APPENDIX 2. REPLACEMENT PAGES

This appendix includes replacements for pages of the Draft SEIR that have been modified in response to comments. Following this cover page, the replacement pages are divided by Draft SEIR section, with a cover sheet for each section that lists the pages that need to be replaced. Each replacement page that follows the cover sheet should be put in the binder in the appropriate Draft SEIR section, and the original Draft SEIR page should be removed and discarded. Both the original and the new text are shown on each replacement page (original text that has been removed is shown in ~~strike-out~~; new text is underlined), and new pages are indicated in the page number at the bottom of each page (e.g., "**New** C.3-2"). In addition, a line is shown in the right margin (like that at the end of this line) indicating the location of each change. If all old pages are discarded, the entire Final SEIR will fit into the same binder in which the Draft SEIR was distributed.

For two sections, entirely new sections are provided here (because of the number of changes). Those sections are:

- Biological Resources (Section C.3) – Replace all text but do not discard color figures at end of section.
- Appendix 4 (Air Quality Emission Inventory Data)

In each of these cases, the original section from the Draft SEIR should be removed from the binder and discarded, and the enclosed sections (with "New" in the page number footer) should be inserted.

Executive Summary

Remove Page(s):	**Replace With:**
ES-16 to ES-17	**New** ES-16 to **New** ES-17
ES-22 to ES-40	**New** ES-22 to **New** ES-40

4.10 VISUAL RESOURCES

The project area landscapes are comprised primarily of low, rolling grass-covered hills and level grazing land and agricultural fields. Since this type of terrain typically offers few screening opportunities, tall structures such as transmission line towers tend to be very visible if located in close to moderate proximity to roads or other points of public visual access, such as parks and recreation areas. The industrial character of transmission line structures also creates visual contrast with the more natural character of the rural agricultural setting. The primary issue of concern for the Proposed Project and Alternatives is the project's potential to degrade views from local and regionally important roadways (Interstate 5 [I-5]; State Routes 33, 152, and 198; Eldorado Road; and Jayne Avenue) and recreation areas (Los Banos Creek State Recreation Area and Little Panoche Reservoir).

The Project area has not undergone substantial development since the FEIS/EIR was published. However, a considerable amount of open grazing land has been converted to irrigated agriculture, particularly along the southern half of the proposed Western Corridor, and these changes are noticeable in the landscape. The SEIR uses an updated visual resource analytical methodology, but the conclusions reached (all impacts would be less than significant) are the same as those of the FEIS/EIR.

Impacts of the Proposed Project. Most segments of the Proposed Project would experience no significant visual impacts because they are either sufficiently distant from the primary points of public visual access or within the viewshed of the two existing 500 kV transmission lines. The Western Corridor would be visible to the west of Los Banos Creek Recreation Area, but it would be sufficiently distant from the primary use areas that a significant visual impact would not occur. The corridor would pass immediately adjacent to Little Panoche Reservoir and is prominent in views from both the reservoir and Little Panoche Road. Although the resulting visual impact is adverse, it is less than significant due to the presence of the existing two 500 kV transmission lines in the viewshed. Proposed Segments 6 and 7 would be located in close proximity to local roads and I-5 (where it would be crossed by the line). In this area, the resulting visual impact would be adverse but still less than significant.

Mitigation Measures for the Proposed Project. The Proposed Project does not create any potentially significant visual impacts, so no mitigation measures are required. Two measures are suggested, however, based on measures recommended in the 1988 FEIS/EIR. One would ensure that the visual impacts of construction activities remain less than significant and the second would require tower siting to minimize use of hilltops and to use non-reflective materials in construction.

Comparison of Alternatives. The Western Corridor is generally preferred over the Eastern Corridor Alternative due to its more remote location and/or typically greater distance from I-5, which provides the primary visual access in the project study area.

4.11 NO PROJECT ALTERNATIVE

CEQA requires an evaluation of the No Project Alternative that must include (a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and (b) the events or actions that would

be reasonably expected to occur in the foreseeable future if the project were not approved. These two scenarios are addressed below.

The No Project Alternative could have two components: new generation north of Path 15 and different transmission upgrades. The environmental impacts of large thermal (natural gas fired) power plants can be significant, especially with respect to air quality, water resources, biological resources, and visual resources. The environmental impacts of a transmission line, because the operational impacts are insignificant, would be substantially less than those associated with power generation. However, because power plants are constructed by merchant power generators or local utilities, their construction will likely proceed regardless of whether Path 15 is built.

The No Project Alternative also includes the possibility of a smaller transmission system upgrade that could provide an additional 400 to 500 MW of capacity between the Los Banos and Gates Substations. This transmission upgrade would have impacts that are much less extensive and severe than those of the Proposed Project.

4.12 GROWTH INDUCING EFFECTS

CEQA requires a discussion of the ways in which a project could be an inducement to growth. Potential growth-inducing impacts of the proposed Los Banos-Gates 500 kV Transmission Project could be manifested in two fundamental ways:

- Growth resulting from the direct and indirect employment needed to construct and operate the Proposed Project.
- Growth resulting from the additional power that would be transmitted by the Proposed Project.

Growth resulting from the direct and indirect employment needed to construct and operate the Proposed Project or Alternatives is unlikely. ~~Construction crews for the project are expected to come from within PG&E, with an emphasis on use of workers from the local San Joaquin Valley Area. It is likely that 50 percent of the workers may come from outside the local area, but these workers would not be expected to permanently relocate with their families.~~ None of the construction crews are expected to come from within PG&E. PG&E believes that contractors for construction of the new 500 kV line, substation modifications, and the 230 kV reconductoring work will most likely come from out of state, but less skilled workers may come from the local area. Since PG&E would be contracting much of the labor force from out of state, a large portion of the labor force will remain in the project area for the duration of construction. The construction period for the Proposed Project is considered short term, therefore; no members of the labor force would be expected to permanently relocate their families, so employment patterns in the area are unlikely to change as a result of the project. ~~Given the relatively high unemployment rates in the project area and the large local labor force in the construction industry, the project itself would not significantly affect the employment patterns of the area.~~ Over the long term, operation of the Proposed Project or Alternatives would require very few employees.

Growth resulting from the additional power transmitted by the Proposed Project or Alternatives is also unlikely. For California, Path 15 has been operated as a means of importing energy from Northern to Southern California during the winter and exporting energy from Southern to Northern California during the summer. The driving force behind the need to expand the electrical service capacity along Path 15 is to bring reliability in energy service for both Northern and Southern California, and to drive down the costs of wholesale electricity for all California residents. Neither the Proposed Project nor Alternatives would result in the generation of more electricity, just the ability to more effectively transfer existing electricity between Northern and Southern California. Although all three counties in

Table ES-2 Summary of Impacts: Proposed Project

Impact	Impact Class	Effect	Mitigation	Residual Impact
AIR QUALITY				
2-1: PM_{10} emissions from construction disturbance	II	Less than significant with mitigation	**A-1:** The following procedures for reducing fugitive dust shall be implemented. Records documenting personnel awareness and the wind speed log shall be maintained at the construction site and shall be provided to CPUC's environmental monitor upon request. In order for the items listed below to be modified, the Applicant would be required to provide the CPUC with SJVUAPCD written approval of such modifications prior to the commencement of construction activities. • Traffic speeds on unpaved roads shall not exceed 15~~5~~ mph, except on portions of project access roads that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW. Per Mitigation Measure **B-8**, the designated speed limit within those areas is 10 mph (see Section C.3.3.5.2). PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the unpaved road speed limit restriction. The signed statement shall specify that 15~~5~~ mph is the maximum speed limit on any unpaved road, except on project access road that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW, where the maximum speed limit is 10 mph. • Wash off all truck tires and equipment leaving the construction site. PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness that tires and equipment leaving the construction site are to be washed. • Suspend excavation and grading activity when winds exceed 20 mph for a sustained period of 10 minutes, as measured by an anemometer. PG&E shall measure the wind speed with the anemometer when moderate to high winds occur, based on the fair judgment of a designated PG&E representative. PG&E shall maintain a written log to be maintained at the construction sites that documents day, time, and wind speed of each measurement.	Less than significant
2-2: Construction equipment exhaust emissions of ozone precursors (ROC and NO_x)	I	Potentially significant	**A-2:** Construction equipment shall be maintained in tune, per manufacturing specifications. PG&E/contractor shall provide a maintenance schedule for all vehicles and equipment. PG&E/contractor shall provide a certification from a third-party certified mechanic stating the timing of all internal combustion construction equipment engines has been properly maintained. PG&E/contractor shall re-certify each piece of construction equipment/vehicle based on the respective manufacturer maintenance schedule. Certifications shall be provided to the CPUC before the start of construction, and on an ongoing basis as new equipment is brought to the construction site. **A-3:** Vehicles shall not idle in excess of ten minutes. PG&E shall ensure that project personnel operating vehicles (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the idling restrictions and these records shall be maintained at the construction site for inspection by the CPUC environmental monitor.	Significant
2-3: Equipment emissions related to inspection and maintenance of the Proposed Project	III	Less than significant	No mitigation measures	None

Impact	Impact Class	Effect	Mitigation	Residual Impact
BIOLOGICAL RESOURCES				
3-1: Temporary and permanent loss of sensitive vegetation communities	II - III	Depending on species: Less than significant with mitigation or less than significant	**B-1:** A jurisdictional delineation of wetlands within the proposed transmission line corridor shall be performed by PG&E and verified by the U.S. Army Corps of Engineers before specific avoidance measures can be developed. Similarly, a formal mapping and assessment of alkali and riparian habitat will be required to satisfy CDFG 1601 (Streambed Alteration Agreement) requirements, if project activities (i.e., construction roads) cross the beds or banks of jurisdictional streams. Surveys, mapping, and assessment shall be performed at least 60 days before start of construction and results of these surveys (identification of wetlands, alkali, and riparian habitat) shall be utilized to define areas that are to be avoided in tower siting and location of access roads and other project components. The Project Biologist (defined in Mitigation Measure **B-12**) shall evaluate all proposed tower sites and identify those that are located within 200 feet of identified wetlands, alkali, and riparian habitat. A report summarizing habitat findings with respect to tower locations, along with copies of all maps and assessments shall be submitted to the CPUC for review and approval. **B-2:** Pre-construction surveys shall be performed for identification of all special status plant and animal species within 200 feet of project construction activities (including towers, access roads, and work areas). Special status species, as well as jurisdictional wetlands and riparian habitat (as determined from Mitigation Measures **B-1** and **B-6**, and as identified during 1986 and 2001 field surveys), shall be flagged prior to the start of construction of any project components. The CPUC shall be notified prior to the start of flagging activities so a CPUC-designated biologist may observe these activities. Maps and reports identifying locations of special status plants and animals found in pre-construction surveys, as well as proposed exclusion-fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. To the extent possible, construction activities within significant plant communities will be avoided by placing towers so as to span these areas, maximizing the use of existing access roads, and minimizing the construction of new access roads, using temporary spur roads. Prior to confirming final transmission corridor design, the locations of all project components (towers, roads, temporary work areas, etc.) shall be defined on a map that also illustrates locations of wetlands, riparian habitat, and special status plants and wildlife, and this shall be provided to the CPUC for review and approval. **B-3:** Under conditions where impacts to wetlands, alkali, and riparian habitats cannot be avoided, PG&E shall either restore temporarily disturbed areas to pre-construction conditions following construction or provide off-site compensation for permanent vegetation losses. Where on-site restoration is planned for mitigation of temporary impacts, the Applicant shall develop a Habitat Restoration Plan, which will be submitted to the CPUC and the U.S. Army Corps of Engineers (for wetlands), the California Department of Fish and Game (CDFG) (for riparian habitat), and the Regional Water Quality Control Board (RWQCB) at least 60 days prior to the start of any construction for their review and approval. The plan shall contain information for natural community mitigation, including specifying the location of habitat type to be created, details on soil preparation, seed collection, planting, maintenance, and monitoring for on-site restoration efforts. Quantitative success criteria will also be presented. The mitigation objective for affected significant natural plant communities will be restoration to pre-construction conditions as measured by species cover, species composition, and species diversity. Success criteria will be established by comparison with reference sites approved by the appropriate agencies. Creation or restoration of habitat shall be monitored for five years after mitigation site construction to assess progress and identify problems. Remedial actions will be taken during the five-year period if necessary to	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			ensure the success of the restoration effort. **B-4:** If the CPUC-approved Project Biologist (defined in Mitigation Measure **B-12**), in consultation with project engineers, determines that restoration of temporary impacts is not feasible or where permanent impacts (i.e., loss of habitat) to significant plant communities occur from access road or tower installation, off-site mitigation shall be negotiated at agency-approved mitigation banks or otherwise, to a level acceptable by the CPUC, USFWS, CDFG, or USACE. **B-5:** A Worker Environmental Awareness Program (WEAP) shall be implemented for construction crews by a qualified biologist(s) provided by PG&E and approved by the CPUC prior to the commencement of construction activities. Training materials and briefings shall include but not be limited to, discussion of the Federal and State Endangered Species Acts, the consequences on noncompliance with these acts, identification and values of sensitive species and significant natural plant community habitats, fire protection measures, hazardous substance spill prevention and containment measures, and review of mitigation requirements. This training program shall also incorporate the provisions of Mitigation Measure **H-3** (Hydrology and Water Resources). Training materials and a course outline shall be provided to the CPUC for review and approval at least 30 days prior to the start of construction. PG&E shall provide to the CPUC a list of construction personnel who have completed training, and this list shall be updated by PG&E as required when new personnel start work. No construction worker may work in the field for more than 5 days without receiving the WEAP.	
3-2: Temporary and permanent loss of special status plant species or their habitats	II - III	Ranges between less than significant with mitigation to less than significant	**B-2** through **B-4** (above) and **B-6a:** Prior to construction, comprehensive rare plant surveys shall be conducted (or compiled from previous surveys) for all plants that have been identified within the study area and those plants with the potential to occur in the study area (as defined in Tables C.3-3 and C.3-4). Surveys shall be conducted within appropriate areas along the selected construction ROW and in areas susceptible to surface disturbance by construction vehicles or personnel. Surveys of the selected alignment (if not covered in 2001 spring survey) shall be appropriately timed to cover the blooming periods of the nine special status plant species known to occur in the area (April, May, and July). Maps depicting the results of these surveys will be prepared and will include other recently mapped special status plant occurrences in the area to ensure that the full scope of rare plant habitat in the project corridor vicinity is delineated. Locations of these special status plant populations will be provided to construction personnel. Any special status plant occurrences located within 200 feet of the approved project construction corridor will be fenced prior to the start of any construction, and if feasible, towers or other project components shall not be placed in areas where these plant populations have been identified. Maps and reports, as well as proposed fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. An exception to the fencing requirement would be the gypsum-loving larkspur. Because of the widespread distribution of this plant throughout the project area, it would not be feasible to fence off all of these plant communities. Instead, fencing would be placed in the most concentrated areas of gypsum-loving larkspur at the direction of the CPUC-approved Biological Monitor. **B-6b:** PG&E shall present to the CPUC within 30 days of project approval a report evaluating use of Tubular Steel Poles (TSPs) rather than lattice towers for the transmission line. The report shall evaluate the technical feasibility of using TSPs for this project, and shall present diagrams illustrating the poles, their footing	Potentially significant (see Impact **3-11**)

Impact	Impact Class	Effect	Mitigation	Residual Impact
			requirements, and the approximate ground disturbance required. The report shall also present visual photosimulations of the TSPs from three locations, approved by the CPUC. A comparison of all of these factors with the proposed lattice towers shall also be provided.	
3-3: Impacts to plant communities by disturbance from vehicles or project personnel	II - III	Ranges between less than significant with mitigation to less than significant	**B-2** (above) and **B-7:** PG&E shall map and flag or fence overland travel routes and project access areas prior to construction or periodic maintenance during operation and shall ensure that vehicles or project personnel do not disturb identified areas. Areas flagged shall include wetland, alkaline areas, riparian, and reservoirs and ponds. The mapping/flagging shall be reviewed by a CPUC-approved biologist prior to use of these routes for construction to ensure adequate protection for sensitive plant communities.	Less than significant
3-4: Disturbance of special status plant species and their habitats	II	Less than significant with mitigation	**B-6a & B-6b** (above)	Less than significant
3-5: Erosion and sedimentation	II	Less than significant with mitigation	**H-1** (see Section C.6, Hydrology and Water Quality)	Less than significant
3-6: Wildlife habitat removal	II - III	Ranges between less than significant with mitigation to less than significant	**B-2** (above) and **B-9** (below)	Less than significant
3-7: Wildlife mortality	II - III	Ranges between less than significant with mitigation to less than significant	**B-5** (above) **B-8:** In order to reduce direct mortality impacts during construction, PG&E shall impose the following conditions on all construction personnel, and these requirements shall be addressed in the WEAP (Mitigation Measure **B-5**): • Vehicles shall not exceed 10 mph on the entire ROW or along designated portions of access roads where blunt-nosed leopard lizards are known to occur ~~unpaved access roads or in the ROW~~. These locations will be determined during pre-construction surveys and ~~These roads shall be~~ identified on project maps ~~and speed limits shall be identified on maps~~ prior to the onset of construction. All other areas along dirt access roads outside the limits of known blunt-nosed leopard lizard habitat shall have a 15 mph speed limit, consistent with Air Quality Mitigation Measure **A-1**. • Litter or other debris that may attract animals shall be removed from the project area; organic waste shall be stored in enclosed receptacles, removed from the project site daily, and disposed of at a suitable waste facility. • No pets will be allowed in the construction area, including access roads and staging areas • Construction crews will be educated regarding sensitive wildlife that could be encountered on highways and how to safely avoid them. Crew behavior shall be monitored by a qualified biologist approved by CPUC.	Less than significant
3-8: Wildlife disturbance from increased human presence	II	Less than significant with mitigation	**B-9:** Pre-construction wildlife surveys (following appropriate survey protocol, as applicable) shall be performed by qualified biologists to locate raptor nests, owl/harrier burrows and other resources defined in Table C.3-11 in or adjacent to the ROW and access road areas. Maps and reports, as well as proposed fence locations, shall	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. Based on survey results, construction and operation activities shall be scheduled to avoid critical seasons for sensitive wildlife species, as defined in Table C.3-11 below. Specific identified habitats (nests, riparian habitat, burrows, etc.) shall be avoided during specific seasons throughout the construction, operation, and maintenance of the approved project. Travel routes for vehicles, equipment, and personnel will be along existing roads. If such roads are not present, routes will be flagged or fenced and no activities would be permitted outside these areas. If nests, burrows, or other habitat are observed, the avoidance period and buffer distances shown in Table C.3-11 will be implemented. Specific distances from resources (see Table C.3-11) shall be maintained during construction, operation, and maintenance of the transmission line. Travel areas shall be flagged prior to construction (see Mitigation Measure **B-2**), and biological monitors as specified by CPUC will be present during construction to verify that no vehicular travel occurs outside flagged areas. An exemption to a mitigative measure may be approved on a case-by-case basis when deemed appropriate by the designated Project Biologist, CDFG, or USFWS. An exemption would be approved only after a thorough, site-specific analysis determined that a particular species for which the measure was put in place is not present or would not be significantly impacted. Biological monitors will also have the authority to terminate construction activities if any significant adverse effect on special status species is observed.	
3-9: Increased predation and competition	III	Less than significant	No mitigation measures	Less than significant
3-10: Bird electrocution and tower/line collisions	II	Less than significant with mitigation	**B-10:** Prior to installation of conductors, PG&E shall either (a) perform a study to determine the potential for bird strikes in the areas identified below and then, depending on study results, (b) implement bird strike diverters as defined below. The study shall evaluate the actual bird strike incidents at existing transmission lines in the vicinity of the approved project corridor. If this study determines that bird strikes would not constitute a significant impact, compliance with the remainder of this measure would not be required; if PG&E does not complete this study or if study results confirm the potential benefits of bird flight diverters, the remainder of this measure shall be implemented. The protocol for this study (including the time period, survey intervals, and impact significance criteria) shall be approved by the CPUC, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). If PG&E does not perform the study defined above or if study results determine that flight diverters would likely be beneficial, PG&E shall install bird flight diverters in the areas defined below to reduce bird collision impacts along the proposed or alternative transmission line corridors: • At the Los Banos Substations on any new ~~equipment and~~ transmission lines • On static lines in the vicinity of the Los Banos Reservoir, from MP 4 to 8 in the Western Corridor or from MP 5 to 8 in the Eastern Corridor Alternative; and • On static lines in the vicinity of the Little Panoche Wildlife Area, between Segment 4 (MP 22 to 24) and Alternative Segment 4A (AMP 22 to 24) in the Western Corridor. Prior to installation of conductors, PG&E shall submit its recommendation for the type(s) and spacing of bird	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			flight diverters in the identified areas to the CPUC, the USFWS, and the CDFG for review and approval. Conductors shall not be installed until the CPUC, in conjunction with USFWS and CDFG, has approved an agreement between PG&E, USFWS, and CDFG regarding the type and spacing of bird flight diverters required; diverters shall be installed within 30 days of installation of conductors. Following installation of all bird flight diverters (line markers), PG&E shall begin a three-year monitoring program in the areas identified above to determine the extent of bird collisions in the project area. Existing unmarked transmission lines in similar high bird-use areas shall be monitored during the same period to allow comparisons for determining line marking effectiveness. The protocol for the study (including identification of unmarked lines to be monitored) shall be submitted to the resource agencies for review and approval prior to installation of conductors on new towers. As part of the design of this monitoring program, PG&E shall submit to the CPUC and the U.S. Fish and Wildlife Service information regarding types of bird collision detection systems, their potential for improving study results, and their cost and feasibility in this area. Based on this information, the CPUC will decide whether such a system will be required for the monitoring study. Annual reports providing bird strike data for the new marked lines and for the existing unmarked lines shall be provided to the CPUC, the USFWS, and the CDFG, and a summary report shall be submitted at the end of the three-year monitoring program. The annual reports shall include a discussion of the apparent effectiveness of the line marking techniques selected, and recommendations regarding modification of the type of line markers used if bird collisions are determined to be frequent. PG&E, after review and input by CPUC, USFWS, and CDFG, shall implement the findings of the annual reports by modifying line markers as needed to minimize collisions.	
3-11: Habitat removal or disturbance of special status plant and wildlife species	~~I~~ II	Significant	**B-2, B-4, B-6, B-8,** and **B-9** (above) and **B-11:** If, after applying Mitigation Measures **B-2, B-4, B-6, B-8** and **B-9**, the CPUC-approved Project Biologist determines that all impacts on special status plant and wildlife species cannot be avoided, PG&E shall initiate FESA Section 7 Consultation with the U.S. Fish & Wildlife Service for Federally-listed species and/or CESA 2080 Consultation will be initiated with the California Department of Fish and Game for State-listed species. These consultations shall determine requirements for obtaining a (FWS) Biological Opinion and/or (CDFG) Incidental Take Permit. PG&E shall obtain any such required Biological Opinion or Incidental Take Permit and, in that process, shall work cooperatively with the appropriate agency or agencies to develop appropriate mitigation measures to offset impacts to the affected species. PG&E shall thereafter implement all mitigation recommendations of the FWS and/or CDFG that result from these consultations. **B-11a:** PG&E shall provide land of equal or better habitat value to the City of Coalinga to compensate for any acreage lost within the City of Coalinga's Habitat Mitigation Bank.	Significant
All Biological Resources Impacts	I - II	Less than significant with mitigation	**B-12:** PG&E shall submit to the CPUC for review and approval the resumes and qualifications of a Project Biologist, who will represent PG&E in the field and be responsible for field decisions on biological issues. In addition, resumes of all other environmental field personnel proposed by PG&E for field enforcement of mitigation measures shall be provided to the CPUC for review and approval. Types of qualifications that will be considered for selecting qualified field personnel include: • Emphasis of undergraduate/graduate degree(s)	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			• Related experience • Special skills such as statistical analysis, experimental design, species identification, vegetation sampling, dependent upon the assignment. Depending on the monitoring objective, individuals will have suitable experience in soil science, botany, ecology, restoration, wildlife observation, and wetland delineation. The objective will be to utilize monitors who can collect and analyze the data required to document mitigation success, problems, and, if necessary, suggest remedial action.	
CULTURAL RESOURCES				
4-1: Construction operations could inadvertently affect known cultural resources within or adjacent to the proposed or alternative corridors	II	Less than significant with mitigation	**C-2:** PG&E shall conduct pre-construction field surveys to locate and record cultural resources within the project right-of-way and related construction facilities and roadways. PG&E shall submit the results from the pre-construction survey to the CPUC at least 30 days prior to construction. If resources are found, they shall be formally recorded and/or updates shall be filed for previously recorded sites according to the procedures defined in the Cultural Resources Management Plan (see Mitigation Measure **C-1**). All resources shall be evaluated in accordance with California Register of Historical Resources criteria. **C-3:** PG&E shall avoid known significant or potentially significant cultural resources in/adjacent to the project corridor. They shall consult with cultural resource professionals (approved by the CPUC) during the siting of the transmission line to avoid cultural resources where possible. If avoidance is not possible, specific procedures shall be followed to minimize resource impact or to record resources that cannot be avoided; these procedures shall be identified and reported in the Cultural Resources Management Plan (see Mitigation Measure **C-1**).	Less than significant
4-2: Previously unrecorded cultural resources could be discovered during ground disturbing construction operations. Construction operations in areas of native soil, especially in the near vicinity of flowing and intermittent water sources and former lagoons/marshy areas, could result in the inadvertent exposure of significant buried prehistoric or historic cultural materials.	II	Less than significant with mitigation	**C-4:** PG&E shall consult with interested Native Americans to identify areas or features of significant or potentially significant Native American concern, and shall develop procedures (to be documented in the CRMP, Mitigation Measure **C-1**) for documentation of or preservation of resources that cannot be avoided. Documentation of consultation and issues discussed shall be provided to the CPUC, at least 30 days prior to construction.	Less than significant
4-3: Project construction could affect parks, Wilderness Study Areas (WSA), and recreational areas that may contain cultural resources	II	Less than significant with mitigation	**C-5:** PG&E shall consult with and implement any site-specific cultural resources requirements mandated by the CPUC, State Office of Historic Preservation, and within the jurisdiction of other agencies (e.g., Bureau of Reclamation, Bureau of Land Management (BLM), the California Department of Parks and Recreation (CAL/DPR). Documentation of consultation and issues discussed shall be provided to the CPUC, at least 30 days prior to construction. Areas and parks that may be affected are the following: • California Aqueduct (owned by the Bureau of Reclamation and managed by the California Department of	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			Water Resources (DWR) • Little Panoche Reservoir (jointly managed by the DWR and California Department of Fish and Game) • Panoche Hills Wilderness Study Area (WSA) (BLM) • San Luis Reservoir State Recreation Area (CAL/DPR) • Los Banos Creek Recreation Area (CAL/DPR)	
All Cultural Resources Impacts	II	Less than significant with mitigation	**C-1:** PG&E shall develop and implement a *Cultural Resources Management Plan* (CRMP) for the project covering pre-construction, construction and post-construction activities. PG&E shall submit the CRMP to the CPUC at least 30 days prior to construction for review and approval. The CRMP shall include procedures for pre-construction field survey, designation and avoidance of cultural resources areas, significance evaluation including potential testing and possible data recovery prior to construction, archaeological monitoring during construction, treatment of the unexpected discovery of cultural resources (including Native American burials), and treatment of significant sites that may be exposed during all phases of the project. The CRMP shall detail the qualifications of the Project Archaeologist, reporting requirements by the Project Archaeologist; designate a location for the curation of cultural materials collected during the project; and, specify that archaeologists and other discipline specialists meet any Professional Qualifications Standards mandated by the California Office of Historic Preservation (OHP). The CRMP shall include requirements detailing that prior to construction or ground-disturbing activities, PG&E shall (1) complete cultural resources training for all construction personnel; and, (2) insure that any excavation contract (or contracts for other activities that may have subsurface soil impacts) shall include clauses that require construction personnel to attend training so they are aware of the potential for inadvertently exposing buried archaeological deposits. The CRMP shall include the requirement for and definition of a background briefing for supervisory construction personnel describing the potential for exposing cultural resources, the location of any potential Environmentally Sensitive Areas (ESA) and anticipated procedures to treat unexpected discoveries. Construction personnel shall be trained regarding the recognition of possible buried prehistoric and historic resources during construction. PG&E shall inform all construction personnel of the procedures to be followed upon the discovery of archaeological materials including Native American burials. Wherever a tower, access road, equipment, etc. must be placed or accessed within 100 feet of a recorded, reported or known archaeological site eligible or potentially eligible for the CRHR, the site will be flagged on the ground as an Environmentally Sensitive Area (ESA). Construction equipment would then be directed away from the ESA, and construction personnel would be directed to avoid entering the ESA. Upon discovery of potential buried cultural materials, work in the immediate area of the find shall be halted and PG&E's archaeologist notified. Once the find has been identified, PG&E's archaeologist will make the necessary plans for treatment of the find(s) and for the evaluation and mitigation of impacts if the finds are found to be important according to CEQA.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
GEOLOGY, SOILS, AND MINERALS				
5-1: Unique geologic and paleontologic features	II	Less than significant with mitigation	**G-1:** Prior to construction, PG&E shall develop a Paleontological Resources Monitoring Plan (PRMP) for review and approval by the CPUC, which shall address the treatment of paleontological resources discovered during transmission line construction. The PRMP shall be prepared by a qualified paleontologist; it shall include procedures for significance testing and data recovery. The PRMP shall defer to the Cultural Resources Monitoring Plan (see Mitigation Measure **C-1**) if paleontological resources are found with archaeological resources. The PRMP shall include a requirement for training of construction workers on why vertebrate fossils are important and what they look like. The training shall explain prohibitions against collecting fossils found during construction. The PRMP shall identify areas of high paleontological sensitivity along the approved route, and shall define procedures for evaluation of resources found during construction. It shall define procedures for actions to be taken if paleontological resources are found during construction, procedures for fossil recovery, a data recovery program, and a qualified curation facility.	Less than significant
5-2: Known mineral and energy resources	II	Less than significant with mitigation	**H-9** (see Section C.6, Hydrology and Water Quality)	Less than significant
5-3: Loss of agricultural soils	I - II	Ranges between significant to less than significant with mitigation	**H-1** (see Section C.6, Hydrology and Water Quality)	Significant
5-4: Erosion	II	Less than significant with mitigation	**H-1** (see Section C.6, Hydrology and Water Quality)	Less than significant
5-5: Substantial alteration of topography	II	Less than significant with mitigation	**H-1** (see Section C.6, Hydrology and Water Quality)	Less than significant
5-6: Fault rupture	II	Less than significant with mitigation	**G-2:** In areas where the potential for surface fault rupture exists, PG&E shall perform ~~detailed~~ geotechnical surveys at each tower or substation site to ~~accurately~~ determine the fault locations and the seismic potential of each fault, so that facility locations may be adjusted to avoid this hazard. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to this geological hazard.	Less than significant
5-7: Earthquake induced ground shaking	III	Less than significant	No mitigation measures	Less than significant
5-8: Expansive, soft, or loose soils	II	Less than significant with mitigation	**G-3:** PG&E shall perform ~~design-level~~ geotechnical investigations including soil sampling~~, free-swell~~ and lab tests, ~~density tests, and soil borings or cone penetrometer tests (CPT)~~ as appropriate, to determine the extent of and potential for expansive, soft or loose soils. PG&E shall develop appropriate design features for locations where potential problems are found to exist. Appropriate design features may include excavation of problematic soils and replacement with engineered backfill, ground treatment such as ground densification, and the use of deep foundations such as piers or piles. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
5-9: Ground subsidence and settlement	II - III	Ranges between less than significant with mitigation to less than significant	**G-4:** PG&E shall evaluate the potential for subsidence or settlement of approved project facilities due to the presence of compressible or hydrocompactive soils during ~~design-level~~ geotechnical investigations. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. The results of the investigations will be used to develop appropriate pre-construction ground treatments, and incorporate foundation and structural designs to accommodate expected settlements. ~~PG&E shall remove or rework near surface deposits found to be potentially susceptible to hydrocompaction prior to placing new engineered fill.~~ Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Less than significant
5-10: Slope instability and unstable soil conditions	II	Less than significant with mitigation	**G-5:** PG&E shall perform ~~design-level~~ geotechnical surveys to evaluate the potential for unstable slopes, landslides, mudflows, and debris flows along the approved corridors. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Facilities should be located away from steep hillsides, debris flow source areas, the mouths of steep sidehill drainages, and the mouths of canyons that drain steep terrain. Specially designed deep foundations may be used in areas of shallow sliding where unstable slopes cannot be avoided. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Less than significant
HYDROLOGY AND WATER RESOURCES				
6-1: Potential for tower construction and road building activities to accelerate hillslope erosion, increase sediment loading to local channels, and reduce surface water quality	II	Less than significant with mitigation	**H-1:** An erosion control and sediment transport control plan shall be submitted first to the CVRWQCB and CPUC for review and approval, and then to Merced and Fresno Counties along with grading permit applications. This plan shall be prepared in accordance with the standards provided in the Manual of Erosion and Sedimentation Control Measures (ABAG, 1981) and in compliance with practices recommended by the Natural Resources Conservation Service. Implementation of the plan will help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan shall be designed specifically for the hydrologic setting of the approved project, which includes upland slopes, tributary creeks, and larger streams. The plan shall define the specific Best Management Practices (BMPs) that will be adhered to during construction activities. Erosion minimizing efforts such as hay bales, water bars, covers, sediment fences, sensitive area access restrictions (for example, flagging), vehicle mats in wet areas, and retention/ settlement ponds shall be installed before extensive clearing and grading begins. Mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during construction activities. Revegetation plans, the design and location of retention ponds, and grading plans shall be submitted to the CDFG for review in the event of construction near waterways. In addition, PG&E shall: • Replant temporarily disturbed areas with a mixture of perennial grasses, forbs, brush, shrubs, and tree species that will provide effective erosion control. Prepare a firm, rough seedbed on fill or cut slopes and apply appropriate types and amounts of fertilizers and seed mixtures. Consider reseeding with native plants only in sensitive areas not subject to grazing. • Restore disturbed surfaces to original conditions, including reseeding or otherwise restoring vegetation on all disturbed slopes exceeding 2 percent, as soon as possible after such grading work is completed or later approved by the Project Biologist. Recontour, prepare the surface, and seed all roads, construction sites, and other disturbed areas not required for project operation and maintenance. • Use standard erosion practices and dust control measures, as defined in mitigation measures for air quality, during construction to protect biological and hydrological resources.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			• Based on weather conditions as determined by the CPUC's Environmental Monitor, ~~T~~temporarily collect excavated or disturbed soil and place it in a controlled area surrounded by siltation fencing, hay bales, or a similarly effective erosion control technique that prevents the transport of sediment. • Restrict the staging of construction materials, equipment, and excavation spoils to areas at least 100 feet outside of drainage channels or tributaries. • Where tower or substation construction activities occur near a creek or channel, sediment containment methods shall be performed at least 100 feet from the channel. • Upon completion of construction activities, excavated soil shall be replaced and graded to match the surroundings, and surplus soil shall be transported from the site and disposed of appropriately. • Use existing roads for access wherever possible. Roads required for construction but not maintenance shall be removed after construction and surfaces restored to original conditions. • Minimize steepness and unobstructed length of fill slopes. Protect newly constructed fill with appropriate materials to prevent erosion. • Avoid road construction on very steep slopes and avoid work on unstable slopes and rock outcrops. • In agricultural areas where grading occurs, stockpile topsoil and replace after construction. Re-grade to original contours and re-seed in accordance with landowner objectives. • Add soil amendments during revegetation to counteract potential chemical imbalances. • Minimize use of heavy equipment on agricultural land.	
6-2: Increased runoff from tower construction and road building activities	III	Less than significant	No mitigation measures	Less than significant
6-3: Increased stream channel erosion, sediment transport, and alteration of the existing drainage pattern due to road building and construction activities	II	Less than significant with mitigation	**H-1** (above) and **H-2:** Access roads shall be designed to account for anticipated surface runoff and channel flow. Culverts designed to convey flow beneath access roads shall be designed for the specific hydrologic and hydraulic conditions occurring at the site. Culvert design should follow standard practices (Caltrans Highway Design Manual, 1999) and should also include energy dissipation practices (Federal Highway Administration, 1983). It is important that flow velocities are maintained below levels that are capable of causing channel erosion downstream or headward channel incision upstream. PG&E shall submit copies of approved grading and construction plans for new roads ~~Construction plans for new roads shall be submitted~~ to the CPUC for review ~~and approval~~ prior to the start of project construction.	Less than significant
6-4: Surface water and groundwater contamination during construction	II	Less than significant with mitigation	**H-3:** An environmental training program shall be established by PG&E to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. This training program shall not only describe general environmental concerns and procedures but shall emphasize site-specific physical conditions to improve hazard prevention. For example, all flow paths to the nearest water bodies should be identified to workers and where hazardous materials may specifically impact the site shall be identified. An outline of the training program and monitoring plan shall be submitted to the CPUC for review and approval prior to the start of construction.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			H-4: A Hazardous Substance Control and Emergency Response Plan (HSCERP) shall be prepared by PG&E and submitted to the CPUC for review and approval. The plan shall include preparations for quick and safe cleanup of accidental spills occurring during construction. This plan will be submitted with the grading permit application. It will prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. More specifically, the plan will identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted. The plan shall include the following: • All refueling, lubrication, and other machinery or vehicular maintenance activities shall be performed at least 150 feet from any tributary, stream channel, aqueduct or canal. This distance is increased to 500 feet when in the vicinity of identified vernal pool wetlands, or the Los Banos and Little Panoche Reservoirs. • Oil-absorbent material, tarps, and storage drums to contain and control any minor releases of transformer oil shall be used. • Describe the clean-up process if excess water and liquid concrete escapes from tower foundations during pouring. This excess will be directed to bermed areas adjacent to the borings where the water will infiltrate or evaporate and the concrete will remain and begin to set. Once the excess concrete has been allowed to set up (but before it is dry), it will be removed and transported to an approved landfill for disposal.	
6-5: Tower foundation impacts to groundwater hydrology	III	Less than significant	No mitigation measures	Less than significant
6-6: Tower foundation impacts to groundwater quality	II	Less than significant with mitigation	**H-1, H-3,** and **H-4** (above) and **H-5:** Prior to final tower siting, PG&E shall research existing information about the project corridor to identify and avoid areas with potential existing soil and groundwater contamination (where groundwater is shallower than 20 feet). Findings regarding soil and groundwater contamination conditions shall be supplied to the CPUC in coordination with the agency review of the specific alignment and tower locations for the selected transmission line corridor. Before construction begins along the approved alignment, soil sampling ~~and potholing~~ shall be conducted south of project milepost (MP) 66 (as shown on Figure B-1b) at representative intervals, and soil information shall be provided to construction crews to inform them about soil conditions and potential hazards that were not identified in the records searches performed prior to tower siting. If hazardous materials are encountered in either soils or groundwater, work shall be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they shall be handled, transported, and disposed of in accordance with federal, state, and local regulations.	Less than significant
6-7: Erosion and sediment transport at Los Banos and Gates Substations	III	Less than significant	**H-1, H-3,** and **H-4** (above)	Less than significant
6-8: Surface and groundwater quality impacts at Los Banos and Gates Substations	II	Less than significant with mitigation	**H-1, H-3, H-4,** and **H-5** (above)	Less than significant
6-9: Operational impacts to surface and groundwater	III	Less than significant	No mitigation measures	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
hydrology at tower and substation locations				
6-10: Risk of transmission tower damage through flooding or erosion	II	Less than significant with mitigation	**H-6:** Transmission towers shall not be sited within a distance of 200 feet from the edge of stream channels. ~~a designated 100-year floodplain. Prior to final alignment of transmission towers, the Applicant shall evaluate the position of all towers in light of the most recent (July 2001 or later) floodplain delineations in the project area.~~ To demonstrate compliance, PG&E shall provide the CPUC with a map of tower~~s~~ locations relative to stream courses ~~within 100 feet of identified floodplains~~ 30 days prior to the start of construction.	Less than significant
6-11: Operational impacts to surface and groundwater quality at substations	II	Less than significant with mitigation	**H-7:** If PG&E currently has a spill prevention containment and countermeasure (SPCC) pond that collects runoff from the Los Banos, Gates, and Midway Substations, the pond shall be upgraded to accommodate additional flow resulting from the substation modifications. If there is currently no SPCC pond at these substation sites, PG&E shall update its SPCC plan to explain how the additional runoff or potential releases would be accommodated within the substations. PG&E shall submit the updated SPCC to the CPUC for review and approval 30 days prior to energizing the new lines or the new portion of the substations.	Less than significant
6-12: Conflict with operation of water and oil wells within the transmission corridor	II	Less than significant with mitigation	**H-8:** The final tower siting for the approved project shall avoid existing oil and water wells. Wells that cannot be avoided shall be removed or relocated, and the owner shall be compensated by the Applicant. To demonstrate compliance, at least 30 days prior to construction, PG&E shall provide a map showing all oil and water wells within 200 feet of the edge of the ROW.	Less than significant
LAND USE AND RECREATION				
7-1: Temporary construction disturbances	II - III	Ranges between less than significant with mitigation to less than significant	**L-1:** PG&E shall, to the extent feasible, use access roads that were constructed for the existing 500 kV transmission lines. (These roads, many of which are still used for maintenance, with necessary repair, could be used for access with only construction of spur roads that would be necessary to reach individual tower locations.) PG&E shall document compliance with this measure by submitting an access road plan (demonstrating use of existing roads or reasons why existing roads cannot be used) to the CPUC for review and approval at least 30 days before construction. **L-2:** Construction staging areas and pulling sites shall be located adjacent to roads where practical. PG&E shall coordinate with landowners to establish construction areas (such as conductor pulling and splicing areas and construction yards) on non-agricultural land or in areas with less sensitive crops, where feasible. PG&E shall document compliance with this measure by submitting to the CPUC for review and approval, at least 30 days before construction begins, a plan showing construction staging and pulling areas, demonstrating use of non-agricultural land or reasons why agricultural land cannot be avoided. **L-3:** All access roads not required for maintenance by PG&E after construction should be either permanently closed using the most effective and least environmentally damaging methods appropriate to the landowners, or be regraded (recontoured), restored, and revegetated with the concurrence of the relevant landowners. Any damaged recreation, farm, or residential access roads shall be repaired. PG&E shall document compliance with this measure by submitting to the CPUC for review and approval a plan showing methods to restore and revegetate unnecessary access roads. **L-4:** PG&E shall locate new access roads parallel to landform contours where feasible, in order to minimize ground disturbance and/or reduce scarring. Placement of new access roads on permanent crop land (e.g., orchards) shall be avoided, where feasible. PG&E shall document compliance with this measure by submitting an access road plan (demonstrating conformance to landform contours and avoidance of permanent crop land)	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			to the CPUC for review and approval. **L-5:** In agricultural areas where sites would be graded, PG&E shall stockpile topsoil. After construction, topsoil shall be replaced and the site graded to the original contours. If appropriate, the site shall be reseeded in accordance with agency or landowner objectives. PG&E shall document compliance with this measure by submitting to CPUC for review and approval a plan showing methods to stockpile topsoil and restore construction sites. **L-6:** PG&E shall time construction, whenever practical, to minimize disruption of normal seasonal activities for crop and rangeland and to avoid peak use periods at recreational areas. PG&E shall work with the appropriate County agent and farmers to agree to a construction schedule that would avoid the prime crop planting, growing, and harvesting seasons, to the extent possible. PG&E shall submit a construction schedule to the CPUC for review and approval. The schedule shall document how disruptions to agricultural operations will be avoided. **L-7:** At least one month prior to constructing the project, PG&E shall give advance notice of such construction, construction activity schedules, access restrictions, and anticipated disturbances to property owners, residents, and tenants potentially affected by construction activities (within 1,000 feet of project ROW or access roads). The Applicant shall provide adequate access to existing land uses during all periods of construction and shall notify landowners of alternative access. PG&E shall avoid nighttime construction near noise-sensitive land uses (e.g., residences and campers at recreation areas). PG&E shall document compliance with this measure by submitting to CPUC a copy of the notice for review and approval prior to mailing said notice. PG&E shall provide evidence to CPUC that the notice was delivered to landowners and residents within 1,000 feet of the project ROW and access roads. PG&E shall submit to CPUC for review and approval a plan showing how adequate access to existing land uses will be provided during construction. **L-8:** Immediately after removing sections of grazing fencing, PG&E shall construct a temporary barrier across the section of removed fencing so that grazing animals cannot move through the fencing. Immediately after completing construction in the area, PG&E shall repair the section of removed fencing. PG&E shall close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area. PG&E shall incorporate these requirements into the construction plan and demonstrate to the CPUC that all construction workers are informed of these provisions. **L-9:** PG&E shall include a stipulation in its easement agreements with landowners along the ROW that landowners shall be reimbursed for the value of the crops lost and the cost of any delay or interruption in necessary farming or grazing practices as a result of any interrupted use of cropland or grazing land. Evidence of this stipulation shall be submitted to the CPUC. **L-10:** PG&E shall avoid, to the extent feasible, construction operations that disturb agricultural soil during the wet season (moist soil is generally more susceptible to compaction than dry soil). For any area in which PG&E determines avoidance to be infeasible, PG&E shall provide to the CPUC for review and approval at least two weeks prior to construction at that site, a brief written description of the area and the reasons that avoidance is not considered to be feasible. PG&E shall minimize the use of heavy equipment on agricultural land to avoid soil compaction. Where compaction occurs on agricultural land as a result of construction, the soil shall be ripped to restore adequate	

Impact	Impact Class	Effect	Mitigation	Residual Impact
			percolation of irrigation water through the soil strata. PG&E shall incorporate these requirements into the project construction plan and submit the plan to CPUC for review and approval.	
7-2: Conflicts with existing and planned land uses	II	Less than significant with mitigation	**L-11:** PG&E shall coordinate with property owners during final transmission line design and shall, to the extent feasible, align the transmission line, with the review and approval of the CPUC, so as to avoid existing residences, minimize land use conflicts, and maximize the distance between the line and agricultural operations, planned developments, canals, oil fields, dams, recreation areas, and airstrips located within, adjacent to, and near the ROW. PG&E shall document compliance with this measure by submitting a letter or report to the CPUC prior to the start of construction, documenting unavoidable landowner and land use conflicts, why avoidance is not possible, and proposed resolution. **L-18:** Within the area proposed for the Specific Urban Development Plan (SUDP), *The Villages of Laguna San Luis Community Specific Plan*, and the area designated as kit fox corridor, PG&E shall ~~landscape the transmission line ROW and buffer area or otherwise~~ design the area for integration and compatibility with the planned development and with the existing kit fox habitat conservation corridor. Compliance will be determined by CPUC, in consultation with Merced County planning officials, CDFG, and USFWS.	Less than significant
7-3: Long-term conversion/loss of productive agricultural land	I and III	Potentially significant and less than significant	**L-12:** Tower placement shall be adjusted, with review and approval of the CPUC during final project design, to avoid orchards and vineyards, row crops, and furrow-irrigated crops (with tower-to-furrow angles greater than 61 percent), wherever possible. Also when possible, the corridor should avoid more heavily cultivated crops in preference for non-agricultural land or crops such as alfalfa, corn, and small grains. PG&E shall coordinate work with local landowners to place towers in areas that would cause the least impact (e.g., along the edges of fields or adjacent to mid-section farming roads).	Significant in some segments
7-4: Impacts on agricultural equipment and operation	III	Less than significant	**L-12** (above) and **L-13:** When locating towers in row crops is unavoidable, PG&E shall attempt to locate towers in fields with rows that would be parallel, rather than perpendicular, to the transmission line. Transmission lines shall not be placed in diagonal orientations across cultivated fields, to the extent feasible. At least 30 days prior to construction, PG&E shall submit to the CPUC, for review and approval, a tower location plan that indicates agricultural row orientation.	Less than significant
7-5: Interference with irrigation practices	II	Less than significant with mitigation	**L-13** (above) and **L-14:** Where towers must be placed in agricultural fields, transmission lines and towers shall be placed toward the center of fields where feasible. PG&E shall avoid placing towers at the edge of fields where canals or irrigation ditches are located. PG&E shall document compliance with this measure by submitting to the CPUC, for review and approval, a tower location plan that indicates tower location relative to agricultural fields and irrigation systems. **L-15:** PG&E shall avoid siting of towers in fields using mechanical move irrigation systems, and shall attempt to locate them in fields using flood or border check irrigation over those using furrow irrigation. PG&E shall document compliance with this measure by consulting with landowners to identify irrigation systems and by submitting to the CPUC, for review and approval, a tower location plan that indicates avoidance of areas of mechanical move and furrow irrigation systems.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
7-6: Effects on aerial applications	II	Less than significant with mitigation	**L-13** and **L-14** (above) and **L-16:** When transmission towers are to be installed in or adjacent to agricultural fields, PG&E shall avoid installing them adjacent to existing transmission lines and shall avoid angular joining of corridor segments. PG&E shall document compliance with this measure by submitting to the CPUC, for review and approval, construction plans that show locations of all angle towers in agricultural areas.	Less than significant
7-7: Permanent preclusion of existing, permitted, and planned land uses	II	Less than significant with mitigation	**L-17:** During the right-of-way acquisition process, PG&E shall coordinate with each affected property owner, in order to develop an alignment and specific tower locations, to provide clear information about the right-of-way acquisition process compensation, and construction and maintenance activities, and to understand landowner plans for use of the transmission corridor area in order to minimize the impact of tower and ROW location. PG&E shall document compliance with this measure by submitting to the CPUC written evidence of landowner consultation and a copy of the written information distributed to landowners.	Less than significant
Effects on property values	NA	No CEQA Impact	No mitigation measures	None
Noncompliance with local County General Plan, Policies	II	Less than significant with mitigation	**L-17** (above) **L-18:** Within the area proposed for the Specific Urban Development Plan (SUDP), *The Villages of Laguna San Luis Community Specific Plan*, PG&E shall landscape the transmission line ROW and buffer area or otherwise design the area for integration and compatibility with the planned development. Compliance will be determined by CPUC, in consultation with Merced County planning officials. **L-19:** PG&E shall consult with County officials during the transmission line siting process to evaluate the potential effects on air travel safety. County personnel will review the Proposed Project and PG&E shall submit County recommendations to the CPUC.	Less than significant
SOCIOECONOMICS AND PUBLIC SERVICES				
8-1: Temporary employment	NA	No impact	No mitigation measures	None
8-2 and **8-3:** Temporary and permanent housing	IV	Beneficial	No mitigation measures	Beneficial
8-4: Business in the project area	II, III, and IV	Less than significant with mitigation, less than significant, and Beneficial	No mitigation measures	Less than significant or beneficial
8-5: Institutional activity	NA	No impact	No mitigation measures	None
8-6: Public protection	II and III	Less than significant with mitigation and less than significant	**S-1:** PG&E shall submit a Fire Prevention and Suppression Plan (FPSP). The FPSP shall incorporate measures for prevention and suppression of fire on the ROW and on lands used or traversed by PG&E in connection with the project. The FPSP shall include a list of equipment required by all crews for extinguishing small fires that may be started during construction. PG&E shall provide training to project personnel regarding proper procedures on how to minimize the risk of fire and how to eliminate an existing fire. The FPSP shall be prepared in consultation with all appropriate counties, BOR, and BLM. PG&E shall consult with the California Department of Forestry and Fire for all land in the project area designated as State Responsibility Areas (SRAs). The FPSP will be submitted to the CPUC for review and approval prior to construction. Adherence to the Plan during construction will be monitored by a CPUC-approved construction monitor.	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
8-7: Schools	NA	No impact	No mitigation measures	None
8-8 through **8-11:** Water, wastewater, solid waste, pipelines	III	Less than significant	No mitigation measures	Less than significant
PUBLIC SAFETY, HEALTH, AND NUISANCE				
9-1: Electric and magnetic fields (EMF)	III	Less than significant	No mitigation measures	Less than significant
9-2: Corona and audible noise	III	Less than significant	No mitigation measures	Less than significant
9-3: Radio/television/electronic equipment interference	II	Less than significant with mitigation	**PS-1:** As part of the design and construction process, PG&E shall limit the conductor surface electric gradient in accordance with the IEEE Radio Noise Design Guide. PG&E shall provide the CPUC with documentation of compliance prior to energizing the line. **PS-2:** After energizing the transmission line, PG&E shall respond to and document all radio/television/ equipment interference complaints received and the responsive action taken. These records shall be made available to the CPUC for review upon request. All unresolved disputes shall be referred by PG&E, within 90 days, to the CPUC's Energy Division for Resolution.	Less than significant
9-4: Induced currents and shock hazards in joint use corridors	II	Less than significant with mitigation	**PS-3:** As part of the siting and construction process, PG&E shall identify objects (such as fences, conductors, and pipelines) that have the potential for induced voltages and work with the affected parties to determine proper grounding procedures (CPUC G.0.95 and the NESC do not have specific requirements for grounding). PG&E shall install all necessary grounding measures prior to energizing the line. Thirty days prior to energizing the line, PG&E shall notify in writing, subject to the review and approval of the CPUC Energy Division, all property owners within and adjacent to the Proposed Project ROW of the date the line is to be energized. The written notice shall provide a contact person and telephone number for answering questions regarding the line and guidelines on what activities should be limited or restricted within the ROW. PG&E shall respond to and document all complaints received and the responsive action taken. These records shall be made available to the CPUC for review upon request. All unresolved disputes shall be deferred by PG&E to the Lead Agencies for resolution. The written notice shall describe the nature and operation of the line, and PG&E's responsibilities with respect to grounding all conducting objects. In addition, the notice shall describe the property owner's responsibilities with respect to notification for any new objects, which may require grounding, and guidelines for maintaining the safety of the ROW.	Less than significant
9-5: Effects on cardiac pacemakers	III	Less than significant	No mitigation measures	Less than significant
9-6: Transmission lines in agricultural areas present a safety hazard to aerial applicators	I	Potentially significant	**L-13**, **L-14**, and **L-16** (above) **PS-4:** PG&E shall consult with landowners to determine which aerial applicators cover agricultural parcels within 1 mile of the approved transmission line corridor. PG&E shall provide written notification to all aerial applicators and to the CPUC stating when the new transmission lines and towers will be erected. PG&E shall also provide all aerial applicators and the CPUC with recent aerial photos or topographic maps clearly showing the new lines and towers, as well as all existing PG&E lines and towers within 10 miles of the approved corridor.	Significant in some segments

Impact	Impact Class	Effect	Mitigation	Residual Impact
9-7: Intermittent and continuous noise levels during project construction	III	Less than significant	**L-7** (above)	Less than significant
9-8: Operational noise	III	Less than significant	No mitigation measures	Less than significant
TRANSPORTATION AND TRAFFIC				
10-1: Increased traffic levels	III	Less than significant	No mitigation measures	Less than significant
10-2: Lane closures along 500 kV transmission corridor	II	Less than significant with mitigation	**T-1:** PG&E shall place temporary poles and netting across all portions of I-5 and State Routes that would be crossed by the transmission line to ensure that conductors will not fall onto the roadway during the conductor stringing operations. Because the California Highway Patrol (CHP) would be responsible for closing lanes on all state-controlled roadways, the CHP must concur with date and time of PG&E's proposed encroachment prior to the issuance of a Caltrans Encroachment Permit. In addition, PG&E would be required to provide 7 to 10 days notice of the planned encroachment to the applicable Transportation Management Center (a joint CalTrans and CHP agency). **T-2:** Prior to the start of construction, PG&E shall submit traffic control plans to CalTrans District 6 and the Counties of Merced and Fresno as part of the required traffic encroachment permits. Documentation of the approval of these plans and issuance of encroachment permits shall be provided to the CPUC prior to the start of construction.	Less than significant
10-3: Disruption of bus transit services	II	Less than significant with mitigation	**T-3:** PG&E shall consult with Coalinga Transit at least one month prior to construction to develop methods to reduce potential interruptions to bus transit service in the project area. Documentation of this consultation shall be provided to the CPUC prior to the start of construction.	Less than significant
10-4: Adverse effects of aviation activities	NA	No impact	No mitigation measures	None
10-5: Physical damage to roads	II	Less than significant with mitigation	**T-4:** If damage to roads occurs, PG&E will coordinate repairs with the affected public agencies to ensure that any impacts to area roads are adequately repaired. Roads disturbed by construction vehicles shall be properly restored to ensure long-term protection of road surfaces.	Less than significant
VISUAL RESOURCES				
Visual Impacts in Scenic Corridors	III	Less than significant	**V-1:** Visual disturbance that can result from construction of the transmission line shall be minimized by implementation of the conditions listed below. Prior to the start of construction, PG&E shall submit a plan to CPUC for review and approval that details its procedures for ensuring that these conditions are met. • Temporary facilities, such as construction yards, and conductor tensioning and splicing sites should be sited to minimize disruption of the landscape by landform alteration and vegetation removal • Existing roads will be used for access wherever possible. Minimize number and length of new construction access roads particularly in intensively farmed areas. Use temporary spur roads to towers and remove those roads not required for maintenance. Access roads should be designed to the minimum standards necessary for the construction and maintenance vehicle access. • Locate new access roads parallel to contours of landform wherever feasible. • The limits of construction activities should normally be predetermined, with activity confined within those	Less than significant

Impact	Impact Class	Effect	Mitigation	Residual Impact
			limits. All construction vehicle movement outside the right-of-way should normally be restricted predesignated access or public roads. • No paint or permanent discoloring agents should be applied to rocks or vegetation to indicate survey or construction activity limits. Surveyors, flagging, or other suitable materials should be used to delineate limits. • Where blasting is required for access roads or tower footings, debris should be recovered and removed where practical. • Excavated material or other construction materials should be removed following construction. • In construction areas where excavation is not required, vegetation should be left in place wherever possible and the original contours should be maintained in an undisturbed condition. • Where vegetation is of high density or low diversity is encountered in the right-of-way, clearing to a harsh right-of-way edge should be avoided. Instead, it should be done to emulate natural clearings with irregular edges. **V-2:** In final siting of transmission tower, PG&E shall avoid siting towers on ridgelines and hilltops wherever possible, and shall minimize the number of towers visible from sensitive viewpoints within recreation areas. In areas identified as visually sensitive, the finish on the transmission towers should be dull and non-reflective. Prior to the start of construction, PG&E shall submit to the CPUC for review and approval a siting plan that identifies (a) the tower and conductor finish and its visual properties, (b) all towers that are proposed for ridgelines, and all those visible from State Routes and I-5, and from Los Banos Creek Recreation Area and Little Panoche Reservoir. A visual resources specialist (approved by the CPUC) shall review these locations and determine whether modified locations could reduce the visual impact of the identified towers.	

B. Description of Proposed Project and Alternatives

Remove Page(s):	**Replace With:**
B-7 to B-14	**New** B-7 to **New** B-14
B-19 to B-20	**New** B-19 to **New** B-20
B-27 to B-32	**New** B-27 to **New** B-32

Based on the organization of the previous EIR/EIS, the Proposed Project is described in segments. These segments have been renamed in this document; however, the original segment names from the previous EIR/EIS are noted in parentheses in the descriptions below.

- **Segment 1** (previously West-1) begins at Los Banos Substation. It is a 1.9-mile route segment from Milepost (MP) 0.0 (Los Banos Substation) to MP 1.9 and parallels the existing Moss Landing-Los Banos Intertie in a southwesterly direction for about one mile. Segment 1 then turns southeast to parallel the existing 500 kV lines, part of the Pacific Intertie. PG&E owns a vacant right-of-way that is adjacent to the Moss Landing-Los Banos line.
- **Segment 2** (previously West-2) is 12.7 miles long (MP 1.9 to MP 14.6) and parallels the existing 500 kV Intertie, maintaining the required separation. This segment crosses the western portion of the Los Banos Reservoir. The segment also crosses Ortigalita Creek near MP 13.6.
- **Segment 3** (previously West-4) parallels the 500 kV Intertie for approximately 5.3 miles and ends at the Merced/Fresno County border (MP 20.4) where Segment 4 begins. This segment traverses moderate to steep slopes and is sparsely vegetated.
- **Segment 4** (previously West-5) continues to parallel the 500 kV Intertie and is approximately 8.5 miles long (MP 20.4 to MP 28.9). It crosses east of Little Panoche Reservoir.
- **Segment 5** (previously West-7) continues to parallel the 500 kV Intertie for approximately 41.7 miles (MP 28.9 to MP 70.6 where the line crosses Highway 198). This segment provides an alignment location east of the BLM's Panoche Hills Wilderness Study Area[1] (WSA) while maintaining adequate separation from the existing 500 kV line. East of MP 68.0 the existing Intertie lines cross to the east side of Interstate 5 and parallels an existing 230 kV line. In the southern portion, the segment crosses the Big Blue Hills. In general, moderate to steep slopes with sparse vegetation characterizes this segment. Most of this segment is managed through leases for grazing. Two natural areas are crossed: Tumey Gulch at MP 41.2 and Cantua Creek at MP 57.1.
- **Segment 6** (previously West-9) is approximately 8.6 miles long (MP 70.6 to MP 79.2) and avoids oil wells, oil fields and water extraction wells, but crosses a few evaporation ponds associated with oil operations. Segment 6 is composed of 50 percent agricultural land.
- **Segment 7** (previously West-11) is the southernmost and final segment connecting the Proposed Project route with Gates Substation. It crosses Interstate 5 and runs due east at MP 79.2 then turns south into the Gates Substation. Over 90 percent of this 4.0-mile segment crosses agricultural land.

B.2.1.2 Transmission Line Components

Table B-1 summarizes the facilities and activities associated with all Proposed Project components. Figure B-2 presents a schematic diagram of the project components and how they fit into the region's electric system.

Conductors and Insulators. The Western Corridor will consist of a single-circuit, 500 kV transmission line with bundled 2,300 kcmil (1.75-inch diameter, 61 strands) all aluminum conductors arranged in a horizontal configuration. The three-phase, bundled transmission line will have two subconductors per phase. Spacing between subconductor centers will be 18 inches.

[1] A Wilderness Study Area, as defined by the Bureau of Land Management, is a designation made through the land use planning process of a roadless area that may have wilderness characteristics as described in Section 2(c) of the Wilderness Act of 1964. The Panoche Hills WSA was found by BLM not to have sufficient wilderness characteristics to be designated as a Wilderness Area, but the WSA designation has not yet been removed by Congress.

