

Summary

This Specialist Report describes existing environmental conditions and analyzes environmental impacts related to Hydrology and Water Quality that are expected to result from the implementation of Southern California Edison's (SCE's) proposed Tehachapi Renewable Transmission Project (TRTP). This report has been prepared in support of an Environmental Impact Report and Environmental Impact Statement (EIR/EIS) being prepared jointly by the California Public Utilities Commission (CPUC) and the USDA Forest Service for SCE's proposed TRTP.

Implementation of the proposed TRTP would require the approval of a Certificate of Public Convenience and Necessity by the CPUC and a Special Use authorization from the Forest Service. Amendments to the 2005 Forest Land Management Plan (Forest Plan) would be required to allow the implementation of the TRTP across National Forest System (NFS) lands in the Angeles National Forest (ANF). Additional approvals and permits from other agencies would also be required and vary by alternative.

Impacts related to Hydrology and Water Quality are evaluated for both the construction and operation of the proposed TRTP. Key issues related to Project construction and operations include the following:

- Construction and/or operation could degrade water quality through erosion and sedimentation
- Construction and/or operation could degrade water quality through the accidental release of potentially harmful or hazardous materials
- Diversion of flood flows could cause erosion, sedimentation, or other flood related damage

Overview of the Project Purpose, Proposed Project/Action, and Alternatives

Below is an overview of the alternatives analyzed in this Specialist Report. Pursuant to CEQA (Guidelines Section 15126.6(a)) and NEPA (40 CFR 1505.1(e)), a reasonable range of alternatives to SCE's proposed Project (Alternative 2) are examined in this Specialist Report, which were selected based on the following criteria: (1) the alternative's potential to meet most of the Project objectives/purpose and need; (2) the feasibility of the alternative; and (3) the alternative's ability to address significant environmental issues associated with SCE's proposed Project. As required under CEQA Section 15126.6(e) and NEPA Section 1502.14(d), a No Project/Action Alternative was also considered. The proposed Project and alternatives include the following:

Alternative 1: No Project/Action Alternative. Under the No Project/Action Alternative the Tehachapi Renewable Transmission Project, as proposed, would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated specifically with the proposed Project would not occur. However, in the absence of the Project, SCE still would continue to operate and maintain the existing transmission structures, access, and spur roads for operations and maintenance purposes under a variety of agreements (landowners) and permits (Forest Service and US Army Corps of Engineers). For example, within the ANF, approximately 80 miles of roads are currently being used to access the existing structures along Segments 6 and 11, which the use and maintenance of is authorized through existing roads permits issued by the Forest Service. SCE would also be required to interconnect and integrate power generation facilities into its electric system, as required under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO's Tariff. Various scenarios related to electricity generation and transmission reasonably expected to occur in the foreseeable future are identified in see Section 2.1 of the EIR/EIS.

Alternative 2: SCE's Proposed Project. SCE's proposed Project would involve construction, operation, and maintenance of new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way (ROW) from the Tehachapi Wind Resource Area (TWRA) in southern Kern County south through Los Angeles County and the Angeles National Forest (ANF) and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. Invasive plant species will be controlled using manual techniques and approved herbicides within the Project area on NFS lands on the ANF. The major components of SCE's proposed Project include the following:

- Build a new single-circuit 500-kV transmission line (T/L) traveling approximately 16.8 miles over new ROW between the approved Windhub Substation and the proposed new Whirlwind Substation (Segment 10).
- Build two new single-circuit 220-kV T/Ls for approximately four miles (travelling parallel) in new ROW between the proposed (not part of Project) Cottonwind Substation to the proposed new Whirlwind Substation (Segment 4 - 220 kV).
- Build a new single-circuit 500-kV T/L for approximately 15.6 miles in new ROW between the proposed new Whirlwind Substation to the existing Antelope Substation (Segment 4 - 500 kV).
- Replace approximately 17.4 miles of the existing Antelope-Vincent 220-kV T/L and the existing Antelope-Mesa 220-kV T/L with only one new T/L built to 500-kV standards in existing ROW between the existing Antelope and Vincent Substations (Segment 5).
- Rebuild approximately 18.7 miles of existing 220-kV T/L to 500-kV standards between the existing Vincent and Gould Substations and construct a new 220-kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L between the existing Gould and Mesa Substations (Segment 11).
- Rebuild approximately 31.9 miles of existing 220-kV T/L to 500-kV standards from the existing Vincent Substation to the southern boundary of the ANF, including approximately 26.9 miles of the existing Antelope-Mesa 220-kV T/L and approximately five miles of the existing Rio Hondo-Vincent 220-kV No. 2 T/L (Segment 6).
- Rebuild approximately 15.8 miles of existing Antelope-Mesa 220-kV T/L to 500-kV standards from the southern boundary of the ANF to the existing Mesa Substation (Segment 7).
- Rebuild approximately 33 miles of existing Chino-Mesa 220-kV T/L to 500-kV standards from a point approximately two miles east of the existing Mesa Substation (the "San Gabriel Junction") to the existing Mira Loma Substation. Also rebuild approximately seven miles of the existing Chino-Mira Loma No. 1 line from single-circuit to double-circuit 220-kV structures (Segment 8).
- Build the new Whirlwind Substation, a 500/220-kV substation located approximately four to five miles south of the proposed (no part of Project) Cottonwind Substation near the intersection of 170th Street and Holiday Avenue in Kern County near the TWRA (Segment 9).
- Upgrade the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new T/L construction and system compensation elements (Segment 9).
- Install associated telecommunications infrastructure.

