

This chapter includes the following other discussions and analyses required by CEQA.

- Significant and unavoidable environmental impacts.
- Growth-inducing impacts.
- Significant irreversible environmental impacts.
- Cumulative impacts.

5.1 Significant and Unavoidable Impacts

Section 21067 of CEQA and Sections 15126(b) and 15126.2(b) of the State CEQA Guidelines require that an EIR describe any significant impacts, including those that can be mitigated but not reduced to a less than significant level. Furthermore, where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should also be described. This PEIR has identified the following significant and unavoidable impacts.

- **Air Quality:** Construction emissions of ROG and NOX for program Alternatives 1 and 2 would exceed the BAAQMD thresholds after implementation of Mitigation Measures AQ-1 and AQ-2, (Table 3.3-11); accordingly, cumulative construction impacts would be significant and unavoidable. For the Golden Hills and Patterson Pass projects individually, construction emissions of NOX would exceed the BAAQMD thresholds after implementation of Mitigation Measures AQ-1 and AQ-2 (Tables 3.3-16 and 3.3-21); accordingly, cumulative construction impacts would be significant and unavoidable.
- **Biological Resources:** Operation of the either of the program alternatives, as well as the Golden Hills and Patterson Pass projects considered separately, would result in turbine-related mortality of raptors, other birds, and bats migrating through and wintering in the program area. Although mitigation can reduce these impacts, the likelihood of ongoing turbine-related mortality would constitute a significant and unavoidable impact.
- **Cumulative Traffic Impacts:** cumulative impacts on traffic operation, safety hazards, emergency access, and bicycle facilities could result from program and project construction activities if they take place concurrently with construction of the Sand Hill Repowering Project, which has been identified as resulting in a significant and unavoidable traffic impact.

5.2 Growth-Inducing Impacts

Section 21100(b)(5) of CEQA requires an EIR to discuss how a project, if implemented, may induce growth and the impacts of that induced growth (see also State CEQA Guidelines Section 15126). CEQA requires the EIR to discuss specifically “the ways in which the Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the

surrounding environment” (State CEQA Guidelines Section 15126.2[d]). The State CEQA Guidelines do not provide specific criteria for evaluating growth inducement and state that growth in any area is “necessarily beneficial, detrimental, or of little significance to the environment.” CEQA does not require separate mitigation for growth inducement as it is assumed that these impacts are already captured in the analysis of environmental impacts (see Chapter 3, *Impact Analysis*). Furthermore, the State CEQA Guidelines require that an EIR “discuss the ways” a project could be growth inducing and to “discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment.”

According to the State CEQA Guidelines, a project would have potential to induce growth if it would result in either of the following.

- Remove obstacles to population growth (e.g., through the expansion of public services into an area that does not currently receive these services), or through the provision of new access to an area, or a change in a restrictive zoning or General Plan land use designation.
- Result in economic expansion and population growth through employment opportunities and/or construction of new housing.

In general, a project could be considered growth-inducing if it directly or indirectly affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment in some other way. However, the State CEQA Guidelines do not require a prediction or speculation of where, when, and in what form such growth would occur (State CEQA Guidelines, Section 15145).

The potential growth-inducing impacts of the program and the Golden Hills and Patterson Pass projects are discussed below.

5.2.1 Remove Obstacles to Growth or Provide New Access

The program activities, including the Golden Hills and Patterson Pass projects, would include the construction of new service roads and electrical infrastructure. New service roads would be developed from existing main roads to access repower turbine sites. These roads would be privately owned and would be located within the program area boundary. The new roads would not extend outside of the program area or provide connection points for offsite development. Additionally, as repowering projects are implemented, old collection systems would be decommissioned and new collection systems would be installed. Each wind farm project would have its own electricity collection system with the exception of substations, which could be shared by multiple projects. Some equipment would be replaced while some would be removed and not replaced. The new electrical infrastructure would be located within the program area and would transfer power generated by the wind turbines to the regional electrical grid. More importantly, the new roads and electrical infrastructure would only serve an approved program of repowering, and because of growth and development controls embedded in the East County Area Plan, no additional uses (e.g., housing, industry or commercial activity) that is not already allowed in the program area would be enabled. Therefore, the program would not be expected to indirectly induce population growth through the construction of new service roads or electrical infrastructure.

