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## **4.22 Earth/Geology (CEQA)**

### **4.22.1 Introduction**

The earth/geology analysis addresses the potential for the Master Plan alternatives to increase the consequences of adverse geologic conditions and hazards including earthquake-induced ground shaking, earthquake fault surface rupture, earthquake-induced liquefaction and settlement, non-seismic settlement, expansive soils, slope stability, oil field gases, and construction as more fully described in Section 4.22, *Earth/Geology* (subsection 4.22.1), of the Draft EIS/EIR. Information pertaining to other hazards, including tsunami, oil field subsidence, and subsidence due to groundwater withdrawal, is provided in Technical Report 12, *Earth/Geology Technical Report*, of the Draft EIS/EIR.

### **4.22.2 General Approach and Methodology**

The analysis of earth/geology presented below is based on the general approach and methodology described in Section 4.22, *Earth/Geology* (subsection 4.22.2), of the Draft EIS/EIR. In addition, the analysis completed for this Supplement to the Draft EIS/EIR includes consideration of changes to baseline conditions (see Section 4.22.3 below), using the same methodology applied to the 1996 baseline analysis.

### **4.22.3 Affected Environment/Environmental Baseline**

The affected environment/environmental baseline related to earth/geology used in this Supplement to the Draft EIS/EIR is the same as described in Section 4.22, *Earth/Geology* (subsection 4.22.3), of the Draft EIS/EIR. Evaluation of Year 2000 conditions indicated that no material changes to the affected environment/environmental baseline have occurred that alter the conclusions of the Draft EIS/EIR.

### **4.22.4 Thresholds of Significance**

#### **4.22.4.1 CEQA Thresholds of Significance**

As stated in Section 4.22, *Earth/Geology* (subsection 4.22.4.1), of the Draft EIS/EIR, a significant earth/geology impact would occur if the direct and indirect changes in the environment that may be caused by the particular build alternative would potentially result in one or more of the following future conditions:

- ◆ Substantial damage to structures or infrastructure, or exposure of people to substantial risk of injury, as a result of the creation or acceleration of a geologic hazard.
- ◆ Sediment runoff (erosion) that could not be contained or controlled on-site.
- ◆ Destruction, permanent covering, or material and adverse modification of one or more distinct and prominent geologic or topographic features.

These thresholds of significance are utilized because they address potential concerns relative to geologic hazards and landform alteration associated with the Master Plan build alternatives, namely seismic hazards (ground shaking, surface rupture, liquefaction, seismic settlement, and seismic slope failure), non-seismic settlement, expansive soils, slope stability, oil field gases, and erosion. The thresholds reflect those contained in the *Draft L.A. CEQA Thresholds Guide*<sup>260</sup> that are relevant to this project, as well as relevant issues identified in the suggested Initial Study Checklist contained in the State CEQA Guidelines.

#### **4.22.4.2 Federal Standards**

As stated in Section 4.22, *Earth/Geology* (subsection 4.22.4.2), of the Draft EIS/EIR, the FAA *Airport Environmental Handbook* does not require that this environmental topic be addressed; therefore, no federal standards apply to the following analysis.

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<sup>260</sup> City of Los Angeles, *Draft LA CEQA Thresholds Guide*, May 14, 1998.

## **4.22 Earth/Geology (CEQA)**

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### **4.22.5 Master Plan Commitments**

No Master Plan commitments for earth/geology are proposed.

### **4.22.6 Environmental Consequences**

The environmental impacts to earth/geology under the No Action/No Project Alternative and Alternatives A, B, and C have not changed from those described in Section 4.22, *Earth/Geology* (subsection 4.22.6), of the Draft EIS/EIR.

#### **4.22.6.1 Alternative D - Enhanced Safety and Security Plan**

A complete description of the facilities associated with Alternative D is provided in Chapter 3, *Alternatives* (subsection 3.3.2), of this Supplement to the Draft EIS/EIR.

