8. Alternative 4 (Chino Hills Routes): Impacts and Mitigation Measures

The following section describes the impacts to Hydrology and Water Quality of Alternative 4 (Chino Hills Route Alternatives), as determined by the significance criteria listed in Section 4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels.

8.1 Direct and Indirect Effects Analysis

This alternative would follow the same route as the proposed Project through the Northern and Central Regions, diverging from the proposed Project route along Segment 8A in the Southern Region, at S8A MP 19.2. Therefore, any impacts of the proposed Project that would occur between S8A MP 19.2 and 35.2 (16 miles) or along Segment 8C (6.4 miles) through Chino Hills, Chino, and Ontario would not occur under Alternative 4. Impacts associated with Segment 8B of the proposed Project would still occur under Alternative 4, same as Alternative 2. Where the proposed route for Alternative 4 diverges from the proposed Project route at S8A MP 19.2, it would turn to the southeast, crossing through part of Orange County, San Bernardino County, and CHSP. Therefore, Alternative 4 would introduce Hydrology and Water Quality impacts to these areas which would not be introduced through the proposed Project.

This alternative includes five separate routing options: Route A, Route B, Route C, Route C Modified, and Route D. For the purposes of this impact analysis, the routing options for Alternative 4 are discussed in comparison to each other throughout the following section. As described, the alignment of Alternative 4 would be the same as the proposed Project west and north of S8A MP 19.2; as such, please see Tables 2.3-1 (Proposed Project Northern Region Stream Crossings), 2.3-2 (Proposed Project Central Region Stream Crossings), and 2.3-3 (Proposed Project Southern Region Stream Crossings) for a summary of stream crossings and underlying groundwater basins along this portion of the Alternative 4 route, which is identical to the proposed Project route.

All Hydrology and Water Quality impacts that would occur under the proposed Project would also occur under each of the Alternative 4 routing options. However, due to differences between the proposed Project route and each of the proposed Alternative 4 routing options, different streams and/or groundwater basins would be avoided and/or affected under each routing option. Therefore, this section summarizes all impacts of Alternative 4, which are described in detail for the proposed Project in Section 6.1. Stream crossings that would occur under the proposed Project but that would be avoided under this alternative are listed in Table 2.5-1 (Stream Crossings that would be Avoided by Alternative 4).

All routing options for Alternative 4 would cross nine unnamed streams before they diverge near the border of Chino Hills State Park. After the five routing options for Alternative 4 diverge, they differ in terms of number of streams crossed. Route A would cross five unnamed streams. Route B would cross eight streams, including Aliso Creek and seven unnamed streams. Route C would cross ten unnamed streams, and Route C Modified would cross twelve unnamed streams. Route D would cross four streams, including Aliso Creek and three unnamed streams.

All Hydrology and Water Quality impacts that are expected to occur under the routing options for Alternative 4 are presented in the following discussions according to their corresponding significance criteria.

Water Quality Violations, Waste Discharges, or Polluted Runoff (Criterion HYD1)

As described in the introduction for this analysis of Alternative 4, impacts associated with Criterion HYD1 would be mostly the same for Alternative 4 as for the proposed Project. However, the five different routing options included under Alternative 4 would avoid some surface water and groundwater resources along the proposed Project alignment and would introduce other stream crossings associated with each of the five routing options. These surface water and groundwater resources and the associated impacts and mitigation measures that fall under Criterion HYD1 are summarized below.

Impact H-1 (Construction activities would degrade surface water quality through erosion and accelerated sedimentation) would be the same under Alternative 4 as it would for the proposed Project (please see Section 6.1), with the exception of the five routing options which are described below. As described in Section 6.1, Impact H-1 would result due to several types of soil disturbance. Excavation and/or grading would be required at all tower sites where new pads or footings would be required and at all new and/or expanded substations. Additional clearing of vegetation and/or grading would be required for crane pads, pulling stations, staging areas, and new and/or improved access and spur roads, including an all-weather road used to access the new switching station. Disturbance of soil during construction could result in soil erosion and lowered water quality through increased turbidity and sediment deposition into local streams. In Chino Hills State Park, where the topography is steep and the stream channels are mostly natural and unimproved, the potential for degradation of surface water quality through erosion and sedimentation is relatively high compared to the flatter, more urbanized topography of the portion of the proposed Project that would be avoided under this alternative. Therefore, Impact H-1 for Alternative 4 would be the same as Impact H-1 for the proposed Project, but of a slightly greater magnitude due to the increased potential for erosion and sedimentation through Chino Hills State Park. Impact H-1 for Alternative 4 would require the following mitigation measures, which are fully described in Section 6.1: H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), and B-2 (Implement RCA Treatment Plan).

