11. Alternative 7 (66-kV Subtransmission): Impacts and Mitigation Measures

The following section describes Geology, Soils, and Paleontology impacts of Alternative 7 (66-kV Subtransmission Alternative), as determined by the significance criteria listed in Section 4. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels.

11.1 Direct and Indirect Effects Analysis

The significance criteria used to identify geology, soils, and paleontology impacts are introduced in Section 4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion.

As summarized below, the impacts and mitigation measures for Alternative 7 would be the same as those for Alternative 2. Although Alternative 7 would be include minor re-routes of four 66-kV subtransmission line elements along portions of Segments 7 and 8A, these re-routes are so close to the Alternative 2 route that the geologic materials, terrain, and seismic setting for this alternative would be identical to that of Alternative 2. However, the minor increase in underground construction for two of the 66-kV subtransmission line re-routes would incrementally increase the amount of ground disturbance than that required for the equivalent portions of Alternative 2. Therefore, the potential for some geology, soils, and paleontology impacts to occur would be incrementally increased compared to Alternative 2.

Unique geologic features (Criterion GEO1)

No unique geologic features or geologic features of unusual scientific value for study or interpretation would be disturbed or otherwise adversely affected by Alternative 7. No impact would occur.

Known mineral and/or energy resources (Criterion GEO2)

Impacts associated with Criterion GEO2 for Alternative 7 would be the same as impacts associated with this criterion for the proposed Project, as presented in Section 6.1 and summarized below.

Impact G-1 (Project activities could interfere with access to known energy resources) would be the same as for Alternative 2. Therefore, where the portions of Alternative 7 equivalent to Segments 7, 11, and 8 would cross the Montebello oil field and where the Segment 8 equivalent would cross the northern edge of the Brea-Olinda oil field, there is a potential for Project construction activities to interfere with oil field operations. Impact G-1, as described in Section 6.1, for Alternative 7 would require implementation of Mitigation Measure G-1 (Coordination with oil field operations) to reduce potential impacts to less than significant (Class II).

Triggering or acceleration of geologic processes, such as landslides, soil erosion, or loss of topsoil, during construction (Criterion GEO3)

Impacts associated with Criterion GEO3 for Alternative 7 would be slightly increased than the impacts associated with this criterion for Alternative 2. This alternative would require ground disturbance for construction of the two underground 66-kV re-routes, including excavation for trenches and vaults, and for construction of new poles for both the Segment 7 and Segment 8A (Options 1 and 2) Whittier Narrows

66-kV Overhead Re-Routes. This would result in incrementally increased opportunity to cause construction triggered erosion. No increase in the potential to cause construction triggered landslides would occur with this alternative due to the primarily flat terrain in areas where additional ground disturbance would occur. These impacts and their associated mitigation measures that fall under Criterion GEO3 are summarized in the following paragraphs. Please see Section 6.1 (Direct and Indirect Effects Analysis) for a detailed description of these impacts, as they are similar but have less potential for significant impact than Alternative 2.

Impact G-2 (Erosion could be triggered or accelerated due to construction activities) would be slightly increased under Alternative 7 than it would for Alternative 2 (please see Section 6.1). This alternative would require ground disturbance for construction of the two underground 66-kV re-routes, including excavation for trenches and vaults, and for construction of new poles for both of the Whittier Narrows 66-kV Overhead re-route s, along Segment 7 and Segment 8A (Options 1 and 2), in areas with soils that have hazard of erosion ranging from slight to severe. This would result in incrementally increased opportunity to cause construction triggered erosion. Therefore, there is incrementally more potential for erosion caused by construction of the 66-kV re-routes under Alternative 7. The remaining portion of Alternative 7 is identical to Alternative 2 and the potential of erosion triggered or accelerated due to construction activities is the same as presented in Section 6.1. Construction of Alternative 7 would require implementation of Mitigation Measure H-1a (Implement an Erosion Control Plan and Demonstrate Compliance with Water Quality Permits). With implementation of this measure, as described in Section 6.1, Impact G-2 of Alternative 7 would be less than significant (Class II).

Impact G-3 (Excavation and grading during construction activities could cause slope instability or trigger landslides) for Alternative 7 would be the same as it would for Alternative 2 (see Section 6.1). The Ground disturbance for the 66-kV re-routes of Alternative 7 would occur in flat terrain and would therefore not change the potential for construction triggered landslides to occur, thus Alternative 7 is identical to Alternative 2 in respect to the potential of slope failure or triggered landslides due to construction activities and is the same as presented in Section 6.1. Construction of Alternative 7 would require implementation of Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability) along the transmission line corridors, and all at all sites or access roads that would require grading. With implementation of this measure, as described in Section 6.1, Impact G-3 of Alternative 7 would be less than significant (Class II).