#### **Earthquake-Induced Ground Shaking**

The potential impacts of earthquake-induced ground shaking under Alternative D would be generally the same as those for Alternatives A, B, and C. As with Alternatives A, B, and C, under Alternative D, additional structures and people (relative to baseline conditions) would be exposed to seismically-induced ground shaking through 2015 and the design life of the improvements. The new facilities would be of a similar type as those associated with Alternatives A, B, and C. Exposure of people to ground-shaking hazards would increase over baseline conditions in proportion to the increase in peak hour passengers. The potential for injury would increase under Alternative D compared to baseline conditions given the increased number of passengers in the terminals. Additional details on Alternative D project elements potentially affected by ground shaking are provided in **Table S4.22-1**, Matrix of Potential Earth/Geologic Considerations for Major Master Plan Facilities.

As under the other project alternatives, the level of ground shaking could be severe, with the potential to cause structural damage and injury. As noted previously, this is a condition that exists throughout the Los Angeles region. As with the other build alternatives, the potential for ground shaking hazards due to structural failure would be minimized to a less than significant level under Alternative D by designing structures according to the Uniform Building Code (UBC) and the City of Los Angeles Building Code.

#### **Earthquake Fault Surface Rupture**

Under Alternative D, the potential impacts of earthquake fault surface rupture and co-seismic ground deformation in the eastern portion of LAX would be higher than those for Alternatives A, B, and C. As discussed in detail in Section 4.22, *Earth/Geology* (subsections 4.22.3 and 4.22.6), of the Draft EIS/EIR and in Technical Report 12, *Earth/Geology Technical Report*, of the Draft EIS/EIR, the Charnock Fault may extend towards, and possibly beneath, LAX in the vicinity of the east end of the proposed GTC or west of the GTC and beneath the proposed RAC facility and APM (see **Figure S4.22-1**, Composite Aerial Photo Lineament Map). The likelihood of surface rupture occurring is considered low; however, the potential does exist. Implementation of Alternative D would expose additional facilities and people to potential fault surface rupture in this area relative to the other alternatives. This alternative would increase passenger activities over baseline conditions, although to a lesser degree than the other build alternatives. The new facilities would be very similar to those proposed for Alternatives A, B, and C, the primary differences being the placement of the GTC, ITC, and APM system on the east side of the airport. Additional details on Alternative D project elements potentially affected by fault surface rupture are provided in **Table S4.22-1**.

The hazards of fault surface rupture and co-seismic ground deformation under Alternative D would be similar to those for the other alternatives, including damage to, or failure of, structures, potentially resulting in injury to persons. This condition is not unique in the Los Angeles region.

Table S4.22-1

Matrix of Potential Earth/Geologic Considerations for Major Master Plan Facilities

