III.D. GEOLOGY AND SOILS

This analysis of the potential geology, soils and seismicity impacts associated with the proposed project is based on the following: Geotechnical Engineering Investigation, prepared by Geotechnologies, Inc. dated August 27, 2013 and revised October 18, 2013; and Regional Seismic Evaluation, prepared by Geotechnologies, Inc. dated November 26, 2013 and Revised December 11, 2013. These studies are included as **Appendix E** to this Draft EIR.

EXISTING CONDITIONS

The site consists of a single 23.6-acre parcel bounded by Winnetka Avenue on the west, Prairie Street on the north, existing light industrial/corporate office park uses on the east and a Southern Pacific Railroad right-of-way on the south. A former printing facility for the Los Angeles Times occupies the central portion of the site, and is a multi-story (64 feet) building with 255,815 square feet of floor area. A City of Los Angeles storm drain easement runs along the western and southern perimeter of the site, ranging from 30 to 45 feet along Winnetka Avenue, and approximately 45-feet along the southern border of the site. Exclusive access to the site is currently provided off Prairie Street. Site elevations vary from 860 feet at the northwestern corner to 848 feet at the southeastern corner, resulting in a slight slope to the southeast. Vegetation on the site consists of grass lawns, mature trees, bushes and shrubs. Drainage across the site appears to be by sheetflow to the flood control channel to the south and west.

Regional Geology

The project site is located in the Transverse Ranges Geomorphic Province. The Transverse Ranges are characterized by roughly east-west trending mountains and the northern and southern boundaries are formed by reverse fault scarps. The convergent deformational features of the Transverse Ranges are a result of north-south shortening due to plate tectonics. This has resulted in local folding and uplift of the mountains along with the propagation of thrust faults, including blind thrusts. The intervening valleys have been filled with sediments derived from the bordering mountains.

Subsurface Conditions

Subsurface exploration was conducted for the Geotechnical Engineering Investigation, which consisted of 21 borings at depths between 20 and 50 feet below the site grade. Additionally, subsurface exploration from 2008 included five borings and two test pits ranging in depths between 6 and 50 feet below the site grade.

Fill materials were encountered during exploration to depths ranging between 1 and 12½ feet below the existing site grade. Most of the site is underlain by only 2½ feet of fill. The fill consists of a mixture of sand, silt and occasional clay. The fill ranges between yellowish brown and dark brown in color, and is moist, medium dense to dense, or stiff, and fine grained with occasional gravel.

The fill is in turn underlain by alluvial soils consisting of interlayered mixtures of sand, silt, and clay. The alluvial soils range from yellowish brown to dark brown in color, and are slightly moist to moist, stiff to very stiff, or medium dense to very dense, and fine to coarse grained, with occasional gravel, cobbles, and caliche cementation.

Groundwater

Groundwater was not encountered during exploration to a maximum depth of 50 feet below the existing site grade. The historically highest groundwater level was determined by review of the Canoga Park 7½ Minute Quadrangle Seismic Hazard Evaluation Report, Plate 1.2, Historically Highest Ground Water contours (CDMG, 2005). Review of this plate indicates that that the historically highest groundwater level on the site ranges from 41 feet below grade at the southeastern corner, to 52 feet below grade at the northwestern corner. Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature and other factors, and may also fluctuate across the site.