For the Golden Hills and Patterson Pass projects, the potential for growth inducement would be similar to the program but of a smaller scale. Therefore, the Golden Hills and Patterson Pass projects

would not be expected to indirectly induce population growth through the construction of new service roads or electrical infrastructure.

5.2.2 Economic, Population, and Housing Growth

Typically, the growth-inducing potential of a project is considered significant if it fosters growth or a concentration of population in a different location or in excess of what is assumed in pertinent general plans or land use plans, or projections made by regional planning agencies, such as the Association of Bay Area Governments (ABAG). Section 3.12 of this PEIR, *Population and Housing*, analyzes the proposed program's overall effect on population, including growth-inducement. The proposed program does not include the construction or demolition of any housing, and so would not have a direct impact on population or housing growth. Construction of the proposed program would result in a short-term increase in construction-related job opportunities in the Alameda County region. However, construction workers can be expected to be drawn from the existing construction employment labor force. Therefore, opportunities provided by construction of the proposed program would not likely result in the relocation of construction workers to the program region. Therefore, the employment opportunities provided by construction are not anticipated to induce indirect growth in the region.

For the Golden Hills and Patterson Pass projects, the potential for growth inducement would be similar but of a smaller scale. Therefore, the employment opportunities provided by construction of the Golden Hills and Patterson Pass projects are not anticipated to induce indirect growth in the region.

5.3 Significant Irreversible Environmental Changes

State CEQA Guidelines Section 15126.2(c) requires that an EIR discuss any environmental changes that would be irreversible if a project were implemented. CEQA defines irreversible environmental changes as the irretrievable commitment of resources and/or irreversible damage resulting from environmental accidents. Irreversible changes may include current or future uses of non-renewable resources, and secondary or growth inducing impacts that commit future generations to similar uses. The State CEQA Guidelines describe three distinct categories of significant irreversible changes, including changes in land use that would commit future generations to specific uses; irreversible changes from environmental actions; and consumption of nonrenewable resources.

5.3.1 Changes in Land Use Which Would Commit Future Generations

The program area and the Golden Hills and Patterson Pass project sites, which fall within the program area, are located in eastern Alameda County. The area is currently the location of extensive wind farm development. The *East County Area Plan* designates the entire program area as Large Parcel Agriculture (LPA). According to the *East County Area Plan*, a wind farm is a permitted use with a CUP. The program and the Golden Hills and Patterson Pass projects would not commit future generations to or introduce changes in land use that would vary from the existing conditions.

5.3.2 Irreversible Changes from Environmental Actions

The program involves the construction and repowering of existing wind farms on approximately 50,000 acres in unincorporated eastern Alameda County. The commitment of nonrenewable resources, such as sand, gravel and other components of cement, metals and fossil fuels, necessary for construction and operation of the repowered wind farm would be irreversible.

5.3.3 Consumption of Nonrenewable Resources

Construction of repowered wind farms would require the consumption of nonrenewable resources, such as fuel for construction vehicles and equipment. However, such use would be limited to the short-term construction period. Operation and maintenance of the proposed program and projects would not increase the use of nonrenewable resources relative to existing conditions. The temporary, construction-related increase would not result in significant use of nonrenewable resources and would not commit future generations to similar uses. Moreover, the primary objective of the program, as well as of the Golden Hills and Patterson Pass projects, is to provide an economically viable source of clean, renewable electricity generation that meets California's growing demand for power and fulfills numerous State and national renewable energy policies. The intent is to specifically reduce consumption of non-renewable sources of energy such as coal, natural gas and other hydrocarbon-based fuels.