At a normal operating voltage of 525 kV, the summer normal capacity is 2,278 MVA. The line will be designed with strengths and clearances equal to or greater than the requirements and safety factors specified by the California Public Utilities Commission (CPUC) General Order No. 95.

Two strings of insulators in the shape of an "I" and a center string in the shape of a "V" will be used to support the conductors and maintain electrical design clearance between the conductors and towers. Each "I" insulator string will contain approximately 34 insulators and will be approximately 18 feet long. "V" insulator strings will have 30 to 36-insulators per side. Dead-end towers have three horizontal ("I") insulator strings, one string per conductor. At least one of the overhead ground wires will be a metallic wire encasing a fiber optic bundle, for the protective relays and the SCADA system.

Two overhead ground wires, each approximately 3/8 inch in diameter, will be installed on the top of the towers to protect the conductors from direct lightening strikes. The ground wires are designed to safely transfer lightening current through tower structures into the ground.

Towers. The towers are self-supporting, rectangular base, galvanized steel lattice structures. The towers, which weigh from 10 to 35 tons, will vary in height from 100 to 160 feet and average 120 feet. A typical 500 kV tower is represented in Figure B-3. Towers similar to those proposed have been used extensively by PG&E throughout Northern and Central California.

Tower heights, locations, and span lengths vary and are determined by the following factors: natural terrain and topography; structural limitations; costs; visual considerations; existing and proposed land uses; crossings of manmade features such as roads, canals, and telephone lines; and other criteria that may be unique to the project.

Each leg of the tower will be supported by an augered, cast in place concrete footing, 2 to 3 feet in diameter, extending an average of 10 to 15 feet below ground. Each footing will contain a steel stub angle for structure attachment. Soil tests will be conducted along the route to obtain the geotechnical information necessary for detailed foundation design. The base dimensions of a typical tangent tower[2] will range from 16 by 57 feet to 24 by 69 feet. Angle towers[3] and dead-end[4] towers will range between 26 by 56 feet to 42 by 72 feet. The span between towers will average 1,300 feet, ranging from a minimum of 800 feet to a maximum of 1,500 feet, with some longer or shorter spans depending on topography and other factors. There will be an average of four towers per mile or approximately 336 towers.

[2] Tangent towers (also called suspension towers) are those where the transmission line continues in a straight line without angles on either side if the tower.

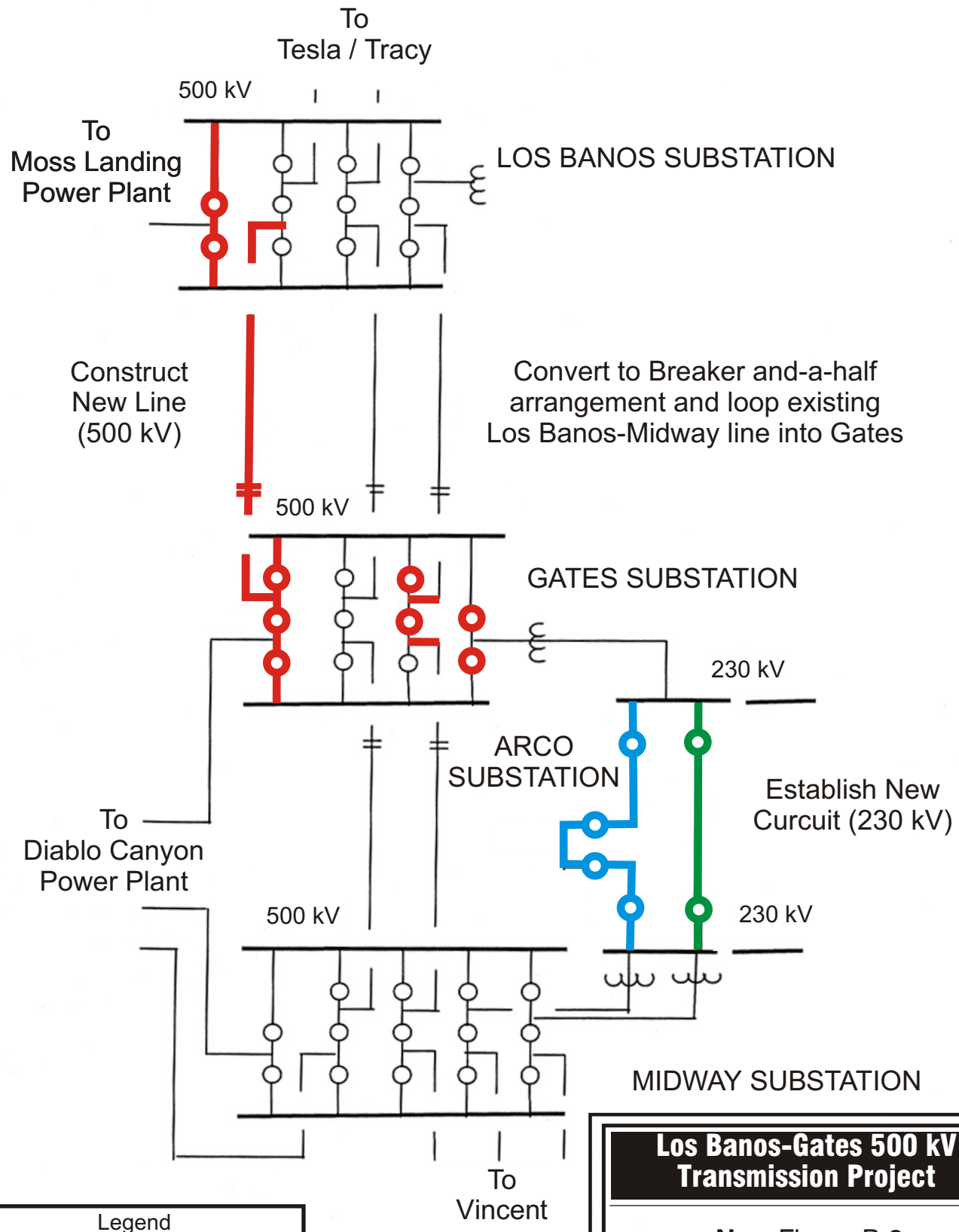
[3] Angle towers are larger and stronger than tangent towers because they must support additional stress that results from the transmission line changing direction.

[4] Dead-end towers are stronger than normal towers; they are usually angle towers or towers that for safety reasons require additional strength due to safety concerns.

Table B-1 Summary Description of Proposed Project Facilities and Activities

Los Banos-Gates 500 kV Transmission Line (new)
• Construct approximately 84 miles of single-circuit, overhead 500 kV transmission line from Los Banos Substation to Gates Substation. The proposed line will likely consist of bundled 2300 kcmil aluminum conductors, installed on self-supporting, rectangular-base lattice structures that will vary in height from approximately 100 to 160 feet in a 200 foot right-of-way (ROW).
Los Banos Substation
• Modify existing Los Banos 500 kV Substation by extending the existing 500 kV bus by one bay and installing two new 500 kV circuit breakers in the new line position. • Relocate the existing Los Banos – Moss Landing 500 kV line to the new bus position and terminate the new Los Banos – Gates 500 kV line at the existing Moss Landing line position. • Possible installation of a 500 kV series capacitor bank on the new Los Banos-Gates line at Los Banos Substation. • Install miscellaneous electrical equipment, including 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Gates Substation
• Modify existing Gates 500 kV Substation by extending the existing 500 kV bus by one bay and installing two new 500 kV circuit breakers in the new line position. • Terminate the new Los Banos – Gates 500 kV line at the new bus position. • Install new line positions in existing vacant bays to loop the existing Los Banos – Midway 500 kV #2 line into Gates Substation. Each new position will include installation of two new 500 kV circuit breakers in the new line positions. • Re-align the existing Los Banos – Midway 500 kV #2 line to loop into Gates Substation. This realignment of 7000 feet of existing line will result in the removal of seven towers and the construction of six towers adjacent to the existing Los Banos – Midway 500 kV #1. • Install a 500 kV series capacitor bank on the new Los Banos-Gates line at Gates Substation similar to the 500 kV series capacitor bank at Los Banos Substation. • Install two new 500 kV circuit breakers for the existing 500/230 kV Transformer Bank 11. Modify arrangement of 500 kV bus from a ring bus to a "breaker and a half" scheme. • Install miscellaneous electrical equipment, including 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems. • Install a new 230 kV line position to accommodate the reconfigured 230 kV transmission line between Gates and Midway Substations. • Install miscellaneous electrical equipment, including 230 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Gates Substation Loop
• Re-align the existing Los Banos – Midway 500 kV #2 line to loop into and out of Gates Substation ~~and move the #1 line within the substation.~~, resulting in the removal of seven towers and the construction of six towers adjacent to the existing Los Banos – Midway kV #1.
Gates-Arco-Midway 230 kV Line
• Reconfigure or reconductor the ~~transmission~~ 230 kV lines between Gates Substation and Midway Substation. ~~so as to establish two 230 kV circuits between these substations (one circuit currently exists).~~ Reconductor would upgrade the conductor on the approximately 50 miles of the single Gates-Arco-Midway 230 kV circuit. Reconfiguring would establish two 230 kV circuits by restoring the second Gates-Midway line and installing line terminals at each station.
Midway Substation
• Install a 230 kV line position to accommodate the reconfigured 230 kV transmission line between Gates and Midway Substations. • Install miscellaneous electrical equipment, including 230 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Los Banos, Gates, and Midway Substations
• Install 500 kV shunt capacitors at ~~various as yet to be determined~~ Los Banos and Gates substations. Install miscellaneous electrical equipment, including ~~500~~ 230 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems at the locations designated for shunt capacitor installation.

[This page left blank intentionally.]



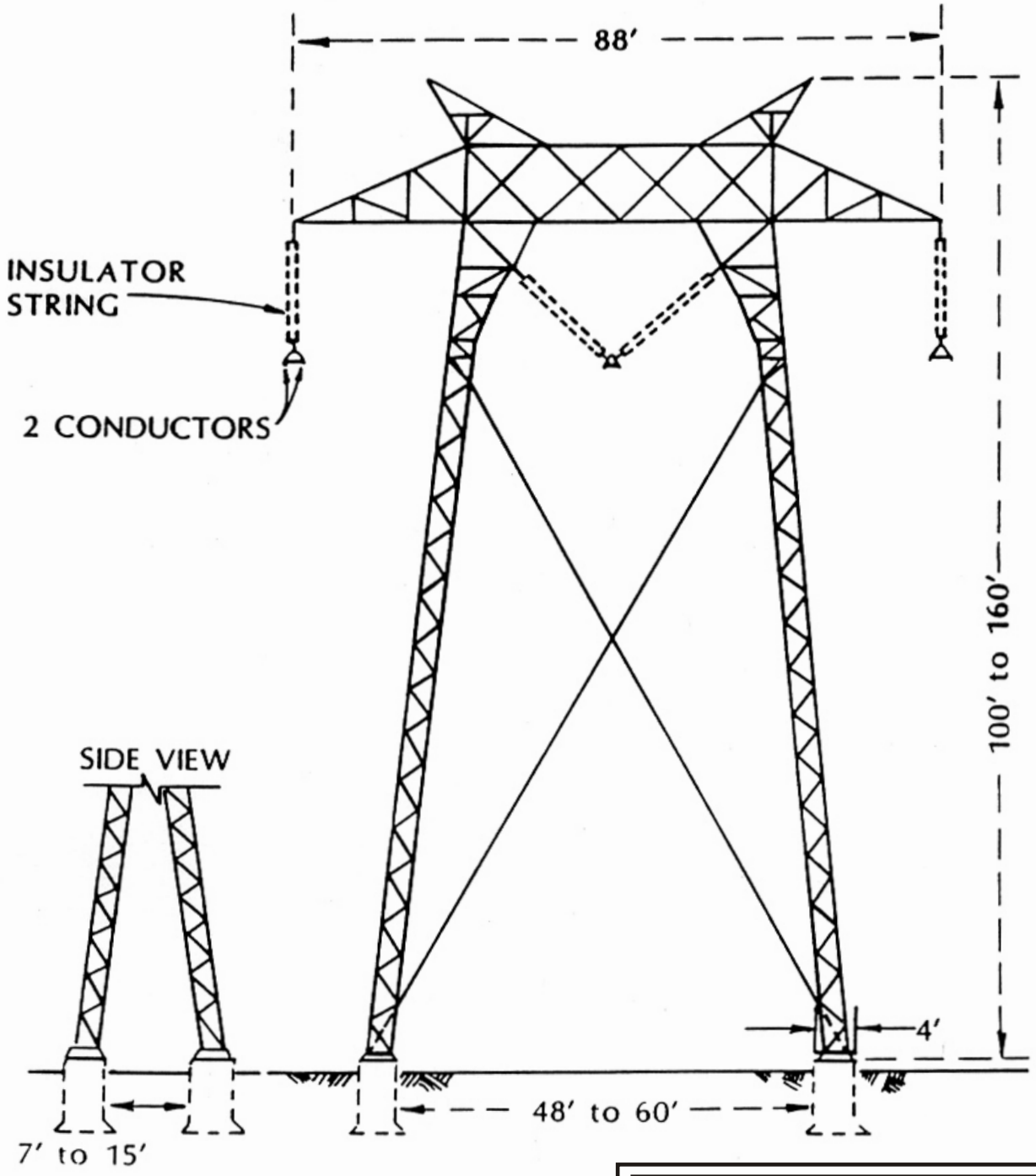
Source: PG&E, 2001.

Los Banos-Gates 500 kV Transmission Project

New Figure B-2

Proposed Plan of Service for Path 15

Aspen Environmental Group



Source: TANC/WAPA, 1986.

Los Banos-Gates 500 kV Transmission Project

Figure B-3

Typical 500 kV Tower

Aspen Environmental Group

B.2.1.3 Los Banos Substation

Los Banos Substation is a transmission substation serving 70, 230, and 500 kV transmission and power lines. The substation is located on the corner of Pacheco Pass Road (State Route 152) and Jasper Sears Road, approximately three miles west of Interstate 5. The substation is manned on a 24-hour basis. PG&E owns approximately 308 acres at Los Banos Substation. However, only 32 acres are within the existing substation fence line; the new transmission line would be connected within the currently fenced area. The remaining acreage, approximately 276 acres, is leased to local farmers for agricultural purposes. Figure B-4 is an aerial photograph of the Los Banos Substation and the approximate location of the proposed new transmission line.

The Proposed Project would require the installation of the following types of electrical equipment at the Los Banos Substation: structural steel, conductor, 500 kV circuit breakers, 500 kV disconnecting switches, 230 kV shunt capacitors, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems at the locations designated for shunt capacitor installation.

B.2.1.4 Gates Substation

Gates Substation is a transmission substation serving 70, 230, and 500 kV transmission and power lines. The substation is located on Jayne Avenue approximately 2 miles east of Interstate 5 near the City of Huron. The substation is manned during normal business hours. PG&E owns approximately 267 acres at Gates Substation; however, only 44 acres are within the existing substation fence line. The Proposed Project would primarily require electrical equipment modifications within the currently fenced area, but a few tower locations would also be changed outside of the substation boundaries. The remaining 223 acres are leased to local farmers for agriculture. Figure B-5 is an aerial photograph of the Gates Substation illustrating the approximate location of the proposed new transmission line and other equipment.

The changes at the Gates Substation required by the Proposed Project are similar to those described above for the Los Banos Substation.

B.2.1.5 Gates-Arco-Midway 230 kV Upgrade

If the proposed 500 kV transmission line is installed between the Los Banos and Gates Substations, additional transmission improvements to the 230 kV transmission system south of Gates would also be required to accommodate the additional power flow from the north. PG&E is considering two options in this area; both would apply to the existing 230 kV transmission line between the Gates and Midway Substations (about 70 miles apart), including the transmission line loop that serves the Arco Substation northwest of Midway (see Figure B-6). The Gates-Arco-Midway 230 kV line is approximately 70 miles long and parallels the Los Banos-Midway Nos. 1 and 2 500 kV lines and Interstate 5 for most of its length. The line extends from the Gates Substation south to the Midway Substation (west of Bakersfield) with a 7.3-mile loop to the Arco Substation. Before explaining the Proposed Project in this area, the existing transmission system must be described.

While the existing line between the Gates Substation and the Midway Substation was originally constructed as a double circuit 230 kV line, it has been modified over time so it now includes:

- The #1 circuit on the Gates-Arco-Midway line is a 230 kV line. This circuit is enhanced in the northern portion by installing 6 to 8 jumpers that connect the two circuits to each other.
- What was constructed as the #2 circuit of the Gates-Arco-Midway line has now been divided into two separate parts. The northern portion is connected to the #1 circuit with jumpers. The southern portion of the #1 circuit is currently operated at 115 kV from Midway Substation to Goose Lake Substation, and is no longer connected to Gates Substation.

PG&E's first option (the "reconfiguring option") for reestablishing the double circuit 230 kV line between Midway and Gates would only require: (a) removal of the 6 or 8 jumpers that connect the two circuits at the north end, and (b) reconnection of the line that now leads to Goose Lake (115 kV Substation) back to its original position on the #2 line (while this line now provides 115 kV service, the conductors are rated for 230 kV service). This option would have no environmental impacts and could be accomplished without disruption to any ground surfaces. Therefore, this option is preferred by PG&E, but the final determination cannot be made until power flow studies are completed.

PG&E's second option (the "reconductoring option") would require that 50 miles of the 80 miles of the ~~the entire double circuit 230 kV line serving~~ Gates-Arco-Midway would be reconductored[5]. This option would increase the rating of this line and allow increased power flow, but it would be significantly more expensive than the reconfiguring option and would only be required if power flow modeling shows that the reconfiguring option would not provide sufficient transmission capacity. Reconductoring can generally be completed with minimal environmental impacts due to use of existing towers and access roads. According to PG&E, ~~it is unlikely that this~~ reconductoring ~~would~~ may require structural ~~enhancements~~ upgrades to the existing towers or installation of new towers, but it is unlikely that installation of new towers would be required. A network of local paved and dirt roads provides access in the reconductoring areas. Principal access to the line is along Interstate 5.

[5] Reconductoring requires removal of the existing conductors and installation of new conductors with greater capacity. It is generally accomplished by pulling the new conductors from tower to tower using a truck on the existing transmission line right-of-way (see Section B.2.2.2).

B.2.1.6 Gates Loop

If the Proposed Project becomes operational, power flow in the Los Banos-Midway No. 1 and No. 2 500 kV lines would be highly unbalanced. During peak conditions the Los Banos-Midway No. 1 line would be overloaded while the No. 2 line would be loaded at less than 70 percent of its rating. This imbalance would increase power losses. Looping the Los Banos-Midway No. 2 line into Gates Substation would relieve the overload of the No. 1 line by balancing the power flow with the No. 2 line. The work includes the realignment of approximately 7,000 feet of the existing Los Banos-Midway No. 2 500 kV transmission line into Gates Substation along an existing right-of-way.

The Gates Loop portion of the Proposed Project consists of moving several existing 500 kV towers and conductors in the vicinity of PG&E's existing Gates Substation to allow space for the new Los Banos-Gates 500 kV line to enter the Gates Substation. The three components of this element of the project are:

- The realignment of the existing Los Banos-Midway No. 2 500 kV line into Gates Substation (this line currently does not enter the Gates Substation but passes east of it). Realignment of the line begins approximately 2,000 feet northwest of Gates Substation. The line will turn south for a distance of 1,800 feet where it will tie into the substation. The line will then leave the substation and turn to the southeast for a distance of 2,500 feet to the point of intersection with the original alignment. The line will then turn to parallel No. 1 to Midway Substation.
- Moving the Los Banos-Midway No. 1 500 kV line slightly to the west to connect to a new bus structure.
- Installation of the new Los Banos-Gates 500 kV line at the far west end of the 500 kV bus structure.

The realignment will result in the removal of seven towers and the construction of six new towers. Three of the towers being removed are on PG&E property. Two of the remaining four towers are on private agricultural land to the north of the substation and two of the towers are on agricultural land to the south of the substation. The six new towers would be constructed on PG&E property.

B.3 PROPOSED PROJECT CONSTRUCTION

This section describes the specific activities that would occur during project construction. Information presented here is used in the analysis of construction impacts in Section C of this SEIR.

B.3.1 500 kV OVERHEAD TRANSMISSION LINE (LOS BANOS TO GATES SUBSTATION)

The construction of a transmission line involves several phases of work: surveying, clearing, determining access requirements, establishing construction facilities, foundation installation, tower assembly, conductor installation, and cleanup and removal of construction facilities. Each of these phases is described in more detail below.

Surveying. Surveying for construction of a transmission line includes property, right-of-way, ground profile, access road, and construction surveys. A typical survey crew includes three people. Four crews would likely be needed to complete necessary surveying for the Proposed Project in six months.

The cleanup work consists of:

- Removing all crossing structures and backfilling the remaining holes;
- Disposing of packing crates, reels, shipping material, and debris;
- Returning to preconstruction condition access roads not required for line maintenance or desired by the landowner;
- Dressing roads, work sites, and tower and structure sites to remove ruts and leveling, discing, and preparing areas for seeding, if required;
- Repairing gates and fences to their original condition or better;
- Grounding of fences and trellises, as needed;
- Seeding and revegetation, undertaken as specified in the mitigation steps;
- Repairing any damage that can be accomplished with PG&E construction forces;
- Removing construction facilities and restoring the land according to the terms of the easement; and
- Contacting property owners and processing any claims for settlement.

B.3.2 CONSTRUCTION PROCEDURES FOR GATES-ARCO-MIDWAY 230 KV RECONDUCTORING

As described in Section B.2.1.4, after the new 500 kV transmission line is installed between the Los Banos and Gates Substations, transmission improvements to the existing 230 kV transmission line between the Gates and Midway Substations (about 70 miles), including the transmission line loop that serves the Arco Substation northwest of Midway the 230 kV transmission system south of Gates, would also be required. One of the two options PG&E is considering is reconductoring the existing line.

Prior to reconductoring, landowners would be contacted to secure permission to obtain access to the right-of-way. Some land areas would be temporarily disturbed by vehicle use, but additional grading is not anticipated. Disturbed areas would include areas for stringing and tensioning as well as areas within and adjacent to the right-of-way, which would be used for reconductoring work. The right-of-way is approximately 360 feet wide for the approximately 70-mile segment, which includes the right-of-way for the 230 kV and the two 500 kV lines. The right-of-way width for the 230 kV Arco tap is about 100 feet.

Before conductor removal, a temporary clearance structure would be installed at road crossings (I-5) and at other locations where the conductors might otherwise contact existing electrical or communication facilities and vehicular traffic during removal.

Pulling and tensioning sites would be established along the right-of-way at about 5-mile intervals. The existing conductor would be detached from the tower structures and placed in a stringing sheave. As the conductor is pulled from the towers, it would be used to pull the new conductor into place. After the new conductor is attached, the crews move onto a new location; clearance structures are removed; the site is cleaned up, and the land is returned to the original state. Any need for equipment storage or laydown areas will be accommodated within the fence lines of either Midway or Arco Substations.

B.3.3 CONSTRUCTION PROCEDURES FOR THE GATES LOOP

As described in Section B.2.1.5, two of the six new towers will be located on PG&E owned land, one on land leased for agricultural purposes and one within the existing fence line. A third tower will be located on agricultural land to the north of the substation and three towers will be located on agricultural land south of the substation. All of the new towers will be located within an existing PG&E right-of-way, immediately adjacent to the Los Banos-Midway No. 1 line. This right-of-way was acquired in 1972. At that time compensation was provided to the landowner. Seven existing towers will be removed. Although PG&E will likely retain the right-of-way, the former tower sites could be returned to agricultural use.

B.3.4 CONSTRUCTION OF SUBSTATION IMPROVEMENTS (LOS BANOS, GATES, AND MIDWAY SUBSTATIONS)

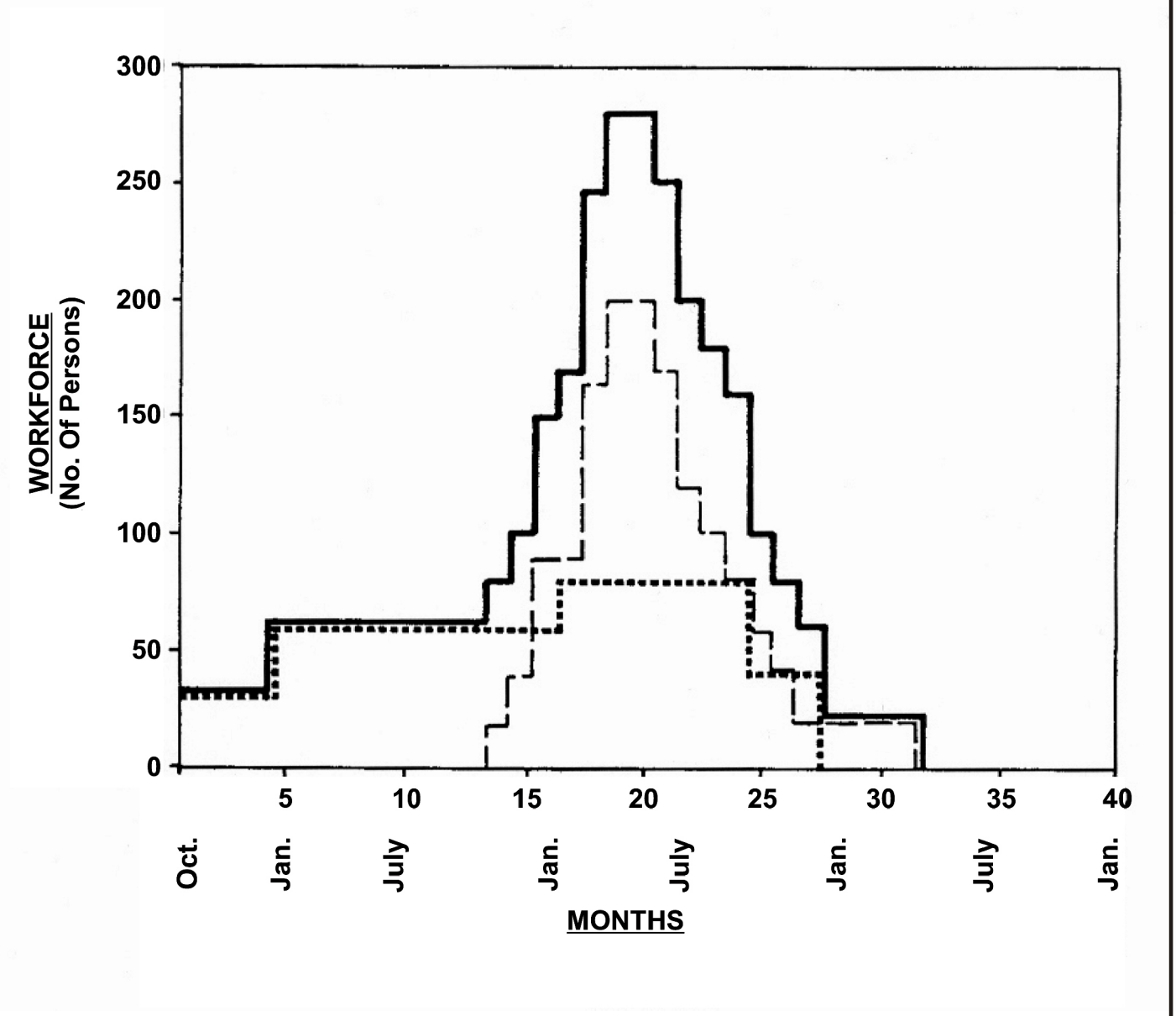
To accommodate the Los Banos-Gates 500 kV Transmission Project, the substation improvements defined in Table B-1, and discussed in Sections B.2.1.2 and B.2.1.3, will need to be completed. All of the substation improvements being proposed will be within the existing substation fence line. All of the construction activities and laydown areas will also be within the existing fence line.

B.3.5 CONSTRUCTION WORKFORCE AND EQUIPMENT

The total construction workforce is separated into two workforces that work concurrently during the construction period: one for substation improvements and another for transmission line construction. As illustrated in Figure B-8, the ~~total~~ construction workforce for the Los Banos-Gates Project north of Gates Substation will average approximately 110 workers over 27 months. The substation workforce is small and relatively stable in size for the length of the construction period, except for the last three months as construction on the substations is completed. Table B-3 lists typical equipment used during construction.

Because the transmission line construction period is only about 14 months long, that workforce will peak and decline rapidly. In the first two months, the workforce will range from 20 to 40 when site clearing and grading are beginning. As different phases of work begin, the workforce will increase to about 90 in the third and fourth months and eventually peak between 150 and 200 workers in the sixth and seventh months, and gradually decline over the next 7 months to a minimal workforce that will remain after operation to finish cleanup activities.

~~All construction crews are expected to come from within PG&E. Use of subcontractors is not expected and hiring of new employees will be minimal, if at all.~~None of the construction crews are expected to come from within PG&E. The use of out-of-state contractors is expected for the construction of the new 500 kV line, substation modifications, and the 230 kV reconductoring work. ~~Although construction crews will come from all over the PG&E system, an emphasis will be made to use workers from the local San Joaquin Valley area. Even so, about 50 percent of the workers would likely come from outside the local area and commute on a weekly basis.~~ Due to the short duration of construction of the Proposed Project, ~~N~~no workers are expected to permanently relocate their families to the San Joaquin Valley.



Note: Excluding labor south of Gates Substation.

Source: TANC/WAPA, 1986.

Los Banos-Gates 500 kV Transmission Project

New Figure B-8

Labor Workforce

Aspen Environmental Group

Table B-3 Equipment Used During Construction

Equipment	Use
Access, Clearing and Cleanup	
Crawler tractor	Road construction
Motorized grader	Maintain Roadways
Tractor-mounted backhoe	Install drainage
Truck-mounted auger	Install fences
½-ton pickup truck	Transport personnel
Crew-cab truck	Transport personnel
Air compressor	Drive pneumatic tools
2-ton truck	Haul materials
Tower Construction	
½-ton pickup trucks	Transport personnel
Crew-cab trucks	Transport personnel
Mechanics service trucks	Service vehicles
Truck-mounted auger	Excavate foundations
Crawler-mounted auger	Excavate foundations
Compressors	Drive pneumatic tools
5-ton and 10-ton trucks	Haul materials
20-ton trailer	Haul materials
Tiltbed trailer	Haul equipment
Backhoe	Excavate foundations
Crawler tractor	Excavate foundations
Concrete mixer trucks	Haul concrete
Tool van	Tool storage
Mobile office trailer	Supervision and clerical office
Assembly	
½-ton pickup trucks	Transport personnel
Crew-cab trucks	Transport personel
Tensioners (truck mounted)	Install conductor
Pullers (truck-mounted)	Install conductor
Reel trailers with reel stands (semitrailer type)	Haul conductor
Tractors (semi-type)	Haul conductor
Low-bed trailers	Haul materials
5-ton and 10-ton trucks	Haul materials
20-ton trailer	Haul materials
Take-up trailers (sock line)	Install conductor
Reel winders	Install conductor
Crawler tractors	Install conductor
Auger (truck-mounted)	Excavate pole holes
15-, 30-, and 80-ton cranes (mobile)	Erect structures
Line truck	Install clearance structures
Tool vans	Tool storage
Mobile office trailer	Supervision and clerical office

B.3.6 RIGHT-OF-WAY ACQUISITION

If the CPUC approves PG&E's Application for a CPCN, and PG&E proceeds with the project, PG&E will need to negotiate and complete contracts for right-of-way easements[7] with affected landowners. New easement rights would be required for transmission lines and access roads. For a new right-of-way, an easement to build, operate, and maintain the transmission line would be acquired. A typical PG&E easement would consist of a 200-foot right-of-way. The right of ingress and egress would also be acquired from adjacent landowners to maintain access to the right-of-way during construction and operation of the transmission line. Access would be established at a mutually convenient location for both the landowner and PG&E.

Several steps are involved in obtaining a transmission line right-of-way. First, a right-of-way agent contacts each owner and informs them that PG&E requires access to their property ~~requests permission~~ for PG&E employees or consultants to ~~enter the property and~~ conduct necessary surveys and other engineering or environmental studies.

Following surveying and mapping of the land to be crossed, an appraisal is prepared to provide a basis for determining the market value of the land rights to be acquired. The appraisal is based upon an evaluation of recent sales of comparable properties and is the basis for the payment offered by PG&E for easement rights. The right-of-way agent provides information about the type and location of the proposed line, width of the easement, conditions of the easement agreement, and the basis for payment.

Transmission line easements are always purchased, except when service is provided to a single customer. An easement value is generally determined by comparing the value of the property without the easement to the value with the easement. Claims for construction damage to land or crops, if any should occur, are generally resolved after construction is completed. PG&E attempts to minimize any such damage that may occur during construction.

PG&E pays taxes on all of its improvements within the easement area. The landowner is responsible for real property taxes on land within the easement, as determined by the local assessor's office. Under the acquired easements, the landowner would retain title to the land. Except for the land used for the tower footings (estimated to be less than one percent of the right-of-way), the landowner may continue to use the land for any compatible purpose consistent with the terms of the easement and the safety of the transmission line.

No buildings or structures may be erected within the easement. Buildings and other structures could damage the line in the event of fire or interfere with access needed for line maintenance. Additionally, wells may not be placed in the easement area because of overhead hazards associated with well drilling and maintenance. As explained above under right-of-way clearing, trees in excess of 15 feet in height that could interfere with line operation would also be prohibited. Other activities that are not inconsistent with the operation and maintenance of the transmissions line may be conducted on the

[7] Easements are the land rights acquired for a transmission line, which are needed for construction, maintenance, and operation.

easement. Farming and grazing are generally encouraged within the right-of-way if appropriate precautions are observed. If necessary, appropriate techniques would be used within the right-of-way to control vegetation that might interfere with reliable service.

The Public Utilities Code grants regulated public utilities, including PG&E, the right of eminent domain. This gives utilities the power to acquire property rights through the courts for facilities to be built in the public interest. As a last resort, eminent domain proceedings, sometimes called condemnation actions, are used if an agreement cannot be reached between a landowner and PG&E or, occasionally, when an owner cannot for some reason legally grant an acceptable easement. Because PG&E has the right of eminent domain, its acquisition of the land required for this project is assumed in this SEIR.

B.4 OPERATION AND MAINTENANCE PROCEDURES

B.4.1 OPERATIONAL CHARACTERISTICS AND PROCEDURES

The proposed transmission line would be energized and operated at a nominal voltage of 525 kV, plus or minus five percent. Changes in load flow would cause minor fluctuations in the actual operating voltage. System dispatchers in power control centers would direct the day-to-day line scheduling and equipment operation by supervisory control to operate, maintain, and protect the system. Circuit breakers would operate automatically in an emergency to help ensure the safety of the system.

B.4.2 GENERAL SYSTEM MONITORING AND CONTROL

According to information presented in the Draft EIR/EIS, a maintenance program would be established to ensure continued reliable service of the transmission system. The proposed transmission line structures, access roads, and rights-of-way would be regularly inspected by air patrol or, if necessary, by foot or vehicle, one to three times per year. Emergency repairs would be made if the transmission line were damaged and required immediate attention. Maintenance crews of fewer than 10 persons would use tools, trucks, assist trucks, aerial lift trucks, cranes and other equipment necessary for repairing and maintaining insulators, conductors, structures and access roads.

C.2 Air Quality

Remove Page(s):	**Replace With:**
C.2-1 to C.2-2	**New** C.2-1 to **New** C.2-2
C.2-4 to C.2-5	**New** C.2-4 to **New** C.2-5
C.2-10 to C.2-13	**New** C.2-10 to **New** C.2-13
C.2-16 to C.2-17	**New** C.2-16 to **New** C.2-18

C.2 AIR QUALITY

This section provides an updated environmental setting and impact analysis from that presented in the Final Environmental Impact Statement/Environmental Impact Report (FEIS/EIR) for the California-Oregon Transmission Project and the Los Banos-Gates Project (TANC/WAPA, 1988). Section C.2.1 describes the environment of the project area, and Section C.2.2 describes the regulations relevant to air quality. Section C.2.3 describes the environmental impacts and mitigation measures of the Proposed Project; Sections C.2.4 and C.2.5 describe environmental impacts and mitigation measures of the alternatives; and Section C.2.6 presents the Mitigation Monitoring Table.

Essentially all the air quality data and analysis presented in this document has been updated to reflect the current environmental baseline and regulatory conditions, as opposed to the conditions presented in the 1988 FEIS/EIR. The Federal Clean Air Act Amendments (CAAA) of 1990 were not in place at the time that the FEIS/EIR was released. It is currently the most widely enforced regulatory tool to reduce air pollution emissions. The CAAA establishes non-attainment area classifications ranked according to the severity of the area's air pollution problem, thus triggering varying requirements the area must comply with in order to meet the standard. In 1991, the California Air Resources Board (CARB) divided the State into separate air basins with similar geographical and meteorological conditions. At the time of the 1988 FEIS/EIR, air pollution was regulated by county air pollution control districts (APCDs). Although this is still the practice of most counties in California, the county agencies in the San Joaquin Valley Air Basin (e.g., Merced APCD, Fresno APCD, etc.) realized that air quality problems would be best managed on a regional basis and so they combined their regulatory agencies into one regional agency, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD).

General air quality in the San Joaquin Valley Air Basin (SJVAB) has not improved since the release of the 1988 FEIS/EIR. Although steady statewide progress has been made that has reduced levels of carbon monoxide, the same cannot be said for ozone and PM_{10} levels in the SJVAB. Ozone and PM_{10} are currently classified as non-attainment of Federal and State Standards and on June 19, 2000, a notice was published in the Federal Register formally notifying the public that the U.S. Environmental Protection Agency (USEPA) was proposing to redesignate the SJVAB from serious to severe non-attainment of the National Standard for ozone.

The 1988 FEIS/EIR indicated that transmission line construction and operation would not be a significant source of air pollutants. For this SEIR, the SJVUAPCD has recommended a 10-ton per year threshold of significance for assessment of potential construction-related impacts associated with ozone precursor emissions. The 1988 FEIS/EIR did not quantify ozone precursor emission levels associated with project construction. The air analysis for this SEIR provides quantification of ozone precursor emissions associated with the Proposed Project. Emissions associated with one ozone precursor (NO_X) were found to be significant. Although it was likely that NO_X emissions generated by the construction of the Eastern Corridor Alternative would be less than those generated under the Proposed Project, it is anticipated that NO_X emissions associated with the Eastern Corridor Alternative would also be significant.

With regard to fine particulates (PM10), the 1988 FEIS/EIR found that impacts would be less than significant with implementation of a mitigation measure that would require frequent watering of the construction sites. Similar to the findings of the FEIS/EIR, this SEIR finds construction PM10 emissions to be less than significant with implementation of the current SJVUAPCD mandatory Regulation VIII control measures and additional recommended mitigation measures, which are much more comprehensive than the mitigation measure recommended in the FEIS/EIR.

The Eastern Corridor Alternative would have less severe impacts than the Proposed Project, although the impact significance levels are the same. Construction of the Eastern Corridor Alternative would not require the development of as many new access roads to each tower location as the Proposed Project. Construction of access roads would require heavy diesel construction equipment that would disturb the ground surface generating PM_{10} emissions, and would produce exhaust that would contain ozone precursor emissions.

C.2.1 ENVIRONMENTAL BASELINE

C.2.1.1 Climate and Meteorology

The study area in which the Proposed Project and Alternative Segments are located is in the San Joaquin Valley Air Basin (SJVAB), which is approximately 250 miles long and an average of 35 miles wide (see Figure C.2-1). The region's air quality is directly related to the basin's topographic features. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the coast ranges in the west (~~6,000 to 8,000~~averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The Valley opens to the sea at the Carquinez Straits into the San Francisco Bay Area. The mountains surrounding the Valley restrict air movement through and out of the basin: the coast range hinders wind access into the San Joaquin Valley from the west, the Tehachapis ~~prevent~~ limit southerly passage of air flow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak air flow that becomes blocked vertically by high barometric pressure over the San Joaquin Valley. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers[1], which vary from 1,500 to 3,000 feet (SJVUAPCD, 1998).

Climate Effects on Air Quality. Specific climatological effects can exacerbate air quality problems in the SJVAB: temperature and precipitation, wind speed and direction, inversion layers, and fog. Temperature and solar radiation (sunshine) are particularly important in the chemistry of ozone formation. Ozone is formed in a photochemical reaction, which requires sunlight. Generally, the higher the temperature, the more ozone is formed, because reaction rates increase with temperature.

[1] A temperature inversion layer is a ~~the height that a~~ layer of warm air ~~contacts~~ over cooler air below. Inversion layers can present problems in polluted areas because they resist the natural dispersion and dilution of air contaminants.

However, extremely hot temperatures can "lift" the inversion layer. Typically, if the inversion layer does not lift to allow the build up of contaminants to be dispersed, the ozone levels will peak in the late afternoon. When winds occur, the ozone levels peak in the early afternoon and decrease in the later afternoon as the contaminants become dispersed. Temperature is not as important in the formation of high carbon monoxide (CO) or particulate matter less than 10 microns (PM_{10}; SJVUAPCD, 1998).

Precipitation and fog tend to reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. CO is slightly water-soluble so precipitation and fog tends to reduce CO concentrations in the atmosphere. PM_{10} is somewhat washed from the atmosphere with precipitation (SJVUAPCD, 1998).

Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind can disperse pollution by mixing vertically and by transporting it to other locations.

The vertical dispersion of air pollutants in the Basin is limited by the presence of persistent temperature inversions. ~~A temperature inversion is when air temperature increases with height to a point~~The height of the base of the temperature inversion is referred to as the "mixing height." The mixing height of a temperature inversion represents an abrupt density change where little exchange of air occurs.

Temperature and Precipitation. Monitoring stations in Los Banos and Five Points were selected to represent the average climate of the northern and southern portions of the study area, respectively. The Los Banos weather station is approximately one-half mile east of Milepost (MP) 3 of Proposed Segment 3. The Five Points weather station is approximately 7 miles east of MP 64 of the Eastern Corridor Alternative Segment 5. As described in Table C.2-1, average summer (July) high and low temperatures in the Los Banos area are 94.1 F and 64.2 F, while the average summer high and low in Five Points are 97.4 F and 62.6 F. Average winter (January) high and low temperatures in the Los Banos area are 53.6 F and 39.1 F, while the average winter high and low in Five Points are ~~53.6~~ 55.2 F and ~~39.1~~ 36.5 F. Annual rainfall at the Los Banos and Five Points monitoring stations average approximately 8.53 and 6.91 inches, respectively. Most of the annual rainfall occurs between November and April, with minor precipitation during summer months. Snow and hailstorms are rare in the project area and severe snow and hailstorms are very rare.

Wind Speed and Direction. During the summer months, wind usually originates at the north end of the Basin and flows in a south-south~~w~~easterly direction through the Basin, through Tehachapi pass, and into the Southeast Desert Air Basin. The mean wind speed in the summer ranges from 16 to 20 mph. In the winter, wind speed and direction data indicate that wind occasionally originates from the south and blows in a north-northwesterly direction. During the winter months, the Basin experiences light, variable winds, less than 10 mph (SJVUAPCD, 1998).

Temperature Inversions. Temperature inversions are more persistent (stable) during the winter months, when the inversion usually occurs 500 to 1,000 feet above the valley floor (SJVUAPCD, 1998). Compared to summer inversion~~s~~ layers that are typically 1,500 to 3,000 feet above the Valley floor,

winter inversions tend to create more localized ~~greater~~ air pollution problems because pollutants are~~stay~~ concentrated below the inversion layer, rather than dispersed~~ing~~ upward, which dilutes the pollutants.

Table C.2-1 Monthly Temperature and Precipitation in the Project Area

Month	Los Banos			Five Points		
	Temperature (F)		Precipitation (inches)	Temperature (F)		Precipitation (inches)
	Maximum	MINIMUM		Maximum	MINIMUM	
January	53.6	39.1	1.80	55.2	36.5	1.48
February	60.0	42.9	1.72	62.7	39.9	1.28
March	65.1	46.0	1.34	68.1	41.9	1.05
April	72.0	49.3	0.46	75.5	45.7	0.52
May	79.8	54.7	0.03	83.9	50.9	0.27
June	87.6	60.3	0.05	91.5	57.1	0.10
July	94.1	64.2	0.03	97.4	62.6	0.01
August	92.8	63.4	0.03	95.3	61.5	0.02
September	87.5	60.7	0.29	90.2	57.9	0.21
October	77.5	54.4	0.44	80.3	50.2	0.35
November	63.7	45.7	0.98	66.6	51.5	0.72
December	54.0	38.5	1.10	55.5	36.2	0.90

Note: The periods of record for the Los Banos and Five Points stations are from July 1, 1968 to December 31, 2000, and December 1, 1948 to July 31, 2000, respectively.
Source: Western Regional Climate Center, 2001.

Fog. Between winter storms, high pressure and light winds allow cold moist air to pool on the Valley floor. This creates strong low-level temperature inversions and very stable air conditions. These conditions create the Valley's famous Tule Fog. The formation of the Tule Fog is caused by local cooling of the atmosphere until it reaches its dew point and becomes saturated. This type of fog is known as radiation fog. Conditions favorable to fog are also conditions favorable to high concentrations of CO and PM_{10}. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights prior to the formation of fog, when a strong surface inversion is present and large numbers of fireplaces are in use (SJVUAPCD, 1998).

C.2.1.2 Existing Air Quality

Criteria Pollutants. The quality of the surface air (air quality) is evaluated by measuring ambient concentrations of criteria pollutants, which are air pollutants for which acceptable levels of exposure can be determined and for which standards have been set. The degree of air quality degradation is then compared to the current National and California Ambient Air Quality Standards (NAAQS and CAAQS). Because of unique meteorological problems in California, and because of differences of opinion by medical panels established by the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (USEPA), there is considerable diversity between State and Federal standards currently in effect in California. In general, the CAAQS are more stringent than the corresponding NAAQS. The standards currently in effect in California are shown in Table C.2-2.

- ***Fugitive Dust (PM_{10}).*** The SJVUAPCD's approach to CEQA analyses of PM_{10} construction emissions is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emissions. The SJVUAPCD emphasizes implementation of the control measures outlined in Regulation VIII (see Table C.2-6) for all sites and implementation of additional enhanced measures for all large construction projects to reduce potential significant construction impacts to a level that is less than significant.
- ***Ozone Precursor Emission Thresholds (ROC and NO_X).*** The SJVUAPCD does not have standard construction significance thresholds for ozone precursors (SJVUAPCD, 1998). However, the SJVUAPCD recommends a 10-ton per year threshold for assessment of potential construction related impacts associated with ozone precursor (ROC and NO_X) emissions for large construction projects lasting many months (SJVUAPCD, 2001a). Therefore, construction-generated ROC or NO_X emissions in excess 10 tons would be considered to have a significant air quality impact.

Operations

The thresholds for ozone precursors and carbon monoxide concentrations are presented below. Thresholds for offensive odors and toxic air contaminants are not addressed below because such operational impacts would not occur under the Proposed Project.

- ***Ozone Precursor Emissions Thresholds.*** Ozone precursor emissions from project operations exceeding 10 tons per year would be considered to have a significant air quality impact per SJVUAPCD operational significance thresholds (SJVUAPCD, 1998). Both direct (on site) and indirect (off site) operational emissions should be evaluated.
- ***Local Carbon Monoxide (CO) Concentrations Thresholds.*** Estimated CO concentrations exceeding the CAAQS of 9 parts per million (ppm) averaged over 8 hours and 20 ppm for 1 hour would be considered a significant impact (SJVUAPCD, 1998).

C.2.3.3 Impacts and Mitigation Measures from 1988 Final EIR/EIS

Table C.2-7 presents all of the air quality impacts from the Final EIS/EIR and their significance (after mitigation) as well as the impacts and significance identified in this SEIR.

Table C.2-7 Summary of Impacts: 1988 FEIS/EIR* and SEIR

Final EIS/EIR Impact	Significance	SEIR Impact	Significance
Dust and engine emissions	Less than significant	**Impact 2-1**: PM_{10} emissions from construction disturbance. **Impact 2-3**: Equipment emissions related to inspection and maintenance of the Proposed Project.	Less than significant with mitigation
		Impact 2-2: Construction equipment exhaust emissions of ozone precursors (ROC and NO_X).	Significant

* Impacts summarized from FEIS/EIR Table 2-B, Summary of Significant Environmental Impacts, Applicable Mitigation Measures, and Mitigation Effectiveness for Los Banos-Gates.

The FEIS/EIR (TANC/WAPA, 1988) concluded that the construction, operation, and maintenance of the proposed 500 kV transmission line project would not significantly impact air quality. The mitigation measures listed in Table C.2-8 were recommended to minimize potential adverse project impacts. The second column of this table shows how the 1988 recommendation is addressed in this SEIR. The mitigation measures recommended in the EIS/EIR are not recommended in this document

because current laws (Regulation VIII) and mitigation measures developed by the SJVUAPCD are much more comprehensive.

Table C.2-8 Mitigation Measures from 1988 FEIS/EIR

Measure from 1988 FEIR/EIS	Disposition
Soil surfaces will be wetted at a rate of 0.5 gallons of water per square yard two times per day for dust control (EPA 1977). This measure reduces dust by about 50 percent.	Covered by Regulation VIII
When possible construction activities should be scheduled during periods of low wind to reduce fugitive dust emissions.	Mitigation Measure **A-1** supersedes this measure
All construction equipment should be frequently monitored and serviced to ensure conformance with exhaust standards.	Mitigation Measure **A-2** supersedes this measure

C.2.3.4 Construction Impacts

The following impacts to air quality associated with the Proposed Project have been identified:

- **Impact 2-1.** PM_{10} emissions from construction disturbance.
- **Impact 2-2.** Construction equipment exhaust emissions of ozone precursors (ROC and NO_X).
- **Impact 2-3.** Equipment emissions related to inspection and maintenance of the Proposed Project.

Impact 2-1: PM_{10} emissions from construction disturbance

Many construction activities associated with the Proposed Project, such as earth-moving operations (e.g., augering and pole access road development) and soil disturbance from construction equipment (especially from travel over unpaved roads), would generate PM_{10} emissions. PM_{10} emissions can vary greatly depending on the level of activity, the specific activities taking place, and weather and soil conditions. Implementation of the SJVUAPCD Regulation VIII Control Measures presented in Table C.2-6, combined with the additional enhanced mitigation measures presented below, would reduce potentially significant PM_{10} emission impacts to levels that are less than significant (**Class II**).

Mitigation Measure for Impact 2-1, PM_{10} Emissions

The following PM_{10} mitigation measure shall be implemented in addition to Regulation VIII control measures during project construction to reduce potential PM_{10} impacts to less than significant levels (**Class II**).

A-1 The following procedures for reducing fugitive dust shall be implemented. Records documenting personnel awareness and the wind speed log shall be maintained at the construction site and shall be provided to CPUC's environmental monitor upon request. In order for the items listed below to be modified, the Applicant shall provide the CPUC with written approval from SJVUAPCD of such modifications prior to the commencement of construction activities.

- Traffic speeds on unpaved roads shall not exceed 15 mph, except on portions of project access roads that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW. Per Mitigation Measure B-8, the designated speed limit within those areas is 10 mph (see Section C.3.3.5.2). PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the unpaved road speed limit restriction. The signed statement shall specify that 15 mph is the maximum speed limit on any unpaved road, except on project access roads that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW, where the maximum speed limit is 10 mph.

- Wash off all truck tires and equipment leaving the construction site. PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness that tires and equipment leaving the construction site are to be washed.
- Suspend excavation and grading activity when winds exceed 20 mph for a sustained period of 10 minutes, as measured by an anemometer. PG&E shall measure the wind speed with the anemometer when moderate to high winds occur, based on the fair judgment of a designated PG&E representative. PG&E shall maintain a written log to be maintained at the construction sites that documents day, time, and wind speed of each measurement.

Impact 2-2: Construction equipment exhaust emissions of ozone precursors (ROC and NO_x)

Because the SJVUAPCD has specifically requested that the CPUC use a construction significance threshold of 10 tons per year to assess potential impacts associated with NO_x and ROC from project construction (SJVUAPCD, 2001a), assumptions regarding the types and use of construction equipment were made to estimate the emissions of NO_x and ROC that would be generated during the peak 12 months of project construction.

Emission levels for construction activities vary with the type of equipment, duration of use, operation schedules, and the number of construction workers. Because of the length of this transmission line project (84 miles), for the purposes of this analysis, it is assumed that two construction spreads would operate simultaneously for the following emission activity sources: access, clearing, and cleanup; tower construction; transmission line assembly; and substation improvements. Table C.2-9 presents the estimated construction emissions for the Proposed Project. Project construction emissions were estimated using emission factors from the South Coast Air Quality Management District's *CEQA Air Quality Handbook*, 1993 and Appendix J of USEPA's AP-42, 1998. Refer to Appendix 3 for all other assumptions and calculations used to estimate the emissions. As indicated in Table C.2-9, the estimated NO_x construction emissions associated with the Proposed Project are above SJVUAPCD's recommended significance threshold of 10 tons for the peak year of construction.

Table C.2-9 Annual Ozone Precursor Emissions from Project Construction

Source	ROC (tons)	NO_x (tons)
Worker Commute Trips	1.32	~~0.01~~2.01
Access, Clearing, and Cleanup	0.36	3.18
Tower Construction	1.66	14.02
Transmission Line Assembly	0.43	3.57
Substation Improvements	0.50	5.47
TOTAL Emissions	**4.27**	**~~26.25~~28.25**
SJVUAQMD Emission Threshold	10	10
Exceedance of the SJVUAQMD Thresholds?	**NO**	**YES**

Ozone precursor emissions from construction would exceed the applicable SJVUAPCD significance criteria for this project, which would result in significant impacts (**Class I**). Although it is anticipated that the Proposed Project would create significant impacts that cannot be reduced to levels that are less than significant, it is the responsibility of the Lead Agency to apply all available feasible mitigation measures to the project to reduce impacts as much as possible. Therefore, Mitigation Measures **A-2** and **A-3** described below are recommended to further reduce emissions.

Mitigation Measures for Impact 2-2, Ozone Precursor Emissions during Construction

A-2 Construction equipment shall be maintained in tune, per manufacturing specifications. PG&E/contractor shall provide a maintenance schedule for all vehicles and equipment. PG&E/contractor shall provide a certification from a third-party certified mechanic stating the timing of all internal combustion construction equipment engines has been properly maintained. PG&E/contractor shall re-certify each piece of construction equipment/vehicle based on the respective manufacturer maintenance schedule. Certifications shall be provided to the CPUC before the start of construction, and on an ongoing basis as new equipment is brought to the construction site.

A-3 Vehicles shall not idle in excess of ten minutes. PG&E shall ensure that project personnel operating vehicles (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the idling restrictions and these records shall be maintained at the construction site for inspection by the CPUC environmental monitor.

C.2.3.5 Operational Impacts

Impact 2-3: Equipment emissions related to inspection and maintenance of the Proposed Project

Emission sources associated with operation of the proposed 84-mile 500 kV transmission line and associated substations would be related to inspection and maintenance of the transmission line, instrumentation and control, substations, and support systems. As described in Section B.4, PG&E would inspect all of the structures from the surface annually for corrosion, misalignment, etc. The proposed transmission line structures, access roads, and rights-of-way would be regularly inspected by air patrol or, if necessary, by foot or vehicle, one to three times per year. Emergency repairs would be made if the transmission line were damaged and required immediate attention. Maintenance crews of fewer than 10 persons would use tools, trucks, assist trucks, aerial lift trucks, cranes and other equipment necessary for repairing and maintaining insulators, conductors, structures and access roads. Emissions generated by routine maintenance and inspection activities would be minimal and well below the SJVUAPCD's operational significant criteria because of the short-term and periodic nature of project operational activities. Potential impacts associated with proposed operations of the project are considered to be adverse, but less than significant (**Class III**).

C.2.3.6 Proposed Changes South of Gates Substation

PG&E has indicated that one option for the reconfiguration of the electrical system south of Gates Substation would require that the entire 70 miles of existing double circuit 230 kV line serving Gates-Arco-Midway be reconductored. Reconductoring requires removal of the existing conductors and installation of new conductors with greater capacity. According to PG&E, it is unlikely that this reconductoring would require structural enhancements to the existing towers, installation of new towers, or development of new access roads. This construction work would include limited or no ground disturbance. Implementation of the applicable SJVUAPCD Regulation VIII Control Measures would insure that all impacts associated with PM_{10} emissions (Impact 2-1) are less than significant (**Class III**).

Table C.2-10 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Proposed Project and Alternatives						
2-1: Construction fugitive dust emission levels	**A-1:** The following procedures for reducing fugitive dust shall be implemented. Records documenting personnel awareness and the wind speed log shall be maintained at the construction site and shall be provided to CPUC's environmental monitor upon request. In order for the items listed below to be modified, the Applicant would be required to provide the CPUC with SJVUAPCD written approval of such modifications prior to the commencement of construction activities. • Traffic speeds on unpaved roads shall not exceed 15~~5~~ mph, except on portions of project access roads that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW. Per Mitigation Measure B-8, the designated speed limit within those areas is 10 mph (see Section C.3.3.5.2). PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the unpaved road speed limit restriction. The signed statement shall specify that 15~~5~~ mph is the maximum speed limit on any unpaved road, except on project access roads that are in designated areas where blunt-nosed leopard lizards are known to occur and/or within the Project ROW, where the maximum speed limit is 10 mph. • Wash off all truck tires and equipment leaving the construction site. PG&E shall insure that all project personnel (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness that tires and equipment leaving the construction site are to be washed. • Suspend excavation and grading activity when winds exceed 20 mph for a sustained period of 10 minutes, as measured by an anemometer. PG&E shall measure the wind speed with the anemometer when moderate to high winds occur, based on the fair judgment of a designated PG&E representative. PG&E shall maintain a written log to be maintained at the construction sites that documents day, time, and wind speed of each measurement.	All unpaved roads used by the construction crews; All construction sites adjacent to public roads; all construction sites where the ground will be disturbed	Construction plan; CPUC to monitor construction activities	PM_{10} emissions are reduced, Effectiveness cannot be monitored in the field	CPUC and the SJVUAPCD	During construction and operations, if applicable

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Proposed Project and Alternatives						
2-2: Construction ozone precursor emission levels	**A-2:** Construction equipment shall be maintained in tune, per manufacturing specifications. PG&E/contractor shall provide a maintenance schedule for all vehicles and equipment. PG&E/contractor shall provide a certification from a third-party certified mechanic stating the timing of all internal combustion construction equipment engines has been properly maintained. PG&E/contractor shall re-certify each piece of construction equipment/vehicle based on the respective manufacturer maintenance schedule. Certifications shall be provided to the CPUC before the start of construction, and on an ongoing basis as new equipment is brought to the construction site.	All construction sites	Construction plan; CPUC to monitor construction activities	NO_x emissions are reduced, Effectiveness cannot be monitored in the field	CPUC and the SJVUAPCD	During construction
	A-3: Vehicles shall not idle in excess of ten minutes. PG&E shall ensure that project personnel operating vehicles (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the idling restrictions and these records shall be maintained at the construction site for inspection by the CPUC environmental monitor.	All construction sites	Construction plan; CPUC to monitor construction activities	NO_x emissions are reduced, Effectiveness cannot be monitored in the field	CPUC and the SJVUAPCD	During construction

C.2.7 REFERENCES

BAAQMD (Bay Area Air Quality Management District). 1999. *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*. Revised December.

CARB (California Air Resources Board). 2001. *Aerometric Data Analysis and Management System website (http://www.arb.ca.gov/adam).*

_____. 2000. California Ambient Air Quality Data 1980–1999.

EMEC (Earth Matters Environmental Consulting). 2000. *Transportation/Air Quality Bulletin*, June.

SCAQMD (South Coast Air Quality Management District). 1993. *CEQA Air Quality Handbook*.

SJVUAPCD (San Joaquin Valley Unified Air Pollution Control District). 1998. *Guide for Assessing and Mitigating Air Quality Impacts*, August 20.

_____. 2001a. Personal communication between Matt Fagundes of Aspen Environmental Group and Dave Mitchell, Supervising Air Quality Planner at the SJVUAPCD, Aug 6.

_____. 2001b. Letter to Robert Masuoka of PG&E from Dave Mitchell, Supervising Air Quality Planner at the SJVUAPCD, May 22.

TANC/WAPA (Transmission Agency of Northern California and Western Area Power Administration). 1986. Draft Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. November.

_____. 1988. Final Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. January.

USEPA (U.S. Environmental Protection Agency). 2001a. Personal communication between Matt Fagundes and Bob Pallrino of the USEPA Region 9 Air Division, August 10.

_____. 2001b. Personal communication (e-mail) between Matt Fagundes and Dave Guiliano of the USEPA Region 9 Air Division, August 6.

_____. 1998. AP-42, Appendix J.

WRCC (Western Regional Climate Center). 2001. Period of Record Monthly Climate Summaries for Los Banos and Five Points, Accessed WRCC Internet site (http://www.wrcc.sage.dri.edu) on August 1.

C.3 Biological Resources

Remove Page(s):	**Replace With:**
C.3-1 to C.3-69	**New** C.3-1 to **New** C.3-70

(Note: Do not remove Figures C.3-1a to C.3-1e)

C.3 BIOLOGICAL RESOURCES

This chapter provides an update on the biological resource impacts from the information presented in the Final Environmental Impact Statement/Environmental Impact Report (FEIS/EIR) for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project (TANC/WAPA, 1988). The biological setting of the project area does not differ significantly from that described in the 1988 FEIS/EIR. Updated aerial imagery confirms that the majority (75 percent) of the Proposed Western Corridor and Western Corridor Alternative Segments still consist of annual grassland. Conversely, 84 percent of the Eastern Corridor Alternative consists of agricultural land. The most noticeable change is that amount of agricultural land along the southern portion of the Western Corridor has increased, reducing the available habitat for native species of plants and wildlife.

The list of plant and animal species potentially affected by the project has changed substantially due to considerable changes to the legal status of many plant and animal species in the Project vicinity since the 1988 FEIS/EIR and updated information on these species from April 2001 field surveys. Some species that were previously federal candidates for endangered or threatened listing have since become either federal Species of Concern or have been elevated to threatened or endangered status. Similarly, some species previously listed as California Species of Concern have lost this status. Others, which had no legal status in 1988 have since become California Species of Concern.