Seismic Hazards

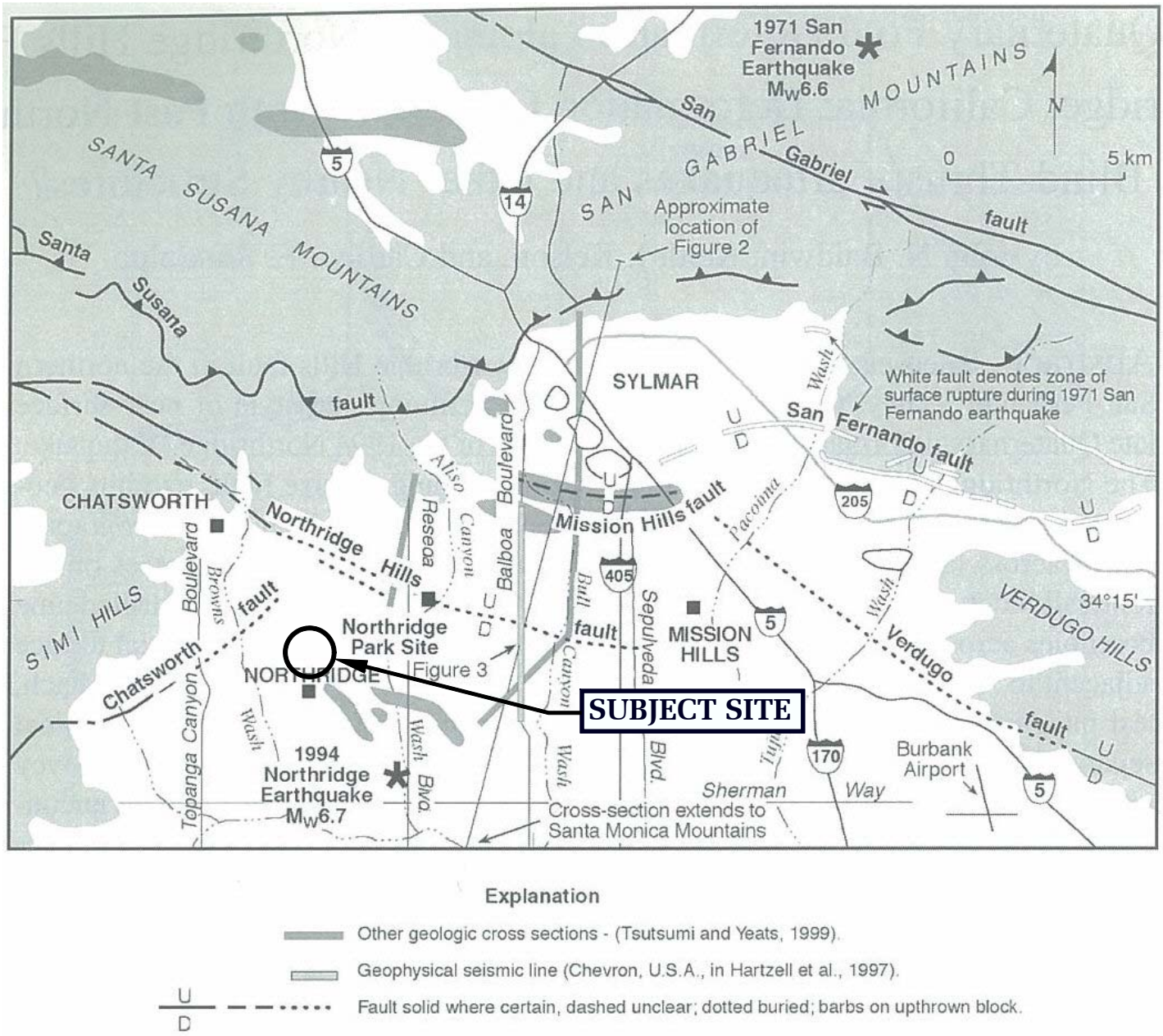
The project site is located within the seismically-active southern California area. As such, earthquakes and other seismically-induced effects are constant potential hazards. Based on the criteria established by the California Division of Mines and Geology (CDMG) now called California Geologic Survey (CGS), faults may be categorized as active, potentially, active, or inactive. Active faults are those, which show evidence of surface displacement within the last 11,000 years (Holocene-age). Potentially active faults are those that show evidence of most recent surface displacement within the last 1.6 million years (Quaternary-age). Faults showing no evidence of surface displacement within the last 1.6 million years are considered inactive for most purposes, with the exception of design of some critical structures. Buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the southern California area. Due to the buried nature of these thrust faults, their existence is usually not known until they produce an earthquake. The risk for surface rupture potential of these buried thrust faults is inferred to be low.[1] However, the seismic risk of these buried structures in terms of recurrence and maximum potential magnitude is not well established. Therefore, the potential for surface rupture on these surface-verging splays at magnitudes higher than 6.0 cannot be precluded.

