

4.6 GEOLOGY AND SOILS

This section provides an overview of geology and soils and evaluates the impacts associated with the proposed project. Topics addressed include suitability of soil for development; geologic faults; and direct and indirect seismic hazards such as floods, subsidence, liquefaction, and landslides. This section was prepared utilizing documents and maps published by the United States Geological Survey (USGS), California Department of Conservation, California Geological Survey (CGS), and the City of Los Angeles.

The proposed project is evaluated in terms of whether the implementation of the West Adams New Community Plan would expose people or structures to adverse effects related to seismic activity or unstable geologic materials within the CPA compared to existing conditions.

REGULATORY FRAMEWORK

Federal

Flood Insurance Rate Maps. Flood Insurance Rate Maps are prepared by the Federal Insurance Administration of the Department of Housing and Urban Development (HUD) after a risk study for a community has been completed and the risk premium rates have been established. The maps indicate the risk premium zones applicable in the community and when those rates are effective. They are used in making flood plain determinations and to determine if a proposed action is located in the base or critical action flood plain, as appropriate.

Uniform Building Code (UBC). The UBC is published by the International Conference of Building Officials and forms the basis for California's building code, as well as approximately 50 percent of the state building codes in the United States. It has been adopted by the California Legislature to address the specific building conditions and structural requirements for California, and provide guidance on foundation design and structural engineering for different soil types. The UBC defines and ranks the regions of the United States according to their seismic hazard potential. There are four types of regions defined by Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest. The City of Los Angeles is located within Seismic Zone 4.

State

Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act). The Alquist-Priolo Act provides policies and criteria to assist cities, counties, and State agencies in the development of structures for human occupancy across the trace of active faults. The Alquist-Priolo Act was intended to provide the citizens of the State with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking.

Seismic Hazards Mapping Act. In order to address the effects of strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events, the State of California passed the Seismic Hazards Mapping Act of 1990. Under the Seismic Hazards Mapping Act, the State Geologist is required to delineate "seismic hazard zones." Cities and counties must regulate certain development projects within these zones until the geologic and soil conditions of the CPA are investigated and appropriate mitigation measures, if any, are incorporated into development plans. The State Mining and Geology Board provides additional regulations and policies to assist municipalities in preparing the Safety Element of their General Plan and encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety. Under Public Resources Code Section 2697, cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and

delineating any seismic hazard. Each city or county shall submit one copy of each geotechnical report, including mitigation measures, to the State Geologist within 30 days of project approval.

California Building Code (CBC). CBC Title 24 is a compilation of building standards, including seismic safety standards for new buildings. CBC standards are based on building standards that have been adopted by state agencies without change from a national model code; building standards based on a national model code that have been changed to address particular California conditions; and building standards authorized by the California legislature but not covered by the national model code. Given the State’s susceptibility to seismic events, the seismic standards within the CBC are among the strictest in the world. The CBC applies to all occupancies in California, except where stricter standards have been adopted by local agencies.

Local

City of Los Angeles General Plan Conservation Element and Safety Element. The City of Los Angeles General Plan provides growth and development policies by providing a comprehensive long-range view of the City as a whole. The General Plan also provides a comprehensive strategy for accommodating long-term growth should it occur as projected. Applicable goals and policies that apply to all development within the City of Los Angeles include a balanced distribution of land uses, adequate housing for all income levels, and economic stability.

The intent of the Conservation Element is the conservation and preservation of natural resources. Policies of the Conservation Element address the effect of erosion on such natural resources as beaches, watersheds and watercourses. Although the Conservation Element cites erosion of hillsides resulting in loss of natural watersheds and features, flooding, and endangerment to structures and people as a continuing issue, it contains limited policies related to erosion and instead refers to the Los Angeles Municipal Code (LAMC Section 91.700 et seq.) and the Flood Hazard Specific Plan (Ordinance 172081), discussed below, for specific guidance.

The Safety Element of the General Plan addresses the issues of protection of people from unreasonable risks associated with natural disasters, fires, floods, and earthquakes. The Safety Element provides a contextual framework for understanding the relationship between hazard mitigation, response to a natural disaster and initial recovery from a natural disaster.

Policies from the Safety Element and Conservation Element related to geology and soils are listed below in **Table 4.6-1**.

TABLE 4.6-1: RELEVANT GENERAL PLAN GEOLOGY AND SOILS GOALS, OBJECTIVES, AND POLICIES	
Goal/Objective/Policy	Goal/Objective/Policy Description
SAFETY ELEMENT - HAZARD MITIGATION	
Policy 1.1.6	State and federal regulations. Assure compliance with applicable State and federal planning and development regulations, e.g., Alquist-Priolo Earthquake Fault Zoning Act, State Mapping Act and Cobey-Alquist Flood Plain Management Act.
CONSERVATION ELEMENT - EROSION	
Objective	Protect the coastline and watershed from erosion and inappropriate sedimentation that may or has resulted from human actions.
Policy 2	Continue to prevent or reduce erosion that will damage the watershed or beaches or will result in harmful sedimentation that might damage beaches or natural areas.
SOURCE: City of Los Angeles General Plan, <i>Safety Element</i> , 1996 and <i>Conservation Element</i> , 2001.	