Alternative 3: West Lancaster Alternative. This alternative would re-route the new 500-kV T/L in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West. This alternative represents a refinement of the applicant's proposed Project that would place the T/L along an undeveloped area instead of through development thereby minimizing disturbance to current residences or access to properties located along the paved 110th Street West. As such, land use impacts and visual impacts would be reduced.

Alternative 4: Chino Hills Alternatives. Five route variations in the Chino Hills area have been analyzed, as described below. These routing options have been retained for further analysis, as each would avoid proximity of the T/L to existing residences of the City of Chino Hills; and implementation of

one of these routing options would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A, between MP 19.2 and MP 35.2.

- **Route A** would place a new double-circuit 500-kV T/L in Segment 8A through Chino Hills State Park (CHSP) parallel to and south of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV T/Ls to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Route B** represents a modification to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be routed completely through CHSP parallel to and north of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, and would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Route C** represents a modification to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and south of an existing double-circuit 220-kV T/L up to CHSP. At this point, this alternative route would turn east for approximately 2.4 miles, remaining just north of the CHSP boundary, to a new 500-kV switching station. A portion of the existing single-circuit 500-kV T/Ls within CHSP would be re-routed to tie into the new switching station, which would allow the new double-circuit 500-kV T/L to connect to these existing 500-kV T/Ls to allow power flow to continue on to the Mira Loma Substation. In addition, a portion of the existing 220-kV T/L within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV T/Ls from just west of the CHSP boundary to the new switching station. The re-routed 500-kV and 220-kV T/Ls would proceed north out of the new switching station, and would then re-enter CHSP paralleling the re-routed 500-kV T/Ls to reconnect with the existing 220-kV T/L.
- **Route C Modified** is similar to the original Route C option, with the exceptions that (1) the new gas-insulated switching station would be located approximately 2,500 feet northwest of the location described for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers.
- **Route D** also represents a refinement to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and north of an existing double-circuit 220-kV T/L up to CHSP. At this point, the alternative route would turn east and proceed to follow the northern boundary of CHSP for approximately 4.2 miles, then just east of Bane Canyon the alignment would turn southeast and cut across CHSP for approximately 1.3 miles to a new 500-kV switching station located immediately east of the boundary of CHSP. This switching station would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area to provide connections to the Mira Loma Substation.

Alternative 5: Partial Underground Alternative. This alternative would utilize Gas-Insulated Line (GIL) technology to place the proposed overhead lines underground along Segment 8A through the City of Chino Hills from approximately S8A MP 21.9 to 25.4 to reduce significant visual impacts and address other community concerns.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative. This alternative would utilize helicopter construction within the ANF to the maximum extent feasible. This alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction. Helicopter staging/support areas have been identified in the vicinity of Segments 6 and 11 to provide for helicopter construction activities within the ANF. A total of 148 new 500-kV towers would be constructed by helicopter under this alternative: 92 along Segment 6 and 56 along Segment 11.

Alternative 7: 66-kV Subtransmission Alternative. This alternative is comprised of four 66-kV subtransmission line elements, including the following: (1) Undergrounding the existing 66-kV subtransmission line on Segment 7 through the River Commons at the Duck Farm Project (Duck Farm Project) between MP 8.9 and MP 9.9 of Segment 7 as requested by the Board of Supervisors County of Los Angeles to minimize the Project's effects to passive recreation opportunities in the planned Duck

Farm Project area; (2) Re-routing and undergrounding the existing 66-kV subtransmission line around the Whittier Narrows Recreation area along Segment 7 (S7 MP 11.4 to 12.025) to provide habitat enhancement for least Bell's vireos as identified by SCE; (3) Re-routing the existing 66-kV subtransmission line through the Whittier Narrows Recreation Area in Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW to reduce the number of structures required (20-foot expanded ROW required); and (4) Re-routing the existing 66-kV subtransmission line around the Whittier Narrows Recreation Area along Segment 8A between the San Gabriel Junction at S8A MP 2.2 and S8A MP 3.8 (2 routing options are provided in this area) to provide habitat enhancement for least Bell's vireos, as identified by SCE.