The project site is not located within any special studies zone (Alquist-Priolo Act, 1972) and no known active fault crosses the site. The locations of significant active and potentially active faults are shown in **Figure III.D-1, Quaternary Geologic Map**. The minimum distances to significant active and potentially active faults in the vicinity of the project site are listed in **Table III.D-1, Seismic Source Summary**. For a detailed discussion of each fault, please refer to the Project Regional Seismic Evaluation included in **Appendix E** to this Draft EIR.

Liquefaction

Liquefaction is a phenomenon where saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

[1] Geotechnical Engineering Investigation, Proposed Mixed-Use Development, 20000 Prairie Street, Chatsworth, California, Geotechnologies, Inc., August 27, 2013, revised October 18, 2013.



Explanation

Other geologic cross sections - (Tsutsumi and Yeats, 1999).

Geophysical seismic line (Chevron, U.S.A., in Hartzell et al., 1997).

U / D — Fault solid where certain, dashed unclear; dotted buried; barbs on upthrown block.

SOURCE: Geotechnologies, Inc., 2014

Figure III.D-1

Quaternary Geologic Map

TABLE III.D-1
SEISMIC SOURCE SUMMARY

Fault Name	Closest Distance (km)	Site Lies	Deterministic Magnitude	Relative Motion	Activity
Santa Susana	7.31	South	6.9	Reverse	A
Sierra Madre (San Fernando)	11.14	Southwest	7.3	Reverse	A (EFZ)
Northridge	13.60	South	6.9	Reverse	A
Simi-Santa Rosa	13.75	Southeast	6.9	Strike Slip	A (EFZ)
Verdugo	13.98	West	6.9	Reverse	A
Santa Monica	16.63	North	7.4	Reverse	PA
Holser	17.28	South	6.8	Reverse	-
Anacapa-Dume	17.48	North	7.2	Reverse	PA
San Gabriel	18.96	Southwest	7.3	Strike Slip	A (EFZ)
Oak Ridge	20.60	Southeast	7.4	Reverse	-
Hollywood	21.47	Northwest	6.7	Strike Slip	A
Malibu Coast	21.74	North	7.0	Strike Slip	A (EFZ)
Oak Ridge (onshore)	21.85	Southeast	7.2	Reverse	-
Sierra Madre	26.06	West	7.2	Reverse	A
Newport-Inglewood	27.24	Northwest	7.5	Strike Slip	A (EFZ)
San Cayetano	28.23	Southeast	7.2	Reverse	A (EFZ)
Elysian Park (Upper)	28.86	Northwest	6.7	Reverse	-
Palos Verdes	29.74	North	7.7	Strike Slip	A
Puente Hills (LA)	31.04	Northwest	7.0	Reverse	-
Raymond	34.34	West	6.8	Reverse	A (EFZ)
Santa Ynez	46.72	Southeast	7.4	Strike Slip	A
Clamshell-Sawpit	48.01	West	6.7	Reverse	PA
San Andreas	49.02	Southwest	8.2	Strike Slip	A (EFZ)
Ventura-Pitas Point	53.75	East	7.3	Reverse	A (EFZ)
Elsinore (Whittier Fault)	55.08	Northwest	7.8	Strike Slip	A (EFZ)
Mission Ridge-Arroyo Parida	58.62	Southeast	6.9	Reverse	-
Oak Ridge (Offshore)	62.29	East	7.0	Reverse	PA
San Jose	65.72	West	6.7	Strike Slip	-
Channel Islands Thrust	68.11	East	7.3	Reverse	-
Red Mountain	68.33	East	7.4	Reverse	A (EFZ)
Santa Cruz Island	69.52	Northeast	7.2	Strike Slip	A
Garlock	71.22	Southeast	7.7	Strike Slip	A (EFZ)
Pleito	72.57	Southeast	7.1	Reverse	A (EFZ)
Chino	74.30	West	6.7	Strike Slip	PA
Cucamonga	74.88	West	6.7	Reverse	A (EFZ)
North Channel	79.05	East	6.8	Reverse	A (EFZ)
Pitas Point (lower) – Montalvo	83.74	East	7.3	Reverse	(A EFZ)
San Joaquin Hills	84.19	Northwest	7.1	Reverse	-
San Jacinto	82.52	West	7.9	Strike Slip	A (EFZ)
Newport-Inglewood (Offshore)	93.90	Northwest	7.0	Strike Slip	A

