construction. These minimum standards include specific requirements for seismic safety, excavation, foundations, retaining walls and site demolition. It also regulates grading activities including drainage and erosion control.

Lake Elsinore Municipal Code (LEMC) – Title 16, Chapter 16.24, Chapter 16.34 and Chapter 16.56

Chapter 16.56 (Improvements-Sanitary Sewer Facilities) of the Lake Elsinore Municipal Code addresses sewage disposal requirements within the City boundaries. Section 16.56.030 provides that where sanitary sewer service is not available, a private sewerage disposal system for each lot as required by the ordinance establishing standards for private sewage disposal systems shall be constructed. Additionally, Section 16.34.040 (Requirements for building permit issuance) establishes that "parcels shall be deemed served by City water and sewer if the distance in feet from the closest property line to the facility to be extended shall be 200 times the number of lots to be developed." Section 16.24.040 (Information – Required) of Chapter 16.24 (Tentative Map) states that a "percolation test may be required if proposed sewage disposal involves percolation into the ground."

City of Lake Elsinore Municipal Code Title 17 (Zoning) Chapter 17.28

Provisions for a Fault Rupture Hazard Overlay Zone are set forth in Chapter 17.28 [(FR) Fault Rupture Hazard Overlay District] of the Lake Elsinore Municipal Code. The purpose of this overlay is to prohibit the location of most structures for human occupancy across traces of active faults and in landslide areas. This Hazard Overlay District implements the policies of the Lake Elsinore General Plan and the provisions of the State of California Alquist-Priolo Special Studies Zones Act. The provisions of the Chapter require a Fault Rupture Hazard Analysis, prepared by a registered soils engineer/geologist, prior to the approval of any project located in a FR Overlay Zone. When a special geologic study zone analysis identifies one or more significant geologic hazards in a project area, the project may be approved only by a written resolution which finds that:

- A. Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant geologic hazards identified in the final analysis; and/or
- B. Such changes or alterations are within the responsibility or jurisdiction of another public agency and such changes have been or can and should be adopted by that agency; and/or
- C. Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the final analysis.

City of Lake Elsinore Municipal Code Title 17 (Zoning) Chapter 17.32

Chapter 17.28 [(PL) Potential Liquefaction Hazard Overlay District] of the Lake Elsinore Municipal Code describes the requirements of the City's Potential Liquefaction Hazard Overlay Zone. The purpose of the Potential Liquefaction Hazard Overlay District is to protect life and property in the City from the effects of seismic activity in areas subject to liquefaction and ground lurching. The purpose of this overlay is also to ensure the review of all proposed discretionary projects within identified potential liquefaction areas by professional soil engineers and the incorporation of site-specific recommendations and mitigation measures as conditions of approval.

5.5.5 Thresholds of Significance

Implementation of the proposed Project would result in a significant adverse environmental impact if any of the following occurs as a result of project implementation:

Threshold GEO-A *Would the proposed project expose people or structures to 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; and/or iv) landslides?*

Threshold GEO-B *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 proposed project, and*

potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Threshold GEO-C *Would the proposed project result in substantial soil erosion or the loss of topsoil?*

Threshold GEO-D *Would the proposed project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

Threshold GEO-E *Would the proposed 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?*

5.5.6 Evaluation of Potential Project Impacts

Threshold GEO-A *Would the proposed project expose people or structures to 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; and/or iv) landslides?*

Threshold GEO-B *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 proposed project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?*

5.5.6.1 Construction Impacts

No potential impacts would result from grading or construction activities for each future implementing development within the Project site because activities would be conducted consistent with state and local building laws and regulations, subject to City review, concurrence and approval of the final grading and building plans.