The types and extent of potential effects from construction, operation, and maintenance of the Proposed transmission line remain similar to those described in the 1988 FEIS/EIR. No significant unmitigable impacts to biological resources were identified in the FEIS/EIR, but this SEIR identifies the potential for significant and unmitigable effects on special status plant and wildlife species. This impact cannot be further defined until specific locations of towers, access roads, and work areas are identified and biological surveys have been completed.

The conclusion of the biological resources analysis is that the Eastern Corridor Alternative would have substantially fewer environmental impacts than the Proposed Western Corridor, due to the extent of agricultural land use in the Eastern Corridor Alternative.

The conclusion of the biological resources analysis is that the Eastern Corridor Alternative would have substantially fewer environmental impacts than the Proposed Western Corridor, due to the extent of agricultural land use in the Eastern Corridor Alternative. As stated by the U.S. Fish & Wildlife Service (USFWS, 2001), "The foothill and valley habitat west of Highway 5 is the only remaining natural habitat for several federally listed species associated with upland habitats of the San Joaquin Valley … The degradation and loss of habitat resulting from the proposed transmission line can be avoided by locating the project east of Highway 5" in the Eastern Corridor Alternative.

C.3.1 ENVIRONMENTAL BASELINE

This section describes the existing biological resources in the Proposed Project region, specific biological resources within the project corridor area, and the regulations applicable to biological resources. Details on species are presented in Appendix 6; that information is summarized in this section. The project corridor area for biological resources includes the Applicant's proposed

transmission line corridor (Western Corridor), several Western Corridor Alternative Segments, and an alternative corridor (Eastern Corridor Alternative), which together total some 214 miles in length. This description of existing biological resources is presented first in terms of a regional overview of the geographic sub-region and the setting of the proposed and alternative corridors. The specific environmental setting of each of the Western Corridor Alternative Segments and the Eastern Corridor Alternative is then presented in Sections C.3.3 and C.3.4, respectively.

The project area has a variety of physical features that offer a diversity of habitat types, represented by a characteristic assemblage of plant species. The large size of the area, together with its geology, soils, climate, and anthropogenic influences have combined to produce a mosaic of floristic components and associated wildlife species. The climate of the project area is dry and shares many characteristics with the desert provinces in California. Precipitation averages approximately 10 to 12 inches annually and occurs primarily during the winter months. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species.

C.3.1.1 Methodology and Data Limitations

During 1986, CH2M Hill biologists surveyed a ¼-mile wide corridor, centered on the Proposed Western Corridor, several Western Corridor Alternative Segments, and the Eastern Corridor Alternative to evaluate plant and wildlife communities and special status species (CH2M Hill, 1986). Jones and Stokes biologists conducted special status plant and wildlife surveys along a ¼-mile wide corridor, centered on the Proposed Western Corridor in Spring 2001 in order to update the 1986 information (Jones and Stokes, 2001). No surveys of the Western Corridor Alternative Segments or the Eastern Corridor Alternative were conducted in 2001. Consequently, for these alternatives, the information on biological resources and results of the 1986 surveys were adapted and extensively utilized.

C.3.1.2 Regional Overview

The project is located at the interface of the eastern Diablo Range of the California Coast Range Mountains and the western margin of the San Joaquin Valley in Merced and Fresno Counties. Most of the Proposed Western Corridor and Alternative Segments are in the foothills portion of the Diablo Mountains. Sections of the Western Corridor, at both its northern and southern ends, cross relatively flat valley topography. The Eastern Corridor Alternative is primarily in the San Joaquin Valley, but passes into the foothills, from approximately milepost (MP) 10 to MP 18.

Vegetation Overview

The vegetation communities that occur in the region are largely influenced by prevailing environmental variation and disturbance history. Individual plant communities generally separate themselves along environmental gradients (Whittaker, 1967). Gradients in soil moisture, soil fertility, temperature, slope, and other physical parameters affect the distribution of individual species and, in turn, the type of plant community that develops at a given location. Since plants generally act as individuals along these environmental gradients (Sawyer and Keeler-Wolf, 1995), it is often difficult to separate the continuum into ecologically discrete plant communities. Plant community classification, despite its

limitations, nonetheless serves an important role in grouping vegetation into relatively homogeneous units, which facilitate study and management.

The project area occurs in the broad zone between the San Joaquin Valley and Central Coast floristic provinces (Hickman, 1993). Vegetation from both provinces is present and is reflected by a transitional zone. As the escarpment rises in the hills along the Diablo Range, the San Joaquin Valley elements of the flora give way to Inner Coast Range species. Vegetation in the region primarily consists of annual grasses and croplands with low and intermediate mixed shrubs in the higher elevations. Trees are generally absent in the region, although some riparian species are present along portions of intermittent stream channels and along the margins of reservoirs. Agricultural lands occur throughout most of the San Joaquin Valley, where native plant cover has been converted to crop and grazing land.

Wildlife Overview

Individuals of many wildlife species often use multiple habitat types throughout their life cycle. Movement among habitat types or between patches of similar vegetation occurs within corridors of vegetative cover acceptable to these species. These corridors can be critical for certain wildlife species to find adequate food, water, nesting or denning sites, and breeding opportunities, or to allow seasonal movements. Where native plant cover has been converted to crop and grazing land, as is the case for most of the San Joaquin Valley, a corresponding decrease usually occurs in habitat that provides the necessary life requisites for many species. Historically, the San Joaquin Valley contained a variety of natural communities and habitats that supported numerous wildlife species. Since the turn of the century, however, much of the original natural habitat within the Valley has been converted to suburban or agricultural land uses. The remaining natural areas represent less than five percent of the total area of the San Joaquin Valley (USFWS, 1998). This loss of habitat has resulted in the elimination of many historical wildlife populations and/or the reduction of population sizes of many species. In this context, the weedy edges of fields and irrigation channels, as well as poorly maintained fields within agricultural areas, have become the only suitable habitat for many wildlife species in the Valley.

There is a corresponding increase in wildlife species diversity with vegetation diversity near the Valley margins and into the foothills of the Diablo Range. Here annual grasslands predominate on flatter areas and rolling foothills. Many wildlife species use annual grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or woody plants for breeding, resting, or cover. Mammals typically found in this habitat include the black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), badger (*Taxidea taxus*), and coyote (*Canis latrans*). Common birds known to breed in the region include the western burrowing owl (*Anthena cunicularia hypugea*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*). The area also provides important foraging habitat for raptors such as the golden eagle (*Aquila chrysaetos*), turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), and prairie falcon (*Falco mexicanus*).

Insert **Figure C.3-1** from the Draft SEIR.

Special Habitat Management Areas

Within the San Joaquin Valley, a number of areas have been designated as special habitat management areas by the California Department of Fish and Game (CDFG). The areas within this project region are depicted in Figure C.3-1 and include:

- Los Banos Wildlife Area
- O'Neill Forebay Wildlife Area
- San Luis Reservoir Wildlife Area
- Upper Cottonwood Creek Wildlife Area
- Panoche Valley.

The Los Banos Wildlife Area, under the jurisdiction of CDFG, is a 5,586-acre mosaic of seasonal and permanent wetlands, grasslands, and riparian areas. It was established in 1929 and is the oldest State-protected wildlife area in California. Many species of ducks and geese congregate here in the winter, as well as raptors and shorebirds. The Los Banos Wildlife Area is approximately 10 miles east of the Eastern Corridor Alternative and 14 miles east of the Western Corridor.

The O'Neill Forebay Wildlife Area is owned by the U.S. Bureau of Reclamation (BOR) and the California Department of Water Resources (CDWR), and operated by the California Department of Fish & Game (CDFG). This 700-acre area consists of ten miles of meandering riparian habitat, with four small ponds intermixed with shrub-grassland and some cultivated crops. Many species of waterfowl are found here, as well as raptors, shorebirds, and songbirds. The O'Neill Forebay Wildlife Area is 0.75 miles north of the Los Banos Substation.

The San Luis Reservoir Wildlife Area is an 870-acre parcel located south of State Route 152 (SR-152) in the Pacheco Pass area. It is owned by the BOR and the CDWR, and operated by the CDFG. The habitat is primarily steep oak-grassland. The San Luis Reservoir Wildlife Area is 6 miles northwest of the Los Banos Substation.

The Cottonwood Creek Wildlife Area is a 6,315-acre parcel of steep oak woodland-grassland habitat typical of higher elevation areas in the interior Coast Range. Mule deer, raptors, and numerous species of upland game birds are common here. The Cottonwood Creek Wildlife Area is 2.5 miles west of Los Banos Substation.

The Little Panoche Wildlife Area is a 780-acre parcel operated by the CDFG and provides refuge for waterfowl, swallows, and swifts. The 30-acre detention reservoir supports populations of crappie, red-eared sun-fish and black bass. The rest of the valley surrounding the reservoir is grassland habitat where common birds such as sparrows, gnatcatchers, thrashers, bluebirds, and raptors are found.

The North Grasslands Wildlife Area is under the jurisdiction of CDFG and consists of a 7,069-acre parcel of wetlands, riparian habitat, and uplands. These restored and created wetlands provide habitat for Swainson's Hawk and Sandhill Crane. The North Grasslands Wildlife Area is located 8 miles east-northeast of the junction between I-5 and State Route 165 (SR-165).

The Volta Wildlife Area is under the jurisdiction of CDFG and is a 2,891-acre parcel 6.5 miles northwest of the City of Los Banos. It is located 4.5 miles east of I-5 and 5 miles southeast of Santa Nella.

According to the landowner, there is a Kit Fox Corridor on the private land just south of the Los Banos Substation. This land was purchased by CalTrans and PG&E to fulfill U.S. Fish & Wildlife Service requirements for endangered species habitat take related to nearby construction projects. Further discussion is provided by the landowner in Comment Letter 4 (Final SEIR Appendix 1).

C.3.1.3 Environmental Setting: Proposed Project

Most of the Western Corridor occurs in the foothills portion of the Diablo Mountains. Sections of the Western Corridor, at both the northern and southern termini, cross relatively flat valley topography. There are no perennial streams draining the west slope of the Diablo Range within the Western Corridor. The ephemeral streams generally flow during late winter and early spring, and except for temporary flows immediately after a storm event, dry up by mid-summer.

C.3.1.3.1 *Vegetation*

A minimum ¼-mile wide survey corridor was used to provide regional context to evaluate plant species and communities found within the Western Corridor and right-of-way (ROW). Unless otherwise noted, the information discussed in this section is adapted and summarized from the results of 1986 biological surveys conducted by CH2M Hill. Plant communities were described according to methodologies and nomenclature developed by Holland (1986). In addition, rare plant surveys conducted in Spring 2001 by Jones and Stokes Associates are included to supplement previous information on rare plant species from 1986.

Within the Western Corridor, seven major vegetation types were identified, which include:

- Alkaline Areas
- Grasslands
- Wetlands
- Riparian Communities
- Scrub
- Barrens
- Agricultural Lands.

Table C.3-1 lists the acreage of each vegetation type by segment. Within the Western Corridor, grasslands represent the largest acreage at 75 percent (11,327 acres), followed by agricultural lands at about 22 percent (3,367 acres). Riparian (151 acres) and scrub (155 acres) communities respectively contribute to approximately one percent of the total, while marshland, alkaline, and barren areas account for approximately 0.3 percent (52 acres). These general vegetation types can be further broken down into various natural community types based on existing descriptions developed by Holland (1986), which are typically used to provide consistency for vegetation community descriptions and floristic surveys. The 11 plant community types identified in the Western Corridor are described in Appendix 6, and the locations of specific natural communities are depicted in Figures C.3-2a through C.3-2e (these figures are presented at the end of this section). Table C.3-2 relates the vegetation community classifications used in this document to those commonly used.

Table C.3-1 Distribution of Vegetation by Segment

CORRIDOR SEGMENT			VEGETATION TYPE (ACRES)						
Segment #	Length (Miles)	Total (Acres)	Grasslands	Scrub	Riparian Communities	Wetlands	Alkaline Areas	Barrens	Agricultural/ Other Lands
Western Corridor									
Segment 1	1.9	365	260	0	0	0	0	0	105
Segment 2	12.7	2,425	2,258	107	19	10	28	0	0
Segment 3	5.3	1,300	1,300	0	0	0	0	0	0
Segment 4	8.5	1,545	1,472	48	0	2	0	0	23
Segment 5	41	6,020	5,104	0	12	0	0	12	904
Segment 6	10.5	2,756	933	0	107	0	0	0	1,716
Segment 7	4	632	0	0	13	0	0	0	619
TOTAL	83.9	15,043	11,327	155	151	12	28	12	3,367
Western Corridor Alternative Segments									
Segment 2A	12.9	2350	2195	0	10	110	28	0	0
Segment 4A	9	1636	1500	60	48	28	0	0	0
Segment 6A	10.3	1588	135	0	71	0	0	0	1382
Segment 6B	11.7	3191	2831	0	82	0	0	0	275
TOTAL	43.9	8765	6661	60	211	138	28	0	1657
Eastern Corridor Alternative									
All Segments	85.7	15,296	2,390	0	209	0	0	0	12,907

Table C.3-2 Comparison of Vegetation Type Classifications

EIS Vegetation Type CH2M Hill and PG&E (1986)	Terrestrial Natural Community[1] (R. Holland, 1986)	CNDDB Natural Community[2] (1999)	CNPS Habitat Type[3] (Skinner & Pavlik, 1994)	WHR[4] (1988)
Alkaline Areas				
Iodine Bush Scrub	Alkaline Meadow (45310)	Great Valley Iodine Bush Scrub (*Allenrolfea occidentalis*; 36.110.00)	N/A	Alkali Desert Scrub (ASC)
Alkali Playa	Alkali Playa (46000)	Alkali Playa (46.000.00)	Playas (Plyas)	Alkali Desert Scrub (ASC)
Grasslands				
Cismontane Non-Native Grassland	Non-native Grassland (42200)	Red Brome dominated, Non-Native Grassland (42.025.00)	Valley & Foothill Grassland (VFGr)	Annual Grassland (AGS)
Cismontane Native Bunchgrass	Valley Needlegrass Grassland (42110)	Purple Needlegrass (*Nassella pulchra*; 41.150.00); One-sided bluegrass (*Poa secunda*; 41.180.00); Nodding needlegrass (Nassella cernua, 41.140.00)	Valley & Foothill Grassland (VFGr)	Perennial Grassland (PGS)
Wetlands				
Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh (52410)	Bulrush – Cattail Freshwater Marsh (*Scirpus* spp.-*Typha* spp.) 52.102.01	Marshes and Swamps (MshSw)	Fresh Emergent Wetland (FEW)
Cismontane Alkali Marsh	Cismontane Alkali Marsh (52310)	Cismontane Alkali Marsh (52.203.00)	Marshes and Swamps (MshSw)	Fresh Emergent Wetland (FEW)
Riparian Communities				
Central Coast Riparian Woodland	Great Valley Cottonwood Riparian Forest (61410) Sycamore Alluvial Woodland (62100)	Fremont cottonwood riparian forest and woodland (61.130.06); Central California sycamore alluvial woodland (61.311.00)	Riparian Forest (RpFrs) Riparian Woodland (RpWld)	Valley Foothill Riparian (VRI)
Alluvial and Riparian Scrub	Mulefat Scrub (63310) Valley Saltbush Scrub (36220) Tamarisk Scrub (63810)	Mulefat Scrub (*Baccharis salicifolia*; 63.510.00) Valley Saltbush Scrub (*Atriplex* spp.; 36.302.00) Shrub Tamarisk (*Tamarix* spp.; 63.810.02)	Riparian Scrub (RpScr) Chenopod Scrub (ChScr)	Valley Foothill Riparian (VRI)
Scrub				
Salt Bush Scrub	Valley Saltbush Scrub (36220)	Great Valley Allscale scrub (36.340.00) Valley Saltbush Scrub (36.600.00)	Chenopod Scrub (ChScr)	Alkali Desert Scrub (ASC)
Barrens				
Serpentine Barrens	N/A	N/A	N/A	N/A
Shale Barrens	N/A	N/A	N/A	N/A
Agricultural				
Agricultural Lands	N/A	N/A	N/A	Cropland (CRP) Pasture (PAS)

1. Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Nongame-Heritage Prog., Dep. Fish and Game, Sacramento, Calif. 156pp.
2. CDFG, 1999. List of California Terrestrial Natural Communities Recognized by the Natural Diversity Database. CA Department of Fish & Game, Natural Heritage Division, Natural Diversity Database. 65 pp.
3. Skinner, M.W. and B.M. Pavlik, 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. 337 pp.
4. Mayer, K.E. and W.F. Laudenslayer (eds.), 1988. A Guide to Wildlife Habitats of California. 166 pp.

Special Status Plants

Special status plants are defined as species listed under the Federal/California Endangered Species Acts (FESA/CESA), and the Native Plant Protection Act (NPPA) §1901, candidates for such listing, or species that would meet the criteria for listing but have not yet been formally listed, such as plants included in Lists 1A, 1B, and 2 of the California Native Plant Society's (CNPS) Inventory (Skinner and Pavlik, 1994). Plant species on CNPS Lists 3 and 4 generally do not qualify for protection under CESA and NPPA.

Many special status plant species occur within the San Joaquin Valley. Thirty-seven species with the potential to occur in the study area have been identified from recent (2001) field surveys, database records, preliminary reports, and by professional botanists familiar with the area (Table C.3-3). Nine special-status plant species were observed within the study area during April 2001 field surveys. These are listed in Table C.3-4 and include: forked fiddleneck (*Amsinckia vernicosa* var. *furcata*), crownscale (*Atriplex coronata* var. *coronata*), Lost Hills crownscale (*Atriplex vallicola*), recurved larkspur (*Delphinium recurvatum*), gypsum-loving larkspur (*Delphinium gypsophilum* ssp. *gypsophilum*), protruding buckwheat (*Eriogonum nudum* var. *indictum*), cottony buckwheat (*Eriogonum gossypinum*), Idrea buckwheat (*Eriogonum vestitum*), and San Benito poppy (*Eschscholzia hypecoides*). None of these species has a Federal or State listing status. Because precipitation in the 2000-2001 rainy season was below normal, several species that might have been present in years with normal or above-normal rainfall would not have been evident in the study area during 2001 spring surveys. Thus, although these species were not evident at known reference locations, their absence from the study area cannot be confirmed. Consequently, Table C.3-3 lists the 37 special status plant species that were not observed, but have potential to occur in the study area. Appendix 6 describes in detail the special status plants observed in the study corridor, as well as those with the potential to occur in the study area.

C.3.1.3.2 *Wildlife*

Wildlife occurs throughout the study area in suitable habitat. Species occurrence along the Western Corridor is also influenced by climate and season. Species observed along the Proposed Western Corridor are presented in Table C.3-5 and discussed below with respect the habitat types and location in which they occur.

Eight primary wildlife habitats are associated with the Proposed Project. These habitat types correspond with the vegetation types and other landscape features previously identified (and discussed in detail in Appendix 6) and comprise five upland and three general wetland/aquatic types. These include:

- Scrub
- Barrens
- Agricultural lands
- Grasslands
- Alkaline areas
- Wetlands
- Riparian
- Reservoirs and ponds.

Table C.3-3 Special Status Plant Species Occurring or Potentially Occurring in the Proposed Western Corridor (Jones and Stokes, 2001)

Common Name *Scientific Name*	Legal Status[a] Federal/State/CNPS	California Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area[b]
San Benito thornmint *Acanthomintha obovata* ssp. *Obovata*	SC/E/A	Inner South Coast Ranges, including portions of Fresno, Monterey, San Benito, and San Luis Obispo Counties	Chaparral, oak woodland, valley and foothill grassland on heavy clay, alkaline, or serpentinite soils below 5,000 feet	Apr–Jun	Moderate
Forked fiddleneck *Amsinckia vernicosa* var. *furcata*	SC/–/–	Southern San Joaquin Valley and adjacent inner south Coast Ranges including portions of Fresno, Kings, Kern, San Benito, and San Luis Obispo Counties	Annual grassland, cismontane woodland, on loose, shaly slopes, between 160 and 3,300 feet	Mar–May	Observed
Oval-leaved snapdragon *Antirrhinum ovatum*	–/–/4	Southern San Joaquin Valley; southern south inner Coast Ranges; Kern, Monterey, Santa Barbara, San Benito, San Luis Obispo, and Ventura Counties	Often alkaline, clay or gypsum substrates of chaparral, cismontane woodland, pinyon-juniper woodland, valley and foothill grassland, between 650 and 3,300 feet	May–Nov	Low
Salinas milk-vetch *Astragalus macrodon*	–/–/4	Central south Coast Ranges; Kern, Monterey, San Benito, and San Luis Obispo Counties	Chaparral openings, cismontane woodland, valley and foothill grassland on sandstone, shale, or serpentinite	Apr–Jun	Low
Heartscale *Atriplex cordulata*	SC/–/1B	Western Central Valley and valleys of adjacent foothills	Alkali grassland, alkali meadow, alkali scrub, below 660 feet	May–Oct	Low
Crownscale *Atriplex coronata* var. *coronata*	–/–/4	Southern Sacramento Valley; San Joaquin Valley; eastern south inner Coast Ranges; Alameda, Contra Costa, Fresno, Kings, Kern, Glenn, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, and Stanislaus Counties	Chenopod scrub, valley and foothill grassland, vernal pools, on fine alkaline soils below 660 feet	Apr–Oct	Observed
San Joaquin spearscale *Atriplex joaquiniana*	SC/–/1B	West edge of Central Valley from Glenn County to Tulare County	Alkali grassland, alkali scrub, alkali meadows, saltbush scrub, below 1,000 feet	Apr–Sept	Low
Lost Hills crownscale *Atriplex vallicola*	SC/–/1B	Lost Hills, vicinity of McKittrick in Kern County, scattered locations in Fresno and Merced Counties	Alkali sink, alkaline vernal pool, saltbush scrub	May–Aug	Observed
Chaparral harebell *Campanula exigua*	–/–/1B	San Francisco Bay region; northern inner south Coast Ranges; Alameda, Contra Costa, San Benito, Santa Clara, and Stanislaus Counties	Rocky areas in chaparral, usually on serpentinite	May–Jun	Low
California jewelflower *Caulanthus californicus*	E/E/1B	Historically common in western San Joaquin Valley and interior foothills; currently at scattered locations in Fresno, Kern, San Luis Obispo, and Santa Barbara Counties	Sandy or loamy soils in annual grassland, chenopod scrub, pinyon-juniper woodland	Feb–May	Low
Brewer feets clarkia *Clarkia breweri*	–/–/4	Inner south Coast Ranges; southeast San Francisco Bay; Mt Hamilton Range; Alameda, Fresno, Merced, Monterey, San Benito, Santa Clara, and Stanislaus Counties	Chaparral and cismontane woodland, coastal scrub, on talus or dry slopes, often serpentine, below 4,000 feet	April–May	Low
Small-flowered morning-glory *Convolvulus simulans*	–/–/4	San Joaquin Valley; central western and southwestern California; southern Channel Islands; Contra Costa, Kern, Los Angeles, Riverside, San Benito, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, and Stanislaus Counties; San Clemente, Santa Catalina, and Santa Cruz Islands; Baja California	Chaparral openings, coastal scrub, valley and foothill grassland, on clay soils in serpentinite seeps, between 100 and 2,300 feet	Mar–Jul	Moderate
Hispid bird feets-beak *Cordylanthus mollis* ssp. *Hispidus*	SC/–/1B	Central Valley; Alameda, Kern, Merced, Placer, and Solano Counties	Meadow, grassland, playa, on alkaline soils, below 500 feet	Jun–Sep	Low
Palmate bird feets-beak *Cordylanthus palmatus*	E/E/1B	Livermore Valley and scattered locations in the Central Valley from Colusa County to Fresno County	Alkaline grassland, alkali meadow, chenopod scrub	May–Oct	Low
Gypsum-loving larkspur *Delphinium gypsophilum* ssp. *gypsophilum*	–/–/4	Fresno, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, and Stanislaus Counties	Atriplex scrub, cismontane woodland, grassland	Apr–May	Observed

Common Name *Scientific Name*	Legal Status[a] Federal/State/CNPS	California Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area[b]
Recurved larkspur *Delphinium recurvatum*	SC/–/1B	San Joaquin Valley and Central Valley of the south Coast Ranges, Contra Costa County to Kern County	Subalkaline soils in annual grassland, saltbush scrub, cismontane woodland, vernal pools, between 100 and 2,000 feet	Mar–May	Observed
Hoover feets eriastrum *Eriastrum hooveri*	T/–/4	Fresno, Kings, Kern, Santa Barbara, San Benito, San Luis Obispo, and Tulare Counties	Chenopod scrub, valley and foothill grassland, sparsely vegetated alkaline alluvial fans	Apr–Jul	Moderate
Kern mallow *Eremalche kernensis*	E/–/1B	Vicinity of Lokern, Kern County	Valley sink scrub, saltbush scrub, on sandy clay-loam soils, between 600 and 900 feet	Apr–May	Low
Clay-loving buckwheat *Eriogonum argillosum*	–/–/4	Monterey, San Benito, and Santa Clara Counties	Cismontane woodland on serpentinite or clay soils	Mar–Jun	Low
Cottony buckwheat *Eriogonum gossypinum*	SC/–/4	Fresno, Kings, Kern, and San Luis Obispo Counties	Clay soils in chenopod scrub, valley and foothill grassland	Mar–Sep	Observed
Protruding buckwheat *Eriogonum nudum* var. *indictum*	–/–/4	Fresno, Kern, Merced, Monterey, San Benito, and San Luis Obispo Counties	Chaparral, chenopod scrub, cismontane woodland on clay, serpentinite substrates	May–Dec	Observed
Idria buckwheat *Eriogonum vestitum*	–/–/4	Fresno, Merced, and San Benito Counties	Valley and foothill grassland	May–Aug	Observed
Jepson feets woolly sunflower *Eriophyllum jepsonii*	–/–/4	Alameda, Contra Costa, Kern, San Benito, Santa Clara, Stanislaus, and Ventura Counties	Chaparral, cismontane woodland, coastal scrub, sometimes serpentinite, on dry, rocky slopes, between 1,000 and 3,500 feet	Apr–Jun	Low
San Benito poppy *Eschscholzia hypecoides*	–/–/4	Fresno, Imperial, Mendocino, Monterey, San Benito, and San Luis Obispo Counties	Chaparral, cismontane woodland, valley and foothill grassland on serpentinite clay substrates	Mar–Jun	Observed
Stink Bells *Fritillaria agrestis*	SC/–/4	Alameda, Contra Costa, Fresno, Kern, Mendocino, Monterey, Mariposa, Placer, Sacramento, Santa Barbara, San Benito, San Luis Obispo, San Mateo, Stanislaus, and Tuolumne Counties	Chaparral, cismontane woodland; valley and foothill grassland, on clay, sometimes serpentinite substrate	Mar–May	Moderate
Hall's feet tarweed *Deinandra halliana*	–/–/1B	Fresno, Monterey, San Benito, and San Luis Obispo Counties	Chenopod scrub, oak woodland, grasslands on clay soils on floodplains	Apr–May	Moderate
Pale-yellow layia *Layia heterotricha*	SC/–/1B	Interior foothills of the south Coast Ranges, Transverse Ranges, and Tehachapi Mountains; Fresno, Kings*, Kern*, Monterey*, Santa Barbara, San Luis Obispo*, Ventura, and possibly San Benito Counties	Cismontane woodland, pinyon- juniper woodland, grassland in open areas on alkaline or clay soils below 5,250 feet	Mar–Jun	Moderate
Munz feets tidy-tips *Layia munzii*	–/–/1B	Western San Joaquin Valley and interior foothills valleys from Fresno County to San Luis Obispo County	Chenopod scrub, grasslands, flats and hillsides in alkaline clay soils, between 170 and 2,500 feet	Mar–Apr	Low
San Joaquin woolly-threads *Monolopia congdonii*	E/–/1B	Carrizo Plain and western San Joaquin Valley from San Benito County to Kern County	Saltbush scrub, grassland, on flats in alkaline or loamy soils	Mar–May	Moderate
Panoche peppergrass *Lepidium jaredii* ssp. *Album*	SC/–/1B	Fresno, San Benito, and San Luis Obispo Counties	Grassland in alluvial fans, washes	Feb–Jun	Moderate
Benitoa *Lessingia occidentalis*	–/–/4	Fresno, Monterey, and San Benito Counties	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland on serpentinite	May–Nov	Low
Showy madia *Madia radiata*	–/–/1B	Scattered populations in the interior foothills of the south Coast Ranges; Contra Costa, Fresno, Kings, Kern, Monterey, Santa Barbara, San Benito, San Joaquin, and San Luis Obispo Counties	Oak woodland, grassland, slopes below 3,000 feet	Mar–May	Moderate

Common Name *Scientific Name*	Legal Status[a] Federal/State/CNPS	California Distribution	Habitat Requirements	Blooming Period	Likelihood to Occur within Project Area[b]
Hall's feet bush mallow *Malacothamnus hallii*	–/–/1B	Alameda, Contra Costa, Merced, and Santa Clara Counties	Chaparral between 30 and 2,500 feet	May–Sep	Low
Slender nemacladus *Nemacladus gracilis*	–/–/4	Fresno, Kings, Kern, Los Angeles, and Merced Counties	Cismontane woodland, valley and foothill grassland on sandy or gravelly substrate	Mar–May	Low
Arburua Ranch jewel-flower *Streptanthus insignis* ssp. *Lyonii*	SC/–/1B	Merced County	Coastal scrub, sometimes on serpentinite	Mar–May	Low
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	SC/–/1A	Historically known from the northwest San Joaquin Valley and adjacent Coast Ranges foothills	Grasslands in alkaline hills below 1,500 feet	Mar–Apr	Low
Kings Gold *Twisselmannia californica*	–/–/1B	Known from one occurrence near Kettleman City, Kings County	Subalkaline, sandy clay soil in spinsecale scrub	Mar–Apr	Low

Notes: [a] Status explanations:

Federal

E = Listed as endangered under the Federal Endangered Species Act.
T = Listed as threatened under the Federal Endangered Species Act.
PE = Proposed for federal listing as endangered under the Federal Endangered Species Act.
PT = Proposed for federal listing as threatened under the Federal Endangered Species Act.
C = Species for which U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list.
SC = Species of Concern.
– = No listing.

State

E = Listed as endangered under the California Endangered Species Act.
T = Listed as threatened under the California Endangered Species Act.
R = Listed as rare under the California Native Plant Protection Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
C = Candidate species for listing under the California Endangered Species Act.
SSC = Species of special concern in California.
– = No listing.

California Native Plant Society

1A = List 1A species: presumed extinct in California.
1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
3 = List 3 species: plants about which more information is needed to determine their status.
4 = List 4 species: plants of limited distribution.
– = No listing.
* = Known populations believed extirpated from that County.
? = Population location within County uncertain.

[b] Definitions of levels of occurrence likelihood:

High: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions and suitable microhabitat conditions.

Moderate: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions but suitable microhabitat conditions are not present.

Low: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or habitat conditions of poor quality.

None: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or suitable habitat not present in any condition.

Table C.3-4 Special Status Plant Species Identified in the Western Corridor (~~April 2001~~Jones and Stokes, 2001)

Segment Number	Milepost	Species (Latin Name)	Species (Common Name)
2	3.9, 4.0, 6.6, 7.8, 9.7, 9.9, 11.5, 11.6, 11.8	Delphinium gypsophilum	Gypsum-loving larkspur
3	16.3, 17.3, 17.9, 18.1, 18.9, 19.2		
4	21.9, 24.6, 28.6		
5	45.4, 47.7, 49.0, 49.2, 49.3, 49.5, 50.0, 50.5, 51.3, 51.6, 51.8, 51.9, 52.3, 52.4, 52.5, 52.8, 52.9, 53.1, 53.3, 53.7, 53.8, 54.0, 54.2, 56.1, 57.3, 57.7, 59.3, 59.9, 60.4, 61.1, 61.4, 62.3, 62.4, 63.3, 63.6, 63.9, 64.0, 64.1, 64.2, 64.7, 65.5		
4	25.7	Eriogonum gossypinum	Cottony buckwheat
5	38.9, 52.7, 55.9		
4	26.2	Eriogonum vestitum	Idrea buckwheat
5	37.2, 37.5, 37.7, 37.9, 38.2, 42.7, 43.1, 44.0, 47.3, 49.9, 52.6, 52.7, 52.8, 53.0, 53.2, 53.5, 53.6, 53.7, 53.8, 54.0, 54.3, 54.5, 54.6, 54.7, 54.8, 55.0, 55.1, 56.1, 56.4	Atriplex vallicola	Lost Hills crownscale
5	44.5, 45.1, 65.7, 66.0, 66.1, 66.2, 66.3, 66.6, 66.8, 66.9	Delphinium recurvatum	Recurved larkspur
5	46.0, 46.4, 47.0, 48.5, 48.8	Eriogonum nudum var. indictum	Protruding buckwheat
5	47.0, 47.1, 49.0, 53.5, 53.6, 53.7, 54.2	Amsinckia vernicosa ssp. furcata	Forked fiddleneck
5	49.7	Eschscholzia hypecoides	San Benito poppy
5	50.0, 51.0, 66.2, 66.3	Atriplex coronata	Crownscale

These communities provide habitat for a variety of rodents, small- and medium-sized mammals and songbirds that are common and abundant throughout this portion of the Central Valley. Small- and medium sized mammals commonly associated with these habitats include: the California ground squirrel, black-tailed jackrabbit, western harvest mouse, California vole, and coyote. Common songbirds include: the horned lark, savannah sparrow *(Passerculus sandwinchesis)*, western meadowlark, and American robin *(Turdus migratorius)*. Riparian and wetland habitats provide the highest intrinsic value to wildlife because they are associated with available water and provide denser vegetative cover. While riparian and wetland habitats cover only a small percentage of the area along the proposed corridor, they provide habitat for up to 80 percent of all vertebrate species recorded in the area. Table C.3-5 lists the wildlife species recorded or with moderate to high potential to occur in the study area.

General Wildlife Presence and Distribution

California mule deer (*Odocoilus hemionus californicus*) are the principal big game species found along the Proposed Project Corridor. The population centers (areas of highest concentration) of these resident deer generally occur to the west of the study area, where the animals tend to congregate in higher elevation juniper habitats. Correspondingly, the distribution of mule deer in the Valley project area is extremely limited. In this context, native scrub and riparian communities in the project area are important habitats, as they provide a good source of available cover and browse for these deer.

Table C.3-5 Wildlife Species Observed or with the Potential to Occur within the Western Alignment During 1986 (CH2M Hill, 1986) and 2001 (Jones and Stokes, 2001) Field Surveys

WILDLIFE		HABITATS						
Common Name	*Scientific Name*	Marshland	Alkaline Areas	Grassland	Riparian	Scrub	Dune	Reservoirs & Ponds
Mammals								
Opossum	*Didelphis virginia*				X			
Desert cottontail	*Sylvilagus audubonii*			X	X			
Black-tailed jackrabbit	*Lepus californicus*			X				
California ground squirrel	*Spermophilus beecheyi*		X	X	X			
Botta's pocket gopher	*Thomomys bottae*			X	X			
San Joaquin antelope squirrel	*Ammo spermophilus nelsoni*		X	X	X			
Giant kangaroo rat	*Dipodomys ingens*						X	
Short-nosed kangaroo rat	*Dipodomys nitratoides brevinasus*						X	
Kangaroo rats (general)	*Dipodomys sp.*		X	X	X	X		
Coyote	*Canis latrans*			X	X	X		
San Joaquin kit fox	*Vulpes macrotis mutica*			X	X			
Racoon	*Procyon lotor*	X			X			
Western spotted skunk	*Spilogale gracilis*			X				
Bobcat	*Felis rufus*				X			
Birds								
Pied-billed grebe	*Podiceps podiceps*							X
Eared grebe	*Podiceps nigricollis*							X
Western grebe	*Aechmorphorus occidentalis*							X
Snowy egret	*Egretta thula*							X
Cattle egret	*Bubulcus ibis*							X
Mallard	*Anas platyrhynchos*							X
Northern pintail	*Anua acuta*							X
Cinnamon teal	*Anas crecca*				X			X
Northern shoveler	*Anas clypeata*							X
Ruddy duck	*Oxyura jamaicensus*							X
Turkey vulture	*Cathartes aura*			X				
Black-skouldered kite	*Elanus caeruleus*			X				
Northern harrier	*Circus cyaneus*			X				X
Swainson's hawk	*Buteo swainsoni*			X				X
Red-tailed hawk	*Buteo jamaicensis*			X	X	X		

WILDLIFE		HABITATS						
Common Name	*Scientific Name*	Marshland	Alkaline Areas	Grassland	Riparian	Scrub	Dune	Reservoirs & Ponds
Golden eagle	*Aquila chrysaetos*			X	X			
American kestrel	*Falco sparverius*				X			
Western burrowing owl	*Anthene cunicularia hypugea*			X		X		
California quail	*Callipepla californica*			X	X			
American coot	*Fulica americana*							X
Killdeer	*Charadrius vociferus*		X	X	X			X
Black-necked stilt	*Himantopus mexicanus*							X
American avocet	*Recurvirostra americana*							X
Greater yellow legs	*Tringa melanoleuca*							X
Western sandpiper	*Calidris mauri*							X
Morning dove	*Zenaida macroura*			X	X			
Strigid owl					X			
Coasta hummingbird	*Calypte costae*				X			
Western kingbird	*Tyrannus verticalis*				X			
Horned lark	*Eremophila alpestris*			X				
Northern rough-winged swallow	*Stelgidopteryx serripennis*	X			X			
Cliff swallow	*Hirundo pyrrhonota*	X			X			
Barn swallow	*Hirundo rustica*				X			X
Common crow	*Corvus brachyrhynchos*			X				
Common raven	*Corvus corax*			X				
Rock wren	*Salpinctes obsoletus*			X				
American robin	*Turdus migratorius*			X				
Northern mockingbird	*Mimus polyglottos*			X				
Loggerhead shrike	*Lanius ludovicianus*			X		X		
European starling	*Sturnus vulgaris*				X			
Lark sparrow	*Chondestes grammacus*			X				
Savannah sparrow	*Passerculus sandwinchensis*			X				
White crowned sparrow	*Zonotrichia leucophrys*				X			
Tricolored blackbird	*Agelaius tricolor*	X			X			
Western meadowlark	*Sturnella neglecta*			X	X	X	X	
Brewer's blackbird	*Euphagus cynanocephalus*			X				

WILDLIFE		HABITATS						
Common Name	*Scientific Name*	Marshland	Alkaline Areas	Grassland	Riparian	Scrub	Dune	Reservoirs & Ponds
Northern oriole	*Icterus galbula*				X			
House finch	*Carpodacus mexicanus*			X	X			
House sparrow	*Passer domesticus*				X			
Reptiles								
Blunt-nosed leapord lizard	*Wislizenii silus*			X				
Western fence lizard	*Sceloporus occidentalis*				X			
Desert spiny lizard	*Sceloporus magister*				X			
Side-blotched lizard	*Uta stansburiana*			X		X		
Coachwhip	*Masticophis flagellum*			X				
Gopher snake	*Pituophis melanoleucus*			X				
Garter snake	*Thamnophis sp.*	X						
San Joaquin whipsnake	*Masticophis flagellum ruddocki*			X				
Western rattlesnake	*Crotalus viridis*			X		X		
Western pond turtle	*Clemmys marmorata pallida*	X						X
Amphibians								
Western toad	*Bufo boreas*	X			X			
Pacific treefrog	*Hyla regilla*	X			X			
California red-legged frog	*Rana aurora draytoni*	X			X			X
Foothill yellow-legged frog	*Rana boylii*	X			X			X
California tiger salamander	*Ambystoma tigrinum californienus*	X			X			X

The Proposed Western Corridor crosses the administrative boundaries of two deer herds (administrative boundaries are determined by CDFG).

1. The Pacheco Deer Herd contains resident California mule deer and Columbian black-tailed deer *(Odocoileus hemionus columbianus)*. The population objective for this deer herd is to maintain the carrying capacity needed to support 3,000 or more animals. The Merced County portion of the deer range is almost entirely in private ownership. Public lands include state park lands as well as the San Luis and Cottonwood Creek State Wildlife Areas.

2. The Coalinga sub-unit of Avenal Deer Herd also crosses the Proposed Western Corridor, while the Temblor sub-unit occurs outside the proposed corridor. The Avenal herd has been steadily decreasing since the 1980's – from about 2,900 animals in 1980 to only 1,400 animals in 1999. The higher-elevation portions of this range are the most favorable deer habitat, and like the Pacheco Deer Herd, most of the range occurs on private property.

Three species of upland game birds were observed or have the potential to occur within the Proposed Western Corridor. These include California quail (*Callipepla californica*), chuckar (*Alectoris chuckar*), and morning dove (*Zenidea macroura*). California quail are found around residential developments and along riparian corridors at higher, foothill elevations. Morning doves are common in shrub and riparian habitats. Chuckar habitat is marginal throughout most of the proposed corridor. The best habitat is associated with steeper drainage areas in Segment 1, the northernmost portion of Segment 2 and along the middle portion of Segment 5.

Waterfowl are abundant winter residents of the project area, and are found at reservoirs, ponds, and wetland habitats along the proposed corridor. Important waterfowl areas include:

- Little Panoche Reservoir and Creek, (MP 23.0)
- Los Banos Reservoir (MP 6.0)
- Various water storage ponds (MP 72.0 to MP 73.0) near the southernmost terminous of the proposed corridor.

Large numbers of mallards (*Anas platyrhynchos*), northern pintails (*Anua acuta*), and other ducks winter in northern San Joaquin Valley wetlands, east of the project area. While these wetlands would not be directly affected by project construction, the presence of these waterfowl concentrations is important because of local movements between valley wetlands and reservoirs within and directly adjacent to the project area.

The open terrain of the valley and foothills generally supports modest populations of rodents, lagomorphs, and small birds that are the prey base for many raptor species. While the proposed tranmission corridor traverses important raptor foraging habitat, the limited amount and distribution of vegetative cover offers few nesting sites. Raptors known to occur within the western corridor and in the vicinity include: turkey vulture *(Cathartes aura)*, black-shouldered kite, *(Elanus caeruleus)*, northern harrier *(Circus cyaneus)*, Swainson's hawk *(Buteo swainsoni)*, red-tailed hawk *(Buteo jamaicensis)*, golden eagle *(Aquila chrysaetos)*, American kestrel *(Falco sparverius)*, prairie falcon *(Falco mexicanus)*, and western burrowing owl *(Anthene cunicularia)*.

Western burrowing owls were encountered most frequently in the study area with a total of four adults and 10 active burrows identified along the Western Corridor between MP 14.6 and MP 17.8 in Segment 3 and along Segment 5 between MP 52.6 and MP 70. The northern harrier, Swainson's hawk, and golden eagle were observed foraging in predominantly grassland areas within Segment 5, although no nests from these species were located. More detailed information and locations for these species are presented in Table C.3-6.

Special Status Wildlife Species

Special status wildlife species are defined as species listed under the Federal/California Endangered Species Acts (FESA/CESA), as well as birds listed in the Migratory Bird Treaty Act.

Field surveys conducted in April of 2001 identified eight special-status wildlife species within the study area: the loggerhead shrike (*Lanius ludovicianus*), California horned lark (*Eremophila alpestris*), tricolored blackbird (*Agelaius tricolor*), western burrowing owl, golden eagle, northern harrier, San Joaquin antelope squirrel (*Ammosperophilus nelsoni*), and blunt-nosed leopard lizard (*Gambelia silus*) (Jones and Stokes, 2001). In addition to the special-status species directly observed at the site, active burrows of American badger (*Taxidea taxus*), San Joaquin kit fox (*Vulpes macrotis*), and giant (*Dipodomys ingens*) and short-nosed (*Dipodomys nitratoides brevinasus*) kangaroo rats were recorded within the proposed corridor.

In addition, several ponds and pools associated with drainages located in the study area are considered potential breeding habitat for California tiger salamander (*Ambystoma tigrinum californiense*), California red-legged frog (*Rana aurora draytoni*), and southwestern pond turtle (*Clemmys marmorata pallida*) (Jones and Stokes, 2001). Potential foothill yellow-legged frog (*Rana boylii*) habitat is present at Panoche Creek within the study area. An old mine located in the survey area may serve as potential roosting habitat for Yuma myotis (*Myotis yumanensis*). Appendix 6 presents descriptions of each of these species.

C.3.1.4 Environmental Setting: Western Corridor Alternative Segments

Alternative Segments 2A and 4A of the Western Corridor are situated in relatively steep terrain located in the foothills portion of the Diablo Mountains. In contrast, Segments 6A and 6B cross relatively flat grassland and agricultural land within the San Joaquin Valley. All of the ephemeral creeks and reservoirs within these alternative corridors are located within Segment 2A and 4A. Annual grassland is the predominant vegetation at most sites.

As for the Western Corridor, information discussed in this section is adapted and summarized from the results of 1986 biological surveys conducted by PG&E's consultants. In addition, rare plant and animal surveys conducted in spring 2001 by PG&E consultants are included to supplement the 1986 information on rare plant species.

Table C.3-6 Special Status Wildlife Species Occurring or Potentially Occurring in the Proposed Corridor Area (CH2M Hill, 1986; Jones and Stokes, 2001)

Common Name *Scientific Name*	Status[a] Federal/ State	California Distribution	Habitat Requirements	Potential to Occur in Project Area	Milepost (MP)	Comments
Loggerhead shrike *Lanius ludovicianus*	SC/SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north to Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	Observed	MP 48.75 MP 36.75	Numerous birds, no nests
California horned lark *Eremophila alpestris actia*	–/SSC	Found throughout much of the state, less common in mountainous areas of the north coast and in coniferous or chaparral habitats	Common, abundant resident in a variety of open habitats, usually where large trees and shrubs are absent; grasslands and deserts to dwarf shrub habitats above tree line	Observed	MP 49.30	Numerous birds, no nests
Tricolored blackbird *Agelaius tricolor*	SC/SSC	Largely endemic to California; permanent residents in the Central Valley from Butte County to Kern County; at scattered coastal locations from Marin County south to San Diego County; breeds at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; nesting habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony; requires large foraging areas, including marshes, pastures, agricultural wetlands, dairies, and feedlots, where insect prey is abundant	Observed	MP 4.35	Flock of ~100 birds, not nesting
Western burrowing owl *Athene cunicularia hypugea*	SC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Rodent burrows in sparse grassland, desert, and agricultural habitats	Observed	MP 70.00 MP 69.17 MP 65.20 MP 65.05 MP 64.75 MP 64.80 MP 64.22 MP 61.52 MP 52.40 MP 52.60 MP 17.80 MP 17.90 MP 18.95 MP 14.65	4 birds, 10 active burrows
Golden eagle *Aquila chrysaetos*	P/SSC, FP	Foothills and mountains throughout California; uncommon nonbreeding visitor to lowlands such as the Central Valley	Cliffs and escarpments or tall trees for nesting; annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals for prey	Observed	UNKNOWN	1 adult bird, 1 juvenile bird, no nests
Northern harrier *Circus cyaneus*	--/SSC	Throughout lowland California; has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands providing tall cover	Observed	MP 32.28 MP 66.52	Several birds, no nests
San Joaquin kit fox *Vulpes macrotis mutica*	E/T	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	Moderate to high		Numerous potential burrows, potential habitat along entire study area. No sign observed.

Common Name *Scientific Name*	Status[a] Federal/ State	California Distribution	Habitat Requirements	Potential to Occur in Project Area	Milepost (MP)	Comments
San Joaquin antelope squirrel *Ammospermophilus nelsoni*	SC/T	Western side of the San Joaquin Valley from southern Merced County south to Kern and Tulare Counties; also found on the Carrizo Plain in San Luis Obispo County and the Cuyama Valley in San Luis Obispo and Santa Barbara Counties	Arid grasslands from 200 to 1,200 feet, with loamy soils and moderate shrub cover of atriplex and other shrub species	Observed	MP 52.47	1 adult squirrel
American badger *Taxidae taxus*	--/--	Occurs statewide except for the northwestern corner in Del Norte County and parts of Humboldt and Siskiyou Counties	Uses open areas with scattered shrubs and trees for cover and loose soil for digging	Moderate to high		Numerous potential burrows, potential habitat along entire study area
Giant kangaroo rat *Dipodomys ingens*	E/E	Occurs at high densities in only 12 square miles of habitat along the western side of the San Joaquin Valley, in five separate localities on Elkhorn Plain, Carrizo Plain, McKittrick Valley, and Cuyama Valley in Kern and San Luis Obispo Counties	Restricted to flat, sparsely vegetated areas with native annual grassland and shrubland habitats; requires uncultivated soils consisting of dry, fine, sandy loams for burrowing	Moderate to high	MP 51.12 MP 40.46 MP 40.95 MP 62.70	Possible scat found, potential habitat in study area
Short-nosed kangaroo rat *Dipodomys nitratoides brevinasus*	SC/SSC	Western side of the San Joaquin Valley from Merced County to Kern County; isolated populations also in San Benito, San Luis Obispo, and Santa Barbara Counties	Arid grassland and desert scrub communities on flat or gently sloping terrain with friable soils	Moderate to high	MP 49.90 MP 44.80 MP 44.40 MP 70.35 MP 69.72 MP 69.52 MP 68.90 MP 66.95 MP 66.60 MP 39.40 MP 50.45 MP 58.65 MP 32.35 MP 37.35	Possible scat found, potential habitat in study area
Yuma myotis *Myotis yumanensis*	SC/--	Considered common and widespread in northern California; colonies known from Marin and San Francisco Counties	Roosts colonially in a variety of natural and human-made sites, including caves, mines, buildings, bridges, and trees; in northern California, maternity colonies are usually in fire-scarred redwoods, pines, or oaks; forages for insects over water bodies	Moderate to high	UNKNOWN	Potential roosting habitat in abandoned mine
California tiger salamander *Ambystoma tigrinum californiense*	C/SSC, P	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to Santa Barbara County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	Moderate to high	MP 4.35 MP 57.30 MP 65.15 MP 64.15	Potential habitat in stock ponds and pools in drainages
California red-legged frog *Rana aurora draytoni*	T/SSC, P	Found along the coast and coastal mountain ranges of California from Humboldt County to San Diego County; Sierra Nevada (mid-elevations [above 1,000 feet] from Butte County to Fresno County)	Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation and riparian species along the edges; may estivate in rodent burrows or cracks during dry periods	Moderate to high	MP 4.35 MP 57.30 MP 65.15 MP 64.15	Potential habitat in stock ponds and pools in drainages

Common Name *Scientific Name*	Status[a] Federal/ State	California Distribution	Habitat Requirements	Potential to Occur in Project Area	Milepost (MP)	Comments
Foothill yellow-legged frog *Rana boylii*	SC/SSC, P	Occurs in the Klamath, Cascade, north Coast, south Coast, and Transverse Ranges; through the Sierra Nevada foothills up to approximately 6,000 feet (1,800 meters) south to Kern County	Creeks or rivers in woodlands or forests with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby	Moderate to high	MP 36.70	Potential habitat in Panoche Creek
Southwestern pond turtle *Clemmys marmorata pallida*	SC/SSC, P	Occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts; range overlaps with that of the northwestern pond turtle throughout the Delta and in the Central Valley from Sacramento County to Tulare County	Woodlands, grasslands, and open forests; aquatic habitats, such as ponds, marshes, or streams, with rocky or muddy bottoms and vegetation for cover and food	Moderate to high	MP 4.35 MP 57.30 MP 65.15 MP 64.15	Potential habitat in stock ponds and pools in drainages
Blunt-nosed leopard lizard *Gambelia (=Crotaphytus) silus*	T/E, FP	San Joaquin Valley from Stanislaus County through Kern County and along the eastern edges of San Luis Obispo and San Benito Counties	Open habitats with scattered low bushes on alkali flats, and low foothills, canyon floors, plains, washes, and arroyos; substrates may range from sandy or gravelly soils to hardpan	Observed	MP 59.65 MP 33.0	2 Juvenile lizards
San Joaquin whipsnake *Masticophis flagellum ruddocki*	SC/SSC, P	From Colusa County in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner coast ranges; an isolated population occurs at Sutter Buttes; known elevational range from 20 to 900 meters	Occurs in open, dry, vegetative associations with little or no tree cover; in valley grassland and saltbush scrub associations; often in association with mammal burrows	Moderate to high		Potential habitat along entire study area

[a] Status explanations

Federal

T = listed as threatened under federal Endangered Species Act
C = candidate for listing as threatened or endangered under federal Endangered Species Act
SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking
-- = no status definition
FPD = federally proposed for de-listing

State

E = listed as endangered under state Endangered Species Act
T = listed as threatened under state Endangered Species Act
SSC = species of special concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking
P = protected
FP = fully protected
-- = no status definition

C.3.1.4.1 *Vegetation*

Three to four major vegetation types were identified within each of the Western Corridor Alternative Segments. Table C.3-1 lists the acreage of each vegetation type by Alternative Segment within the project area. Detailed descriptions of each vegetation type and associated plant communities are presented in Appendix 6. Within the four proposed Western Corridor Alternative Segments, grasslands represent the largest acreage at 76 percent (6,661 acres), followed by agricultural lands at 19 percent

(1,657 acres). Riparian (211 acres) and wetland (138 acres) communities contribute to approximately four percent of the total, while scrub and alkaline areas (88 acres) account for the balance.

Grasslands are the predominant vegetation type within Segments 2A, 4A, and 6B. Alkaline areas are limited to the Salt Creek Drainage (MP 8.5) within Segment 2A, while riparian scrub communities only occur along Little Panoche Creek (MP 22.5) within Segment 4A. Riparian communities occur along ephermal drainages within all segments, while wetlands are primarily associated with the Los Banos Reservoir (MP 6.0) and the Little Panoche Reservoir (MP 23.0) in Segments 2A and 4A, respectively. Agricultural lands are the predominant vegetation type found within Segment 6A.

Special Status Plant Species

The special status species associated with the Western Corridor Alternative Segments include many of those associated with the Western Corridor itself.

C.3.1.4.2 *Wildlife*

Wildlife habitat types associated with the Western Corridor Alternative Segments are generally the same as those previously described for the proposed Corridor and correspond with the vegetative types previously discussed in C.3.1.4.1 above. These communities provide habitat for many of the same rodents, small- and medium-sized mammals, and songbirds that are common and abundant in the proposed transmission Corridor.

As with the proposed corridor, the distribution of mule deer within the Western Corridor Alternative Segments is extremely limited. Population centers of these resident herds occur to the west of the Alternative Segments, where the majority of deer tend to congregate in higher elevation Juniper habitats.

The open terrain in Segments 2A, 4A, 6A, and 6B provides important foraging opportunities for raptors and limited nesting sites are located within the riparian community along Los Banos Creek (MP 6.0) and Ortigalita Creek (MP 14.0) in Segment 2A. Several cliffs located along the southwest side of Little Panoche Valley showed signs of use by raptors as reported in the 1986 survey. The riparian community along Little Panoche Creek within Segment 4A provides good nesting habitat for raptors such as Swainson's and red-tailed hawks, although none were observed in the area during 1986 field surveys.

Special Status Wildlife Species

A number of the sensitive wildlife species discussed for the Western Corridor are also expected to occur in many of the vegetation communities within the Western Corridor Alternative Segments. Although limited wildlife information was collected for these alternatives during 2001 surveys, data from 1986 suggest that the area does provide at least marginal to good habitat for a number of raptor species, tri-colored blackbird, San Joaquin kit fox, blunt-nosed leopard lizard, and California tiger salamander.

During 1986 surveys, several small flocks of tricolored blackbirds were observed in emergent wetlands associated with a number of manmade ponds in Segment 6B, and several (golden eagle and prairie falcon) were observed near the Los Banos Reservoir in Segment 2A. Potential San Joaquin kit fox habitat was observed from MPs 11 to 15, 22 to 23, and 68 to 69. Blunt-nosed leopard lizard habitat is located near MP 11 and from MP 68 to 69. Habitat for the California tiger salamander exists in association with a number of small man-made ponds located in Segment 6B between MP 70.0 and MP 71.0 and near MP 76.

C.3.1.5 Environmental Setting: Eastern Corridor Alternative

The Eastern Corridor Alternative occurs primarily within the San Joaquin Valley, but passes into the foothills of the Coast Range from approximately EMP 10 to EMP 18. Elevations along this corridor range from a low of 298 feet (91 m), near the Los Banos Substation, to a high of approximately 456 feet (139 m) along portions of Segment 3. There are no perennial streams within the Eastern Corridor Alternative and the ephemeral streams generally flow during late winter and early spring, and except for temporary flows immediately after a storm event, dry up by mid-summer.

C.3.1.5.1 *Vegetation*

A minimum of a ¼-mile wide survey corridor was used to provide an adequate regional context to evaluate plant species and communities found within the Eastern Corridor Alternative and ROW. Information discussed in this section is adapted and summarized from the results of 1986 biological surveys conducted by PG&E's consultants (CH2M Hill, 1986). Rare plant surveys in spring 2001 were conducted only for the Western Corridor and Western Corridor Alternative Segments (Jones and Stokes, 2001). There is no recent information on rare plant species for the Eastern Corridor Alternative.

General vegetation types in the Eastern Corridor Alternative, as mapped in 1986, consist of: (1) Grasslands, (2) Riparian Communities, and (3) Agricultural Lands. Table C.3-1 lists the acreage of each vegetation type within the Eastern Corridor Alternative. Agricultural lands represent the largest acreage at 84 percent (12,907 acres), with grasslands at 15 percent (2,390 acres), followed by riparian communities at one percent (209 acres). Many of the riparian communities within the Eastern Corridor Alternative have been degraded by channelization and agricultural encroachment. Riparian habitat occurs along Los Banos Creek (EMP 6.5), Panoche Creek (EMP 35), and Cantua Creek (EMP 56.5). A well-developed and more extensive riparian community occurs along Los Gatos Creek (EMP 79). The streambed is wide and open and is bordered on both sides by a nearly continuous band of Fremont cottonwood and, to a lesser extent, tamarisk.

Special Status Plant Species

There are no known occurrences of sensitive plants within this corridor, and areas of potential habitat for sensitive plant species lie outside the Eastern Corridor Alternative in the alkali areas nearer the dam pool.

C.3.1.5.2 *Wildlife*

There are few significant natural wildlife habitat types associated with this corridor, as this portion of the project area is nearly completely converted to agricultural use. The limited remnants of natural vegetation remaining within this corridor generally provide the only suitable habitat for a limited number of rodents, small- and medium-sized mammals, and songbirds.

Riparian habitat along Little Panoche Creek (EMP 23.0) and Los Gatos Creek (EMP 76.0) provides potential nesting habitat for raptors. During 1986 surveys, golden eagles were observed near EMP 14 and 15. Golden eagles were observed nesting on existing transmission line towers near EMP 43, however, no active nests were observed in the Eastern Corridor Alternative (CH2M Hill, 1986).

Special Status Wildlife Species

Potential habitat for the blunt-nosed leopard lizard occurs between EMP 12.0 and EMP 14.0, while potential for both the blunt-nosed leopard lizard and giant kangaroo rat occur along Laguna Seca Creek near EMP 16.0 and Little Panoche Creek near EMP 23.0 (CH2M Hill, 1986).

C.3.2 APPLICABLE REGULATIONS, PLANS, AND STANDARDS

Applicable regulations include federal, state, and local regulations that address the protection of sensitive species, wetlands, streams, riparian plant communities, and heritage trees. While the regulations governing project impacts on biological resources have not changed since preparation of the 1988 FEIS/EIR, there have been changes to a number of listed species. Some species that were previously federal candidates for endangered or threatened listing have since become either Federal Species of Concern or have been elevated to threatened or endangered status. Similarly, some species previously listed as California Species of Concern have lost this status. Others, which had no legal status in 1988 have since become California Species of Concern. Table C.3-7 lists each species whose status has changed since the FEIS/EIR and explains the change.