SOURCE: Regional Seismic Evaluation, Proposed Mixed-Use Development, 20000 Prairie Street, Chatsworth, California, Geotechnologies, Inc., November 26, 2013 and Revised December 11, 2013.
A = Active, A (EFZ) Active (Earthquake Fault Zone) and PA = Potentially Active

The Seismic Hazard Map for the Canoga Park Quadrangle by the State of California (CDMG, 1998) indicates that most of the project site lies outside the boundary of the State designated liquefaction zone, but the southeastern-most corner touches the mapped zone of a "Liquefiable" area.[2] The determination of liquefiable area is based on historic groundwater depth records, soil type, and distance to a fault capable of producing a substantial earthquake.

Settlement

Seismically-induced settlement or compaction of dry moist, cohesionless soils can be an effect related to earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structures.

Tsunamis and Seiches

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine landslide or volcanic eruption. The project site is located approximately 13 miles northeast of the Pacific Ocean. Seiches are oscillations generated in enclosed bodies of water that can be caused by ground shaking associated with an earthquake.

Landsliding

Shaking during an earthquake may lead to seismically induced landslides, especially in areas that have previously experienced landslides or slumps, in areas of steep slopes, or in saturated hillsides. The project site is relatively flat and is not located within a hilly area or positioned downslope from any unprotected slopes or landslide areas.

ENVIRONMENTAL IMPACT

THRESHOLD OF SIGNIFICANCE

The proposed project would be considered to have a significant impact if it were to cause one or more of the following conditions:

a) 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 or based on other substantial evidence of a known fault;

   ii) Strong seismic ground shaking;

   iii) Seismic-related ground failure, including liquefaction;

   iv) Landslides;

b) Result in substantial soil erosion or the loss of topsoil?

[2] Geotechnologies, July 1, 2014.

c) 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 landslides, lateral spreading, subsidence, liquefaction, or collapse;

d) Would the 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; or

e) 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 City of Los Angeles L.A. CEQA Thresholds Guide, the proposed project would also result in a significant geotechnical impact if it exceeds the following threshold:

(a) A project would normally have a significant geologic hazard impact if it would cause or accelerate geologic hazards, which would result in substantial damage to structures or infrastructures, or expose people to substantial risk of injury.

Project Impacts

Excavation and Development

The proposed project would develop a corporate and residential mixed-use development totaling 1,212,515 million square feet of floor area. The project would consist of two following components: (1) adaptive re-use and rehabilitation of the existing light industrial/office building for the Applicant's corporate headquarters, light industrial functions and new creative office tenants, (2) development of 700 rental housing units in four main residential buildings with extensive shared recreational campus amenities, and (3) approximately 11,000 square feet of ancillary, campus and neighborhood serving retail uses and 3,000 square feet of restaurant uses. Excavation for the entire project would be approximately 38,000 cubic yards of excavated soil materials (to allow for a partial level of subterranean parking in Buildings B and C). An ancillary (vacant) single-story 5,060 square foot structure, as well as a former gas station would be demolished to accommodate the project. The proposed at-grade mixed-use structures should be supported on conventional foundations in a uniform compacted fill pad. For the construction of a uniform compacted fill pad, all existing fill materials and upper native soils found within the footprint of the proposed structures should be removed and re-compacted consistent with the recommendations of the Project Geotechnical Engineering Investigation included as **Appendix E** to this Draft EIR.