Summary of Impacts and Mitigation Measures

Direct and Indirect Effects

Table S-1 lists the direct and indirect environmental impacts of the proposed Project and alternatives analyzed in this Specialist Report. The direct and indirect effects of the Project and alternatives are described in full detail in Sections 5 through 11. Alternative 1 (No Project/No Action) impacts are fully described in Section 5; however, because no potential future project information is available an impact significance level for Alternative 1 is not included in the table below.

Significant and Unavoidable Impacts

Significant and unavoidable impacts are those that cannot be reduced to a less-than-significant level with application of recommended mitigation measures. There are no impacts of the proposed Project and alternatives that are considered significant and unavoidable.

Cumulative Impacts

Table S-2 lists the significant cumulative impacts of the proposed Project as described in Section 6.2. This analysis describes the potential for impacts of the proposed Project and alternatives to combine with similar effects of other projects within the geographic scope of the cumulative analysis.

Summary Comparison of Alternatives

Section 12 of this Specialist Report provides a comparison of the proposed Project and alternatives based on the analysis presented in Sections 5 through 11. This comparison describes the differences in impacts among the various alternatives, focusing primarily on noteworthy differences between the proposed Project and alternatives.

Based on the analyses of the Hydrology and Water Quality impacts of the proposed Project and alternatives, as presented in Sections 5 through 11, distinguishing characteristics of the alternatives have been highlighted in order to evaluate the overall effect of each alternative. For Hydrology and Water Quality, the differentiators used to compare the alternatives included such considerations as the number of streams that would be crossed, the water quality and level of surrounding development of the streams that would be crossed, the number of miles of Project structures within a Flood Hazard Area, and the potential for underlying groundwater to be contaminated by Project construction activities. A quantitative comparison of the alternatives was conducted for criteria where adequate data are available.

Table S-1. Summary of Impacts and Mitigation Measures										
Impact	Impact Significance								Mitigation Measures	
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt 7	NFS Lands*		
HYDROLOGY AND WATER QUALITY										
H-1: Construction activities would degrade surface water quality through erosion and accelerated sedimentation.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits. H-1b: Dry weather construction. B-2: Implement RCA Treatment Plan.
H-2: Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	H-1a (See Impact H-1) [applicable to Alternatives 5 and 7] H-1b (See Impact H-1)
H-3: Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.	N/A	Class III	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
H-4: Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	H-1a (See Impact H-1)
H-5: Project structures would be inundated by mudflow.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	G-3: Conduct geological surveys for landslides and protect against slope instability.
H-6: Discharge of contaminated groundwater during dewatering operations would degrade surface water quality.	N/A	No Impact	No Impact	No Impact	Class II	No Impact	Class II	Class II	No	H-1a (See Impact H-1)

N/A = Not Available.

+ Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts.

* Indicates that this impact is applicable to the portion of the Project on National Forest System lands.

For comparison purposes, Table S-3 presents a summary matrix of the environmental issues associated with the proposed Project and the alternatives. As a result of constructing 148 transmission towers in the ANF by helicopters, Alternative 6 (Maximum Helicopter Construction in the ANF) would include the least amount of new or upgraded access and spur roads, in comparison with the proposed Project and other alternatives. Therefore, the amount of erosion and sedimentation that would occur under Alternative 6 would be lower and the subsequent impacts to surface and groundwater quality would also be diminished. Alternative 3 (West Lancaster) would follow the same route as the proposed Project except for a short distance in the North Region where the transmission line would traverse two additional unnamed streams (in comparison with the proposed Project). Alternative 4 (Chino Hills Routes), Route D, would cross fewer streams and overlies one fewer groundwater basin than the proposed Project,

Alternative 3, or Alternative 6, but would affect high quality, natural streams within CHSP that would not be affected by the aforementioned alternatives. Alternative 4, Route A, would cross one more stream than Alternative 4, Route D; Alternative 4, Route B, would cross four additional streams; and Alternative 4, Route C, would cross six additional streams, and Route C Modified would cross eight additional streams (in comparison with Alternative 4, Route D). Alternative 5 (Partial Underground) would avoid several stream crossings that would occur under the proposed Project; however, this alternative would have greater potential to come in direct contact with groundwater resources as a result of the 3.5-mile underground segment included in the South Region (Segment 8). Alternative 7 (66-kV Subtransmission) would also introduce the potential to come into contact with groundwater resources as a result of the undergrounded portions of 66-kV subtransmission line in the South Region.