5.5.6.2 Operational Impacts

The Elsinore fault zone is assumed active within the Project's boundaries. The last recorded ground rupture on the Elsinore fault occurred in 2010 in vicinity of the Laguna Salada segment in Baja California. The last earthquake over magnitude 5.2 along the main trace of the Elsinore fault was a Mw 6 quake near the Temescal Valley in 1910 that produce no known surface rupture. Lesser magnitude

earthquakes have occurred along the Elsinore fault zone in 1890, 1918, 1923, 1937, 1954, 1968, and 1982. Therefore, although the Elsinore fault complex is considered active, it is unlikely that the Project site would be subject to surface rupture during a seismic event. Additionally, the Alquist-Priolo Special Studies Zone for the Wildomar Fault, an Elsinore fault zone strand, is found within ELSPA No. 11 along the southwestern boundary of Planning Area 3, the northeastern boundary of Planning Area 4 and a portion of the southwestern boundary of Planning Area 5. Nonetheless, implementation of mitigation measures **MM GEO-1 through MM GEO-5** would ensure adequate setbacks for habitable structures away from active faults and fissures **would be required to reduce potential impacts to less than significant levels.**

Because the Project site is in southern California, all new development would be subject to periodic seismic activity as are all developments within the region. It is anticipated that structures would be subject to the effects of ground shaking. However, all new structures and facilities proposed would be designed and constructed in accordance with current state and local laws and regulations including the California Building Code (CBC), City Municipal Code Title 15 (Building Code) and Title 17 (Zoning) Chapter 17.28 and 17.32 to ensure that the potential damage from seismic shaking **would be less than significant.**

Potential impacts resulting from liquefaction, ground lurching, landslides, slope stability issues, and seismic-induced ground settlement would also be considered less than significant because of the generally flat nature of the Project site, relatively low risk for liquefaction and medium-stiff to very-stiff dense soil characteristics as described in the existing conditions section. Any required remediation of loose soils, slope contours, or re-compaction to ensure ground stability would be planned for during the design phase and incorporated into the grading plans. In addition, all new structures and facilities proposed would be designed and constructed in accordance with the current state and local laws and regulations, as discussed above, to ensure that potential damage from these potential secondary seismic-related hazards **would be less than significant.**

Although risk factors related to seismicity and the stability of the underlying geologic unit are anticipated to be generally low based on site conditions described above, mitigation measures **MM GEO-1 through MM GEO-9** would require each future implementing development project to evaluate site-specific conditions, make geotechnical recommendations for site grading, and locate habitable structures at least 50 feet from an active fault; thus, ensuring potential **impacts would be reduced to less than significant levels.**

Impact GEO-1 *New structures proposed as part of a future implementing development project could expose new habitable structures and its occupants to harm resulting from potentially significant seismic-related and/or underlying geologic stability hazards, if such habitable structures are located within 50 feet of an active fault or if underlying geologic conditions are not evaluated and addressed based on site-specific geotechnical recommendations and current state and local building code laws and regulations.*

Threshold GEO-C *Would the proposed project result in substantial soil erosion or the loss of topsoil?*

5.5.6.3 Construction Impacts

Excavation and site grading would be required to prepare the portions of the Project site for future implementing development projects. Soil erosion can occur as a result of wind and water on exposed soils during the grading and site preparation phase of a project. Excavation and grading necessary to prepare the site for new development would result in exposure of underlying soils that could be subject to erosion if not properly protected during grading and construction operations; thus, it would be necessary to incorporate temporary erosion protection during grading and site development activities pursuant to standard state and local laws and regulations. Exposed soils during grading can be adequately addressed through the provision of appropriate Best Management Practices (BMPs) that would be included in the Stormwater Pollution Prevention Plan (SWPPP) as indicated in Section 5.8, Hydrology and Water Quality. Implementation of the BMPs prescribed in the SWPPP, compliance with City grading standards and implementation of mitigation measures **MM GEO-10 would ensure that the potential for short-term erosion of the exposed soils during grading and construction would be less than significant.**

Impact GEO-2 *Grading and construction activities could expose soils to potentially significant erosion problems from wind or rain if Best Management Practices (BMPs) are not implemented as part of the approved grading plan for future implementing development projects.*

5.5.6.4 Operational Impacts

Compliance with standard state and local stormwater regulations would ensure new development meets grading code requirements for slope steepness, landscaping and soil compaction, stability, and drainage. Thus, the Site would be improved during grading and construction to avoid significant soil erosion and/or loss of topsoil in the post development condition. The applicant would be required to prepare a Water Quality Management Plan (WQMP) that includes implementation of BMPs to address erosion, consistent with State and local laws and regulations. With implementation of standard WQMP and BMP requirements, **impacts would be less than significant.**

Threshold GEO-D *Would the proposed project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

5.5.6.5 Construction Impacts

No potential impacts would result from short-term construction activities because issues with expansive soils and corrosive soils would be associated with long-term integrity of a structure's foundation. No mitigation is required.

