

7 Development of the Tehachapi Wind Resource Area

The Tehachapi Wind Resource Area (TWRA) is situated at the southern end of the San Joaquin Valley and spreads into the adjacent Mojave Desert. The TWRA consists of undeveloped, rural land, ranging from high desert floor to mountain passes, to tall mountains, with elevation ranging from 2,500 feet to approximately 8,000 feet above sea level. It is located in an area highly susceptible to wildfires, with vegetation consisting of juniper woodland, Joshua tree woodland, and Mojave Creosote scrub, with areas of introduced annual grasses, native needle grass grassland, and pine oak woodlands. High-velocity wind conditions typically occur in the TWRA with occasional periods with Santa Ana-like wind conditions.

Currently, approximately 3,400 wind turbines exist in the Tehachapi/Mojave area of the TWRA, producing about 710 MW of power. An analysis was conducted to present the potential impacts and mitigation, on a programmatic level, for the development of wind generation projects necessary to achieve an estimated capacity of 4,500 MW within the TWRA.

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives					
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	Cumulative Significance per Alternative
Agricultural Resources					
Convert Farmland to non-agricultural use (Criterion AG1)	Construction activities would result in temporary and permanent impacts to Farmland (Impact AG-1)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could convert farmland to non-agricultural use.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially convert farmland to non-agricultural use. This impact is considered cumulatively considerable.	Class I (All Alts)
	Operation would permanently convert Farmland to non-agricultural use (Impact AG-2)	Over time, development and urbanization have gradually converted some areas of agricultural land to non-agricultural uses. However, such historical conversion does not have persistent influence.	Present and future actions could result in the permanent conversion of farmland to non-agricultural use. However, due to the small area to be converted under the proposed Project, there is not considered to be a potential for similar impacts of other projects to combine with this impact of the Project.	The area of land that would be permanently converted for the use of the proposed Project following site restoration and Project completion would be under the ten acre minimum mapping unit (5.83 acres of Farmland and 1.83 acres of land under Williamson Act contract) resulting in a less than significant impact for the Project. However, this conversion would have the potential to combine with similar impacts of other projects and therefore would be considered cumulatively considerable.	Class I (All Alts)
Interfere with agricultural operations (Criterion AG2)	Construction activities would interfere with agricultural operations (Impact AG-3)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could interfere with agricultural operations.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would interfere with agricultural operations. During construction activities. This impact is considered cumulatively considerable.	Class I (All Alts)
	Operation would interfere with agricultural operations (Impact AG-4)	Past actions include construction of existing transmission lines, which likely interfered with agricultural operations, but do not have persistent influence.	Construction and operation of present and future development projects at or near the proposed Project could interfere with agricultural operations.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would interfere with agricultural operations. This impact is considered cumulatively considerable.	Class I (All Alts)
Air Quality					
Emissions of air pollutants would exceed any SCAQMD, AVAQMD, or KCAPCD regional air quality standard (Criterion AIR1)	Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1)	Long-term trends in reduced emissions of most criteria pollutants have generally reduced criteria pollutant concentrations; however, those trends have flattened in recent years and over the past ten years only one significant change in attainment status has occurred (SCAB attained State and Federal CO standards).	Present and future development projects would result in exceedances of regional thresholds.	In the event that any currently unknown projects, would be constructed concurrently with TRTP in the SCAQMD, KCAPCD, and AVAQMD jurisdictions then the proposed Project would have cumulatively significant impacts in those jurisdictions.	Class I (All Alts)

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	Operating emissions would exceed the SCAQMD, AVAQMD, and KCAPCD regional emission thresholds. (Impact AQ-2)	Past actions (e.g., development, urbanization) have resulted in operation emissions exceeding regional thresholds	Present and future actions (e.g., development, urbanization) would result in operation emissions exceeding regional thresholds.	The proposed Project's operation will have a net emission decrease, so it will not contribute to regional emissions and would have a less-than-significant cumulative regional impact	Class III (All Alts)
SCAQMD Localized Significance Thresholds (Criterion AIR2)	Construction of the Project would expose sensitive receptors to substantial pollutant concentrations. (Impact AQ-3)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and future actions (e.g., development, urbanization) would result in exceeding localized thresholds.	The proposed Project would result in cumulatively significant impacts to sensitive receptors after mitigation.	Class I (All Alts)
	Operation of the Project would expose sensitive receptors to substantial pollutant concentrations. (Impact AQ-4)	Past actions (e.g., development, urbanization) have resulted in exposure of sensitive receptors to operational pollution emissions.	Present and future actions (e.g., development, urbanization) would result in exposure of sensitive receptors to operation emissions.	Since the proposed Project's operation will have minimum direct localized operating emission and will create a net emission decrease, it will have a less-than-significant cumulative localized impact to sensitive receptors.	Class III (All Alts)
Toxic air contaminant emissions would exceed SCAQMD risk thresholds. (Criterion AIR3)	Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds. (Impact AQ-5)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and future actions identified in the cumulative projects section 3.3.6.2 of the EIR/EIS, would not result in emissions exceeding SCAQMD thresholds.	Given the temporary nature and low toxic air contaminant emission level for the proposed Project's and cumulative project's, the proposed Project would not have a less-than-significant cumulative health risk	Class III (All Alts)
Expose a substantial number of people to objectionable odors. (Criterion AIR5)	The Project would create objectionable odors. (Impact AQ-7)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and future project construction equipment and operations, such as asphalt paving, may create temporary and mildly objectionable odors. However, odor-generating activities from other current and proposed Projects would have to occur concurrently in very close proximity with the other odor-generating activities.	Given the temporary nature and relative mildness of the Project's construction odors, odor impacts related to the proposed Project would be adverse but not cumulatively significant	Class III (All Alts)
Greenhouse gas emissions (Criterion AIR8)	Emissions would contribute to climate change. (Impact AQ-10)	California's greenhouse gas emissions are large in a world-scale context and growing over time. The State is responsible for approximately 500 million metric tons of CO ₂ equivalent and is therefore contributing to climate	Present and foreseeable future actions will contribute to climate change.	The proposed Project will allow a reduction in GHG emissions from electricity generation resulting in beneficial impacts and would not result in impacts that would be cumulatively considerable.	No Impact (All Alts)

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		change.			
Biological Resources					
Impacts to riparian or sensitive natural communities (Criterion BIO1)	Construction activities would result in temporary and permanent losses of native vegetation. (Impact B-1)	Past and present agricultural, military, and development activities has resulted in the continued loss and the degradation of riparian and natural areas that historically supported populations of common, unique, or rare species.	Present and future development at or near the proposed Project could result in considerable loss of native vegetation types that are limited in distribution within southern California.	The impacts to native vegetation have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Loss of sensitive desert wash or riparian habitat. (Impact B-2)	Much of this habitat has been lost over the last several decades due to development and agricultural practices, particularly in undeveloped portions of the Project area where off-road vehicle paths and paved roads transect desert washes.	Present and foreseeable future actions in these areas would reduce and/or degrade desert wash and riparian habitat types that are limited in distribution within southern California.	The impacts to sensitive desert wash and riparian habitat types has the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Establishment and spread of noxious weeds. (Impact B-3)	Several noxious weeds already exist within or near the proposed Project in well-established populations, often clearly associated with a source of disturbance such as grazing, land development, and road construction.	The spread of existing weeds or the introduction of new weed populations would contribute to the cumulative spread of weeds occurring from other present and reasonably foreseeable projects.	The introduction and spread of noxious weeds by the proposed Project has the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and result in wildlife mortality. (Impact B-4)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and foreseeable future actions in these areas would result in considerable disturbance to wildlife, especially common species.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be potentially adverse and cumulatively considerable.	Class I (All Alts)
	Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors. (Impact B-5)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and foreseeable future actions in these areas could result in considerable loss of nesting birds if construction activities were spatially or temporally combined.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, is significant because the impact substantially reduces the acreage of several habitat types that are important for nesting birds and limited in distribution in southern California, such as riparian habitats.	Class I (All Alts)

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	Loss of foraging habitat for wildlife. (Impact B-6)	Same as B-1	Present and foreseeable future actions in these areas would result in considerable loss of foraging habitat.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of several habitat types that are important for wildlife and limited in distribution in southern California.	Class I (All Alts)
Impacts to endangered or threatened species, or proposed or critical habitat (Criterion BIO2)	Disturbance of endangered, threatened, or proposed plant species or their habitat. (Impact B-7)	Same as B-1	Present and foreseeable future actions in this area will result in considerable adverse impacts to these plants and their habitats.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat for multiple candidate, sensitive, and special-status plants in the region.	Class I (All Alts)
	Loss of California red-legged frog and mountain yellow-legged frog. (Impact B-8)	Past actions and natural events (e.g., road construction, development, recreational activities, fire, and drought) have resulted in considerable adverse effects that both species are now at the brink of extirpation in Southern California.	Although foreseeable future actions in the Central Region are limited and are expected to have minimal effects on red-legged and yellow-legged frogs, overall, future actions could adversely affect these species in the proposed Project area.	Project impacts, should they occur, would contribute substantially to the incremental take of and loss of habitat for these species when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects. These impacts would be cumulatively considerable because the aforementioned past actions and natural events have so severely impacted California red-legged frog and mountain yellow-legged frog populations that both species are now at the brink of extirpation in southern California	Class I (All Alts)
	Loss of arroyo toad. (Impact B-9)	Past actions and natural events in the Central Region (e.g., road construction, development, recreational activities, fire, and drought) have resulted in considerable adverse effects to arroyo toads.	Present and future Road construction, development, recreational activities, fire, and drought) would result in considerable adverse effects to arroyo toads.	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, arroyo toad when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I (All Alts)
	Loss of desert tortoise. (Impact B-10)	Past actions and natural events within the Northern Region have resulted in considerable adverse effects to desert tortoises.	Present and foreseeable future actions could adversely affect desert tortoises in the Northern Region.	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, desert tortoises when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I (All Alts)

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	Mortality of desert tortoises as a result of increased predation by common ravens. (Impact B-11)	Past actions (e.g., development, urbanization, landfill construction, litter, recreation) have resulted in considerable incremental adverse impacts to desert tortoises resulting from common raven predation.	Present activities and foreseeable future actions in this area will result in considerable incremental adverse impacts to desert tortoises resulting from common raven predation.	None of the aforementioned foreseeable projects would occur in the vicinity of the proposed Project and in known occupied desert tortoise habitat and are, therefore, not cumulatively considerable. Raven population increases, if they occur, are expected to be small, and food supplies are not expected to change appreciably in portions of the Project area where desert tortoises may occur. Therefore, a significant increase in cumulative predation of the desert tortoise, if present, by common ravens is not expected.	Class III (All Alts)
	Loss of special-status fish. (Impact B-12)	The Santa Ana sucker, arroyo chub, and Santa Ana speckled dace are known to occur in the project area. Fuel treatments used in the past to remove upland vegetation could increase stream sedimentation through the deposition of erosional silt adjacent to the streams potentially impacting special-status fish species.	Present and foreseeable future actions could adversely affect special-status fish species.	Impacts to special-status fish species or their habitat due to the proposed Project, have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable	Class I (All Alts)
	Loss of critical habitat for the Santa Ana sucker. (Impact B-13)	The Santa Ana sucker is known to occur in the project area. Fuel treatments used in the past to remove upland vegetation could increase stream sedimentation through the deposition of erosional silt adjacent to the streams potentially impacting the Santa Ana sucker.	Present and foreseeable future actions could adversely affect the Santa Ana sucker.	Impacts to Santa Ana sucker would be cumulatively significant.	Class I (All Alts)
	Loss of California condor. (Impact B-14)	Past activities, including numerous infrastructure and residential development projects and fuel management and restoration projects within the ANF may have resulted in impacts to California condors.	Present and foreseeable future actions including numerous infrastructure and residential development projects proposed for the Antelope Valley and Chino and Puente Hills, and 8,500 acres of fuel management and restoration projects within the ANF would have the potential to impact and result in	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities have the potential to impact and result in the loss of California condors.	Class I (All Alts)