Los Angeles Municipal Code (LAMC) Section 91.700. Section 91.700, in Chapter 9 of the LAMC, incorporates by reference Chapter 7 of the CBC, regarding the use of fire-resistant building materials, fire suppression systems, and other safety elements related to building design and construction.

Flood Hazard Specific Plan. The Flood Hazard Specific Plan (Ordinance No. 172081) qualifies the City to be in the Regular Status classification of the National Flood Insurance Program. This Specific Plan and the Los Angeles Building Code Chapter 31 qualify property owners for greater coverage limits and generally lower flood insurance premium rates.

City of Los Angeles Emergency Operations Organization (EOO). The EOO helps to administer certain policies and provisions of the Safety Element. The EOO is a City department comprising all City agencies. The EOO Master Plan and associated EOO plans establish the chain of command, protocols, and programs for integrating all of the City's emergency operations into one unified operation. Each City agency in turn has operational protocols to implement EOO plans and programs. A particular emergency or mitigation triggers a particular set of protocols that are addressed by implementing plans and programs. The City's emergency operations program encompasses all of these protocols, plans, and programs.

City of Los Angeles Building Code. Earthwork activities, including grading, are governed by the Los Angeles Building Code, which is contained in LAMC, Chapter IX, Article 1. Specifically, Section 91.7006.7 includes requirements regarding import and export of material; Section 91.7010 includes regulations pertaining to excavations; Section 91.7011 includes requirements for fill materials; Section 91.7013 includes regulations pertaining to erosion control and drainage devices; Section 91.7014 includes general construction requirements, as well as requirements regarding flood and mudflow protection; and Section 91.7016 includes regulations for areas that are subject to slides and unstable soils.

Additionally, the Los Angeles Building Code includes specific requirements addressing seismic design, site grading, foundation design, cut and fill slope design, soil expansion, geologic investigations and reports before and during construction, retaining walls, soil and rock testing, basement walls, shoring of adjacent properties, and potential primary and secondary seismic effects, and groundwater. The Los Angeles Building Code incorporates by reference the 2007 CBC, with City amendments for additional requirements. The City Department of Building and Safety is responsible for implementing the provisions of the Los Angeles Building Code.

EXISTING SETTING

Seismicity

Seismic events present the most widespread threat of devastation to life and property. With an earthquake, there is no containment of potential damage. Since 1800, there have been approximately 60 damaging seismic events, or earthquakes, in the Los Angeles Region. Since 1933, there have been four moderate-size earthquakes which have caused numerous deaths and substantial property damage in the metropolitan Los Angeles area. These four events are identified by their location as the Long Beach (March 11, 1933; magnitude 6.3), San Fernando (February 9, 1971; magnitude 6.4), Whittier Narrows (October 1, 1987; magnitude 5.9), and Northridge (January 17, 1994; magnitude 6.7) earthquakes.

Faults. The entire Southern California area is considered a seismically active region. A fault is a fracture or line of weakness in the earth's crust, along which rocks on one side of the fault are offset relative to the same rocks on the other side of the fault. Based on criteria established by the CGS, faults may be categorized as active, potentially active, or inactive. Active faults are those that show evidence of surface displacement within the last 11,000 years (Holocene age). Potentially active faults are those that show evidence of displacement within the last 1.6 million years (Quaternary age). Faults showing no evidence of displacement