Master Plan Alternatives and Related Major Facilities	Slope Stability	Oil Field Subsidence	Oil Field Gas	Groundwater/Dewatering	Settlement	Expansion	Fault Surface Rupture	Ground Shaking	Liquefaction	Seismic Stability	Seismic Slope Settlement	Tsunami, Seiche, Flooding	Tunneling	Grading	Existing Foundations
<b>No Action/No Project Alternative 2005, 2015</b>															
New Taxiways (North, South Airfields)	-	-	-	-	X	X	-	-	X	-	X	-	-	X	-
2 Remote Boarding Lounges - Westside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	-
Cargo Facility Improvements	-	-	-	-	X	X	X	X	X	-	-	-	-	X	X
I-405/Arbor Street Interchange	X	-	-	-	X	-	X	X	X	X	-	-	-	X	-
Century Cargo Roadway System	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
LAX Northside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	X
Continental City	X	-	-	X	X	X	X	X	-	-	-	-	-	X	-
<b>Alternative A – Added Runway North Facilities 2005</b>															
New Runway 24L Extension/Taxiways	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
New Taxiways over Aviation	-	-	-	-	X	X	X	-	-	-	-	-	-	X	-
New West Terminal, Satellite Concourses & Parking Structure	X	-	X	X	X	-	-	X	X	-	X	-	X	X	X
Redevelop Century Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New East Imperial Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New Admin/Maintenance Facilities	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New Flight Kitchen	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
Ring Road And Regional Roads															
West Terminal Access – Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Westchester Parkway – Realignment/Grade Separations	X	-	-	-	X	X	X	X	X	X	X	-	-	X	-
Aviation Blvd. – Depressed Between Century & Imperial	X	-	-	X	X	X	X	-	-	X	-	-	-	X	-
I-105/Imperial – Extend South to Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Sepulveda – New Interchange, Tunnel, Westchester to Century	X	-	-	X	X	-	X	X	X	X	X	-	X	X	-
Arbor Vitae – Interchanges	X	-	-	-	X	X	X	X	-	X	-	-	-	X	-
Demolition and Clearing of Acquisition Areas	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
Westchester Southside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	-
<b>Alternative A – Added Runway North Facilities 2015</b>															
New Runway 24R/Taxiways	-	-	-	-	X	-	X	-	X	-	X	-	-	X	-
Relocate Runway 24C/Taxiways	-	-	-	-	X	-	X	-	X	-	X	-	-	X	-
Relocate Runway 24L/Taxiways	-	-	-	-	X	-	X	-	X	-	X	-	-	X	-
Upgrade Runway 25R/Taxiways	-	-	-	-	X	-	X	-	X	-	X	-	-	X	-
Reconstructed Runway 25L/Taxiways	-	-	-	-	X	-	X	-	X	-	X	-	-	X	X
Reconfiguration of CTA	-	-	-	-	X	X	-	X	X	-	X	-	-	X	X
Automated People Mover	X	-	X	X	X	-	-	X	X	X	X	-	X	X	X
La Cienega Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
South Cargo Complex East	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
Imperial Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New Fuel Farm	X	-	-	-	X	-	-	X	X	X	X	-	-	X	X
LAX Expressway	X	-	-	X	X	-	X	X	-	X	-	-	X	X	-
Lincoln Blvd. Interchange	-	-	-	-	X	-	-	-	X	-	X	-	-	X	-
Green Line to West Terminal	X	-	X	X	X	-	X	X	X	X	X	-	X	X	X
<b>Alternative B – Added Runway South Facilities 2005</b>															
New 24L Runway Extension/Taxiways	-	-	-	-	X	-	X	X	X	-	X	-	-	X	-
New Taxiways over Aviation	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
New West Terminal, Satellite Concourses & Parking Structure	X	-	X	X	X	-	X	X	X	X	X	-	X	X	-
New La Cienega Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New East Imperial Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
Redevelop Century Cargo Complex	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
Westchester Parkway Cargo Complex	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
New Admin/Maintenance Facilities	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New Flight Kitchens	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
Ring Road and Regional Roads															
West Terminal Access – Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Westchester Parkway – Realignment/Grade Separations	X	-	-	-	X	X	X	X	X	X	X	-	-	X	-
Aviation Blvd. – Depressed Between Arbor Vitae & Imperial	X	-	-	X	X	X	X	-	-	X	-	-	-	X	-
I-105/Imperial – Extend South to Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Sepulveda – New Interchange, Tunnel Westchester to Century	X	-	-	X	X	-	X	X	X	X	X	-	X	X	-

Table S4.22-1

Matrix of Potential Earth/Geologic Considerations for Major Master Plan Facilities