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			the loss of California condors.		
	Disturbance of nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat. (Impact B-15)	Increased levels of disturbance due to past development projects have resulted in disturbance to least Bell's vireos within the Rio Hondo area and to southwestern willow flycatchers and yellow-billed cuckoos, if present, in riparian areas of the proposed Project.	Present and foreseeable future actions could adversely affect least Bell's vireos and other listed riparian birds.	The combined effect of the proposed Project with other past projects and future projects would be significant, because their impact increases the level of disturbance to least Bell's vireos within the project area. Disturbance to southwestern willow flycatchers and yellow-billed cuckoos, if present, would also occur in riparian areas of the proposed Project and would combine with the effects of other projects in the area.	Class I (All Alts)
	Loss of coastal California gnatcatchers. (Impact B-16)	Continued loss and fragmentation of suitable coastal sage scrub habitat contributes to the regional decline of this species.	The effects created by other present and reasonably foreseeable projects, would be substantial due to the reduction of suitable habitat in the region.	The impacts to coastal California gnatcatchers have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Loss of critical and/or occupied habitat of the coastal California gnatcatcher. (Impact B-17)	Impacts to coastal California gnatcatcher habitat due to past activities include loss of habitat due to grading and clearing for projects, dust and the spread of noxious weeds, and increased human presence.	Present and reasonably foreseeable projects, would result in adverse impacts by reducing the acreage of critical or occupied habitat in the region.	The impacts to coastal California gnatcatcher habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Disturbance to nesting Swainson's Hawks. (Impact B-18)	Nesting Swainson's hawks, considered likely within the Northern region of the proposed Project. Past construction activities would result in disturbance during the breeding season resulting in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, disruption of breeding activity due to increased dust, noise, and human presence, and the loss of habitat due to new or improved roads.	Present and reasonably foreseeable projects, would increase the potential for disturbance to nesting Swainson's hawks.	The impacts of the proposed Project to nesting Swainson's hawks have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)

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	Loss of foraging habitat for Swainson's hawks. (Impact B-19)	The effect of past projects has resulted in increased potential for disturbance to nesting Swainson's hawks in the northern portion of the project area.	The effects created by other present and reasonably foreseeable projects, would be substantial due to the reduction of suitable habitat in the region.	The impacts of the proposed Project to Swainson's hawk foraging habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Electrocution of State and/or federally protected birds. (Impact B-20)	Past activities involving transmission projects, most likely have resulted in impacts to State and/or federally protected birds most likely within the Northern Region.	The effects created by other present and reasonably foreseeable projects, would be the result of continued development of the Region with the expansion of small distribution lines to support both residential and industrial development. The majority of electrocutions are caused by lines that are energized at voltage levels less than 69 kV, and large, aerial-perching birds such as hawks and eagles are most susceptible to electrocution from these lines.	The cumulative impacts of transmission lines on State and federally protected birds resulting from the Project and other past, present, and reasonably foreseeable projects will be cumulatively significant and unavoidable	Class I (All Alts)
	Collision with overhead wires by State and/or federally protected birds. (Impact B-21)	Within the Northern Region, where approximately 17 miles of transmission lines proposed in the Antelope Transmission Project Segment 2 would come within close proximity (>0.5 miles) of Segment 5 of the Project has increased the potential for bird strikes.	As the flight paths become more constrictive and larger numbers of transmission lines, towers, structures, and vehicles occur in the region the numbers of birds subject to collision will continue to rise.	When combined with impacts from past, present, or reasonable future projects, these impacts would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Disturbance to Mohave ground squirrel. (Impact B-22)	Past actions (e.g., development, urbanization, landfill construction, litter, recreation) have resulted in considerable incremental adverse impacts to Mohave ground squirrel habitat loss.	The Antelope Valley is anticipated to grow substantially in the coming decades. Anticipated present and future projects would result in a significant cumulative loss of more than 65,858 acres of suitable habitat for Mohave ground squirrel. Continued loss and fragmentation of suitable habitat in the Antelope Valley will continue to contribute to the decline of this species within	The impacts of the proposed Project to Mohave ground squirrel have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)

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			the region.		
Effects on a candidate, sensitive, or special-status species (Criterion BIO3)	Loss of candidate, Forest Service Sensitive, or special-status plant species. (Impact B-23)	Past actions and natural events (e.g., development, urbanization, recreation, fire, and drought) have resulted in considerable incremental adverse impacts to special-status plants and their habitats.	Present and foreseeable future actions (including numerous infrastructure and residential development projects proposed for the Antelope Valley and Chino and Puente Hills, and fuel treatment and infrastructure projects within the ANF) will result in considerable adverse impacts to special-status plants and their habitats.	The impacts to special-status plants have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Mortality or injury of, and loss of nesting habitat for southwestern pond turtles. (Impact B-24)	Past actions and natural events have resulted in considerable incremental adverse impacts to southwestern pond turtles and their nesting habitat.	Present and foreseeable future actions (such as the Amargosa Creek Improvements Project; Corridor Management Plan - Angeles Crest Scenic Byway, CA State Route 2 Enhancement; and California High Speed Train System and Maglev, and numerous small- and large-scale residential and planned community developments) in this area will result in considerable adverse impacts to southwestern pond turtles and their nesting habitat.	Project impacts, should they occur, would contribute substantially to the incremental mortality, injury, and loss of nesting habitat for southwestern pond turtles when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I (All Alts)
	Injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes. (Impact B-25)	Influence from past action or natural events same as for B-23	Present and foreseeable future actions in this area will also result in considerable impacts to these speci	The impacts to two-striped garter snakes and south coast garter snakes have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Injury or mortality of, and loss of habitat for, Coast Range newts. (Impact B-26)	Past actions and natural events (e.g., development, urbanization, recreation, fire, and drought) have resulted in considerable incremental adverse effects to Coast Range newts, particularly in the San Gabriel Valley, where effects of development and urbanization have been most	Present and foreseeable future actions in this region are limited and are expected to have minimal effects on this species.	The impacts to coast range newts, primarily from past activities have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)

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		intense.			
	Injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species. (Impact B-27)	Past actions and natural events (e.g., development, urbanization, recreation, fire, and drought) within the geographic extent have resulted in considerable incremental injury or mortality of, and loss of habitat for, these species.	Present and foreseeable future actions throughout the Project Area region will also result in considerable impacts of this kind to these species.	The impacts to special-status terrestrial herpetofauna have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Disturbance of wintering mountain plovers. (Impact B-28)	Influence from past action or natural events is the same as for B-23 and has substantially reduced the total amount of suitable wintering habitat in the region	Present and foreseeable future development within the Northern Region of the Project may reduce the total amount of suitable wintering habitat in the region.	The impacts of the proposed Project to wintering mountain plovers have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I (All Alts)
	Loss of occupied burrowing owl habitat. (Impact B-29)	Construction activities from past activities have resulted in the loss of suitable and possibly occupied burrowing owl habitat in the Northern and Southern regions of the Project area.	Present and foreseeable future actions in this area will also result in considerable impacts to these species.	Construction-related impacts to occupied burrowing owl habitat have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Loss of occupied California spotted owl habitat. (Impact B-30)	Construction activities from past activities have resulted in the loss of suitable and possibly occupied California spotted owl habitat in the Central region of the Project area.	Present and future construction activities would result in the loss of suitable and possibly occupied California spotted owl habitat in the Central Region of the Project.	Construction-related impacts to occupied California spotted owl habitat have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Disturbance of nesting California spotted owls. (Impact B-31)	Same as B-29 for disturbance.	Construction activities due to present and future projects could potentially result in disturbance of nesting California spotted owls in the Central Region of the Project especially in the Upper Big Tujunga Creek and Mill Creek areas.	Construction-related disturbance to nesting California spotted owls has the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Disturbance of nesting avian "species of special concern." (Impact B-32)	Construction activities from past projects have taken place within or adjacent to habitats that are important for nesting avian species of special concern in Southern California resulting in considerable disturbance.	Present and future actions in these areas would result in considerable loss of nesting birds, because construction activities would take place within or adjacent to habitats that are important for nesting avian species of special concern in	Construction-related impacts to nesting avian species of special concern have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)

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			Southern California.		
	Mortality of, and loss of habitat for, special-status bat species. (Impact B-33)	Impacts from past projects have reduced the acreage of suitable roosting habitat in the region, especially in the ANF and the Puente and Chino Hills portion of the proposed Project area.	Present and future projects would result in the loss of suitable roosting habitat for pallid bat, western red bat, hoary bat, spotted bat, and western mastiff bat. Continued loss and fragmentation of suitable habitat in the Chino and Puente Hills from ongoing development will contribute to the regional decline of these species.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable roosting habitat in the region.	Class I (All Alts)
	Transmission line strikes by special-status bat species. (Impact B-34)	Due to the ability of these bat species to detect and avoid transmission lines during echolocation the impacts of transmission line strikes on special-status bat species resulting from past is less than significant.	Less than significant	The frequency of transmission line strikes by special-status bats is expected to be quite low despite these cumulative effects, due to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission line strikes on special-status bat species resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant	Class III (All Alts)
	Mortality of, and loss of habitat for, special-status mammals. (Impact B-35)	These animals were subject to potential mortality from past construction activities.	Present and foreseeable future development will contribute to the continued loss and fragmentation of suitable habitat contributing to the regional	Construction-related impacts to special-status mammals have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Mortality of San Diego desert woodrat. (Impact B-36)	Past development has resulted in the continued loss and fragmentation of suitable habitat in the Chino and Puente Hills contributing to the regional decline of these species.	Present and foreseeable future development will contribute to the continued loss and fragmentation of suitable habitat contributing to the regional decline of these species.	The impacts to San Diego desert woodrat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Mortality of, and loss of habitat for, the ringtail. (Impact B-37)	Influence from past action or natural events same as for B-35 in terms of impact to the ringtail.	Same as B-35 Present and foreseeable effects.	The impacts to the ringtail have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
	Mortality of American badgers. (Impact B-38)	Past development activities have resulted in the continued loss and fragmentation of suitable grassland and open shrub habitat in the	Same as B-35 Present and foreseeable effects.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage	Class I (All Alts)