Table C.3-7 Special Status Updates for Plant and Wildlife Species Occurring or Potentially Occurring in the Proposed Corridor Area

Common Name	*Scientific Name*	Current Legal Status Federal/State/CNPS (Plant listings only)	1986 Legal Status Federal/State/CNPS (Plant listings only
De-listed Plant Species			
Santa Clara thornmint	*Acanthomintha lanceolata*		-/C/4
San Joaquin saltbush	*Atriplex patula ssp. spicata*		C2*/-/5*
Sloth thistle	*Cirsium crassicaule*		C2*/C/1B
Rattan's cryptantha	*Cryptantha rattanii*		-/C/4
Congdon's eatonella	*Eatonella congdonii*		-/-/4
Rock daisy	*Erigeron petrophilus*		-/C/5*
Delta Cyote-thistle	*Eryungium racemosum*		C/E/1B
Delta tule-pea	*Lathyrus jepsonii var. jepsonii*		C2*/-/1B
Indian Valley bush mallow	*Malacothamnus aboriginum*		-/C/4
Colusa grass	*Neostapfia colusana*		C2*/E/1B
San Joaquin Valley orcuttia	*Orcuttia inaequalia*		C/E/1B
Bearded allocarya	*Plagiobothrys hystriculus*		C2*/-/1B
Sanford's arrowhead	*Sagittaria sanfordii*		C2*/-/3
Green's tuctoria	*Tuctoria greenii*		C/CR*/1B
Newly Listed Plant Species			
San Benito thornmint	*Acanthomintha obovata* ssp. *Obovata*	SC/E/A	
Oval-leaved snapdragon	*Antirrhinum ovatum*	–/–/4	
Salinas milk-vetch	*Astragalus macrodon*	–/–/4	
Heartscale	*Atriplex cordulata*	SC/–/1B	
Crownscale	*Atriplex coronata* var. *coronata*	–/–/4	
San Joaquin spearscale	*Atriplex joaquiniana*	SC/–/1B	
Small-flowered morning-glory	*Convolvulus simulans*	–/–/4	
Recurved larkspur	*Delphinium recurvatum*	SC/–/1B	
Protruding buckwheat	*Eriogonum nudum* var. *indictum*	–/–/4	
San Benito poppy	*Eschscholzia hypecoides*	–/–/4	
Hall's feet tarweed	*Deinandra halliana*	–/–/1B	
Pale-yellow layia	*Layia heterotricha*	SC/–/1B	
Munz feets tidy-tips	*Layia munzii*	–/–/1B	
San Joaquin woolly-threads	*Monolopia congdonii*	E/–/1B	
Panoche peppergrass	*Lepidium jaredii* ssp. *Album*	SC/–/1B	
Showy madia	*Madia radiata*	–/–/1B	
Kings Gold	*Twisselmannia californica*	–/–/1B	
Updated Plant Species Listings			
Forked fiddleneck	*Amsinckia vernicosa* var. *furcata*	SC/–/–	C2*/C/1B
Lost Hills crownscale	*Atriplex vallicola*	SC/–/1B	C2*/-/1B
Chaparral harebell	*Campanula exigua*	–/–/1B	-/C/4
California jewelflower	*Caulanthus californicus*	E/E/1B	C2*/C/3
Brewer feets clarkia	*Clarkia breweri*	–/–/4	-/C/4
Hispid bird feets-beak	*Cordylanthus mollis* ssp. *Hispidus*	SC/–/1B	C2*/C/1B
Palmate bird feets-beak	*Cordylanthus palmatus*	E/E/1B	PE/E/1B
Gypsum-loving larkspur	*Delphinium gypsophilum* ssp. *Gypsophilum*	–/–/4	-/C/4
Hoover feets eriastrum	*Eriastrum hooverii*	T/–/4	C2*/-/4
Kern mallow	*Eremalche kernensis*	E/–/1B	C2*/-/1B
Cottony buckwheat	*Eriogonum gossypinum*	SC/–/4	C2*/-/4
Idria buckwheat	*Eriogonum vestitum*	–/–/4	C3c*/C/4
Jepson feets woolly sunflower	*Eriophyllum jepsonii*	–/–/4	-/C/4
Stink Bells	*Fritillaria agrestis*	SC/–/4	C2*/C/4

Common Name	*Scientific Name*	Current Legal Status Federal/State/CNPS (Plant listings only)	1986 Legal Status Federal/State/CNPS (Plant listings only
Benitoa	*Lessingia occidentalis*	–/–/4	C3c*/-/4
Arburua Ranch jewel-flower	*Streptanthus insignis* ssp. *Lyonii*	SC/–/1B	C2*/-/3
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	SC/–/1A	C2*/-/1B
~~De-listed Wildlife Species~~			
~~Giant garter snake~~	~~*Thamnophis couchi gigas*~~		~~C2*/T~~
~~Bald eagle~~	~~*Haliaeetus leucocephalus*~~		~~E/E~~
~~Swainson's hawk~~	~~*Buteo swainsoni*~~		~~C2*/T~~
~~White-faced ibis~~	~~*Plegadis chihi*~~		~~C2*/-~~
~~San Joaquin pocket mouse~~	~~*Perognathus inornatus inornatus*~~		~~C2*/-~~
Newly Listed Wildlife Species			
Loggerhead shrike	*Lanius ludovicianus*	SC/SSC	
California horned lark	*Eremophila alpestris actia*	–/SSC	
Western burrowing owl	*Athene cunicularia hypugea*	SC/SSC	
Golden eagle	*Aquila chrysaetos*	P/SSC, FP	
Northern harrier	*Circus cyaneus*	--/SSC	
American badger	*Taxidae taxus*	--/--	
Yuma myotis	*Myotis yumanensis*	SC/--	
California red-legged frog	*Rana aurora draytoni*	T/SSC, P	
Foothill yellow-legged frog	*Rana boylii*	SC/SSC, P	
Southwestern pond turtle	*Clemmys marmorata pallida*	SC/SSC, P	
San Joaquin whipsnake	*Masticophis flagellum ruddocki*	SC/SSC, P	
Updated Wildlife Species Listings			
Giant garter snake	*Thamnophis couchi gigas*	T/T	C2*/T
Bald eagle	*Haliaeetus leucocephalus*	T/E	E/E
Swainson's hawk	*Buteo swainsoni*	-/T	C2*/T
White-faced ibis	*Plegadis chihi*	SC/-SSC	C2*/-
San Joaquin pocket mouse	*Perognathus inornatus inornatus*	SC/-	C2*/-
Tri-colored blackbird	*Agelaius tricolor*	SC/SSC	C2*/-
San Joaquin antelope squirrel	*Ammospermophilus nelsoni*	SC/T	C2*/T
Giant kangaroo rat	*Dipodomys ingens*	E/E	PE/E
Short-nosed kangaroo rat	*Dipodomys nitratoides brevinasus*	SC/SSC	C2*/-
California tiger salamander	*Ambystoma tigrinum californiense*	C/SSC, P	C2*/-
Blunt-nosed leopard lizard	*Gambelia (=Crotaphytus) silus*	T/E, FP	E/E

Notes: [a] Status explanations:

Federal

E Listed as endangered under the Federal Endangered Species Act.
T Listed as threatened under the Federal Endangered Species Act.
PE Proposed for federal listing as endangered under the Federal Endangered Species Act.
PT Proposed for federal listing as threatened under the Federal Endangered Species Act.
C Species for which U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list.
C2*, C3c* July 1995, USFWS issued a new policy which excepted C2 and C3 candidate species listings under the ESA. Former C2 candidates are referred to as species at risk, while C3 species ~~as too wide spread and/or not threatened~~ retain no legal status.
CR* Believed to be a typo in the 1986 EIS Report Listing.
SC Species of Concern.
– No listing.

State

E Listed as endangered under the California Endangered Species Act.
T Listed as threatened under the California Endangered Species Act.

R Listed as rare under the California Native Plant Protection Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
C Candidate species for listing under the California Endangered Species Act.
SSC Species of special concern in California.
FP California Department of Fish and Game Fully Protected Species
P California Department of Fish and Game Protected Species
– No listing.

California Native Plant Society

1A List 1A species: presumed extinct in California.
1B List 1B species: rare, threatened, or endangered in California and elsewhere.
2 List 2 species: rare, threatened, or endangered in California but more common elsewhere.
3 List 3 species: plants about which more information is needed to determine their status.
4 List 4 species: plants of limited distribution.
5* Plants too widespread for listing.
– No listing.
* Known populations believed extirpated from that County.
? Population location within County uncertain.
[b] Definitions of levels of occurrence likelihood:

High: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions and suitable microhabitat conditions.

Moderate: Known occurrence of plant in region from Natural Diversity Data Base, or other documents in the vicinity of the project; or presence of suitable habitat conditions but suitable microhabitat conditions are not present.

Low: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or habitat conditions of poor quality.

None: Plant not known to occur in the region from the Natural Diversity Data Base, or other documents in the vicinity of the project; or suitable habitat not present in any condition.

C.3.2.1 Federal Laws and Regulations

Federal Endangered Species Act. The Federal Endangered Species Act of 1973 and Title 16 (implementing regulations) of the United States Code of Regulations (CFR) 17.1 et seq., designate and provide for protection of threatened and endangered plants and animals and their critical habitat. Procedures for addressing federal-listed species follow two principal pathways, both of which require consultation with the USFWS, which administers the Act for all terrestrial species. The first pathway (FESA, Section 10(a) Incidental Take Permit) is set up for situations where a non-federal government entity (or where no federal nexus exists) must resolve potential adverse impacts to species protected under the Act. The second pathway ~~is spelled out under~~ (FESA, Section 7 Consultation) ~~of the Act~~ and involves projects with a federal connection or requirement; typically these are projects where a federal lead agency is sponsoring or permitting the Proposed Project. For example, a permit from the U.S. Army Corp of Engineers (USACE) may be required if a project will result in wetland impacts. In these instances, the Federal lead agency (e.g., the USACE) initiates and coordinates the following steps:

- Informal consultation with USFWS to establish a list of target species
- Preparation of biological assessment assessing potential for the project to adversely affect listed species
- Coordination between state and federal biological resource agencies to assess impacts/proposed mitigation
- Development of appropriate mitigation for all significant impacts on federally listed species.

The USFWS ultimately issues a final Biological O~~o~~pinion on whether the project will affect the federally listed species. A Section 10(a) Endangered Species Incidental Take Permit may be necessary when the "taking" of a species is incidental to the lawful operation of a project.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the Fish and Game Code. Enforcement of the Act is carried out by USFWS law enforcement officials, while California Fish and Game Codes are enforced by CDFG game wardens.

Bald Eagle Act. All raptors and their nests are protected from take or disturbance under the Migratory Bird Treaty Act (16 USC, § 703 et seq.) and California statute (FGC § 3503.5). The golden eagle is also afforded additional protection under the Bald Eagle Act, amended in 1973 (16 USC, § 669 et seq.).

Federal Clean Water Act. As also described in Sections C.6 (Hydrology and Water Resources), Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the USACE. The definition of waters of the United States includes wetland areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency (USEPA) also has authority over wetlands and may override a USACE permit. Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may be eligible for one of the Nationwide Permits that require less review than an individual permit.

Executive Order 11990, Section 1(a) established a policy of "no net loss" of wetlands. Compensation for wetland impacts may include restoration and/or off-site replacement or enhancement. However, the characteristics of the restored or enhanced wetlands must be equal to or better than those of the affected wetlands.

C.3.2.2 State Laws and Regulations

California Endangered Species Act. Sections 2050 through 2098 of the California Fish and Game Code outline the protection provided to California's rare, endangered, and threatened species. Section 2080 of the California Fish and Game Code prohibits the taking of plants and animals listed under the authority of the California Endangered Species Act of 1984. Individual animal species declared to be threatened or endangered by the California Fish and Game Commission are listed in Title 14 of the California Code of Regulations (CCR) under Section 670.5. In addition, the Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 et seq.) gives the CDFG authority to designate state Endangered, Threatened, and Rare plants and provides specific protection measures for identified populations.

Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. The CEQA Guidelines, Section 15065 ("Mandatory Findings of Significance") requires that a reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 ("Rare or endangered species") provides for assessment of unlisted species as

rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the California Native Plant Society's Lists 1A, 1B, and 2 would typically be considered under CEQA.

California Streambed Alteration Notification/Agreement. Sections 1601-1606 of the California Fish and Game Code require that a Streambed Alteration Application be submitted to the CDFG for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFG reviews the proposed actions and, if necessary, submits to the Applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the Department and the Applicant is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. In these instances, the conditions of the Section 404 permit and the Streambed Alteration Agreement may overlap.

California Fish and Game Codes. Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code outline protection for fully-protected species of mammals, birds, reptiles and amphibians, and fish. Species that are fully protected by these Sections may not be taken or possessed at any time. The Department cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock.

Specific Sections of the California Fish and Game Code pertinent to the current project include:

- Section 3503 (which prohibits the taking, possession, or needless destruction of the nest or eggs of any bird),
- Section 3503.5 (which prohibits the taking, possession, or destruction of any bird in the order Falconiformes or Strigiformes [birds-of-prey] or the taking, possession, or destruction of the nest or eggs of any such bird), and
- Section 3513 (which prohibits the taking or possession of any migratory non-game bird as designated in the Migratory Act).

C.3.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

In assessing environmental impacts and proposing mitigation measures for the Proposed Project and Alternatives related to biological resources, we first provide an overview of the definition and use of significance criteria related to biological resources. Subsequently, we discuss impact assessment methodology and ultimately, identify impacts, assign a level of significance to each, and propose specific measures that should be taken to avoid or minimize significant impacts on vegetation and wildlife resources.

C.3.3.1 Impacts Significance Criteria

General Significance Criteria

Significance criteria for impacts to biological resources are taken from § 15065 and Appendix G of the CEQA Guidelines, and § 21083 of the Public Resources Code.

Vegetation Impacts Significance Criteria

The following significance criteria were used to assess the significance of potential project impacts to affected vegetation resources. All impacts that are defined as significant in § 15065 of the CEQA Appendix G Guidelines have been designated as significant in this SEIR. Significant impacts are those that would result in:

- Substantial disturbance of a special status species or its habitat
- Substantial reduction in the numbers of a special status plant species
- Indirect loss of a special status plant species or its habitat
- Filling or degradation of wetlands and waters subject to the jurisdiction of the USACE pursuant to the Federal Clean Water Act (no net loss of wetlands)
- Creation of substantial barriers for dispersal of plant species
- Compaction of soils, clearing of vegetation, or other activities that substantially increase erosion and sedimentation
- Introduction of non-native plant species or facilitating the dispersal of existing populations of non-native plants.

Wildlife Impacts Significance Criteria

Evaluation of impacts to wildlife resources considers the magnitude of impact, the rarity of the resource, and susceptibility of the resource to impacts. All impacts that are defined in § 15065 of the CEQA Appendix G Guidelines as significant have been designated as significant in this SEIR. A project is considered to have potentially significant biological impacts if it would:

- Substantially diminish habitat for fish or wildlife species
- Cause a fish or wildlife population to drop below self-sustaining levels
- Interfere substantially with the movement of any resident or migratory fish or wildlife species
- Reduce the number or restrict the range of a rare or endangered species
- Adversely affect species under the protection of the Migratory Bird Treaty Act (burrowing owls, nesting raptors, passerines)
- Threaten to eliminate an animal community
- Filling or degradation of wetlands and waters subject to the jurisdiction of the USACE pursuant to the Federal Clean Water Act (no net loss of wetlands)
- Substantially affect a rare or endangered species or the habitat of that species.

Significant impacts to biological resources are not limited to projects affecting only State or Federally listed endangered species. A species that is federally- or state-listed will also be considered rare or endangered if it can be shown to meet the following criteria (CEQA Guidelines, § 15380):

- When its survival and reproduction in the wild are in immediate jeopardy from one or more causes
- It is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens
- It is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

C.3.3.2 Impact Assessment Methodology

Impacts on Vegetation Resources

Vegetation resources were surveyed in 1986 and in 2001 within a ¼-mile wide corridor, extending along the length of the proposed transmission line's Western Corridor, as well as several Western Corridor Alternative Segments. Vegetation resources for the Eastern Corridor Alternative were surveyed only during 1986. Proposed locations and impact parameters (i.e., anticipated project activities/facilities) were compared with the locations of identified biological resources to determine the following:

- Type of resource affected
- Area, population, and status of the resource affected
- Nature of the potential impact (e.g., construction vs. maintenance, short-term vs. long-term, and direct vs. indirect).

All potential impacts to vegetation resources were related to the significance threshold criteria in Section C.3.1.2.1, above.

Since specific access road, tower footing, and conductor tensioning and splicing locations ha~~ve~~d not been designated at the time of this evaluation, it is assumed for purposes of analysis in this document that tower locations are uniformly distributed at 1,300 foot intervals and that one mile of new access roads will need to be constructed for every mile of transmission line (see Section B, Project Description). Special status plant populations were reviewed and designated for avoidance based on species rarity, magnitude of the potential impacts, and sensitivity of the species to disturbance. Mitigation for all potentially significant impacts, including those that could result from access roads, is also proposed.

Impacts on Wildlife Resources

Significance criteria were applied to wildlife species populations and habitats within the proposed transmission line corridor to evaluate potential impacts associated with the construction and operation of the Proposed Project. An example of a significant impact is substantial disturbance to or removal of a special status species nest or burrow (e.g., burrowing owl, California tiger salamander, and loggerhead shrike). Impacts to less sensitive wildlife species or habitat (i.e., habitat that does not contain wildlife concentration areas or critical resources) would be considered adverse but less than significant. Examples include most annual grassland areas and agricultural lands that may be used by some species for foraging.

C.3.3.3 Impacts and Mitigation Measures from 1988 FEIS/EIR

Table C.3-8 summarizes the impacts from the 1988 FEIS/EIR, and compares them to the impacts presented in this SEIR. In one case (Impact 3-11), this SEIR determined that the potential impact on special status plant and animal species could be more severe than the 1988 FEIS/EIR. Each impact is described in more detail in the next section.

Table C.3-8 Impacts from 1988 FEIS/EIR Compared to Impacts Identified in This SEIR

Final EIS/EIR Impact	Significance	SEIR Impact	Significance
Temporary removal of vegetation	Less than significant after mitigation	**Impact 3-1:** Temporary and/or permanent loss of sensitive vegetation communities **Impact 3-2:** Temporary and/or permanent loss of special status plant species and their habitats **Impact 3-3:** Disturbance of plant communities **Impact 3-4:** Disturbance of special status plant species and their habitats **Impact 3-5:** Erosion and sedimentation.	Less than significant after mitigation
Permanent loss of vegetation	Less than significant after mitigation		
Surface clearing of wildlife habitat	Less than significant after mitigation	**Impact 3-6:** Removal of wildlife habitat **Impact 3-7:** Wildlife mortality **Impact 3-8:** Wildlife disturbance from increased human presence	Less than significant after mitigation
Temporary wildlife displacement during construction	Less than significant after mitigation		
Increased predation or competition	Less than significant	**Impact 3-9:** Increased predation and/or competition	Less than significant
Avian collisions with transmission lines	Less than significant after mitigation	**Impact 3-10**: Bird electrocution and tower/line collisions	Less than significant after mitigation
Clearing of wildlife habitat; displacement during construction	Less than significant after mitigation	**Impact 3-11:** Habitat removal or disturbance of special status wildlife species	Potentially significant

Table C.3-9 lists the mitigation measures recommended in the 1988 FEIS/EIR and shows how those measures have been incorporated into this SEIR. The full text of mitigation measures is presented in the next section, and the locations at which each measure is recommended are identified by segment.

Table C.3-9 Disposition of Mitigation Measures from 1988 FEIS/EIR

Mitigation Measure from 1988 FEIS/EIR	Disposition in this SEIR
Conduct site-specific scoping sessions as required under Section 7 (Endangered Species Act, 1973, as amended) consultation procedures to focus field studies, impact analysis, and potential mitigation assessments.	Incorporated into Mitigation Measure **B-12**.
Conduct ground surveys of potential sensitive plant habitat during the appropriate period, prior to selection of final alignments.	Incorporated into Mitigation Measures **B-1** and **B-6a/b**.
Detailed mitigation plans would be developed that define the extent and types of additional field studies, and how the results of these studies could be coordinated with detailed engineering surveys. As part of the siting process, numerous construction and siting details will be developed and presented to the regulatory agencies for review and comment. Where mitigation measures are specified in the plan, field monitoring schedules and progress reports will be prepared and submitted to the agencies. Biologists could accompany crews during the site selection and construction phases to ensure sensitive resources are identified and avoided. The results of the siting and mitigation efforts for the Lost Banos-Gates project would also be presented in a report of findings to the CPUC and other appropriate agencies.	Components incorporated into Mitigation Measures **B-2**, **B-7**, **B-8**, and **B-11**.
Technical specialists, including biologists, will survey the preliminary alignment in the field to determine any site-specific conditions that can be avoided. For biological resources, these will include San Joaquin kit fox burros and denning areas, areas where blunt-nosed leopard lizard occur, giant kangaroo rat burrows, raptor nesting areas, and productive wetlands areas.	Incorporated into Mitigation Measures **B-1** and **B-11**.
Replant temporarily disturbed areas with a mixture of perennial grasses, forbs, brush, shrubs, and tree species that will provide effective erosion control. Prepare a firm, rough seedbed on fill or cut slopes and apply appropriate types and amounts of fertilizers and seed mixtures. Consider reseeding with native plants only in sensitive areas not subject to grazing.	Incorporated into Mitigation Measure **B-3**.
Perform contour discharge or ripping operations at the conclusion of construction. This would loosen compacted soil and develop the seedbed for revegetation.	Deleted because this mitigation measure is discussed under Hydrology and Water Quality (Mitigation Measure **H-1**)
Where possible, avoid road construction on very steep slopes to minimize surface erosion and slumping.	Incorporated into Mitigation Measure **B-2**.
Recontour, prepare the surface, and seed all roads, construction sites, and other disturbed areas not required for project operation and maintenance.	Incorporated into Mitigation Measure **B-3**.

Mitigation Measure from 1988 FEIS/EIR	Disposition in this SEIR
As much as possible, avoid construction activities and land surface disturbance in the immediate vicinity of unique plant communities and habitat features, such as remnant sand dunes, rock outcrops, riparian zones, alkali areas, other wetlands, kit fox natal dens, and raptor nesting cliffs. These unique features will be determined in consultation with the resource agencies.	Components incorporated into Mitigation Measures **B-2**, **B-6**, **B-7**, **B-8**, and **B-11**.
Avoid construction activities in watercourses and wetlands since these areas are both infrequent and sensitive in the generally arid project area.	Incorporated into Mitigation Measures **B-2** and **B-7**.
Avoid work on unstable slopes and rock outcrops.	Deleted because this mitigation measure is discussed under Hydrology and Water Quality (Mitigation Measure **H-1**)
Minimize surface disturbing activities such as grubbing, grading, ditching, and filling to the extent possible.	Incorporated into Mitigation Measure **B-2**.
Provide fire protection measures and avoid releases of fuels, soils, and other hazardous substances to the ground and water.	Incorporated into Mitigation Measure **B-2**.
Schedule activities to minimize construction in the specific vicinity of golden eagle nests or kit fox natal dens during the periods of the greatest sensitivity (i.e., February through the end of the nesting or denning period).	Incorporated into Mitigation Measures **B-2** and **B-11**.
Attach raptor nesting platforms to towers at intervals greater than one mile in raptor use areas. Place these on the towers in positions least likely to cause operation and maintenance problems. The number of nesting platforms would be determined during the transmission line alignment analysis.	Deleted because this mitigation measure increases the likelihood of impacts under Impact 3-9.
Avoid permanent access road clearing to the extent possible, allowing the short annual grasses to cover the ground surface.	Incorporated into Mitigation Measure **B-2**.

C.3.3.4 General Biological Impacts Within the Proposed Transmission Line Corridor

The following discussion presents an overview of the general types of anticipated impacts, followed by detailed discussions of each on vegetation and wildlife resources with measures proposed to mitigate significant impacts.

C.3.3.4.1 *Vegetation*

Potential impacts to special status plants and vegetation communities are stated in terms of the five categories below:

- **Impact 3-1:** Temporary and/or permanent loss of sensitive vegetation communities
- **Impact 3-2:** Temporary and/or permanent loss of special status plant species and their habitats
- **Impact 3-3:** Disturbance of plant communities
- **Impact 3-4:** Disturbance of special status plant species and their habitats
- **Impact 3-5:** Erosion and sedimentation.

Impact 3-1 and 3-2: Temporary and/or Permanent Loss of Sensitive Vegetation Communities

The Proposed Project can result in permanent loss and/or temporary disturbance to sensitive plant communities and associated wildlife habitat. Temporary disturbance includes short-term impacts during construction. Permanent loss involves long-term impact associated with permanent project features that will remain throughout the life of the project. Tower work areas would occupy from 912 to 1,656 square feet per structure and structure foundations would occupy an estimated 56 square feet per structure. Examples of these impacts are:

- Construction access roads (temporary)
- Construction yards (temporary)
- Tower site clearance (temporary)
- Conductor tensioning and splicing sites (temporary)
- Tower foundations (permanent)
- Operational access roads (permanent).

Each of these activities would cause the removal of existing vegetation and disturbance of surface soils.

Impact 3-3 and 3-4: Disturbance of Sensitive Vegetation Communities and/or Special Status Plant Species

Surface disturbance occurs during construction, operation, and maintenance of the Proposed Project especially when vehicles are driven over existing vegetation, but that vegetation is not intentionally cleared. Impacts would be related to the following activities:

- Movement of equipment and project personnel during line-stringing, where ground clearance not required
- Movement of equipment and project personnel for annual project maintenance, including tree trimming
- Access by general public during life of project.

Each of these activities could cause temporary damage to existing vegetation, but would not likely involve removal or substantial disruption of surface soils. The most common type of surface disturbance is associated with rubber-tired or steel-tracked vehicles used to string the line and transport personnel and materials along the project corridor.

Impact 3-5: Erosion and Sedimentation

Erosion and sedimentation have the potential to occur during and after construction and are routinely related to the following activities:

- Exposure of surface soils from removal of vegetation
- Compaction of soils and disturbance of soil profile from vehicle movement.

Erosion and sedimentation can temporarily or permanently damage vegetation communities by removing or substantially disrupting surface soil layers. Drainages and marshland and riparian areas could be substantially degraded by the accumulation of sediments and alteration of natural hydrologic characteristics. Specific impacts and mitigation measures are described below, as well as in Sections C.5 (Geology and Soils) and C.7 (Hydrology and Water Quality). Impacts from movement of equipment and project personnel can vary in magnitude from minor to severe, depending on variables such as vegetation type, soil morphology, topography, volume of construction traffic, and specific types of vehicles used. Efforts to restore areas that have not been severely affected by these impacts may cause more damage than the original impact. The proposed mitigation for these impacts accounts for agency discretion to identify areas where restoration efforts would be beneficial.

C.3.3.4.2 *Wildlife*

Impacts to terrestrial wildlife resources as a result of the Proposed Project are separated into those likely to occur from construction (both short-term and long-term impacts) and those that could occur as a result of transmission line operation and maintenance. Potential impacts to federal- and state-listed species, candidate species, and species of special concern are also discussed.

General impact categories to terrestrial wildlife include:

- **Impact 3-6:** Removal of wildlife habitat
- **Impact 3-7:** Wildlife mortality
- **Impact 3-8:** Wildlife disturbance from increased human presence
- **Impact 3-9:** Increased predation and/or competition
- **Impact 3-10:** Bird electrocution and tower/line collisions
- **Impact 3-11:** Habitat removal or disturbance of special status wildlife species.

These impact categories are described below. Project-related disturbance in each category includes all activities that might occur during the life of the project, including construction, operation and scheduled maintenance activities.

Impact 3-6: Wildlife Habitat Removal

Wildlife habitat removal includes activities such as: (1) ground surface grading and blading, (2) tree or shrub removal, (3) tree trimming, or (4) scraping of road surfaces that disturbs surface and subsurface soils. Each of these activities could effectively remove existing habitat, thereby reducing its availability to local wildlife populations. Habitat removal could occur primarily during project construction, when vehicles require access to structure locations. In some areas, access would require construction of new roads or upgrading of existing roads. Blading of previously undisturbed surfaces may also occur to access structure locations. Blading would remove rocks, large shrubs, and other objects from the soil surface, leaving a relatively clear pathway for construction vehicles. In addition, habitat could be removed at many structure locations, conductor tensioning and splicing locations, and at construction yards. Construction yards may not be graded in all cases; however, it is anticipated that these areas could be substantially damaged by vehicle parking and materials storage activities during construction.

Impact 3-7: Direct Wildlife Mortality

This involves the direct loss of small mammals, reptiles, and other less mobile species that could result, primarily, from the access by construction vehicles. Direct mortality may also be associated with increased human activity, particularly involving animal/vehicle collisions.

Impact 3-8: Wildlife Disturbance from Increased Human Presence

Indirect impacts resulting from human disturbance during project construction, maintenance, or the reclamation efforts (due to heavy vehicle operation, or helicopter flights, nighttime lighting, noise, etc.)

could cause displacement of some wildlife to other habitats, which may or may not be able to support additional individuals. Impacts as a result of increased human disturbance may also include avoidance of preferred habitat areas and reduced reproductive success in local wildlife populations, including songbirds, small mammals, reptiles, and special status species.

Impact 3-9: Increased Predation and Competition

The Proposed Project would introduce structures to areas that currently do not have trees or other tall structures that would allow predator perching. As a result, some wildlife species in the vicinity of the proposed transmission line corridor (i.e., raptors) would be given a competitive advantage. The introduction of tall structures that can be used as perches during hunting would benefit some raptor populations by providing a secure vantage point from which to survey large areas of habitat. In addition, habitats that raptors had previously used only occasionally could become routine hunting areas due to the increase in available perches and potential nest sites. Wildlife displaced from construction areas could be forced into already occupied habitat, thus placing them at a competitive disadvantage from resident individuals of the same species or those of different species with similar requirements.

Impact 3-10: Bird Electrocution and Tower/Line Collision

Raptors and large waterfowl are most susceptible to electrocution because of their size, distribution, and behavior (Olendorff et al., 1981). They often perch on tall structures that offer optimal views of potential prey. Bird electrocutions occur when the wingspan of the bird is greater than the spacing between any two conductors on a power pole or when a bird bridges the gap between a conductor and a ground wire. The high-voltage (500 kV) transmission lines for the Proposed Project will be constructed with a greater distance between conductors (44 feet) and between conductors and static lines (15 feet) than the wingspans of the largest North American raptor or waterfowl (i.e., 80 inches for bald eagles and sandhill cranes) in the project area and therefore will present little to no risk of bird electrocution. Bird electrocution could occur at the Los Banos or Gates Substations or with any low voltage power lines (less than 69 kV) associated with ~~the~~ these substations, where conductors are closer together than 80 inches (the wingspan of the largest North American raptor or waterfowl).

Bird collisions with power lines generally occur when: (1) a power line or other aerial structure transects a daily flight path used by a concentration of birds, and (2) migrants are traveling at reduced altitudes and encounter tall structures in their path (Brown, et al., 1993). Collision rates generally increase in low light conditions, during inclement weather, such as rain or snow, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. The potential for bird collisions with power lines or substation facilities associated with this project is greatest in the vicinity of the:

- Los Banos Substation – near the O'Neill Forebay and Cottonwood Creek Wildlife Areas;
- Los Banos Reservoir – from MP 4 to 8 in the western corridor or from MP 5-8 in the Eastern Corridor Alternative; and

- Little Panoche Wildlife Area – between Segment 4 (MP 22 to 24) or Alternative Segment 4A (AMP 22 to 24) in the Western Corridor.

Impact 3-11: Habitat Removal or Disturbance of Special Status Wildlife Species

In general, construction and operational impacts of the Proposed Project on special status wildlife species and their habitats would be similar to those discussed in the sections for vegetation and general wildlife. However, similar impacts can have greater effects on special status wildlife species, since the distribution and abundance of many of these species are limited.

C.3.3.5 Biological Impacts and Mitigation Measures for the Proposed Project

Proposed Project impacts are presented according to the impact categories described in Section C.1. Significant impacts could be identified as either **Class I** (significant and unmitigable) or **Class II** (potentially significant but mitigable to less than significant). Specific, proposed mitigation measures are numbered and cross-referenced where they apply to more than one impact. Not all vegetation communities, special status plants, general or special status wildlife identified in the biological baseline (Section C.3.1) will be addressed in this section. Only biological resources potentially affected by the project will be addressed, using information obtained through field surveys and published and unpublished data from resource agencies. Mitigation Measures **B-1 through B-12** below place emphasis on avoidance as the primary means of mitigating potential impacts to natural plant communities, wetlands, and special status species. Factors considered in evaluating priority for avoidance include:

- Regulatory status (state and federal legal protection)
- Known distribution
- Resource concentration/dispersal
- Potential for natural recovery or restoration.

Biological resources that have high sensitivities to impacts are identified and given the highest priority for avoidance. Other forms of mitigation are recommended where avoidance was not possible. Off-site compensation should be used to mitigate for loss and for the recovery lag time inherent in restoration and natural recovery of plant communities and habitats.

C.3.3.5.1 *Vegetation Impacts*

Impact 3-1: Temporary and Permanent Loss of Sensitive Vegetation Communities

Annual Grassland/Scrub and Agricultural Areas. ~~Approximately~~ An estimated 186 acres of natural grassland/scrub vegetation will be temporarily affected within Segments 1–~~–~~6, while forty-nine (49) acres of agricultural land will be temporarily affected within Segments 1, 5, 6, and 7. Table C.3-10 presents a summary of disturbed areas by vegetation type for each segment within the Proposed Western Corridor and Alternatives. During construction, approximately 119 acres of grassland/scrub vegetation and 31 acres of agricultural lands along the western corridor will be permanently replaced by tower bases and access roads. However, the actual amount of vegetation lost may be less, if new access roads are not required along the entire ROW, and existing roads can be upgraded as necessary. Some non-native annual grassland and agricultural land may also be temporarily affected by the

movement of construction vehicles along the ROW to deliver supplies and equipment during construction activities.

Table C.3-10 Temporary and Permanent Disturbance Acreages for Plant Communities

Summary of Vegetation Temporarily Disturbed[a]					
Corridor Alternative	Segment Length (Miles)	Total Land Required[a] (Acres)	Vegetation Type		
			Grassland & Scrub (Acres)	Agricultural (Acres)	Other Land[b] (Acres)
Proposed Western Corridor					
Segment 1	1.9	5.3	3.7	1.5	0.0
Segment 2	12.7	36.3	35.6	0.0	0.7
Segment 3	5.3	15.2	15.2	0.0	0.0
Segment 4	8.5	24.2	22.9	0.5	0.8
Segment 5	41.0	117.5	99.6	17.8	0.3
Segment 6	10.5	30.1	10.7	18.2	1.2
Segment 7	4.0	11.4	0.0	11.4	0.0
TOTAL	**83.9**	**240.0**	**187.7**	**49.4**	**3.0**
Western Corridor Alternative Segments					
Segment 2A	12.9	36.9	34.7	0.0	2.2
Segment 4A	9.0	25.7	24.1	0.0	1.6
Segment 6A	10.3	29.5	2.6	26.0	1.3
Segment 6B	11.7	33.4	30.2	2.7	0.4
TOTAL	**43.9**	**125.5**	**91.6**	**28.7**	**5.5**
Eastern Corridor Alternative					
All Segments	85.7	240.8	37.7	203.8	0.0
Summary of Vegetation Permanently Disturbed [c,d]					
Proposed Western Corridor					
Segment 1	1.9	3.4	2.4	1.0	0.0
Segment 2	12.7	23.1	22.6	0.0	0.5
Segment 3	5.3	9.6	9.6	0.0	0.0
Segment 4	8.5	15.5	14.7	0.3	0.5
Segment 5	41.0	74.6	63.2	11.2	0.2
Segment 6	10.5	19.2	6.8	11.6	0.8
Segment 7	4.0	7.3	0.0	7.3	0.0
TOTAL	**83.9**	**152.7**	**119.3**	**31.4**	**2.0**
Western Corridor Alternative Segments					
Segment 2A	12.9	23.5	22.0	0.0	1.5
Segment 4A	9.0	16.1	16.1	15.0	1.1
Segment 6A	10.3	19.2	1.7	16.7	0.8
Segment 6B	11.7	21.4	19.2	1.9	0.3
TOTAL	**43.9**	**80.2**	**59.0**	**33.6**	**3.7**
Eastern Corridor Alternative					
All Segments	85.7	156.0	24.0	132.0	0.0

[a] Excludes construction yards and work camp (21.1 acres).
[b] Includes alkali, wetland, and riparian vegetation.
[c] Assumes one mile of new road per mile of transmission line and an average road width of 14 feet. Also assumes maximum impact that all roads would be maintained. Some access roads not required for maintenance or desired for use by landowner will be returned to a natural condition.
[d] Assumes four towers per mile of transmission line and 20 feet x 60 feet dimensions (0.03 acres).

Due to the already disturbed nature of much of the non-native annual grassland and agricultural land in the project area, temporary and permanent impacts to these plant communities are considered **Class III** impacts – adverse but less than significant. As described in Section C.7, Land Use, there is more agricultural land now along the Western Corridor than there was at the time of the 1986 Draft EIS/EIR, so some grassland has already been lost. No specific mitigation measures are therefore proposed for impacts to these non-native annual grassland or agricultural areas.

Alkali, Wetland, and Riparian Vegetation. Approximately three acres of alkali, wetland, and riparian vegetation would be temporarily impacted from blading for construction access within Segments 2, 4, 5, and 6. Approximately two (2) acres of these vegetation types would be permanently lost. These include alkali grass vegetation in Segment 2, alkali and wetland vegetation in Segment 4, and riparian vegetation within Segments 5 and 6. Temporary loss of these plant communities will result from movement of construction vehicles between towers. Although tower placement will generally avoid these plant communities, permanent impacts to these communities could result from construction of access roads and work areas around each tower. Due to the sensitivity of these plant communities, potential impacts to alkali, wetland, or riparian vegetation are considered **Class II** impacts that are significant, but mitigable by avoidance, restoration, and/or off-site compensation as described by Mitigation Measure **B-1** below.

Mitigation Measures for Impact 3-1, Temporary and Permanent Vegetation Losses in Alkali, Wetland, and Riparian Vegetation Communities

The objective of the following mitigation measures (**B-1 through B-5**) is to reduce potential impacts to significant natural plant communities within and adjacent to the proposed transmission corridor to a less than significant level by either avoiding these communities, restoring affected areas on-site, or enhancing similar areas at off-site locations. Permanent and temporary loss of wetland, alkali, and riparian plant communities will therefore be mitigated by a combination of avoidance, restoration, and off-site compensation.

B-1 A jurisdictional delineation of wetlands within the proposed transmission line corridor shall be performed by PG&E and verified by the U.S. Army Corps of Engineers before specific avoidance measures can be developed. Similarly, a formal mapping and assessment of alkali and riparian habitat will be required to satisfy CDFG 1601 (Streambed Alteration Agreement) requirements, if project activities (i.e., construction roads) cross the beds or banks of jurisdictional streams. Surveys, mapping and assessment shall be performed at least 60 days before start of construction and results of these surveys (identification of wetlands, alkali, and riparian habitat) shall be utilized to define areas that are to be avoided in tower siting and location of access roads and other project components. The Project Biologist (defined in Mitigation Measure **B-12**) shall evaluate all proposed tower sites and identify those that are located within 200 feet of identified wetlands, alkali, and riparian habitat. A report summarizing habitat findings with respect to tower locations, along with copies of all maps and assessments shall be submitted to the CPUC for review and approval.

B-2 Pre-construction surveys shall be performed for identification of all special status plant and animal species within 200 feet of project construction activities (including towers, access roads, and work areas). Special status species, as well as jurisdictional wetlands and riparian habitat (as determined from Mitigation Measures **B-1** and **B-6**, and as identified during 1986 and 2001 field surveys), shall be flagged prior to the start of construction of any project components. The CPUC shall be notified prior to the start of flagging activities so a CPUC-designated biologist may observe these activities. Maps and reports identifying locations of special status plants and animals found in pre-construction surveys, as well as proposed exclusion-fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. If feasible, construction activities within significant plant communities shall be avoided by placing towers so as to span these areas, maximizing the use of existing

access roads, minimizing the construction of new access roads, and using temporary spur roads. Prior to confirming final transmission corridor design, the locations of all project components (towers, roads, temporary work areas, etc.) shall be defined on a map that also illustrates locations of wetlands, riparian habitat, and special status plants and wildlife, and this shall be provided to the CPUC for review and approval. If it is determined that special status plant or wildlife habitat cannot be avoided, Mitigation Measure **B-11** shall be implemented.

B-3 Under conditions where impacts to wetlands, alkali, and riparian habitats cannot be avoided, PG&E shall either restore temporarily disturbed areas to pre-construction conditions following construction or provide off-site compensation for permanent vegetation losses.

Where on-site restoration is planned for mitigation of temporary impacts, the Applicant shall develop a Habitat Restoration Plan, which will be submitted to the CPUC and the U.S. Army Corps of Engineers (for wetlands), the California Department of Fish and Game (CDFG) (for riparian habitat), and the Regional Water Quality Control Board (RWQCB) at least 60 days prior to the start of any construction for their review and approval. The plan shall contain information for natural community mitigation, including specifying the location of habitat type to be created, details on soil preparation, seed collection, planting, maintenance, and monitoring for on-site restoration efforts. Quantitative success criteria will also be presented. The mitigation objective for affected significant natural plant communities will be restoration to pre-construction conditions as measured by species cover, species composition, and species diversity. Success criteria will be established by comparison with reference sites approved by the appropriate agencies.

Creation or restoration of habitat shall be monitored for five years after mitigation site construction to assess progress and identify problems. Remedial actions will be taken during the five-year period if necessary to ensure the success of the restoration effort.

B-4 If the CPUC-approved Project Biologist (defined in Mitigation Measure **B-12**), in consultation with project engineers, determines that restoration of temporary impacts is not feasible or where permanent impacts (i.e., loss of habitat) to significant plant communities occur from access road or tower installation, off-site mitigation shall be negotiated at agency-approved mitigation banks or otherwise, to a level acceptable by the CPUC, USFWS, CDFG, or USACE.

B-5 A Worker Environmental Awareness Program (WEAP) shall be implemented for construction crews by a qualified biologist(s) provided by PG&E and approved by the CPUC prior to the commencement of construction activities. Training materials and briefings shall include but not be limited to, discussion of the Federal and State Endangered Species Acts, the consequences on noncompliance with these acts, identification and values of sensitive species and significant natural plant community habitats, fire protection measures, hazardous substance spill prevention and containment measures, and review of mitigation requirements. This training program shall also incorporate the provisions of Mitigation Measure **H-3** (Hydrology and Water Resources). Training materials and a course outline shall be provided to the CPUC for review and approval at least 30 days prior to the start of construction. PG&E shall provide to the CPUC a list of construction personnel who have completed training, and this list shall be updated by PG&E as required when new personnel start work. No construction worker may work in the field for more than 5 days without receiving the WEAP.

Impact 3-2: Temporary and Permanent Loss of Special Status Plants or Their Habitat

The following special status plant species could be affected by project construction and operation.

- ***Forked Fiddleneck.*** Temporary loss of potential forked fiddleneck habitat would be approximately 4.6 acres, while permanent habitat loss would be approximately 6.1 acres. Potential impacts would be concentrated in the Ceirvo Hills area of Segment 5 between MP 47.0 and 49.5 and between MP 52.0 and 54.5. Because forked fiddleneck is a CNPS List 4 species (relatively widespread in oak woodland and annual grassland habitats from San Benito to Kern County), potential impacts to this species and its habitat is considered **Class III**, adverse but less than significant. No mitigation is proposed.

- ***Crownscale.*** Temporary loss of potential crownscale habitat would be approximately 1.9 acres. Permanent habitat loss would be approximately 2.3 acres. Potential impacts to habitat for this species would be concentrated on low terraces associated with intermittent streams and in soils with high levels of salt, within Segment 5 – between MP 50.0 and 51.0 and between MP 66.0 and 67.0. Because crownscale is a CNPS List 4 species (relatively widespread in saltbush scrub and annual grassland habitats with alkaline soils), potential impacts to this species and its habitat is considered **Class III**, adverse but less than significant. No mitigation is proposed.

- ***Lost Hills Crownscale.*** Temporary loss of suitable habitat for Lost Hills crownscale would be approximately 8.3 acres, while permanent habitat loss would be approximately 11.8 acres. Potential impacts to this species habitat would be limited to the Tumey Hills, Ciervo Hills, and Monocline Ridge areas in Segment 5 – at numerous locations between MP 37.5 and 56.5, where blading is required for construction access and tower construction. Lost Hills Crownscale is a CNPS List 1B species that is presently known in the inner South Coast Ranges, from Merced County to Kern County. On the basis of existing information, the species occupies a limited geographic range, specialized habitat requirements, and frequently integrates morphologically with crownscale. Therefore, the potential clearing of habitat for this species is considered a potentially significant (**Class II**) impact, mitigable by restoration, as described in Mitigation Measures **B-2** (above) and **B-6** (below).

- ***Recurved Larkspur.*** Temporary loss of recurved larkspur habitat would be approximately 1.8 acres. Permanent habitat loss would be approximately 2.3 acres. Potential impacts to this species habitat from blading for construction access and tower construction may occur on low terraces associated with intermittent streams and in soils with high levels of salt within Segment 5 – between MP 44.5 and 45.0 and between MP 66.0 and 67.0. Recurved larkspur is a CNPS List 1B species that is presently in and around the San Joaquin and Sacramento Valleys in annual grasslands or in association with saltbush scrub or valley sink scrub. On the basis of its status in California, the potential clearing of habitat for this species is considered a potentially significant (**Class II**) impact, mitigable by restoration as described in Mitigation Measures **B-3** and **B-4**.

- ***Cottony Buckwheat.*** Temporary and permanent loss of cottony buckwheat habitat would be approximately 0.9 and 1.4 acres, respectively. Potential impacts to suitable habitat for this species will occur in the Panoche Hills area of Segment 4 – near MP 27.5, the Tumey Hills area of Segment 5 – near MP 39.0, and in the Ciervo Hills area in Segment 5 – between MP 53.5 and 55.5. Because cottony buckwheat is a CNPS List 4 species (widely distributed in the inner South Coast Ranges, the southwest San Joaquin Valley, and the southern Sierra Nevada foothills from Fresno to Kern Counties), potential clearing of this species habitat is considered a **Class III** impact, adverse but less than significant. No mitigation is proposed.

Mitigation Measure for Impact 3-2, Loss of Special Status Plant Species and Their Habitats

Mitigation Measure **B-6a** presents a plan to avoid impacts to special status plants during construction and operation. Mitigation Measure **B-6b** presents another method of reducing habitat loss: use of Tubular Steel Poles (TSPs) rather than lattice structures to support the conductors. TSPs would be constructed with only two footings (rather than the four required for the lattice towers), and the footings would be closer together. As a result, the ground disturbance would be reduced by at least half. It is

noted that this mitigation measure has the potential to create a significant visual impact in some parts of the project area; that impact is acknowledged in Section C.11.3.7, Visual Resources.

B-6a Prior to construction, comprehensive rare plant surveys shall be conducted (or compiled from previous surveys) for all plants that have been identified within the study area and those plants with the potential to occur in the study area (as defined in Tables C.3-3 and C.3-4). Surveys shall be conducted within appropriate areas along the selected construction ROW and in areas susceptible to surface disturbance by construction vehicles or personnel. Surveys of the selected alignment (if not covered in 2001 spring survey) shall be appropriately timed to cover the blooming periods of the nine special status plant species known to occur in the area (April, May, and July). Maps depicting the results of these surveys will be prepared and will include other recently mapped special status plant occurrences in the area to ensure that the full scope of rare plant habitat in the project corridor vicinity is delineated.

Locations of ~~these~~ special status plant populations will be provided to construction personnel. Any special status plant occurrences located within 200 feet of the approved project construction corridor will be fenced prior to the start of any construction, and if feasible, towers or other project components shall not be placed in areas where these plant populations have been identified. Maps and reports, as well as proposed fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. Gypsum-loving larkspur, while a CNPS List 4 (watch list) species, has no special status under FESA, CESA or the NPPA. It occurs at numerous locations along the proposed ROW and because of its prevalence and abundance within the project area, this species is exempted from the above fencing requirement.

B-6b PG&E shall present to the CPUC within 30 days of project approval a report evaluating use of Tubular Steel Poles (TSPs) rather than lattice towers for the transmission line. The report shall evaluate the technical feasibility of using TSPs for this project, and shall present diagrams illustrating the poles, their footing requirements, and the approximate ground disturbance required. The report shall also present visual photosimulations of the TSPs from three locations, approved by the CPUC. A comparison of all of these factors with the proposed lattice towers shall also be provided.

Impact 3-3: Impacts to Plant Communities by Disturbance from Vehicles or Project Personnel

Potential impacts to plant communities could be caused by movement of construction/maintenance vehicles and equipment within a single lane, up to a 15-foot wide corridor roughly parallel to the transmission line centerline. Impacts could include soil compaction, crushing of vegetation, and disruption of microphytic crusts[1]. Not all plant communities are equally sensitive to surface disturbance, not all of these impacts would occur in every plant community, and such disturbance would be limited to areas where other existing surface roads are not available. Quantification of these impacts is not possible at this time because site-specific data are lacking. However, plant communities that would be the most affected by disturbance from vehicles, equipment or project personnel include annual grassland, scrub, and riparian communities. Surface disturbance to annual grassland plant communities are considered **Class III** impacts that are adverse but less than significant, whereas surface

[1] A thin layer of mosses, lichens, and other non-flowering organisms found at the soil surface that serve as an important link in the soil nutrient cycle.

disturbance to wetland, scrub, and riparian communities would be considered a **Class II** impact that is significant, but mitigable by avoidance measures described in Mitigation Measures **B-2** and **B-7**.

Mitigation Measure for Impact 3-3, Disturbance to Plant Communities

B-7 PG&E shall map and flag or fence overland travel routes and project access areas prior to construction or periodic maintenance during operation and shall ensure that vehicles or project personnel do not disturb identified areas. Areas flagged shall include wetland, alkaline areas, riparian, and reservoirs and ponds. The mapping/flagging shall be reviewed by a CPUC-approved biologist prior to use of these routes for construction to ensure adequate protection for sensitive plant communities. No project components shall be constructed within these sensitive areas.

Impact 3-4: Disturbance of Special Status Plants

All of the special status plant species previously discussed under Impact 3-2 also have the potential to be affected by vehicles or project personnel. Since sensitivity to such disturbance would vary by individual species and circumstance, quantification of these impacts is not possible at this time with existing data. Impacts from surface disturbance would likely be greatest along the southern half of Segment 5 between MP 45.0 and MP 65.0, because this area contains the highest concentration and diversity of special status plant species within the western corridor. Lost Hills crownscale and forked fiddleneck have a wider distribution throughout this area, therefore the magnitude of impacts to suitable habitat for these species are likely to be greater than for other species with a narrower distribution, such as cottony buckwheat, whose habitats can be more easily avoided. Potential impacts to special status plant species and their habitats as a result of surface disturbance would be a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance as described in Mitigation Measure **B-6**.

Impact 3-5: Erosion and Sedimentation

Grading, excavation, and similar activities during construction, and permanent re-contouring of slopes for access roads and pole sites, could increase the potential for erosion of disturbed surfaces prior to reclamation. Short-term water erosion of soils on slopes greater than approximately 15 percent would occur during heavy storms, which could affect downslope vegetation. Erosion and sedimentation could adversely affect drainages and wetlands within and adjacent to the project area and might delay or prevent suitable recovery of disturbed surfaces. Erosion and sedimentation is considered a potentially significant (**Class II**) impact, requiring mitigation. Mitigation Measure **H-1** (Section C.6, Hydrology and Water Quality) requires preparation and implementation of a comprehensive Erosion Control Plan.

C.3.3.5.2 *Wildlife*

Impact 3-6: Wildlife Habitat Removal

Approximately 241 acres of general wildlife habitat would be temporarily disturbed and 151 acres would be permanently removed during construction of access roads and placement of towers along the proposed transmission line corridor, thereby reducing the amount of habitat available to local wildlife

populations. Habitat removal would occur primarily during project construction when vehicles require access to structure or substation locations. In addition, habitat would be removed at many structure locations, at substation locations, and at construction staging areas. Staging areas may not be graded in all cases; however, it is anticipated that these areas could be substantially affected by vehicle parking and materials storage activities during construction.

Permanent and temporary loss of habitat within the ROW could affect some small mammal, reptile and/or amphibian species with very limited home ranges and mobility. For these species, the clearing for access roads and staging areas could represent a slight reduction in the carrying capacity of a portion of their home range until a productive vegetation cover is re-established. However, most of these species are common and widely distributed throughout the area and the loss of some individuals as a result of habitat removal would have a negligible impact on populations of the species throughout the region. Therefore, the potential clearing of habitat for most of the smaller wildlife species along the proposed alignment is considered a **Class III** impact, adverse but less than significant. Consequently, no mitigation is proposed.

Potential impacts to specific wildlife species are described below.

- ***Mule Deer.*** Construction of the proposed alignment would temporarily disturb an estimated 190 acres of habitat that serves as permanent range of resident mule deer. An estimated 151 acres of mule deer habitat would be permanently disturbed. Because, however, of the limited value of most of this habitat to mule deer, and the scattered distribution of deer within and adjacent to the project area, impacts to resident deer using the area would be minor and non-significant. Therefore, the potential clearing of habitat for mule deer is considered a **Class III** impact, adverse but less than significant, and no mitigation is proposed.

- ***Game Birds.*** The majority of the proposed transmission line corridor provides limited habitat for California quail and chuckars. Morning doves are relatively common throughout the region and construction of the proposed alignment would only remove a very small percentage of available habitat for this species. Therefore, the potential clearing of habitat for game bird species is considered a **Class III** impact, and no mitigation is proposed.

- ***Raptors.*** Several species of raptors were observed foraging along the proposed transmission corridor, including the northern harrier, golden eagle, and red-tailed hawk. Though several appropriate nesting sites for these species were identified in riparian areas along the proposed ROW, no nesting by these species was observed. Although construction activities could occur near these riparian corridors, all mature trees that could potentially be used by nesting raptors can be avoided during construction with implementation of Mitigation Measure B-2 (in which exclusion flagging or fencing would protect riparian habitat), resulting in less than significant (**Class II**) impacts.

- ***Burrowing Owls.*** Much of the habitat along the proposed ROW alignment is suitable for nesting by burrowing owls. Temporary loss of potential burrowing owl habitat could be up to 19.0 acres, while permanent habitat loss could be as high as 28.6 acres, depending on the availability of existing access roads. Potential impacts to this species will be concentrated between MP 14.6 and 17.8 in Segment 3 and between MP 52.6 and MP 70.0 in Segment 5. Disturbance to burrowing owl nesting habitat would be considered a potentially significant (**Class II**) impact, mitigable by implementation of Mitigation Measure **B-9** below.

Impact 3-7: Direct Wildlife Mortality

Direct loss of small mammals, reptiles, and other less mobile species would result primarily from the use of construction vehicles during stringing of the line, and use of other construction or maintenance

vehicles within the 160-foot ROW. Surface disturbance during construction and maintenance of the Proposed Project could result in a potential loss of less mobile individual animals and/or ground nests. Clearing, grading, excavating and/or burying habitats could also lead to mortality of small mammals, reptiles, and nesting birds with eggs or young, resulting in an adverse but less than significant impact (**Class III**).

Direct mortality could also occur as a result of animal-vehicle collisions. During construction, equipment and other vehicles could collide with wildlife on construction sites or during travel to and from sites. Most mortality, if it occurred, would probably be on paved highways such as I-5, Highway 152, and State Routes 145 and 198, where project-related vehicles would be traveling at higher speeds than on dirt or gravel roads. Wildlife that are particularly vulnerable to collisions with vehicles are species that are inconspicuous, slow moving, and/or nocturnal. Potential wildlife mortality related to vehicle collisions with most common mammal, bird, and reptile species (i.e., non-sensitive species) would be considered a potentially significant (**Class II**) impact, mitigable with implementation of Mitigation Measure **B-8**.

Mitigation Measure for Impact 3-7, Direct Wildlife Mortality

The purpose of this measure is to provide specific directions and descriptions of actions that would reduce human contact related mortality among wildlife in the vicinity of the project during construction. Effective application of this mitigation measure would result in little mortality among wildlife in the vicinity of the Proposed Project during construction, thereby reducing impacts to wildlife to a less than significant level (**Class II**).

B-8 In order to reduce direct mortality impacts during construction, PG&E shall impose the following conditions on all construction personnel, and these requirements shall be addressed in the WEAP (Mitigation Measure **B-5**):

- Vehicles shall not exceed 10 mph on the entire ROW or along designated portions of access roads where blunt-nosed leopard lizards are known to occur ~~unpaved access roads or in the ROW~~. These locations will be determined during pre-construction surveys and ~~These roads shall be~~ identified on project maps ~~and speed limits shall be identified on maps~~ prior to the onset of construction. All other areas along dirt access roads outside the limits of known blunt-nosed leopard lizard habitat shall have a 15 mph speed limit, consistent with Air Quality Mitigation Measure A-1.
- Litter or other debris that may attract animals shall be removed from the project area; organic waste shall be stored in enclosed receptacles, removed from the project site daily, and disposed of at a suitable waste facility
- No pets will be allowed in the construction area, including access roads and staging areas
- Construction crews will be educated regarding sensitive wildlife that could be encountered on highways and how to safely avoid them. Crew behavior shall be monitored by a qualified biologist approved by CPUC.

Impact 3-8: Wildlife Disturbance from Human Presence

Indirect impacts on wildlife could occur as a result of noise and increased human presence throughout the project area, with heaviest concentrations occurring during construction at tower and substation

locations, during stringing of the line, and at construction staging areas. These activities are likely to temporarily displace a variety of wildlife from adjacent habitats, lowering the overall habitat availability and effectiveness of these areas. These zones are not likely to be completely abandoned by wildlife, but the effective use of these areas could be reduced during construction, depending on a number of factors such as the particular wildlife species, time of year, presence of topographic features, and amount of foliage and vegetation present. Since this effect could potentially be detrimental to some wildlife during their critical life stages and could increase competitive pressures among adjacent populations and habitats, the impact could be significant. Indirect impacts resulting from human disturbance during project construction, maintenance, or the reclamation process (due to heavy vehicle operation, or helicopter flights, etc.) could therefore cause some wildlife displacement to other habitats, which may or may not be able to support additional animals. Impacts as a result of increased human disturbance may also include reduced reproductive success in local wildlife populations, including songbirds, small mammals, reptiles, and special status species. The following species could be affected. Mitigation Measure **B-9** is presented following the species descriptions.

- ***Loggerhead Shrike.*** Suitable habitat in annual grassland and riparian areas for the loggerhead shrike is found at a number of locations along the proposed corridor. Numerous individual loggerhead shrikes and several pairs displaying territorial behavior were observed in riparian areas within the study area near MP 36.75 and MP48.7 in Section 5. Construction activities may result in the: (1) direct loss of nest sites by removal of nesting shrubs or (2) indirect impacts to nesting and fledgling activities of loggerhead shrikes from noise and general construction activities within the range of ¼ - to ½ -mile, depending on a number of factors. Potential construction disturbance during the breeding season of the loggerhead shrike is considered a **Class II** impact that is significant, but mitigable by pre-construction surveys and avoidance measures described in Mitigation Measure **B-9**.

- ***California Horned Lark.*** Suitable habitat in annual grassland and sparsely vegetated ground for the California horned lark is found at a number of locations along the proposed corridor, within:

  - Segment 2, between MP 8.5 and MP 10.0
  - Segment 5 between MP 48.5 and 49.5, and between MP 57.0 and MP 57.5.

  Construction of the proposed alignment would temporarily disturb an estimated 1.86 acres of habitat that serves as nesting habitat for this species. An estimated 3.1 acres of nesting habitat for the California horned lark would be permanently disturbed. Additional impacts to this species could occur from surface disturbance, which could result in crushed vegetation and potential loss of individual nests, eggs, or young. Indirect impacts to nesting and fledgling activities of California horned larks from noise and general construction activities could also occur within the range of ¼ - to ½ -mile depending on a number of factors. Potential construction disturbance during the breeding season of the California horned lark is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Tricolored Blackbird.*** Along the proposed transmission line corridor, suitable habitat for the tricolored blackbird is found in annual grassland and wetlands along the proposed transmission line corridor, with a colony of birds observed between MP 4.0 and MP 4.5 in Segment 2. The tricolored blackbird could be impacted if construction of the line occurred within 250 feet of a breeding colony and caused an interruption of this species breeding season. Construction disturbance during the breeding season of the tricolored blackbird is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Western Burrowing Owl.*** Burrowing owls have been observed nesting in a variety of areas along the western corridor – between MP 14.6 and MP 17.8 in Segment 3, and between MP 52.6 and MP 70.0 along Segment 5. Construction of the proposed alignment would temporarily disturb an estimated 19.0 acres of habitat that

serves as nesting habitat for this species. An estimated 28.6 acres of nesting habitat for the burrowing owl could be permanently disturbed. Indirect impacts to nesting and fledging activities of burrowing owls from noise and general construction activities could also occur within the range of 250-feet of an active nest. Likewise, if burrowing owls move into a construction zone prior to the start of construction, or during construction, there is a potential for individual owls, their young, and their eggs to be destroyed. Loss of foraging and nesting habitat, or construction disturbance during the breeding season are considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Golden Eagle.*** No nesting golden eagles were observed along the proposed alignment and no large stick nests were identified along the corridor during the field surveys, however, the potential for the species to nest within, and/or directly adjacent to the study area cannot be discounted. One adult bird and one juvenile bird were recorded soaring within the study area during field surveys; however, the specific location of this observation was not reported. Noise and activity associated with transmission tower construction could disturb foraging activities of the golden eagle, and cause it to temporarily avoid the construction area. This would be considered a less than significant impact because non-breeding golden eagles, which have a large foraging range, would be able to temporarily disperse to similar adjacent habitat during construction.

  Although construction activities would occur near potential nest sites for the golden eagle, all mature trees and cliff areas that could potentially be used by nesting birds will be avoided during construction. Disturbance to potential nesting sites for raptors is considered a potentially significant (**Class II**) impact, mitigable with implementation of recommended Mitigation Measures **B-2** and **B-9**.

- ***Northern Harrier.*** Several northern harriers were observed foraging in annual grasslands within Segment 5, near MP 32.3 and MP 66.5. Although no nests or nesting activity was observed, this species likely nests within suitable grassland habitat in the study area. Like the golden eagle, noise and activity associated with transmission tower construction during the non-nesting season could disturb the northern harrier, and cause it to temporarily avoid the construction area. This would be considered a less than significant (**Class III**) impact because non-breeding northern harriers would be able to temporarily disperse to similar adjacent habitat during construction.

  Harriers are ground-nesting raptors that are sensitive to human disturbance. This species could abandon nesting attempts if disturbed during the breeding season. Additional impacts to this species could occur from surface disturbance, which could result in crushed vegetation and potential loss of individual nests, eggs, or young. Indirect impacts to nesting and fledgling activities of northern harriers from noise and general construction activities could also occur within the range of ¼ - to ½ -mile depending on a number of factors. Potential construction disturbance during the breeding season of the northern harrier is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***San Joaquin Kit Fox.*** Although no direct observations of San Joaquin kit fox were made within the project area, sign in the form of burrows, tracks, and scat suggest its occurrence is likely. While direct impacts to the San Joaquin kit fox can generally be avoided, construction-related disturbances could have a negative impact upon its habitat. A permanent loss of denning and feeding habitat could occur as a result of the construction of access roads and the permanent placement of tower footings. The anticipated permanent loss of grasslands throughout the project area is approximately 120 acres. This loss is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

  Increased human presence and increased traffic in the area could also adversely impact the kit fox. Indirect impacts to denning and feeding kit foxes from noise and general construction activities could also occur within the range of ¼ - to ½ -mile depending on topographic conditions, and light and noise associated with nighttime traffic and construction can be especially hazardous to nocturnal species such as the San Joaquin kit fox. Potential disturbance related impacts to the San Joaquin kit fox is considered a potentially significant (**Class II**) impact, mitigable with implementation of Mitigation Measure **B-9**, while vehicle-related collisions

with kit fox would be considered a **Class II** impact that is potentially significant, but mitigable with implementation of recommended Mitigation Measure **B-8**.