5.4 Cumulative Impacts

5.4.1 Approach to Impact Analysis

Legal Requirements

State CEQA Guidelines require that the cumulative impacts of a project be addressed in an EIR when the cumulative impacts are expected to be significant and when the project's incremental effect is cumulatively considerable (State CEQA Guidelines Section 15130[a]). Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (State CEQA Guidelines Section 15355[b]). Such impacts can result from individually minor but collectively significant actions taking place over time.

Section 15130 of the State CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

Methodology

According to the State CEQA Guidelines, an adequate discussion of significant cumulative impacts should contain the following discussions.

- An analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the project.

- A summary of the expected environmental effects to be produced by those projects, with specific reference to additional information stating where that information is available.
- A reasonable analysis of the cumulative impacts of the relevant projects.

An EIR must examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative impacts.

When evaluating cumulative impacts, CEQA recommends one of the following two methods.

1. Projects to consider in the cumulative analysis include any past, present, and probable future projects producing related or cumulative impacts, including projects outside the control of the lead agency (i.e., project list approach).
2. The cumulative analysis would consider projections contained in an adopted local, regional, or statewide plan, or would use a prior environmental document which has been adopted or certified for such a plan (i.e., plan approach).

Additionally, the cumulative background may differ for each resource (water-type projects for effects related to fish may differ from traffic-type projects for effects related to traffic, air, and noise). The California Supreme Court, in *Ebbetts Pass Forest Watch v. California Department of Forestry and Fire Protection* (2008) 43 Cal. 4th 936, acknowledged that the area subject to cumulative impact analysis may differ from resource to resource. Although that decision dealt with CDF's certified regulatory program, the principles set forth in it are applicable to CEQA in general (see also *Environmental Protection and Information Center v. California Department of Forestry and Fire Protection* (2008) 44 Cal. 4th 459).

This analysis is based on a combination of the plan/projections and list approaches, using the land use designations of the ECAP in combination with known other relevant projects in the APWRA area. The primary ECAP land designation in the program area is Large Parcel Agriculture, which allows low intensity agriculture and grazing, related uses and residential and residential accessory uses not more than 12,000 square feet floor area with a 100-acre minimum parcel size. The dominant land uses are wind energy generation, agriculture, and cattle grazing. The rural-residential districts on Dyer and Midway Roads are separate, small rural communities.

The spatial boundary for the study of a cumulative impact varies depending on the resource of concern. For example, impacts related to geology and archeological resources are generally site specific, while air and noise impacts can encompass larger areas. Most of the impacts are site-specific and limited in terms of geography, and do not have the ability to compound impacts from past, existing or future projects beyond the program area. In these circumstances, CEQA directs that it is not necessary to address in detail the impacts from other projects:

“[w]here a lead agency is examining a project with an incremental effect that is not ‘cumulatively considerable,’ a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable” (CEQA Guidelines, §15130, subd. [a]); and

“[a]n EIR should not discuss impacts which do not result in part from the project evaluated in the EIR” (State CEQA Guidelines Section 15130 subd. [a][1]).

5.4.2 Analysis of Cumulative Impacts

The description below presents the cumulative background used for the assessment of cumulative impacts for specific topical areas as well as an assessment of cumulative impacts and the contribution to those impacts by the program. Given the nature of a cumulative analysis, the contribution of the program would encompass the contribution of the specific projects. Where the contribution of a specific project would differ from that of the program, this is specifically described.

Aesthetics

The geographic scope considered for potential cumulative impacts on visual/aesthetic resources is the viewshed of the public and recreational users common to the program area. Within the viewshed of the program area and project sites, the Vasco Wind project, in combination with the proposed program and projects, could contribute to cumulative impacts on visual/aesthetic resources. The Vasco Wind Repowering Project is located adjacent to the northern boundary of the program area in Contra Costa County. The Vasco Winds Repowering Project extends horizontally from north of Brushy Peak Regional Preserve to approximately 1 mile west of the California aqueduct extending to Bethany Reservoir.