Route A. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-1 under the proposed Project would not be affected under the Route A option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route A would introduce the potential for Impact H-1 to affect five new unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-1 for Alternative 4, Route A, would be less than significant **(**Class II**)**.

Route B. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-1 under the proposed Project would not be affected under the Route B option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route B would introduce the potential for Impact H-1 to affect eight new streams, including Aliso Creek and seven unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-1 for Alternative 4, Route B, would be less than significant **(**Class II**)**.

Route C. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-1 under the proposed Project would not be affected under the Route C option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted

include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route C would introduce the potential for Impact H-1 to affect ten new unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-1 for Alternative 4, Route C, would be less than significant (Class II).

Route C Modified. As with Route C, described above, several streams that would have the potential to be affected by Impact H-1 under the proposed Project would not be affected under the Route C Modified option and the following streams that would be affected by the proposed Project would be avoided by Route C Modified: Little Chino Creek, Chino Creek, and Cucamonga Creek. Route C Modified would introduce the potential for Impact H-1 to affect twelve unnamed streams. Additionally, in comparison with the original Route C, site-specific effects of Impact H-1 would be slightly different under Route C Modified, due to the switching station being relocated to a site approximately 2,500 feet northwest of the original Route C location. Implementation of the mitigation measures listed above and described in detail in Section 3.8.6.1 would reduce Impact H-1 for Route C Modified to a less-than-significant level (Class II).

Route D. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-1 under the proposed Project would not be affected under the Route D option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route D would introduce the potential for Impact H-1 to affect four new streams, including Aliso Creek and three unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-1 for Alternative 4, Route D, would be less than significant (Class II).

Impact H-2 (Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials) would be mostly the same under Alternative 4 as it would for the proposed Project (please see Section 6.1), with the exception of the five routing options which are described below. Surface water and groundwater quality could be degraded through the accidental release of hazardous materials during Project-related construction activities. Such materials include: lead-based paint flakes, diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids. The preparation and pouring of concrete and the use of motorized equipment are examples of construction activities that would specifically involve the use of potentially harmful materials. Impact H-2 for Alternative 4 would require the following mitigation measure, which is fully described in Section 6.1: H-1b (Dry weather construction).

Route A. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-2 under the proposed Project would not be affected under the Route A option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route A would introduce the potential for Impact H-2 to affect five new unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-2 for Alternative 4, Route A, would be less than significant (Class II).

Route B. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-2 under the proposed Project would not be affected under the Route B option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route B would introduce the potential for Impact H-2 to affect eight new streams, including Aliso Creek and seven

unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-2 for Alternative 4, Route B, would be less than significant (Class II).

Route C. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-2 under the proposed Project would not be affected under the Route C option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route C would introduce the potential for Impact H-2 to affect three new unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-2 for Alternative 4, Route C, would be less than significant (Class II).

Route C Modified. The effect of Impact H-2 under Route C Modified would be similar to Route C, described above, except that site-specific effects related to the new switching station would differ as a result of the new switching station being located approximately 2,500 feet northwest of the location proposed under the original Route C. As with Route C, the proposed Route C Modified would avoid unnamed streams affected by the proposed Project, as well as the following named streams: Little Chino Creek, Chino Creek, and Cucamonga Creek. Route C Modified would introduce the potential for Impact H-2 to affect twelve unnamed streams. Implementation of the mitigation measures listed above and described in detail in Section 3.8.6.1 would reduce Impact H-2 for Route C Modified to a less-than-significant level (Class II).