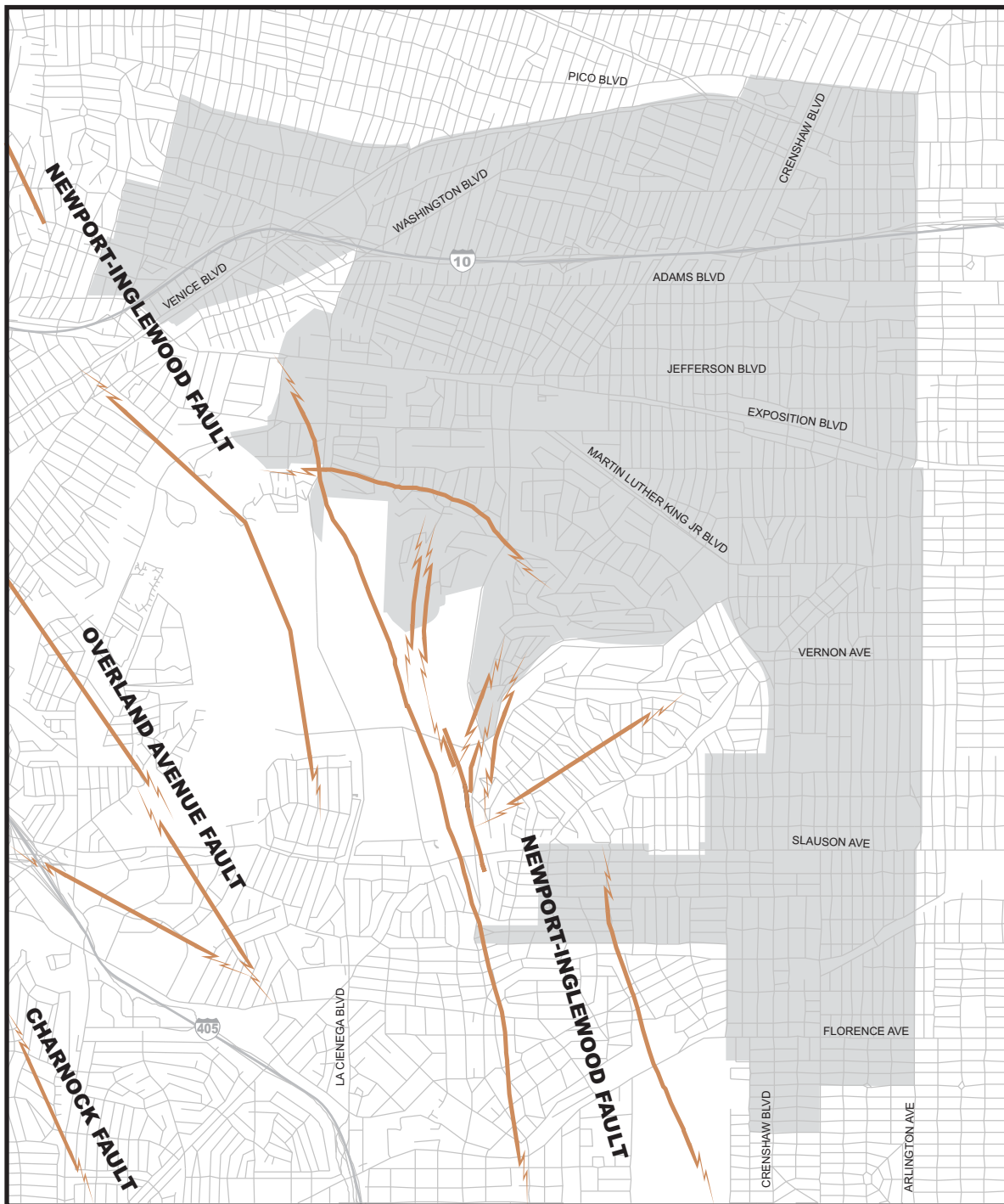
within the last 1.6 million years may be considered inactive for most purposes, except for some critical structures.

Many active earthquake fault zones have been mapped in the Los Angeles area; typically they have been visible, above ground faults, such as the San Andreas Fault. However, earthquakes along the unmapped faults, such as the blind thrust fault associated with the Northridge earthquake, are increasingly becoming the focus of study and concern. These faults may dominate the geology of the Los Angeles basin in a way not previously known. As shown in **Figure 4.6-1**, there are several faults considered to be active within the West Adams CPA. **Table 4.6-2** provides a summary of major named active faults in Southern California. These faults are all part of the Newport-Inglewood Fault Zone. Each of these generally trends northwest to southeast.

TABLE 4.6-2: MAJOR NAMED ACTIVE FAULTS IN SOUTHERN CALIFORNIA				
Fault	Maximum Magnitude	Slip Rate (mm/yr)	Type of Fault	Most Recent Seismic Event
Cabrillo	6.0 - 6.8	Uncertain	Right normal	Holocene
Cucamonga	6.0 - 7.0	5.0 - 14.0	Thrust	Holocene
Elsinore (Glen Ivy Segment)	6.8	5.0	Right lateral strike-slip	Late Quaternary
Hollywood	5.8 - 6.5	0.33 - 0.75	Left reverse	Holocene
Los Alamitos Thrust	Uncertain	Uncertain	Thrust	Uncertain
Malibu Coast	Uncertain	0.3	Reverse	Late Quaternary
Northridge Thrust	6.5 - 7.5	3.5 - 6.0	Thrust	1994
Newport-Inglewood Zone	6.0 - 7.4	0.6	Right lateral	1933
Oak Ridge	6.5 - 7.5	3.5 - 6.0	Thrust	Holocene
Palos Verdes	6.0 - 7.0	0.1 - 3.0	Right reverse	Holocene
Raymond	6.0 - 7.0	0.1 - 0.22	Left lateral	Holocene
San Andreas (Southern Segment)	6.8 - 8.0	20.0 - 35.0	Right lateral strike-slip	1857
San Cayetano	6.5 - 7.3	1.3 - 9.0	Thrust	Uncertain
San Fernando	6.0 - 6.8	5.0	Thrust	1971
San Gabriel	Uncertain	1.0 - 5.0	Right-lateral strike-slip	Late Quaternary
San Jacinto (San Bernardino Segment)	6.5 - 7.5	7.0 - 17.0	Right lateral strike-slip	1968
Santa Monica	6.0 - 7.0	0.27 - 0.39	Left reverse	Late Quaternary
Sierra Madre	6.0 - 7.0	0.36 - 4.0	Reverse	Holocene
Simi-Santa Rosa	Uncertain	Uncertain	Reverse	Holocene
Verdugo	6.0 - 6.8	0.5	Reverse	Holocene
Whittier	6.0 - 7.2	2.5 - 3.0	Right lateral strike-slip	1987
SOURCE: Southern California Earthquake Data Center website, http://www.data.scec.org/fault_index , accessed August 11, 2011.				

Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Not all earthquakes result in surface rupture. The Loma Prieta Earthquake of 1989 caused major damage in the San Francisco Bay Area but the movement deep in the earth did not break through to the surface. Fault rupture almost always follows preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they are accompanied by shaking.

Before a project can be permitted within an Alquist-Priolo Earthquake Fault Zone, the City of Los Angeles requires a geologic investigation to demonstrate that proposed building(s) will 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 (generally 50 feet).



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LEGEND:

- West Adams CPA
- Faults

SOURCE: ESRI and TAHA, 2012.

APPROX.
SCALE



FIGURE 4.6-1

REGIONAL FAULTS

Ground Shaking. The principal seismic hazard occurring as a result of an earthquake produced by local faults is strong ground shaking. The intensity of ground shaking depends on several factors, including the magnitude of the earthquake, distance from the earthquake epicenter, and the underlying soil conditions. In general, the larger the magnitude of an earthquake and the closer a site to the epicenter of the event, the greater the effects will be. However, soil conditions can also amplify the earthquake shock waves. Generally, the shock waves remain unchanged in bedrock, are amplified to a degree in thick alluvium, and are greatly amplified in thin alluvium.

Modern, well-constructed buildings are designed to resist ground shaking through the use of shear walls and reinforcements. The entire Southern California area is considered a seismically active region, and every building in the region is susceptible to ground shaking and earthquakes. The City of Los Angeles Building Code includes regulations and requirements designed to reduce risks to life and property to the maximum extent feasible.

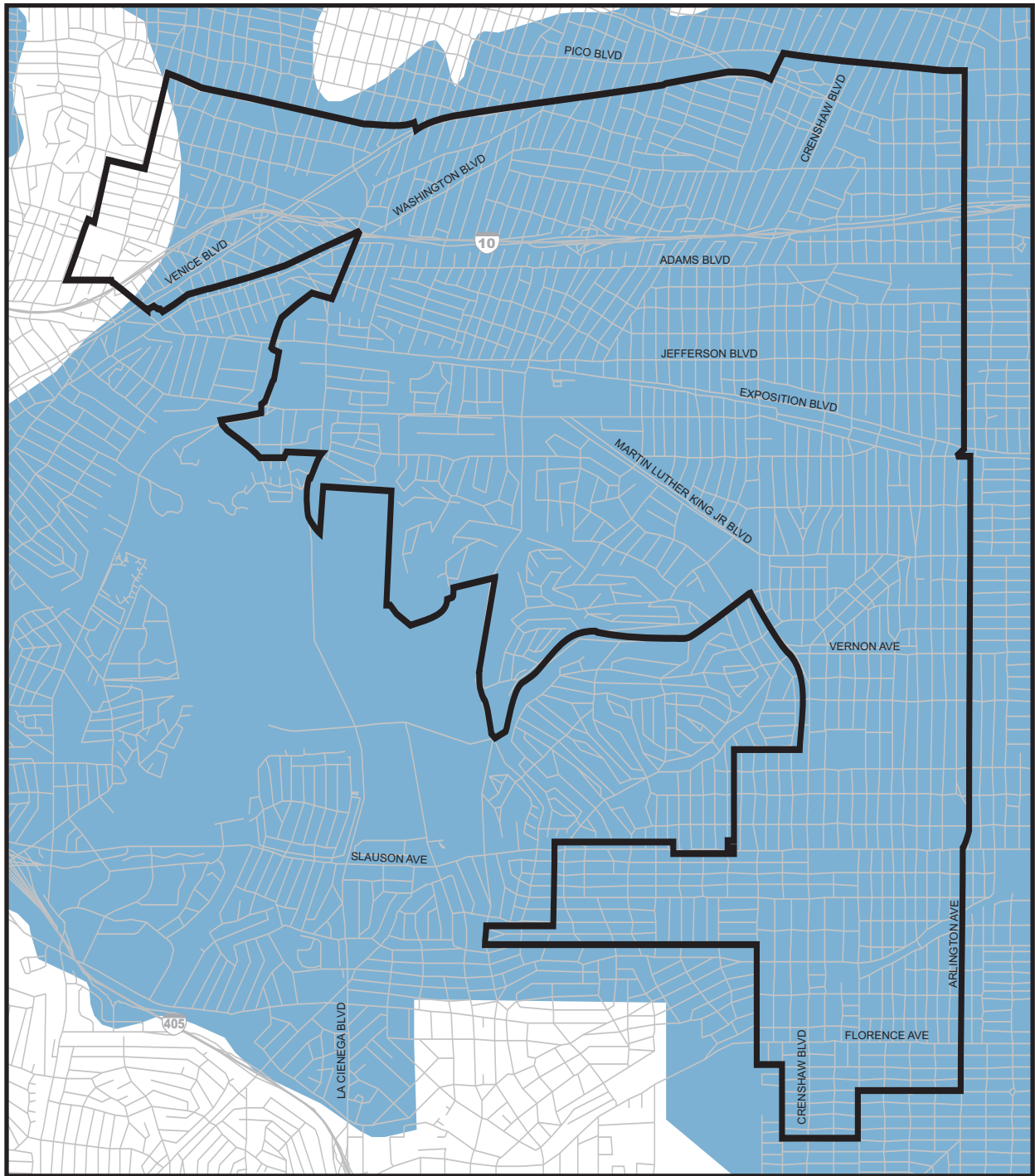
Liquefaction. Liquefaction involves the sudden loss of strength in saturated, cohesionless soils that are subjected to ground vibration and which results in temporary transformation of the soil into a fluid mass. If the liquefying layer is near the surface, the effects are much like that of quicksand for any structures located on top of it. If the layer is deeper in the subsurface, it may provide a sliding surface for the material above it. The effects of liquefaction include the loss of the soil's ability to support footings and foundations which may cause buildings and foundations to buckle. These failures have been observed in the 1971 San Fernando and the 1994 Northridge earthquakes.