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		Antelope Valley and Chino and Puente Hills contributing to the regional decline of these species.		of suitable habitat in these two regions.	
Effects on federally protected wetlands (Criterion BIO4)	Loss of wetland habitats. (Impact B-39)	Throughout California, wetland habitats have been degraded and lost at an alarming rate due to the placement of fill for development.	Present and foreseeable future projects would also contribute to the cumulative loss of these habitat types.	Impacts to wetland habitats have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable	Class I (All Alts)
Interference with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)	Interference with established bird and bat migratory corridors. (Impact B-40)	The Antelope Transmission Project in combination with the proposed Project could potentially occur along a significant migratory route in the Antelope Valley for migratory bats, including western red bat and hoary bat. However, these migratory corridors would not be lost owing to the ability of these bat species to detect and avoid transmission lines during echolocation.	Present and foreseeable projects could potentially occur along migratory routes for migratory bats, including western red bat and hoary bat. However, these migratory corridors would not be lost owing to the ability of these bat species to detect and avoid transmission lines during echolocation.	The cumulative impacts of transmission lines on bird and bat migratory corridors resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant.	Class III (All Alts)
	Corona noise would result in disturbance to wildlife. (Impact B-41)	Corona noise is already present along most of the proposed Project.	Corona noise from the proposed Project and future projects will result in louder corona noise for segments near existing lines. However, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Animals, especially breeding birds and other wildlife that use sound for communication, would be expected to move away from the line in order to minimize interference with communication.	Corona noise from past, present, and future projects (including the proposed Project) is not expected to combine with noise from other projects in a cumulatively significant manner.	Class III (All Alts)
	Effects to Management Indicator Species (Impact 42)	Past actions and natural events (e.g., development, urbanization, recreation, fire, and drought) have resulted in considerable incremental adverse impacts to Management Indicator Species.	Present and foreseeable future actions (including numerous infrastructure and residential development projects proposed for the Antelope Valley and Chino and Puente Hills, and fuel treatment and infrastructure projects within	The cumulative impacts on Management Indicator Species resulting from the Project and other past, present, and reasonably foreseeable projects will be cumulatively significant and unavoidable.	Class I (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
			the ANF) will result in considerable adverse impacts to special-status plants and their habitats.		
Cultural Resources					
Adverse effect on historic properties (Criterion CR1)	Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places (C-1).	Erosion, illicit artifact collection, and other effects of increased access and use resulting from construction of the existing project, plus the impacts of ongoing operation and maintenance, continue to affect some cultural properties.	The integrity of properties could be diminished from the proposed Project and potential new housing and infrastructure; continuing and increasing recreational use of the Forest landscape; continued ranching and agricultural activities; continuing urban development in the Los Angeles Basin; on-going transportation development and improvement; and the development of wind, solar, and other resources and the infrastructure to connect such resources with their points of consumption.	Preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the proposed Project's contribution to cumulative degradation of the regional resource base. If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. This impact is considered cumulatively considerable.	Class I (All Alts)
Expose and/or damage to Native American human remains (Criterion CR3)	Native American human remains could be uncovered, exposed, and/or damaged during Construction (Impact C-2)	Current operational activities and natural events do not appear to be uncovering human remains.	The uncovering of Native American human remains could occur during construction of the proposed Project and potential new housing and infrastructure; continuing and increasing recreational use of the Forest landscape; continued ranching and agricultural activities; continuing urban development in the Los Angeles Basin; on-going transportation development and improvement; and the development of wind, solar, and other resources and the infrastructure to connect such resources with their points of consumption.	Exposure of unanticipated Native American human remains or sacred features during construction would be a significant and unavoidable impact to the remains and an adverse effect under the regulations in the National Historic Preservation Act. Implementation of Mitigation Measures would reduce the severity of impacts to the extent feasible but would not reduce impacts to a level of less than significant. This impact is considered cumulatively considerable.	Class I (All Alts)

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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	Cumulative Significance per Alternative
Environmental Contamination and Hazards					
Soil contamination, including flammable or toxic gases, during construction (Criterion ECH1)	Soil or groundwater contamination results due to improper handling and/or storage of hazardous materials during construction activities (Impact E -1)	All construction impacts are temporary in nature and soil or groundwater contamination would have likely been cleaned up. However, it is possible that previous contamination persists.	Construction of present and future development projects at or near the proposed Project could occur and accidental releases of hazardous materials used during construction could take place.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially result in soil or groundwater contamination. However, mitigation would be included for the proposed Project to ensure that any accidental spills or releases are cleaned up. Also, it is likely that past and future projects would have and will do the same. This impact is not considered cumulatively considerable.	Class III (All Alts)
Mobilization of contaminants currently existing in the soil, creating potential pathways of exposure to humans or other sensitive receptors (Criterion ECH2)	Excavation or grading could result in mobilization of existing soil or groundwater contamination from known sites. (Impact E- 2)	Preexisting soil and groundwater contamination could be encountered during proposed Project construction.	Construction of present and future development projects at or near the proposed Project could occur and accidental releases of hazardous materials used during construction could take place resulting in the potential for future mobilization of soil or groundwater contamination.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially result in the mobilization of soil or groundwater contamination. However, mitigation would be included for the proposed Project to require investigation of potentially contaminated sites along the proposed transmission line route as well as clean up of any contamination identified. Therefore, this impact is not considered cumulatively considerable.	Class III (All Alts)
	Landfill gas and/or natural gas located near active, inactive or abandoned oil wells could be encountered during excavation or grading, resulting in explosions or exposure of workers to toxic gases. (Impact E-3)	The presence of landfill gas and/or natural gas located near active, inactive or abandoned oil wells could be encountered during excavation or grading.	Construction of present and future development projects at or near the proposed Project could occur and the presence of landfill gas and/or natural gas near active, inactive or abandoned oil wells could be encountered during excavation or grading, resulting in explosions or exposure of workers to toxic gases.	Mitigation included for the proposed Project would reduce the potential for encountering methane and other natural gases, but the potential for encountering natural gases would still exist. For a cumulative impact to occur, natural gas encountered by the proposed Project would have to combine with gas encountered during concurrent construction activities of a project located in very close proximity to the proposed Project. No concurrent projects located immediately adjacent to the portions of the route located near landfills or oil wells have been identified. Therefore, this impact would not be cumulatively considerable.	Class III (All Alts)
	Unanticipated preexisting soil and/or groundwater contamination could be encountered during excavation or grading. (Impact E-4)	Preexisting soil and groundwater contamination could be encountered during proposed Project construction.	Construction of present and future development projects at or near the proposed Project could occur and accidental releases of hazardous materials used during construction could take place resulting in soil or groundwater	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially result in soil or groundwater contamination. However, mitigation would be included for the proposed Project to require identification and disposal of potentially impacted soil. Therefore, this impact is not considered cumulatively considerable.	Class III (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
			contamination.		
	Excavation or grading could result in mobilization of existing soil contamination or encountering ordnance from known munitions testing and disposal sites. (Impact E-6) [Alts 4C & 4D Only]	The presence of preexisting soil contamination or ordnance could be encountered during proposed Project construction.	Construction of present and future development projects at or near the proposed Project could occur and accidental releases of hazardous materials used during construction could take place resulting in soil contamination or hazardous conditions if ordnance is encountered.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially result in soil contamination or encounters with ordnance. Mitigation included for the proposed Project would reduce the potential for soil contamination or encountering ordnance. Therefore, this impact would not be cumulatively considerable.	Class III (Alts 4C & 4D Only)
Contamination of soils or groundwater during operation of the Project, resulting in exposure of workers and/or the public to contaminated or hazardous materials (Criterion ECH3)	Soil or groundwater contamination could result from an accidental spill during operation. (Impact E-5)	Preexisting soil and groundwater contamination could have taken place and would be encountered during proposed Project construction, which would result in exposure of construction workers to potential health hazards.	Construction of present and future development projects at or near the proposed Project could occur and accidental releases of hazardous materials used during construction could take place resulting in soil or groundwater contamination.	Past, present, and future projects (including the proposed Project) could produce a combined effect that would potentially result in soil or groundwater contamination. However, mitigation would be included for the proposed Project to require measures to minimize and/or avoid unforeseen spills of hazardous materials during operations as well as to clean up potentially harmful materials in the unlikely event of a release. Therefore, this impact is not considered cumulatively considerable.	Class III (All Alts)
Geology, Soils, and Paleontology					
Known mineral and/or energy resources (Criterion GEO2)	Project activities could interfere with access to known energy resources (Impact G-1)	Known sand and gravel resources, limestone and dolomite, and stone quarries are located within the general Project area. However, the towers for the existing transmission line are located outside of the existing quarry boundaries and it is assumed that any new towers would be at similar tower spacing.	The potential for this impact to combine with similar effects of other projects would only occur if other projects were implemented in the same area at the same time as the proposed Project. However, construction of the proposed Project would preclude other projects from being implemented concurrently in the same location.	The proposed Project impacts would not have the potential to combine with similar effects from other projects and would not be cumulatively considerable.	No Impact (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
Triggering or acceleration of geologic processes, such as landslides, soil erosion, or loss of topsoil, during construction (Criterion GEO3)	Erosion could be triggered or accelerated due to construction activities (Impact G-2)	Past actions or events do not have a persistent influence.	The potential for this impact to combine with similar effects of other projects would only occur if other projects were implemented in the same area at the same time as the proposed Project. However, construction of the proposed Project would preclude other projects from being implemented concurrently in the same location.	The proposed Project impacts would not have the potential to combine with similar effects from other projects and would not be cumulatively considerable.	No Impact (All Alts)
	Excavation and grading during construction activities could cause slope instability or trigger landslides (Impact G-3)	Past actions or events do not have a persistent influence.	The potential for this impact to combine with similar effects of other projects would only occur if other projects were implemented on the same slopes at the same time as the proposed Project. However, construction of the proposed Project would preclude other projects from being implemented concurrently in the same location.	The proposed Project impacts would not have the potential to combine with similar effects from other projects and would not be cumulatively considerable.	No Impact (All Alts)
Exposure to potential risk of loss or injury due to earthquake-related ground rupture (Criterion GEO4)	Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards (Impact G-4)	Past actions or events do not have a persistent influence.	Other projects could cross active faults with potential for ground surface rupture.	Collapse of Project structures and adjacent structures would combine to result in a significant impact where such structures are in close proximity to other structures or people located adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within active fault zones that have been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	Class III (All Alts)
Exposure to potential risk of loss or injury due to seismically induced ground shaking, landslides, liquefaction,	Project structures could be damaged by seismically induced groundshaking and/or ground failure exposing people or structures to hazards (Impact G-5)	Past actions or events do not have a persistent influence.	People or structures of other projects could be at risk of loss or injury from seismically-induced ground shaking and ground failure.	Collapse of Project structures and adjacent structures due to seismically induced ground shaking and ground failure would combine to result in a significant impact where such structures are in close proximity to other structures or people, such as other parallel and crossing transmission lines and substations, and residential and commercial developments located	Class III (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
settlement, lateral spreading, and/or surface cracking (Criterion GEO5)				adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within areas of potential significant seismic shaking and seismically induced ground failures that have been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	
	Existing structures could be damaged by ground settlement along the tunnel exposing people or structures to hazards. (Impact G-9) [Alt 5 Only]	Past actions or events do not have a persistent influence.	People or structures of other projects could be at risk of loss or injury from seismically-induced ground shaking and ground failure.	Impact would combine but not be cumulatively significant with impacts of other past, present and reasonably foreseeable projects.	Class III (Alt 5 Only)
Exposure to potential risk of loss or injury where corrosive soils or other unsuitable soils are present (Criterion GEO6)	Project structures could be damaged by problematic soils exposing people or structures to hazards (Impact G-6)	Past natural events including corrosive subsurfaces exist along the proposed route, the corrosive soils could have a detrimental effect on concrete and metals.	Other project structures could be damaged by corrosive/expansive soil.	Collapse of Project structures and adjacent structures due to damage from corrosive or other unsuitable soils would combine to result in a significant impact where such structures are in close proximity to other structures or people, such as other parallel and crossing transmission lines and substations, and residential and commercial developments located adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within areas of potentially unsuitable and damaging soils that have been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	Class III (All Alts)
Damage to Project structures due to slope failure (Criterion GEO7)	Transmission line structures could be damaged by landslides, earth flows, or debris slides, during operation (Impact G-7)	Past natural events may have resulted in unidentified unstable slopes in the Project area.	Future slope failure could damage other project structures located in hillside areas with unstable slopes.	Collapse of Project structures and adjacent structures due to landslides and other slope failures would combine to result in a significant impact where such structures are in close proximity to other structures or people, such as other parallel and crossing transmission lines and substations, and residential and commercial developments located adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within areas of unstable and potentially unstable slopes that have	Class III (All Alts)