5.5.6.6 Operational Impacts

While there is currently no soil mapping that identifies specific areas within the City that are subject to expansive soils, such soils are known to exist in the City. Past soil sampling done at the Project site found very low to medium expansion potential; thus, expansive soil as defined by the uniform building code may be encountered throughout portions of the site, requiring specialized grading recommendations for remediation such as removal and re-compaction of soils and/or foundation recommendations for soils exposed at finished grade. In addition, corrosive soils are also known to be present at the Project site. Previous soil samples taken at the Project site found very low to high near-surface corrosive soils due to soluble sulfate content. Consistent with standard City requirements, testing for corrosive soils as part of the soils and geotechnical reporting would be conducted and appropriate recommendations would be made for corrosive soils to ensure the long-term integrity of newly constructed structural foundations. Such recommendations for expansive soils and corrosive soils would be implemented through mitigation measures **MM GEO-1** through **MM GEO-8** to minimize risk to life and property. ***Implementation of these measures would reduce potential impacts to less than significant levels.***

Impact GEO-3 *New structures proposed as part of a future implementing development project could expose new habitable structures and its occupants to harm resulting from potentially significant expansive and/or corrosive soils, if such soils are not remediated or if such habitable structures foundation systems are not constructed based on site-specific geotechnical recommendations and current state and local building code laws and regulations.*

Threshold GEO-E *Would the proposed 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?*

5.5.6.7 Construction Impacts

No potential impacts would result from short-term construction activities because issues associated with septic tanks or alternative wastewater disposal systems would be associated with long-term integrity of such systems affected by underlying soil conditions and hydrology.

5.5.6.8 Operational Impacts

The Project is located within the Elsinore Valley Municipal Water District (EVMWD) service area. Based on the EVMWD's 2016 Sewer System Master Plan, existing sewer lines occur within Corydon Street, Mission Trail Drive and Lakeshore Drive serving existing buildings and homes within eastern portions of proposed Planning Areas 2 and 3; existing Summerly residential development and The Links at Summerly Golf Course in proposed Planning Area 1; existing Serenity Development located in proposed Planning Area 4; and residential development in proposed Planning Area 8. There is currently no existing wastewater treatment plant facility or sewer system available within western portions of proposed Planning Areas 2 and 3 or within proposed Planning Area 6. New development in these areas as part of a future implementing development project would be serviced by the Project's proposed backbone

infrastructure improvements within the IIAs, which includes construction of new sewer lines within the Project site for connecting to EVMWD existing lines and EVMWD-proposed sewer upgrades per the EVMWD's Sewer System Master Plan. Therefore, no impacts would occur and no mitigation is required.

In the unlikely event that septic tanks or an alternative waste disposal system is needed on an interim basis until the backbone infrastructure improvements and/or master planned facilities are constructed, prior to the installation of such systems, project applicants would be required to comply with applicable City requirements. Future development allowed under the proposed development would be required to comply with the provisions of Chapter 16.24, Chapter 16.34 and Chapter 16.56 of the City's Municipal Code. Therefore, the proposed project would not result in the installation of septic tanks or alternative waste water disposal systems in soils incapable of adequately supporting such sewage disposal systems. **No impacts would occur and no mitigation is required.**

5.5.7 General Plan Consistency Impacts

The City of Lake Elsinore Community Development Element includes various policies related to geology, seismicity, and soils. The applicable policies within this section and project analysis are discussed in Table 5.5-1.