Repowering Program

The widely spaced distribution of the new, larger Repowering Program turbines detracts less from the natural landscape than the existing string configuration (Figures 3.1-3 to 3.1-7) and de-clutters the hillsides and ridgelines compared to the smaller turbines that are closer together and installed in higher densities. This configuration allows for views of the rolling, grassy terrain to become more cohesive and prominent and less interrupted by anthropogenic features.

The Vasco Wind Repowering Project could affect views from Vasco Road, which is a County-designated scenic route where no turbines currently exist in Alameda County. A portion of Vasco Road is located in the northwestern corner of the program area boundary (Figure 3.1-2). Therefore, the proposed program could contribute to a cumulatively considerable impact on this County-designated scenic route. However, existing Alameda and Contra Costa County policies would prevent the program from contributing to a cumulatively significant impact.

When considered with the Vasco Wind Repowering Project, the program could contribute to a cumulatively considerable impact on visual character where no turbines exist near the northern boundary of the program area. However, Alameda County Policy ECAP 105, together with Mitigation Measures AES-2a, AES-2b, AES-c, AES-3, and AES-5, would prevent the proposed program from contributing to a cumulatively considerable impact.

In addition, cumulative impacts on daytime and nighttime views resulting from light and glare would be less than significant for the proposed program through compliance with existing Alameda County policies and measures included in the program, and cumulative impacts on daytime and nighttime views for the Vasco Winds Repowering Project would be reduced to a less-than-significant level with implementation of Mitigation Measure AES-5. Therefore, construction of both projects would not result in a cumulatively considerable impact because the combined impacts of the two projects would not create a new source of light, glare, or shadow flicker experienced by residents and businesses of sufficient magnitude that day or nighttime views in the area would be substantially degraded.

Golden Hills Project

The Vasco Wind Repowering Project is within 5 miles of the Golden Hills project area. The widely spaced distribution of the new, larger turbines detracts less from the natural landscape than the existing string configuration (Figures 3.1-3 to 3.1-7) and de-clutters the hillsides and ridgelines compared to the smaller turbines that are closer together and installed in higher densities. This configuration allows for views of the rolling, grassy terrain to become more cohesive and prominent and less interrupted by anthropogenic features but could introduce large, visually obtrusive turbines within the viewsheds of scenic vistas and scenic roadways. However, Alameda County Policy ECAP 105, together with AES-2a, AES-2b, AES-2c, AES-3, and AES-5, would prevent the Golden Hills Project from contributing to a cumulatively considerable impact.

In addition, cumulative impacts to daytime and nighttime views resulting from light and glare would be less than significant for the Golden Hills Project due to existing Alameda County policies and measures included in the project, and cumulative impacts on daytime and nighttime views for the Vasco Winds Repowering Project would be reduced to a less-than-significant level with implementation of Mitigation Measure AES-5. Construction of both projects would not result in a cumulatively considerable impact because the combined impacts of the two projects would not create a new source of light, glare, or shadow flicker experienced by residents and businesses of sufficient magnitude that day or nighttime views in the area would be substantially degraded.

Patterson Pass Project

The Patterson Pass Project is approximately 6.4 miles south of the northern program area boundary, and the Vasco Wind Repowering Project is north of this northern boundary. The widely spaced distribution of the new, larger turbines detracts less from the natural landscape than the existing string configuration (Figures 3.1-3 to 3.1-7) and de-clutters the hillsides and ridgelines in contrast with the smaller turbines that are closer together and installed in higher densities. This configuration allows for views of the rolling, grassy terrain to become more cohesive and prominent and less interrupted by anthropogenic features but could introduce large, visually obtrusive turbines within the viewsheds of scenic vistas and scenic roadways. However, Alameda County Policy ECAP 105, together with AES-2a, AES-2b, AES-2c, AES-3, and AES-5, would prevent the Patterson Pass Project from contributing to a cumulatively considerable impact.