Exposure to potential risk of loss or injury due to earthquake-related ground rupture (Criterion GEO4)

Impacts associated with Criterion GEO4 for Alternative 7 would be similar to impacts associated with this criterion for Alternative 2, as presented in Section 6.1, and summarized below. There are two additional potential fault crossings which are associated with the southward projection of the East Montebello Hills fault. This fault trends toward both the Segment 7 and Segment 8A (Options 1 and 2) Whittier Narrows 66-kV OH Re-Routes and potentially underlies these subtransmission lines. The crossing of this fault would result in an incrementally increased potential for fault rupture damage for Alternative 7 compared to Alternative 2.

The re-routed and underground portions of the two 66-kV subtransmission lines of Alternative 7 are located the same distance from active faults as the equivalent portions of Alternative 2. However, the alignment of the Alternative 7 reroutes would result in two additional potential fault crossings associated with the southward projection of the East Montebello Hills fault, which trends towards both the Segment

7 and Segment 8A (both Options 1 and 2) Whittier Narrows 66-kV OH re-routes. However, Impact G-4 (Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards) would only be incrementally increased for Alternative 7 compared to Alternative 2 (see Section 6.1) as the associated portions of Segments 7 and 8A are also crossed by the projections of this fault. Therefore, implementation of Mitigation Measure G-4 (Avoid placement of Project structures within active fault zones) would be required for the two Whittier Narrows 66-kV OH re-routes (Segment 7 and Segment 8A, Option 1 or Option 2) where it crosses the trend of the active East Montebello Hills fault and for portions of Alternative 7 corresponding to Segments 5, 6, 7, 11, and 8A where it crosses the active San Andreas (Segment 5), San Gabriel (Segments 6 and 11), Clamshell-Sawpit (Segment 6), Sierra Madre (Segments 7 and Segment 11 north of S11 MP 19), East Montebello Hills (Segments 7 and 8A), Whittier (Segment 8A), Chino (Segment 8A), and Central Ave (Segment 8A) faults. Implementation of this mitigation measures would reduce potential impacts to less than significant (Class II).

Exposure to potential risk of loss or injury due to seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking (Criterion GEO5)

Impacts associated with Criterion GEO5 for Alternative 7 would be the same as impacts associated with this criterion for Alternative 2, as presented in Section 6.1, and summarized below.

Impact G-5 (Project structures could be damaged by seismically induced groundshaking and/or ground failure exposing people or structures to hazards) would be the same under Alternative 7 as it would for Alternative 2 (see Section 6.1). The potential for strong to severe groundshaking, liquefaction, and earthquake induced slope failures along Alternative 7 are identical to Alternative 2 (see Section 6.1). Local strong to severe groundshaking may occur along the Alternative 7 alignment that corresponds to portions of Segments 4, 5, 6, 7, 9, and 11 and would require implementation of Mitigation Measure G-5a (Reduce effects of groundshaking). Portions of Alternative 7 equivalent to the portions of Segments 5, 7, 11, 8A, 8B, and 8C that cross young alluvial deposits in the Leona Valley, San Gabriel Valley, western Chino Basin, and active river washes and streams would require implementation of Mitigation Measure G-5b (Conduct geotechnical investigations for liquefaction). Portions of Alternative 7 equivalent to Segments 5, 6, 11, and 8A where they are located along hillsides or ridgelines in geologic units of moderate to steep slopes that are susceptible to slope failures would require implementation of Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability). Implementation of these measures, as described in Section 6.1, would reduce Impact G-5 of Alternative 7 to less than significant (Class II).

Exposure to potential risk of loss or injury where corrosive soils or other unsuitable soils are present (Criterion GEO6)

Impacts associated with Criterion GEO6 for Alternative 7 would be identical to those associated with this criterion for Alternative 2, as described in Section 6.1, and there would be no change in the potential for damage to Project structures due to unsuitable soils. This impact and its associated mitigation measure that falls under Criterion GEO6 are summarized below.

Impact G-6 (Project structures could be damaged by problematic soils exposing people or structures to hazards) would be the same for Alternative 7 as it would be for Alternative 2 because this alignment would cross the same soil types as the Alternative 2 alignment. Soils along the alignment have a potential to corrode steel and concrete ranging from low to high and expansion potential ranging from low to high.

Corrosive and/or expansive soils can cause damage to structure foundations, potentially comprising the structural integrity of the structure, which would be a significant impact (see Section 6.1). Therefore Alternative 7 would require implementation of Mitigation Measure G-6 (Conduct geotechnical studies to assess soil characteristics and aid in appropriate foundation design), as described in Section 6.1, to reduce impacts to less than significant (Class II).