Areas susceptible to liquefaction in the West Adams CPA are identified in **Figure 4.6-2**. As shown, liquefaction areas cover a large portion of the West Adams CPA. Methods exist for safely designing and constructing facilities in liquefaction-prone areas; however, they are costly. While avoidance is a better option, liquefaction areas lie within already developed regions. Therefore, early planning recognition will allow more intelligent siting of critical facilities that must remain functional following a local earthquake.

Landslides. A landslide is a mass down-slope movement of earth materials under the influence of gravity, and includes a variety of forms including: rockfalls, debris slides, mudflows, block slides, soil slides, slumps, and creeps. These mass movements are triggered or accelerated by earthquake-induced ground motion, increased water content, excessive surface loading, or alteration of existing slopes by man or nature. Earthquake-induced landslides, usually associated with steep canyons and hillsides, can originate on, or move down, slopes as gentle as one degree in areas underlain by saturated, sandy materials. Within the West Adams CPA, areas identified as landslide zones are primarily located in the areas between Fairfax Avenue, La Brea Avenue, and Crenshaw Boulevard along the West Adams CPA's southern boundaries. These zones are within the Baldwin Hills area, adjacent to Kenneth Hahn State Recreation Area (**Figure 4.6-3**).



Soils and Geologic Materials

Soil Erosion. The factors contributing to potential soil erosion include: climate, the physical characteristics of soils, topography, land use, and the amount of soil disturbance. In general, the loss of ground cover caused by construction activities is a primary factor contributing to an increase in soil erosion potential. Erosion potential is also directly related to the steepness of the terrain. As the West Adams CPA is a highly urbanized area covered by impermeable surfaces, the potential for erosion is relatively low. However, the actual potential for erosion is difficult to predict as the conditions under which this hazard can occur are site specific. The City of Los Angeles Building Code (LAMC Section 91.700 et seq.) regulates grading, excavations, landfill, and other construction activities that might cause or be impacted by slope or ground instability, erosion, or flooding in hillside areas.



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LEGEND:

-  West Adams CPA
-  Liquefaction Areas

SOURCE: City of Los Angeles, ESRI, and TAHA, 2012.