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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	Cumulative Significance per Alternative
				been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	
Destruction of unique paleontological resources (Criterion GEO8)	Grading and excavation could destroy paleontologic resources (Impact G-8)	Past natural actions or events may have resulted in unidentified paleontologic resources in the Project area.	Other projects could traverse areas with unique paleontologic resources although no adverse impact is likely.	Should resources be discovered during construction of current and future projects, they would be subject to legal requirements designed to protect them, thereby reducing the effect of impacts to a less-than-significant level	Class III (All Alts)
Hydrology and Water Quality					
Water Quality Violations, Waste Discharges, or Polluted Runoff (Criterion HYD1)	Construction activities would degrade surface water quality through erosion and 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 (All Alts)
	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 (All Alts)
	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.	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 and does not contribute considerably to cumulative effects.	Class III (All Alts)
	Discharge of contaminated groundwater during dewatering operations would degrade surface water quality (Impact H-6) [Alts 5 & 7 Only]	It is unlikely that past discharges of contaminated groundwater continue to affect surface water quality.	Dewatering operations are regulated under the NPDES permitting process and would not likely contaminate surface water.	Past, present, and future projects (including the proposed Project) would not likely produce a combined effect that would degrade surface water quality through discharge of contaminated groundwater.	No Impact (Alts 5 & 7 Only)

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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	Cumulative Significance per Alternative
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.	For the Project this impact would be reduced to a less-than-significant level with implementation of mitigation measures, as would be required for present and foreseeable residential development projects. Therefore, the cumulative impact would be less than significant.	Class III (All Alts)
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 (All Alts)
Land Use					
Preclude a permitted land use, or create a disturbance that would diminish the function of a particular land use (Criterion LU1)	Construction of the Project would temporarily disrupt, displace, or preclude existing residential land uses (Impact L-1)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could temporarily disrupt, displace, or preclude existing residential land uses.	No projects would be constructed at the same time as the proposed Project that would affect the residential land uses within 1,000 feet of the proposed Project's construction-related activities.	No Impact (All Alts)
	Construction of the Project would temporarily disrupt, displace, or preclude existing non-residential land uses (Impact L-2)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could temporarily disrupt, displace, or preclude existing non-residential land uses.	Present and future projects (including the proposed Project) could produce a combined effect that would preclude the use of, disturb, or diminish the function of a particular land use within the study area. However, no projects would be constructed at the same time as the proposed Project that would affect the non-residential land uses within 1,000 feet of the proposed Project's construction-related activities. The construction of Alternative 4, Routes A through D, in combination with other proposed energy projects, would result in a significant and unavoidable cumulative impact to non-residential uses. Along Segment 8A of Alternative 5, construction could require the take of commercial and services uses via eminent domain. If eminent domain is required for construction of this alternative, it would	No Impact (Alts 2,3,6,7) Class I (Alt. 4) Class I (Alt. 5)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
Conflict with any applicable federal, State, or local land use plans, goals, or policies (Criterion LU2)	Construction, operation or maintenance of the Project would conflict with relevant federal, State, or local land use plans, goals, or policies (Impact L-5)	The conflict or violation with relevant federal, State, or local land use plans, goals, or policies does not have a persistent influence.	Construction of present and future development projects at or near the proposed Project could potentially conflict with relevant federal, State, or local land use plans, goals, or policies.	The proposed Project would be consistent with USDA Forest Service land use policies and local land use plans and policies as they relate to transmission lines and associated facilities and would be authorized by the USDA Forest Service through its permitting and Forest Plan amendment prior to construction. Additionally, the proposed Project would implement mitigation measures to avoid conflicts with any applicable federal, State or local land use plans, goals, or policies that would be cumulatively considerable. Routes A through D of Alternative 4 would conflict with the Chino Hills State Park (CHSP) General Plan, and the expansion of existing ROW or the creation of new ROW within the CHSP may facilitate the siting of future transmission lines within the Park, which would further conflict with the goals and guidelines of the CHSP General Plan. The contribution of the Alternative 4 to this impact would be significant.	Class III (All Except Alt 4) Class I (Alt 4)
Noise					
Substantial temporary or periodic increase in ambient noise levels during construction in the vicinity of sensitive receptors above existing levels (Criterion NOI1)	Construction noise would be substantially higher than ambient noise and would disturb sensitive receptors located within 200 feet of construction activities resulting in a significant and unavoidable impact (Impact N-1)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could cause construction noise that would substantially disturb sensitive receptors.	Present and future projects (including the proposed Project) could produce a combined effect that would potentially disturb sensitive receptors. The contribution of the proposed Project to this impact would be significant.	Class I (All Alts)
	Construction noise levels would violate local standards (Impact N-2)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future development projects at or near the proposed Project could cause construction noise levels that would violate local standards.	Present and future projects (including the proposed Project) could produce a combined effect that would potentially violate local standards. The contribution of the proposed Project to this impact would be significant.	Class I (All Alts)

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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	Cumulative Significance per Alternative
Permanent and substantially higher levels of ambient noise source in the vicinity of sensitive receptors (Criterion NOI2)	Permanent noise levels along the ROW would increase due to corona noise from operation of the transmission lines and substations (Impact N-3)	Past projects have introduced people, automobile and truck traffic, and industrial land uses that have resulted in increased noise within the developed portions of the proposed ROW.	Construction of present and future development projects at or near the proposed Project could cause permanent noise levels along the ROW to increase.	Past, present and future projects (including corona noise from the proposed Project) could produce a combined effect that would potentially increase permanent noise levels along the ROW. The contribution of the proposed Project to this impact would be significant.	Class I (All Alts)
	Operational noise levels would violate local standards (Impact N-4)	Past projects that have violated local standards regarding operational noise levels could have a persistent influence.	Construction of present and future development projects at or near the proposed Project could cause operational noise levels that would violate local standards.	Past, present and future projects (including corona noise from the proposed Project) could produce a combined effect that would potentially increase permanent noise levels that would violate local standards. The contribution of the proposed Project to this impact would be significant.	Class I (All Alts)
Public Services and Utilities					
Increased demand for public services that cannot be readily met by existing public service providers and facilities (Criterion PSU1)	Emergency services would be needed if an accident or other emergency incident occurs at a construction site (Impact PSU-1)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects near the proposed Project could cause potentially hazardous safety and fire conditions.	Could produce a combined effect that would potentially require emergency response services. The contribution of the proposed Project to this impact is not significant.	Class III (All Alts)
Impede or interfere with existing public services emergency access (Criterion PSU2)	Temporary lane closures during the construction period would interfere with emergency response vehicles (Impact PSU-2)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects in the Project area could interfere with emergency response units.	Could produce a combined effect that would interfere with the regular flow of traffic, and limit the ability of emergency response teams to respond to a call. The contribution of the proposed Project to this impact is not significant.	Class III (All Alts)
	Construction and operation would impede emergency aircraft response services. However, Project helicopters would be restricted by FAA rules on temporary flight restrictions from flying in designated areas, therefore eliminating any potential interference with aerial firefighting operations (Impact PSU-3)	Past actions include construction of existing transmission lines, which reduce the effectiveness of firefighting.	Construction of other projects in the vicinity of the proposed Project could also cause interruptions for emergency response operations.	Interference with aerial operations; Project's contribution would be cumulatively considerable but less than significant, as all flight operations would be restricted by FAA rules.	Class III (All Alts)

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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	Cumulative Significance per Alternative
Major reduction or interruption of existing utility systems or cause a collocation accident (Criterion PSU3)	Utility systems would be temporarily disrupted during the construction period (Impact PSU-4)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects near the proposed Project could cause disruptions in utility services.	Could produce a combined effect that would cause multiple utility outages and disruptions to the public; however, if a disruption is known to be unavoidable, SCE would coordinate with the affected jurisdiction/s and service provider/s in order to avoid multiple or extended disruptions, in accordance with Mitigation Measure PSU-4. Therefore, Impact PSU-4 would be cumulatively considerable but less than significant.	Class III (All Alts)
	Public Works maintenance yards would be disrupted during the construction period (Impact PSU-5)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects near the proposed Project could interfere with daily operations at Public Works maintenance yards.	Could produce a combined effect that would cause multiple disruptions and restrict access to Public Works maintenance yards; however, it is unlikely that the maintenance yards in the vicinity would be disrupted by activities from multiple construction sites. If a disruption is known to be unavoidable, SCE would coordinate with the appropriate Public Works Department/s in order to avoid multiple or extended disruptions. Therefore, Impact PSU-5 would be cumulatively considerable but less than significant.	Class III (All Alts)
Substantially change the ability of water treatment, wastewater treatment, or solid waste facilities to adequately supply water and accommodate solid waste and wastewater (Criterion PSU4)	Project construction would temporarily increase water use and Project operation would contribute to increased long-term water consumption. However, water requirements of the Project would not change the ability of the water suppliers to serve existing customers. (Impact PSU-6)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects near the proposed Project would require the use of water.	Could produce a combined effect that would put a strain on the existing water supply. The contribution of the proposed Project to this impact is small.	Class III (All Alts)
	Additional wastewater would be generated during Project construction and operation. However, the proposed Project would not place a significant burden on wastewater facilities serving the area and would not necessitate expansion of wastewater collection or	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and reasonably foreseeable future projects in the vicinity of the proposed route would contribute to wastewater generation.	Not expected to produce a combined effect that would exceed the capabilities of the wastewater facilities.	Class III (All Alts)