- ***San Joaquin Antelope Squirrel.*** Although suitable habitat for the San Joaquin antelope squirrel is present throughout the study area, only one antelope squirrel was observed in the entrance to a burrow within Segment 5, near MP 52.5. Permanent habitat loss for this species could occur as a result of construction of access roads and the permanent placement of tower footings. Additional impacts to this species could occur from surface disturbance, which could result in crushed burrows and potential loss of individuals or young. Indirect impacts breeding San Joaquin antelope squirrels from noise and general construction activities could also occur within the range of 300 feet from an active burrow. Potential construction disturbance during the breeding season of the San Joaquin antelope squirrel is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***American Badger.*** While direct impacts to the American badger can generally be avoided, construction-related disturbances could have a negative impact upon its habitat. A permanent loss of denning and feeding habitat could occur as a result of the construction of access roads and the permanent placement of tower footings. The anticipated permanent loss of grasslands throughout the project area is approximately 120 acres. This loss is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

  Increased human presence and increased traffic in the area could also adversely impact the badger. Indirect impacts to denning and feeding sites from noise and general construction activities could also occur within the range of ¼ -mile depending on topographic conditions. Potential disturbance related impacts to the American badger is considered a potentially significant (**Class II**) impact, mitigable by avoidance measures as described in Mitigation Measure **B-9**.

- ***Giant Kangaroo Rat.*** Although no individuals were directly observed along the proposed western corridor, possible giant kangaroo rat tracks and burrows were observed throughout Segment 5, at a number of locations between MP 38.0 and MP 68.5. Potential habitat of varying quality occurs along portions of Segment 5, near MP 40.5, 40.9, 51.1, and 62.7. If present, a permanent loss habitat for this species could occur as a result of construction of access roads and the permanent placement of tower footings. Additional impacts to this species could occur from surface disturbance, which could result in crushed burrows and potential loss of individuals or young. Indirect impacts to breeding individuals from noise and general construction activities could also occur within the range of 300 feet from an active burrow. Potential construction disturbance during the breeding season of the giant kangaroo rat is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Short-nosed Kangaroo Rat.*** Like the giant kangaroo rat, the short-nosed kangaroo rat is generally associated with woodland habitat. Possible short-nosed kangaroo rat sign was observed within Segment 6, between MP 70.0 and MP70.5, and potential habitat occurs along the proposed corridor from the Merced and Fresno County line south to the Gates Substation. If present, impacts to this species could occur from permanent loss habitat and surface disturbance, resulting in crushed burrows and potential loss of individual adults or young. Indirect impacts from noise and general construction activities could also occur within the range of 300 feet from an active burrow. Potential construction disturbance during the breeding season of the short-nosed kangaroo rat is considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Yuma Myotis (Bat).*** The Yuma myotis is likely to occur in the project area, where it may forage on insects. Impacts to day roosts, maternity roosts, and night roosts are not anticipated because no impact to the abandoned mine where these bats roost will occur. The project will not significantly impact the Yuma myotis and no mitigation is proposed (**Class III**).

- ***California Tiger Salamander.*** Potential habitat for California tiger salamanders is associated with stock ponds and pool areas in drainages in: Segment 2, near MP 4.3; and Segment 5, at MP 57.3, 64.1, and 65.1. Construction activities in these areas may disturb or remove occupied or potentially occupied breeding and

estivation[2] habitat for this salamander. The permanent loss of estivation habitat as a result of construction of access roads and towers could occur in numerous grassland habitats with wetlands in close proximity. The temporary loss of estivation habitat could occur at laydown areas and pull sites. Removal or disturbance of small drainages, stock ponds, and estivation and breeding habitat would be considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***California Red-legged Frog.*** Though the project area is not proposed as critical habitat for this species, suitable breeding, estivation (mammal burrows, riparian thickets), and dispersal habitat for the California red-legged frog is present along ponds and pool areas in drainages in: Segment 2, near MP 4.3; and Segment 5, at MP 57.3, 64.1, and 65.1. Construction activities in the vicinity of stock ponds, permanent seeps, drainage crossings, dispersal corridors and estivation habitat could potentially disturb or remove habitat occupied or potentially occupied by this frog. Construction activities for access roads could result in the loss of eggs, tadpoles, juveniles, and adults. The permanent loss of estivation habitat could occur in numerous locations in the project area as a result of construction of access roads and towers. Temporary loss of estivation habitat could occur at laydown areas and pull sites. Removal or disturbance of small drainages, stock ponds, and estivation and breeding habitat would be considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Foothill Yellow-legged Frog.*** Like the California red-legged frog, suitable breeding, estivation, and dispersal habitat for the foothill yellow-legged frog is present along ponds and pool areas in drainages in: Segment 2, near MP 4.3; and Segment 5, at MP 57.3, 64.1, and 65.1. Construction activities in the vicinity of these areas could potentially disturb or remove habitat occupied or potentially occupied by this frog resulting in the loss of eggs, tadpoles, juveniles, and adults. Removal or disturbance of small drainages, stock ponds, and estivation and breeding habitat would be considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Southwestern Pond Turtle.*** Though there were no direct observations of southwestern pond turtles within the proposed corridor, potential habitat (e.g. stock ponds and pool areas in drainages) occurs in: Segment 2, near MP 4.3; and Segment 5, at MP 57.3, 64.1, and 65.1. Construction activities near stock ponds and drainage crossings may disturb or remove suitable habitat or potentially suitable habitat for this species, if present. Construction activities for access roads near streams could result in the loss of nests, hatchlings, and/or adults. The western pond turtle is a CDFG Species of Special Concern; therefore, removal of potential aquatic turtle habitat would be considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***Blunt-nosed Leopard Lizard.*** Two juvenile blunt-nosed leopard lizards were observed within Segment 5, near MP 33.0 and MP 59.6. Potential habitat of varying quality for the blunt-nosed leopard lizard is present throughout the much of the proposed corridor. Portions of the proposed corridor that overlap potential blunt-nosed leopard lizard habitat include:

  - MP 15.0 to MP 20.0 in Segment 3
  - MP 20.5 to MP 24.0 in Segment 4
  - MP 29.0 to 33.0, MP 38.0 to 46.0
  - MP 58.0 to 59.0 in Segment 5.

  Construction of the proposed corridor could temporarily disturb an estimated 20.2 acres of potential habitat for this species. An estimated 32.7 acres of potential habitat for the blunt-nosed leopard lizard could be permanently disturbed. Indirect impacts to blunt-nosed leopard lizards from noise and general construction activities could also occur within the range of 250-feet of an active burrow. Likewise, if lizards move into a construction zone prior to the start of construction, or during construction, there is a potential for individuals, their young, and/or their eggs to be destroyed. Loss of potential blunt-nosed leopard lizard habitat, or

[2] Estivation is the dormancy of some animals during the dry season.

construction disturbance during the breeding season are considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

- ***San Joaquin Whipsnake.*** No San Joaquin whipsnakes were observed during the field surveys. However, there is a single CNDDB record within 1,000 feet of the survey area near MP 15.0, and potential habitat in the form of valley grassland and saltbush scrub is present within much of the project area. Construction activities near suitable habitat or potentially suitable habitat for this species could therefore result in the loss of nests, young, and/or adults. Removal or disturbance of potential habitat for this species would be considered a potentially significant (**Class II**) impact, mitigable by pre-construction surveys and avoidance measures as described in Mitigation Measure **B-9**.

Mitigation of indirect impacts through avoidance during critical seasons (Mitigation Measure **B-9** below) would reduce this potentially significant impact to less than significant levels (**Class II**).

Mitigation Measure for Impact 3-8, Wildlife Disturbance from Human Presence

The primary mitigation measures to reduce potential impacts to wildlife resulting from increased human presence during construction are avoidance by pre-construction surveys to determine wildlife presence or absence and appropriate construction timing to avoid.

B-9 Pre-construction wildlife surveys (following appropriate survey protocol, as applicable) shall be performed by qualified biologists to locate active raptor nests, owl~~/harrier~~ ~~burrows~~ and blunt-nosed leopard lizard burrows and other resources defined in Table C.3-11 in/or adjacent to the ROW and access road areas. Maps and reports, as well as proposed fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction.

Based on survey results, construction and operation activities shall be scheduled to avoid critical breeding, nesting and rearing seasons for sensitive wildlife species occupying a given area, as defined in Table C.3-11 below. Specific identified habitats (nests, riparian habitat, burrows, etc.) shall be avoided during specific seasons throughout the construction, operation, and maintenance of the approved project. Travel routes for vehicles, equipment and personnel will be along existing roads. If such roads are not present, routes will be flagged or fenced and no activities would be permitted outside these areas. If active nests, burrows or other habitat are observed, the avoidance period and buffer distances shown in Table C.3-11 will be implemented.

Specific distances from resources (see Table C.3-11) shall be maintained during construction, operation and maintenance of the transmission line. Travel areas shall be flagged prior to construction (see Mitigation Measure **B-2**), and biological monitors as specified by CPUC will be present during construction to verify that no vehicular travel occurs outside flagged areas. However, an exemption (variance) to a mitigative measure may be approved by CDFG or USFWS on a case-by-case basis. When a particular species (i.e. blunt-nosed leopard lizard) for which a specific mitigation measure has been proposed cannot be avoided by construction activities, a variance will be requested from the appropriate resource agency by the designated Project Biologist. Biological monitors will also have the authority to terminate construction activities if any significant adverse effect on special status species is observed.

Table C.3-11 Avoidance and Buffer Requirements for Reducing Impacts to Special Status Wildlife Species

Special Status Species	Habitat[1]	Potential Impact	Critical Season	Buffer Distance (radius)	Buffer for over-flights
Loggerhead shrike	nest site	construction	2/1 - 9/1	250 feet	500 feet
California horned lark	nest site	construction	2/1 - 9/1	250 feet	500 feet
Tricolored balckbird	nest site	construction	2/1 - 9/1	250 feet	500 feet
Western burrowing owl	wintering burrow nest site	construction	9/1 - 1/31 2/1 - 8/31	160 feet 250 feet	500 feet 500 feet
Golden eagle	nest site	construction	2/1 - 9/1	0.25 mile	500 feet
Northern harrier	nest site	construction	2/1 - 9/1	0.25 mile	500 feet
San Joaquin kit fox	known dens ~~potential dens~~	construction	None	300 feet ~~100 feet~~	500 feet
San Joaquin antelope squirrel	~~Potential~~ known ~~-~~burrows	construction	3/1 - 9/1	300 feet	none
American badger	~~potential~~ known dens	construction	3/1 - 9/1	300 feet	none
Giant kangaroo rat	~~potential~~ known burrows	construction	3/1 - 9/1	300 feet	none
Short-nosed kangaroo rat	~~potential~~ known burrows	construction	3/1 - 9/1	300 feet	none
Yuma myotis	roost sites in abandoned mine	construction	None	none	none
California tiger salamander	breeding pools aquatic habitat	construction	5/1 - 10/31 11/1 - 4/30	30 feet 200 feet	none none
California red-legged frog	proposed critical habitat aquatic breeding habitat	construction	5/1 - 10/31 11/1 - 4/30	30 feet 200 feet	none
California yellow-legged frog	aquatic breeding habitat	construction	11/1 - 4/30	200 feet	none
Southwestern pond turtle	aquatic breeding habitat	construction	5/1 - 10/31 ~~11/1 - 4/30~~	~~30 feet~~ 200 feet	~~none~~ none
Blunt-nosed leopard lizard	known breeding habitat	construction	3/1 - 9/1	~~300~~ 200 feet	none
San Joquin whipsnake	mammal burrows	construction	all year	none	none

[1] Avoidance areas will be identified by coordinate or MP and will be provided to construction management before project construction begins.
[2] Subject to modification upon approval by CDFG.

Impact 3-9: Increased Predation and Competition

New transmission towers in this area with few existing trees or other perching sites could increase the opportunity for raptors to prey on wildlife in general along the Western Corridor. This is potentially a project-specific impact and a cumulative impact, given that there already are perching opportunities on the existing 500 kV and other transmission towers in the project area. There is a potential for raptors to perch on new towers and prey on sensitive species such as the San Joaquin antelope squirrel. Although neither the numbers of San Joaquin antelope squirrels nor raptors is large along the Proposed Western Corridor, a decrease in the antelope squirrel population could be a significant impact. Likewise, predation on tricolored blackbirds, giant kangaroo rats, short-nosed kangaroo rats, California horned larks, and/or western burrowing owls or their young could be a significant impact. However, raptors can already hunt in the project area by flying through it and hovering on the thermal updrafts along the foothills. Therefore, the small incremental increase in predation that could result from this project is considered to be less than significant (**Class III**).

Impact 3-10: Bird Electrocution and Tower/Line Collisions

Electrocution only occurs when a bird simultaneously contacts two conductors of different phases or a conductor and a ground. This happens most frequently when a bird attempts to perch on a structure with insufficient clearance between these elements. On a 500 kV transmission line, all clearances

between conductors or between conductors and ground are sufficient to protect even the largest birds and no impacts are expected (APLIC, 1996).

Operational impacts of the proposed transmission line include the potential for bird mortality from collisions with wires and tower structures. Passerines (i.e., songbirds) are known to collide with wires (APLIC, 1994), particularly during nocturnal migrations or poor weather conditions (Avery et al., 1978). However, passerines have a lower potential for collisions than larger birds, such as swans and cranes. Some behavioral factors contribute to a lower collision mortality rate for these birds. Passerines tend to fly under powerlines, as opposed to larger species, which generally fly over the lines and risk colliding with the higher static lines, and many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al., 1978).

One of the primary factors in determining the potential for birds collisions with transmission lines is the number of birds flying through the area. For instance, a Mare Island study (Hartman et al., 1992) found that both bird flights and collision mortality were much greater on a section of a 115 kV pole line that paralleled a tidally influenced salt pond than on a section that passed through a hayfield. High use of the salt pond by migratory waterfowl and shorebirds resulted in more collisions than a hayfield that is generally used by fewer birds. Other factors that influence the rate of bird collision are species, age, flocking behavior, weather conditions, land use, topography, and line placement and configuration (APLIC, 1994).

It is difficult to predict the magnitude of collision-caused bird mortality without extensive information on bird species and movements in the project vicinity. These data are not available for the proposed transmission line corridor. However, it is possible to make some qualitative predictions based on previous studies in other areas. It is generally expected that collision mortality will be greatest where the movements of susceptible species are the greatest (e.g. wetlands, water bodies, etc.). In addition, the placement and visibility of the line will influence collision mortality.

The potential for bird mortality from collisions with transmission lines is greatest with waterfowl, because of the local movements of relatively large numbers of waterfowl that occur between San Joaquin Valley wetlands east of the project area, and reservoirs, ponds, and wetland habitats within and adjacent to the project area.

Raptor mortality from collisions should not be a concern along this transmission line. Raptor collisions with wires are generally uncommon, as they have better visual acuity and are able to avoid the wires. No bird electrocution impacts are expected from the main 500 kV transmission line or the 230 kV lines associated with the Gates Substation, therefore no mitigation is necessary at that location.

All waterfowl species are vulnerable to collisions to some degree, but large-bodied birds are more vulnerable (Anderson, 1978; Faanes, 1987). Collisions with power lines have been documented as a problem for waterfowl and cranes during flights between foraging and roosting areas in large waterfowl staging areas in North Dakota, Colorado, and Nebraska (Faanes, 1987; Morkill and Anderson, 1993; Brown and Drewien, 1995). The potential for collisions increases during periods of low visibility, such

as low cloud ceiling, fog, precipitation, and darkness. Waterfowl flight activity often increases during inclement weather and in the early morning and early evening, which increases their risk of collision. Other factors that affect waterfowl collision rates include flocking behavior; the proximity of staging or feeding areas to power lines; panic flushes from disturbance; and preoccupation with other activities, such as courtship, territory defense, and predator avoidance (APLIC, 1994). The potential for collision mortality of waterfowl and other birds (Mitigation Measure **B-10**, below) is a potentially significant (**Class II**) impact. However, due to the lack of site-specific information in the project area related to the direction of bird flight, frequency of corridor crossing, and weather conditions, the mitigation measure is presented with an option for a bird collision study as a first step toward confirming the impact potential.

Mitigation Measure for Impact 3-10, Bird Collision Impacts

B-10 Prior to installation of conductors, PG&E shall either (a) perform a study to determine the potential for bird strikes in the areas identified below and then, depending on study results, (b) implement bird strike diverters as defined below. The study shall evaluate the actual bird strike incidents at existing transmission lines in the vicinity of the approved project corridor. If this study determines that bird strikes would not constitute a significant impact, compliance with the remainder of this measure would not be required; if PG&E does not complete this study or if study results confirm the potential benefits of bird flight diverters, the remainder of this measure shall be implemented. The protocol for this study (including the time period, survey intervals, and impact significance criteria) shall be approved by the CPUC, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG).

If PG&E does not perform the study defined above or if study results determine that flight diverters would likely be beneficial, PG&E shall install bird flight diverters in the areas defined below to reduce bird collision impacts along the proposed or alternative transmission line corridors:

- At the Los Banos Substations on any new ~~equipment and~~ transmission lines
- On static lines in the vicinity of the Los Banos Reservoir, from MP 4 to 8 in the Western Corridor or from MP 5 to 8 in the Eastern Corridor Alternative; and
- On static lines in the vicinity of the Little Panoche Wildlife Area, between Segment 4 (MP 22 to 24) and Alternative Segment 4A (AMP 22 to 24) in the Western Corridor.

Prior to installation of conductors, PG&E shall submit its recommendation for the type(s) and spacing of bird flight diverters in the identified areas to the CPUC, the USFWS, and the CDFG for review and approval. Conductors shall not be installed until the CPUC, in conjunction with USFWS and CDFG, has approved an agreement between PG&E, USFWS, and CDFG regarding the type and spacing of bird flight diverters required; diverters shall be installed within 30 days of installation of conductors.

Following installation of all bird flight diverters (line markers), PG&E shall begin a three-year monitoring program in the areas identified above to determine the extent of bird collisions in the project area. Existing unmarked transmission lines in similar high bird-use areas shall be monitored during the same period to allow comparisons for determining line marking effectiveness. The protocol for the study (including identification of unmarked lines to be monitored) shall be submitted to the resource agencies for review and approval prior to

installation of conductors on new towers. As part of the design of this monitoring program, PG&E shall submit to the CPUC and the U.S. Fish and Wildlife Service information regarding types of bird collision detection systems, their potential for improving study results, and their cost and feasibility in this area. Based on this information, the CPUC will decide whether such a system will be required for the monitoring study. Annual reports providing bird strike data for the new marked lines and for the existing unmarked lines shall be provided to the CPUC, the USFWS, and the CDFG, and a summary report shall be submitted at the end of the three-year monitoring program. The annual reports shall include a discussion of the apparent effectiveness of the line marking techniques selected, and recommendations regarding modification of the type of line markers used if bird collisions are determined to be frequent. PG&E, after review and input by CPUC, USFWS, and CDFG, shall implement the findings of the annual reports by modifying line markers as needed to minimize collisions.

C.3.3.5.3 *Special Status Plant and Wildlife Species*

Impact 3-11: Habitat Removal or Disturbance of Special Status Plant and Wildlife Species

In general, construction and operational impacts of the Proposed Project on special status plant and wildlife species and their habitats would be similar to those discussed in the sections for vegetation and general wildlife, as discussed under Impacts 3-1 through 3-10 above. However, these impacts can be more severe for special status plant and wildlife species, since the distribution and abundance of many of these species are limited.

The major components of the Proposed Project that would cause impacts to biological resources are the transmission towers, construction access roads, and staging areas. These project features can generally be sited to avoid direct impacts to special status species, and mitigation measures have been proposed with the intent that such avoidance occurs. However, site-specific surveys have not been completed within the Western Corridor because the precise location of project components has not yet been defined. As a result, it is difficult to determine the magnitude of impacts that will result from the project as proposed, and whether mitigation measures previously presented would fully eliminate the impacts by ensuring avoidance. If engineering concerns, topographic constraints, or other issues result in the unavoidable siting of a project component in a location where loss of special status plant species or wildlife habitat would occur, project impacts could be significant. If this occurs, Mitigation Measure **B-11** requires consultation with the CDFG and USFWS to determine additional protective or compensatory measures. If these additional measures were successful in eliminating or otherwise offsetting the identified impact, the residual impact would be less than significant; however, since there is no assurance of this, the conclusion of this SEIR is that the impact on special status plant and wildlife species will be significant (**Class I**).

Mitigation Measure for Impact 3-11, Impacts on Special Status Plant and Wildlife Species

B-11 If, after applying Mitigation Measures **B-2, B-4, B-6, B-8** and **B-9**, the CPUC-approved Project Biologist determines that all impacts on special status plant and wildlife species cannot be avoided, PG&E shall initiate FESA Section 7 Consultation with the U.S. Fish & Wildlife Service for Federally-listed species and/or CESA 2080 Consultation will be initiated with the California Department of Fish and Game for State-listed species. These consultations shall

determine requirements for obtaining a (FWS) Biological Opinion and/or (CDFG) Incidental Take Permit. PG&E shall obtain any such required Biological Opinion or Incidental Take Permit and, in that process, shall work cooperatively with the appropriate agency or agencies to develop appropriate mitigation measures to offset impacts to the affected species. PG&E shall thereafter implement all mitigation recommendations of the FWS and/or CDFG that result from these consultations.

Depending on the specific location of the transmission line within the corridor, the Proposed Project Segment 6 and Western Corridor Alternative Segment 6B could potentially traverse land identified as Habitat Mitigation Bank land under the City of Coalinga's Habitat Conservation Plan. The Habitat Mitigation Bank was created in response to the requirements of the Federal Endangered Species Act and the California Endangered Species Act. The following parcels could potentially be traversed by the project:

- Sec 8-Twp 20S-R16E, 160 acres in the southwest region of the parcel;
- Sec 16-Twp 20S-R16E, 320 acres in the western half of the parcel; and
- Sec 32-Twp 20S-R16E, 155 acres.

Section 16 would be traversed by the Proposed Project (Segment 6) and Sections 8 and 32 would be traversed by Western Corridor Alternative Segment 6B. Loss of this mitigation bank land would be a potentially significant impact (Class II). Implementation of Mitigation Measure B-11a would ensure that impacts would be less than significant.

B-11a PG&E shall provide land of equal of better habitat value to the City of Coalinga to compensate for any acreage lost within the City of Coalinga's Habitat Mitigation Bank.

C.3.3.5 Reconfiguration South of Gates Substation

If reconductoring of the Gates-Arco-Midway 230 kV line is required, PG&E has stated that it is unlikely that existing towers will need to be replaced or moved. In that case, impacts of reconductoring would be less than significant (Class III). However, if ground disturbance is required, potential impacts to biological resources could occur and Mitigation Measures B-1 through B-12 should be implemented, as applicable, to ensure that impacts are less than significant (Class II).

C.3.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR WESTERN CORRIDOR ALTERNATIVE SEGMENTS

The Western Corridor Alternative Segments would result in similar types of impacts to biological resources as the proposed transmission line corridor. However, Segments 2A and 4A would have greater potential for impact than the equivalent Proposed Project segments due to the greater extent of riparian vegetation near these alternatives.

Approximately 92 acres of grassland/scrub vegetation and 29 acres of agricultural land could at least be temporarily affected within the Western Corridor Alternative Segments – approximately 59 acres of grassland/scrub vegetation and 34 acres of agricultural land could be permanently replaced by tower

bases and access roads (see Table C.3-11). However, the actual amount of vegetation lost would likely be less, since it is assumed that new access roads would be required for the entire project corridor. Due to the disturbed nature of, and human modifications to, non-native annual grassland and agricultural areas, temporary and permanent impacts to these plant communities are considered **Class III** impacts that are adverse, but not significant. Consequently, no specific mitigation is proposed for impacts to non-native annual grassland or agricultural areas.

Approximately 5.5 acres of alkali, wetland, and riparian vegetation would be temporarily impacted from blading for construction access, while permanent loss of these vegetation types would be approximately 3.7 acres. Temporary loss of these plant communities will result from surface disturbance by construction vehicles, equipment and personnel. Although tower placement will generally avoid these plant communities, permanent impacts could result from access roads and possibly the work area around each tower. Due to the sensitivity of these plant communities, potential impacts to alkali, wetland, or riparian vegetation are considered **Class II** impacts that are potentially significant, but mitigable by avoidance, restoration, and off-site compensation as described by Mitigation Measures **B-1 through B-7**.

Construction impacts to special status plant species within the Western Corridor Alternative Segments would be the same as those described for the proposed transmission line corridor. Proposed Mitigation Measure **B-6** for impacts related to the proposed transmission line corridor would adequately reduce these impacts to less than significant levels (**Class II**).

The open terrain in Segments 2A, 4A, 6A, and 6B provides important foraging opportunities for raptors and potential nesting sites are located within the riparian communities along Los Banos Creek (MP 6.0) and, Ortigalita Creek (MP 14.0) in Segment 2A, and along Little Panoche Creek within Segment 4A. Habitat and/or breeding impacts to several special status species associated with these areas, including the golden eagle, northern harrier, tricolored blackbird, San Joaquin kit fox, blunt-nosed leopard lizard, and California tiger salamander, could occur if the Western Corridor Alternative Segments are implemented. However, proposed Mitigation Measure **B-9** should be implemented to reduce these impacts to less than significant levels (**Class II**).

C.3.5 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE EASTERN CORRIDOR ALTERNATIVE

The Eastern Corridor Alternative would be located along predominantly agricultural lands and would avoid nearly all sensitive biological resources of the Proposed Western Corridor. Eighty-five percent of both temporary and permanent impacts to plant communities would occur within agricultural land. There would be limited temporary or permanent impacts to natural alkaline, wetland, or riparian under this alternative, however, quantification of these losses is not possible due to limited information on this area. Placement of towers along the Eastern Corridor Alternative would eliminate impacts from erosion and reduce impact due to bird collisions and increased predation.

This alternative would eliminate impacts to most special status plant and animal species. The potential for impact remains for the blunt-nosed leopard lizard, giant kangaroo rat, and San Joaquin kit fox. Kit fox occur in agricultural land where uncultivated land is maintained, allowing for denning sites and a suitable prey base (Hanson, 1988). This is particularly true in areas within the Eastern Corridor Alternative where little natural habitat remains. Therefore, the Eastern Corridor Alternative represents potential habitat for the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat and this alternative would result in same types and magnitude of impact as those described for the proposed transmission line corridor. Proposed Mitigation Measure **B-9** would adequately reduce these impacts to less than significant levels **(Class II**).

C.3.6 MITIGATION MONITORING PROGRAM

Mitigation for significant impacts to biological resources includes avoidance, minimization, restoration, compensation, and education. Specific mitigation for affected resources will be developed in consultation with the California Public Utilities Commission, Bureau of Land Management, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and associated resource management agencies and individuals, utilizing the general mitigation guidelines adopted by those agencies. Table C.3-12 summarizes the mitigation monitoring program for the impacts discussed in Sections C.3.3 through C.3.4.

The following additional mitigation measure will ensure that biological resource monitoring conducted by PG&E will be conducted by individuals with specific qualifications relevant to the resources that will be monitored.

B-12 PG&E shall submit to the CPUC for review and approval the resumes and qualifications of a Project Biologist, who will represent PG&E in the field and be responsible for field decisions on biological issues. In addition, resumes of all other environmental field personnel proposed by PG&E for field enforcement of mitigation measures shall be provided to the CPUC for review and approval. Types of qualifications that will be considered for selecting qualified field personnel include:

- Emphasis of undergraduate/graduate degree(s)
- Related experience
- Special skills such as statistical analysis, experimental design, species identification, vegetation sampling, dependent upon the assignment.

Depending on the monitoring objective, individuals will have suitable experience in soil science, botany, ecology, restoration, wildlife observation, and wetland delineation. The objective will be to utilize monitors who can collect and analyze the data required to document mitigation success, problems, and, if necessary, suggest remedial action.

Table C.3-12 Mitigation Monitoring Program

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
3-1: Temporary and/or permanent loss of sensitive vegetation communities (**Class II**)	**B-1** A jurisdictional delineation of wetlands within the proposed transmission line corridor shall be performed by PG&E and verified by the U.S. Army Corps of Engineers before specific avoidance measures can be developed. Similarly, a formal mapping and assessment of alkali and riparian habitat will be required to satisfy CDFG 1601 (Streambed Alteration Agreement) requirements, if project activities (i.e., construction roads) cross the beds or banks of jurisdictional streams. Surveys, mapping and assessment shall be performed at least 60 days before start of construction and results of these surveys (identification of wetlands, alkali, and riparian habitat) shall be utilized to define areas that are to be avoided in tower siting and location of access roads and other project components. The Project Biologist (defined in Mitigation Measure **B-12**) shall evaluate all proposed tower sites and identify those that are located within 200 feet of identified wetlands, alkali, and riparian habitat. A report summarizing habitat findings with respect to tower locations, along with copies of all maps and assessments shall be submitted to the CPUC for review and approval. **B-2** Pre-construction surveys shall be performed for identification of all special status plant and animal species within 200 feet of project construction activities (including towers, access roads, and work areas). Special status species, as well as jurisdictional wetlands and riparian habitat (as determined from Mitigation Measures **B-1** and **B-6**, and as identified during 1986 and 2001 field surveys), shall be flagged prior to the start of construction of any project components. The CPUC shall be notified prior to the start of flagging activities so a CPUC-designated biologist may observe these activities. Maps and reports identifying locations of special status plants and animals found in pre-construction surveys, as well as proposed exclusion-fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. To the extent possible, construction activities within significant plant communities will be avoided by placing towers so as to span these areas, and maximizing the use of existing access roads, and minimizing the construction of new access roads, using temporary spur roads. Prior to confirming final transmission corridor design, the locations of all project components (towers, roads, temporary work areas, etc.) shall be defined on a map that also illustrates locations of wetlands, riparian habitat, and special status plants and wildlife, and this shall be provided to the CPUC for review and approval. **B-3** Under conditions where impacts to wetlands, alkali, and riparian habitats cannot be avoided, PG&E shall either restore temporarily disturbed areas to pre-construction conditions following construction	All wetland, alkali, and riparian habitats in the proposed and alternate corridors	CDFG, CPUC	Biological monitor present; photodocument-ation; report submitted for review and approval within 30 days of construction	Planting survival rate designated in restoration plan (percent cover, height, species composition)	Throughout project construction Restoration plan - 60 days prior to construction. Annual report to be submitted to CPUC during 5-year monitoring period

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	or provide off-site compensation for permanent vegetation losses. Where on-site restoration is planned for mitigation of temporary impacts, the Applicant shall develop a Habitat Restoration Plan, which will be submitted to the CPUC and the U.S. Army Corps of Engineers (for wetlands), the California Department of Fish & Game (CDFG) (for riparian habitat), and the Regional Water Quality Control Board (RWQCB) at least 60 days prior to the start of any construction for their review and approval. The plan shall contain information for natural community mitigation, including specifying the location of habitat type to be created, details on soil preparation, seed collection, planting, maintenance, and monitoring for on-site restoration efforts. Quantitative success criteria will also be presented. The mitigation objective for affected significant natural plant communities will be restoration to pre-construction conditions as measured by species cover, species composition, and species diversity. Success criteria will be established by comparison with reference sites approved by the appropriate agencies. Creation or restoration of habitat shall be monitored for five years after mitigation site construction to assess progress and identify problems. Remedial actions will be taken during the five-year period if necessary to ensure the success of the restoration effort. **B-4** If the CPUC-approved project biologist (defined in Mitigation Measure **B-12**), in consultation with project engineers, determines that restoration of temporary impacts is not feasible or where permanent impacts (i.e., loss of habitat) to significant plant communities occur from access road or tower installation, off-site mitigation shall be negotiated at agency-approved mitigation banks or otherwise, to a level acceptable by the USFWS, CDFG, or USACE. **B-5** A Worker Environmental Awareness Program (WEAP) shall be implemented for construction crews by a qualified biologist(s) provided by PG&E and approved by the CPUC prior to the commencement of construction activities. Training materials and briefings shall include but not be limited to, discussion of the Federal and State Endangered Species Acts, the consequences on noncompliance with these acts, identification and values of sensitive species and significant natural plant community habitats, fire protection measures, hazardous substance spill prevention and containment measures, and review of mitigation requirements. This training program shall also incorporate the provisions of Mitigation Measure **H-3** (Hydrology and Water Resources). Training materials and a course outline shall be provided to the CPUC for review and approval at least 30 days prior to the start of construction. PG&E shall provide to the CPUC a list of construction personnel who have completed training, and this list shall be updated by PG&E as required when new personnel start work. No construction worker					

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	may work in the field for more than 5 days without receiving the WEAP.					
3-2: Temporary and/or permanent loss of special status plant species and their habitats (**Class II**) **3-4:** Disturbance of special status plant species and their habitats (**Class II**)	**B-6a** Prior to construction, comprehensive rare plant surveys shall be conducted (or compiled from previous surveys) for all plants that have been identified within the study area and those plants with the potential to occur in the study area (as defined in Tables C.3-3 and C.3-4). Surveys shall be conducted within appropriate areas along the selected construction ROW and in areas susceptible to surface disturbance by construction vehicles or personnel. Surveys of the selected alignment (if not covered in 2001 spring survey) shall be appropriately timed to cover the blooming periods of the nine special status plant species known to occur in the area (April, May, and July). Maps depicting the results of these surveys will be prepared and will include other recently mapped special status plant occurrences in the area to ensure that the full scope of rare plant habitat in the project corridor vicinity is delineated. Locations of these special status plant populations will be provided to construction personnel. Any special status plant occurrences located within 200 feet of the approved project construction corridor will be fenced prior to the start of any construction. Maps and reports, as well as proposed fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. An exception to the fencing requirement would be the gypsum-loving larkspur. Because of the widespread distribution of this plant throughout the project area, it would not be feasible to fence off all of these plant communities. Instead fencing would be placed in the most concentrated areas of gypsum-loving larkspur at the direction of the CPUC approved Biological Monitor. **B-6b** PG&E shall present to the CPUC within 30 days of project approval a report evaluating use of Tubular Steel Poles (TSPs) rather than lattice towers for the transmission line. The report shall evaluate the technical feasibility of using TSPs for this project, and shall present diagrams illustrating the poles, their footing requirements, and the approximate ground disturbance required. A comparison of all of these factors with the proposed lattice towers shall also be provided.	All areas with potential habitat for sensitive plant species in the proposed and alternate corridors	CDFG, CPUC	Biological monitor present; photo-documentation; report submitted for review and approval to responsible agencies within 30 days of construction	No loss of special status plants	Throughout project construction
3-3: Disturbance of plant communities (**Class II**)	**B-2** (above) **B-7** PG&E shall map and flag or fence overland travel routes and project access areas prior to construction or periodic maintenance during operation and shall ensure that vehicles or project personnel do not disturb identified areas. Areas flagged shall include wetland, alkaline areas, riparian, and reservoirs and ponds. The mapping/flagging shall be reviewed by a CPUC-approved	All undeveloped portions of proposed and alternate corridors	CDFG, CPUC	Biological monitor present; report to be submitted to responsible agencies for review prior to construction	No activity outside of designated areas	Throughout project construction and periodic maintenance

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	biologist prior to use of these routes for construction to ensure adequate protection for sensitive plant communities.					
3-5: Erosion and sedimentation (**Class II**)	**H-1** Erosion Control Plan (see Section C.6, Hydrology and Water Quality)	(see H-1)				
3-7: Wildlife mortality (**Class II**)	**B-8** In order to reduce direct mortality impacts during construction, PG&E shall impose the following conditions on all construction personnel, and these requirements shall be addressed in the WEAP (Mitigation Measure **B-5**, above): • Vehicles shall not exceed 10 mph on the entire ROW or along designated portions of access roads where blunt-nosed leopard lizards are known to occur ~~unpaved access roads or in the ROW~~. These locations will be determined during pre-construction surveys and ~~These roads shall be~~ identified on project maps ~~and speed limits shall be identified on maps~~ prior to the onset of construction. All other areas along dirt access roads outside the limits of known blunt-nosed leopard lizard habitat shall have a 15 mph speed limit, consistent with Air Quality Mitigation Measure A-1. • Litter or other debris that may attract animals shall be removed from the project area; organic waste shall be stored in enclosed receptacles, removed from the project site daily, and disposed of at a suitable waste facility • No pets will be allowed in the construction area, including access roads and staging areas • Construction crews will be educated regarding sensitive wildlife that could be encountered on highways and how to safely avoid them. Crew behavior shall be monitored by a qualified biologist approved by CPUC.	All undeveloped portions of proposed and alternate corridors and adjacent roadways	CDFG, CPUC	Biological monitor present; report to be submitted to responsible agencies for review within 30 days of construction	No loss of special status wildlife	Throughout project construction
3-8: Wildlife disturbance from increased human presence (**Class II**)	**B-9** Pre-construction wildlife surveys (following appropriate survey protocol, as applicable) shall be performed by qualified biologists to locate raptor nests, owl/harrier burrows and other resources defined in Table C.3-10 in/or adjacent to the ROW and access road areas. Maps and reports, as well as proposed fence locations, shall be provided to the CPUC's approved biological monitor for review and approval prior to the start of construction. Based on survey results, construction and operation activities shall be scheduled to avoid critical seasons for sensitive wildlife species, as defined in Table C.3-11 below. Specific identified habitats (nests, riparian habitat, burrows, etc.) shall be avoided during specific seasons throughout the construction, operation, and maintenance of the approved project. Travel routes for	All potential nest trees for raptors and burrowing owl burrows	CDFG, CPUC	Specific monitoring/ reporting determined by CDFG; documentation also provided to CPUC for review.	No loss of habitat components	Throughout project construction

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	vehicles, equipment and personnel will be along existing roads. If such roads are not present, routes will be flagged or fenced and no activities would be permitted outside these areas. If nests, burrows or other habitat are observed, the avoidance period and buffer distances shown in Table C.3-11 will be implemented. Specific distances from resources (see Table C.3-11) shall be maintained during construction, operation and maintenance of the transmission line. Travel areas shall be flagged prior to construction (see Mitigation Measure **B-2**), and biological monitors as specified by CPUC will be present during construction to verify that no vehicular travel occurs outside flagged areas. An exemption to a mitigative measure may be approved on a case-by-case basis when deemed appropriate by the designated Project Biologist, CDFG, or USFWS. An exemption would be approved only after a thorough, site-specific analysis determined that a particular species for which the measure was put in place is not present or would not be significantly impacted. Biological monitors will also have the authority to terminate construction activities if any significant adverse effect on special status species is observed.					
3-10: Bird electrocution and tower/line collisions (**Class II)**	**B-10** Prior to installation of conductors, PG&E shall either (a) perform a study to determine the potential for bird strikes in the areas identified below and then, depending on study results, (b) implement bird strike diverters as defined below. The study shall evaluate the actual bird strike incidents at existing transmission lines in the vicinity of the approved project route. If this study determines that bird strikes would not constitute a significant impact, compliance with the remainder of this measure would not be required; if PG&E does not complete this study or if study results confirm the potential benefits of bird flight diverters, the remainder of this measure shall be implemented. The protocol for this study (including the time period, survey intervals, and impact significance criteria) shall be approved by the CPUC, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). If PG&E does not perform the study defined above or if study results determine that flight diverters would likely be beneficial, PG&E shall install bird flight diverters in the areas defined below to reduce bird collision impacts along the proposed or alternative transmission line corridors: • At the Los Banos Substations on any new ~~equipment and~~ transmission lines • On static lines in the vicinity of the Los Banos Reservoir, from MP 4	Select portions of proposed and alternate corridors	USFWS, CPUC, CDFG	Biological monitor present; photo-documentation; report to responsible agencies within 90 days of construction/periodic maintenance	Established mortality thresholds	Throughout project construction and periodic maintenance

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	to 8 in the Western Corridor or from MP 5 to 8 in the Eastern Corridor Alternative; and • On static lines in the vicinity of the Little Panoche Wildlife Area, between Segment 4 (MP 22 to 24) and Alternative Segment 4A (AMP 22 to 24) in the Western Corridor. Prior to installation of conductors, PG&E shall submit its recommendation for the type(s) and spacing of bird flight diverters in the identified areas to the CPUC, the USFWS, and the CDFG for review and approval. Conductors shall not be installed until the CPUC, in conjunction with USFWS and CDFG, has approved an agreement between PG&E, USFWS, and CDFG regarding the type and spacing of bird flight diverters required; diverters shall be installed within 30 days of installation of conductors. Following installation of all bird flight diverters (line markers), PG&E shall begin a three-year monitoring program in the areas identified above to determine the extent of bird collisions in the project area. Existing unmarked transmission lines in similar high bird-use areas shall be monitored during the same period to allow comparisons for determining line marking effectiveness. The protocol for the study (including identification of unmarked lines to be monitored) shall be submitted to the resource agencies for review and approval prior to installation of conductors on new towers. As part of the design of this monitoring program, PG&E shall submit to the CPUC and the U.S. Fish and Wildlife Service information regarding types of bird collision detection systems, their potential for improving study results, and their cost and feasibility in this area. Based on this information, the CPUC will decide whether such a system will be required for the monitoring study. Annual reports providing bird strike data for the new marked lines and for the existing unmarked lines shall be provided to the CPUC, the USFWS, and the CDFG, and a summary report shall be submitted at the end of the three-year monitoring program. The annual reports shall include a discussion of the apparent effectiveness of the line marking techniques selected, and recommendations regarding modification of the type of line markers used if bird collisions are determined to be frequent. PG&E, after review and input by CPUC, USFWS, and CDFG, shall implement the findings of the annual reports by modifying line markers as needed to minimize collisions.					
3-11: Habitat removal or disturbance of special status wildlife species (**Class ~~I or~~ II)**	**B-11** If, after applying Mitigation Measures **B-2, B-4, B-6, B-8** and **B-9**, the CPUC-approved Project Biologist determines that all impacts on special status plant and wildlife species cannot be avoided, PG&E shall initiate FESA Section 7 Consultation with the U.S. Fish & Wildlife Service for Federally-listed species and/or CESA 2080 Consultation will be initiated with the California Department of Fish and Game for State-listed species. These consultations shall determine requirements for obtaining a (FWS) Biological Opinion	Various locations along proposed and alternate corridors	USFWS, CPUC, CDFG	Biological monitor present; photo-documentation; report to responsible agencies within 90 days of construction/perio	No loss of special status wildlife or suitable habitat	Throughout project construction and periodic maintenance

Impact (Class)	Mitigation Measures	Location	Responsible Agency	Monitoring/ Reporting Action	Effectiveness Criteria	Timing
Proposed Project and Alternatives						
	and/or (CDFG) Incidental Take Permit. PG&E shall obtain any such required Biological Opinion or Incidental Take Permit and, in that process, shall work cooperatively with the appropriate agency or agencies to develop appropriate mitigation measures to offset impacts to the affected species. PG&E shall thereafter implement all mitigation recommendations of the FWS and/or CDFG that result from these consultations. **B-11a** PG&E shall provide land of equal of better habitat value to the City of Coalinga to compensate for any acreage lost within the City of Coalinga's Habitat Mitigation Bank.			dic maintenance		
All impacts	**B-12** PG&E shall submit to the CPUC for review and approval the resumes and qualifications of a Project Biologist, who will represent PG&E in the field and be responsible for field decisions on biological issues. In addition, resumes of all other environmental field personnel proposed by PG&E for field enforcement of mitigation measures shall be provided to the CPUC for review and approval. Types of qualifications that will be considered for selecting qualified field personnel include: • Emphasis of undergraduate/graduate degree(s) • Related experience • Special skills such as statistical analysis, experimental design, species identification, vegetation sampling, dependent upon the assignment. Depending on the monitoring objective, individuals will have suitable experience in soil science, botany, ecology, restoration, wildlife observation, and wetland delineation. The objective will be to utilize monitors who can collect and analyze the data required to document mitigation success, problems, and, if necessary, suggest remedial action.	Entire project	CPUC with input from CDFG and USFWS	CPUC to review and approve resumes	Qualified environmental field personnel enforce measures thoroughly and correctly	30 days before start of construction

C.3.7 REFERENCES

Al-Shehbaz, I.A. 1999. *Twisselmannia* (Brassicaceae), a remarkable new genus from California. Novon 9:132-135.

American Ornithologists' Union. 1983. Check-list of North American birds. 6th edition. Allen Press. Lawrence, KS.

Arizona Game and Fish Department (AGFD). 1993. Bats of Arizona. Arizona Wildlife Views, Special Heritage Edition. Vol. 36(8). 36 pp.

_____. 1997. Yuma myotis (*Myotis yumanensis*). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 3 pp.

Balestreri, A.N. 1981. Status of the San Joaquin kit fox at Camp Roberts, California. (Contract No. DAKF03-81-M-C736.) California Polytechnic State University, San Luis Obispo, CA. Prepared for the U.S. Department of the Army, Directorate of Facilities Engineering, Environmental and Natural Resources, Fort Ord, CA.

Beedy, E.C., S.D. Sanders, and D.A. Bloom. 1991. l Breeding status, distribution, and habitat associations of the tricolored blackbird (*Agelaius tricolor*). 1850-1989. (JSA 88-187.) Prepared by Jones & Stokes Associates, Inc. Sacramento, CA. Prepared for U.S. Fish and Wildlife Service, Sacramento, CA.

Behle, W.H. 1942. Distribution and variation of the horned larks (*Otocoris alpestri*s) of western North America. University of California Publications in Zoology 46(3):205–316.

Bent, A.C. 1950. Life histories of North American wagtails, shrikes, vireos, and their allies. (Smithsonian Institution U.S. National Museum Bulletin 197.) U.S. Government Printing Office. Washington, DC.

Boolootian, R.A. 1954. An analysis of sub-specific variations in *Dipodomys nitratoides*. J. Mammal. 35:570-577.

Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. Country Life Books, London. 945 pages.

CalFlora: Information on California plants for education, research and conservation. [web application]. 2001. Berkeley, California: The CalFlora Database [a non-profit organization]. Available: http://www.calflora.org/. (Accessed: Jun 07, 2001)

California Department of Fish and Game (CDFG). 1985. Golden eagle status review. Nongame wildlife investigations. (W-65-R-2, Job No. II-17.) Unpublished report. Sacramento, CA.

_____. 1988. 1987 Annual Report on the Status of California's State-Listed Threatened and Endangered Plants and Animals. Sacramento, CA.

_____. 1989. 1988 Annual Report on the Status of California's State-Listed Threatened and Endangered Plants and Animals. Sacramento, CA.

_____. 1990. Approved Survey Methodologies for Sensitive Species. Blunt-nosed Leopard Lizard, *Gambelia silus*. Region 4, Fresno, California.

_____. 1992. Annual Report on the Status of California's State-Listed Threatened and Endangered Plants and Animals. Sacramento, CA.

_____. 1994. Staff Report Regarding Mitigations for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California. Sacramento, California.

_____. 1995. Staff Report on Burrowing Owl Mitigation. Sacramento, CA.

CNDDB (California Native Diversity Data Base) 2001.

California Native Plant Society. 2000. CNPS Inventory - 6th Edition (draft). Sacramento, CA. [http://www.cnps.org/rareplants/inventory/6thEdition.htm]

Clifton, S.D. 1989. Results of Analysis of San Joaquin Kit Fox Scats from Kellogg Creek Watershed Area, Contra Costa and Alameda Counties, CA. July 1988. Prepared for Jones & Stokes Associates, Inc. (JSA 87-031). Sacramento, CA.

Cowardin, L.M., Carter, V., Golet, F.C., and LaRoe, E.T. 1977. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS—79/31.

Egoscue, H.J. 1956. Preliminary Studies of the Kit Fox in Utah. Journal of Mammalogy 37:351–357.

Easterla, D.A., and J.O. Whitaker, Jr. 1972. Food Habits of Some Bats from Big Bend National Park, Texas. J. Mammal. 53:887-890.

Fraser, J.D., and D.R. Luukkonen. 1986. The loggerhead shrike. Pages 933-941 in R.L. De Silvestro (ed.), Audubon Wildlife Report 1986. National Audubon Society. New York, NY.

Grinnell, J. 1920. A new kangaroo rat from the San Joaquin Valley, California. J. Mammal. 1:178A-179.

Grinnell, J. 1922. A geographical study of the kangaroo rats of California. Univ. Calif. Publ. Zool. 24:1-124.

Grinnell, J., and J.S. Dixon. 1918. The game birds of California. University Press, Berkely. 642 pp.

Grinnell, J., and A.H. Miller. 1944. The distribution of the birds of California. (Pacific coast avifauna number 27.) Cooper Ornithological Club. Berkeley, CA.

Gustafson, S.S. 1992. Salamander survey gives scientists some surprises. Transect 10(2):5.

Hafner, M.S. 1979. Density, distribution, and taxonomic status of Dipodomys nitratoides nitratoides Merriam, 1894 (Rodentia-Heteromyidae). Ph.D dissertation, Univ. New Mexico, Albuquerque, 225 pp.

Hall, E.R. 1981. The mammals of North America. 2nd ed. 2 Vols. John Wiley and Sons, New York. 1271 pp.

Hall, F.A. 1983. Status of the Kit Fox (*Vulpes macrotis mutica*) at the Bethany Wind Turbine Generating (WTG) Project Site, Alameda, CA. The Resources Agency, California Department of Fish and Game. Sacramento, CA.

Hawbecker, A.C. 1953. Environment of the Nelson antelope ground squirrel. J. Mammal. 34:324-334.

Hayes, M.P., and M.R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog *(Rana aurora draytoni)* and the foothill yellow-legged frog *(Rana boylei)*: implications for management. Pages 144-158 in R. Sarzo, K. E. Severson, and D. R. Patton (tech. coords.), Proceedings of the symposium on the management of amphibians, reptiles, and small mammals in North America. (General Technical Report RM-166.) U.S. Forest Service. Flagstaff, AZ.

Hayes, M.P., and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog *Rana aurora draytoni* (Ranidae). The Southwestern Naturalist 30(4):601-605.

Hickman, J.C. (ed.). 1993. The Jepson Manual. University of California Press, Berkeley, CA.

Hoffman, W.M. 1974. The Fresno kangaroo rat study. California Department of Fish and Game, Sacramento, Spec. Wildl. Invest., Final Rep., W-54-4, Job II-5.4, 23 pp.

Hoffmeister, D.F. 1986. Mammals of Arizona. Tucson, AZ: University of Arizona Press. 602 pp.

Holland, D.C. 1985. An ecological and quantitative study of the western pond turtle (*Clemmys marmorata*) in San Luis Obispo County, California. MA Thesis, Fresno State University, Fresno, CA.

_____. 1991. A synopsis of the ecology and status of the western pond turtle (*Clemmys marmorata*) in 1991. Report prepared for the United States Fish and Wildlife Service, National Ecology Research Center, San Simeon Field Station, San Simeon, CA.

Holland, D.C., M.P. Hayes, and E. McMillan. 1990. Late summer movement and mass mortality in the California tiger salamander *(Ambystoma californiense)*. The Southwestern Naturalist 35(2):217-220.

Jennings, M.R. 1988. Natural history and decline of native ranids in California. Pages 61-72 in H.F. DeLisle, P.R. Brown, B. Kaufman, and B.M. McGurty (eds.), Proceedings of a conference on California herpetology. (Special Publication [4]:1-143.) Southwestern Herpetologists Society. Van Nuys, CA.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. California Department of Fish and Game. Sacramento, CA.

Jones & Stokes Associates, Inc. 2001. Results of the special-status plant and wildlife surveys conducted along the proposed Path 15 transmission line project in Fresno and Merced counties. Sacramento, CA. Prepared for Pacific Gas and Electric Company, San Francisco, CA.

~~Jones & Stokes Associates, Inc~~_____. 1998. Biological assessment for construction and operation of AT&T Corp.'s cable upgrade project. Draft. October. (JSA 98-036), Sacramento, CA. Prepared for AT&T Corp.

Larsen, Sheila. Wildlife biologist. U.S. Fish and Wildlife Service, Ventura, CA. Construction constraints for California red-legged frog. Personal Communication with Steve Avery.

Lewis, H., and C. Epling. 1954. A taxonomic study of California delphiniums. Brittonia 8:1-22.

MacWhirter, R.B., and K.L. Bildstein. 1996. Northern Harrier (*Circus cyaneus*) in A. Poole and F. Gill (eds.), The Birds of North America. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Morrell, S.H. 1972. Life history of the San Joaquin kit fox. California Fish and Game 58(3):162–174.

Moyle, P.B. 1973. Effects of introduced bullfrogs, *Rana catesbeiana,* on the native frogs of the San Joaquin Valley. Copeia 1973(1):18-22.

Natural Diversity Data Base. 2001. RareFind 2, Version 2.1.2 (March 5, 2001 update). Computer database search of Tassajara, Livermore, Byron Hot Springs, Altamont, Clifton Court Forebay, Dublin, La Costa Valley, and Midway quadrangles. California Department of Fish and Game. Sacramento, CA.

O'Farrell, T.P., W.H. Berry, and G.D. Warrick. 1987. Distribution and status of the endangered San Joaquin kit fox, *Vulpes macrotis mutica*, on Fort Hunter Liggett and Camp Roberts, California. (EGG-10282-2194.) EG&G Energy Measurements, Inc. Goleta, CA. Prepared for the U.S. Department of the Army, Corps of Engineers, through the U.S. Department of Energy, Nevada Operations Office, Reno, NV.

Orloff, S., F. Hall, and L. Spiegel. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of their range. Transactions of the Western Section of the Wildlife Society 22:60–70.

Remsen, J.V., Jr. 1978. Bird species of special concern in California: an annotated list of declining or vulnerable bird species. (Wildlife Management Branch Administrative Report No. 78-1.) California Department of Fish and Game, Nongame Wildlife Investigations. Sacramento, CA.

Rorabaugh, Jim. Wildlife biologist. U.S. Fish and Wildlife Service, Ventura, CA. May 1, 1992. Reasons for decline in California horned lark. Letter to Ed Whisler.

Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento, CA.

Skinner, M.W., and B.M. Pavlik. 1994. Inventory of rare and endangered vascular plants of California, Fifth edition. California Native Plant Society Special Publication Number 1, Sacramento, CA.

Stebbins, R.C. 1972. California amphibians and reptiles. University of California Press. Berkeley, CA.

_____. 1985. A field guide to western reptiles and amphibians. 2nd ed. Houghton Mifflin Company. Boston, MA.

Storer, T.I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27:1-342.

Thelander, C.G. 1974. Nesting territory utilization by gold eagles (*Aquila chrysaetos*) in California during 1974. (Wildlife Management Branch Administrative Report No. 74-7.) Nongame Wildlife Investigations, California Department of Fish and Game. Unpublished report. Sacramento, CA.

Twisselmann, E.C. 1967. A flora of Kern County, California. Univ. San Francisco, San Francisco, CA, 395 pp.

U.S. Fish and Wildlife Service (USFWS). 1983. The San Joaquin kit fox recovery plan. Portland, OR.

_____. 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR.

_____. 1999. Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance. Sacramento, CA.

_____. 2001. Letter from Jan C. Knight, Chief, Endangered Species Division, to Robert M. Masuoka, PG&E. June 1.

Welsh, S.L. 2000. Nomenclatural Proposals in *Atriplex l.* (Chenopodiaceae).

Western Bat Working Group (WBWG). 1998. Ecology, conservation and management of western bat species, bat species accounts (draft). Unpublished document prepared as preliminary information for a group workshop conducted in February 1998. Obtained from Bill Austin, U.S. Fish and Wildlife Service, 520-527-0849.

Werschkul, D.F., and M.T. Christensen. 1977. Differential predation by *Lepomis macrochirus* on the eggs and tadpoles of *Rana*. Herpetologica 33:237-241.

White, C.M. 1994. Population trends and current status of selected western raptors. Studies in Avian Biology 15:161–172.

Williams, D.F. 1980. Distribution and population status of the San Joaquin antelope ground squirrel and giant kangaroo rat. (Nongame Wildlife Investigation Report E-W-4.) California Department of Fish and Game. Sacramento, CA.

_____. 1985. A review of the population status of the Tipton kangaroo rat, Dipodomys nitratoides nitratoides. U.S. Fish and Wildlife Service, Sacramento, Endangered Species Office, CA, Final Rep., 44 pp.

_____. 1986. Mammalian Species of Special Concern in California. (Wildlife Management Administrative Report 86-1.) The Resources Agency, California Department of Fish and Game. Sacramento, CA.

_____. 1992. Geographic distribution and population status of the giant kangaroo rat, *Dipodomys ingens* (Rodentia, Heteromyidae). Page 301-328 in D. F. Williams, S. Byrne, and T. A. Rado (eds.), Endangered and sensitive species of the San Joaquin Valley, California. California Energy Commission. Sacramento, CA.

Williams, D.F. and K.S. Kilburn. 1992. The conservation status of the endemic mammals of the San Joaquin Faunal region, California. Pages 329-345 in D. F. Willams, S. Byrne, and T. A. Rado (eds.), Endangered and sensitive species of the San Joaquin Valley, California. California Energy Commission, Sacramento, CA.

Williams, D.F., and W. Tordoff III. 1988. Operations and maintenance schedule: Elkhorn Plain Ecological Reserve, San Luis Obispo County, California. California Dept. Fish and Game, Nongame-Heritage Program, Sacramento, CA Final Rip. 71 pp.

Williams, D.F., D.J. Germano, and W. Tordoff III. 1993. Population studies of endangered kangaroo rats and bluntnosed leopard lizards in the Carrizo Plain Natural Area, California. California Dept. Fish and Game, Nongame Bird and Mammal Sec., Rep. 93-01:1-114.

Williams, D.F., E.A. Cypher, P.A. Kelly, N. Norvell, C.D. Johnson, G.W. Colliver, and K.J. Miller. 1997. Draft recovery plan for upland species of the San Joaquin Valley, California. Prepared for the U.S. Fish and Wildlife Service. Portland, OR.

Whittaker R.H. 1967. Gradient analysis of vegetation. Biological Review 42:207-264.

Zarn, M. 1974. Habitat management series for unique or endangered species. Burrowing owl. (Report No. 11.) U.S. Bureau of Land Management. Denver, CO.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990. California wildlife; volume II: birds. California Department of Fish and Game. Sacramento, CA.

_____. 1990. California wildlife; Volume III: Mammals. California Department of Fish and Game. Sacramento, CA.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer (ed.). 1988. California's Wildlife; Volume I: Amphibians and Reptiles. California Department of Fish and Game. Sacramento, CA.

C.5 Geology, Soils, and Minerals

Remove Page(s):	**Replace With:**
C.5-5 to C.5-6	**New** C.5-5 to **New** C.5-6
C.5-9 to C.5-12	**New** C.5-9 to **New** C.5-12
C.5-23 to C.5-44	**New** C.5-23 to **New** C.5-46

bedrock units. The Tulare Formation consists of sand, silt, and clay in varying amounts with depth and forms the primary groundwater reservoir within the valley proper.

One member of the Tulare Formation of importance is the Corcoran Clay member, which varies in thickness across the San Joaquin Valley, and forms a confining layer for deeper sediments of the Tulare. This confining layer is absent in portions of the western valley margin, and tilted and exposed at the surface along the project alignment in the vicinity of Panoche Creek.

Older Alluvium is mapped as alluvial fan deposits in the inter-fan areas between the larger drainages of Ortigalita, Little Panoche, Panoche and Los Gatos Creeks, and around the nose of Anticline Ridge north and east of Coalinga. These deposits are characterized by poorly sorted, unconsolidated sand, silt, clay and minor gravel, which are moderately well dissected by streams and exhibit strong soil development. Except for their angular unconformity with the Tulare Formation, these deposits are very similar to the Tulare deposits and it is very difficult to distinguish them in surface exposures.

Pleistocene age Terrace Deposits occupy the margins of the larger creek drainages, but are only extensive enough to have been mapped along the margins of Cantua and Panoche Creeks. These terrace deposits are clearly older than present-day floodplain deposits due to their elevation above the floodplain and their extensive soil development. These deposits consist mainly of boulders, gravel, sand, and silt deposits ranging from 2 to 20 feet in thickness.

Alluvial fan and stream floodplain deposits of Holocene age are present in the stream valleys and the uppermost layers of the alluvial fans. In general, these deposits consist of unconsolidated sand, silt, and clay, with minor gravel. Poor soil development and a lack of deeply incised stream channels dissecting the fan surface characterize Younger alluvial deposits. Holocene stream terraces are generally low-lying deposits with only a few feet of separation in elevation from modern floodplain deposits. These deposits exhibit moderate to poor soil development and are difficult to distinguish from more recent deposits of present-day streams. These deposits have only been carefully mapped in the project area in the vicinity of San Luis Reservoir and O'Neill Forebay, where they were used to delineate the age and recency of fault activity through soil dating techniques.

Landslide deposits are generally found at the base of steep slopes and ridges. Extensive landslide hazard mapping has not been performed in the project area due to the sparse population and limited hazard to life and property. Several large landslides have been mapped along the Proposed Project Corridor along Big Blue Ridge (Dibblee, 1971, 1975).

Stream channel deposits are found in the active channels and floodplains of modern streams within the project area. These deposits consist primarily of gravel, sand, and silt, with minor clay, and are typically between 5 and 100 feet thick.

C.5.1.1.3 *Faults and Seismicity*

The faults in the Los Banos-Coalinga area were formed by the interaction between the Pacific and North American tectonic plates. Under the current tectonic regime, the Pacific Plate moves

northwestward relative to the North American Plate. The primary right lateral, strike-slip faults of the San Andreas fault system accommodate most of the relative motion of the tectonic plates. In addition, numerous minor faults and folds within the project area accommodate a smaller portion of the crustal strain. The most notable of these faults are the Ortigalita, Quien Sabe, Nunez, and O'Neill faults ~~system~~, and the Great Valley fault system, a series of blind thrust faults associated with the Coast Range-Central Valley (CRCV) geomorphic boundary (Jennings, 1994; Wakabayashi and Smith, 1994). These faults and folds accommodate the relative motion between the tectonic plates through deformation by strike-slip, reverse and thrust fault movements as well as folding. The effects of this deformation include mountain building, widespread regional uplift, basin development, and the generation of earthquakes.