Agricultural and Forestry Resources

The program area contains 24.21 acres of Prime Farmland and 0.36 acre of Farmland of Statewide Importance. Mitigation Measure AG-1 would ensure that no Prime Farmland or Farmland of Statewide Importance is converted to nonagricultural use. Because the program would not result in any impacts on farmland or forestry resources, it would not result in or contribute to a cumulatively considerable impact.

Air Quality

The BAAQMD has identified project-level thresholds to evaluate criteria pollutant impacts (Section 3.2). In developing these thresholds, the BAAQMD considered levels at which project emissions would be cumulatively considerable. As noted in their CEQA Guidelines (2011a),

In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

The criteria pollutant thresholds presented in Section 3.2 therefore represent the maximum emissions the program may generate before contributing to a cumulative impact on regional air quality. Therefore, as noted in Section 3.3, *Air Quality*, projects that would result in an increase in ROG, NOX, PM10, or PM2.5 of more than their respective project-level daily mass thresholds indicated in Table 3.3-5 would also be considered to contribute considerably to a significant cumulative impact.

Operation of the program Alternative 1, program Alternative 2, the Golden Hills Project, and the Patterson Pass Project would not result in new permanent stationary sources of criteria pollutants, nor would operation increase criteria pollutant emissions from any existing stationary sources. No new permanent workers would be employed under any the Program alternatives or the two projects, and inspections and scheduled wind turbine maintenance would continue to occur as under existing conditions. Daily emissions of criteria pollutants associated with these activities are anticipated to be unchanged and would not be considered to result in a significant contribution to existing air quality violations.

Construction emissions of ROG and NOX for program Alternative 1 and program Alternative 2 are greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-1 and AQ-2, (Table 3.3-11), and therefore cumulative construction impacts are significant and unavoidable. For the Golden Hills Project and the Patterson Pass Project, construction emissions of NOX would be greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-1 and AQ-2, (Tables 3.3-16 and 3.3-21), and therefore cumulative construction impacts would be significant and unavoidable.

Biological Resources

Program

The analysis of cumulative impacts on biological resources was carried out at two geographic scales. Construction-related impacts, which would largely pertain to disturbance and potential loss of land cover types and the associated effects on special-status terrestrial species, were considered in the context of the northern Diablo Range. Cumulative impacts associated with avian and bat fatalities through turbine collision were considered in the context of the entire APWRA (both Alameda and Contra Costa Counties) as well as the Montezuma Hills Wind Resource Area in neighboring Solano County.

Implementation of either program alternative could result in the permanent loss of vegetation and wetlands. Compensation for the loss of vegetation and wetlands would mitigate those impacts with the goal of no net loss. It is expected that each project implemented under the program would be required to mitigate losses vegetation and wetlands, resulting in no net loss, and thereby reducing any contribution to cumulative impacts to a less-than significant level.

Implementation of the program could result in the injury, mortality, or disturbance of special-status and common wildlife species during construction, with the potential to affect local populations.

Implementation of mitigation measures identified in this PEIR would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction, and would avoid or reduce the program's contribution to cumulative effects on local populations.

The program would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would contribute to impacts of other projects that remove these habitats in the program region. However, permanent disturbance of undeveloped land would be offset by restoration of habitat when existing roads and turbine pads and foundations are restored to natural conditions. With this offset, and with implementation of mitigation measures identified in this PEIR that require restoration of temporarily affected habitat and compensation for the permanent loss of habitat, the program's contribution to cumulative impacts would be reduced to a less-than-significant level.

Avian and bat mortality associated with turbine collisions has been identified as a significant and unavoidable impact. By definition, and considered with other sources of avian mortality (e.g., the Contra Costa County portion of the APWRA and the neighboring Montezuma Hills Wind WRA), this would constitute a considerable contribution to a significant cumulative impact.

