

10. Alternative 6 (Maximum Helicopter Construction in the ANF): Impacts and Mitigation Measures

The following section describes Geology, Soils, and Paleontology impacts of Alternative 6 (Maximum Helicopter Construction in the ANF 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.

10.1 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 6 would be substantially the same as those for Alternative 2, with minor differences in potential impacts to occur due to the differing amounts of ground disturbance required for each alternative. Although Alternative 6 would be installed along Segment 6 and Segment 11 in the ANF using maximum helicopter construction, the route of the transmission line and tower locations for Alternative 6 would be identical to that of Alternative 2 and would therefore be within the same geologic materials and terrain. However, the increased use of helicopter construction would require construction of 11 helicopter staging areas and would reduce the number of access and spur roads that would need to be created or graded resulting in slightly less ground disturbance than required for the equivalent portions of Alternative 2. Therefore, the potential for some geology, soils, and paleontology impacts to occur would be incrementally decreased compared to Alternative 2.

Unique geologic features (Criterion GEO1)

No unique geologic features or geologic features of unusual scientific value for study or interpretation exist at any of the helicopter staging sites or along the transmission line route, and therefore none would be disturbed or otherwise adversely affected by Alternative 6. No impact would occur.

Known mineral and/or energy resources (Criterion GEO2)

Impacts associated with Criterion GEO2 for Alternative 6 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 that identified for Alternative 2. Therefore, where the portions of Alternative 6 equivalent to Segments 7, 8, and 11 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 6 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 6 would be less than the impacts associated with this criterion for Alternative 2. Although this alternative would require ground disturbance and grading for 10 helicopter staging areas through the ANF, the associated decrease in grading required for fewer access and spur roads would result in slightly less ground disturbance compared to Alternative 2. This would result in incrementally decreased opportunity to cause construction triggered erosion and landslides. 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 less under Alternative 6 than it would for Alternative 2 (please see Section 6.1). The maximum helicopter construction along Segment 6 and Segment 11 through the ANF would require construction of 10 helicopter staging areas but would reduce the number of access and spur road that would need to be created or upgraded, which would require less overall ground disturbance in soils that have a hazard of erosion ranging from slight to severe. Therefore, there is incrementally less potential for erosion caused by construction in the ANF portion of Segment 6 and Segment 11 under Alternative 6. The remaining portion of Alternative 6 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 6 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 6 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 6 would be incrementally less than it would for Alternative 2 (see Section 6.1). The maximum helicopter construction along Segment 6 and Segment 11 through the ANF would require construction of 10 helicopter staging areas but would reduce the number of access and spur roads that would need to be created or upgraded, which would require less overall ground disturbance in steep mountainous terrain, which would decrease the potential for construction related slope instability or landslides. The remaining portion of Alternative 6 is identical to Alternative 2 and the potential of slope failure or triggered landslides due to construction activities is the same as presented in Section 6.1. Construction of Alternative 6 would require implementation of Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability) along the transmission line corridors, and 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 6 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 6 would be the same as impacts associated with this criterion for Alternative 2, as presented in Section 6.1, and summarized below.

Impact G-4 (Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards) would be the same for Alternative 6 as it would for Alternative 2 (see Section 6.1). Therefore, the portions of Alternative 6 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 would require implementation of Mitigation Measures G-4 (Avoid placement of Project structures within active fault zones). Implementation of these mitigation measures is recommended to 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 6 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 6 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 6 is identical to Alternative 2 (see Section 6.1). Local strong to severe groundshaking may occur along the Alternative 6 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 6 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 6 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 6 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 6 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 are summarized in the following paragraphs.

Impact G-6 (Project structures could be damaged by problematic soils exposing people or structures to hazards) would be the same for Alternative 6 as the alignment crosses 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, a significant impact (see Section 6.1). Therefore Alternative 6 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 6 would be the same as the impacts associated with this criterion for the proposed Project (Alternative 2). Although the maximum helicopter construction along Segment 6 and Segment 11 through the ANF would require construction of 10 helicopter staging areas and would reduce the number of access and spur road that would need to be created or upgraded in the steep mountainous terrain, the permanent transmission line structures would be the same as Alternative 2, which would result in no change to the potential for slope instability or landslides to damage project structures during operation of the Project. Therefore the potential impact to transmission line facilities for Alternative 6 is the same as that presented in Section 6.1 for Alternative 2. This impact and its associated mitigation measure that falls under Criterion GEO3 are summarized in the following paragraph. Please see Section 6.1 (Direct and Indirect Effects Analysis) for a detailed description of these impacts, as they are the same as Alternative 2.

Impact G-7 (Transmission line structures could be damaged by landslides, earth flow, or debris flows, during operation) would be the same for Alternative 6 as it would for Alternative 2 (see Section 6.1). The transmission line portion of Alternative 6 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. Alternative 6 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 6 would be less than significant (Class II).

Destruction of unique paleontological resources (Criterion GEO8)

Impacts associated with Criterion GEO8 for Alternative 6 would be the same as the impacts associated with this criterion for Alternative 2, and presented in Section 6.1, and summarized below.

Impact G-8 (Grading and excavation could destroy paleontologic resources) would be the same under Alternative 6 as it would for Alternative 2 (please see Section 6.1). Although construction of the ANF portions of Segment 6 and Segment 11 would result in less ground disturbance, the areas of decreased ground disturbance would be located primarily within non-fossiliferous igneous and metamorphic rock, which would result in no change in potential impact to paleontologic resources compared to Alternative 2. The other portions of Alternative 6 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. With implementation of these APMs, as described in Section 6.1, Impact G-8 of Alternative 6 would be less than significant (Class III).

10.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 6. This alternative would require construction of 13 helicopter staging areas near to the transmission line routes. As a result of the increased helicopter construction, implementation of Alternative 6 would reduce the number of access and spur roads that would need to be created or upgraded, but would still follow the same transmission route 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, (although use of

helicopter construction would be increased), and would result in the same operational capacity as the proposed Project.

Based on the substantial similarity of Alternative 6 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).

10.2.1 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 6 is identical to the proposed Project, as presented in Section 6.2.1.

10.2.2 Existing Cumulative Conditions

The existing cumulative conditions of Alternative 6 are identical to the proposed Project as discussed in Section 6.2.2.

10.2.3 Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 6 would be exactly the same as Alternative 2, described in Section 6.2.3.

10.2.4 Cumulative Impact Analysis

As discussed for the proposed Project in Section 6.2.4, Impacts G-1 through G-3 of Alternative 6 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 6 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.

10.2.5 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 the incremental contribution of Alternative 6 to cumulative impacts.

However, there are no impacts or significant cumulative effects of Alternative 6 related to Geology, Soils, and Paleontology and no additional mitigation is required.