Erosion and Topsoil

Although project development has the potential to result in the erosion of soil during site preparation and construction activities, erosion would be reduced by implementation of appropriate erosion control during grading. During the construction phase of the project, activities are subject to requirements of the National Pollutant Discharge Elimination System (NPDES) Construction Permit. Compliance with the NPDES permit includes the implementation of Best Management Practices (BMPs), some of which are specifically implemented to reduce soil erosion or loss of topsoil. In addition to the NPDES permit, the Municipal Building Code also addresses grading, excavation, and fills and requires a local Storm Water Pollution Prevention Plan (SWPPP) and a Wet Weather Erosion Control Plan (WWECP) to be developed

for the project. The SWPPP would require implementation of an erosion control plan to reduce the potential for wind or waterborne erosion during the construction process. Furthermore, the project drainage system will intercept and convey runoff in accordance with the City of Los Angeles Low Impact Development (LID) Best Management Practice Handbook, to provide percolation and infiltration, and minimize any potential for erosion (see **III.G, Hydrology & Water Quality**). No continued erosion potential would exist after completion of construction. With the implementation of water quality control and erosion control permits required by the Los Angeles Regional Water Quality Control Board and the City of Los Angeles, impacts with respect to erosion and topsoil would be less than significant.

Expansive Soils

Expansive soils are typically associated with fine-grained clayey soils that have the potential to shrink and swell with repeated changes in the moisture content. The onsite geologic materials are in the very low to moderate expansion range. The geotechnical investigation conducted for the project includes reinforcing recommendations consistent with the requirements of the City of Los Angeles Department of Building and Safety. Therefore, with adherence to the requirements contained in the geotechnical investigation, potential impacts relative to expansive soils would be less than significant.

Ground Surface Rupture

Ground rupture is defined as surface displacement, which occurs along the surface trace of the causative fault during an earthquake. Based on research of available literature and results of the site reconnaissance, no known active, or potentially active, faults underlie the project site. In addition, the project site is not located within an Alquist-Priolo Earthquake Fault Zone. Based on these considerations, ground rupture due to faulting is considered low at the project site.

Ground Shaking

The primary geologic hazard to the proposed project is moderate to strong ground motion (acceleration) caused by an earthquake on any of the local or regional faults. Based on information derived from the subsurface investigation, the project site is classified as Site Class D, which corresponds to a “Stiff Soil” Profile. This information and the site coordinates were input into the USGS Ground Motion Parameter Calculator to calculate the Maximum Considered Earthquake (MCE) Ground Motions for the Project Site. The ground motion parameters for both the 2010 CBC and 2013 CBC are presented in the Project Geotechnical Engineering Investigation included as **Appendix E** to this Draft EIR. As also detailed in the Project Geotechnical Engineering Investigation, the peak ground acceleration (PGA) and modal magnitude were obtained from the USGS Probabilistic Seismic Hazard Deaggregation program which indicated a PGA of 0.48g and a modal magnitude of 6.6 for the Project Site.

Consistent with the conclusions and recommendations of the Project Geotechnical Engineering Investigation included as **Appendix E** to this Draft EIR, the project would be designed and constructed in accordance with State and local building codes to reduce the potential for exposure of people or structures to seismic risks to the maximum extent possible. The proposed buildings would be designed to resist ground shaking through modern construction techniques. The project would comply with the California Department of Conservation, Division of Mines and Geology (CDMG) Special Publications 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California (1997), which provides guidance for the evaluation and mitigation of earthquake-related hazards, and with the seismic safety requirements in the

Uniform Building Code (UBC) and the Los Angeles Municipal Code (LAMC). Therefore, the risks from seismic ground shaking are considered to be less than significant.