Master Plan Alternatives and Related Major Facilities	Slope Stability	Oil Field Subsidence	Oil Field Gas	Groundwater/Dewatering	Settlement	Expansion	Fault Surface Rupture	Ground Shaking	Liquefaction	Seismic Stability	Seismic Slope Settlement	Tsunami, Seiche, Flooding	Tunneling	Grading	Existing Foundations
Arbor Vitae – Interchanges	X	-	-	-	X	X	X	X	-	X	X	-	-	X	-
Aviation Blvd. Tunnel	X	-	-	X	X	-	X	X	X	X	X	-	X	X	-
Demolition and Clearing of Acquisition Areas	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
Westchester Southside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	-
<b>Alternative B – Added Runway South Facilities 2015</b>															
Relocated/Replacement Runway 24R/Taxiways	X	-	-	-	X	-	-	X	X	X	X	-	-	X	X
Relocated/Replacement New Runway 24C/Taxiways	X	-	-	-	X	-	-	X	X	X	X	-	-	X	X
New Runway 24L/Taxiways	X	-	-	-	X	-	-	X	X	X	X	-	-	X	X
Reconfiguration of CTA	-	-	-	-	X	X	X	X	X	-	X	-	X	X	X
Automated People Mover	X	-	X	X	X	-	-	X	X	X	X	-	X	X	X
New Imperial Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
Off-site Fuel Farm	X	-	-	-	X	-	X	X	X	X	X	-	-	X	-
Lincoln Blvd. Interchange	-	-	-	-	X	-	-	-	X	-	X	-	-	X	-
LAX Expressway	X	-	-	-	-	-	-	-	-	-	X	-	-	X	X
Green Line to West Terminal	X	-	X	X	X	-	X	X	X	X	-	-	X	X	X
<b>Alternative C – No Additional Runway Facilities 2005</b>															
Extend/Upgrade Runway 24L/Taxiways	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
Relocate/Upgrade Runway 24R/Taxiways	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
New Westside Terminal, Satellite Concourses & Parking Structure	X	-	X	X	X	-	X	X	X	X	X	-	X	X	-
Expansion of TBIT	-	-	-	-	X	X	-	X	X	-	X	-	-	X	X
Westchester Parkway Cargo Complex	-	-	-	-	X	X	X	X	X	-	-	-	-	X	X
New Admin/Maintenance/Flight Kitchen/General Aviation Facilities	X	-	-	-	X	-	-	X	X	X	X	-	-	X	X
Ring Road and Regional Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Terminal Access – Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Westchester Parkway – Realignment/Grade Separations	X	-	-	-	X	X	X	X	X	X	X	-	-	X	-
Aviation Blvd. – Depressed Between Arbor Vitae & Imperial	X	-	-	X	X	X	X	-	-	X	-	-	-	X	-
I-105/Imperial – Extend South to Pershing	X	-	-	-	X	-	-	X	X	X	X	-	-	X	-
Sepulveda – New Interchange, Tunnel Westchester To Century	-	-	-	X	-	-	X	X	X	X	X	-	X	X	-
Arbor Vitae – Interchanges	X	-	-	-	X	X	X	X	-	X	X	-	-	X	-
Demolition and Clearing of Acquisition Areas	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
Westchester Southside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	X
<b>Alternative C – No Additional Runway Facilities 2015</b>															
Relocate Runway 25L	X	-	-	-	X	X	X	-	X	-	X	-	-	X	-
Realign/Widen Taxiways B, C	-	-	-	-	X	X	X	-	X	-	X	-	-	X	-
Automated People Mover	X	-	X	X	-	-	-	X	X	-	X	-	X	X	X
Underground Spine Road CTA to West Terminal	X	-	X	X	-	-	-	X	X	-	X	-	X	X	X
Manchester Square Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
Redevelop Century Cargo Complex	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
New Cargo Ramp SE Corner of Airport	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
South Cargo Complex (East / West)	-	-	-	-	X	-	X	X	X	-	X	-	-	X	X
Manchester Square Cargo Complex	-	-	-	-	X	X	X	X	-	-	-	-	-	X	-
Fuel Farm – Additions to Existing	-	-	-	-	X	-	-	X	X	-	X	-	-	X	-
LAX Expressway	X	-	-	X	-	-	-	-	-	-	X	-	X	X	-
Green Line to West Terminal	X	-	X	X	X	-	X	X	X	X	X	-	X	X	X