Golden Hills Project

Construction of the Golden Hills project could result in the permanent loss of vegetation and wetlands. Mitigation for these effects, implemented with the goal of no net loss, would reduce the contribution to cumulative impacts to a less-than-significant level.

Construction of the proposed project could result in the injury, mortality, or disturbance of special-status and common wildlife species during construction, with the potential to affect local populations. Implementation of mitigation measures identified in this PEIR would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction, and would avoid or reduce the project's contribution to cumulative effects on local populations.

The proposed project would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would contribute to impacts of other projects that remove these habitats in the project region. However, permanent disturbance of undeveloped land would be offset by restoration of habitat when existing roads and turbine pads and foundations are restored to natural conditions. With this offset, and with implementation of mitigation measures identified in this PEIR that require restoration of temporarily affected habitat and compensation for the permanent loss of habitats, the project's contribution to cumulative impacts would be reduced to a less-than-significant level.

Avian and bat mortality associated with turbine collisions has been identified as a significant and unavoidable impact. By definition, and considered with other sources of avian mortality (e.g., the Contra Costa County portion of the APWRA and the neighboring Montezuma Hills Wind WRA), this would constitute a considerable contribution to a significant cumulative impact.

Patterson Pass Project

Construction of the Patterson Pass Project could result in the permanent loss of vegetation and wetlands. Mitigation for these effects, implemented with the goal of no net loss, would reduce the contribution to cumulative impacts to a less-than-significant level.

Construction of the proposed project could result in the injury, mortality, or disturbance of special-status and common wildlife species during construction, with the potential to affect local populations. Implementation of mitigation measures identified in this PEIR would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction, and would avoid or reduce the project's contribution to cumulative effects on local populations.

The proposed project would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would contribute to impacts of other projects that remove these habitats in the project region. However, permanent disturbance of undeveloped land would be offset by restoration of habitat when existing roads and turbine pads and foundations are restored to natural conditions. With this offset, and with implementation of mitigation measures identified in this PEIR that require restoration of temporarily affected habitat and compensation for the permanent loss of habitats, the project's contribution to cumulative impacts would be reduced to a less-than-significant level.

Avian and bat mortality associated with turbine collisions has been identified as a significant and unavoidable impact. By definition, and considered with other sources of avian mortality (e.g., the Contra Costa County portion of the APWRA and the neighboring Montezuma Hills Wind WRA), this would constitute a considerable contribution to a significant cumulative impact.

Cultural Resources

The geographic scope of potential cumulative effects with respect to cultural resources is usually limited to areas within the physical footprint of a proposed project. With the implementation of the mitigation measures presented in this EIR, the proposed program could have a less-than-significant impact on historic resources, archaeological resources, and human remains.

Simultaneous construction of multiple repowering projects in the program area and other development and infrastructure projects in the vicinity of the program area could potentially result in significant impacts on historic resources, archaeological resources, and human remains, should they be present within the program area or the vicinity of the program area. However, implementation of mitigation measures identified in this EIR will ensure that impacts would not be such that they would result in or contribute to a cumulative impact.

Geology, Soils, Mineral Resources, and Paleontological Resources

Construction in a seismically active region puts people and structures at risk from a range of earthquake-related effects, particularly seismic ground shaking and landsliding in the project area. However, as discussed above, various mechanisms are in place to reduce seismic-related risk, including mitigation measures and project-specific geotechnical investigation and seismic design standards promulgated by the county building codes. Neither the proposed program as a whole nor the Golden Hills and Patterson Pass projects would contribute considerably to the existing cumulative impact related to seismic hazards. The geographic scope of potential cumulative effects with respect to paleontological resources is usually limited to areas within the physical footprint of a proposed project. With the implementation of the mitigation measures presented in this EIR, the proposed program could have a less-than-significant impact on paleontological.