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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	Cumulative Significance per Alternative
	treatment facilities serving the area. (Impact PSU-7) Additional solid waste would be generated during Project construction and operation. (Impact PSU-8)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction of present and future residential development projects near the proposed Project would generate waste.	Not expected to produce a combined effect that would generate waste and exceed the capacity of active disposal sites.	Class III (All Alts)
Conflict with or be unable to adhere to federal, State, and/or local laws, regulations, or standards relating to solid waste (Criterion PSU6)	The amount of waste material recycled during construction activities would not adhere to State standards (Impact PSU-9)	The violation of State standards regarding solid waste by past actions does not have a persistent influence.	Present and reasonably foreseeable projects, including multiple large-scale residential projects, must comply with solid waste standards and regulations.	The proposed Project would comply with standards and regulations relating to solid waste. As such, the proposed Project would not contribute to the cumulative impact and would not be cumulatively considerable.	Not Cumulatively Considerable (All Alts)
Socioeconomics					
Private property values	Project implementation would decrease existing private property values. (Impact S-1)	Past projects related to urban development have contributed to both increased and decreased private property values, depending upon location-specific factors.	Present and future urban development projects, including utility infrastructure, could affect private property value.	The Project area is experiencing rapid rates of growth and residential development. This growth trend indicates that the Project area is consistently becoming a more desirable place to site homes and businesses, which typically leads to an increase in property values. However, regardless of any potential increase in private property values, the proposed Project would have the potential to adversely affect property values.	Not Significant (All Alts)
Revenue decrease for agricultural landowners	Construction activities would cause a temporary decrease in revenues for agricultural landowners. (Impact S-2)	Past urban development has created opportunities for local business revenue, but has also removed agricultural lands from development, thereby decreasing revenue for landowners.	Present and future urban development and expanding residential developments are expected to continue encroaching upon agricultural areas in the North Region.	The proposed Project may result in temporarily decreased agricultural revenues during construction; this impact could combine with similar effects of other projects if such projects were to occur at the same time and in the same vicinity. The proposed Project is not expected to permanently remove agricultural areas, including farmland, from continuation of present usage.	Not Cumulatively Considerable (All Alts)
Public agency revenue	Operational activities would benefit public agency revenue. (Impact S-3)	Public revenue generally fluctuates with population growth.	As population growth continues, public revenue should also increase.	The Project's incremental contribution to the overall revenue impacts due to combined operation of projects in the Project area would likely result in beneficial revenue impacts to public agencies through property taxes, sales taxes, and other forms of public revenue.	Not Cumulatively Considerable (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
Traffic and Transportation					
Closure of roads or reduction of travel lanes (Criterion TRA1)	Closure of roads to through traffic or reduction of travel lanes would result in substantial congestion (Impact T-1)	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development projects will necessitate temporary lane closures throughout the Project area.	All projects requiring work within ROWs of public streets and highways are required to obtain encroachment permits. In order for a cumulative impact to occur, lane closures from different projects would have to occur at the same time and on the same road or a connecting road within close proximity (up to two miles) to the lane closure from the proposed Project. Past projects in the Project area would not combine with impacts of the proposed Project because construction of those projects is complete and lane closures associated with such construction would no longer be necessary. Therefore, it is considered unlikely that this impact of the proposed Project would combine with similar impacts of other projects to result in a cumulatively significant impact.	Class III (All Alts)
Unacceptable level of service reduction to vicinity roads (Criterion TRA2)	Construction traffic would result in congestion on area roadways (Impact T-2)	Residential development that increases local population also contributes traffic trips on area roadways which contribute to congestion.	Ongoing and future development will continue to contribute additional vehicle traffic to roadways which will result in increased congestion.	Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by minimizing the amount of construction traffic on area roadways.	Class III (All Alts)
Restricted access to properties (Criterion TRA3)	Underground construction activities would temporarily restrict access to properties. (Impact T-11) [Alt 7 Only]	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development will continue to contribute additional potential restrictions to access properties,	If other projects required the use of the same public ROW at the same time as the proposed Project, the regulatory agency responsible for issuing the encroachment permit would ensure that work within a public road would not occur simultaneously with the proposed Project to avoid significant cumulative impacts.	Class III (Alt 7 Only)
Restrict the movements of emergency vehicles (Criterion TRA4)	Construction activities could temporarily interfere with emergency response (Impact T-3)	Residential development that increases local population also contributes traffic trips on area roadways which also contribute to congestion that could result in delayed emergency response.	Ongoing and future development will continue to result in increased congestion on area roadways which could delay emergency response.	Mitigation Measures effectively reduce the proposed Project's contribution to a cumulative impact by requiring construction activity to be coordinated in advance with emergency service providers to avoid restricting movements of emergency vehicles.	Class III (All Alts)
Disruption to transit service (Criterion TRA5)	Construction activities could temporarily disrupt transit routes (Impact T-4)	Residential development that increases local population also contributes traffic trips on area roadways which also contribute to	Ongoing and future development will continue to result in increased congestion on area roadways which could result in delays for	Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by requiring construction activity to be coordinated in advance with school districts and	Class III (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives					
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	Cumulative Significance per Alternative
		congestion that could result in delays for transit providers.	transit providers.	transit providers. Additionally, lane closures associated with the proposed Project would be of very short duration.	
Disruption to rail traffic (Criterion TRA6)	Construction activities would cause a temporary disruption to rail traffic or operations (Impact T-5)	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development projects will occasionally necessitate temporary disruption to rail traffic.	Compliance with railroad permit requirements would ensure that proposed Project construction activities would not disrupt rail traffic. Other projects would be required to obtain similar permits, thus railroad companies would be able to regulate the timing of potential disruptions and cumulative impacts would not occur.	No Impact (All Alts)
Impediment of pedestrian movements or bike paths (Criterion TRA7)	Construction activities could temporarily interfere with the use of pedestrian/bicycle paths (Impact T-6)	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development projects will necessitate temporary closure of bicycle and pedestrian routes throughout the Project area.	Implementation of Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by requiring establishment of alternative pedestrian and bicycle routes around the proposed Project construction zone for safe passage as well as temporary detours for trail users.	Class III (All Alts)
Reduction in the supply of parking spaces (Criterion TRA8)	Construction would result in localized shortages of public parking along the Project ROW (Impact T-7)	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development projects will necessitate temporary reductions in parking supply. Additionally, population increases from new residential developments will also place additional demand on public parking throughout the Project area.	This impact would occur in residential areas during daytime hours when street parking is most ample. Therefore, it is unlikely that other projects with the potential to eliminate substantial numbers of public parking spaces would be located in close proximity of the proposed Project.	No Impact (All Alts)
Construction would be inconsistent with transportation plans (Criterion TRA9)	Construction would conflict with planned transportation projects (Impact T-8)	Construction activities are temporary and therefore past actions do not have persistent influence.	Ongoing and future development projects that would place structures near roadway ROW will continue to have the potential to conflict with future transportation projects.	The proposed Project would be required to obtain an encroachment permit or other such agreement from the applicable jurisdictional agency and would therefore not conflict with planned transportation projects.	No Impact (All Alts)
Noticeable deterioration of road surfaces (Criterion TRA10)	Construction vehicles and equipment could damage road ROWs (Impact T-9)	Traffic from past construction projects, if not mitigated, as well as increased traffic from residential development and heavy rains and melting snow (at high elevation) contribute to deterioration of road surfaces.	Roadway surfaces will experience deterioration from ongoing and future construction traffic as well as from future permanent residents as the local population continues to increase.	Deterioration caused by Project construction traffic would be repaired and would not have the potential to combine with deterioration or damage from other projects.	No Impact (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
Adverse effects to aviation activities (Criterion TRA11)	Project transmission structures could present an aviation hazard (Impact T-10)	Past projects that result in construction of tall structures such as transmission towers, radio towers, and high rise buildings contribute to adverse effects to aviation.	Ongoing and future projects that place structures within military flight zones or structures in excess of 200 feet will have the potential to conflict with or obstruct aviation traffic.	Final design of all projects with structures greater than 200 feet in height would have to comply with FAA guidelines. Projects located within military flight pathways would be required to submit the project application to the appropriate US Military Branch for review to ensure conflicts would not occur. Compliance with these procedures would ensure that potential impacts from multiple projects would not combine.	Class III (All Alts)
Visual Resources					
Substantial adverse effects on the existing landscape character and visual quality of the site and its surroundings (Criterion VIS1)	Temporary visibility of construction activities and equipment involved with the Project would alter the landscape character and visual quality of landscape views. (Impact V-1)	All construction impacts are temporary in nature and therefore past actions do not have persistent influence.	Present and future construction-related impacts would combine if they occur at the same time and in the same vicinity.	Ongoing development throughout the cumulative effects area for visual resources would be readily visible throughout the Project area, and would be cumulatively adverse and significant.	Class I (All Alts)
	For a landscape that currently has no transmission lines, introduction of a new transmission line in a new ROW would adversely affect landscape character and visual quality (Impact V-2)	Introduction of a new transmission line into a landscape that currently has no transmission lines would result in a persistent influence, as the life expectancy of a transmission line may be as much as 50 years.	In Segment 10, it is reasonably foreseeable that new wind farms will be constructed and operated in the Tehachapi Wind Resource Area. The introduction of a new transmission line plus new wind turbine generators is a significant, unavoidable visual impact. In Segment 4 along 110 th Street West, introduction of a new transmission line parallel to a County designated scenic highway would impact visual resources	New transmission infrastructure in areas that currently do not have such industrial facilities would adversely affect natural-appearing landscape character and visual quality. Also, one new transmission line may encourage development of other transmission lines or cross-country infrastructure in a parallel corridor. Development of additional transmission lines along Segment 10, Segment 4, or Segment 8A in Rose Hills Memorial Park would increase potential cumulative visual effects.	Class I (All Alts)
	For a landscape with an existing transmission line, increased structure size and new materials would result in adverse visual effects (Impact V-3)	Combined with the adverse visual effects of existing transmission lines in Segments 4 through 8 and Segment 11, introduction of newer, taller transmission line structures would create a persistent adverse visual effect.	With increased population in the North and South Areas, it is reasonably foreseeable that additional new transmission lines will be needed in the future. Existing 220-kV single-circuit transmission lines can be expected to be reconstructed to 500-kV single- or double-circuit capacities.	Increased structure size and new materials of these future transmission lines would result in similar adverse visual effects.	Class I (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
	Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would adversely affect landscape character and visual quality (Impact V-4)	Existing SCE access roads, spur roads, splicing/ pulling locations have created visual scars in the landscape and have disrupted natural vegetative patterns, especially in the Center Area (Angeles National Forest). Some revegetation has naturally occurred in some of these areas.	With increased population in the North and South Areas, it is reasonably foreseeable that additional new transmission lines will be needed in the future, which in turn, will necessitate additional vegetative clearing and/or earthwork. Existing 220-kV single circuit transmission lines can be expected to be reconstructed to 500-kV single or double circuit capacities in the future.	With construction of these new transmission lines, it is reasonably foreseeable that additional vegetative clearing would occur; further affecting and potentially reducing landscape character and visual quality.	Class I (All Alts)
Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. (Criterion VIS2)	New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glare in certain lighting conditions (Impact V-5)	Existing transmission line conductors reflect sunlight and produce glare in certain lighting conditions and from certain viewing angles, especially when viewed from above, such as in the Center Area.	With increased population in the North and South Areas, it is reasonably foreseeable that additional new transmission lines will be needed in the future. Existing 220-kV single circuit transmission lines can be expected to be reconstructed to 500-kV single or double circuit capacities in the future. Construction of additional transmission lines using the same technology that is currently producing glare off conductors would create adverse visual impacts.	New materials used in construction of existing and future projects (including the proposed Project) within the Project area viewshed have created and have the potential to produce, respectively, daytime glare and new sources of nighttime light and glare leading to cumulatively adverse and significant visual impacts.	Class I (All Alts)
Damage scenic resources within a scenic highway viewshed or a national scenic trail viewshed (including, but not limited to, trees, rock outcroppings, and historic buildings. (Criterion VIS3)	The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or scenic trail viewshed (Impact V-6)	Existing transmission lines in the Center Area (ANF) for Segments 6 and 11 and in the South Area for Segment 8 have already created a persistent adverse visual effect on scenic highway and scenic trail viewsheds.	Existing 220-kV single circuit transmission lines can be expected to be reconstructed to 500-kV single or double circuit capacities in the future, due to increased population in the North and South Areas.	Combined with the adverse visual effects of existing transmission lines, introduction of newer, taller transmission line structures in Segments 6 and 11 in the Center Area (ANF) and in Segment 8 in the South Area would create a persistent adverse visual effect on scenic highway and scenic trail viewsheds.	Class I (All Alts)
	The Project would conflict with established visual resource management plans or landscape conservation plans. (Impact V-7)	Existing transmission lines in the Center Area (ANF) for Segments 6 and 11 and in the South Area for portions of Segment 8 in the Puente Hills have already created	Existing 220-kV single circuit transmission lines can be expected to be reconstructed to 500-kV single or double circuit capacities in the future, due to increased	Future projects, including the proposed Project, that would upgrade the size of transmission lines or maintain/improve access and spur roads would add to cumulative visual effects resulting in cumulative significant impacts that would be in conflict with	Class I (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
		persistent adverse visual effects that are in conflict with established visual resource management plans or landscape conservation plans.	population in the North and South Areas.	established visual resource management plans or landscape conservation plans.	
Wilderness and Recreation					
Directly or indirectly disrupt or preclude activities in established federal, State, or local recreation areas or wilderness areas. (Criterion REC1)	Construction activities would restrict access to or disrupt activities within established recreational areas. (Impact R-1)	Past development activities have resulted in open space areas being consistently converted to other land uses, as needed to accommodate the increasing population putting strains on the capacity of the recreational resources.	Present and future urban development in the Project Area will likely be sited on former open space or agricultural areas, thereby resulting in less open space available for developed and dispersed recreational purposes.	Due to the likely potential for this impact to affect the same recreational resource(s) at the same time, Impact R-1 would be cumulatively significant and unavoidable.	Class I (All Alts)
	Operation and maintenance activities would restrict access to or disrupt activities within established recreational areas. (Impact R-2)	Impacts of operational activities are lasting in nature because they will occur repeatedly and regularly for the lifetime of the Project. However, past urbanization of the North and South Regions has resulted in the widespread conversion of open space.	Urbanization and residential developments are expected to continue expanding in the Project Area; related encroachment on recreational resources and opportunities is also expected to continue into the future.	Although the operation of other projects could preclude certain recreational areas from use, ongoing development and planned urban expansion in the North and South Regions include new recreational areas and resources to accommodate growing population. Project operational activities in the ANF would not be cumulatively considerable regarding the preclusion of recreational or wilderness areas.	Class III (All Alts)
Substantially contribute to the long-term loss or degradation of the factors that contribute to the value of federal, State, local, or private recreational facilities or wilderness areas (Criterion REC2)	Project activities (construction or operation and maintenance) would cause or contribute to the degradation of one or more of the four primary characteristics of a designated Wilderness Area (Impact R-3)	Following the designation of a Wilderness Area by Congress, the area is protected by federal law from activities that would degrade its primary WA characteristics; however, activities surrounding the WA may affect characteristics of the area with persistent influence.	Due to the unique and sensitive nature of designated WAs as natural preserved space and Dispersed Recreation, any project that would include development or infrastructure placement in close proximity to the WA boundaries would have the potential to combine with the proposed Project.	The proposed Project would contribute to degradation of the San Gabriel WA's characteristic of "solitude and unconfined recreation"; due to the sensitivity and uniqueness of designated WAs, any other project that would occur near that San Gabriel WA and would have the potential to degrade any of the WA's four primary characteristics would be significant.	Class I (All Alts)
	The Project would cause or contribute to degradation of the Pacific Crest National Scenic Trail (PCT). (Impact R-4)	Past projects have encroached upon the PCT in numerous areas along its route; such encroachment will continue to affect the PCT experience into the future.	Due to the unique and sensitive nature of the PCT as a recreational resource, any project that would include development or infrastructure placement in close proximity to the PCT would have the potential to combine with the proposed Project.	The proposed Project would traverse the PCT three times and as such, the contribution to the cumulative impact is substantial. Similar impacts are expected to be associated with other development projects along the PCT. Cumulative effect would be significant.	Class I (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives					
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	Cumulative Significance per Alternative
	The Project would contribute to degradation of Off-Highway Vehicle (OHV) trails or Open Riding Areas, or would result in a loss of recreational opportunity for OHV users. (Impact R-5)	The only designated OHV areas are in the ANF; past actions are not expected to contribute to long-term loss of OHV areas in the ANF.	Present and future actions would combine with the proposed Project impacts to OHV trails and opportunities if they would remove existing OHV trails or Open Riding Areas in the ANF from use, including through the upgrade of roadways to an OML that would prevent OHV use (OML 3 or above).	It is expected that the Forest Service will continue to provide designated OHV areas in the Forest and as such, if present or future projects in the ANF require OHV roads to be upgraded, they will be returned to original condition after project construction, thereby avoiding long-term loss of degradation. Project contribution to this cumulative impact is not significant.	Class III (All Alts)
	The Project would facilitate unmanaged recreational uses that would contribute to the long-term loss or degradation of recreational opportunities. (Impact R-6)	The effects of past actions on facilitating unmanaged recreation through the installation of roads that are used by unauthorized recreationists (particularly in the Forest) will continue to influence future conditions, as the roads continue to be utilized by recreationists to access unauthorized areas (such as OHV use in areas not designated for OHVs).	Present and future actions that would result in road improvements within the ANF would have the potential to combine with impacts of the proposed Project with regards to the facilitation of unmanaged recreation.	The proposed Project would require that existing access roads be improved and new roads be constructed to provide access for construction and maintenance vehicles to all transmission towers associated with the Project. Road improvements within the ANF could lead to unmanaged recreation and would have a substantial influence on the potential cumulative impact due to the fact that unmanaged recreation is a recognized threat to the integrity of designated Inventoried Roadless Areas and Wilderness Areas, which are considered to be particularly sensitive.	Class I (All Alts)
Wildfire Prevention and Suppression					
Adverse effects on fire prevention and suppression activities (Criterion FIRE1)	Construction and/or maintenance activities would reduce the effectiveness of firefighting (Impact F-1)	All construction and maintenance impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction and maintenance of present and future development projects near the proposed Project could reduce the effectiveness of firefighting.	Could produce a combined effect that would reduce the effectiveness of firefighting. The contribution of the proposed Project to this impact would not be cumulatively considerable.	Class III (All Alts)
	The presence of new or higher overhead transmission line would reduce the effectiveness of firefighting (Impact F-2)	Previous construction of transmission lines on the site presently serve as barriers to firefighting operations and have persistent influence.	Operation of present and future transmission line projects near the proposed Project could reduce the effectiveness of firefighting.	Could produce a combined effect that would reduce the effectiveness of firefighting. The contribution of the proposed Project to this impact would be cumulatively significant and unavoidable.	Class I (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives

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	Cumulative Significance per Alternative
Exposure of communities, firefighters, and/or natural resources to an increased risk of wildfire (Criterion FIRE2)	Construction and/or maintenance activities would increase the risk of wildfire (Impact F-3)	All construction and maintenance impacts are temporary in nature and therefore past actions do not have persistent influence.	Construction and maintenance of present and future development projects near the proposed Project could increase the risk of wildfire.	Could produce a combined effect that would increase the risk of wildfire. The contribution of the proposed Project to this impact would be cumulatively significant and unavoidable.	Class I (All Alts)
	Construction and/or maintenance activities would increase the risk of personnel injury or death in the event of fire. (Impact F-4)	Previous construction of transmission lines on the site presently create an ongoing source of potential wildfire ignitions and have persistent influence.	Operation of present and future transmission line projects near the proposed Project could continue to create ongoing sources of potential wildfire ignitions.	The contribution of the proposed Project would not combine with other past, present, nor reasonably foreseeable projects to result in a cumulative impact to personnel. Therefore this impact would not be cumulatively significant.	No Impact
Increased ignition potential and rate of fire spread (Criterion FIRE3)	Presence of the overhead transmission line would increase the risk of wildfire. (Impact F-5)	Previous construction of transmission lines sources of potential wildfire ignitions.	Operation of present and future transmission line projects near the proposed Project could increase the risk of wildfire.	The incremental effects of the proposed Project on non-native species introduction that adversely affect wildfire behavior are considered cumulatively considerable. This impact would be cumulatively significant and unavoidable	Class I (All Alts)
	Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread. (Impact F-6)	Previous project activities at the site likely introduced non-native plants, which contributed to an increased ignition potential and rate of fire spread. Additional activities, such as human travel on roadways and recreational hiking in wildland areas, could have transported non-native plant seeds in soils compacted in tire treads and on the soles of hiking boots.	Operation of present and future transmission line projects near the proposed Project could continue to introduce non-native plants, contributing to an increased ignition potential and rate of fire spread.	The incremental effects of the proposed Project on non-native species introduction that adversely affect wildfire behavior are considered cumulatively considerable. This impact would be cumulatively significant and unavoidable	Class I (All Alts)
Electrical Interference and Hazards					
Harmful interference with radio/television/communications/electronic equipment (Criterion EI1)	The Project would cause radio, television, communications, or electronic equipment interference (Impact EI1-1)	Immediately along existing corridors there is a potential for electronic interference.	Construction of present and future development projects at or near the proposed Project would be expected to have the potential for electronic interference.	Could produce a combined effect that would result in the potential for electronic interference. However, this impact is mitigable under the proposed Project. The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact (All Alts)
Induced currents or shock hazards to the public (Criterion EI2)	The Project would cause induced currents and shock hazards in joint use corridors (Impact EI2-2)	Immediately along existing corridors there is a potential for induced currents and shock hazards.	Construction of present and future development projects at or near the proposed Project would be expected to have the potential for induced currents and shock hazards.	Could produce a combined effect that would result in the potential for induced currents and shock hazards. However, this impact is mitigable under the proposed Project. The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact (All Alts)

Table 4. Cumulative Effects Matrix of Proposed Project and Alternatives					
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	Cumulative Significance per Alternative
Interference with cardiac pacemakers (Criterion EIH3)	Project operation would result in electric fields that would affect cardiac pacemakers (Impact EIH-3)	Immediately along existing corridors there is a potential for interference with cardiac pacemakers.	Construction of present and future development projects at or near the proposed Project would be expected to have the potential for interference with cardiac pacemakers.	Could produce a combined effect that would result in the potential for interference with cardiac pacemakers. However, this impact would be of short duration and is not considered significant or harmful. The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact (All Alts)
Introduction of hazards related to wind or earthquakes (Criterion EIH4)	Project structures would be affected by wind and earthquakes. The risk that high winds or an earthquake would cause transmission line structures to threaten public safety is not significant (Impact EIH-4)	Immediately along existing corridors there is a potential for structural hazards related to wind or earthquakes.	Construction of present and future development projects at or near the proposed Project would be expected to have the potential for structural hazards related to wind or earthquakes.	Could produce a combined effect that would result in the potential for structural hazards related to wind or earthquakes. However, the proposed Project would be constructed on steel lattice towers or tubular steel poles, where failure as a result of extreme wind conditions would be highly unlikely. Overhead transmission lines are designed for dynamic loading under variable wind conditions that generally exceed earthquake loads. The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact (All Alts)

7.1 Study Area

A study area was established using the Kern County zoning ordinance, the locations of existing transmission systems and wind farms, the California Energy Commission annual wind power density map, land uses and flight restriction zones in the area, areas of biological sensitivity, and assistance from Kern County. The TWRA study boundary encompasses an area that can potentially provide 4,500 MW of wind generation. Included in this boundary are existing wind farm locations, the proposed PdV Wind Energy Project, and the first phase of the proposed Alta-Oak Creek Mojave Project. The regional location is shown on Figure 16.

The TWRA study area is divided into a northern area and a southern area. The northern area is expected to be served by the Los Angeles Department of Water and Power transmission system. However, the possibility exists for the area to require future SCE service. The southern area would likely be served by the Windhub and Whirlwind substations of the SCE transmission system.

The total acreage of the TWRA is 232,198 acres, with the northern area encompassing 50,437 total acres, and the southern area encompassing 181,761 acres. The combined total acreage of the areas within the TWRA that cannot be developed on is 27,037, or 133 acres for the northern area and 26,904 acres for the southern area. Given that the proposed PdV Wind Energy Project and the proposed Alta-Oak Creek Mojave Project (both located in the southern area of the TWRA) have a combined wind capacity of approximately 1,100 MW, an additional 3,400 MW of wind capacity would need to be developed within the study area for the TWRA to reach its full wind potential. The total land within the TWRA available for wind development is 205,161 acres or 88.35 percent. In the southern area, this is 154,857 acres or 66.69 percent, and in the northern area, this is 50,304 acres or 21.66 percent. In order to develop an additional 3,400 MW of wind capacity, approximately 17,000 to 57,800 acres of land would be required. The southern area of the TWRA alone should be able to accommodate this required acreage.