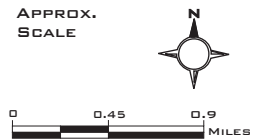
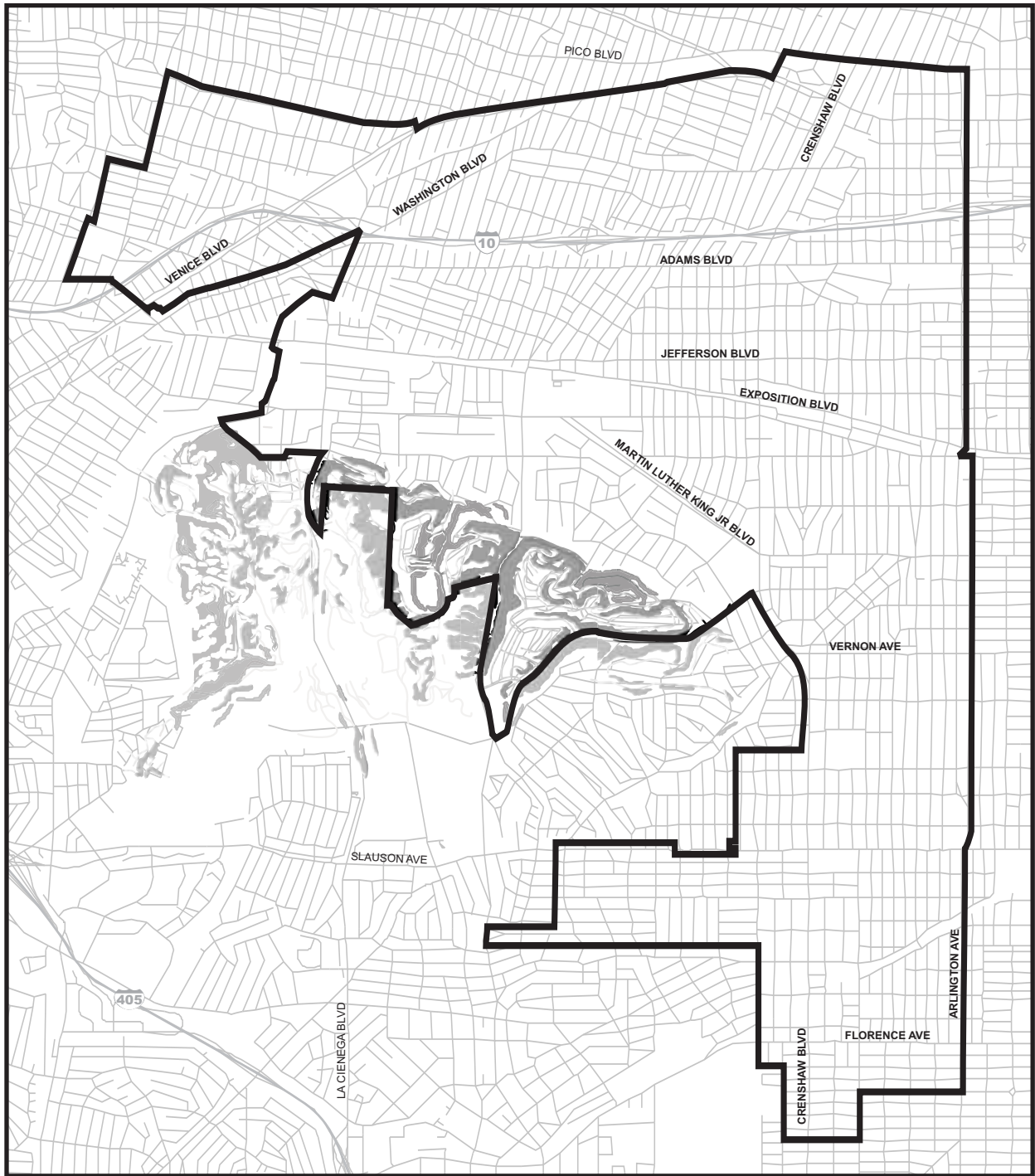



FIGURE 4.6-2

LIQUEFACTION AREAS



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LEGEND:

-  West Adams CPA
-  Landslide Zones

SOURCE: City of Los Angeles, ESRI, and TAHA, 2012.

APPROX.
SCALE



Unstable Soils. The West Adams CPA would be subject to low-level differential settlement due to the intense shaking associated with seismic events.¹ This type of hazard results primarily in damage to property when an area settles to different degrees over a relatively short distance. The actual potential for settlement is difficult to predict as the conditions under which this hazard can occur are site specific.

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 ability of clayey soil to change volume can result in uplift or cracking to foundation elements or other rigid structures such as slabs-on-grade, rigid pavements, sidewalks, or other slabs or hardscape founded on these soils. Expansive soils may be present within the West Adams CPA.

Septic Tanks

The West Adams CPA is currently served by City-owned wastewater treatment and disposal facilities and does not utilize a septic system.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact related to geology and soils if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving:
 - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
 - Strong seismic ground shaking
 - Seismic-related ground failure, including liquefaction
 - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; and/or
- Have soils capable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater.

City of Los Angeles CEQA Thresholds Guidelines

In addition, based on the criteria set forth in the City of Los Angeles CEQA Thresholds Guide (2006), the determination of significance shall be made on a case-by-case basis, considering the following factors:

The proposed project would have a significant impact on geologic hazards if:

- The project causes or accelerates geologic hazards which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury.

¹City of Los Angeles Citywide General Plan Framework, *Final Environmental Impact Report*, January 1995.

The proposed project would have a significant impact on sedimentation and erosion if:

- The project causes or accelerates instability from erosion so as to result in a geologic hazard to other properties; or
- The project accelerates natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site.

The proposed project would have a significant impact on landform alteration if:

- One or more distinct and prominent geologic or topographic features would be destroyed, permanently covered, or materially and adversely modified. Such features may include, but are not limited to, hilltops, ridges, hill slopes, canyons, ravines, rock outcrops, water bodies, streambeds, and wetlands.

IMPACTS

The proposed project is the adoption of the West Adams New Community Plan and its implementing ordinances. These ordinances, which include standards and guidelines for projects within the West Adams CPA include a Community Plan Implementation Overlay District (CPIO) containing several subdistricts throughout the plan area, as well as amendments to the existing Crenshaw Corridor Specific Plan. The proposed project further involves General Plan amendments and zone changes to create consistency with the City's General Plan Framework Element, as well as create consistency between both planned and existing uses of parcels and their relationship to surrounding areas. Through implementation of the CPIO, the proposed project further restricts detrimental uses, incentivizes development in targeted areas, and provides development standards to ensure that new construction is consistent with neighborhood character, as well as corrects minor errors within the existing West Adams Community Plan. While there are geology and soil impacts to consider within the West Adams CPA, they are subject to the federal, State, and local policies and guidelines mentioned above; therefore, the proposed West Adams New Community Plan its implementing ordinances do not contain any specific guidelines that would affect geology or soils.