Table S4.22-1

Matrix of Potential Earth/Geologic Considerations for Major Master Plan Facilities

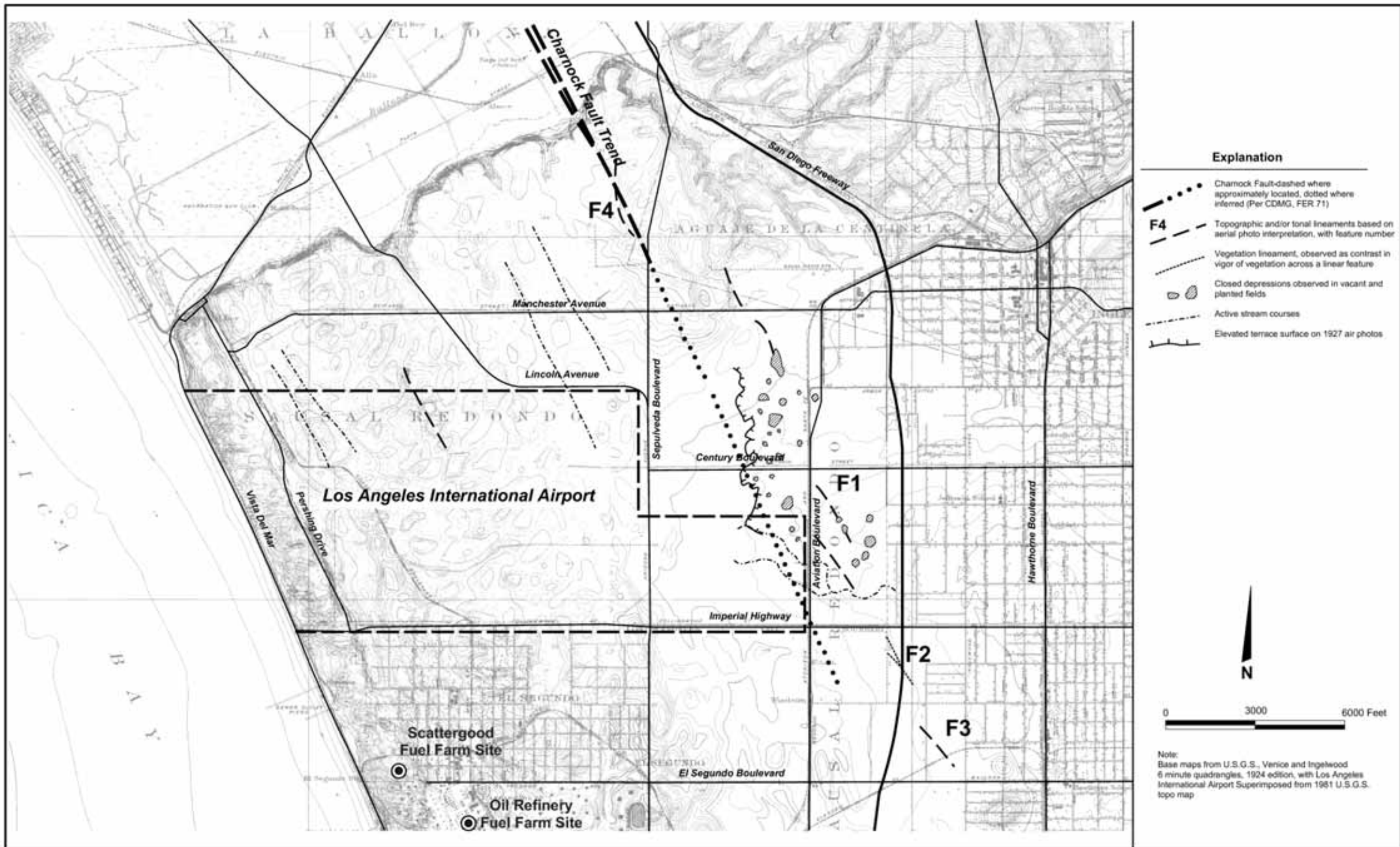
Master Plan Alternatives and Related Major Facilities	Slope Stability	Oil Field Subsidence	Oil Field Gas	Groundwater/Dewatering	Settlement	Expansion	Fault Surface Rupture	Ground Shaking	Liquefaction	Seismic Stability	Seismic Slope Settlement	Tsunami, Seiche, Flooding	Tunneling	Grading	Existing Foundations
<b>Alternative D – Enhanced Safety and Security Plan Facilities 2015</b>															
North Airfield Facilities – Extend Runways 24R, 24L	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
North Airfield Facilities – New Parallel Center Taxiway F	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
North Airfield Facilities – Relocate, Realign and widen Taxiways	-	-	-	-	X	X	X	X	X	-	X	-	-	X	X
South Airfield Facilities – Reconstruct Runway 25L	X	-	-	-	X	X	X	X	X	-	X	-	-	X	-
South Airfield Facilities – New Parallel Center Taxiway	X	-	-	-	X	X	X	X	X	-	X	-	-	X	-
South Airfield Facilities – Relocate, Realign and widen Taxiways	X	-	-	-	X	X	X	X	X	-	X	-	-	X	-