7.2 Programmatic Analysis

A programmatic analysis, based on reasoned assumptions that constitute a scenario of future activities developed for future buildout, was conducted for wind development within the TWRA boundary, using the Kern County Significance Criteria, the Kern County General Plan, and information from existing and proposed wind farms in the area. Analyses were performed on 16 environmental issue areas that are described below. The proposed Alta-Oak Creek Mojave Project was included in this programmatic analysis, however, the mitigation measures are only meant as a guide for the proposed project; Final mitigation measures will be developed by Kern County during a project specific analysis to be completed at a later date. For a detailed discussion on each issue area and the full text of mitigation measures of the TWRA programmatic analysis, please refer to Chapter 6 of the Draft EIR/EIS.

Aesthetics. No officially designated scenic vistas were found to be located within the TWRA viewshed, but several unofficial public viewing areas exist, such as roadways and other publicly accessible locations. The natural condition of the potential wind development area would be converted by potential projects to a commercial-scale wind farm consisting of wind turbines approximately 400 feet tall. The existing visual character of the area would be altered and no feasible mitigation measures could be implemented to preserve the natural condition of potential project sites.

The California Scenic Highway System designates State Route (SR) 58 as an “Eligible” scenic highway, but it is not officially designated at this time.

For each future wind facility, the wind turbines, operations and maintenance facilities, project substation, overhead electrical transmission lines that would interconnect a potential project substation to a transmission line, and switching station and maintenance facilities located at the transmission interconnection point have the potential to create significant visual impacts. Also, the clearing and grading required for proposed project access/maintenance roads and level pads for proposed project facilities could be visually apparent due to the removal of vegetation and the creation of cut and fill slopes. No feasible mitigation measures can be implemented to preserve the existing visual character of the potential wind facility sites and impacts would be significant and unavoidable.

Continuous lighting atop the wind turbines and security lighting for office and maintenance buildings would change the night sky view. This impact would substantially change the aesthetic character of the rural area and is considered significant and avoidable after mitigation.

Agricultural Resources. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance exists within the TWRA. The TWRA does include 34,368 acres of lands that are subject to Williamson Act contracts, some of which would be permanently affected in the event wind farms are developed. Appropriate mitigation measures can reduce impacts to less than significant. In addition, the potential for development of the TWRA to result in the cancellation of an open-space contract, Williamson Act contract, or farmland security zone is considered to be a less than significant impact.

Given the height and dispersed nature of most wind turbines, existing agricultural uses can continue in conjunction with wind energy generation. At the end of the various projects lifespan, infrastructure would be removed and the land disturbed by the projects would be restored to agricultural use. Less than significant impacts to conversion of farmland are expected to occur.

Air Quality. During construction, future wind development projects would exceed the significance thresholds for emissions established in the Kern County Air Pollution Control District (KCAPCD) guidelines for implementing CEQA. Implementation of mitigation measures in conformance with applicable air quality plans would not obstruct implementation of the attainment plan. Project operation of future wind development would not result in significant emissions and, therefore, would not conflict with applicable air quality plans.

Construction of the wind development projects would result in emissions of the air pollutants CO, ROGs, NOX, sulfur oxides, PM10, and PM2.5 from fuel combustion and exhaust from construction equipment and vehicle traffic, grading, and use of toxic materials (e.g., paints and lubricants). However, emissions during project operations would not exceed KCAPCD thresholds. Even with mitigation, temporary emissions during construction would remain significant.

Odor emissions from wind development project construction and operation would be limited to odors associated with vehicle and engine exhaust and fueling, and are not expected to result in significant impacts to air quality. Additionally, construction workers may be exposed to criteria pollutants, which could result in adverse health effects, and mitigation would be required to reduce impacts to less than significant.

Biological Resources. Within the TWRA, twenty-eight special-status species have moderate to high potential to occur, and other species could occur as well. Impacts to special-status plant species and their habitats could occur through the removal of vegetation and grading for turbine pads, substations, transmission and meteorological towers, access roads, etc. Additionally, fugitive dust generated during construction activities can settle on nearby vegetation. Increased levels of dust on plants can significantly

impact photosynthetic capabilities and degrade the overall vegetation community. Likewise, impacts may occur to jurisdictional waters during grading and vegetation removal (which could cause erosion, sedimentation, and/or degradation of water quality). Without detailed surveys and project-specific siting information it is unknown how future projects developed in the TWRA would impact sensitive plants and their habitats, and therefore these impacts would remain significant and unavoidable. Due to the extremely long time frame required for establishment of many sensitive desert plant communities, temporary impacts in many cases would be considered permanent if restoration goals cannot be achieved within a reasonable time frame (for example, five years).

Construction may also result in the temporary degradation of the value of adjacent native habitat areas due to noise, increased human presence, erosion, and vehicle traffic. The extent of concurrent development is unknown at this time, and if several adjacent wind developments are under construction at the same time, impacts to wildlife in the area could be substantial. In addition, construction activities would disturb vegetation and have the potential to impact nesting birds during the breeding season (March through August). Ground-nesting birds could also be impacted by foot or vehicle/equipment traffic. Appropriate mitigation measures can reduce impacts to less than significant.

The Mojave ground squirrel (MGS) has been identified in the southern portions of the TWRA during surveys for other projects. Since no protocol surveys for MGS were completed for the TWRA, all potential MGS habitat is assumed to be occupied by the MGS. With the lack of definitive survey data, the project construction must be assumed to have a substantial impact on this species. Take of this State-listed species or loss of habitat would constitute a significant impact. Because site-specific project details are unknown at this time, impacts to the Mojave ground squirrel are considered significant and unavoidable.

Previous surveys for projects in the southern portion of the TWRA also detected potential abandoned desert tortoise burrows. Furthermore, the presence of transmission towers associated with development of the TWRA may draw ravens to the area by providing perching and nesting sites, which would increase raven density and lead to increased predation pressure on juvenile desert tortoises. Because desert tortoises have a moderate potential to occur, and the majority of the TWRA is located west of the known populations of desert tortoise, mitigation measures can reduce impacts to less than significant.

Suitable nesting habitat may occur within the TWRA for the California condor. Suitable foraging habitat is widespread throughout the TWRA, and although condors are not known to regularly use any particular site within the TWRA, they are expected to occur broadly over the area during foraging trips. The greatest concern to condors in the TWRA is the potential to collide with power lines and wind turbines. Implementation of mitigation measures would reduce impacts to this species, but not to a level of less than significant because any loss of the California condor would be significant.

Transmission lines would be constructed as part of the wind developments that would be built in the TWRA. Raptors and other large aerial perching birds are susceptible to electrocution, which occurs only when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these elements. Raptor species that utilize the towers for nesting could be electrocuted while landing. Furthermore, nests may be built in areas that are susceptible to electrical charges that may result in fire as well as an electrical outage. It is unknown what bird species may collide with the transmission structures and lines that would be constructed as part of wind developments in the TWRA, and therefore it is assumed that some migrating species could be federal or

State listed or of other special status, and their mortality would be a significant impact that is not mitigable to less-than-significant levels.

Operation of the wind component is expected to result in mortality of birds and bats due to collision with wind turbines. The TWRA lies within the Pacific Flyway, one of four major avian migratory pathways in North America. Many species, particularly passerines, are expected to move through the TWRA during spring and winter migrations. Wind turbines are expected to pose a particular threat to migratory birds that fly at night or under conditions of low visibility. Studies show that bat mortality from collision with wind turbines is highest during the late summer and fall migration season. Avian and bat mortality would be significant and not mitigable to less-than-significant levels.

Buildout of the TWRA would likely result in impacts to oak trees. It is unknown the extent or location of activities that could impact oak trees at this point, and environmental analysis conducted for each future wind project would have to quantify impacts to oak trees. Appropriate mitigation measures can reduce impacts to less than significant.

Cultural Resources. Properties important to Native American communities and other ethnic groups, including tangible properties possessing intangible traditional cultural values, may be present within the TWRA. Appropriate mitigation measures can reduce impacts to less than significant.

Cultural resources are most likely to be impacted by construction of tower/turbine foundations, access roads, and connections to substations. Since the specific impact areas of the proposed projects have not been finalized, and other requirements are unknown at present, project-specific background research and field studies were not performed for this programmatic analysis. Such studies must be undertaken in subsequent and project EIRs/EISs to identify project-specific direct and indirect impacts and develop appropriate mitigation measures.

The TWRA contains a high surface area of exposed rock types possessing a medium to high sensitivity for the possibility of fossils, primarily in the southeast section and within the Tehachapi Valley. Unfortunately many of the recorded fossil sites within the project vicinity were discovered and subsequently published in the early half of the 1900s with uncertainties as to their exact location and present day conditions. Appropriate mitigation measures can reduce impacts to less than significant. Additionally, cultural resources within the TWRA could contain historic or prehistoric period interments. Potential project impacts on human remains are conservatively assumed to be significant and unavoidable.

Geology and Soils. Wind energy related facilities within the TWRA would be subject to hazards of surface fault rupture at crossings of active traces of the Garlock fault and other local faults, and would not be subject to the regulations and guidelines related to the Alquist-Priolo Special Studies Zones Act as long as any occupied structures are not constructed in the Earthquake Fault Zones identified within the TWRA. It is likely that the proposed projects within the TWRA would be subjected to at least one moderate or larger earthquake occurring close enough to produce strong groundshaking in the TWRA. Appropriate mitigation measures can reduce impacts to less than significant.

Portions of the TWRA specifically in the Tehachapi Mountains are located along hillsides or ridgelines in geologic units of moderate to steep slopes. Potential for seismically induced landslides, liquefaction, settlement, and surface cracking exists. In addition, portions of the TWRA are underlain by soils classified as having moderate to severe hazard of erosion on roads and trails. Appropriate mitigation measures can reduce impacts to less than significant.

Hazards and Hazardous Materials. Future wind projects within the TWRA would use various petrochemicals during construction and operation, resulting in potential for soil contamination from improper handling, spills, or leaks. However, future wind projects are not expected to require the use, treatment, disposal, or transport of significant quantities of hazardous materials. Should future wind projects require the use or presence of these materials, secondary hazards may result, such as fuels with a combustion source igniting and initiating a wildfire. Appropriate mitigation measures can reduce impacts to less than significant.

Additionally, buried hazardous materials could be encountered and subsequently released into the environment. The applicant of a future wind project would handle, remove, and dispose of the hazardous materials in accordance with the Hazardous Materials Business Plan and any other applicable local, state, and federal requirements. Appropriate mitigation measures can reduce impacts to less than significant.

Installation of foundations for wind tower/turbines would require excavation to significant depths. Should blasting be required for foundation installation, the potential use of explosives could ignite a fire, which is considered significant due to the moderate to high fire rating within the TWRA. Appropriate mitigation measures can reduce impacts to less than significant.

No schools are located within one-quarter mile of the TWRA. Because the development of the TWRA would occur over the course of several years, it is possible that schools could be built within the TWRA during this time period. Appropriate mitigation measures can reduce impacts to less than significant.

According to the Department of Toxic Substances Control's Hazardous Waste and Substances site "Cortese" List, no hazardous waste facilities subject to corrective action are located within the TWRA. Future wind development is not anticipated to be located on sites which are included on a list of hazardous materials sites or create a significant hazard to the public or the environment.