Route D. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-2 under the proposed Project would not be affected under the Route D option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route D would introduce the potential for Impact H-2 to affect four new streams, including Aliso Creek and three unnamed streams. With implementation of the mitigation measures listed above and described in detail in Section 6.1, Impact H-2 for Alternative 4, Route D, would be less than significant (Class II).

Impact H-3 (Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials) would be mostly the same under Alternative 4 as it would for the proposed Project (please see Section 6.1), with the exception of the five routing options which are described below. Surface and groundwater quality could potentially be degraded through the accidental release of potentially harmful or hazardous materials during Project operation and maintenance activities. Potentially harmful materials could be accidentally released during operational and maintenance activities at or near tower locations and along access roads. Due to the use of vehicles and other motorized equipment, some of the potentially hazardous substances that could be released include: diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, and lubricant grease. However, the potential for this impact to occur would be minimal due to the low number of vehicle trips required for operation and maintenance.

Route A. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-3 under the proposed Project would not be affected under the Route A option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route A would

introduce the potential for Impact H-3 to affect five new unnamed streams. As described in detail in Section 6.1, Impact H-3 for Alternative 4, Route A, would be less than significant (Class III).

Route B. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-3 under the proposed Project would not be affected under the Route B option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route B would introduce the potential for Impact H-3 to affect eight new streams, including Aliso Creek and seven unnamed streams. As described in detail in Section 6.1, Impact H-3 for Alternative 4, Route B, would be less than significant (Class III).

Route C. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-3 under the proposed Project would not be affected under the Route C option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route C would introduce the potential for Impact H-3 to affect ten new unnamed streams. As described in detail in Section 6.1, Impact H-3 for Alternative 4, Route C, would be less than significant (Class III).

Route C Modified. As previously described, the switching station included under Route C Modified is located approximately 2,500 feet northwest of the location included under the original Route C. Therefore, the configuration of access roads to be used during operations and maintenance activities would also be different under Route C Modified and as a result, site-specific effects of Impact H-3 that would occur in relation to switching station activities would also vary under Route C Modified. Similar to the original Route C, the proposed Route C Modified would avoid the occurrence of Impact H-3 at several unnamed and named streams that would be affected under the proposed Project. Route C Modified would introduce the potential for Impact H-3 to affect twelve unnamed streams during operations and maintenance activities. However, site-specific differences between the original Route C and the Route C Modified option would not affect the overall significance of Impact H-3, in comparison with Route C and therefore, as described in detail in Section 3.8.6.1, Impact H-3 for Route C Modified would be less than significant (Class III).

Route D. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-3 under the proposed Project would not be affected under the Route D option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route D would introduce the potential for Impact H-3 to affect four new streams, including Aliso Creek and three unnamed streams. As described in detail in Section 6.1, Impact H-3 for Alternative 4, Route D, would be less than significant (Class III).

No further impacts would be introduced by Alternative 4 under Criterion HYD1. As mentioned, please see Section 6.1 for a detailed description of the impacts and mitigation measures listed above.

Depletion of Groundwater Supplies or Interference with Groundwater Recharge (Criterion HYD2)

Should groundwater be encountered during construction-related excavation, dewatering of the construction site would be required. For the proposed Project, depth to groundwater is approximately 75 feet or more bgs, and the maximum construction-related excavation depth is approximately 40 feet bgs. Although Alternative 4 would include several different routing options of the proposed transmission line in the Southern Region, no excavation beyond 40 feet bgs would be required along the re-routed section

of the transmission line, and depth to groundwater in that area is approximately 75 feet or more bgs. Therefore no direct contact with a main groundwater would be expected to occur during construction of Alternative 4. However, it may be possible for perched groundwater to be encountered during excavation activities, which would necessitate the implementation of APM HYD-6 (Drilling and Construction Site Dewatering Management). As described in Section 6, the potential encountering and dewatering of perched groundwater during construction activities would not cause or contribute to depletion of groundwater supplies or interference with groundwater recharge.