New Ground Transportation Center – Intermodal Trans. Center	X	-	X	X	X	X	X	X	X	-	X	-	-	X	X
CTA - New Terminals 1- 4 and North Linear Concourse	X	-	-	X	X	-	X	X	X	-	X	-	-	X	X
Reconfigure Terminals 4-8	X	-	-	-	X	-	X	X	X	-	X	-	-	X	X
New Midfield Satellite Concourse	X	-	X	X	X	-	-	X	X	-	X	-	X	X	X
Reconfigure Tom Bradley Intn'l Terminal	x	-	X	X	X	-	-	X	X	-	X	-	X	X	X
Automated People Mover – CTA to Satellite Concourse (underground)	X	-	X	X	-	-	X	X	X	-	X	-	x	X	X
Automated People Mover – East of Sepulveda (above grade or cut)	X	-	X	X	-	-	X	X	X	x	X	-	-	X	X
Rent A Car Facilities	X	-	X	X	X	-	X	X	X	-	X	-	-	X	X
South Cargo Complex (Demo & 2 new bldgs)	-	-	-	-	X	-	-	X	X	-	X	-	-	x	X
Century Cargo Complex – New Building	-	-	-	-	X	-	-	X	X	-	X	-	-	X	X
New General Aviation Building , South Cargo Area	-	-	-	-	X	X	X	X	-	-	-	-	-	X	X
New CNG/LNG Facility – Arbor Vitae and Aviation	-	-	-	-	X	-	-	X	X	-	X	-	-	X	-
New Airline Maintenance Facility-West Side	-	-	-	-	X	-	-	X	X	-	X	-	-	X	X
LAX Northside	-	-	-	-	X	-	-	X	X	-	X	-	-	X	X
Demolition and Clearing of Acquisition Areas	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X