Faults are classified as active, potentially active, or inactive by the California Division of Mines and Geology (CDMG) based on the age of most recent activity (Jennings, 1994) as defined below:

- Historic faults have experienced surface rupture during historic time (about the last 200 years) and are associated with either a recorded earthquake with surface rupture, aseismic creep or displaced fault survey lines,
- Holocene age faults have had surface displacement within the past 11,000 years, as demonstrated by young geomorphic evidence, offset young deposits, or radiometrically dated material,
- Late Quaternary age faults show evidence of surface rupture within approximately the last 700,000 years, as demonstrated using the same geomorphic evidence as for Holocene age faults, above,
- Quaternary age faults show evidence of surface rupture younger than about 1.6 million years ago, including faults which displace undifferentiated Plio-Pleistocene age deposits,
- Pre-Quaternary age faults show no evidence of movement within the Quaternary (about the past 1.6 million years) or lack evidence of displacement of younger deposits. Also included in this category are known faults for which detailed studies have not determined fault activity and those faults identified only in preliminary mapping.

The classification of "active" is applied to Historic and Holocene age faults, "potentially active" is applied to Quaternary and late Quaternary age faults, and "inactive" is applied to pre-Quaternary age faults. These classifications were ~~developed~~ adopted by the Alquist Priolo Act (1972) to ~~regulate the extent of~~ help delineate Special Studies Zones where detailed ~~study~~ geologic investigations are required prior to development ~~of projects across known fault traces~~. ~~This~~ These classifications ~~is~~ are not meant to imply that inactive fault traces will not rupture, only that they have not been shown to have ruptured for some time and the probability of future rupture is low. This ~~classification system also does~~Alquist Priolo Special Studies Zones do not address subsurface or "blind" faults, which can ~~rupture and~~ cause significant earthquake damage, without surface rupture.

The blind thrust faults of the CRCV boundary are low to moderately dipping subsurface faults, which do not reach the earth's surface. Movement on this fault system was responsible for the 1983 Coalinga and 1985 Kettleman Hills earthquakes. Wakabayashi and Smith (1994) subdivided the blind thrust fault system along the CRCV boundary into 18 to 25 fault segments, using historic seismicity and changes in surface geomorphology. Each of these fault segments is thought to be capable of producing moderate earthquakes with maximum Richter magnitudes ranging between 5.7 and 6.8 (Wakabayashi and Smith, 1994; Petersen, et al., 1996).

Since the 1994 Northridge earthquake, the California Division of Mines and Geology (CDMG) and the United States Geological Survey (USGS) have taken renewed interest in investigating the potential for

Table C.5-1 Fault Activity
Known Active and Potentially Active Faults Within 50-mile (80-kilometer) Radius

Fault / Fault Segment Name	Minimum Distance From Project		Potential Rupture Length	Activity	Max. Earthquake Magnitude
	(mi)	(km)	(km)	(Geologic period)	(M_w)
Calaveras--Southern Segment	25.0	40.3	106	Historical (1989)	6.2
Calaveras--All Segments	25.0	40.3	48	Historical (1989)	7.0
Great Valley 7	26.8	43.2	45	Holocene	6.7
Great Valley 8	5.2	8.4	41	Holocene	6.6
Great Valley 9	4.5	7.3	39	Holocene	6.6
Great Valley 10	4.3	7.0	22	Historical (1983)	6.5
Great Valley 11	4.4	7.1	25	Historical (1985)	6.4
Great Valley 12	4.3	7.0	17	Holocene	6.3
Great Valley 13	4.4	7.1	30	Holocene	6.5
Great Valley 14	5.6	9.0	24	Holocene	6.4
Greenville	36.8	59.3	73	Historical (1980)	6.9
Hayward--Southern Segment	50.0	80.0	43	Historical (1868)	6.9
Hayward--Total Length	50.0	80.0	86	Historical (1868)	7.1
Hayward--Southeast Extension	41.4	66.6	26	Holocene	6.7
Monte Vista-Shannon	46.6	74.6	41	Quaternary	6.8
Monterey Bay - Tularcitos	50.0	80.0	84	Holocene	7.1
O'Neill	0.15	0.24	24	~~Holocene~~ Quaternary	6.4
Ortigalita	3.9	6.3	66	Holocene	6.9
Quien Sabe	20.6	33.2	23	Holocene	6.4
Rinconada	43.7	70.4	189	Quaternary	7.3
San Andreas--Santa Cruz Mtn Segment	37.8	60.8	37	Historical (1989)	7.0
San Andreas--(1906)	31.1	50.1	438	Historical (1906)	7.9
San Andreas--Pajaro Segment	31.1	50.1	22	Historical (1906)	6.8
San Andreas--Creeping Segment	24.0	38.6	125	Historical (creep)	*
San Andreas--Parkfield Segment	21.1	34.0	37	Historical (1857)	6.7
San Andreas--Cholame Segment	27.9	44.9	62	Historical (1857)	6.9
San Andreas--(1857)	21.1	34.0	345	Historical (1857)	7.8
San Juan	32.6	52.5	68	Quaternary	7.0
Sargent	26.8	43.2	53	Holocene	6.8
Zayante-Vergeles	29.5	47.4	56	Quaternary	6.8

Notes: km = kilometer
M_w = moment magnitude
mi = miles
Source: Blake, 2000; Petersen et al., 1996; Wesnousky, 1986.

Panoche Series. The Panoche Series soils are developed on recently deposited alluvial fan materials. The fan materials were in turn derived from calcareous and gypsiferous sandstones and shales of the Diablo Range and foothills. The series contains a wide range of soil types, varying from sandy loam to silty clay, with loam and clay-loam being the dominant types. They are typically located on the valley side of the Kettleman Series soils. Panoche soils typically do not have distinct horizons, but contain stratified layers of coarse and medium-fine particles. They are formed in semi-arid valleys that have long, hot dry summers and an average rainfall of between 5 and 10 inches. These soils typically have good surface and internal drainage. Short grass and dry adapted shrubs are the predominant vegetation. These soils make excellent agricultural soils for irrigated crops and good sheep pasture (Cole, 1952; Harradine, 1950).

C.5.1.1.5 *Minerals*

Mineral resources found in the project area include petroleum, gypsum, and sand and gravel. These materials have been extracted at several locations.

Petroleum

Economic deposits of oil and natural gas occur in the southern portion of the project area near Coalinga. Exploration for petroleum first started in the 1890's near Oil City, about 10 miles north of Coalinga. Since that time, seven major oil fields have been developed in the project area. However, almost 96 percent of the oil produced in the project area during 1999 came from the Coalinga field.

Production in the Coalinga field was approximately 22,500 barrels per day (bpd) in 1999 (Division of Oil and Gas and Geothermal Resources Annual Report, 2000). This field was switched from primary recovery methods (gravity flow and pumping) to steam enhanced recovery operations during the 1960's and 1970's. By injecting steam and water into the reservoir, the viscous petroleum components are more readily recovered and reservoir pressures may be maintained at higher levels, making recovery more efficient. The production life of the field is expected to extend beyond the year 2010.

The remaining oil fields in the project vicinity are: the Coalinga East Extension, Jacalitos, Guijarral Hills, Pleasant Valley, Kettleman Hills, and Pyramid Hills fields. These fields produced only about 950 bpd or 4 percent of the oil from this area during 1999. These fields are not well suited to enhanced recovery operations and depend on primary recovery methods (PG&E, 1982).

All seven of the existing oil fields in the project area have expanded slightly since publication of the EIS/EIR in 1988, and production from these fields continues to be an important energy resource in the region. In addition to petroleum production near Coalinga, natural gas is produced from two small fields near Cheney Ranch, adjacent to the Eastern Corridor Alternative. Recent discoveries of natural gas have also been made near Tres Picos Farms, in the Cantua Nueva and Turk Anticline gas fields. Discoveries of this nature are encouraging for the prospect of additional fields yet to be discovered.

Oil and gas fields present a siting constraint to the Proposed Project. Well drilling and the normal operations and maintenance required for oil wells (i.e., the use of cranes, towers, drill rigs, etc.) are

not compatible with right-of-way (ROW) restrictions for a transmission line. However, directional-drilling techniques can be used to keep new well sites away from the power lines.

Table C.5-2 Productive Oil Fields Crossed by the Project

Segment	Miles Crossed	Oil Field(s)
Proposed Segment 5	1.0	Coalinga
Proposed Segment 6	2.5	Coalinga East and Guijarral Hills
Alternative Segment 6A	1.0	Coalinga
Alternative Segment 6B	2.8 to 4.5	Coalinga East, Pleasant Valley, and Guijarral Hills

Sand and Gravel

Isolated deposits of sand and gravel have been extracted on a limited basis at several small quarry operations within the project area. These operations are generally in the valleys of creeks draining the Diablo Range and are removing recent alluvial deposits from the valley floors. Operations have been identified near Milepost (MP) 7 on Los Banos Creek, MP 23 on Little Panoche Creek, MP 37 on Panoche Creek, MP 58 on Cantua Creek, and at MP 62 and MP 70 on Los Gatos Creek, north of the Coalinga Airport. The only large pit operation in the area is at the Folsom gravel pit on Los Gatos Creek one mile north of Coalinga. This operation is outside of the immediate project area. Most developed and potential sources of aggregate within the project area have difficulty meeting the rigid state and federal specifications for aggregate materials. Hence, the Folsom deposits, which do meet the standards, were extensively developed.

Potential aggregate fill and select fines sources have been identified for development in the event of construction of the Los Banos Grandes Reservoir project. If this project were to be approved and built, one of the proposed borrow areas for the Salt Creek Damsite underlies the Proposed Project between MP 8.3 and MP 9.0. It should be noted that both of the existing 500kV transmission lines also cross this potential borrow area and approximately 1.65 miles of these lines would be required to be relocated if this dam is approved according to existing plans (DWR, 1986); however, according to DWR, the project will not be built in the near future.

Gypsum

Quaternary deposits of impure gypsum have been mined near Los Banos and at other isolated locations along the west side of the San Joaquin Valley. These materials are used for agriculture as soil amendments. No known commercially viable gypsum extraction areas are within the project area.

C.5.1.1.6 *Paleontology*

Paleontological study in the project area was initiated in 1937 by the discovery of a nearly complete skeleton of an Elasmosaurid Plesiosaur near Moreno Gulch on the northeastern side of the Panoche Hills.

Personnel from the University of California at Berkeley and the California Institute of Technology conducted intensive paleontological investigations. Activities were concerned primarily with the

recovery of vertebrate fossil material and resulted in Camp's (1942) study on Mosasaurs and Wells' (1943) study on Plesiosaurs. These publications documented the distinctiveness of these Mesozoic era reptiles from other known North American forms and identified the Moreno Formation as one of special scientific interest.

The Moreno Formation is a marine deposit formed in California during the last years of the Cretaceous Period and early years of the Tertiary Period, (approximately 63 to 65 million years ago). It was formed in an arm of the sea that covered the Central Valley and the formation's sedimentary material came from erosion of lands to the west. Portions of this deposit are exposed along the Eastern border of the Diablo Range on the western edge of the San Joaquin Valley. These hills form the Diablo Range and extend from the Livermore Area south to the Coalinga region. Both geologists and paleontologists regard the Moreno Formation as one of the most extensive, if not the most extensive, marine deposit in the world that includes the Cretaceous-Tertiary boundary. The abundance and diversity of its paleontological resources make it one of the most significant areas of geological and paleontological investigation.

Three kinds of vertebrates represented by fossil remains are most associated with the scientific significance of the Moreno Formation. They are the Dinosaurs, Plesiosaurs, and Mosasaurs.

Fragmentary remains of seven specimens represent dinosaurs. All are Hadrosaurs, often called Duck-billed Dinosaurs. These were large, plant-eating Dinosaurs, many species that frequented shallow waters of the coastlines to feed on aquatic vegetation. The specimens found in Moreno represent individuals that were washed out to sea after their death. Hadrosaurs were widely distributed, very abundant, and diverse, and they reached their peak of development in late Cretaceous. The hadrosaurs disappeared from the fossil record with the close of the Cretaceous period. Accurate identification of the California specimens cannot be made until more extensive remains of the skulls have been found.

The long-necked Plesiosaurs were abundant throughout the Cretaceous Period and have been found in many marine deposits of the world. Three different kinds of Plesiosaurs have been identified from the Moreno. They are of unusual interest because these kinds have not been found in any other parts of the world; mostly kinds of Plesiosaurs have a wide distribution. Plesiosaurs became scarce in the fossil record before the close of the Cretaceous, and the California specimens are among the latest known. Plesiosaurs also disappeared from the fossil record at the close of the Cretaceous period.

Large marine inhabiting lizards became abundant in the shallow seas of the Late Cretaceous. These reptiles, called Mosasaurs, were the dominant predators of the sea during their relatively short existence, and they also became extinct at the close of the Cretaceous. The Mosasaurs, identified from the Moreno, are unlike the Mosasaurs from other parts of the world. Only those from deposits in Belgium and the Netherlands equal the diversity of the California Mosasaurs. The Moreno Formation is one of the few places in the world where Mosasaur remains and the Cretaceous-Tertiary boundary are in the same deposit.

C.5.2.2 State

In California, the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. This Act and supplemental amendments group faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geotechnical explorations in order to determine whether building setbacks should be established.

C.5.2.3 Regional and Local

The conservation and seismic safety elements of General Plans for the cities of Coalinga, Huron and Los Banos, and for Fresno and Merced counties contain policies for the protection of unique geologic features and avoidance of geologic hazards. Local grading ordinances establish detailed procedures for excavation and grading required during construction. ~~In addition, building codes in each jurisdiction establish standards for construction of aboveground structures and foundations, generally in accordance with the Uniform Building Code.~~

C.5.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.5.3.1 Introduction

Geologic and soils impacts include both the impact on the geologic and soils environment from excavation, trenching, backfilling, and grading activities during construction of the proposed facilities and the impact of geologic hazards on the long term operation and maintenance of the Proposed Project. Some of the geologic hazards may also constitute a hazard to workers during construction of the project facilities. The geologic and soils impacts are found to differing extents along each segment of the Proposed Project and the Alternatives. Therefore, general impacts and mitigation measures are discussed below, followed by a description of the locations of the potential impacts by segment. Section C.5.3.3 explains the differences between the impacts and mitigation measures presented in this SEIR and those in the original EIS/EIR.

C.5.3.2 Definition and Use of Significance Criteria

Geologic and soil conditions were evaluated with respect to the impacts the project may have on the local geology, soils, and mineral resources, as well as the impact specific geologic hazards may have upon the Proposed Project and its related facilities. The standards of significance for these impacts were derived from Appendix G of the CEQA guidelines and appendices, thresholds of significance developed by local agencies, government codes and ordinances, and requirements stipulated by California Alquist-Priolo statutes. Significance criteria and methods of analysis were also based on standards set or expected by state and federal governing agencies for the evaluation of geologic hazards as outlined by the CDMG in Special Publication 117 (1997).

Impacts of the Proposed Project or Alternatives on the geologic environment would be considered significant if:

- Unique geologic features or geologic features of unusual scientific value for study or interpretation would be disturbed or otherwise adversely affected by the transmission line alignment and consequent construction activities
- Known mineral and/or energy resources would be rendered inaccessible by transmission line construction
- Agricultural soils would be converted to non-agricultural uses
- Geologic processes, such as landslides or erosion, could be triggered or accelerated by construction or disturbance of landforms
- Substantial alteration of topography would be required or could occur beyond that which would result from natural erosion and deposition.

Impacts of the following geologic hazards on the Proposed Project or Alternatives would be considered significant if:

- High potential exists for ground rupture due to presence of an active earthquake fault crossing transmission line alignment, with attendant potential for damage to the substations, transmission lines, or other project structures
- High potential exists of earthquake-induced ground shaking, which could cause liquefaction, settlement, lateral spreading, and/or surface cracking along the transmission line alignment, resulting in attendant damage to the transmission line or other project structures
- Potential for failure of construction excavations exists due to the presence of loose saturated sand or soft clay
- Presence of corrosive soils exists which would damage transmission line support structures.
- Potential for settlement or ground subsidence exists due to soft, compressible or collapsible soils.

C.5.3.3 Impacts and Mitigation Measures from 1988 FEIS/EIR

Table C.5-3 presents the geologic impacts identified in the FEIS/EIR, and then compares the impacts to those identified in this SEIR. Impacts and mitigation measures are described in detail in Section C.5.3.4.

Table C.5-4 lists the mitigation measures that were proposed in the FEIS/EIR (TANC/WAPA, 1988) in the area of Earth Resources for the minimization of impacts on and from the Proposed Project, and shows how those measures are addressed in this document. These mitigation measures have been modified because they were generally vague and lacked sufficient enforcement provisions consistent with CEQA Guidelines and CPUC policy. The Mitigation Monitoring Program (Table C.5-5) outlines the enforcement provisions for the mitigation measures.

Table C.5-3 Summary of Impacts: 1988 FEIS/EIR* and SEIR

Final EIS/EIR Impact	Significance	SEIR Impact	Significance
Soil erosion	Less than significant after mitigation	Impact 5-4, Erosion	Less than significant after mitigation
Soil compaction and horizon mixing	Less than significant after mitigation		Less than significant after mitigation
Slope stability	Less than significant after mitigation	Impact 5-5, Substantial Alteration of Topography Impact 5-10, Slope Instability and Unstable Soil Conditions	Less than significant after mitigation
Soil hydrocompaction	Less than significant after mitigation	Impact 5-8, Expansive, Soft, or Loose Soils Impact 5-9, Ground Subsidence and Settlement	Less than significant after mitigation
Loss of productive agricultural land	Significant	Impact 5-3, Loss of Agricultural Soils	Significant
Disturbance or destruction of cultural resources	Less than significant after mitigation	Impact 5-1, Unique Geologic and Paleontologic Features	Less than significant after mitigation
Mineral and petroleum resources	Less than significant after mitigation	Impact 5-2, Known Mineral and Energy Resources	Less than significant after mitigation
Seismicity, fault rupture	Less than significant	Impact 5-6, Fault Rupture	Less than significant after mitigation
Seismicity, ground shaking	Less than significant	Impact 5-7, Earthquake Induced Ground Shaking	Less than significant

* Impacts from FEIS/EIR are from Table 2-B, Summary of Significant Environmental Impacts, Applicable Mitigation Measures, and Mitigation Effectiveness for Los Banos-Gates

Table C.5-4 Mitigation Measures from 1988 FEIS/EIR

Impact	Text of Mitigation Measure	Disposition in this SEIR
General	Base the tower design on geotechnical evaluation and sound geotechnical engineering practice, including analysis for cut and fill slopes, compaction requirements, and surface or slope drainage.	Replaced by **G-3**, **G-5**
Erosion, Slope Instability, Unstable Soil Conditions	Existing roads will be used for access wherever possible. Minimize number and length of new construction access roads particularly in intensively farmed areas. Use temporary spur roads to towers and remove those roads not required for maintenance. Access roads should be designed to the minimum standards necessary for construction and maintenance vehicle access.	Incorporated into **H-1**
	Design drainage control structures to carry runoff at appropriate velocities. Use properly sized and installed culverts under permanent access road fill sections and discharge runoff to natural drainages that will not be overloaded.	Included in **H-2**
	Minimize steepness and unobstructed length of fill slopes. Protect newly constructed fills from rain splash and surface runoff with slope protection, such as punch straw, tackifier, or jute netting.	Incorporated into **H-1**
	Replant temporarily disturbed areas with a mixture of perennial grasses, forbs, brush, shrubs, and tree species that will provide effective erosion control. Prepare a firm, rough seedbed on fill or cut slopes and apply appropriate types and amounts of fertilizers and seed mixtures. Consider reseeding with native plants only in sensitive areas not subject to grazing.	Incorporated into **H-1**
	Where possible, avoid road construction on very steep slopes to minimize surface erosion and slumping.	Incorporated into **H-1**
	Avoid work on unstable slopes and rock outcrops.	Incorporated into **H-1**
Erosion, Soil Compaction	Avoid causative construction operations during the wet season. Moist soil is generally more susceptible to compaction than dry soil. Minimize the use of heavy equipment on agricultural land to avoid soil compaction.	Included in **H-1**
	Perform contour discharge or ripping operations at the conclusion of construction. This would loosen compacted soil and develop the seedbed for revegetation.	Replaced by **H-1**
	In agricultural areas where sites would be graded, topsoil should be stockpiled. After construction, topsoil should be replaced and the site graded to the original contours. If appropriate, the site should be reseeded in accordance with agency or landowner objectives.	Incorporated into **H-1**
	Add soil amendments to seedbed during revegetation to counteract potential chemical imbalances.	Incorporated into **H-1**
Mineral Resources	Avoid active oil wells and water extraction wells and critical facilities. Cross non-critical facilities if resources cannot be avoided.	Included in ~~**H-9**~~ **H-8**
Paleontologic Resources	Conduct pre-construction field surveys to locate and record paleontologic resources within the project right-of-way and, in particular, resources that are situated at proposed facilities and roadway locations.	Incorporated into **G-1**
	Avoid sensitive resources by locating construction activities in non-sensitive locations. Consultation with paleontological resource professionals during the siting of the transmission line will facilitate mitigation through avoidance.	Incorporated into **G-1**
Soil Hydro-compaction	Identification of soil parameters that may be used during project design to identify the locations of potential problem areas.	Incorporated into **G-4**
	Site-specific field investigations for the project design that will evaluate susceptible locations.	
	Development of alternative foundation designs for those areas where they are needed, possibly to include pile foundations or pre-wetting and collapse of susceptible soils.	
	Construction of alternative foundations, as appropriate.	

C.5.3.4 General Impacts and Mitigation Measures

This section describes the general types of impacts that occur in the area of the Proposed Project and Alternatives. Subsequent sections explain specifically where each impact occurs, and recommends specific locations for implementation of mitigation measures.

Impact 5-1: Unique Geologic and Paleontologic Features

There are no unique geologic features identified within the Proposed Project area, therefore there is no impact to geologic features. Unique and potentially significant paleontologic features are found along the Proposed Project Corridor, Western Alternative Segment 4A, and the Eastern Corridor Alternative.

The paleontological resources are discussed further in the section for each of those segments. Implementation of Mitigation Measure **G-1** will reduce the impacts of the project upon these resources to a less than significant level (**Class II**).

Mitigation Measure for Impact 5-1, Unique Geologic and Paleontologic Features

G-1 Prior to construction, PG&E shall develop a Paleontological Resources Monitoring Plan (PRMP) for review and approval by the CPUC, which shall address the treatment of paleontological resources discovered during transmission line construction. The PRMP shall be prepared by a qualified paleontologist; it shall include procedures for significance testing and data recovery. The PRMP shall defer to the Cultural Resources Monitoring Plan (see Mitigation Measure C-1) if paleontological resources are found with archaeological resources.

The PRMP shall include a requirement for training of construction workers on why vertebrate fossils are important and what they look like. The training shall explain prohibitions against collecting fossils found during construction.

The PRMP shall identify areas of high paleontological sensitivity along the approved route, and shall define procedures for evaluation of resources found during construction. It shall define procedures for actions to be taken if paleontological resources are found during construction, procedures for fossil recovery, a data recovery program, and a qualified curation facility.

Impact 5-2: Known Mineral and Energy Resources

The Proposed Project Corridor traverses the Coalinga, Coalinga East Extension, Pleasant Valley, and Guijarral Hills oilfields in the vicinity of Coalinga. The construction of the transmission line over existing wells would prohibit the operation of cranes and drilling rigs from operating for routine operation and maintenance of these existing oil production wells and related facilities. The land use restrictions imposed by construction of the transmission line would also preclude drilling operations for new wells beneath the alignment. Similar use restrictions would be applicable to existing groundwater extraction wells.

Mitigation Measure ~~**H-9**~~ **H-8** (in Section C.6, Hydrology and Water Quality) requires that active oil and water extraction wells and critical facilities be avoided whenever possible and to cross over only non-critical facilities where they cannot be avoided. Implementation of this mitigation measure will reduce this impact on existing facilities to a less than significant level (**Class II**). Modern directional drilling techniques allow wells to be drilled from locations not directly over the resource, permitting utilization of mineral and groundwater resources underlying the transmission alignment.

Impact 5-3: Loss of Agricultural Soils

The Proposed Project Corridor crosses agricultural lands in the southern portion. Construction of the transmission line would permanently remove the areas beneath the transmission line support towers from agricultural production. The areas beneath each tower measures about 25 by 70 feet amounting to approximately 0.23 acre per tower. The proposed tower spacing of between 800 and 1,500 feet would average four towers per mile of transmission line amounting to approximately 0.92 acre per mile of

transmission line (specific acres lost is presented in the segment analysis in the next section). Conversion of agricultural soils to a non-agricultural use is a significant and unmitigable impact (**Class I**); this impact is also evaluated in Section C.7, Land Use, from the perspective of loss of the use of agricultural land.

Construction of the transmission line would also require the use of pulling sites to be located at approximately 5-mile intervals on level terrain, and each encompassing approximately 0.9 acre. The use of these sites would be temporary, and they would be returned to their original condition after construction was completed. The implementation of Mitigation Measure **H-1** (in Section C.6, Hydrology and Water Quality) will reduce these impacts to a less than significant level (**Class II**).

Impact 5-4: Erosion

The potential for erosion significantly increases as slopes become steeper and less vegetated. Activities such as excavating, pier drilling, road construction, and grading have the potential to cause increased soil erosion because of surface disturbance and vegetation removal. Fine-grained soils can rapidly develop rilling (erosion creating small channels) once vegetation is removed~~, and this effect can be exacerbated by the application of water for dust control~~. Implementation of Mitigation Measure **H-1** will reduce this impact to a less than significant level (**Class II**).

Impact 5-5: Substantial Alteration of Topography

The alteration of the local topography caused by the construction of the project is primarily due to construction of all-weather access roads for the construction and maintenance of project facilities. Extensive cut and fill operations will not be required for the Proposed Project. Mitigation Measure **H-1** would ensure that erosion would be prevented and restoration completed (**Class II**).

Impact 5-6: Fault Rupture

Segments 3 and 4 of the Proposed Project and Alternative Segment 4A alignments cross strands of the potentially active O'Neill Fault between Los Banos and Little Panoche Reservoirs (Jennings, 1994; Chin, et al., 1993; Dibblee, 1975). The existing Los Banos Substation may overlie two potentially active traces of the O'Neill Fault (Herd, 1979; Chin et al., 1993). The Eastern Corridor Alternative crosses three strands of the O'Neill Fault and the San Joaquin Fault, a thrust fault associated with the Great Valley fault system~~,~~. ~~both of which are~~ The Great Valley fault system has been classified as ~~potentially~~ active (~~Jennings~~Petersen et. al, 1996)~~4)~~. The age of most recent fault movement on the O'Neill Fault is unclear; ~~however,~~ with one segment of the fault potentially having ruptured as recently as Holocene time (Herd, 1979). In general, the hazard posed by earthquake surface fault rupture to overhead transmission lines is minor and is only imposed on the support structures, because of the ability of the lines to accommodate the offset.

The implementation of Mitigation Measure **G-2**, requiring a ~~design-level~~ geotechnical investigation and standard engineering practice in placement of tower footings and substation equipment in order to avoid active and potentially active faults, would reduce the impact of this potential hazard to a less than significant level (**Class II**).

Mitigation Measure for Impact 5-6, Fault Rupture

G-2 In areas where the potential for surface fault rupture exists, PG&E shall perform ~~detailed~~ geotechnical surveys at each tower or substation site to ~~accurately~~ determine the fault locations and the seismic potential of each fault, so that facility locations may be adjusted to avoid this hazard. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to this geological hazard.

Impact 5-7: Earthquake Induced Ground Shaking

The hazard of earthquake induced strong ground shaking from local and regional seismic sources would affect the Proposed Project Corridor and all Alternatives at approximately the same level. The shaking intensity at any given site along the project alignment would be determined by the factors of epicentral distance, earthquake magnitude, and local surface soil conditions. According to the 1986 Draft EIS/EIR, PG&E has committed to following the guidelines for seismic design as presented in IEEE 693, with requirements which are much more stringent than those in the Uniform Building Code. When these guidelines are followed, structures are designed for up to 1.0 g of shear stress from wind loading, and should be capable of withstanding peak ground accelerations approaching that level. While peak ground acceleration in the project area has been measured at slightly higher levels during local seismic events (Stover, 1987), these higher levels have been of very short duration. By following these guidelines and incorporating standard engineering practice in the design and construction of project facilities, impacts from ground shaking would be less than significant (**Class III**).

Impact 5-8: Expansive, Soft, or Loose Soils

Saturated loose sand and soft clay soils may pose difficulties in access for construction and in excavation of foundations for towers or piers. There is a possibility that compaction or differential settlements may occur on the alluvial fans where there are soft or loose deposits or rapid lateral variations in soil strength. Implementation of Mitigation Measure **G-3** would ensure that these impacts are less than significant.

Mitigation Measure for Impact 5-8, Expansive, Soft, or Loose Soils

G-3 PG&E shall perform ~~design level~~ geotechnical investigations including soil sampling~~, free swell~~ and lab tests, ~~density tests, and soil borings or cone penetrometer tests (CPT)~~ as appropriate, to determine the extent of and potential for expansive, soft or loose soils. PG&E shall develop appropriate design features for locations where potential problems are found to exist. Appropriate design features may include excavation of problematic soils and replacement with engineered backfill, ground treatment such as ground densification, and the use of deep foundations such as piers or piles. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.

Impact 5-9: Ground Subsidence and Settlement

Subsidence is the settling of the ground surface caused by compaction of underlying unconsolidated sediments, often because of the withdrawal of groundwater or hydrocarbons. Ground subsidence can also cause relative elevation changes within an area, increasing the potential for inadequate drainage, localized flooding, or increased erosion. Subsidence can also be caused by strong ground motions, and the presence of soft, loose, or compressible soils not removed during excavation or grading.

Past subsidence from groundwater withdrawal is as much as 20 feet along the proposed corridor in the vicinity of the Gates Substation. Subsidence in the project area had largely stopped by about 1975, due to the decrease in groundwater pumping after completion of the California Aqueduct (Ireland et al., 1984).

Subsidence impacts due to groundwater withdrawal would be less than significant (**Class III**) with implementation of site-specific, ~~design-level~~ review and incorporation of standard engineering practices as part of the project.

Ground subsidence can also occur as a result of collapsible or hydrocompactive soils. The semi-arid climate of the western San Joaquin Valley combined with the occurrence of alluvial fan deposits, primarily composed of mud and debris flow deposits between the larger alluvial drainages have created the hazard of hydrocompactive soils. These soils consist of primarily thinly layered, fine-grained sediments of expansive clay with minor silt and fine sand. These soils have never been completely saturated since deposition, and upon irrigating or applying a load, such as a tower footing, they may collapse. These soils are known to exist along the Eastern Corridor Alternative, in the inter-fan areas between the drainages of Little Panoche, Panoche, and Cantua Creeks. Mitigation Measure **G-4** would reduce these impacts to less than significant levels (**Class II**).

Mitigation Measure for Impact 5-9, Ground Subsidence and Settlement

G-4 PG&E shall evaluate the potential for subsidence or settlement of approved project facilities due to the presence of compressible or hydrocompactive soils during ~~design-level~~ geotechnical investigations. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. The results of the investigations will be used to develop appropriate pre-construction ground treatments, and incorporate foundation and structural designs to accommodate expected settlements. ~~PG&E shall remove or rework near surface deposits found to be potentially susceptible to hydrocompaction prior to placing new engineered fill.~~ Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.

Impact 5-10: Slope Instability and Unstable Soil Conditions

Destabilization of natural or constructed slopes could occur as a result of construction activities, and from loading of unstable slopes with heavy construction equipment and project facilities. Excavation of access roadways, and grading could alter existing slope profiles and result in the excavation of slope-supporting material, over-steepening of slopes, or increased loading. Construction activities

should be suspended during and immediately following periods of heavy or extended precipitation when slopes are more susceptible to failure. Numerous small landslides are located in the vicinity of the Proposed Project Corridor. Implementation of Mitigation Measure **G-5** is recommended for these conditions.

Mitigation Measure for Impact 5-10, Slope Instability and Unstable Soil Conditions

G-5 PG&E shall perform ~~design level~~ geotechnical surveys to evaluate the potential for unstable slopes, landslides, mudflows, and debris flows along the approved corridors. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Facilities should be located away from steep hillsides, debris flow source areas, the mouths of steep sidehill drainages, and the mouths of canyons that drain steep terrain. Specially designed deep foundations may be used in areas of shallow sliding where unstable slopes cannot be avoided. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.

C.5.3.5 Proposed 500 kV Transmission Line Corridor

The Proposed Project Corridor for the 500 kV transmission line will be subject to the geologic hazard of strong shaking from regional seismicity at approximately the same severity along the entire length of the corridor. The distance from localized blind thrust faults along the range front varies between zero and five miles, and the width of the seismogenic zone precludes eliminating the hazard by modification of the corridor. The following sections explain the specific anticipated impacts by segment.

C.5.3.5.1 *Segment 1*

Portions of Segment 1 cross level to rolling terrain of older alluvium and Tulare Formation deposits which contain moderate to high amounts of clay. The clays derived from local marine sedimentary rocks are predominantly montmorillonite and are subject to expansion with changes in moisture content. The presence of these clays poses a moderate to severe geologic hazard from expansive soils, and soft or loose soils. Mitigation Measure **G-3** is recommended to reduce these impacts to a less than significant level (**Class II**).

Portions of Segment 1 of the Proposed Project traverse steep bedrock terrain of predominantly sandstone. Alterations of these steep slopes by construction of the project and access roads will expose the project facilities to the hazards of increased potential for landslide and slope instability, and the increased potential for erosion. The alignment traverses areas of moderately steep to very steep terrain and is subject to intense rainfall over brief periods, both of which are factors likely to generate mudflows and debris flows. These hazards have not been adequately mapped in the project area.

Implementation of Mitigation Measures **H-1** and **G-3**, including ~~design level~~ geotechnical investigations, and use of standard engineering and construction practices, does not adequately describe the measures necessary to reduce the impacts from slope instability, landslides, mudslides, and debris flows on project facilities in areas of steep terrain. Mitigation Measure **G-5** is also recommended to

further clarify requirements in this segment and reduce these impacts to a less than significant level (**Class II**).

C.5.3.5.2 *Segment 2*

Segment 2 of the Proposed Project traverses predominantly moderate to steeply sloping terrain composed of sandstone, shale, and conglomerate. Alteration of these slopes by construction of the project and access roads will cause increased potential for erosion, landslide, and slope stability hazards. Minimizing roadway construction as required by Mitigation Measures **H-1** and **G-3** would reduce these potential hazards to a less than significant level (**Class II**).

Small portions of Segment 2 overlie low rolling terrain of older alluvium and Tulare Formation deposits which have moderate to high content of expansive clay soils, and soft or loose soils. In areas where these soil conditions exist, Mitigation Measure **G-3** should be implemented to reduce the hazard to a less than significant level (**Class II**).

C.5.3.5.3 *Segment 3*

Segment 3 of the Proposed Project traverses predominantly moderate to steeply sloping terrain composed of shale with minor sandstone beds. Alterations to these slopes by construction of project facilities and construction access roads will cause increased potential for erosion and slope stability hazards. Mitigation Measures **H-1** and **G-3** would reduce these potential hazards to a less than significant level (**Class II**).

A significant portion of Segment 3 overlies gently sloping terrain of Tulare Formation deposits which have a moderate content of expansive clay soils, and soft or loose soils. In areas where these soil conditions exist, implementation of Mitigation Measure **G-3** would reduce the hazard to a less than significant level (**Class II**).

Segment 3 of the Proposed Project crosses several traces of the potentially active O'Neill Fault. The hazard of surface fault rupture to project structures in this area is limited to the locations of the tower structures, as previously discussed in Impact 5-6, Fault Rupture. The implementation of Mitigation Measure **G-2** would reduce the impact of these hazards on project facilities to a less than significant level (**Class II**).

C.5.3.5.4 *Segment 4*

Segment 4 of the Proposed Project predominantly overlies gently to moderately sloping terrain composed of Tulare Formation gravelly sand. Construction of project structures and access roads on these deposits will cause minor increases in erosion and slope stability hazards that are less than significant (**Class III**).

Segment 4 crosses a mapped trace of the potentially active O'Neill Fault at about MP 21.0. Implementation of Mitigation Measure **G-2** is recommended to reduce the hazard of surface fault rupture to a less than significant level (**Class II**).

C.5.3.5.5 *Segment 5*

Segment 5 of the Proposed Project extends across predominantly gently sloping to nearly level terrain comprised of young alluvial fan deposits between Capita Wash and Panoche Creek (MP 31.2 to MP 36.7). These deposits are subject to the geologic hazards of increased erosion, settlement, subsidence, and soft and loose soils. Implementation of Mitigation Measures **H-1** and **G-3** would reduce these hazards to a less than significant level (**Class II**). These deposits are primarily used for agricultural production, and construction of project facilities along this segment would require conversion of these soils to a non-agricultural use (see Section C.7, Land Use).

North of Capita Wash (MP 28.9 to MP 31.2), from Panoche Creek to south of Tumey Gulch (MP 36.7 and MP 42.4), and between Cantua and Martinez creeks (MP 57.5 to MP 62.0), this segment of the Proposed Project overlies gently to moderately sloping terrace deposits of the Tulare Formation. These portions of Segment 5 would be subject to the geologic hazards of increased erosion, expansive, soft or loose soils, slope instability, and mudflows and debris flows. Implementation of Mitigation Measures **G-2** and **G-3** would reduce these hazards to a less than significant level (**Class II**).

This segment traverses moderate to very steep slopes between Tumey Gulch and Cantua Creek (MP 42.4 to MP 57.5) and gentle to moderate slopes from south of Martinez Creek to Skunk Hollow (MP 62.0 to MP 69.0). These portions of Segment 5 would be subject to the geologic hazards of increased erosion, landslide, slope instability, mudslides, and debris flows. Implementation of Mitigation Measures **G-3** and **G-5** would reduce these hazards to a less than significant level (**Class II**).

Known paleontologic resources of significance are found to the west of this segment alignment in the Domengine Formation (Dibblee, 1975). This formation also underlies the Tulare Formation between MP 28.9 and MP 30.0 at shallow depth. There exists the potential for discovery of paleontologic resources of significance in this portion of Segment 5, however, implementation of Mitigation Measure **G-1** during siting surveys and the construction of site facilities shall reduce this impact to a less than significant level (**Class II**).

Segment 5 of the Proposed Project also crosses the northern portion of the Coalinga oilfield between MP 66.0 and MP 67.0. Mitigation Measure ~~**H-9**~~ **H-8** would reduce this impact to a less than significant level (**Class II**).

C.5.3.5.6 *Segment 6*

Segment 6 extends across low hills with gentle to moderate slopes from Skunk Hollow to Shell Creek (MP 69.0 to MP 71.3) crossing terrace deposits of the Tulare Formation This portion of Segment 6 would be subject to the geologic hazards of subsidence from oil extraction, erosion, and soft or loose

soils. Implementation of Mitigation Measure **G-3** would reduce these hazards to a less than significant level (**Class II**).

From Shell Creek to east of the Guijarral Hills (MP 71.3 to MP 79.2), the Proposed Project Corridor crosses gently sloping alluvial fan deposits. This portion of Segment 6 would be subject to subsidence, settlement, erosion, and soft or loose soils. Implementation of Mitigation Measure **G-3** would reduce these hazards to a less than significant level (**Class II**).

Portions of this segment from MP 69.7 to MP 71.7 cross the East Coalinga Extension and the Guijarral Hills oil fields, and approaches within 200 feet of 9 existing wells and within 500 feet of 12 additional existing wells. The implementation of Mitigation Measure ~~**H-9**~~ **H-8** would reduce this impact to a less than significant level (**Class II**).

Small portions of this segment crossing Los Gatos Creek could overlie potentially liquefiable granular materials in surface or subsurface deposits. The depth to groundwater is generally well below the potentially liquefiable zones, so this impact would be less than significant (**Class III**). While seasonal stream flows may provide temporary saturation in shallow layers, this would not affect towers placed outside of stream zones.

C.5.3.5.7 *Segment 7*

Segment 7 of the Proposed Project extends east from the Guijarral Hills to the existing Gates Substation, crossing predominantly gentle to nearly level terrain, which has been extensively developed for agricultural production. The construction of the project along this segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use (see Section C.7, Land Use).

The geologic hazards that would affect this segment are subsidence, settlement, and soft or loose soils. Implementation of Mitigation Measures **G-3** would reduce these hazards to a less than significant level (**Class II**).

Small portions of this segment along Zapato Creek could overlie potentially liquefiable granular materials in surface or subsurface deposits. The depth to groundwater in this semi-arid climate is generally well below the liquefiable zones, so this potential impact is considered to be less than significant (**Class III**).

C.5.3.6 Proposed Substation Modifications

The following sections describe the impacts from geologic hazards that would affect the proposed changes to the substations and other facilities south of the Gates Substation.

C.5.3.6.1 *Los Banos Substation*

The proposed modifications to the Los Banos Substation will require a ~~design level~~ geotechnical ~~study~~ survey ~~for~~ to evaluate ~~evaluating~~ the potential for surface fault rupture through the substation. Of the

two traces of the O'Neill Fault crossed by Segment 1 of the Eastern Corridor Alternative, the eastern trace is mapped as continuous through the ~~northwest~~ northeast corner of the substation, and the western trace is mapped to the edge of the Tulare Formation deposits south of the substation. This western fault trace potentially extends through the center of the existing substation. The proposed modifications within the substation should be subject to Mitigation Measure **G-2** requiring that these fault traces be located and evaluated for their seismic potential. Implementation of site-specific geotechnical evaluations and recommendations from these studies would reduce the potential impact of surface fault rupture to project facilities to a less than significant level (**Class II**).

C.5.3.6.2 *Gates Substation*

The modifications to the Gates Substation will not significantly affect the agricultural lands that surround the facility. The construction of the transformer banks and switches within the facility will be exposed to the potential hazards of expansive, soft or loose soils, and ground subsidence. Implementation of site-specific ~~design-level~~ geotechnical studies and standard engineering practices as required in Mitigation Measure **G-3** would reduce these potential hazards to a less than significant level (**Class II**).

C.5.3.7 Gates Loop

The proposed changes in the area of the Gates Substation include the removal of seven transmission line towers and construction of 6 new replacement towers at another location. These new tower locations would be subject to the geologic hazards of ground subsidence, and soft or loose soils. Implementation of Mitigation Measure **G-3** would reduce these impacts to a less than significant level (**Class II**).

C.5.3.8 Reconductoring South of Gates Substation

Because the reconductoring that may be required on the Gates-Arco-Midway 230 kV transmission line would not require placement of new transmission towers, there would be no impacts to geology, soils, or minerals.

C.5.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR WESTERN CORRIDOR ALTERNATIVE SEGMENTS

The geologic hazard of strong ground shaking from regional seismicity will affect the Western Corridor Alternative Segments with approximately the same severity as the Proposed Project. Minor variations in site-specific soil conditions and the distance to future epicenters will determine the severity of shaking from any future seismic event. Other impacts are described below by segment.

C.5.4.1 Segment 2A

Segment 2A of the Western Corridor traverses predominantly moderate to very steep terrain of sandstone, shale, and conglomerate. Alteration to these slopes by construction of project facilities and construction access roads will cause an increased potential for erosion, landslide, and slope stability

hazards. Implementation of Mitigation Measures ~~**G-3**~~ **H-1** and **G-5** would reduce the hazard to a less than significant level (**Class II**).

Moderate to steep slopes comprised of shale bedrock along this segment may be subject to hazard from expansive soils. The soils found on these slopes contain predominantly expansive clays; however, the limited depth of these soils results in a less than significant (**Class III**) impact.

C.5.4.2 Segment 4A

Segment 4A of the Western Corridor traverses predominantly sandstone and shale beds of the Panoche Formation with minor exposures of the Moreno Shale, and the Domengine and Laguna Seca formations. These bedrock units form moderate to steeply sloping terrain south of Little Panoche Creek and will expose the project segment to increased hazard from landslide, slope instability, and erosion. Implementation of Mitigation Measures ~~**G-2**~~ **H-1** and ~~**G-3**~~ **G-5** would reduce these hazards to a less than significant level (**Class II**).

A significant portion of this segment overlies sandy clay and marl deposits of the Tulare Formation, traversing gentle to moderate slopes. The construction of project facilities and access roads on these deposits will increase the hazards of slope instability and erosion. Implementation of Mitigation Measures ~~**G-3**~~ **H-1 and G-5** would reduce these hazards to a less than significant level (**Class II**).

Known paleontologic resources of significance are found to the south of the segment alignment in Moreno Shale, and the Laguna Seca and Domengine formations (Dibblee, 1975). These formations also underlie the Tulare Formation between AMP 27.8 and AMP 29.4 at shallow depth. There exists the potential for discovery of paleontologic resources of significance in this portion of Segment 4A, however, implementation of Mitigation Measure **G-1** during siting surveys and construction of site facilities would reduce this impact to a less than significant level (**Class II**).

C.5.4.3 Segment 6A

Alternative Segment 6A crosses gently sloping terrain between AMP 69.0 and AMP 70.9, overlying terrace deposits of Tulare Formation. This segment extends across older and younger alluvial fan deposits from AMP 70.9 to AMP 78.3. These portions of Segment 6A would be subject to the geologic hazards of settlement, subsidence, erosion, and soft or loose soils. Implementation of Mitigation Measure **G-3** would reduce these hazards to a less than significant level (**Class II**).

Portions of this segment cross the East Coalinga Extension (AMP 69.5 to AMP 70.6) oil field, and approaches within 500 feet of 8 existing wells. This segment passes east of Guijarral Hills oil field and avoids all existing facilities there. The implementation of Mitigation Measure ~~**H-9**~~ **H-8** would reduce this impact to a less than significant level (**Class II**).

Much of this segment has been developed for agricultural production. The construction of the project along this alternative segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use (see Section C.7, Land Use).

Small portions of this segment crossing Los Gatos Creek overlie potentially liquefiable granular materials in surface or subsurface deposits. The depth to groundwater is generally well below the potentially liquefiable zones, so this impact is less than significant (**Class III**).

C.5.4.4 Segment 6B

Alternative Segment 6B crosses gently sloping low rolling hills between AMP 69.0 and AMP 76.5, and from AMP 77.8 to AMP 78.8, overlying predominantly terrace deposits of Tulare Formation. These portions of Segment 6B would be subject to the geologic hazards of subsidence, erosion, and soft or loose soils. Implementation of Mitigation Measure **G-3** would reduce these hazards to a less than significant level (**Class II**).

Segment 6B crosses young alluvium within the Los Gatos Creek valley from AMP 76.5 to AMP 77.8 and extends across young alluvial fan deposits from AMP 78.8 to AMP 80.7. This portion of the alignment would be subject to the geologic hazards of settlement, subsidence, erosion, and soft or loose soils. Implementation of Mitigation Measures **G-3** would reduce these hazards to a less than significant level (**Class II**).

Portions of this segment cross the East Coalinga Extension (AMP 71.9 to AMP 73.5), the Pleasant Valley (AMP 76.2 to AMP 76.5), and the Guijarral Hills (AMP 78.8 to AMP 79.8) oil fields, and approaches within 500 feet of 23 existing wells. The implementation of Mitigation Measure ~~**H-9**~~ **H-8** would reduce this impact to a less than significant level (**Class II**).

Portions of this segment have been developed for agricultural production. The construction of the project along this alternative segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use (**Class I**).

The portion of this segment crossing Los Gatos Creek overlies potentially liquefiable granular materials in surface and subsurface deposits. The depth to groundwater is generally well below the potentially liquefiable zones, so this impact would be less than significant (**Class III**).

C.5.5 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE EASTERN CORRIDOR ALTERNATIVE

This section describes the environmental impacts and mitigation measures for the Eastern Corridor Alternative. Many of the Alternative segments are subject to similar hazards as the Proposed Project and these geologic hazards are briefly discussed below. Geologic hazards, which are different from those of the Proposed Project, are discussed in detail within each segment.

C.5.5.1 Segment 1

Segment 1 of the Eastern Corridor Alternative crosses two strands of the potentially active O'Neill Fault. In addition to the hazard of strong ground shaking from regional seismicity, this segment is also

susceptible to the hazard of surface fault rupture (Herd, 1979). Implementation of Mitigation Measure **G-2** would reduce the impact of this potential hazard to a less than significant level (**Class II**).

C.5.5.2 Segment 2

Segment 2 of the Eastern Corridor Alternative crosses a third fault trace of the O'Neill fault system, and will be subject to the potential hazard of severe ground shaking from regional earthquakes and surface fault rupture. Implementation of Mitigation Measure **G-2** would reduce this hazard to a less than significant level (**Class II**).

Segment 2 will also be subject to the potential geologic hazards of expansive, soft, or loose soils, settlement, erosion potential, slope instability, and unique or significant paleontologic resources. Implementation of Mitigation Measures **G-3** and **G-5** would reduce the impacts of these hazards to a less than significant level (**Class II**).

Known paleontologic resources exist in the exposures of Moreno Formation sandstones roughly between MP 5.0 and MP 5.4 and in the abutment north of Los Banos Dam contain significant ammonite fossil localities (Dibblee, 1975). These beds also underlie the Tulare Formation deposits at potentially shallow depth between MP 5.6 and MP 6.2. There exists the potential for disturbance of these paleontologic resources along this segment; however, implementation of Mitigation Measure **G-1** during site surveys and construction of project facilities would reduce this impact to a less than significant level (**Class II**).

C.5.5.3 Segment 3

Segment 3 of the Eastern Corridor Alternative will be subject to the potential geologic hazards of expansive, soft or loose soils, ground subsidence or settlement, erosion potential, and slope instability, mudflows or debris flows. Implementation of Mitigation Measures **G-3** and **G-5** would reduce the impacts of these hazards to a less than significant level (**Class II**).

C.5.5.4 Segment 4

Segment 4 of the Eastern Corridor Alternative will be subject to the potential geologic hazards of expansive, soft or loose soils, ground subsidence or settlement, erosion potential, and slope instability, mudflows or debris flows. Implementation of Mitigation Measures **H-1, G-3, G-4,** and **G-5** would reduce the impacts of these hazards to a less than significant level (**Class II**).

Portions of the deposits mapped as older alluvium and young alluvium along Segment 4 of the Eastern Corridor Alternative are known to be subject to hydrocompaction. These types of soils are inter-fan deposits between the drainages of Little Panoche and Panoche creeks, and Panoche and Cantua creeks, rich in expansive clays, such as montmorillonite, which have not been saturated since deposition. These areas are to be further evaluated during site-specific ~~design level~~ geotechnical studies and appropriate measures, such as pre-compaction, are to be incorporated into the design and construction plan where avoidance is impractical. Implementation of Mitigation Measure **G-4** shall reduce the

impacts from soft or compressible soils or from hydrocompactive soils to a less than significant level (**Class II**).

Large portions of this segment have been developed for agricultural production. The construction of the project along this alternative segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use. This impact is addressed in Section C.7, Land Use.

C.5.5.5 Segment 5

Segment 5 of the Eastern Corridor Alternative overlies agricultural soils along its entire length. This segment will be subject to the potential geologic hazards of expansive, soft, or loose soils, ground subsidence or settlement, and erosion potential. Implementation of Mitigation Measures **H-1, G-3,** and ~~**G-5**~~ **G-4** would reduce the impacts of these hazards to a less than significant level (**Class II**).

This segment primarily crosses lands that have been developed for agricultural production. The construction of the project along this alternative segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use.

C.5.5.6 Segment 6

Segment 6 of the Eastern Corridor Alternative will be subject to the potential geologic hazards similar to those discussed for Segment 5, above. Implementation of Mitigation Measures **G-3** and **G-5**, described above, would reduce the impacts of these hazards to a less than significant level (**Class II**).

This segment is almost entirely developed for agricultural production. The construction of the project along this alternative segment would permanently remove small portions of these agricultural soils and convert them to a non-agricultural use.

C.5.6 MITIGATION MONITORING, COMPLIANCE, AND REPORTING TABLE

Table C.5-5 on the following page presents the mitigation monitoring criteria for Geology, Soils, and Minerals.

Table C.5-5 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Proposed Project, Western and Eastern Corridor Alternatives						
Impacts to unique geologic and paleontologic resources (Class II)	**G-1** Prior to construction, PG&E shall develop a Paleontological Resources Monitoring Plan (PRMP) for review and approval by the CPUC, which shall address the treatment of paleontological resources discovered during transmission line construction. The PRMP shall be prepared by a qualified paleontologist; it shall include procedures for significance testing and data recovery. The PRMP shall defer to the Cultural Resources Monitoring Plan (see Mitigation Measure C-1) if paleontological resources are found with archaeological resources. The PRMP shall include a requirement for training of construction workers on why vertebrate fossils are important and what they look like. The training shall explain prohibitions against collecting fossils found during construction. The PRMP shall identify areas of high paleontological sensitivity along the approved route, and shall define procedures for evaluation of resources found during construction. It shall define procedures for actions to be taken if paleontological resources are found during construction, procedures for fossil recovery, a data recovery program, and a qualified curation facility.	Panoche Hills – Moreno Formation Area of Critical Concern	Review of siting plans for towers and access roads by agency approved paleontologist. Agency approval of recovery and evaluation plan.	Plan/design avoids disturbing resources to extent feasible.	CPUC, BLM, local planning agencies	Prior to construction

Impact	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Crossings of active or potentially active faults by project facilities (Class II)	**G-2** In areas where the potential for surface fault rupture exists, PG&E shall perform ~~detailed~~ geotechnical surveys at each tower or substation site to ~~accurately~~ determine the fault locations and the seismic potential of each fault, so that facility locations may be adjusted to avoid this hazard. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to this geological hazard.	Crossings of potentially active traces of the O'Neill and San Joaquin faults.	Approved engineer to review ~~and approve~~ geotechnical report, site plans, and foundation designs	Identification of fault traces and avoidance of active and potentially active fault traces beneath project structures.	CPUC~~,~~ and ~~CDMG,~~ local planning agencies	Prior to construction
Expansive, soft or loose soils (Class II)	**G-3** PG&E shall perform ~~design-level~~ geotechnical investigations including soil sampling~~, free swell~~ and lab tests, ~~density tests, and soil borings or cone penetrometer tests (CPT)~~ as appropriate, to determine the extent of and potential for expansive, soft, or loose soils. PG&E shall develop appropriate design features for locations where potential problems are found to exist. Appropriate design features may include excavation of problematic soils and replacement with engineered backfill, ground treatment such as ground densification, and the use of deep foundations such as piers or piles. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Areas with moderately to highly expansive soils, soft, or loose soils, or soils subject to compaction or settlement.	Approved engineer to review ~~and approve~~ geotechnical report, grading plans, and foundation designs	Plan/design identifies hazardous soils and presents analysis for soil treatments and foundation designs selected for prevention of settlements to extent feasible	CPUC, BLM, CDWR, local planning agencies	Prior to construction

Impact	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Ground subsidence and settlement (Class II)	**G-4** PG&E shall evaluate the potential for subsidence and settlement of approved project facilities due to the presence of compressible or hydrocompactive soils during ~~design-level~~ geotechnical investigations. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. The results of the investigations will be used to develop appropriate pre-construction ground treatments, and incorporate foundation and structural designs to accommodate expected settllements. ~~PG&E shall remove or rework near surface deposits found to be potentially susceptible to hydrocompaction prior to placing new engineered fill.~~ Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Inter-fan areas between Little Panoche and Panoche Creeks, Panoche and Cantua Creeks, and other known of suspected areas of hydrocompactive soils	Approved engineer to review ~~and approve~~ geotechnical and engineering reports, site plans, and foundation designs	Engineering reports shall identify areas of hydrocompaction susceptibility and present analysis of settlement potential and rationale for ground treatments and foundations selected.	CPUC, BLM, CDWR, local planning agencies	Prior to construction
Slope instability and unstable soil conditions	**G-5** PG&E shall perform ~~design-level~~ geotechnical surveys to evaluate the potential for unstable slopes, landslides, mudflows and debris flows along the approved corridors. PG&E shall submit these geotechnical reports to the CPUC for review ~~and site approval~~ prior to the start of construction. Facilities should be located away from steep hillsides, debris flow source areas, the mouths of steep sidehill drainages, and the mouths of canyons that drain steep terrain. Specially designed deep foundations may be used in areas of shallow sliding where unstable slopes cannot be avoided. Incorporation of standard engineering practices as part of the project shall ensure that persons or structures are not exposed to geological hazards.	Areas of steep terrain, with evidence of prior landslides or other slope instability are present.	Approved engineer to review ~~and approve~~ geotechnical report, site plans, and foundation designs	Plan/design identifies potential slope instabilities and presents analysis for alternative site selection, criteria for non-avoidance, and foundation designs selected for slope instabilities affecting project facilities to extent feasible	CPUC, BLM, CDWR, local planning agencies	Prior to construction

C.5.7 REFERENCES

Abrahamson, N.A. and W. Silva. 1997. *Empirical Attenuation Relations for Shallow Crustal Earthquakes*. Seismological Research Letters, Vol. 68, No. 1, Jan/Feb., pp. 9-23.

Bartow, J.A. 1996. Geologic Map of the West Border of the San Joaquin Valley in the Panoche Creek-Cantua Creek Area, Fresno and San Benito Counties, California. U.S. Geological Survey Miscellaneous Investigations Field Studies Map I-2430.

Bennett, J.H. and R.W. Sherburne, eds. The 1983 Coalinga, California Earthquakes. California Department of Conservation, Division of Mines and Geology (CDMG) Special Publication 66.

Blake, T.F. 2000. EQFAULT: A Computer Program for the Estimation of Peak Horizontal Acceleration from 3-D Fault Sources, Windows 95/98 Version. Thomas F. Blake Computer Services and Software.

Bonilla, M.G. and J.J. Lienkaemper. 1991. Factors Affecting the Recognition of Faults Exposed in Exploratory Trenches. U.S. Geological Survey Bulletin 1947.

Bull, W.B. 1964. Alluvial Fans and Near Surface Subsidence in Western Fresno County, California. U.S. Geologic Survey Professional Paper 437-A.

California Division of Oil, Gas, and Geothermal Resources, 2000. 1999 Annual Report of the State Oil and Gas Supervisor: The Eighty-Fifth Annual Report. California Department of Conservation, Division of Oil, Gas, and Geothermal Resources: http://www.consrv.ca.gov/dog/publications/annualr_b.html

Camp, C.L. 1942. California Mosasaurs. Memoirs of the University of California, University of California Press, v. 13, no. 1.

California Department of Water Resources (CDWR). 1986. Geologic Study on the Feasibility of Los Banos Grandes Project: State Water Project, Future Supply, Los Banos Offstream Storage Unit, Project Geology Branch. California Department of Water Resources.

_____. 1990. Los Banos Grandes Facilities: Draft Environmental Impact Report. Department of Water Resources, Division of Planning.

California Division of Mines and Geology (CDMG). 1997a. Guidelines for Evaluating and Mitigating Seismic Hazards in California. CDMG Special Publication 117.

_____. 1997b. *Fault-Rupture Hazard Zones in California, Alquist-Priolo Special Studies Zones Act of 1972 with Index to Special Studies Zones Maps*. CDMG Special Publication 42, Revised.

Chin, J.L., J.R., Morrow, C.R. Ross, and H.E. Clifton. 1993. Geologic Maps of Upper Cenozoic Deposits in Central California. U.S. Geological Survey Miscellaneous Investigations Series Map I-1943.

Cole, R.C. et al. 1952. Soil Survey of the Los Banos Area, California. U.S. Bureau of Plant Industry, Soils, and Agricultural Engineering; Soil Series 1939, No. 12.

Dibblee, T.W. Jr. 1971. Geologic maps of 17 Quadrangles along the San Andreas Fault in the Vicinity of King City, Coalinga, Panoche Valley, and Paso Robles, California. U.S. Geologic Survey Open-File Report 71-87.

_____. 1975. Geologic Map of the San Benito, Quien Sabe, Tumey Hills, Panoche Valley, Pacheco Pass, Ortigalita Peak, and Hollister Quadrangles, California. U.S. Geologic Survey Open-File Report 75-394.

Hall, C.E. and J.W. Carlson. 1965. *Stabilization of Soils Subject to Hydrocompaction, in* Bulletin of the Association of Engineering Geologists, Vol. 2, No. 2, July, 1965, p. 47-58.

Harradine, F.F. 1950. Soils of Western Fresno County, California. University of California College of Agriculture, Agricultural Experiment Station, Berkeley, California.

_____. 1952. Soil Survey of the Coalinga Area, California. U.S. Department of Agriculture, Series 1944, No. 1.

Herd, D.G. 1979. Geologic Map of O'Neill Forebay, Western Merced County, California. U.S.Geological Survey Open-File Report 79-359.

Idriss, I.M. 1991. *Selection of Earthquake Ground Motions at Rock Sites*. Report prepared for the Structures Division, Building and Fire Research Laboratory, National Institute of Standards and Technology, Department of Civil Engineering, University of California, Davis, California.

Institute of Electrical and Electronics Engineers (IEEE). 1997. Draft Recommended Practices for Seismic Design of Substations. Prepared by the Working Group F1 of the West Coast Substation Subcommittee, Institute of Electrical and Electronics Engineers, IEEE Standards Project P693.

Ireland, R.L., J.F. Poland, and F.S. Riley. 1984. Land Subsidence in the San Joaquin Valley, California as of 1980. U.S. Geological Survey Professional Paper 437-I.

Jennings, C.W. 1994. *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*. California Division of Mines and Geology, Geologic Data Map No. 6, Scale 1:750,000.

Miller, R.E., J.H. Green, and G.E. Davis. 1971. Geology of the Compacting Deposits in the Los Banos-Kettleman City Subsidence Area, California. U.S. Geological Survey Professional Paper 497-E.

Norris, R.M. and R.W. Webb. 1990. Geology of California, 2nd Edition. John Wiley and Sons, Inc., New York, New York.

Pacific Gas and Electric Company (PG&E), 1986. Los Banos-Gates 500 kV Transmission Project Environmental Report and Technical Appendices.

Pacific Gas and Electric Company, 1982. Coalinga-Gates Growth and Development Study. PG&E Land Department, Land Use Planning Unit.

Petersen, M.D., W.A. Bryant, C.H. Cramer, T. Cao, M.S. Reichle, A.D. Frankel, J.J. Lienkaemper, P.A. McCrory, and D.P. Schwartz. 1996. *Probabilistic Seismic Hazard Assessment for the State*

of California. California Division of Mines and Geology Open-File Report 96-08/U.S. Geological Survey Open-File Report 96-706.

Rymer, M.J. and W.L. Ellsworth, eds. 1990. The Coalinga, California, Earthquake of May 2, 1983. U.S. Geological Survey Professional Paper 1487.