Creation of new impervious surfaces through construction of Alternative 4 could interfere with groundwater recharge by reducing the amount of surface area through which precipitation and surface water percolates to underground aquifers. However, impervious surfaces that would result from construction of Alternative 4 would cover very small areas and would be distributed over a large geographic region, and therefore would not substantially interfere with groundwater recharge.

Operation and maintenance of Alternative 4 would consist of transmission of electric current through the transmission line as well as periodic activities which would consist of driving construction vehicles along or within the transmission ROW and would have no effect on groundwater recharge. Therefore, all impacts related to Criterion HYD2 would be exactly the same as those for the proposed Project and, as described under Criterion HYD2 in Section 6.1, and no impact would occur.

Siltation, Erosion, or Other Flood Related Damage from Impeding or Redirecting Flood Flows through Placement of a Structure in a Stream or Flood Hazard Area (Criterion HYD3)

As described in the introduction for this analysis of Alternative 4, impacts associated with Criterion HYD3 would be mostly the same for Alternative 4 as for the proposed Project. However, the five different routing options included under Alternative 4 would avoid some surface water and groundwater resources along the proposed Project alignment and would introduce other stream crossings associated with each of the five routing options. These surface water and groundwater resources and the associated impacts and mitigation measures that fall under Criterion HYD3 are summarized below.

Impact H-4 (Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows) would be mostly the same under Alternative 4 as it would for the proposed Project (please see Section 6.1), with the exception of the five routing options which are described below. Encroachment of a Project structure into a stream channel or floodplain could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. Project structures include transmission towers, as well as structures associated with substation and switching station facilities. Although this alternative introduces several re-route options for the proposed transmission line in the Southern Region, the re-route options would not cross through or be placed within any new Flood Hazard Areas. The impediment of flood flows is most likely to occur where transmission towers or other permanent Project features are constructed in or closely adjacent to a watercourse. The five different routing options included under Alternative 4 would avoid some surface water and groundwater resources along the proposed Project alignment and would introduce other stream crossings associated with each of the five routing options. The following mitigation measure would be required for Impact H-4 under Alternative 4: H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits).

Route A. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-4 under the proposed Project would not be affected under the Route A option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route A would introduce the potential for Impact H-4 to affect five new unnamed streams. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-4 for Alternative 4, Route A, would be less than significant **(**Class II**)**.

Route B. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-4 under the proposed Project would not be affected under the Route B option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route B would introduce the potential for Impact H-4 to affect eight new streams, including Aliso Creek and seven unnamed streams. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-4 for Alternative 4, Route B, would be less than significant **(**Class II**)**.

Route C. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-4 under the proposed Project would not be affected under the Route C option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route C would introduce the potential for Impact H-4 to affect ten new unnamed streams. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-4 for Alternative 4, Route C, would be less than significant **(**Class II**)**.

Route C Modified. The same unnamed and named streams that would be avoided under the original Route C option, described above, would also be avoided under Route C Modified. Additionally, under Route C Modified, the potential for Impact H-4 to affect Project infrastructure and facilities would be introduced along approximately twelve unnamed streams. With implementation of the mitigation measure listed above and described in detail in Section 3.8.6.1, Impact H-4 for Route C Modified would be less than significant (Class II).

Route D. As shown in Table 2.5-1, several streams that would have the potential to be affected by Impact H-4 under the proposed Project would not be affected under the Route D option. In addition to the unnamed streams that would be avoided, the named streams that would no longer be impacted include Little Chino Creek, Chino Creek, and Cucamonga Creek. However, Route D would introduce the potential for Impact H-4 to affect four new streams, including Aliso Creek and three unnamed streams. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-4 for Alternative 4, Route D, would be less than significant **(**Class II**)**.

No further impacts would be introduced by Alternative 4 under Criterion HYD3. As mentioned, please see Section 6.1 for a detailed description of the impacts and mitigation measures listed above.