Construction

The West Adams New Community Plan describes the capacity for future development for a portion of the City. While the proposed project includes a series of implementing ordinances, it is not an implementation plan in and of itself, and its adoption does not constitute a commitment to any project-specific construction. However, construction related to future capacity within the West Adams CPA would have the following impacts.

Seismicity

Construction related to the proposed project would not affect seismicity. Therefore, no further discussion of construction impacts to seismicity is necessary.

Soils and Geologic Materials

Soil Erosion. Proposed changes associated with the West Adams New Community Plan would involve new construction, which would result in an increase in grading and subsequent erosion and loss of topsoil within the West Adams CPA. However, all earthwork and grading activities associated with the proposed project would require grading permits from the Department of Building and Safety that include requirements and standards designed to limit potential impacts related to soil erosion. All on-site grading and site preparation must comply with applicable provisions of Chapter IX, Division 70 of the LAMC, which addresses grading, excavations, and fills, as well as the recommendations of a site-specific geotechnical report.

Implementation of the City's codes, regulatory requirements, standard grading and building permit requirements, and the application of Best Management Practices, would ensure that potential impacts from erosion or loss of top soils would be less than significant. Therefore, the proposed project would result in less-than-significant impacts related to soil erosion.

Unstable Soils. New construction generated by the West Adams New Community Plan could take place on soils that are unstable, and, therefore, could result in landslides, lateral spreading, subsidence, liquefaction, or collapse. As previously stated, the City requires the approval of a site-specific geotechnical report for new developments where unstable soils may be indicated. In addition, all earthwork and grading activities require grading permits from the Department of Building and Safety that include requirements and standards designed to limit potential soil instability impacts. Compliance with the recommendations of the geotechnical report and Chapter IX, Division 70 of the LAMC, which addresses grading, excavations, and fills, as well as with any specific requirements established by the Department of Public Works and/or the City Engineer would reduce hazards related to unstable soils. Therefore, the proposed project would result in less-than-significant impacts related to unstable soils.

Expansive Soils. As development under the West Adams New Community Plan occurs, buildings could be constructed on areas of expansive soils. As described above, the City requires, as a standard practice, the preparation, review, and approval of geotechnical reports for new developments. In addition, all earthwork and grading activities require grading permits from the Department of Building and Safety, compliance with the LAMC, and adherence to the recommendations of a site-specific geotechnical report. Compliance with the existing codes and requirements would reduce expansive soil-related hazards. Therefore, the proposed project would result in less-than-significant impacts related to expansive soils.

Septic Tanks

As previously mentioned, the West Adams CPA is currently served by City-owned wastewater treatment and disposal facilities and does not utilize a septic system. Therefore, no impacts related to septic tanks would occur.

Operations

Seismicity

Faults. Small areas along the southwestern boundary of the West Adams CPA have been mapped as Alquist-Priolo Earthquake Fault Zones. These areas contain a mix of single- and multi-family residential, commercial, industrial/manufacturing, and open space uses. The West Adams New Community Plan proposes changes within an Alquist-Priolo Earthquake Fault Zone, including the creation of a transit-oriented development (TOD) CPIO subdistrict. TOD CPIO subdistricts involve intensifying development around proposed transit areas, in order to improve transportation access. The proposed TOD located within an Alquist-Priolo Earthquake Fault Zone is within the Jefferson/La Cienega Boulevards CPIO subdistrict, between La Cienega and Rodeo Boulevards where they intersect with Jefferson Boulevard. This area is largely developed with commercial and industrial/manufacturing uses. Implementing the proposed West Adams New Community Plan would create the capacity for intensified development in this area by increasing the maximum floor area ratio (FAR) and changing the zoning from limited industrial to commercial and commercial/manufacturing uses. These changes would allow specialized TOD development parameters for commercial and industrial properties within a half-mile radius of the proposed Expo LRT station at Jefferson and La Cienega Boulevards. The majority of the changes associated with the proposed West Adams New Community Plan are related to the implementation of design standards; however, some proposed changes in FAR would increase the intensity of potential development, thereby increasing the number of residents in certain portions of the West Adams CPA. Therefore, although this area is currently developed, more intense redevelopment could occur with implementation of the proposed West Adams New Community Plan.

As discussed above, a seismic event along a fault zone has the potential to cause surface ground rupture resulting in loss, injury, or death. The increased intensity of development within certain portions of the West Adams CPA would result in a greater number of people exposed to potential seismic hazards. However, as stated above, the City of Los Angeles has strict requirements for within an Alquist-Priolo Earthquake Fault Zone, including requiring a geologic investigation by a licensed geologist.