Sadigh, K., C.Y. Chang, N.A. Abrahamson, S.J. Chiou, and M.S. Power. 1993. Specification of Long-period Ground Motions: Updated Attenuation Relationships for Rock Site Conditions and Adjustment Factors for Near-fault Effects. *Proceedings of ATC-17-1 Seminar on Seismic Isolation, Passive Energy Dissipation, and Active Control*. San Francisco, California. p. 59-70.

Scholl, R.E. and J.L. Stratta. 1984. Coalinga, California, Earthquake of May 2, 1983: Reconnaissance Report. Earthquake Engineering Research Institute Report No. 84-03, Berkeley, California.

Stover, C.W. 1983. United States Earthquakes, 1983. U.S. Geological Survey Bulletin 1698.

Transmission Agency of Northern Californiaand Western Area Power Administration (TANC/WAPA). 1988. Final Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project.

Uhrhammer, R.A., R.B. Darragh, and B.A. Bolt. 1983. *The 1983 Coalinga Earthquake Sequence: May 2 through August 1, in* Bennett, J.H., and R.W. Sherburne, eds., The 1983 Coalinga, California Earthquakes. CDMG Special Publication 66, p. 221-232.

Wakabayashi, J. and D.L. Smith. 1994. *Evaluation of Recurrence Intervals, Characteristic Earthquakes, and Slip Rates Associated with Thrusting along the Coast Range--Central Valley Geomorphic Boundary, California, in* Bulletin of the Seismological Society of America. v. 84, no. 6, p. 1,960-1,970.

Wells, D.W. and K.J. Coppersmith. 1994. *New Empirical Relationships among Magnitude, Rupture Length, Rupture Width, Rupture Area, and Surface Displacement, in* Bulletin of the Seismological Society of America. v. 84, no. 4, p. 974-1,002.

Wesnousky, S.G. 1986. *Earthquakes, Quaternary Faults, and Seismic Hazard in California*. Journal of Geophysical Research, V.91, no. B12, p. 12,587-12,631.

William Lettis and Associates, Inc. 1998. Quaternary Deformation at the East Front of the Diablo Range near Tracy, California; erp-web.er.usgs.gov/reports/ansnsum/vol38/ni/g3011.htm

Wong, I.G. and R.W. Ely. 1983. *Historical Seismicity and Tectonics of the Coast Ranges--Sierran Block Boundary: Implications to the 1983 Coalinga, California Earthquakes, in* Bennett, J.H., and R.W. Sherburne, eds., The 1983 Coalinga, California Earthquakes. CDMG Special Publication 66, p. 89-104.

Working Group on California Earthquake Probabilities (WG99). 1999. *Earthquake Probabilities in the San Francisco Bay Region: 2000 to 2030—A Summary of Findings*. U.S. Geological Survey Open-File Report 99-517.

Yeats, R.S., K. Sieh, and C.R. Allen. 1997. *The Geology of Earthquakes*. Oxford University Press.

Youd, T.L. and D.M. Perkins. 1978. Mapping Liquefaction Induced Ground Failure Potential, *Proceedings of the American Society of Civil Engineers, Journal of the Geotechnical Engineering Division*. Vol. 104, No. GT 4.

Ziony, J.I., ed. 1985. Evaluating Earthquake Hazards in the Los Angeles Region – An Earth Science Perspective. U.S. Geological Survey Professional Paper 1360.

C.6 Hydrology and Water Resources

Remove Page(s):	**Replace With:**
C.6-21 to C.6-22	**New** C.6-21 to **New** C.6-22
C.6-25 to C.6-32	**New** C.6-25 to **New** C.6-32
C.6-37 to C.6-41	**New** C.6-37 to **New** C.6-45

As described above, the transmission line corridor has been divided into segments for the purpose of this environmental review. Many, if not all, of the hydrologic impacts associated with general construction and maintenance procedures for the proposed transmission line are similar for all corridor segments. As such, these impacts are described once at the beginning of Section C.6.3.4 and not repeated for each corridor segment. However, impacts that are related to specific conditions within a particular corridor segment are described separately.

C.6.3.2 Definition and Use of Significance Criteria

As specified in CEQA Guidelines (Section 15064.7), a threshold of significance is an identifiable quantitative, qualitative, or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

Appendix G of the CEQA Guidelines generally defines impacts to surface water and groundwater quantity and quality as being significant if they were to:

- Permanently decrease the capacity of drainages or alter drainage patterns
- Cause a detrimental increase in site erosion or downstream siltation
- Increase the potential for substantial flood damage
- Expose people or structures to flooding in the event of a dam failure
- Result in a substantial degradation of surface or groundwater quality to the extent that beneficial uses are impacted or water quality criteria are exceeded
- Substantially decrease the available groundwater supply or affect groundwater recharge

More specifically, the CEQA checklist asks if the Proposed Project would:

- Violate any water quality standards or waste discharge requirements?
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or offsite?
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?
- Otherwise substantially degrade water quality?
- Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows?
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

The following significance criteria have also been considered in response to the specific nature of the Proposed Project. These significance criteria are based on experience from previous transmission line projects and studies in California. Impacts to surface and groundwater resources would be considered significant if:

- Transmission tower structures or substations constructed in conjunction with the transmission line would be subjected to a substantial risk of damage through flooding or erosion. ~~, which is defined as an increase of one foot per second in 100-year flow velocity~~
- Stream bank erosion, streambed scour, or long-term channel degradation would result due to exposure of the tower foundations or substation modifications to flowing water.
- Potential flooding or stream erosion in the project area would result in significant damage to access roads/bridges or to other structures related to the Proposed Project. Significant damage to these structures could place the transmission line at risk of failure, and is defined by lateral erosion which outflanks the structure, vertical scour which extends deeper than the structure piers or abutments, and overtopping of the structure.
- Construction activities would violate state or federal water quality standards or objectives, or would result in the discharge of contaminants (such as gasoline or diesel fuel) into the surface flow of a stream.
- Construction or operation of the project would divert or reduce subsurface flow to wetland areas, springs, or aquifers.
- The proposed project would alter hydrologic and/or hydraulic conditions such that the 100-year water surface elevation in the streams and water courses of the project area would rise in excess of one-tenth of a foot.
- The Proposed Project or Alternatives would result in a long-term substantial increase in the sediment load of a stream (e.g., post-project construction).
- Construction would result in a short-term, direct discharge of sediment into a flowing stream in excess of the minimum necessary to divert flows around the construction site.

When evaluating the potential project impacts, it is assumed that PG&E will comply with all applicable federal, state, and local regulatory requirements that protect surface water and groundwater resources. For example, poles will not be placed within waterway protection corridors defined by city and county codes, and therefore will not impact these waterways. In accordance with the Clean Water Act, it is assumed that PG&E will prepare and implement a SWPPP that will include BMPs to minimize construction impacts on surface water and groundwater quality. The SWPPP will be prepared once the project is approved and after project facilities are sited and designed. The SWPPP will then be reviewed and approved by the CVRWQCB and Merced and Fresno Counties.

C.6.3.3 Impacts and Mitigation Measures from 1988 FEIS/EIR

The FEIS/EIR document (TANC/WAPA, 1988) concluded that, with implementation of mitigation, the construction, operation, and maintenance of the proposed 500 kV transmission line project would not significantly impact water resources. Water quality impacts were primarily described as a result of construction-related disturbances. Impacts due to the construction of access roads at stream crossings and along steep hillslopes were identified as potentially the most severe. Such impacts could lead to significant erosion and sediment transport. Project operational impacts would be the continued erosion originally caused by the construction activity. These erosion impacts would require a long time for full recovery with the return of vegetative cover. Table C.6-7 presents the impacts identified in the 1988 FEIS/EIR, and shows how the previously identified impacts are evaluated in this SEIR.

intervals); conductor splicing sites (0.02 acre per 2 miles); construction yards (5.7 acres at 3 locations); work camps (2.0 acres at 2 sites); and new access roads (typically one mile of new road per one mile of transmission line) (see Table B-3 in Section B.3.1).

Impact 6-1: Potential for Tower Construction and Road Building Activities to Accelerate Hillslope Erosion, Increase Sediment Loading to Local Channels, and Reduce Surface Water Quality

During construction of the 500 kV transmission line, adverse surface water quality impacts due to sediment loading of excavated spoils could occur in creeks and wetlands adjacent to the construction area or immediately downstream. Tower and access road construction activities that include scraping, excavating, grading, backfilling, excess soil disposal, and topsoil handling and replacement are likely to generate sediment. In particular, excavation activities needed to prepare the concrete foundations for the towers will bring soil, sediment, rock, and perhaps water to the surface.

The potential for excavated spoils to enter the surface water drainage network is greatest near creek crossings and wetlands. The several intermittent and ephemeral streams crossed by the Proposed Project Corridor (Table C.6-1) could be impacted by sediment loading. In addition, identified wetlands along Salt Creek (Figure C.6-2) in the hillslope terrain near MP 9.0 could be adversely impacted by sediment loading from project construction. The potential for construction-related sediment and excavated spoils to enter the surface water drainage network represents a significant water quality impact. Additionally, this impact can have an accumulative effect of reducing the flood-carrying capacity of downstream channels.

State and county permitting requirements should ensure that this sediment loading impact is a less than significant impact. Construction-induced sediment and excavated spoils shall be managed in accordance with the requirements of the State Water Resources Control Board General NPDES Permit for stormwater runoff associated with construction activities ("general permit"). The State's general permit outlines requirements for filing a Notice of Intent prior to construction, and for developing a Storm Water Pollution Prevention Plan (SWPPP) that outlines "best management practices" to control discharges from the construction area.

To ensure that sedimentation and runoff are minimized, in compliance with the NPDES Permit, Mitigation Measure **H-1** requires that an Erosion Control Plan (ECP) be developed to compliment the SWPPP and prevent the runoff of construction-related and excavated materials into the drainage system. The ECP specified by Mitigation Measure **H-1** will be submitted to Merced and Fresno Counties along with grading permit applications. Implementation of the ECP will help stabilize graded areas and waterways, and reduce erosion and sedimentation, thus reducing this impact to less than significant levels (**Class II**).

Mitigation Measure for Impact 6-1, Potential for Tower Construction and Road Building Activities to Accelerate Hillslope Erosion, Increase Sediment Loading to Local Channels, and Reduce Surface Water Quality

H-1 An erosion control and sediment transport control plan shall be submitted first to the CVRWQCB and CPUC for review and approval, and then to Merced and Fresno Counties along with grading permit applications. This plan shall be prepared in accordance with the standards provided in the Manual of Erosion and Sedimentation Control Measures (ABAG, 1981) and in compliance with practices recommended by the Natural Resources Conservation Service. Implementation of the plan will help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan shall be designed specifically for the hydrologic setting of the approved project, which includes upland slopes, tributary creeks, and larger streams.

The plan shall define the specific Best Management Practices (BMPs) that will be adhered to during construction activities. Erosion minimizing efforts such as hay bales, water bars, covers, sediment fences, sensitive area access restrictions (for example, flagging), vehicle mats in wet areas, and retention/ settlement ponds shall be installed before extensive clearing and grading begins. Mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during construction activities. Revegetation plans, the design and location of retention ponds, and grading plans shall be submitted to the CDFG for review in the event of construction near waterways. In addition, PG&E shall:

- Replant temporarily disturbed areas with a mixture of perennial grasses, forbs, brush, shrubs, and tree species that will provide effective erosion control. Prepare a firm, rough seedbed on fill or cut slopes and apply appropriate types and amounts of fertilizers and seed mixtures. Consider reseeding with native plants only in sensitive areas not subject to grazing.
- Restore disturbed surfaces to original conditions, including reseeding or otherwise restoring vegetation on all disturbed slopes exceeding 2 percent, as soon as possible after such grading work is completed or later if approved by the Project Biologist. Recontour, prepare the surface, and seed all roads, construction sites, and other disturbed areas not required for project operation and maintenance.
- Use standard erosion practices and dust control measures, as defined in mitigation measures for air quality, during construction to protect biological and hydrological resources.
- Based on weather conditions as determined by the CPUC's Environmental Monitor, ~~T~~temporarily collect excavated or disturbed soil and place it in a controlled area surrounded by siltation fencing, hay bales, or a similarly effective erosion control technique that prevents the transport of sediment.
- Restrict the staging of construction materials, equipment, and excavation spoils to areas at least 100 feet outside of drainage channels or tributaries.
- Where tower or substation construction activities occur near a creek or channel, sediment containment methods shall be performed at least 100 feet from the channel.
- Upon completion of construction activities, excavated soil shall be replaced and graded to match the surroundings, and surplus soil shall be transported from the site and disposed of appropriately.
- Use existing roads for access wherever possible. Roads required for construction but not maintenance shall be removed after construction and surfaces restored to original conditions.
- Minimize steepness and unobstructed length of fill slopes. Protect newly constructed fill with appropriate materials to prevent erosion.
- Avoid road construction on very steep slopes and avoid work on unstable slopes and rock outcrops.

- In agricultural areas where grading occurs, stockpile topsoil and replace after construction. Re-grade to original contours and re-seed in accordance with landowner objectives.
- Add soil amendments during revegetation to counteract potential chemical imbalances.
- Minimize use of heavy equipment on agricultural land.

Impact 6-2: Increased Runoff from Tower Construction and Road Building Activities

Surface soil compaction and the reduction of available pore water space will occur as a result of scraping, grading, and other mechanized and vehicular traffic activities. This work will also remove the protective cover of vegetation, which acts as an important rainfall interceptor during storm events. The net result of increased compaction and reduced vegetation is a reduced infiltration capacity, which will generate greater surface runoff during precipitation events. This impact will be most severe at new road locations, tower locations, material lay-down areas, work camps, and at pull, tension, and splicing sites where construction activities are most intense. Construction and traffic activities occurring when the ground is wet or saturated will also increase the runoff potential.

The potential net increase in runoff due to increased impervious surfaces associated with new tower footings and the gravel road along the transmission line corridor is considered to be a less than significant impact because of the relatively small area impacted relative to the size of the overall drainage basins (**Class III**), and no mitigation is required.

Impact 6-3: Increased Stream Channel Erosion, Sediment Transport, and Alteration of the Existing Drainage Pattern Due to Road Building and Construction Activities

Although the overall increase in runoff due to increased impervious surfaces of roadway and other construction areas is probably not significant (as described above in Impact 6-2), the erosive impact of runoff becomes significant when this flow is concentrated at key locations. The generally northwest-southeast trending transmission line corridor crosses several intermittent and ephemeral streams which flow eastward out of the Diablo Range (Section C.6.1.1.1). Construction and road building activities across these stream valleys may alter existing surface runoff patterns such that more flow will be concentrated at particular stream crossings. This typically occurs when corrugated metal pipe culverts are used to convey flow beneath new access roads. Potential impacts of road construction and culvert emplacement include concentrating flow, which could increase stream erosion and sediment transport through channel incision. Besides gulleying effects, poorly designed stream crossings and culverts can negatively impact the existing drainage pattern through flow blockage or the redirection of tributary flow, also known as channel capture. The potential for concentrated runoff and increased erosion to result from road crossings of ephemeral streams and other construction activities is considered potentially significant (**Class II**) but mitigable to less than significant levels through the application of Mitigation Measures **H-1** (above) and **H-2**, following.

Mitigation Measure for Impact 6-3, Road Building and Construction Activities

H-2 Access roads shall be designed to account for anticipated surface runoff and channel flow. Culverts designed to convey flow beneath access roads shall be designed for the specific

hydrologic and hydraulic conditions occurring at the site. Culvert design should follow standard practices (Caltrans Highway Design Manual, 1999) and should also include energy dissipation practices (Federal Highway Administration, 1983). It is important that flow velocities are maintained below levels that are capable of causing channel erosion downstream or headward channel incision upstream. PG&E shall submit copies of approved grading and construction plans for new roads ~~Construction plans for new roads shall be submitted~~ to the CPUC for review ~~and approval~~ prior to the start of project construction.

Impact 6-4: Surface Water and Groundwater Contamination During Construction

Construction of the proposed transmission line would require the use of a variety of motorized heavy equipment, including trucks, cranes, dozers, air compressors, graders, backhoes, and drill rigs. This equipment requires job site replenishment of hazardous chemicals in the form of fuels, oils, grease, coolants, and other fluids. The accidental spill of these, or other, construction-related materials could lead to the discharge of contaminants into the drainage system. Conveyance of contaminants could take place directly at the time of the spill. Alternatively, the contaminants could be held in place until a runoff event delivered them to a watercourse later or they could infiltrate into the soil and groundwater below. A chemical spill affecting a stream channel, wetland area, or groundwater reserve would be a significant impact. However, various permitting conditions and Mitigation Measures **H-3** and **H-4** would reduce the impact of spilled and transported contaminants to a less than significant level (**Class II**).

In addition to permitting conditions described above in Impact 6-1, the Applicant will develop BMPs to prevent contamination as part of the requirements for a National Pollutant Discharge Elimination System (NPDES) permit by the State Water Resources Control Board. BMPs shall be approved by the CPUC, Regional Water Quality Control Board, and affected public agencies prior to permit issuance. They will be modified as necessary during construction to minimize the possibility of contaminated discharge into surface waters. Any spill occurring during construction activities shall be contained and immediately cleaned up.

Mitigation Measures **H-3** and **H-4** require development of a training program and hazardous substance control plan to prevent contaminated water from exiting the construction site and entering into the drainage or groundwater system.

Mitigation Measures for Impact 6-4, Surface Water and Groundwater Contamination During Construction

H-3 An environmental training program shall be established by PG&E to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. This training program shall not only describe general environmental concerns and procedures but shall emphasize site-specific physical conditions to improve hazard prevention. For example, all flow paths to the nearest water bodies should be identified to workers and where hazardous materials may specifically impact the site shall be identified. An outline of the training program and monitoring plan shall be submitted to the CPUC for review and approval prior to the start of construction.

H-4 A Hazardous Substance Control and Emergency Response Plan (HSCERP) shall be prepared by PG&E and submitted to the CPUC for review and approval. The plan shall include preparations for quick and safe cleanup of accidental spills occurring during construction. This plan will be submitted with the grading permit application. It will prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. More specifically, the plan will identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted. The plan shall include the following:

- All refueling, lubrication, and other machinery or vehicular maintenance activities shall be performed at least 150 feet from any tributary, stream channel, aqueduct or canal. This distance is increased to 500 feet when in the vicinity of identified vernal pool wetlands, or the Los Banos and Little Panoche Reservoirs.
- Oil-absorbent material, tarps, and storage drums to contain and control any minor releases of transformer oil shall be used.
- Describe the clean-up process if excess water and liquid concrete escapes from tower foundations during pouring. This excess will be directed to bermed areas adjacent to the borings where the water will infiltrate or evaporate and the concrete will remain and begin to set. Once the excess concrete has been allowed to set up (but before it is dry), it will be removed and transported to an approved landfill for disposal.

Impact 6-5: Tower Foundation Impacts to Groundwater Hydrology

The foundation of each lattice tower will require digging four holes that will be filled with steel and concrete. Each hole is about 3 feet in diameter and about 10-15 feet deep. Depth to groundwater in the hillslope terrain of the Proposed Western Corridor is generally considered to be deeper than the base of the tower foundations. Shallower groundwater elevations are more typically observed east of the Proposed Western Corridor (Figures C.6-1a and C.6-1b). As such, from a regional perspective there is no appreciable impact to groundwater hydrology along the Western Corridor. However, specific tower locations may occur in areas where groundwater is shallower.

Since the footprint of each foundation is quite small relative to the size of the regional groundwater reservoirs, impacts to groundwater hydrology are considered to be less than significant (**Class III**). Although not expected along the Western Corridor with its deeper groundwater levels, if digging of the tower foundation holes does contact groundwater, the construction team may be required to pump groundwater to dewater the excavation. If this occurs, pumped groundwater would be disposed of according to the SWPPP. Although minor short-term localized changes (e.g., drawdown) in groundwater flow could occur as a result of dewatering during drilled pier construction, impacts would be temporary and less than significant (**Class III**).

Impact 6-6: Tower Foundation Impacts to Groundwater Quality

Groundwater quality in the project area could be significantly impacted if borings and tower foundations penetrated areas with pre-existing impaired soil or water quality conditions. Construction activities could thereby create a cross-contamination between polluted layers and other (deeper or shallower) non-polluted groundwater zones. The Applicant states that it does not have information on ocations with potentially impaired or contaminated soil or groundwater resources. This issue is more

important in the southern project area (Segment 6) near Coalinga where there are numerous oil wells, pipelines, and tanks, as well as a waste disposal site. Therefore, Mitigation Measure **H-5** seeks to address the potential for groundwater contamination by requiring an investigation of soil and groundwater quality conditions through available informational sources, as well as requiring a field testing program in conjunction with finalizing the Proposed Western Corridor. Implementation of Mitigation Measure **H-5** would reduce this impact to less than significant levels (**Class II**).

Mitigation Measure for Impact 6-6, Tower Foundation Impacts

H-5 Prior to final tower siting, PG&E shall research existing information about the project corridor to identify and avoid areas with potential existing soil and groundwater contamination (where groundwater is shallower than 20 feet). Findings regarding soil and groundwater contamination conditions shall be supplied to the CPUC in coordination with the agency review of the specific alignment and tower locations for the selected transmission line corridor.

Before construction begins along the approved alignment, soil sampling ~~and potholing~~ shall be conducted south of project milepost MP 66 (as shown on Figure B-1b) at representative intervals, and soil information shall be provided to construction crews to inform them about soil conditions and potential hazards that were not identified in the records searches performed prior to tower siting. If hazardous materials are encountered in either soils or groundwater, work shall be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they shall be handled, transported, and disposed of in accordance with federal, state, and local regulations.

In contrast to the condition described above where impaired soil or groundwater could be contacted during construction, soil and groundwater resources that are not currently impaired could also be significantly impacted if surface contaminants, either from soil or construction-related fuels and materials, were to invade excavations that had bored into shallow groundwater bodies. This is similar to Impact 6-4 described above, but would occur in the tower footings rather than at the surface. State and county permitting requirements and the application of Mitigation Measures **H-1**, **H-3**, and **H-4** would reduce potential impacts to a less than significant level (**Class II**).

C.6.3.4.2 *Los Banos, Gates, and Midway Substation Upgrades*

Upgrades to the Los Banos and Gates Substations involve establishing new concrete footings and slabs to accommodate new transformer banks, circuit switches, and cable termination stations. In addition, there is need to install new series capacitors to facilitate changes in other hook-ups, and other improvements related to relays and circuits. All of these upgrades will occur within the footprints and fence lines of the existing substations.

Impact 6-7: Erosion and Sediment Transport at Los Banos and Gates Substations

Potential construction-related erosion and sediment transport impacts at the Los Banos and Gates Substation sites are considered to be less than significant due to the limited scale of construction at these substations. The application of an Erosion Control Plan, specialized on-site training, and a Hazardous

Materials Plan as described above in Mitigation Measures **H-1**, **H-3**, and **H-4** will ensure that these impacts remain less than significant (**Class III**).

Impact 6-8: Surface and Groundwater Quality Impacts at Los Banos and Gates Substations

Potential construction-related impacts to surface water and groundwater quality at the Los Banos and Gates Substation sites would occur mostly from contamination through the spill of fuels and other fluids. This impact is very similar to Impact 6-4 described above for the construction of the overhead transmission lines. Potential construction impacts to surface water and ground water quality would be reduced to a less than significant level (**Class II**) through the application of Mitigation Measures **H-1**, **H-3**, **H-4**, and **H-5** as described above.

C.6.3.4.3 *Gates-Arco-Midway Reconductoring and Gates Loop*

Two additional project elements involve the potential reconductoring or reconfiguration of the existing Gates-Arco-Midway transmission line south of the Gates Substation and realigning of portions (7,000 feet) of the Los Banos-Midway No. 2 route at the Gates Substation (Gates Loop). The Gates Loop realignment will involve the removal of 7 existing towers and the construction of 6 new towers adjacent to the existing Los Banos-Midway No. 1 line. The pulling and tensioning construction activities for the reconductoring process are similar to those same activities when constructing a new transmission line. Likewise, the tower and alignment changes for the Gates Loop component of the project does not require any additional types of construction activities beyond what is required for the construction of the proposed transmission line. As such, the construction impacts associated with the Gates-Arco-Midway reconductoring and Gates Loop are very similar to Impacts 6-1 through 6-6 described above. These impacts would be reduced to less than significant levels (**Class II**) through the application of Mitigation Measures **H-1 through H-5**.

C.6.3.5 Project Maintenance and Operational Impacts

Impact 6-9: Operational Impacts to Surface and Groundwater Hydrology at Tower and Substation Locations

At each tower site, a concrete foundation approximately 3 feet in diameter and up to 15 feet deep will be constructed. Placement of this impervious material restricts storm water infiltration. However, this impact is considered to be less than significant (**Class III**) because the total area impacted by tower foundations is small. This issue was also addressed above in Impact 6-2 for towers outside of substation areas. Since the modifications to the Los Banos and Gates Substations will occur within the existing footprint of the substation, no significant impacts to hydrology are expected.

Impact 6-10: Risk of Transmission Tower Damage Through Flooding or Erosion

As indicated in the description of significance criteria above, a significant impact would occur if project transmission towers were subjected to a substantial risk of damage through flooding or erosion through the exposure of tower foundations to running water. Additionally, if flooding or stream erosion in the project area resulted in significant damage to access roads/bridges or to other structures related to the

Proposed Project, this would also be considered a significant impact. As described above, most of the project area is zoned as regions outside of the 500-year flood zone. However, there are certain creeks whose adjacent floodplains have been designated as 100-years flood zones. This is more applicable along the Eastern Corridor Alternative. Impact 6-10 would be reduced to a less than significant level (**Class II**) by the implementation of Mitigation Measure **H-6**.

Mitigation Measure for Impact 6-10, Risk of Transmission Tower Damage Through Flooding or Erosion

H-6 Transmission towers shall not be sited within a distance of 200 feet from the edge of stream channels~~a designated 100-year floodplain~~. ~~Prior to final alignment of transmission towers, the Applicant shall evaluate the position of all towers in light of the most recent (July 2001 or later) floodplain delineations in the project area.~~ To demonstrate compliance, PG&E shall provide the CPUC with a map of towers~~.~~ locations relative to stream courses ~~within 100 feet of identified floodplains~~ 30 days prior to the start of construction.

Impact 6-11: Operational Impacts to Surface and Groundwater Quality at Substations

Future operation of the new equipment in the modified areas of the Los Banos, Gates, and Midway Substations could result in the release of fuels and oil thereby creating a significant surface water quality impact (**Class II**). In particular, the release of mineral oil from oil-filled electrical equipment, either from slow leaks or catastrophic failure, could wash into adjacent drainages or infiltrate into the water table.

The Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act prohibit the release of any oil to waters of the state. The use of oil-absorbent material, tarps, and storage drums will be used to contain and control any minor releases of transformer oil to the site as described in Mitigation Measure **H-4**. Spills that may occur during project operation shall be controlled through the implementation of a Spill Prevention Containment and Countermeasure (SPCC) pond as specified in Mitigation Measure **H-7** below. Existing SPCC plans for the Los Banos, Gates, and Midway Substations will need to be revised to include the new equipment and the expanded area of the substations. Incorporation of SPCC measures into the project design would reduce impacts to a less than significant level (**Class II**).

Mitigation Measure for Impact 6-11, Operational Impacts to Surface and Groundwater Quality at Substations

H-7 If PG&E currently has a spill prevention containment and countermeasure (SPCC) pond that collects runoff from the Los Banos, Gates, and Midway Substations, the pond shall be upgraded to accommodate additional flow resulting from the substation modifications. If there is currently no SPCC pond at these substation sites, PG&E shall update its SPCC plan to explain how the additional runoff or potential releases would be accommodated within the substations. PG&E shall submit the updated SPCC to the CPUC for review and approval 30 days prior to energizing the new lines or the new portion of the substations.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
6-1 Accelerated hillslope erosion, increased sediment loading, and reduced surface water quality due to tower construction and road building activities (**Class II**)	**H-1** An erosion control and sediment transport control plan shall be submitted first to the CVRWQCB and CPUC for review and approval, and then to Merced and Fresno Counties along with grading permit applications. This plan shall be prepared in accordance with the standards provided in the Manual of Erosion and Sedimentation Control Measures (ABAG, 1981) and in compliance with practices recommended by the Natural Resources Conservation Service. Implementation of the plan will help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan shall be designed specifically for the hydrologic setting of the approved project, which includes upland slopes, tributary creeks, and larger streams. The plan shall define the specific Best Management Practices (BMPs) that will be adhered to during construction activities. Erosion minimizing efforts such as hay bales, water bars, covers, sediment fences, sensitive area access restrictions (for example, flagging), vehicle mats in wet areas, and retention/ settlement ponds shall be installed before extensive clearing and grading begins. Mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during construction activities. Revegetation plans, the design and location of retention ponds, and grading plans shall be submitted to the CDFG for review in the event of construction near waterways. In addition, PG&E shall: • Replant temporarily disturbed areas with a mixture of perennial grasses, forbs, brush, shrubs, and tree species that will provide effective erosion control. Prepare a firm, rough seedbed on fill or cut slopes and apply appropriate types and amounts of fertilizers and seed mixtures. Consider reseeding with native plants only in sensitive areas not subject to grazing.	All Proposed and Alternative construction sites	CPUC to review construction plans, monitor construction.	Compliance with Best Management Practices, SWPPP, and ECP. Permits issued; inspections during construction show no significant impacts. Construction-related sediment is prevented from reaching drainage network.	Merced County Dept. Public Works Fresno County Dept. Public Works USACOE CDFG SWRCB CVRWQCB CPUC	Review plans and permits prior to construction, inspect during construction.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	• Restore disturbed surfaces to original conditions, including reseeding or otherwise restoring vegetation on all disturbed slopes exceeding 2 percent, as soon as possible after such grading work is completed or later if approved by the Project Biologist. Recontour, prepare the surface, and seed all roads, construction sites, and other disturbed areas not required for project operation and maintenance. • Use standard erosion practices and dust control measures, as defined in mitigation measures for air quality, during construction to protect biological and hydrological resources. • Based on weather conditions as determined by the CPUC's Environmental Monitor, temporarily collect excavated or disturbed soil and place it in a controlled area surrounded by siltation fencing, hay bales, or a similarly effective erosion control technique that prevents the transport of sediment. • Restrict the staging of construction materials, equipment, and excavation spoils to areas at least 100 feet outside of drainage channels or tributaries. • Where tower or substation construction activities occur near a creek or channel, sediment containment methods shall be performed at least 100 feet from the channel. • Upon completion of construction activities, excavated soil shall be replaced and graded to match the surroundings, and surplus soil shall be transported from the site and disposed of appropriately. • Use existing roads for access wherever possible. Roads required for construction but not maintenance shall be removed after construction and surfaces restored to original conditions. • Minimize steepness and unobstructed length of fill slopes. Protect newly constructed fill with appropriate materials to prevent erosion.					

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	• Avoid road construction on very steep slopes and avoid work on unstable slopes and rock outcrops. • In agricultural areas where grading occurs, stockpile topsoil and replace after construction. Re-grade to original contours and re-seed in accordance with landowner objectives. • Add soil amendments during revegetation to counteract potential chemical imbalances. • Minimize use of heavy equipment on agricultural land.					
6-3 Increased stream channel erosion, sediment transport, and alteration of existing drainage pattern due to road building activities (**Class II**)	**H-2** Access roads shall be designed to account for anticipated surface runoff and channel flow. Culverts designed to convey flow beneath access roads shall be designed for the specific hydrologic and hydraulic conditions occurring at the site. Culvert design should follow standard practices (Caltrans Highway Design Manual, 1999) and should also include energy dissipation practices (Federal Highway Administration, 1983). It is important that flow velocities are maintained below levels that are capable of causing channel erosion downstream or headward channel incision upstream. PG&E shall submit copies of approved grading and construction plans for new roads ~~Construction plans for new roads shall be submitted~~ to the CPUC for review ~~and approval~~ prior to the start of project construction.	All Proposed road building locations	CPUC to review road and culvert design, construction, operation, and maintenance plan; monitor construction.	Compliance with approved plan. Flow networks of existing streams and drainage channels are not extensively altered. Channel erosion is not initiated as a result of construction activities	Merced County Dept. Public Works Fresno County Dept. Public Works USACOE CVRWQCB CDFG CPUC	Review design and construction plans prior to construction, inspect during construction.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
6-4 Construction-related surface water and groundwater contamination **(Class II)**	**H-3** An environmental training program shall be established by PG&E to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. This training program shall not only describe general environmental concerns and procedures but shall emphasize site-specific physical conditions to improve hazard prevention. For example, all flow paths to the nearest water bodies should be identified to workers and where hazardous materials may specifically impact the site shall be identified. An outline of the training program and monitoring plan shall be submitted to the CPUC for review and approval prior to the start of construction. **H-4** A Hazardous Substance Control and Emergency Response Plan (HSCERP) shall be prepared by PG&E and submitted to the CPUC for review and approval. The plan shall include preparations for quick and safe cleanup of accidental spills occurring during construction. This plan will be submitted with the grading permit application. It will prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. More specifically, the plan will identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted. The plan shall include the following: • All refueling, lubrication, and other machinery or vehicular maintenance activities shall be performed at least 150 feet from any tributary, stream channel, aqueduct or canal. This distance is increased to 500 feet when in the vicinity of identified vernal pool wetlands, or the Los Banos and Little Panoche Reservoirs.	All Proposed and Alternative construction sites	CPUC to Review and provide training program guidelines. CPUC to review HSCERP Plan prior to site mobilization or construction activities.	Development of Compliance with Best Management Practices. Permits issued; inspections during construction show no significant impacts. Spills effectively cleaned up.	CVRWQCB Merced County Dept. Public Works Fresno County Dept. Public Woksr USACOE CDFG CPUC	During construction Review plans and permits prior to construction, inspect during construction.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	• Oil-absorbent material, tarps, and storage drums to contain and control any minor releases of transformer oil shall be used. • Describe the clean-up process if excess water and liquid concrete escapes from tower foundations during pouring. This excess will be directed to bermed areas adjacent to the borings where the water will infiltrate or evaporate and the concrete will remain and begin to set. Once the excess concrete has been allowed to set up (but before it is dry), it will be removed and transported to an approved landfill for disposal.					
6-6 Groundwater quality impacts and construction of tower foundations **(Class II)**	**H-5** Prior to final tower siting, PG&E shall research existing information about the project corridor to identify and avoid areas with potential existing soil and groundwater contamination (where groundwater is shallower than 20 feet). Findings regarding soil and groundwater contamination conditions shall be supplied to the CPUC in coordination with the agency review of the specific alignment and tower locations for the selected transmission line corridor. Before construction begins along the approved alignment, soil sampling ~~and potholing~~ shall be conducted south of project milepost (MP) 66 (as shown on Figure B-1b) at representative intervals, and soil information shall be provided to construction crews to inform them about soil conditions and potential hazards that were not identified in the records searches performed prior to tower siting. If hazardous materials are encountered in either soils or groundwater, work shall be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they shall be handled, transported, and disposed of in accordance with federal, state, and local regulations.	All Proposed and Alternative construction sites	CPUC to review contamination data in reference to project alignment. CPUC to review soil sampling results prior to construction.	Selected project alignment will avoid areas with potential contamination. Environmental monitor to ensure that hazardous materials encountered are handled in accordance with regulations	CVRWQCB CPUC Merced County Dept. Public Works Fresno County Dept. Public Woks	Review contamination information prior to selecting project alignment. Review soil sampling results prior to construction, inspect during construction.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
6-8 Los Banos and Gates Substation upgrades and construction-related impacts to surface water and groundwater quality **(Class II)**	**H-1**, **H-3,** and **H-4** (see above**)**	Los Banos and Gates Substations	CPUC to review construction plans; monitor construction.	Compliance with Best Management Practices, SWPPP, and ECP. Permits issued; inspections during construction show no significant impacts. Construction-related sediment is prevented from reaching drainage network.	CVRWQCB CPUC Merced County Dept. Public Works Fresno County Dept. Public Woks USACOE	Review plans and permits prior to construction, inspect during construction.
6-10 Risk of transmission tower damage through flooding or erosion **(Class II)**	**H-6** Transmission towers shall not be sited within a distance of 200 feet from the edge of stream channels ~~a designated 100-year floodplain~~. ~~Prior to final alignment of transmission towers, the Applicant shall evaluate the position of all towers in light of the most recent (July 2001 or later) floodplain delineations in the project area.~~ To demonstrate compliance, PG&E shall provide the CPUC with a map of tower~~s~~ locations relative to stream courses ~~within 100 feet of identified floodplains~~ 30 days prior to the start of construction.	Along the Proposed or Alternative Project Corridors.	CPUC to review tower alignment plans ~~in terms of recent floodplain delineations~~in relation to stream locations.	Selected project alignment will avoid tower locations ~~on 100-year floodplains.~~within 200 feet of edge of stream channels	~~Merced County Dept. Public Works~~ ~~Fresno County Dept. Public Woks~~ CPUC USACOE CVRWQCB ~~CPUC~~ Merced County Dept. Public Works Fresno County Dept. Public Woks	Review plans and permits prior to construction.

Table C.6-9 Mitigation Monitoring Program

Impact (Class)	Mitigation Measure	Location	Monitoring/Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
6-11 Operational impacts to surface water and groundwater quality at substations **(Class II)**	**H-4** (above) **H-7** If PG&E currently has a spill prevention containment and countermeasure (SPCC) pond that collects runoff from the Los Banos, Gates, and Midway Substations, the pond shall be upgraded to accommodate additional flow resulting from the substation modifications. If there is currently no SPCC pond at these substation sites, PG&E shall update its SPCC plan to explain how the additional runoff or potential releases would be accommodated within the substations. PG&E shall submit the updated SPCC to the CPUC for review and approval 30 days prior to energizing the new lines or the new portion of the substations.	Los Banos and Gates Substations	CPUC to review (SPCC) construction, operation, and maintenance plan; monitor construction.	Compliance with approved plans. On-site runoff detention system and pond will be sized according to approved Best Management Practices.*	CVRWQCB CPUC	Review construction, operation, and maintenance plan prior to construction; monitor construction.
6-12 Operation of water and oil wells within Proposed Project Corridor	**H-8** The final tower siting for the approved project shall avoid existing oil and water wells. Wells that cannot be avoided shall be removed or relocated, and the owner shall be compensated by the Applicant. To demonstrate compliance, at least 30 days prior to construction, PG&E shall provide a map showing all oil and water wells within 200 feet of the edge of the ROW.	Along the Proposed or Alternative Project Corridors	CPUC to review tower alignment plans in terms of identified oil and water well locations.	Selected project alignment will avoid locations with oil or water wells.	Merced County Dept. Public Works Fresno County Dept. Public Woks CVRWQCB CPUC	Review well location information prior to selecting project alignment.

C.6.7 REFERENCES

California Biodiversity Council and UC Davis Information Center for the Environment, Natural Resources Project Inventory: Watershed Project Inventory Website. 2001. Http://endeavor.des.ucdavis.edu/wpi/ lists watershed projects and studies by County with contact information.

California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch (DFG). 1997. Website. Http://maphost.dfg.ca.gov/wetlands/default.htm, detailed delineation of vernal pools and other wetlands areas.

California Resources Agency (CRA). 1995. *San Joaquin River Management Plan*, prepared by an advisory council established by Assembly Bill 3603. February.

CPUC (California Public Utilities Commission). 2000. Tri-Valley 2002 Capacity Increase Project, Draft Environmental Report (Volume I). December.

_____. 1997. Website. Http://maphost.dfg.ca.gov/wetlands/vp_asses_rept/fig11.htm. Broad delineation of vernal pool regions for the Central Coast Vernal Pool Region.

Central Valley Regional Water Quality Control Board (CVRWQCB). 1998. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region, 4th edition, The Sacramento River Basin and The San Joaquin River Basin*. Website. Http://www.swrcb.ca.gov/rwqcb5/files.html#anchor616381.

DWR (California Department of Water Resources). 1998. *California Water Plan Update* (Bulletin 160-98), p.4-29, Figure 4-9: Areas of Shallow Groundwater in the San Joaquin Valley.

_____. 1998b. *California Water Plan* (Bulletin 160-98), Chapter 8. Options for Meeting Future Water Needs in Interior Regions of California, San Joaquin River Hydrologic Region. Available at http://rubicon.water.ca.gov/b16098/v2txt/ch8sj.html

_____. Division of Planning and Assistance. 2001. Website. Http://well.water.ca.gov/. Current and historic groundwater monitoring well data.

_____. Division of Planning and Assistance, San Joaquin District. 1997. Website. Http://wwwdpla.water.ca.gov/sjd/waterquality/drainage/. Groundwater level (1991, 1997) and electric conductivity (1995) contour maps for the Central Valley.

_____. San Joaquin District. 1998. Boundaries of Public Water Agencies, San Joaquin Valley (map).

_____. Groundwater well monitoring websites. Http://wwwdpla.water.ca.gov/sjd/waterquality/drainage/ and Http://well.water.ca.gov/.

_____. San Joaquin Valley, Drainage Monitoring Program. 1997. District Report (March 2000).

EPA (U.S. Environmental Protection Agency). 2001. Website. Http://www.epa.gov/surf3/hucs/18040001/. General watershed information for the Middle San Joaquin-Lower Chowchilla watershed.

Federal Emergency Management Agency (FEMA). Merced County Flood Insurance Rate Maps (1995) and Fresno County (2001, not yet reviewed).

Mayer, Carlynn. 2001. Water Management Section, California Department of Water Resources, Fresno, Ca.

PG&E (Pacific Gas & Electric Company). 1986. Los Banos-Gates 500 kV Transmission Project Environmental Report and Technical Appendices. September.

Planert, Michael and John S. Williams. USGS. 1995. *Ground Water Atlas of the United States - Segment 1 California Nevada* By Central Valley Aquifer System, Ground Water Quality. Website. Http://ca.water.usgs.gov/gwatlas/valley/quality.html.

TANC/WAPA (Transmission Agency of Northern California and Western Area Power Administration). 1986. Draft Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. November.

_____. 1988. Final Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. January.

United States Army Corps of Engineers (USACE), California Department of Water Resources (DWR), and U.S. Bureau of Reclamation (BOR). 1999. San Joaquin River Basin, Arroyo Pasajero (Fresno County), CA, Feasibility Investigation, Draft Feasibility Report. March.

United States Bureau of Reclamation (BOR). 2001. Website. Http://dataweb.usbr.gov/. Information on BOR Central Valley Project reservoirs and facilities.

United States Department of the Interior and the California Resources Agency. 1990. *A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley* (Rainbow Report). Website. Http://wwwdpla.water.ca.gov/agriculture/drainage/implementation/hq/rainbowreport.pdf. September.

Westlands Water District. 2001. Website. Http://www.westlandswater.org/. Shallow and deep groundwater elevation and depth contour maps (biennial, 1993-2001).

C.7 Land Use and Recreation

Remove Page(s):	**Replace With:**
C.7-3 to C.7-4	**New** C.7-3 to **New** C.7-4
C.7-7 to C.7-8	**New** C.7-7 to **New** C.7-8
C.7-19 to C.7-22	**New** C.7-19 to **New** C.7-22
C.7-29 to C.7-32	**New** C.7-29 to **New** C.7-32
C.7-37 to C.7-42	**New** C.7-37 to **New** C.7-42

Chevron and Equilon (formerly Texaco and Shell) operate two oil pipelines that cross the proposed corridor. Oil development occurs in the southern portion of the study area.

The land crossed by the Proposed Western Corridor and the area surrounding the corridor is predominantly grazing and open space, with some recreation, wildlife habitat, and irrigated agriculture in the southern portion. According to local officials, almond orchard production in this area greatly exceeds County averages.

In the north, the proposed corridor crosses the western portion of the recreation area at Los Banos Reservoir and the Little Panoche Reservoir in northern Fresno County. In the southernmost portion of the corridor, there are a variety of land uses including oil production and operation areas, commercial development along I-5, and developed agriculture and agribusiness operations. Two residences are located within the proposed corridor at Milepost (MP) 68 and MP 80 (PG&E, 1986).

Due to hilly terrain, seasonal water supplies, limited access, and generally poor soil characteristics, agricultural production is somewhat limited. However, consultation with local and regional agencies indicates that more lands in the project area are being planted with crops. In recent years, agricultural uses within the study area have been converted from row crops to permanent crops (e.g., orchards) and from grazing to crops. This change, which is partially due to market conditions and water costs, has occurred since the Draft EIS/EIR was prepared in 1986. Therefore, more area within or adjacent to the study area is now devoted to row crops and orchards, compared to agricultural uses in the 1980s. Figure C.7-1 (maps a through e, presented at the end of this section) shows agriculture types within the study corridor for both the proposed and alternative routes.

C.7.1.2 Environmental Setting: Proposed Project

This section describes the land jurisdiction and uses along the individual segments (numbered 1 through 7) of the Proposed Western Corridor, as described in Section B.2 (Project Description). Unless indicated otherwise, the land uses on public undeveloped lands crossed by the proposed corridor include grazing, dispersed recreation, open space, and wildlife habitat. The land uses on the private undeveloped lands crossed by the proposed corridor include grazing, open space, and wildlife habitat.

Agricultural production along the proposed route is quantified in Table C.7-1. As shown in the table, agricultural production is concentrated in Segments 5, 6, and 7 and approximately 13 percent of the proposed corridor is used for intensive agricultural production.

Table C.7-1 Agricultural Production Within Proposed Project Corridor

Proposed Project (West)	HAY	Orchard	Seasonal Crop	Grazing+ Other	Total Acres Ag	% total Ag	TOTAL
Segment 1	0	0	0	491	0	0.0%	491
Segment 2	0	0	0	2,521	0	0.0%	2,521
Segment 3	0	0	0	1,627	0	0.0%	1,627
Segment 4	0	0	0	1,632	0	0.0%	1,632
Segment 5	0	255	479	6,994	734	9.5%	7,728
Segment 6	40	332	505	1,917	877	31.4%	2,794
Segment 7	0	151	493	107	644	85.8%	751
TOTAL	40	738	1,477	15,289	2,255	12.9%	17,544

C.7.1.2.1 *Merced County*

Segments 1, 2, and 3 are located in Merced County. They cross private land, the State of California land (CDPR and CDFG), and the U. S. Bureau of Reclamation (BOR) land at Los Banos Reservoir. The majority of the proposed corridor in Merced County is located on land designated as Foothill Pasture by the Merced General Plan and zoned A-1, General Agriculture, and A-2, Exclusive Agriculture.

Segment 1

The Western Corridor commences at the existing PG&E Los Banos Substation, located within a 32-acre fenced area. Acreage outside the fenced area is owned by PG&E (276 acres) and leased to local farmers for grazing. From the substation parcel, the initial 0.5-mile section of the transmission corridor crosses undeveloped CDFG and State of California land, designated as San Joaquin Kit Fox habitat corridor. This area has been established by the CDFG and USFW in conjunction with mitigation requirements for nearby construction projects. The remaining 1.5-mile is on private undeveloped land~~, with MP 0.75 to MP 1.25 planted in seasonal hay~~. A variety of highway commercial uses are located immediately east of the Los Banos Substation on Gonzaga Road (at the intersection of SR-33 and SR-152) including a truck stop, café, two automobile service stations, motel, and RV campground. A 62-unit residential subdivision is under construction south of the existing commercial uses. These uses are located 0.5 mile east of the proposed transmission corridor.

There is a pending application for a Specific Urban Development Plan (SUDP), The Villages of Laguna San Luis Community Specific Plan, which is a 4,200-acre new town development proposed on Gonzaga Road. The "new town" plan includes the Los Banos Substation within its boundaries and proposes development to the west, south, and east of the substation (see Figure C.7-2). Proposed development includes 14,721 new residences, over 1,300,000-square feet of new commercial space, and 109 acres of public and quasi-public uses (Cope, 2001). Segment 1, located entirely within the community plan area, is identified as Open Space (OS) in the proposed plan, due to the existence of the Kit Fox habitat corridor. An EIR is being prepared for the proposed plan, with a decision on the application anticipated within one year.

Another potential development, the Agua Fria Village, extends across a portion of Segment 1 and into Segment 2. The development includes about 1000 acres of urban uses (residential, commercial, institutional, and recreational) and about 3000 acres of wildlife conservation area and recreational open space. However, at the time of Final SEIR preparation, no application has been filed with Merced County and no entitlements for the development have been authorized. The area has been annexed to the San Luis Water District water service area. A portion of this same area may be utilized as a mitigation bank for kit fox habitat, pursuant to approval by USFW and CDFG.

The San Luis Reservoir State Recreation Area is located northeast of the Los Banos Substation, outside of the proposed corridor. This large recreation facility offers over 65 miles of shoreline and recreational opportunities such as boating, fishing, sailing, water skiing, camping, and migratory waterfowl hunting in the fall and winter seasons. Total annual visitor use in 2000-2001 was over 500,000 (including day use and camping at both Basalt and O'Neill Forebay; Hardcastle, 2001).

Segment 2

This 12.7-mile segment parallels the two existing PG&E 500 kV lines (Pacific Intertie), maintaining a 2,000-foot separation. The segment crosses undeveloped private land through most of its length and crosses State of California lands (CDPR) between MP 5 and MP 6, and BOR lands at Los Banos Creek Recreation Area (including Los Banos Reservoir) at MP 6 to MP 6.5. These public lands are part of the Los Banos Creek Recreation Area managed by the CDPR, with recreational activities including fishing, boating, swimming, camping (20 primitive sites), picnicking, hiking, equestrian camping, horseback riding, and in-season hunting. The highest seasonal use is from May through September. Annual visitor use at Los Banos Creek Recreation Area is listed in Table C.7-2 and the location of the reservoir in relation to the proposed corridor is shown in Figure C.7-3.

Table C.7-2 Los Banos Creek Recreation Area Annual Visitor Attendance

Year	Day Use	Camping	Total
1996-97	47,650	5,254	52,904
1997-98	31,322	3,504	34,826
1998-99	44,388	2,871	47,259
1999-00	71,033	4,572	75,605
2000-01	55,911	4,375	60,286

Source: CDPR, 2001.

Segment 3

This segment parallels the Pacific Intertie for approximately 5.3 miles, traversing private undeveloped hilly terrain and native grasslands through its entire length.

C.7.1.2.2 *Fresno County*

Segments 4, 5, 6, and 7 are located in Fresno County. These segments cross private land, U.S. Bureau of Reclamation (BOR) land at Little Panoche Dam, and dispersed BLM lands. The majority of the proposed corridor in Fresno County is located on land designated as Westside Rangeland and Agriculture by the Fresno County General Plan and the Coalinga Regional Plan. Zoning is designated as AE, Exclusive Agriculture. Private agricultural land in the corridor is located in the San Luis Water District or the Westlands Water District.

Segment 4

This segment begins at the Merced/Fresno County border at MP 20.5 and parallels the Intertie for its entire length to MP 29. The corridor crosses mainly undeveloped private lands characterized by hilly grassland terrain used for grazing. Small areas of agricultural uses are located near the corridor from MP 21.25 to MP 21.75 and from MP 25 to MP 26.

At MP 23, the segment crosses the eastern side of Little Panoche Reservoir Wildlife Area at Little Panoche Dam, owned by the BOR and managed by the CDWR. The California Department of Fish and Game (CDFG) manages the undeveloped Little Panoche Reservoir Wildlife Area for public use, with recreation activities consisting mainly of fishing, hunting, nature study, and dog trials. Annual use in 2000 was approximately 3,200 visitors for day use activities.

The southern two miles of this segment cross the eastern edge of BLM's Panoche Hills Management Area. These BLM lands are managed for multiple use, primarily livestock grazing, dispersed recreation (upland game hunting, sightseeing, birdwatching, and picnicking), and wildlife use. No developed BLM recreational facilities are located on lands crossed by this segment.

Segment 5

This segment parallels the Pacific Intertie for its entire 40-mile length from MP 29 to MP 69, and crosses mainly undeveloped private land with moderate to steep slopes and sparse vegetation. Most of this segment is managed through leases for grazing (PG&E, 1986). Several areas of developed agricultural uses are located at MPs 31 to 36. An agricultural equipment storage area is located at MP 32 (PG&E, 1986).

The northern seven miles of this segment cross private land to the east of BLM's Panoche Hills Wilderness Study Area (WSA), sited to comply with BLM's management policy which prohibits development of any kind within a designated WSA.

This segment crosses Panoche Creek near MP 37 and the entrance to BLM's Tumey Hills Recreation Area, which provides hunting and limited equestrian use. From MP 37 to MP 55, the segment passes through private lands along the Tumey Hills and Monocline Ridge; at MP 44.5 to MP 45 and MP 46 to MP 46.5, the segment crosses dispersed BLM lands.

Developed features crossed by this segment include the San Luis Water District Third Canal, from MP 29 to MP 31, an existing 230 kV transmission line at MP 37, two existing oil pipelines at MP 41, and an oil pipeline from MP 61 to MP 63. At MP 65, a Mack Pumping station is used for oil operations (PG&E, 1986). A mobile home residence is located at MP 68 (PG&E, 1986).

Segment 6

This 10.5-mile segment crosses mainly private cultivated and grazing lands and skirts existing oil fields. Although the proposed ROW avoids most oil wells, a few oil operation evaporation ponds are within the proposed corridor. A small area of BLM land is located at MP 69. This segment crosses the Coalinga East Oil Field from MP 70 to MP 70.5 and the Guijarral Hills Oil Field at MP 77. Existing oil tanks are adjacent to, but not within, the study corridor.

- Interference with agricultural equipment operation, irrigation practices, or aerial spraying activities that would result in long-term impairment of agricultural operations and productivity.
- Permanent or long-term preclusion of a recreational use or temporary preclusion (longer than one week) during the peak use season.
- Conflict with the established residential, agricultural, or recreational use of an area.
- Conflict with Federal, State, or County land use plans, policies, or regulations adopted to avoid or mitigate environmental impacts.
- Short-term land use disruptions (longer than one week) or farming disruptions for a period of time, which would preclude one or more crop seasons.

Visual effects of the project on the quality of the rural landscape are assessed in Section C.11, Visual Resources.

C.7.3.3 General Impacts and Mitigation Measures

The general types of land use and recreation impacts that may result from the Proposed Project or Alternatives are described below. The specific locations where each impact could occur, impact significance, and recommended mitigation measures are presented in Section C.7.3.5. The significance of each impact depends on the extent and location of its occurrence.

Impact 7-1: Temporary Construction Disturbances

A variety of construction activities will temporarily disturb existing land uses. In addition to noise, dust, traffic, and visual disturbances to existing land uses and on recreational activities, grazing lands within the ROW would be temporarily lost as a result of removing vegetation, grading, overland travel, site preparation, and assembling and erecting structures. Construction activities would also result in a temporary loss of the use of grazing land outside the ROW as a result of overland travel, constructing new access routes, and constructing and using staging areas. Also, construction may necessitate removal of fencing and gates. A small amount of crops would be temporarily removed for construction activities. However, these losses would be more severe in the case of permanent crops such as vineyards and orchards, which require numerous years to be re-established to productive levels. In addition, soil compaction may occur as a result of construction equipment and activities, necessitating remedial activities to restore agricultural uses.

Since precise locations for towers, access roads, and staging areas have not been identified, assumptions were made about overall land disturbance, based on project description information (e.g., number of towers per mile, size of staging areas, and acreage for new roads). This information allows assessment of construction impacts and identification of appropriate mitigation measures. The overall amount of land that would be subject to physical disturbance would be about 261 acres. Short-term land disturbances are significant in areas where intensive farming or developed land uses occur within or adjacent to the proposed ROW. The duration and extent of the impact can be reduced through implementation of Mitigation Measures **L-1 through L-10** (below).

Mitigation Measures for Impact 7-1, Temporary Construction Disturbances

L-1 PG&E shall, to the extent feasible, use access roads that were constructed for the existing 500 kV transmission lines. (These roads, many of which are still used for maintenance, with necessary repair, could be used for access with only construction of spur roads that would be necessary to reach individual tower locations.) PG&E shall document compliance with this measure by submitting an access road plan (demonstrating use of existing roads or reasons why existing roads cannot be used) to the CPUC for review and approval at least 30 days before construction.

L-2 Construction staging areas and pulling sites shall be located adjacent to roads where practical. PG&E shall coordinate with landowners to establish construction areas (such as conductor pulling and splicing areas and construction yards) on non-agricultural land or in areas with less sensitive crops, where feasible. PG&E shall document compliance with this measure by submitting to the CPUC for review and approval, at least 30 days before construction begins, a plan showing construction staging and pulling areas, demonstrating use of non-agricultural land or reasons why agricultural land cannot be avoided.

L-3 All access roads not required for maintenance by PG&E after construction should be either permanently closed using the most effective and least environmentally damaging methods appropriate to the landowners, or be regraded (recontoured), restored, and revegetated with the concurrence of the relevant landowners. Any damaged recreation, farm, or residential access roads shall be repaired. PG&E shall document compliance with this measure by submitting to the CPUC for review and approval a plan showing methods to restore and revegetate unnecessary access roads.

L-4 PG&E shall locate new access roads parallel to landform contours where feasible, in order to minimize ground disturbance and/or reduce scarring. Construction of new access roads on permanent crop land (e.g., orchards) shall be avoided, where feasible. PG&E shall document compliance with this measure by submitting an access road plan (demonstrating conformance to landform contours and avoidance of permanent crop land) to the CPUC for review and approval.

L-5 In agricultural areas where sites would be graded, PG&E shall stockpile topsoil at locations acceptable to landowners if applicable. After construction, topsoil shall be replaced and the site graded to the original contours. If appropriate, the site shall be reseeded in accordance with agency or landowner objectives. PG&E shall document compliance with this measure by submitting to CPUC for review and approval a plan showing methods to stockpile topsoil and restore construction sites.

L-6 PG&E shall time construction, whenever practical, to minimize disruption of normal seasonal activities for crop and rangeland and to avoid peak use periods at recreational areas. PG&E shall work with the appropriate County agent and farmers to agree to a construction schedule that would avoid the prime crop planting, growing, and harvesting seasons, to the extent possible. PG&E shall submit a construction schedule to the CPUC for review and approval. The schedule shall document how disruptions to agricultural operations will be avoided.

L-7 At least one month prior to constructing the project, PG&E shall give advance notice of such construction, construction activity schedules, access restrictions, and anticipated disturbances to property owners, residents, and tenants potentially affected by construction activities (within 1,000 feet of project ROW or access roads). The Applicant shall provide adequate access to existing land uses during all periods of construction and shall notify landowners of alternative access. PG&E shall avoid nighttime construction near noise-sensitive land uses (e.g.,

residences and campers at recreation areas). PG&E shall document compliance with this measure by submitting to CPUC a copy of the notice for review and approval prior to mailing said notice. PG&E shall provide evidence to CPUC that the notice was delivered to landowners and residents within 1,000 feet of the project ROW and access roads. PG&E shall submit to CPUC for review and approval a plan showing how adequate access to existing land uses will be provided during construction.

L-8 Immediately after removing sections of grazing fencing, PG&E shall construct a temporary barrier across the section of removed fencing so that grazing animals cannot move through the fencing. Immediately after completing construction in the area, PG&E shall repair the section of removed fencing. PG&E shall close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area. PG&E shall incorporate these requirements into the construction plan and demonstrate to the CPUC that all construction workers are informed of these provisions.

L-9 PG&E shall include a stipulation in its easement agreements with landowners along the ROW that landowners shall be reimbursed for the value of the crops lost and the cost of any delay or interruption in necessary farming or grazing practices as a result of any interrupted use of cropland or grazing land. Evidence of this stipulation shall be submitted to the CPUC.

L-10 PG&E shall avoid, to the extent feasible, construction operations that disturb agricultural soil during the wet season (moist soil is generally more susceptible to compaction than dry soil). For any area in which PG&E determines avoidance to be infeasible, PG&E shall provide to the CPUC for review and approval at least two weeks prior to construction at that site, a brief written description of the area and the reasons that avoidance is not considered to be feasible.

PG&E shall minimize the use of heavy equipment on agricultural land to avoid soil compaction. Where compaction occurs on agricultural land as a result of construction, the soil shall be ripped to restore adequate percolation of irrigation water through the soil strata. PG&E shall incorporate these requirements into the project construction plan and submit the plan to CPUC for review and approval.

Impact 7-2: Conflicts with Existing and Planned Land Uses

The proposed transmission line may conflict with several types of land uses occurring within the proposed or alternative corridors. These uses include residences, agricultural operations, airstrips, planned developments, oil operation areas, canals, and dams. Although it may be possible to route the transmission line to avoid these uses in most cases, complete avoidance may not be possible. Potential conflicts include the following:

- **Residences –** For safety reasons, residential structures cannot be located within a transmission right-of-way.
- **Agricultural Operations –** The transmission line would be incompatible with agricultural operations that include buildings and structures such as farm and forage buildings, irrigation pipe laydown areas, grain storage tanks, and feedlots.
- **Planned Developments –** A new town is being proposed around the Los Banos Substation, including homes, parkland, and commercial uses. The proposed corridor would pass through areas of the new town designated as open space. This open space area is a kit fox corridor, planned as a habitat mitigation area (see Section C.3 for a discussion of impacts on kit fox habitat).
- **Canals –** Several canals are crossed by the proposed or alternative corridors. There are concerns associated with potential interference with canal maintenance operations.
- **Oil Field Operations –** Transmission lines may present a hazard to oil drilling and maintenance operations. Also, future drilling in areas containing known untapped oil reserves could be hindered by the presence of transmission lines.

- **Dams –** The Little Panoche Dam and Los Banos Dam are crossed by alternative corridors. There is a potential concern associated with conflicts with facilities at the base of the dams.
- **Recreation Areas –** The Proposed Western Corridor may pose conflicts with existing or proposed recreational uses and facilities. Conflicts include restriction of certain recreation activities in the immediate vicinity of the transmission line and degradation of the scenic quality of the recreational area. However, through proper siting and standard construction practices (see Mitigation Measure **L-7**), impacts on recreation can be reduced to levels that are not significant.
- **Airstrips –** Four airstrips are located in the vicinity of the proposed and alternative corridors.

Mitigation Measure **L-11** would reduce or avoid land use conflicts with the Proposed Project or Alternatives.