Table S-2. Cumulative Effects Matrix – Alternative 2: Proposed Action

Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
HYDROLOGY AND WATER QUALITY					
Water quality violations, waste discharges, or polluted runoff (Criterion HYD1)	Construction activities would degrade surface water quality through erosion and accelerated sedimentation (Impact H-1).	Past changes in topography, such as the cutting of roads through the forest, continue to influence the potential for erosion and sedimentation.	Construction of present and future residential development projects near the proposed Project could cause erosion and sedimentation.	Past, present, and future projects (including the proposed Project) would produce a combined effect that would degrade surface water quality through erosion and sedimentation. The contribution of the proposed Project to this impact is small.	Class I
	Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-2).	Past releases of potentially harmful or hazardous materials continue to impact water quality.	Construction of present and future residential development projects near the proposed Project could cause accidental releases of potentially harmful or hazardous materials.	Past, present, and future projects (including the proposed Project) would produce a combined effect that would degrade surface water quality through the accidental release of potentially harmful or hazardous materials. The contribution of the proposed Project to this impact is small.	Class I
	Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-3).	Past releases of potentially harmful or hazardous materials continue to impact water quality.	Operation of present and future residential development projects near the proposed Project could cause accidental releases of potentially harmful or hazardous materials.	Past, present, and future projects (including the proposed Project) would produce a combined effect that would degrade surface water quality through the accidental release of potentially harmful or hazardous materials. The contribution of the proposed Project to this impact is small.	Class III
	Discharge of contaminated groundwater during dewatering operations would degrade surface water quality. (Impact H-6)	The Chino Subbasin exceeds MCLs for TDS, inorganics, radiology, nitrates, pesticides, VOCs, and perchlorate.	Any present and future activities that are similar to or the same as the past activities that caused the contamination of the Chino Subbasin could perpetuate or worsen existing groundwater quality conditions.	This impact would not be cumulatively considerable because compliance with required NPDES discharge permits would ensure the discharge of clean and/or treated groundwater; the clean and/or treated discharge would not contribute to the degradation of surface water.	No Impact
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)	Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows (Impact H-4).	Past changes to the hydrology within the Project area, including the creation of impervious surfaces, continue to redirect flood flows.	Present and future residential development projects near the proposed Project could impede flood flows.	Past, present, and future projects (including the proposed Project) would produce a combined effect that would impede flood flows. The contribution of the proposed Project to this impact is small.	No Impact

Table S-2. Cumulative Effects Matrix – Alternative 2: Proposed Action					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
Damage from Inundation by Mudflow (Criterion HYD5)	Project structures would be inundated by mudflow (Impact H-5).	Past changes in topography, such as the cutting of roads through the forest, continue to influence the potential for mudflow.	Present and future projects that drastically change the topography and/or permeability of the Project area could increase the potential for mudflow.	Past, present, and future projects (including the proposed Project) would produce a combined effect that would increase the potential for Project structures to be inundated by mudflow. The contribution of the proposed Project to this impact is small.	Class III

Table S-3. Summary Comparison of Environmental Issues/Impacts

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Heli. Construction in ANF)	Alternative 7 (66-kV Subtransmission)
Number of named stream crossed by ROW (Impacts H-1, H-2, H-4)	Many named streams would be crossed by various actions in lieu of the Project, but the exact number is unknown.	41	Same as Alternative 2.	Alts 4A and 4C/4C Mod: 32; Alts 4B and 4D: 33.	36	Same as Alternative 2.	Same as Alternative 2.
Number of unnamed stream crossed by ROW (Impacts H-1, H-2, H-4)	Many unnamed streams would be crossed by various actions in lieu of the Project, but the exact number is unknown.	160	162	Alternative 4A: 152; Alternative 4B: 154; Alternative 4C: 157; Alternative 4C Mod: 159; Alternative 4D: 150.	157	Same as Alternative 2.	Same as Alternative 2.
Miles of T/L within a Flood Hazard Area (Impact H-4)	T/Ls that would be built in lieu of the Project could be placed in Flood Hazard Areas, but the number of miles is unknown.	19.94	19.86	Alternatives 4A through 4D and 4C Mod: 14.12. Eastern transition station also located in a Flood Hazard area.	19.76	Same as Alternative 2.	Same as Alternative 2.
Number of named streams crossed by new and/or improved access and/or spur roads in the ANF	Many named streams would be crossed by various actions in lieu of the Project, but the exact number is unknown.	14	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	6	Same as Alternative 2.
Number of unnamed streams crossed by new and/or improved access and/or spur roads in the ANF	Many unnamed streams would be crossed by various actions in lieu of the Project, but the exact number is unknown.	123	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	62	Same as Alternative 2.