The proposed project encourages targeted redevelopment within the West Adams CPA. Elements such as increasing the intensity of development in proposed transit areas and revitalizing existing commercial corridors and industrial areas would require the construction of new buildings. As stated previously, any new structures constructed within the West Adams CPA would be required to comply with the seismic safety guidelines in the City's General Plan Safety Element, as well as the seismic safety requirements in the CBC and the City of Los Angeles Building Code. In addition, redevelopment would likely result in the replacement of old buildings that are not built to current seismic standards with new buildings that meet the most recent building codes and regulations. Replacing these existing older structures with new structures built to the latest seismic standards would reduce the risk of loss, injury or death as a result of fault rupture. Therefore, the proposed project would result in less-than-significant impacts related to fault rupture.

Ground Shaking. The West Adams CPA is located in the seismically active region of Southern California and will likely be subjected to strong ground shaking during the life-time of the proposed project. The General Plan Amendments, zone changes, and established overlay zones associated with the proposed West Adams New Community Plan are intended to provide housing and employment opportunities to accommodate the increased anticipated population, housing, and employment growth. In addition, these changes would encourage revitalization along commercial and transit-served corridors, and enable opportunities for increased employment and new housing along commercial corridors and centers. As a result, the population and the number of dwelling units would increase under the proposed West Adams New Community Plan, thereby increasing the number of people and structures exposed to geologic hazards, including strong seismic ground shaking.

As with any new development in the State of California, building design and construction would be required to conform to the current seismic design provisions of the CBC. Further, construction of individual projects developed as part of the proposed West Adams New Community Plan would also be required to adhere to the seismic design requirements of the Los Angeles Building Code, as well as the General Plan Safety Element, which would ensure new buildings would be designed to resist ground shaking through modern construction techniques.

Compliance with the 2007 CBC, the City of Los Angeles Building and Grading Codes, and the existing General Plan policies would ensure that the City would minimize ground shaking hazards. Therefore, the proposed project would result in a less-than-significant impact related to ground shaking.

Liquefaction. As previously shown in **Figure 4.6-2**, large portions of the West Adams CPA are in liquefaction zones. Implementation of the proposed West Adams New Community Plan includes zone changes, land use designation and district amendments, and the establishment of overlay zones and TOD areas. Refinements to zoning regulations are proposed to enable opportunities for increased employment and new housing; particularly along commercial corridors at centers, and at transit stations. The areas subject to liquefaction within the West Adams CPA are currently developed with existing structures; however, elements of the proposed West Adams New Community Plan could involve the redevelopment of these areas, as well as the replacement of existing structures with new buildings. Prior to construction of new structures in liquefaction-prone areas, a site-specific geotechnical evaluation is required that would specifically address and include measures to minimize liquefaction. Any new development under the proposed project would comply with the recommendations identified in the geotechnical evaluation, as well as the City of Los Angeles Building and Grading Codes and any specific requirements established by the Department of Public Works and/or the City Engineer. Therefore, the proposed project would result in less-than-significant impacts related to liquefaction.

Landslides. As shown in **Figure 4.6-3** above, portions of the West Adams CPA susceptible to landslides are primarily located in the areas between Crenshaw Boulevard, Fairfax and La Brea Avenues along the West Adams CPA southern boundaries. These zones are within the Baldwin Hills area, and adjacent to the Kenneth Hahn State Recreation Area, which are primarily designated for open space and low-density residential uses. These areas have not been identified as areas of change under the proposed project. Therefore, no impacts related to landslides would occur.

Soils and Geologic Materials

Operation of the proposed project would not affect soils and geologic materials. Therefore, no further discussion of operation impacts to soils and geologic materials is necessary.

Septic Tanks

As previously mentioned, the West Adams CPA is currently served by City-owned wastewater treatment and disposal facilities and does not utilize a septic system. Therefore, no impacts related to septic tanks would occur.

MITIGATION MEASURES

Construction

Seismicity

No impacts related to seismicity would occur. No mitigation measures are required.

Soils and Geologic Materials

Impacts related to soil erosion, unstable soils, and expansive soils would be less than significant. No mitigation measures are required.

Septic Tanks

No impacts related to septic tanks would occur. No mitigation measures are required.

Operations

Seismicity

Impacts related to faults, ground shaking, liquefaction, and landslides would be less than significant. No mitigation measures are required.

Soils and Geologic Materials

No impacts related to soils and geologic materials would occur. No mitigation measures are required.

Septic Tanks

No impacts related to septic tanks would occur. No mitigation measures are required.

SIGNIFICANCE OF IMPACTS AFTER MITIGATION

Construction

Seismicity

No impacts related to seismicity would occur.

Soils and Geologic Materials

Impacts related to soil erosion, unstable soils, and expansive soils were determined to be less than significant without mitigation.

Septic Tanks

No impacts related to septic tanks would occur.

Operations

Seismicity

Impacts related to faults, ground shaking, liquefaction, and landslides were determined to be less than significant without mitigation.

Soils and Geologic Materials

No impacts related to soils and geologic materials would occur.

Septic Tanks

No impacts related to septic tanks would occur.