Simultaneous construction of multiple repowering projects in the program area and other development and infrastructure projects in the vicinity of the program area could potentially result in significant impacts on paleontological resources, should they be present within the program area

or the vicinity of the program area. However, implementation of the mitigation measures to protect paleontological resources identified in this EIR will ensure that impacts would not be such that they would result in or contribute to a cumulative impact.

Greenhouse Gas Emissions

GHG emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would have a cumulatively considerable impact on global climate change. Although the geographic scope of cumulative impacts related to GHG emissions is global, this analysis focuses on the state, the region, and this program's direct and/or indirect generation or offset of GHG emissions. The proposed program, the Golden Hills Project, and the Patterson Pass Project would result in a long-term net reduction of approximately 96,049 metric tons of CO_{2e} per year, 18,727 metric tons of CO_{2e} per year, and 6,204 metric tons of CO_{2e} per year, respectively, and would not conflict with the State's GHG reduction goals. Therefore, the project-specific incremental impact on GHG emissions resulting from the program or from either of the two projects would not be cumulatively considerable.

Hazards and Hazardous Materials

Potential cumulative hazards and hazardous materials impacts are generally site-specific and depend on past, present, and future uses and existing soil, sediment, and conditions. The geographic scope of potential cumulative impacts relating to wildland fires includes the high fire hazard areas in which access and haul roads would be shared throughout the APWRA and other projects being constructed at the same time. The background for the cumulative analysis included existing windfarms including: Golden Hills Project, Patterson Pass, Summit, AWI, Vasco, FloDesign Wind Turbine Corp. These projects, together with the existing old-generation windfarm facilities and the proposed Mariposa Energy Center and Cool Earth Solar Energy Facility near Mountain House.

The project would contribute less-than-significant impacts related to accidental releases of hazardous materials; interference with air navigation; or flammable or combustible materials. There is no evidence of existing subsurface conditions that would potentially contribute to cumulative impacts relating to hazards and hazardous materials. No records exist indicating that contaminated sites or hazardous substances are located in areas to be disturbed. The program and all cumulative projects would be required to adhere to regulations that govern hazardous materials storage and handling, water quality BMPs, FAA regulations related to airspace, and fire prevention and management. Together, these measures would ensure that impacts related to exposure to hazardous materials would be minimized and/or avoided. Therefore, the project's incremental, less-than-significant impacts in these areas would not be cumulatively considerable.

Hydrology and Water Quality

The geographic scope considered for potential cumulative impacts related to Hydrology and Water Quality included the Brushy Creek, Clifton Court Forebay, Mountain House Creek, Lower Old River, Lower Corral Hollow Creek, and Upper Corral Hollow Creek watersheds which flow generally east toward the Central Valley and a narrow strip along the western portion of the program area—comprising the Upper Arroyo Las Positas and Arroyo Seco watersheds that drains west toward the San Francisco Bay region. For groundwater resources, the area considered was the Tracy Subbasin.

Impacts associated with implementation of the repowering program would be less than significant with compliance with NPDES requirements. Other projects in the same watersheds would also be required to comply with NPDES requirements, ensuring that significant impacts would not occur. There would be no impacts associated with implementation of the repowering program related to flooding, and therefore the repowering program could not contribute to any cumulative impact related to flooding.

Land Use and Planning

Because the proposed program and projects would not result in any impacts on land use, it would not result in or contribute to a cumulatively considerable effect.

Noise

The cumulative noise analysis considers the construction and operation of other repowering projects in the program area vicinity that could cumulatively contribute to the ambient noise environment at the existing residences near the existing and proposed turbine sites in the program area. For construction noise impacts, the analysis considers the cumulative impacts at existing residences near the construction activities from construction of multiple repowering projects simultaneously in the program area. Because noise diminishes rapidly with distance (6 dBA per doubling of distance for point sources), the noise analysis evaluates impacts at existing residences in areas immediately surrounding the project turbine sites and construction activities.