Liquefaction

Most of the project site lies outside the boundary of a State designated liquefaction zone, however, the southeastern-most corner touches the mapped zone.[3] Two site-specific liquefaction analyses were performed following the Recommended Procedures for Implementation of the California Geologic Survey Special Publication 117A, Guidelines for Analyzing and Mitigating Seismic Hazard in California (CGS, 2008). As detailed in the Project Geotechnical Engineering Investigation included as **Appendix E** to this Draft EIR, these analyses determined that the potential for liquefaction at the project site during the design earthquake is considered to be remote. As such, impacts with respect to liquefaction are considered to be less than significant.

Settlement

Some seismically-induced settlement of the proposed structures should be expected as a result of ground shaking. As detailed in the Project Geotechnical Engineering Investigation (see **Appendix E** to this Draft EIR), seismic dry sand settlements were calculated for soils encountered in Borings 6 and 19. Consistent with the requirements of the Department of Building and Safety, the total and differential settlements calculated have been considered in the design of the proposed structures and are reflected in the recommendations and conclusions of the Project Geotechnical Engineering Investigation. As such, impacts with respect to settlement are considered to be less than significant.

Tsunamis and Seiches

Review of the County of Los Angeles Flood and Inundation Hazards Map, indicates the project site is not located within the mapped tsunami inundation boundaries nor is the site located within mapped inundation boundaries due to a seiche or a breached upgradient reservoir. Therefore, the potential impact associated with tsunamis and seiches would be less than significant.

Landsliding

The probability of seismically-induced landslides occurring on the project site is considered to be low due to the relatively flat topographic gradient across and adjacent to the project site. In addition, it is anticipated that the proposed mixed-use structures will be location a minimum of 20 feet away from the existing flood control channel. Since the channel is approximately 8 to 9 feet in depth, the proposed mixed-use structures would not be affected in the event that the channel's retaining walls failed. Therefore, the potential impact associated with landslides would be less than significant.

REGULATORY COMPLIANCE MEASURE

RC-III.D-1 Prior to issuance of a grading permit, a qualified geotechnical engineer shall prepare and submit to the Department of Building and Safety a final Geotechnical

[3] Source: Geotechnologies, July 1, 2014.

Investigation that provides final recommendations to address seismic safety and design requirements for foundations and excavation. The final Geotechnical Investigation shall include all applicable recommendations included in the Project Geotechnical Engineering Investigation included as **Appendix E** to the Draft EIR. A qualified geotechnical engineer shall be retained by the Applicant to be present on the Project Site during excavation, grading, and general site preparation activities to monitor the implementation of the recommendations specified in the Geotechnical Investigation as well as other recommendations made in subsequent geotechnical investigations prepared for the project subject to City review and approval. If needed, the geotechnical engineer shall provide structure-specific geologic and geotechnical recommendations that shall be documented in a report to be approved by the City and appended to the project's previous geotechnical investigations.

MITIGATION MEASURES

No mitigation measures are required.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of **Regulatory Compliance Measure III-RC-D-1** would ensure impacts with respect to geology and soils would be less than significant.

CUMULATIVE IMPACTS

Geologic and soils hazards are site-specific, and there is little, if any, cumulative geological relationship between the project and the related projects. Nevertheless, cumulative development in the area would increase the overall residential and 24-hour population, thus, increasing the risk of exposure to seismically-induced hazards. However, adherence to applicable State and federal regulations, building codes, and sound engineering practices, impacts with respect to geologic hazards would be reduced to less than significant levels. In addition, with adherence to the recommendations in the final Geotechnical Investigation, project impacts with respect to geology and soils would be less than significant. Therefore, the project would not compound or increase potential cumulative impacts, and cumulative geology and soil impacts would be less than significant.