Damage to Project structures due to slope failure (Criterion GEO7)

Impacts associated with Criterion GEO7 for Alternative 7 would be the same as the impacts associated with this criterion for the proposed Project (Alternative 2). New structures and facilities constructed for the 66-kV re-routes would be located in flat terrain and would not be subject to slope stability issues. Therefore the potential impact to transmission line facilities is the same as that identified for Alternative 2, as presented in Section 6.1, and summarized below.

Impact G-7 (Transmission line structures could be damaged by landslides, earth flow, or debris flows, during operation) would be the same for Alternative 7 as it would be for Alternative 2 (see Section 6.1). With the exception of the minor 66-kV re-routes, Alternative 7 is identical to Alternative 2 and the potential for failure of existing unstable slope or landslides during operation of the Project is the same as presented in Section 6.1. Therefore, Alternative 7 would require implementation of Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability) in hillside and mountainous areas. With implementation of this measure, as described in Section 6.1, Impact G-7 of Alternative 7 would be less than significant (Class II).

Destruction of unique paleontological resources (Criterion GEO8)

Impacts associated with Criterion GEO8 for Alternative 7 would be similar to the impacts associated with this criterion for Alternative 2, as described in Section 6.1, and summarized below.

Impact G-8 (Grading and excavation could destroy paleontologic resources) would be slightly increased under Alternative 7 compared to Alternative 2 (please see Section 6.1). Due to the slight increase in ground disturbance associated with excavation of trenches and vaults for the two underground 66-kV re-routes of Alternative 7 and excavation for the new poles for the two overhead re-routes, this alternative would result in a corresponding increase in the potential for disturbing paleontologic resources during construction compared to Alternative 2. The other portions of Alternative 7 would have the same potential to disturb paleontologic resources as the corresponding portions of Alternative 2 (see Section 6.1). Although construction could disturb unique paleontologic resources, as with Alternative 2, application of SCE's planned APMs would reduce the potential for destruction of these resources to less than significant, resulting in no change in the potential for Impact G-8 to occur. With implementation of these APMs, as described in Section 6.1, Impact G-8 of Alternative 7 would be less than significant (Class III).

11.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 7. The re-routed portions of Alternative 7 diverge only slightly from the proposed Project alignments and therefore have the same geologic and seismic settings as the corresponding portions of the proposed Project. The remainder of this alternative route would be identical to that of the proposed Project and would, therefore, result in substantially similar or identical impacts as the proposed Project. As a result, this alternative would traverse the same geologic materials as the portion of the proposed

Project route it is proposed to replace, would require similar types of construction activities to build, and would result in the same operational capacity as the proposed Project.

Based on the substantial similarity of Alternative 7 to the proposed Project, this alternative's contribution to cumulative impacts would be similar or identical to that of the proposed Project. However, when compared to the proposed Project, each alternative's contribution to certain cumulative impacts may be incrementally increased or decreased as a result of the change in construction (underground versus overhead). Such increases or decreases would result from:

- The nature of the alternative (e.g., underground or overhead);
- The location of the alternative with respect to land uses and specific resources; or
- The location of past, present, or reasonably foreseeable projects with which impacts of the alternative route would have the potential to combine (i.e., the other projects are located such that their impacts would or would not combine with impacts of the alternative, as compared to the proposed Project).

11.2.1 Geographic Extent

The geographic extent for the analysis of cumulative impacts related to geology, soils, and paleontology is limited to the Project site and the immediate vicinity surrounding Project substations, laydown areas, staging sites, and the transmission line ROWs occupied by the proposed alignment. These geographic limits are appropriate to consider the potential cumulative impacts as the geologic materials and terrain at the Project site and directly adjacent to the Project site are the most significant factors to evaluate the potential for geologic hazards, unsuitable soil and paleontologic resources at a project site. Impacts would have the potential to occur during construction and operation and would be limited to the areas where concurrent construction is occurring. The geographic extent for Alternative 7 is identical to the proposed Project, as presented in Section 6.2.1.

11.2.2 Existing Cumulative Conditions

The existing cumulative conditions of Alternative 7 are identical to the proposed Project as discussed in Section 6.2.2.

11.2.3 Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 7 would be exactly the same as Alternative 2, described in Section 6.2.3.

11.2.4 Cumulative Impact Analysis

As discussed for the proposed Project in Section 6.2.4, Impacts G-1 through G-3 of Alternative 7 would not have the potential to combine with impacts of other past, present and reasonably foreseeable projects for the same reasons discussed in Section 6.2.4. Impacts G-4 through G-8 for Alternative 7 would combine but not be cumulatively significant (Class III) with impacts of other past, present and reasonably foreseeable projects for the same reasons discussed in Section 6.2.4.

11.2.5 Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for the proposed Project in Section 6.1 (Direct and Indirect Effects Analysis) would help to reduce Alternative 7's incremental contribution to cumulative impacts. However,

there are no impacts or significant cumulative effects of Alternative 7 related to Geology, Soils, and Paleontology and no additional mitigation is required.