Flooding from Increased Rate or Amount of Surface Runoff (Criterion HYD4)

The amount of surface runoff is determined by the amount of precipitation and other imported water that enters a watershed, minus the amount of precipitation and imported water that infiltrates into the groundwater. Infiltration is determined by several factors, including soil type, antecedent soil moisture, rainfall intensity, the amount of impervious surfaces within a watershed, and topography. The rate of

surface runoff is largely determined by topography and the storm hydrograph (the intensity of rainfall over a given period of time). Alternative 4 would not alter any precipitation amounts or intensities, nor would it require any additional water to be imported into the proposed Project area. Creation of new impervious surfaces through construction of Alternative 4 could interfere with groundwater recharge by reducing the amount of surface area through which precipitation and surface water percolates to underground aquifers. However, impervious surfaces that would result from construction of Alternative 4 would cover very small areas and would be distributed over a large geographic region, and therefore would have the same effect on groundwater infiltration as described for the proposed Project under Section 6.1.

Alternative 4 would not substantially alter precipitation amounts or intensities, or the amount of precipitation or imported water that infiltrates into the groundwater. Therefore, all impacts related to Criterion HYD4 would be exactly the same as those for the proposed Project and, as described under Criterion HYD4 in Section 6.1, no impact would occur.

Damage from Inundation by Mudflow (Criterion HYD5)

As described in the introduction for this analysis of Alternative 4, impacts associated with Criterion HYD5 would be mostly the same for Alternative 4 as for the proposed Project. However, the five different routing options included under Alternative 4 would avoid some surface water and groundwater resources along the proposed Project alignment and would introduce other stream crossings associated with each of the five routing options. These surface water and groundwater resources and the associated impacts and mitigation measures that fall under Criterion HYD5 are summarized below.

Impact H-5 (Project structures would be inundated by mudflow) would be mostly the same under Alternative 4 as it would for the proposed Project (please see Section 6.1), with the exception of the five routing options which are described below. Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow events are caused by a combination of factors, including soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall that the soil is not able to sufficiently drain or absorb. As a result, soil and rock materials become unstable and eventually slide away from their existing location, in a mudflow event. The several re-route options for the proposed transmission line in the Southern Region would pass through steep terrain within the CHSP, where soils are susceptible to mudflow. Therefore, the Hydrology and Water Quality impacts of Alternative 4 that fall under Criterion HYD5 would be similar but of a greater magnitude than the proposed Project. The following mitigation measure would be required for Impact H-5 under Alternative 4: G-3 (Conduct geological surveys for landslides and protect against slope instability).

> ***Route A.*** As described above, 16 miles of Segment 8A (MP 19.2 – 35.2) would not occur under this alternative route, although Segment 8B would still be constructed between the Chino and Mira Loma Substations, same as Alternative 2. Mudflow hazards associated with those 16 miles of the proposed Project's Segment 8A would not affect this alternative route. However, Route A would introduce new steep terrain and soils susceptible to mudflow near Chino Hills State Park, which could produce potential new mudflow hazards that would not be introduced under the proposed Project. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-5 for Alternative 4, Route A, would be less than significant (Class II).

Route B. As described above, 16 miles of Segment 8A (MP 19.2 – 35.2) would not occur under this alternative route, although Segment 8B would still be constructed between the Chino and Mira Loma Substations, same as Alternative 2. Mudflow hazards associated with 16 miles of the proposed Project's Segment 8A would not affect this alternative route. However, Route B would introduce new steep terrain and soils susceptible to mudflow near Chino Hills State Park, which could produce potential new mudflow hazards that would not be introduced under the proposed Project. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-5 for Alternative 4, Route B, would be less than significant **(**Class II**)**.

Route C. As described above, 16 miles of Segment 8A (MP 19.2 – 35.2) would not occur under this alternative route, although Segment 8B would still be constructed between the Chino and Mira Loma Substations, same as Alternative 2. Mudflow hazards associated with those 16 miles of the proposed Project's Segment 8A would not affect this alternative route. However, Route C would introduce new steep terrain and soils susceptible to mudflow near Chino Hills State Park, which could produce potential new mudflow hazards that would not be introduced under the proposed Project. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-5 for Alternative 4, Route C, would be less than significant **(**Class II**)**.