Table 5.5-1. Seismic Activity Consistency Analysis

Goal/Policy #	Goal/Policy Text	Consistency Analysis
Goal PS 6	Minimize risk of loss of life, injury, property damage, and economic and social displacement due to seismic and geological hazards resulting from earthquakes and geological constraints.	CONSISTENT. Potential seismic impacts are evaluated in the Project's EIR. The Site does not lie within the latest <u>A portion of the Alquist-Priolo Special Studies Zone for the Wildomar Fault crosses the southwestern portion of the Project site Zones.</u> The Project would comply with City and state building and seismic safety requirements that reduce the risk of loss of life, injury, property damage, and economic and social displacement due to seismic and geological hazards.
PS 6.1	Encourage the pursuit of federal and state programs that assist in the seismic upgrading of buildings to meeting building and safety codes.	CONSISTENT. Development or redevelopment in the Project site area would be required to meet current building and safety codes including seismic hazard protection.
PS 6.2	Continue to require Alquist-Priolo and other seismic analyses be conducted for new development to identify the potential for	CONSISTENT. See consistency discussion for Goal PS 6. The Geologic and Geotechnical Investigations report identified minor zones

Goal/Policy #	Goal/Policy Text	Consistency Analysis
	ground shaking, liquefaction, slope failure, seismically induced landslides, expansion and settlement of soils, and other related geologic hazards for areas of new development in accordance with the Fault Rupture Hazard Overlay District adopted by the City of Lake Elsinore Zoning Code. The City may require site-specific remediation measures during permit review that may be implemented to minimize impacts in these areas.	of potential soil liquefaction at depths below 25 feet. The report also analyzed the potential for seismically induced landslides and determined the site is not subject to this risk. The report concluded the Project site is suitable for the proposed development from a geologic and geotechnical engineering standpoint, provided the recommendations in the report are incorporated into the Project design and implemented during construction. The recommendations of the report would be integrated as necessary pursuant to the analysis completed in the EIR and described in this Specific Plan.

Based on the analysis provided in Table 5.5-1., the Project is consistent with the General Plan and no additional mitigation is required.

5.5.8 Cumulative Impacts

Cumulative impacts to geology, soils and seismicity are addressed in the General Plan EIR which is incorporated by reference into this Draft EIR. Cumulative development in the Project area would increase the amount of exposed soils during grading and may result in increased erosion and downstream sedimentation. However, due to short-term nature of grading and construction activities, cumulative impacts resulting from erosion and sedimentation are not anticipated to be significant. The risk of seismic activity and ground shaking is common to the Project site and to all cumulative development in southern California.

Cumulative impacts would be mitigated through individual design features. All future development would be subject to review and being compliant with activities creating dust emissions during construction, grading and operations, including complying with the goals, policies and implementation programs for designing buildings to be in conformance with the California Building Code (CBC). Though future development would be subject to potential seismic or geologic hazards, the City's General Plan's contribution to geologic cumulative effects is considered less than cumulatively considerable and thus is not significant.

Development within the City requires that project development comply with Federal, State and local regulations that are designed to protect people from increased hazards such as earthquakes, landslides and soil erosion. With implementation of the applicable provisions of the City's Municipal Code that relate to geotechnical hazards, expansive soils, corrosive soils, landslides, and subsidence within the City

and Sphere of Influence (SOI), ***potential cumulative impacts would be less than significant and no additional mitigation measures are required.***

5.5.9 Impacts and Mitigation Measures

Impact GEO-1 *New structures proposed as part of a future implementing development project could expose new habitable structures and its occupants to harm resulting from potentially significant seismic-related and/or underlying geologic stability hazards, if such habitable structures are located within 50 feet of an active fault or if underlying geologic conditions are not evaluated and addressed based on site-specific geotechnical recommendations and current state and local building code laws and regulations.*

MM GEO-1 Prior to approval of future implementing development projects within the ESLP, a geotechnical engineering investigation shall be prepared by a California registered geologist or Certified engineering geologist and submitted to the Engineering Department. Said report shall contain the detailed soil, foundation, and seismic design parameters to be used in the project design.