Several airports lie within close proximity to the TWRA and the TWRA is also located within an area with height restrictions of 400 feet, implemented to protect military operations. Appropriate mitigation measures would minimize the potential for future wind projects to interfere with military flight operations or air navigation in the project area.

The development of future wind projects within the TWRA would not alter any emergency access routes that currently exist or modify existing patterns of emergency access. It also would not inhibit access of emergency vehicles by requiring the closure of public roads. A significant increase in future wind project-related traffic is not anticipated and therefore would not affect the existing level of service (LOS) on roads, which could indirectly affect emergency access.

Danger of fire will increase during future wind project construction due to the use of heated mufflers, explosives, and possible disposal of cigarettes. Lightning strikes on wind turbines and fire sparks from the wind turbine generators during operation could result in a fire as well. Appropriate mitigation measures can reduce impacts to less than significant.

The Kern Mosquito and Vector Control District performs vector control, but no established vector control district exists in the area of Kern County where the TWRA is located. Future wind projects within the TWRA are not expected to result in long periods of standing water, trash piles or open containers that could provide breeding areas for mosquitoes or flies.

The potential for rotor and tower failure in wind turbines exists, which could affect project personnel of future wind projects or the public. The Wind Energy (WE) Combining District of the Kern County

Ordinance requires the design of wind projects to include required setbacks to prevent impacts to the public. Appropriate mitigation measures can reduce impacts to less than significant.

Hydrology and Water Quality. Within the TWRA, road construction for both temporary and permanent roadways has the potential to cause soil instability resulting in erosion and sedimentation, which could potentially degrade surrounding water quality. Implementation of Best Management Practices (BMP) and appropriate mitigation measures can reduce impacts to less than significant.

Projects associated with development of the TWRA would result in an impact to groundwater supplies and recharge if associated construction, maintenance, or decommissioning activities would require a substantial supply of local groundwater resources or would obstruct existing groundwater recharge rates, for instance through the creation of substantial new impermeable areas. Water used during construction or operation of wind development projects would be trucked in from off-site (outside the TWRA) or obtained from local groundwater wells or surface water bodies near the construction site. Any use of local groundwater or surface water supplies would be in full compliance with requirements of the Lahontan RWQCB and is therefore not expected to result in depletion of local water supplies. Furthermore, due to the nature of wind farms and the type of infrastructure involved, and considering that development of the TWRA is expected to occur over a long period of time, any required amount of water would be minimal and would not result in the long-term depletion of groundwater supplies.

Encroachment of a turbine tower or other wind development infrastructure into a stream channel or floodplain, including FEMA-designated Flood Hazard Areas, 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. Implementation of BMPs and appropriate mitigation measures can reduce impacts to less than significant.

There are no major levees or dams within the TWRA, and the types of projects associated with development of the TWRA would not have the potential to cause the failure of a levee or dam. It is not located within a dam inundation area or within the inundation area for any other natural body of water and would therefore not be subject to seiche hazards. The TWRA is also not situated near the coast and would therefore not be subject to any tsunami hazards. Some areas of the TWRA may be conducive to mudflow events, particularly on steep slopes with unstable soils in the more mountainous terrain of the northern TWRA. At this time, it is not known exactly how development of the TWRA would be distributed through the region, or exactly where wind turbine towers and other infrastructure would be located within the TWRA and therefore, it is assumed that some infrastructure associated with wind development in the TWRA could be subject to inundation by mudflow. Implementation of BMPs and appropriate mitigation measures can reduce impacts to less than significant.

Land Use. The TWRA is located in an area with existing wind farms. There are very limited residential uses and mostly in the southern portion of the TWRA and therefore a lack of an established community. Additionally, wind development would be in-line with existing uses in the area and no significant impacts related to physically dividing an established community would occur.

If an individual project is proposed on parcels that are not zoned to allow for the WE combining district, then an application for a zone change would need to be submitted to Kern County. The individual project application would then be subject to the approval of Kern County and CEQA review. With the implementation of mitigation measures, wind development of the TWRA is not expected to result in significant impacts related to conflicts with applicable land use plans.

The West Mojave Plan (WMP) may potentially apply to the TWRA. The desert tortoise and Mohave ground squirrel among other local sensitive species would be protected under this Plan; however, the Plan has not yet been approved and currently does not apply to non-federal lands. It is assumed that projects would be required to comply with the WMP as a condition of their approval.

Mineral Resources. The Calcite Mine, Shumaker Mine, Mojave Quarry, and the Gravel Pit are mines located within a mile of proposed wind energy projects in the TWRA. Construction and operation of the proposed wind energy projects would traverse the Mineral and Petroleum land use designation. Power transmission facilities are a permitted use by the Kern County General Plan; however, access roads and construction staging areas are not a permitted use. Appropriate mitigation measures can reduce impacts to less than significant.

Noise. The probability that wind energy development within the TWRA would violate Kern County noise standards depends upon the placement of the wind turbines and the location of the sensitive receptors. Based on assumptions derived from the analysis that was conducted for the proposed PdV Wind Energy Project, this impact would be less than significant with the incorporation of mitigation measures.

Construction activities associated with wind energy development within the TWRA would cause temporary groundborne vibration and groundborne noise. However, it is anticipated that sufficient distance between residences and wind turbine construction sites would be maintained to prevent exposure to excessive groundborne vibration and groundborne noise.

The nearest public airport/public use airport is located approximately 30 miles to the west of the TWRA and the TWRA is located outside the Kern County Airport Land Use Compatibility Plan area. Therefore, people residing or working within the TWRA would not be exposed to excessive noise levels for a project within the Kern County Airport Land Use Compatibility Plan. Likewise, there are no private airstrips located within the TWRA or within an 8-mile radius of the study area.

Population and Housing. The development of the TWRA would not create a significant number of jobs and induce substantial population growth during construction or operation of future wind projects. Since a portion of the construction work force for each future wind project is likely to come from the proposed wind project area, it would negate an increase in population from individuals relocating to Kern County.

The TWRA is an undeveloped area which requires future construction workers to commute to their respective wind project sites and find housing in nearby cities, including Rosamond, Tehachapi, and Mojave. Given the existing accommodations and vacancy rates in these cities, they are expected to be able to accommodate the small increase in future wind project-related construction work force. In addition, very few scattered residences are located within the TWRA and are not expected to be displaced by future proposed wind projects.

Public Services. A Fire Safety Plan would be prepared for each project to reduce the potential for that project to start a wildfire during construction. Personnel and equipment available at nine stations of the Kern County Fire Department would be sufficient to respond to a fire at future wind project sites, should one occur.

Although potential is low, the development of future wind projects within the TWRA may attract vandals or other security risks and potentially increase traffic along State Highway 14 that would increase demand on police protection/law enforcement services in the event of an incident. More than likely, fencing the perimeter of each future wind project site would occur to be consistent with the WE Combining District requirements. This measure would minimize the need for police surveillance and response.

The potential exists for the children of temporary construction workers for each project from outside of the project area, to be placed in local schools. Each future wind project is expected to require approximately 10 to 16 permanent employees for operation and it is anticipated that these employees would be local to the project area. In the event that permanent employees relocate from another area, the Mojave, Tehachapi, and Southern Kern Unified School Districts would be able to accommodate the expected increase in the number of students. Additionally, the nearby Tehachapi Mountain Park (5,000 acres) is expected to accommodate increased use by future wind project personnel and their families.

A small number of accidents may occur during the entire construction period of each future wind project, but the small number in addition to other non-project related accidents is not expected to exceed the capacity of existing medical services. The applicant for each project would prepare and implement a Health and Safety Plan to minimize emergency incidents at the project site.

Public Utilities. Wastewater generated by construction of future wind projects would be limited to that generated by construction personnel and would be accommodated by portable toilets which would be emptied into municipal sewage systems or septic systems. Wastewater generation would not exceed wastewater treatment requirements, nor would it require the construction or expansion of wastewater treatment facilities. Additionally, stormwater runoff would not be increased such that it would require the construction or expansion of stormwater drainage facilities.

Water would be required for dust control as well as for concrete and drinking water for construction personnel, but would not require any new water treatment facilities nor would it require the acquisition or expansion of water entitlements. Solid waste generated by construction activities would be a minute fraction of the capacities of the landfills serving the TWRA and would not exceed any landfill capacities nor would it conflict with any statutes or regulations associated with solid waste.

Traffic and Transportation. The TWRA is located in a remote, rural area where the existing volume of traffic on local roadways is low. The addition of construction-related traffic from future wind projects is not anticipated to cause the existing level of service on local roadways to exceed service capacity. In addition, traffic is expected to be distributed among several roads depending on the specific location of each future wind project.

Construction equipment transport and deliveries would be scheduled to occur during the day to limit additional traffic during commuter hours. Also, occasional equipment and materials deliveries would occur, but these are not anticipated to cause a significant increase in traffic. Appropriate mitigation measures can ensure impacts are less than significant.

The Level of Service (LOS) on existing County roads is now at or above the acceptable LOS D. Future wind projects within the TWRA would cause a temporary increase in traffic during project construction and operation, but would not result in an exceedance of LOS C on County roads. Appropriate mitigation measures can ensure impacts are less than significant.

The east-southeastern boundary of the TWRA is located approximately 2.0 miles west of the north-western end of the Edwards Air Force Base. Specific areas within the TWRA are required to limit the heights of structures to 400 feet above ground elevation (Kern County Zoning Ordinance 19.08.160). Implementation of mitigation measures would limit turbine height to ensure that hazards resulting from the location of the future wind project sites within the TWRA in proximity to military aviation operations are less than significant.

Future wind projects within the TWRA would design new project access roads using standard engineering practices and design measures. Heavy construction equipment would be used on roadways which could result in damage to roads and may increase hazards for the public and future wind project personnel. Potential hazards also exist from tracking dust, soils, and other materials from graded construction sites onto public roads. Appropriate mitigation measures can ensure impacts are less than significant.

The development of future wind projects within the TWRA would not alter any emergency access routes that currently exist or modify existing patterns of emergency access. It also would not inhibit access of emergency vehicles by requiring the closure of public roads. Advance coordination with emergency service providers in order to develop alternative routes and adjust service areas and destinations as necessary to maintain emergency service coverage and response times, would mitigate this impact to less than significant.

During construction of future wind projects, a limited increase in demand for parking for construction equipment and personnel vehicles would exist. However, all parking is expected to be accommodated within the future wind project sites and is not anticipated to result in the physical displacement of existing parking.

Wilderness and Recreation. Neither the temporary increase in population due to construction personnel nor the long-term increase in population due to operational staff of future wind projects would result in a noticeable increase in use of any one park in the area. None of the currently proposed or reasonably expected wind energy projects within the TWRA involve the construction or expansion of recreational facilities.

The TWRA is roughly bisected by the Pacific Crest Trail (PCT) and construction activities related to wind turbine site preparation and transmission line construction would temporarily disrupt the use of or access to the PCT. No feasible mitigation exists that could prevent heavy equipment from operating within close proximity to the PCT. Any fences that are installed in connection with wind energy projects would also degrade the visual quality of the surrounding wilderness and could disrupt or restrict access to the PCT if not properly designed. Mitigation would reduce the severity of these impacts, but the degradation of the recreational quality of the PCT and surrounding wilderness would be significant and unavoidable.

Several nearby parks, including the Tehachapi Mountain Park, Mojave West Park, and Mojave East Park, would be impacted by development of the TWRA. Because access to parks that surround the TWRA would be maintained during construction activities, and because any increase in noise or dust levels would be small and temporary, any disruption of the use of nearby parks would be less than significant.