The implementation of the repowering program along with other repowering projects in the vicinity of the program area would replace the majority of existing turbines with fewer and larger modern turbines. The modern turbines are expected to have several characteristics that reduce aerodynamic sound levels and make for quieter operations than the existing turbines. The modern turbines are expected to have relatively low rotational speeds and pitch control on the rotors, both of which reduce sound levels.

Nonetheless, the analysis provided above at both the program and project level indicates that there is potential for repowering projects to result in noise that exceeds County noise standards which would result in significant cumulative operational noise impacts. Implementation of Mitigation Measure NOI-1, however, would ensure compliance with County noise standards and would avoid significant cumulative operational noise impacts.

Construction of multiple repowering projects simultaneously in the program area could potentially result in a cumulative construction noise impact at residences located near the construction activities. However, the impact would be temporary and localized and implementation of Mitigation Measure NOI-2 would reduce cumulative impacts to a less-than-significant level.

Population and Housing

Because the proposed program would not result in any impacts related to population and housing, it would not contribute to any cumulative impacts.

Public Services

Because the proposed program would not result in any impacts on public services, it would not contribute to any cumulative impacts.

Recreation

Because the program and the Golden Hills and Patterson Pass Projects would have no impact on Recreation, it would not contribute to any cumulative impacts related to recreation.

Transportation/Traffic

The cumulative traffic analysis considers the other projects in the program area vicinity that would involve construction activities concurrently with those of the proposed projects and that could use the same access roadways to the project areas, creating the potential to cumulatively degrade the traffic operation, bicycle facilities, and safety condition on the local access roads in the vicinity of the proposed projects. The traffic impacts associated with the program and two individual projects are mostly caused by the construction traffic and activities. Once the turbines are installed and in operation, maintenance needs would be limited and not substantially greater than currently required; postconstruction traffic generation would not differ materially from current maintenance traffic levels. Accordingly, cumulative traffic analysis concentrated on construction activities.

Construction of multiple repowering projects simultaneously in the program area and other development and infrastructure projects in the vicinity of the program area could potentially result in cumulative construction traffic impacts on freeways and county roadways used for haul routes and worker access to the project sites. The cumulative construction impacts on traffic operation, safety hazards, emergency access, and bicycle facilities would be similar to the impacts discussed in Section 3.15.2 and are considered to be significant. Implementation of Mitigation Measure TRA-1 would reduce the program's cumulative contribution to the significant impact. The mitigation includes implementation of circulation and detour plans, installing traffic control devices, scheduling, to the extent feasible, truck and worker trips outside of peak commute hours, and coordination of project construction activities with the affected agencies to identify and minimize overlap with other area construction projects. However, because the construction activities and associated traffic from the Sand Hill Repowering Project in the program area is expected to result in a significant and unavoidable traffic impact, any proposed repowering projects with the construction activities taking place concurrently with construction of the Sand Hill Repowering Project would contribute to a significant and unavoidable cumulative impact on traffic operation, safety hazards, emergency access, and bicycle facilities on the roadway and bicycle facilities in the vicinity of the Sand Hill Repowering Project.

Utilities and Service Systems

The program and proposed projects consist of operational modifications to existing wind turbine facilities and subsequent turbine removal and site reclamation, and would not create a need for the construction or expansion of utilities and service systems. In addition, there is no existing water service onsite, and the project would not cause a need for water service. The program area is located entirely in a rural setting; stormwater runoff drains primarily through natural drainage swales, ditches, and watercourses. No construction or expansion of wastewater systems would be required there would be no connections to a public sewer system. The proposed program would also not generate a substantial amount of solid waste because turbines and components will be sold or recycled. For these reasons, projects resulting in a significant increase in demand for public services would not be consistent with the existing ECAP land use designations and policies for the program area, and therefore no cumulative impact is likely to occur. Therefore, it is not anticipated that the

proposed program could make a considerable contribution to any cumulative impacts on utilities or services such as wastewater, water supply, or solid waste.