Route C Modified. The potential for Impact H-5 to occur under Route C Modified would be the same as described above for the original Route C option, with site-specific differences related to the switching station being located approximately 2,500 feet northwest of the location proposed under the original Route C. Terrain in the area of the switching station location under Route C Modified is comparable to terrain at the switching station under the original Route C and therefore, any differences in the occurrence of Impact H-5 would be site-specific as related to the switching station. However, implementation of the mitigation measure listed above and described in detail in Section 3.8.6.1 would reduce Impact H-5 for Route C Modified to a less-than-significant level (Class II).

Route D. As described above, 16 miles of Segment 8A (MP 19.2 – 35.2) would not occur under this alternative route, although Segment 8B would still be constructed between the Chino and Mira Loma Substations, same as Alternative 2. Mudflow hazards associated with those 16 miles of the proposed Project's Segment 8A would not affect this alternative route. However, Route D would introduce new steep terrain and soils susceptible to mudflow near Chino Hills State Park, which could produce potential new mudflow hazards that would not be introduced under the proposed Project. With implementation of the mitigation measure listed above and described in detail in Section 6.1, Impact H-5 for Alternative 4, Route D, would be less than significant **(**Class II**)**.

No further impacts would be introduced by Alternative 4 under Criterion HYD5. As mentioned, please see Section 6.1 for a detailed description of the impacts and mitigation measures listed above.

8.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 4 (Chino Hills Route Alternatives). This alternative consists of five different routing options which would diverge from the proposed Project route in the City of Chino Hills. The route for Alternative 4 would be exactly the same as that of the proposed Project for all segments except Segment 8, where the Alternative 4 routing options (Routes A through D and C Modified) would diverge from the proposed Project alignment at S8A MP 19.2. Furthermore, Alternative 4 would require the same 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 4 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 rerouted portion of the alternative. With regards to Alternative 4, any incremental increases or decreases in the Project's contribution to the cumulative scenario would result from the location of the alternative alignments associated with Routes A, B, C, C Modified, and D.

8.2.1 Geographic Extent

Alternative 4 differs from the proposed Project in the southwestern portion of the proposed route, near the cities of Chino, Chino Hills, and Ontario. This area is still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 6.2.1. Therefore, the geographic extent of the cumulative analysis for Alternative 4 is exactly the same as that for Alternative 2 and would include all of the Northern, Central, and Southern Regions.

8.2.2 Existing Cumulative Conditions

The existing cumulative conditions for Alternative 4 are exactly the same as for Alternative 2, as described in Section 6.2.2.

8.2.3 Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 4 would be exactly the same as Alternative 2, described in Section 6.2.3.

8.2.4 Cumulative Impact Analysis

As described in Section 6.2, impacts associated with Alternative 4 would be cumulatively considerable if they would have the potential to combine with impacts of other past, present, or reasonably foreseeable projects. The proposed re-route options of Alternative 4 would have the potential to incrementally increase or decrease the proposed Project's contribution to cumulative impacts because they would have the potential to affect surface water and groundwater resources that would not be affected by the proposed Project, and they would likewise avoid effects to some surface water and groundwater resources that would be impacted by the proposed Project. The analysis of the Alternative 4 routing options provided in Section 8.1 indicates that although there would be some location-specific differences between the proposed Project and the Alternative 4 routing options, such location-specific differences are limited to a portion of the Southern Region and across the entirety of the proposed routes (including the proposed Project), the nature of impacts that would occur are the same between the proposed Project and Alternative 4. As such, the contribution of Alternative 4 to cumulative impacts would be the same as the proposed Project's contribution, as summarized below. Please see Section 6.2.4 (Cumulative Effects Analysis: Alternative 2) for a detailed discussion of these cumulative Project impacts.

The following impacts would be cumulatively considerable but less than significant **(**Class III**)**: Impact H-3 (Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials) and Impact H-5 (Project structures would be inundated by mudflow).

The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable **(**Class I**)**: Impact H-1 (Construction activities would degrade surface water quality through erosion and accelerated sedimentation) and Impact H-2 (Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials).

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

Mitigation measures introduced for Alternative 4 in Section 8.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for Hydrology and Water Quality.