- = Not Applicable

X = Applicable

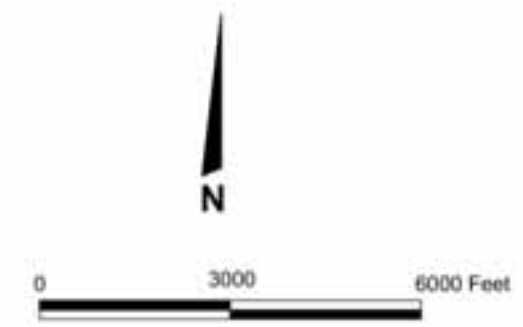
Source: Taylor-Hunter Associates, 2002.

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**Explanation**

- Charcock Fault-dashed where approximately located, dotted where inferred (Per CDMG, FER 71)
- F4** Topographic and/or tonal lineaments based on aerial photo interpretation, with feature number
- Vegetation lineament, observed as contrast in vigor of vegetation across a linear feature
- Closed depressions observed in vacant and planted fields
- Active stream courses
- Elevated terrace surface on 1927 air photos



Note:  
 Base maps from U.S.G.S., Venice and Inglewood  
 6 minute quadrangles, 1924 edition, with Los Angeles  
 International Airport Superimposed from 1951 U.S.G.S.  
 topo map



The nature and even the existence of the Charnock Fault in the LAX vicinity is uncertain. As discussed in detail in Section 4.22, *Earth/Geology* (subsections 4.22.3 and 4.22.6), of the Draft EIS/EIR and in Technical Report 12, *Earth/Geology Technical Report* (subsection 2.2), of the Draft EIS/EIR, the Charnock Fault is not considered active by the State of California and is not subject to the zoning restrictions of the Alquist-Priolo Earthquake Fault Zoning Act. It is not currently possible to mitigate the potential effects by zoning around the fault because its exact location in the LAX area is uncertain. Because the potential for damage at LAX is considered low, and the potential for damage to structures associated with Alternative D (and for injury to persons using the new facilities) is considered even lower, the impact of fault surface rupture is considered less than significant.

### **Other Geologic Hazards/Construction Considerations**

Potential impacts associated with other geologic hazards namely earthquake-induced liquefaction and settlement, non-seismic settlement, expansive soils, slope stability, construction considerations, and oil field gases under Alternative D would be essentially the same as those for Alternatives A, B, and C. Alternative D would involve many of the same type of improvements as the other build alternatives, although, overall, the level of development would be reduced. This alternative would increase passenger activities over baseline conditions, although to a lesser degree than the other build alternatives. There would be differences in project components that would be susceptible to, or affected by, various geologic hazards, as identified in **Table S4.22-1**.

Earth-related construction considerations would be essentially the same as those for Alternatives A, B, and C. Under Alternative D, total earthwork volumes are estimated to include 4,121,926 cubic yards of cut (1,264,870 cubic yards which are unsuitable for fill) and 1,400,666 cubic yards of fill, resulting in a net disposal fill requirement of 1,456,390 cubic yards.

As with Alternatives A, B, and C, compliance with requirements to conduct site-specific geotechnical investigations during design and to design and implement remedial and protective measures would ensure that the potential impacts associated with these geologic hazards under Alternative D would be less than significant.

### **4.22.7 Cumulative Impacts**

The cumulative impacts to earth/geology associated with the No Action/No Project Alternative and Alternatives A, B, or C, in combination with other past, present, and probable future projects, have not changed from those described in Section 4.22, *Earth/Geology* (subsection 4.22.7), of the Draft EIS/EIR.

#### **4.22.7.1 Alternative D - Enhanced Safety and Security Plan**

Similar to the No Action/No Project Alternative, additional facilities and people would be exposed to seismically-induced ground shaking and other earthquake-related hazards compared to baseline conditions. Regional projects, including Playa Vista and infill development, would also expose additional facilities and people to seismically-induced ground shaking hazards. The impact of increased exposure of facilities and people to ground shaking hazards resulting from Alternative D, in conjunction with regional projects, would be reduced by designing structures in accordance with the requirements of the UBC and the City of Los Angeles Building Code.

Other geologic hazards are dependent on local conditions and would not necessarily apply to other projects in the vicinity of LAX, including landforms, expansive soil, slope stability, fault surface rupture, or settlement. Identification of these local hazards relies on site-specific investigations and they are not considered to be cumulative in nature.

### **4.22.8 Mitigation Measures**

Under Alternatives A, B, C, and D potential impacts associated with ground shaking, fault surface rupture, liquefaction, seismic settlement, non-seismic settlement, expansive soils, slope stability, oil field gas, and construction would be less than significant; therefore, no mitigation is required.

## **4.22 Earth/Geology (CEQA)**

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