MM GEO-2 Grading plans for projects within the ESLP shall include a grading monitoring and testing program under direction of a California registered geotechnical engineer and/or Certified engineering geologist to verify compliance with the geotechnical recommendations and to confirm that the geotechnical conditions found are consistent with the findings of the investigation performed under MM GEO-1.

MM GEO-3 Proposed structures in the ESLP shall be designed in accordance with Uniform Building Code, local building codes, and site-specific ground motion parameters developed during subsequent site planning investigations, whichever has precedence.

MM GEO-4 Prior to approval of future implementing development projects within the ESLP and within areas enclosed by the State of California Special Studies maps, a fault hazards investigation shall be conducted by a geotechnical engineer to identify potential hazards onsite associated with the ~~Glen Ivy North Wildomar~~ fault and previously theorized buried en-echelon faults. The geotechnical engineer in coordination with the City shall make design and setback recommendations, where required. Pending results of the investigation, additional evaluation (e.g. fault trenching) may be required by the geotechnical engineer in coordination with the City to ensure engineering design and setback recommendations are site-appropriate.

MM GEO-5 Due to the known or potential presence of active faults, potentially capable of surface rupture, structures for human occupation shall not be permitted within 50 feet of any capable faults or fault zones now documented or ultimately documented during further geologic/geophysical investigation of the site during the design of future implementing development projects within the ESLP.

MM GEO-6 Prior to approval of a future implementing development, a site-specific geotechnical subsurface investigation shall be conducted by a California registered geologist to determine design soil liquefaction parameters and provide specific recommendations for site grading and foundation design for projects within the ESLP.

MM GEO-7 Prior to issuance of a grading permit for projects within the ESLP, documentation of slope stability shall be required when the type of fill material has been determined.

MM GEO-8 Use of Sulphur resistant concrete (e.g. "Type V" or equivalent with fly ash) shall be required per Standard Specifications for Public Works Construction for areas containing near surface, high-sulfate content soils for projects within the ESLP.

MM GEO-9 Prior to tentative map approval for projects within the ESLP, the project geotechnical, civil, and structural engineers shall review seismic seiche design parameters and incorporate appropriate design standards into the site plan.

Impact GEO-2 *Grading and construction activities could expose soils to potentially significant erosion problems from wind or rain if Best Management Practices (BMPs) are not implemented as part of the approved grading plan for future implementing development projects.*

MM GEO-10 Prior to issuance of grading permits, Applicants shall submit a detailed grading plan, which shall at a minimum include the following information:

- 1) Preliminary quantity estimates for grading (i.e., cut and fill);
- 2) Designation of areas of temporary borrowing or depositing of material;
- 3) Techniques which will be utilized to prevent erosion and sedimentation during and after the grading process. Approved erosion and sedimentation control measures shall include but not be limited to:
 - a) measures to retain sediment on the site such as design and specifications for sediment detention basins and traps, and silt fences;
 - b) measures to control surface runoff and erosion on the site such as applying mulches, stabilizers, and designs and specifications for diverters, dikes, and drains; and
 - c) measures to enhance and restore groundcover on the site such as identifying types of seeds, fertilizer and application rates, type, location and extent of pre-existing undisturbed vegetation.
- 4) A schedule for the routine inspection, upkeep, and maintenance of all erosion control features shall be included.
- 5) Approximate timeframes for grading including identification of areas which may be graded during the higher probability rain months of January through March.
- 6) Final pad and roadway elevations.

Impact GEO-3 *New structures proposed as part of a future implementing development project could expose new habitable structures and its occupants to harm resulting from potentially significant expansive and/or corrosive soils, if such soils are not remediated or if such habitable structures foundation systems are not constructed based on site-specific geotechnical recommendations and current state and local building code laws and regulations.*

Mitigation Measures MM-GEO-1 through MM GEO-8 would reduce impacts to less than significant levels.

5.5.10 Level of Significance after Mitigation

With the implementation of standard state and local laws and regulations and Mitigation Measures **MM GEO-1** through **MM GEO-10**, all potentially significant impacts related to seismic activity and adverse soils conditions would either be avoided or reduced to a less than significant level. ***No significant unavoidable adverse impacts would remain following mitigation.***

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