Mitigation Measure for Impact 7-2, Conflicts with Existing and Planned Land Uses

L-11 PG&E shall coordinate with property owners during final transmission line design and shall, to the extent feasible, align the transmission line, with the review and approval of the CPUC, so as to avoid existing residences, minimize potential land use conflicts, and maximize the distance between the line and agricultural operations, planned developments, canals, oil fields, dams, recreation areas, and airstrips located within, adjacent to, and near the ROW. PG&E shall document compliance with this measure by submitting a letter or report to the CPUC prior to the start of construction, documenting unavoidable landowner and land use conflicts, why avoidance is not possible, and proposed resolution.

Impact 7-3: Long-Term Conversion/Loss of Productive Agricultural Land

In intensively farmed areas, transmission towers and access roads may permanently displace agricultural production. An estimated 0.03-acre per tower would be lost and an additional 1.5 acres per mile of transmission line would be lost to access roads. The proposed corridor includes a small amount of prime farmland and intensively farmed land (see Table C.7-1; impacts on prime soils are addressed in Section C.5). Grazing land losses would not be significant due to the fact that there is very little permanent loss of natural vegetation.

The loss of productive farmland would result in financial impacts on farmers. The amount of land lost would depend on the type of crop and the irrigation method. The main irrigation factor to consider is the angle of the tower-to-furrow irrigated crops (usually row crops). Crop values have a wide variation from year to year. While the trend towards almond orchards within the study area has resulted in high yields and profitable crops, the price of almonds has fluctuated from $2 per pound to $0.80 per pound. Because of this wide fluctuation, it is not practical to attempt to quantify a definite value per acre for farmland that may be lost to the Proposed Project Corridor, as that value is likely to change by the time right-of-way (ROW) easement acquisitions are pursued. When ROW easement negotiations occur, average values will need to be calculated. In addition to almond orchards, several blocks of pistachios are located within the study area. Compared to almond trees, which take four to five years to reach full production, pistachio trees do not reach full production until 10 years of age.

Based on the limited occurrence of intensively farmed land, the potential impact from loss of productive agricultural land in the Western Corridor is limited to the southern segments (see segment discussion below). Impacts on the Eastern Corridor Alternative and several of the Western Corridor Alternative Segments may be significant. Mitigation Measure **L-12** is recommended in these areas, as defined in the segment discussions below. Note also that Mitigation Measure **B-6b** (Section C.3, Biological

C.7.3.5 Proposed 500 kV Transmission Corridor

This section provides a detailed discussion of specific land use and recreation impacts that would occur on each segment of the Proposed Project corridor. Both the type of impact and impact significance are identified, by segment.

The Proposed Project will have no impact on land ownership or jurisdiction. The Applicant will obtain necessary right-of-way (ROW) permits for the crossing of Federal lands. ROW easements on private lands will be acquired through negotiations with landowners. An easement would permit the owner to continue the use of the land for most activities (e.g., grazing or agricultural operations). However, due to safety considerations, buildings, structures, wells, or trees more than 15 feet in height would not be allowed within the ROW. Most potential land use conflicts (i.e., residential, agricultural operation areas, planned developments, canals, oil field areas, dams, recreation areas, and pipelines) can be avoided during alignment.

Agricultural impacts are focused in the intensively farmed areas primarily at the southern end of the proposed corridor. The potential impacts on agriculture vary by segment, depending on the amount of intensively farmed land, type of crops, and the location of the corridor through the fields. Since agricultural impacts would be limited to a small portion of the proposed corridor, Table C.7-7 was prepared to illustrate these impacts. See Figure C.7-1 (a through e) for specific locations of agricultural lands.

Table C.7-7 Agricultural Impacts on Proposed Project Corridor

Segment	Impact 7-3 Loss of Productive Land	Impact 7-4 Effects on Agricultural Equipment & Operations	Impact 7-5 Interference with Irrigation Practices	Impact 7-6 Effects on Aerial Applications
1	Negligible	Low - Insignificant	Low - Insignificant	None
2	None	None	None	None
3	None	None	None	None
4	Low-Insignificant	Low - Insignificant	Low - Insignificant	Low - Insignificant
5	Moderate – Significant, Mitigable*	Moderate- Significant, Mitigable*	Moderate – Significant Mitigable*	Moderate – Significant, Mitigable*
6	Moderate – Significant, Mitigable*	Moderate – Significant, Mitigable*	Moderate ~~– Insignificant~~ Significant, Mitigable	Moderate - High – Significant, Mitigable*
7	High - Significant, Mitigable*	Moderate - Insignificant	High – Significant, Mitigable*	High – Significant, Unavoidable

*See Section C.7.3.3 for full description of impact and applicable mitigation measures.

Segment 1

No intensively farmed land would be affected on this segment. Land use impacts along this segment are focused on the proposed 4,200-acre "new town" Villages of Laguna San Luis Community Specific Plan land area that surrounds the proposed transmission line corridor. The corridor is designated as open space in the proposed development plan (for purposes of kit fox habitat conservation) and therefore would not cross any future developed land uses. (See Section C.3 for a discussion of impacts on habitats.) The separation between the corridor and the nearest proposed developed land use (designated as very low density, two residential units per acre) would be about 2,000 feet. To ensure land use compatibility and minimization of conflicts (Impact 7-2, **Class II**), Mitigation Measure **L-17** (above) should be applied, as well as Mitigation Measure **L-18** (following).

L-18 Within the area proposed for the Specific Urban Development Plan (SUDP), *The Villages of Laguna San Luis Community Specific Plan*, and the area designated as kit fox corridor, PG&E ~~shall landscape the transmission line ROW and buffer area or otherwise~~ design the area for integration and compatibility with the planned development and with the existing kit fox habitat conservation corridor. Compliance will be determined by CPUC, in consultation with Merced County planning officials, CDFG, and USFW.

A second urban development project, the Agua Fria Village, may be proposed south of the Villages of Laguna San Luis, within Segments 1 and 2. Preliminary plans indicate that a portion of the development site (including land slated for urban uses as well as land planned for wildlife conservation) would be within the proposed transmission line corridor. However, the project would require a rezone and General Plan amendment from Merced County; no development application has been filed with the County.

Segment 2

As shown in Table C.7-7, agriculture would not be impacted along this segment. The corridor would cross public recreational lands in the Los Banos Creek Recreation area managed by the CDPR. No significant impacts will occur from the proposed corridor crossing this recreation resource, as all recreational activity takes place about three miles downstream where developed recreational facilities exist (e.g., campgrounds, day use areas, and boat launch). Short-term construction effects would be minor and not significant to the majority of recreation visitors. Long-term effects related to visual impacts on the recreational quality of the reservoir would not be significant because of the distance of the corridor from the main recreation area and the presence of two existing 500 kV transmission lines 0.5 mile to the east. See Section C.11, Visual Resources, for a detailed discussion of visual impacts.

Segment 3

No developed land uses would be affected along this segment. Some grazing land could be subject to short-term construction impacts, which would be less than significant (Impact 7-1, **Class III**).

Segment 4

This segment of the Western Corridor would cross the Little Panoche Reservoir Wildlife Area east of the dam, thus avoiding impacts on recreational areas around the reservoir. Short-term construction disturbances may conflict with fishing, hunting, and nature study. With implementation of mitigation measures of providing public access to recreation areas (Measure **L-7**), repairing damaged recreation access roads (Measure **L-11**), and avoiding peak use periods (Measure **L-6**), the impact would not be significant (**Class II**). The long-term presence of the transmission line would not impact recreation activities. Impacts on agriculture (Impacts 7-3, 7-4, 7-5, and 7-6) are not considered significant because of the limited amount of cultivated agriculture and grazing along this segment (**Class III**, see Table C.7-7).

Segment 5

Segment 5 of the Western Corridor crosses the entrance to BLM's Tumey Hills Recreation Area and other BLM parcels with dispersed recreational opportunities. The corridor passes through the eastern edge of the BLM lands where construction disturbances on recreational use would not be significant, unless access to the area was blocked during peak use periods (Impact 7-1, Mitigation Measures **L-6** and **L-7**). This impact would be less than significant (**Class II**) with implementation of these mitigation measures. Most hunting occurs several miles west of the corridor. The long-term presence of the transmission line would not interfere with recreational activities.

Since the Western Corridor crosses numerous agricultural lands (including orchards) in Segment 5, agricultural uses may be impacted (see Table C.7-3). Short-term construction impacts (Impact 7-1) and impacts related to loss of productive land, agricultural operations, irrigation practices, and aerial spraying would be significant, but mitigable (**Class II**) with implementation of Mitigation Measures **L-1 through L-10**.

The San Luis Water District Third Canal would be crossed in this segment, creating the potential for conflicts with canal maintenance activities. This impact (Impact 7-2, **Class II**) would be mitigable through working with the Water District on the project alignment (Mitigation Measure **L-11**).

One residence near MP 68 may be subject to short-term construction impacts, as well as long-term land use conflicts. However, the residence can be avoided through proper alignment within the project corridor. Mitigation Measures **L-11** and **L-7** (requiring construction notification) would reduce these impacts to less than significant levels (Impacts 7-1 and 7-2, **Class II**).

Segment 6

Because this segment passes through more developed areas, short-term construction disturbances (e.g., disruptions to farm operations, commercial areas, oil fields) and long-term land use conflicts may be significant (Impacts 7-1 and 7-2, **Class II**). Construction impacts can be mitigated through the application of Mitigation Measures **L-1 through L-11**. Conflicts with existing land uses would be mitigated through Mitigation Measure **L-11** (working with landowners to align the corridor to maximize the distance from existing development, including oil field structures). The presence of the transmission line near the Harris Ranch Airstrip will require review by the Fresno County Airport Land Use Commission.

Impacts on irrigated agriculture may be significant, depending on the exact alignment and tower placement within the study corridor (see Table C.7-3). Impacts 7-3 through 7-6 would be reduced with implementation of Mitigation Measures **L-12 through L-16**, and impacts would be less than significant (**Class II**). A portion of the proposed route is developed with irrigated orchards and row crops. Long-term damage to existing producing orchards, substantial disturbance to essential irrigation equipment and practices, and disruption of current aerial spraying practices would occur if the route cannot be re-aligned to avoid these cultivated areas. As a result, Impacts 7-3 through 7-6 may remain significant in some areas, if effective mitigation is not implemented.

Segment 7

Agricultural uses may be significantly impacted in this segment (see Table C.7-3; Impacts 7-3, 7-5, and 7-6). Mitigation Measures **L-12 through L-15**, if fully implemented, can effectively mitigate impacts related to loss of productive lands and interference with irrigation practices. However, Impact 7-6, effects on aerial applications, is considered significant and unavoidable (**Class I**) because the towers and lines would be located in agricultural areas and would be oriented in ways that would interfere with aerial spraying.

C.7.3.6 Proposed Substation Modifications

C.7.3.6.1 *Los Banos Substation*

Modifications within the PG&E Substation property will have minimal effects on surrounding land uses. A small amount of hay production area and/or grazing area (currently taking place on PG&E land leased to local farmers) may be converted to substation use (Impact 7-3, **Class III**). The nearest existing developed land uses are about 0.5 mile from the Los Banos Substation, and thus will not be substantially affected by construction noise, dust, and visual effects (Impact 7-1, **Class III**).

C.7.3.6.2 *Gates Substation*

Construction effects on nearby land uses will be negligible, as no developed land uses are in the immediate vicinity of the Gates Substation.

C.7.3.7 Proposed Changes South of Gates Substation

The proposed modifications south of the Gates Substation will result in minor and short-term construction effects such as noise, dust, and access restrictions on nearby land uses (Impact 7-1, **Class III**). Mitigation Measures **L-2**, **L-6**, **L-7**, and **L-10** would further reduce construction disturbances.

C.7.3.8 Policy Consistency Analysis

Pursuant to the significance criteria established in Section C.7.3.2, Proposed Project conflicts with land use policies adopted to avoid or mitigate environmental impacts would be considered significant impacts. The Proposed Project was reviewed to assess the potential for policy conflicts with Federal, State, and local land use regulations. Many land use policies require mitigation of impacts or protection of resources and habitats. In these cases, the project would be consistent with a particular policy if specific mitigation measures recommended elsewhere in this document were implemented.

C.7.3.8.1 *Federal Policies*

As stated in the regulatory setting, Section C.7.2, BLM land is managed through the Hollister Resource Management Plan. The Plan designates utility corridors to conform to the Western Utility Group Western Regional Corridor Maps. Since the I-5 corridor is shown as a utility corridor in the Plan, BLM considers the Proposed Project Corridor consistent with the Plan (Byrne, 2001).

C.7.3.8.2 *Local Policies*

General plans of the two counties crossed by the proposed and alternative project corridors were reviewed for policy consistency issues.

Merced County General Plan

Land use policies related to transmission lines are in the Circulation Element of the Merced County General Plan:

Table C.7-9 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Proposed Project and Alternatives						
Construction activities would disrupt existing land use activities	**L-1:** PG&E shall, to the extent feasible, use access roads that were constructed for the existing 500 kV transmission lines. (These roads, many of which are still used for maintenance, with necessary repair, could be used for access with only construction of spur roads that would be necessary to reach individual tower locations.) PG&E shall document compliance with this measure by submitting an access road plan (demonstrating use of existing roads or reasons why existing roads cannot be used) to the CPUC for review and approval at least 30 days before construction.	All Proposed and Alternative Segments	Construction plan; CPUC to monitor construction activities	Miles of new access roads minimized.	CPUC	Prior to construction
	L-2: Construction staging areas and pulling sites shall be located adjacent to roads where practical. PG&E shall coordinate with landowners to establish construction areas (such as conductor pulling and splicing areas and construction yards) on non-agricultural land or in areas with less sensitive crops, where feasible. PG&E shall document compliance with this measure by submitting to the CPUC, at least 30 days before construction begins, a plan showing construction staging and pulling areas, demonstrating use of non-agricultural land or reasons why agricultural land cannot be avoided.	Construction staging areas and pulling sites	Construction plan; CPUC to monitor construction activities	Agricultural lands and sensitive crops are avoided.	CPUC	Prior to and during construction
	L-3: All access roads not required for maintenance by PG&E after construction should be either permanently closed using the most effective and least environmentally damaging methods appropriate to the landowners, or be regraded (recontoured), restored, and revegetated with the concurrence of the relevant landowners. Any damaged recreation, farm, or residential access roads shall be repaired. PG&E shall document compliance with this measure by submitting to the CPUC a plan showing methods to restore and revegetate unnecessary access roads.	All Proposed and Alternative Segments	CPUC to monitor post-construction cleanup activities	Roads restored to natural conditions	CPUC	After construction
	L-4: PG&E shall locate new access roads parallel to landform contours where feasible, in order to minimize ground disturbance and/or reduce scarring. Placement of new access roads on permanent crop land (e.g., orchards) shall be avoided, where feasible. PG&E shall document compliance with this measure by submitting an access road plan (demonstrating conformance to landform contours and avoidance of permanent crop land) to the CPUC for review and approval.	All Proposed and Alternative Segments	Construction plan; CPUC to monitor construction activities	Ground disturbance and scarring from access road construction is minimized	CPUC	Prior to construction

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	L-5: In agricultural areas where sites would be graded, PG&E shall stockpile topsoil. After construction, topsoil shall be replaced and the site graded to the original contours. If appropriate, the site shall be reseeded in accordance with agency or landowner objectives. PG&E shall document compliance with this measure by submitting to CPUC a plan showing methods to stockpile topsoil and restore construction sites.	Agricultural areas disturbed by construction	Construction plan; CPUC to monitor construction activities	Agricultural soils are not degraded	CPUC	During and after construction
	L-6: PG&E shall time construction, whenever practical, to minimize disruption of normal seasonal activities for crop and rangeland and to avoid peak use periods at recreational areas. PG&E shall work with the appropriate County agent and farmers to agree to a construction schedule that would avoid the prime crop planting, growing, and harvesting seasons, to the extent possible. PG&E shall submit a construction schedule to the CPUC for review and approval. The schedule shall document how disruptions to agricultural operations will be avoided.	Agricultural and recreational areas	Construction plan; CPUC to review construction schedule	Crop harvesting and planting are not disrupted; recreational facilities are not impaired during peak use periods	CPUC	Prior to and during construction
	L-7: At least one month prior to constructing the project, PG&E shall give advance notice of such construction, construction activity schedules, access restrictions, and anticipated disturbances to property owners, residents, and tenants potentially affected by construction activities (within 1,000 feet of project ROW or access roads). The Applicant shall provide adequate access to existing land uses during all periods of construction and shall notify landowners of alternative access. PG&E shall avoid nighttime construction near noise-sensitive land uses (e.g., residences and campers at recreation areas). PG&E shall document compliance with this measure by submitting to CPUC a copy of the notice for review and approval prior to mailing said notice. PG&E shall provide evidence to CPUC that the notice was delivered to landowners and residents within 1,000 feet of the project ROW and access roads. PG&E shall submit to CPUC a plan showing how adequate access to existing land uses will be provided during construction.	All lands within 1,000 feet of ROW, substation, or access road	CPUC to review and approve copies of mailed notices, bulletins, and published notices	Timely and detailed notices, bulletins, and published notices.	CPUC	At least one month before construction

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	L-8: Immediately after removing sections of grazing fencing, PG&E shall construct a temporary barrier across the section of removed fencing so that grazing animals cannot move through the fencing. Immediately after completing construction in the area, PG&E shall repair the section of removed fencing. PG&E shall close all gates immediately after they are opened to allow construction vehicles and equipment access to a construction area. PG&E shall incorporate these requirements into the construction plan and demonstrate to the CPUC that all construction workers are informed of these provisions.	Grazing lands	Construction plan; CPUC to monitor in the field	No open sections of fencing are observed during inspections of construction areas	CPUC/BLM	During construction and immediately after construction
	L-9: PG&E shall include a stipulation in its easement agreements with landowners along the ROW that landowners shall be reimbursed for the value of the crops lost and the cost of any delay or interruption in necessary farming or grazing practices as a result of any interrupted use of cropland or grazing land.	Agricultural lands along Proposed and Alternative Segments	CPUC to designate responsible party to monitor Applicant compliance with easement stipulation.	Less than 20% of crop farmers complain about inadequate compensation for lost crops	CPUC	Prior to construction
	L-10: PG&E shall avoid, to the extent feasible, construction operations that disturb agricultural soil during the wet season (moist soil is generally more susceptible to compaction than dry soil). PG&E shall minimize the use of heavy equipment on agricultural land to avoid soil compaction. Where compaction occurs on agricultural land as a result of construction, the soil shall be ripped to restore adequate percolation of irrigation water through the soil strata. PG&E shall incorporate these requirements into the project construction plan and submit the plan to CPUC for review and approval.	Agricultural lands	Construction plan; CPUC to monitor in field	Soil compaction does not occur on agricultural lands	CPUC	During construction
Conflicts with existing and planned land uses	**L-11:** PG&E shall coordinate with property owners during final transmission line design and shall, to the extent feasible, align the transmission line, with the review and approval of the CPUC, so as to avoid existing residences, minimize land use conflicts, and maximize the distance between the line and agricultural operations, planned developments, canals, oil fields, dams, recreation areas, and airstrips located within, adjacent to, and near the ROW. PG&E shall document compliance with this measure by submitting a letter or report to the CPUC prior to the start of construction, documenting landowner and land use conflicts and proposed resolution.	Proposed and Alternative Segments	CPUC to review and approve final alignment and tower plans	Approved final plans that avoid displacing developed land uses	CPUC	Prior to construction

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	L-18: Within the area proposed for the Specific Urban Development Plan (SUDP), *The Villages of Laguna San Luis Community Specific Plan*, and the area designated as kit fox corridor, PG&E shall ~~landscape the transmission line ROW and buffer area or otherwise~~ design the area for integration and compatibility with the planned development and with the existing kit fox habitat conservation corridor. Compliance will be determined by CPUC, in consultation with Merced County planning officials, CDFG, and USFWS.	Proposed and Alternative Segments 1	Construction plan and restoration plans; CPUC to review and approve final alignment	Project is integrated with proposed development in safe and aesthetic manner	CPUC	Prior to construction and after construction
Loss of productive agricultural land	**L-12:** Tower placement shall be adjusted, with review and approval of the CPUC during final project design, to avoid orchards and vineyards, row crops, and furrow-irrigated crops (with tower-to-furrow angles greater than 61 percent), wherever possible. Also when possible, the corridor should avoid more heavily cultivated crops in preference for non-agricultural land or crops such as alfalfa, corn, and small grains. PG&E shall coordinate work with local landowners to place towers in areas that would cause the least impact (e.g., along the edges of fields or adjacent to mid-section farming roads).	Agricultural lands	Construction plan; CPUC to review and approve final alignment and tower plans	Approved final plans that avoid/minimize displacing intensive agriculture	CPUC	Prior to construction
Interference with agricultural equipment and operation	**L-13:** When locating towers in row crops is unavoidable, PG&E shall attempt to locate towers in fields with rows that would be parallel, rather than perpendicular, to the transmission line. Transmission lines shall not be placed in diagonal orientations across cultivated fields, to the extent feasible. At least 30 days prior to construction, PG&E shall submit to the CPUC, for review and approval, a tower location plan that indicates agricultural row orientation.	Row crops	Construction plan; CPUC to review and approve final alignment and tower plans	Approved final plans that avoid/minimize perpendicular alignments	CPUC	Prior to construction
Interference with irrigation practices	**L-14:** Where towers must be placed in agricultural fields, transmission lines and towers shall be placed toward the center of fields where feasible. PG&E shall avoid placing towers at the edge of fields where canals or irrigation ditches are located. PG&E shall document compliance with this measure by submitting to the CPUC, for review and approval, a tower location plan that indicates tower location relative to agricultural fields and irrigation systems.	Irrigated crop land	Construction plan; CPUC to review and approve final alignment and tower plans	Approved final plans that avoid/minimize irrigation facilities	CPUC	Prior to construction

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	L-15: PG&E shall avoid siting of towers in fields using mechanical move irrigation systems, and shall attempt to locate them in fields using flood or border check irrigation over those using furrow irrigation. PG&E shall document compliance with this measure by consulting with landowners to identify irrigation systems and by submitting to the CPUC, for review and approval, a tower location plan that indicates avoidance of areas of mechanical move and furrow irrigation systems.	Irrigated crop land	Construction plan; CPUC to review and approve final alignment and tower plans; monitor in field	Approved final plans that avoid/minimize mechanical move irrigation systems	CPUC	Prior to construction
Effects on aerial practices	**L-16:** When transmission towers are to be installed in or adjacent to agricultural fields, PG&E shall avoid installing them adjacent to existing transmission lines and shall avoid angular joining of corridor segments. PG&E shall document compliance with this measure by submitting to the CPUC, for review and approval, construction plans that show locations of all angle towers in agricultural areas.	Crop lands	Construction plan; CPUC to review and approve final alignment and tower plans	Approved final plans that avoid/minimize side by side lines and angular joints	CPUC	Prior to construction
Permanent preclusion of existing and permitted land uses	**L-17:** During the right-of-way acquisition process, PG&E shall coordinate with each affected property owner, in order to develop an alignment and specific tower locations, to provide clear information about the right-of-way acquisition process compensation, and construction and maintenance activities, and to understand landowner plans for use of the transmission corridor area in order to minimize the impact of tower and ROW location. PG&E shall document compliance with this measure by submitting to the CPUC written evidence of landowner consultation and a copy of the written information distributed to landowners.	All Proposed and Alternative Segments	Construction plan; CPUC to review and approve final alignment and tower plans	Approved final plans that avoid/minimize preclusion of land uses	CPUC	Prior to construction

C.7.7 REFERENCES

Bettner, Thad. 2001. Westlands Water District. Personal communication. June 15.

BLM. 1984. *Hollister Resource Management Plan*.

Byrne, Dan. 2001. Bureau of Land Management Realty Specialist, Hollister Office. Personal communication. June 19, July2, August 9.

CDPR. 2001. Personal communication – state park visitor figures.

Cook, William. 2001. California Department of Fish and Game. Written communication. June 12.

Cope, Butch. 2001. Deputy Director, Merced County Planning Department. Personal communication. June 15, June 21.

Coxey, David. 2001. General Manager, San Luis Water District. Personal communication. June 19, August 9.

Edwards, Doug. 2001. Deputy Agricultural Commissioner, Fresno County Department of Agriculture. Personal and written communication. June 18, June 20, July 2.

Epperson, Bob. 2001. Bureau of Reclamation, Realty Specialist. Personal communication. June 12.

Ford, Mike. 2001. California Department of Water Resources. Personal communication. June 18.

Hardcastle. 2001. California Department of Parks and Recreation, Superintendent, 4 Rivers District. Personal communication. July 2.

Kroll and Priestley. 1992. (Property values study)

Laumer, David. 2001. Fresno County Planning and Resource Management Department. Personal communication. June 12.

Marti, Duane. 2001. Bureau of Land Management Realty Specialist, Sacramento Office. Personal communication. July 2.

PG&E (Pacific Gas & Electric Company). 1986. Los Banos-Gates 500 kV Transmission Project Environmental Report and Technical Appendices. September.

Phillips, Jason. 2001. Bureau of Reclamation. Personal communication. June 19.

TANC/WAPA (Transmission Agency of Northern California and Western Area Power Administration). 1986. Draft Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. November.

____. 1988. Final Environmental Impact Statement/Environmental Impact Report for the California-Oregon Transmission Project and the Los Banos-Gates Transmission Project. January.

Ulik, Mary Ann, Planning Director, City of Coalinga. 2001. Personal communication. July 2.

C.8 Socioeconomics and Public Services

Remove Page(s):	**Replace With:**
C.8-9 to C.8-12	**New** C.8-9 to **New** C.8-12

would be considered significant. For schools with no reserve capacity, any project-related enrollment increase will represent an unavoidable significant (Class I) impact.

- **Impact 8-8: Water.** A significant impact would occur if the project or project-related growth would generate a demand that exceeds the ability of water utilities to supply the needed water.
- **Impact 8-9: Wastewater.** A significant impact would occur if the project or project-related population growth would result in wastewater flows that exceed the capacity of the collection and treatment facilities.
- **Impact 8-10: Solid Waste.** A significant impact on landfill capacity would occur if the project or project-related population growth would generate solid waste in excess of landfill capacity.
- **Impact 8-11: Pipelines and Existing Infrastructure.** A significant impact on infrastructure improvements would occur if the project or alternatives reduced the service life of an existing pipeline or other infrastructure.
- Potential impacts on roads are addressed in Section C.10, Transportation and Traffic.

C.8.3.5 Environmental Impacts and Mitigation Measures: Proposed Project and Alternatives

This section discusses general socioeconomic and public services impacts or concerns that are not site-specific, but rather, would apply regardless of the route selected. The impacts of construction or operation and maintenance do not have different impacts based on particular corridors, so impacts of the Proposed Project and Alternative Corridors are covered in one section.

C.8.3.5.1 *Construction Impacts*

Socioeconomics

Construction of the Proposed Project or Alternatives would not have an adverse impact on employment, create a significant impact to permanent or temporary housing, or disrupt any businesses along the corridor.

Impact 8-1: Temporary Employment

According to the 1986 Draft EIS/EIR, a total of 280 construction workers would be working in the project area at any one time, and they would be dispersed among several locations. A maximum of 80 workers would be working on substation improvements and a maximum of 200 workers would be working on transmission line construction at stations along the corridor (see Figure B-8). ~~Half of the work force would be expected to commute daily and the remainder would remain in the area Monday through Friday. Some of the daily commuters would likely be residents of the local impact area cities (TANC/WAPA, 1986). As discussed in Section B.3.4, construction crews are expected to come from within PG&E with an emphasis on use of workers from the local San Joaquin Valley Area.~~ None of the construction crews are expected to come from within PG&E. PG&E states that it expects to use out-of-state contractors for the construction of the new 500 kV line, substation modifications, and the 230 kV reconductoring work. Since PG&E would be contracting much of the labor force from out of state, a large portion of the labor force will remain in the project area for the duration of construction. ~~It is likely that 50 percent of the workers would come from outside the local area but would not be expected to permanently relocate their families.~~ Transmission line construction would require the highest number of employees at one time, but because the transmission line construction period is only about 14 months long, that workforce would peak and decline rapidly (TANC/WAPA, 1986). The construction period for the Proposed Project is considered short term, therefore; no members of the labor force would be expected to permanently relocate their families. Some unskilled laborers may be hired from the local area; ~~Given the relatively high unemployment rates in all three counties and the large local labor force in the construction industry,~~ such potential use of the local labor force would be considered a beneficial impact. ~~there would be no adverse impacts to employment~~.

Impacts 8-2 and 8-3: Temporary and Permanent Housing

Even if the maximum number of construction crew members, a total of 280 people, were from outside the local project area and required temporary housing, the project would not have a significant impact on temporary housing. There are approximately 22 hotels and motels in the Cities of Los Banos, Coalinga, and Huron, and this estimate does not include lodging facilities in unincorporated areas of the county, specifically along Interstate 5 (CACC, 2001; City of Huron, 2001; Los Banos Chamber of Commerce, 2001). The impacts on hotels and other visitor-related services would represent a minor beneficial impact **(Class IV)**. In addition, other major cities in the counties, such as Fresno and Merced, are within commuting distance to the project area.

Impact 8-4: Business in the Project Area

Most materials for the project, such as steel, wire, and substation components, would be purchased from vendors outside the project corridor. A limited number of local firms would benefit from selling consumable materials to the firms and crews working on the projects, and motels and restaurants would benefit from temporary increases in demand. This would be a minor beneficial impact **(Class IV)**.

Construction of the transmission line could result in minor disruption of grazing, crop activity, and oil production along the Proposed Project and Alternative Corridors, but would result in a less than significant impact on employment or business activity with implementation of Land Use Mitigation Measures **L-6 through L-9 (Class II)**. Construction of the transmission line could also result in minor disruption to oil production activities along Western Corridor Alternative Segment 6B. Implementation of Hydrology Mitigation Measure **H-9** would require avoidance of active oil production facilities, resulting in a less than significant impact **(Class II)**.

Construction of the transmission towers would result in the permanent loss of productive farmland. This impact is addressed in Land Use (Section C.7) and in Geology, Soils, and Minerals (Section C.5).

Impact 8-5: Institutional Activity

No residential, commercial, industrial, or institutional structures will be displaced as a result of the Proposed Project or Alternatives.

Public Services

The demand for public services, such as fire and police protection, schools, hospitals, and maintenance of public facilities, will not increase during construction of the project. PG&E will work directly with the County's Public Works Departments regarding construction schedules and work along roadways.

Impact 8-6: Public Protection

Construction of overhead transmission lines could generate risk of fire, particularly bird strikes or downed wires. In addition, operation of heavy equipment, particularly in the areas where dry grass is common, could be a possible source of fire resulting from the Proposed Project or Alternatives. Many

segments of the project are considered SRAs, which require CDF to provide fire protection to these areas. Those segments not within an SRA fall under county jurisdiction. There are fewer areas that would require county fire protection, and with available firemen in each county, there would be no impact to local fire protection.

Many parts of the project would be difficult to access by fire personnel and would make it necessary for the crews on site to have equipment and procedures in place to minimize the risk of fire and to quickly eliminate any small fires that might be started. This is considered a significant impact but could be mitigated to be less significant with implementation of Mitigation Measure **S-1 (Class II)**.

Electrical arcing from power lines can represent a fire hazard. This phenomenon is more prevalent for lower voltage distribution lines since these lines are typically on shorter structures and in much greater proximity to trees and vegetation. Fire hazards from high voltage transmission lines are greatly reduced through the use of taller structures and wider right-of-ways. Further, transmission line right-of-ways are cleared of trees to control this hazard. Fire hazards due to a fallen conductor from an overhead line are minimal due to system protection features. Overhead high voltage transmission lines include system protection designed to safeguard the public and line equipment. These protection systems consist of transmission line relays and circuit breakers that are designed to rapidly detect faults and cut-off power flow to avoid shock and fire hazards. This equipment is typically set to operate in 2 to 3 cycles, representing a time interval range from 2/60 of a second to 3/60 of a second. The operational fire risks are considered less than significant on public services **(Class III)**.

It should be noted that there is a greater chance of smoke from a fire taking a transmission line out of service by "flashover," than the chance of a downed conductor starting a fire. A "flashover" occurs when the air between the conductors or between a conductor and a tower is contaminated with something like smoke from a grass fire. The smoke acts as a conductor for electrons to flow through the contaminated air from one conductor to another, or from a conductor to a tower. Once this occurs, the line protection systems sense the abnormality and power flow is cut-off.

The Proposed Project or Alternatives would not generate any direct impacts on police protection.

Mitigation Measure for Impact 8-6, Public Protection

S-1 PG&E shall submit a Fire Prevention and Suppression Plan (FPSP). The FPSP shall incorporate measures for prevention and suppression of fire on the ROW and on lands used or traversed by PG&E in connection with the project. The FPSP shall include a list of equipment required by all crews for extinguishing small fires that may be started during construction. PG&E shall provide training to project personnel regarding proper procedures on how to minimize the risk of fire and how to eliminate an existing fire. The FPSP shall be prepared in consultation with all appropriate counties, BOR, and BLM. PG&E shall consult with the California Department of Forestry and Fire for all land in the project area designated as State Responsibility Areas (SRAs). The FPSP will be submitted to the CPUC for review and approval prior to construction. Adherence to the Plan during construction will be monitored by a CPUC-approved construction monitor.

Impact 8-7: Schools

Since it is unlikely that construction of the Proposed Project or an Alternative would cause employees to relocate their families to the project area and increase the population, the project would not increase enrollment at any local schools or result in the need to hire additional teachers or staff. There is no impact to schools in the project area.

Impacts 8-8 through 8-11: Water, Wastewater, Solid Waste, and Pipelines

Construction of a 500 kV transmission line and substation upgrade would not have a significant adverse impact on any local utilities in the project area. Along the proposed corridor, project construction could inadvertently contact underground facilities during construction of underground elements or the setting of new transmission poles, potentially leading to short-term service interruptions. A temporary impact to these services could occur, but this impact is less than significant due to its short-term nature **(Class III)**.

Water use during construction would be minimal and would be limited to dust control or other incidental uses. For the majority of the ROW, water would be need to be trucked to the point of use. PG&E has not stated the quantity of water needed for this project nor have they indicated a source, therefore the impact to the water supply can not be addressed at this time.

Project construction would result in an insignificant temporary increase in the total amount of waste generated in the region. Waste that is generated during construction will be disposed of in an environmentally responsible manner in one of the City or County landfills (see "Public Services" in Section C.8.1.2) and impacts would be less than significant.

C.8.3.5.2 *Operation and Maintenance Impacts*

No significant impacts to socioeconomics or public services would result during operation of the project. PG&E maintains transmission lines and substations on a regular basis, so there is no need for local government involvement in maintenance activities. Maintenance crews of fewer than 10 persons would use tools, trucks, assist trucks, aerial lift trucks, cranes, and other equipment necessary for repairing and maintaining insulators, conductors, structures, and access roads. PG&E maintenance crews would most likely be current employees that work on the existing transmission lines in the project area.

Operation of the project would not increase the demand for public water supply, nor would it jeopardize the water quality of the public water supply system. The only post-construction demand for water would be for intermittent domestic use by PG&E personnel.

C.8.4 MITIGATION MONITORING, COMPLIANCE, AND REPORTING TABLE

Table C.8-6 presents the mitigation monitoring program for socioeconomics and public services.

C.9 Public Safety, Health, and Nuisance

Remove Page(s):	**Replace With:**
C.9-23 to C.9-24	**New** C.9-23 to **New** C.9-24

On-site Noise Sources. On-site construction noise would occur primarily from heavy-duty construction equipment (e.g., dozers, backhoes, pile driver). Table C.9-10 presents a list of typical equipment that would be used to construct the transmission line and substations, as well as the noise intensity level at 50 feet from the noise source. Noise levels from these individual pieces of construction equipment range from 70 dBA to 98 dBA at a distance of approximately 50 feet (see Table C.9-10). It should be noted that noise levels are calculated based on the assumption that noise from a localized source is reduced by approximately 6 dBA with each doubling of distance from the source of noise.

In addition to the construction equipment listed in Table C.8-10, helicopters may be used in some areas to transport construction materials and to string the conductors. Short-term helicopter noise can range from 92 to 95 dBA at 150 feet from the helicopter (PG&E, 1999).

Two types of noise are associated with on-site construction activities: intermittent and continuous. The projected maximum intermittent noise level associated with the construction of transmission line structures would range from approximately 82 to 92 dBA at 50 feet and 76 to 86 dBA at 100 feet. Intermittent construction noise could be annoying to sensitive receptors within 1,000 feet of the construction activity. It is estimated that continuous noise levels from the transmission line construction activities at 50 feet would range from 70 to 77 dBA. At 100 feet, noise levels would be approximately 63 to 71 dBA.

Most of the Proposed Western Corridor is remote with a limited number of noise receptors in the area. However, several residences are adjacent to the Proposed Western Corridor and Alternative Segments. Construction noise levels near these receptors could adversely affect residents. It is anticipated that on-site construction noise would be short-term, lasting no longer than a few days at any one given location. Short-term on-site construction noise levels are expected to generate adverse, but less than significant impacts (**Class III**). Although no significant impacts have been identified, Mitigation Measure **L-7** (Section C.7, Land Use and Recreation) would further reduce the impacts by proving advanced notice to property owners, residents, and tenants with 1,000 feet of the proposed construction areas. This measure also requires PG&E to avoid nighttime construction near sensitive land uses (e.g., residences and campers at residential areas).

Off-site Noise Sources. Off-site noise during construction would occur primarily from commuting workers and from various truck trips to and from the construction sites. As described in Section B.3.5 (Proposed Project Construction), the construction workforce for the project would average approximately 110 workers over an estimated 27-month period. It is anticipated that most workers would be meeting at one of the staging areas (at the existing substations) and would travel to the construction site in commuter vans or buses. It is also assumed that truck trips would be required to haul structures, conductor line, and other materials to the construction sites. The peak noise levels (approximately 70 to 75 dBA at 50 feet) associated with passing trucks and commuting worker vehicles would be short-term in duration and would generate adverse, but less than significant impacts (**Class III**). Off-site noise impacts would be essentially the same for the Proposed Western Corridor and Alternative Segments and for the Eastern Corridor Alternative.

Impact 9-8: Operational Noise

Other than corona noise (see Impact 9-2), noise sources associated with operations of the proposed transmission line would be inspection and maintenance of the transmission line, instrumentation and control, and support systems. PG&E would inspect all of the structures from the surface annually for corrosion, misalignment, and excavations. Ground inspection would occur on selected lines to check the condition of hardware, insulators, and conductors. Noise generated by periodic maintenance and inspection activities occurring at various times are considered to be adverse, but less than significant short-term impacts **(Class III)**. Operation and maintenance impacts would be essentially the same from alternative to alternative, so they will not be discussed further under the Western Corridor Alternative Segments.

C.9.2.4 Proposed 500 kV Transmission Line Corridor (Western Corridor)

Impacts 9-1 through 9-5 are general impacts and mitigation measures discussed in Section C.9.2.3. These impacts apply to all areas of the Proposed Project.

Impacts to aerial applicators (Impact 9-6) would be a significant and unmitigable impact (**Class I**) in Segments 5, 6, and 7 due to the presence of agricultural land. As listed in Table C.9-4, Segments 5, 6, and 7 have 9.5%, 31.4%, and 85.8% of land, respectively, that has been identified to be cultivated for agricultural purposes. While implementation of Mitigation Measures **PS-4**, **L-13**, **L-14**, and **L-16** would reduce the safety risk to pilots, the impacts would remain significant. There would be no safety impacts related to aerial applicators in Segments 1, 2, 3, and 4.

Two residences are located within the proposed corridor at Milepost (MP) 68 and MP 80 and a mobile home residence is located at MP 68 (PG&E, 1986). These receptors could experience adverse, but less than significant construction noise impacts (Impact 9-7, **Class III**) as identified above. Although significant impacts have not been identified, implementation of Mitigation Measure **L-4** would further reduce the noise impact.

C.9.2.5 Proposed Substation Modifications

The proposed modifications to the Los Banos and Gates Substations would be within the existing substation footprints. Therefore, there would be no impacts to public health, safety or nuisance.

With regard to operational noise at the Gates and Los Banos Substations, the existing transformers that could operate at higher energy levels after project completion, and the additional equipment that would be needed to be installed ~~at the existing Gates and Los Banos Substations that~~ could generate noise levels above existing conditions. However, there are no sensitive noise receptors in the immediate vicinity of either of the substations. Therefore, operational noise levels at the Gates and Los Banos Substations would result in less than significant impacts (**Class III**).

C.10 Transportation and Traffic

Remove Page(s):	**Replace With:**
C.10-3 to C.10-4	**New** C.10-3 to **New** C.10-4
C.10-7 to C.10-10	**New** C.10-7 to **New** C.10-10

In addition to the roads described above, there is a network of public and private undeveloped roads in the study area that would be used during construction and operation of the project. The most noteworthy of these would be PG&E's existing transmission line right-of-way (ROW) access roads and new access roads constructed for this project. These private dirt roads would be used to access much of the general project area. For direct access to the tower locations, short access roads varying in length from approximately one-quarter mile to a mile would be constructed. These project access roads would be closed to the general public.

Existing Rail Facilities

There are no existing railroads that cross, run parallel to, or are within the vicinity of the proposed or alternative transmission line corridors, or adjacent to any of the existing substation locations. The only major rail line in the project vicinity is the Union Pacific Railroad line that runs through Los Banos, approximately 6 miles northwest of the Eastern Corridor Alternative.

Airport Facilities

Los Banos and Coalinga airports are the closest municipal airport facilities to the Proposed Project, approximately eight miles east of the Los Banos Substation and Segment 1, and approximately six miles west of Segment 6, respectively. There are numerous landing strips in the project area, the closest of which is ~~at~~ the Harris Ranch ~~complex~~ Public Use Airport approximately 1.5 miles east of Segments 6 and 6A of the Western Corridor and approximately 1.5 miles south of the Eastern Corridor Alternative, respectively.

Bus Transit

Local bus services are provided in Los Banos and Coalinga. Merced County Transit operates two local bus routes (Routes 14 and 15) in Los Banos (Merced Co., 2001). These routes do not provide service in the immediate project area. The Coalinga Transit System provides daily service to Fresno and other locations, as well as local service (Coalinga, 2001a). At least one bus route provides service to other cities using SR-33 out of town to SR-198, where it crosses Segments 6, 6A, and 6B of the Western Corridor. The bus route continues along SR-198 across I-5 and crosses Segment 6 of the Eastern Corridor Alternative (Coalinga, 2001b).

C.10.2 APPLICABLE REGULATIONS, PLANS, AND STANDARDS

Construction of the Los Banos-Gates 500 kV Transmission Project could potentially affect roadway traffic flow on public streets, highways, and the I-5, as the transmission line is built across each of the subject roadways. Therefore, it would be necessary for the Applicant to obtain encroachment permits or similar legal agreements from the public agencies responsible for each affected roadway. Such permits are needed for roads that would be crossed by the transmission line, as well as for the parallel roads where transmission line construction activities would require the use of the public ROW (e.g., temporary lane closures). These encroachment permits would be issued by Caltrans District 6 (Fresno), Merced County, and Fresno County.

Transportation management plans would be required by Caltrans for each location where a state roadway would be directly affected by transmission line construction activities, and such plans would be subject to approval by the responsible jurisdictions. These transportation management plans would be required to incorporate the standards and techniques presented in such references as the Caltrans Traffic Manual, Chapter 5, "Manual of Traffic Controls for Construction and Maintenance Work Zones," the Work Area Traffic Control Handbook, the Standard Specifications for Public Works Construction, and/or the Manual on Uniform Traffic Control Devices (MUTCD), Part VI, "Traffic Controls for Street and Highway Construction, Maintenance, Utility and Emergency Operations," (U.S. Department of Transportation, Federal Highway Administration). The transportation plans would include traffic control measures and other procedures that may be necessary during the construction phase.

As described in Section C.10.3.5, if necessary, the project shall comply with all appropriate regulations of the Federal Aviation Administration (FAA), and a Notice of Proposed Construction or Alteration (Form 7460-1) would be required of the Applicant pursuant to Federal Aviation Regulations, Part 77. In addition, any development within the vicinity of the Harris Ranch Airport is subject to the standards established by the Fresno County Airport Land Use Commission's Harris Ranch Airport Land Use Compatibility Plan. Portions of the Proposed Project and Alternative Corridors cross the Plan's "secondary review area," which is a geographic boundary established around the airport to ensure air space protection. Projects proposed in the secondary review area, where structure height exceeds the height limit of the permitted zone, are referred to the Fresno County Airport Land Use Commission for review and consistency with the Harris Ranch Airport Land Use Compatibility Plan.

C.10.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE PROPOSED PROJECT

C.10.3.1 Introduction

A transmission line is inherently more likely to affect transportation facilities (roadways) during construction than during operation, because there is typical only a minimal amount of surface activity required to operate a transmission line after construction is completed. Consequently, the bulk of this transportation analysis is devoted to the potential impacts during the construction phase. The following sections present the construction discussion, which is followed by a description of the mitigation measures that could be used to alleviate the adverse impacts. The phrase "affected public agencies" used throughout the discussion refers to the state and local agencies responsible for the roadways that would be impacted by the project (i.e., Caltrans, Merced County, and Fresno County).

C.10.3.2 Definition and Use of Significance Criteria

The transportation and traffic impacts of the Proposed Project or Alternatives would be considered significant if one or more of the following conditions were to occur as a result of transmission line or substation modification construction or operation. These criteria are based on a review of the environmental documentation for other utility projects in California, as well as on input from staff at

Mitigation Measure for Impact 10-3, Disruption of Bus Transit Services

T-3 PG&E shall consult with Coalinga Transit at least one month prior to construction to develop methods to reduce potential interruptions to bus transit service in the project area. Documentation of this consultation shall be provided to the CPUC prior to the start of construction.

Impact 10-4: Adverse Effects of Aviation Activities

According to the guidelines of the FAA, construction of the Proposed Project could potentially have a significant impact on aviation activities if a structure, crane, or wire were to be positioned such that it would be more than 200 feet above the ground or if an object would penetrate the imaginary surface extending outward and upward from a public or military airport runway or a helipad. It is anticipated that the maximum height of a crane would be approximately 165 feet, and the height of the tallest transmission tower would be about 160 feet. These project components would not extend into navigable airspace unless they were within the restricted area of a designated airport or helipad.

No portion of the Proposed Project comes within one mile of a public or military airport runway. The closest public airport is located at the Harris Ranch complex northeast of Coalinga, approximately 1.5 miles east of Segment 6. Although it is anticipated that there would be no general aviation impact with the construction of the Proposed Project, the presence of the transmission line near the Harris Ranch ~~Airstrip~~ Public Use Airport would require review by the Fresno County Airport Land Use Commission. In reviewing the proposed project, the Fresno County Airport Land Use Commission would require that PG&E rely on the California Department of Transportation Division of Aeronautics Handbook for technical assistance on safety considerations. Issues that the Fresno County Airport Land Use Commission would be concerned about with regard to the proposed project are associated with airspace protection to eliminate the potential for the project to present a hazard to air operations. Airspace protection considerations include height of structures in airport zones, glare from structures or from site lighting, sources of smoke and the potential for electronic interference from the project, and the potential of the project to attract birds.

Since the airspace around private landing strips is not subject to the FAA restrictions, private landing strips and heliports were not identified or analyzed. Although the wires and structures may create a safety hazard for crop sprayers and other private aircraft, the impacts would not be significant according to the FAA guidelines. Refer to Section C.9 (Public Safety, Health, and Nuisance) for safety hazard impacts associated with aerial spraying of agricultural fields.

Impact 10-5: Physical Damage to Roads

PG&E does not expect to cause any physical damage to public roads. However, there is the potential for damage that can be mitigated to less than significant levels with implementation of Mitigation Measure **T-4** below (**Class II**).

Mitigation Measure for Impact 10-5, Physical Damage to Roads

T-4 If damage to roads occurs, PG&E will coordinate repairs with the affected public agencies to ensure that any impacts to area roads are adequately repaired. Roads disturbed by construction vehicles shall be properly restored to ensure long-term protection of road surfaces.

C.10.3.6 Proposed Changes South of Gates Substation

PG&E has indicated that one option for changes south of Gates Substation would require that the entire 70 miles of existing double circuit 230 kV line serving Gates-Arco-Midway be reconductored. However, according to PG&E, it is unlikely that this reconductoring would require structural

enhancements to the existing towers or installation of new towers. Therefore, potential impacts associated with transportation and traffic would be limited to potential short-term road closures during transmission line stringing, Impact 10-2. The existing line crosses SR-41, SR-46, I-5, and numerous Fresno, Kings, and Kern County roads. Potential impacts to Caltrans, Fresno County, Kings County, and Kern County roads would be mitigated to less than significant levels (**Class II**) through implementation of Mitigation Measures **T-1** and **T-2** as described in Section C.10.3.

C.10.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR WESTERN CORRIDOR ALTERNATIVE SEGMENTS

Potential impacts and mitigation measures associated with the Western Corridor Alternative Segments would be similar to those described above in Section C.10.3 for the Proposed Project. Potential impacts associated with increased traffic levels during the construction phase of the Western Corridor Alternative Segments are anticipated to be the same as the equivalent segment of the Proposed Western Corridor. Therefore, impacts are anticipated to be less than significant (**Class III**) and mitigation measures are not recommended.

Both Alternative Segments 6A and 6B cross SR-198. In addition, similar to the Proposed Project, numerous county roads would be crossed along all four (2A, 4A, 6A, and 6B) of the Western Corridor Alternative Segments. Construction of the transmission line over these roads would require lane closures during conductor stringing (Impact 10-2, described above). Potential impacts to Caltrans, Merced County, and Fresno County roads would be mitigated to less than significant levels (**Class II**) through implementation of Mitigation Measures **T-1** and **T-2**, as described in Section C.10.3.

Construction of either Alternative Segments 6A or 6B over SR-198 could also result in disruption of bus transit services (Impact 10-3, described above). Brief closures along SR-198 associated with stringing the transmission line over the highway could affect the service of Coalinga Transit. However, temporary disruption associated with this impact could be mitigated to a level that is less than significant with implementation of Mitigation Measure **T-3**, as described in Section C.10.3 (**Class II**).

The presence of the Alternative Segment 6A transmission line near the Harris Ranch ~~Airstrip~~ Public Use Airport will require review by the Fresno County Airport Land Use Commission (Impact 10-4, described above).

In addition, although PG&E does not expect to cause any physical damage to public roads, there is the potential for damage to roads, Impact 10-5, along Alternative Segments 6A and 6B. However, these impacts could be mitigated to less than significant levels with implementation of Mitigation Measure **T-4**, as described in Section C.10.3 (**Class II**).

C.10.5 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR THE EASTERN CORRIDOR ALTERNATIVE

Potential impacts and mitigation measures associated with the Eastern Corridor Alternative would be similar to those described above in Section C.10.3 for the Proposed Project. Potential impacts

associated with increased traffic levels during the construction phase of the Eastern Corridor Alternative are anticipated to be the same as the Proposed Western Corridor. Therefore, impacts are anticipated to be less than significant (**Class III**) and mitigation measures are not recommended.

The Eastern Corridor Alternative crosses SR-198, SR-155, SR-33, and I-5. In addition, similar to the Proposed Project, numerous county roads would be crossed along the Eastern Corridor Alternative. Construction of the transmission line over these roads would create Impact 10-2, Lane Closure along 500 kV Transmission Corridor. Potential impacts to Caltrans, Merced County, and Fresno County roads would be mitigated to less than significant levels (**Class II**) through implementation of Mitigation Measures **T-1** and **T-2**, as described in Section C.10.3.

Construction of the Eastern Corridor Alternative over SR-198 could also cause disruption of bus transit services, Impact 10-3. Brief closures along SR-198 associated with stringing the transmission line over the highway could affect the service of Coalinga Transit. However, temporary disruption associated with this impact could be mitigated to a level that is less than significant with implementation of Mitigation Measure **T-3**, as described in Section C.10.3 (**Class II**).

The presence of the Eastern Corridor Alternative transmission line near the Harris Ranch ~~Airstrip~~ Public Use Airport will require review by the Fresno County Airport Land Use Commission (Impact 10-4, described above).

In addition, although PG&E does not expect to cause any physical damage to public roads, there is the potential for damage to roads, Impact 10-5, along the Eastern Corridor Alternative. However, these impacts could be mitigated to less than significant levels with implementation of Mitigation Measure **T-4**, as described in Section C.10.3 (**Class II**).

C.10.6 MITIGATION MONITORING, COMPLIANCE, AND REPORTING TABLE

Table C.10-2 presents the mitigation monitoring program for traffic and transportation.

Table C.10-2 Mitigation Monitoring Program

Impact	Mitigation Measure	Location	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Proposed Project and Alternatives						
10-2: Lane closures along 500 kV transmission line corridors	**T-1:** PG&E shall place temporary poles and netting across all portions of I-5 and State Routes that would be crossed by the transmission line to ensure that conductors will not fall onto the roadway during the conductor stringing operations. Because the California Highway Patrol (CHP) would be responsible for closing lanes on all State controlled roadways, the CHP must concur with date and time of PG&E's proposed encroachment prior to the issuance of a Caltrans Encroachment Permit. In addition, PG&E would be required to provide 7 to 10 days notice of the planned encroachment to the applicable Transportation Management Center (a joint Caltrans and CHP agency).	Approx. MP 68, 71, and 81 of the PP; AMP 71 for both Alt. Segs. 6A and 6B; and 17, 67, and 77 for the Eastern Corridor Alternative	CPUC to review project plans to verify pole locations.	Caltrans activities will not be affected by project	CPUC, Caltrans.	Prior to construction.
	T-2: Prior to the start of construction, PG&E shall submit traffic control plans to Caltrans District 6 and the counties of Merced and Fresno as part of the required traffic encroachment permits. Documentation of the approval of these plans and issuance of encroachment permits shall be provided to the CPUC prior to the start of construction.	All public roadways that would be crossed proposed or any of the alternative routes	CPUC to review documentation of: PG&E coordination with affected public agencies; and PG&E conformation to all required conditions.	If traffic flows are generally maintained without severe congestion.	CPUC, Public Works Department of Merced and Fresno Counties.	Prior to and during construction.
10-3: Disruption of bus transit services	**T-3:** PG&E shall consult with Coalinga Transit at least one month prior to construction to develop methods to reduce potential interruptions to bus transit service in the project area. Documentation of this consultation shall be provided to the CPUC prior to the start of construction.	Along SR 198 at Segments 6, 6a, and 6b at approximately MP and AMP 71 and at AMP 77 of the Eastern Alternative	CPUC to review documentation of consultation between PG&E and Coalinga Transit.	If bus transit service in the project area is uninterrupted.	CPUC, Coalinga Transit	Prior to construction.
10-5: Physical damage to roads	**T-4:** If damage to roads occurs, PG&E will coordinate repairs with the affected public agencies to ensure that any impacts to area roads are adequately repaired. Roads disturbed by construction vehicles shall be properly restored to ensure long-term protection of road surfaces.	All public roadways that could be damaged by the construction vehicles.	CPUC to verify that each affected roadway has been satisfactorily restored and/or constructed within 30 days of roadway damage	Restoration/ maintenance of roads to pre-construction conditions as determined by the affected public agency	CPUC, Public Works Department of Merced and Fresno Counties.	During construction and prior to operations.

Notes: PP = Proposed Project; Alt. Segs. = Western Corridor Alternative Segments.

Appendix 4. Air Quality Emission Inventory Data

(Replace the entire Appendix 4 with the pages that follow this cover sheet)

NEW Table 1: Emissions Associated with Commuting Construction Workers

Los Banos-Gates 500 kV Transmission Project

Vehicle Type	Vehicle Trips per Day	Days per Year	Round trip Miles	ROC		NOx		SOx		CO		PM10	
				Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	55.0	261.0	30	2.77	2627.53	1.82	1726.39	0.05	47.43	18.43	17482.11	0.11	104.34
Workers Commuting (LDGT)	55.0	261.0	30	3.84	13.96	2.42	2295.54	0.05	47.43	27.83	26398.66	0.11	104.34
Total Emissions (lbs/year)					2641.49		4021.93		94.86		43880.77		208.69
Total Emissions (tons/year)					1.32		2.01		0.05		21.94		0.10

Notes: Emission factors for ROC, NOx, and CO obtained from Appendix J of AP-42 (USEPA, 1998)

Emission factors for ROC, NOx, and CO assumes 35 mph at 75 F; year 2000

Emission factors for PM10 and SOx obtained from Appendix 9 of CEQA Handbook (SCAQMD, 1993)

Workers cummuting are divided into half Light Duty Gasoline Vehicles (LDGV) and half Light Duty Gasoline Trucks (LDGT). It is assumed that a total of 110 workers would commute to the work site each day. Workers would commute to the job sites 5 days a week for a total of 261 days a year.

NEW Table 2: Mobile Source Emission Estimates With Access, Clearing, and Cleanup Construction

Parameter		Units	Grader	Dozer	Backhoe	Parameter	Units	Water Truck	Haul Truck	
Number of Equipment Units			2	2	2	Miles per trip		100	5	
Operational Hours		hr/day	10	10	10	Trips per day		2	16	
Days per Year		day/year	43	43	43	days per year		43	43	
Average Rated Horse Power		hp	156.6	356	79	Conversion Factor	(lb/g)	0.002205	0.002205	
Typical Load Factor		%	57.50%	59.00%	46.50%					
Emission Factor		lb/hp-hr				Emission Factor	(g/mile)			
	CO		0.008	0.01	0.015	CO		6.42	6.42	
	ROCs		0.003	0.002	0.003	ROCs		1.34	1.34	
	NOx		0.021	0.021	0.022	NOx		9.27	9.27	
	SOx		0.002	0.002	0.002	SOx		0.30	0.30	
	PM10		0.001	0.0005	0.001	PM10		0.43	0.43	
Total Daily Emissions		(lb/year)								**Totals (tons)**
	CO		619.510	1806.344	473.882			121.742	48.697	1.535
	ROCs		232.316	361.269	94.776			25.410	10.164	0.362
	NOx		1626.213	3793.322	695.026			175.787	70.315	3.180
	SOx		154.877	361.269	63.184			5.689	2.276	0.294
	PM10		77.439	90.317	31.592			8.154	3.262	0.105

Assumptions:

43 days = two months of five-day weeks

Approximately 2 haul trips per tower location would be required (assuming 337 towers)

Water truck would drive back and forth between two construction spreads twice a day (assuming spreads are 50 miles apart)

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

Appendix J of AP-42, USEPA AP-42

NEW Table 3: Mobile Source Emission Estimates for Tower Construction

Parameter	Units	Loader	Backhoe	Drill Rig	Parameter	Units	Haul Truck	
Number of Equipment Units		2	2	2	Miles per trip		50	
Operational Hours	hr/day	10	10	10	Trips per day		8	
Days per Year	day/year	214	214	214	days per year		214	
Average Rated Horse Power	hp	147	79	209	Conversion Factc	(lb/g)	0.002205	
Typical Load Factor	%	46.50%	46.50%	75.00%				
Emission Factor	lb/hp-hr				Emission Factor	(g/mile)		
CO		0.011	0.015	0.02	CO		6.42	
ROCs		0.002	0.003	0.003	ROCs		1.34	
NOx		0.023	0.022	0.024	NOx		9.27	
SOx		0.002	0.002	0.002	SOx		0.30	
PM10		0.0015	0.001	0.0015	PM10		0.43	
Total Daily Emissions	(lb/year)							**Totals (tons)**
CO		3218.153	2358.387	13417.800			1211.762	10.103
ROCs		585.119	471.677	2012.670			252.922	1.661
NOx		6728.866	3458.968	16101.360			1749.694	14.019
SOx		585.119	314.452	1341.780			56.624	1.149
PM10		438.839	157.226	1006.335			81.162	0.842

Assumptions:

214 days = ten months of five-day weeks

Aproximatley 5 haul trips would be required per tower location (assuming 337 towers, a tower every 1,300 feet for 83 miles).

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

Appendix J of AP-42, USEPA AP-42

NEW Table 4: Mobile Source Emission Estimates for Transmission Line Assembly

Parameter		Units	Dozer	Crane	Parameter	Units	Utility Truck	
Number of Equipment Units			2	4	Miles per trip		50	
Operational Hours		hr/day	10	10	Trips per day		4	
Days per Year		day/year	43	43	days per year		43	
Average Rated Horse Power		hp	356	194	Conversion Factor	(lb/g)	0.002205	
Typical Load Factor		%	59.00%	43.00%				
Emission Factor		lb/hp-hr			Emission Factor	(g/mile)		
	CO		0.01	0.009	CO		27.83	
	ROCs		0.002	0.003	ROCs		3.84	
	NOx		0.021	0.023	NOx		2.42	
	SOx		0.002	0.002	SOx		0.05	
	PM10		0.0005	0.0015	PM10		0.11	
Total Daily Emissions		(lb/year)						**Totals (tons)**
	CO		1806.344	1291.342			527.740	1.813
	ROCs		361.269	430.447			72.818	0.432
	NOx		3793.322	3300.095			45.890	3.570
	SOx		361.269	286.965			0.948	0.325
	PM10		90.317	215.224			2.086	0.154

Assumptions:

43 days = two months of five-day weeks

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

Appendix J of AP-42, USEPA AP-42

NEW Table 5: Mobile Source Emission Estimates for Substation Improvements

Parameter		Units	Excavator	Dozer	Crane	Parameter	Units	Haul Truck	
Number of Equipment Units			2	2	2	Miles per trip		50	
Operational Hours		hr/day	10	10	10	Trips per day		2	
Days per Year		day/year	64	64	64	days per year		64	
Average Rated Horse Power		hp	151.7	356	194	Conversion Factor	(lb/g)	0.002205	
Typical Load Factor		%	58.00%	59.00%	43.00%				
Emission Factor		lb/hp-hr				Emission Factor	(g/mile)		
	CO		0.011	0.01	0.009	CO		6.42	
	ROCs		0.001	0.002	0.003	ROCs		1.34	
	NOx		0.024	0.021	0.023	NOx		9.27	
	SOx		0.002	0.002	0.002	SOx		0.30	
	PM10		0.0015	0.0005	0.0015	PM10		0.43	
Total Daily Emissions		(lb/year)							**Totals (tons)**
	CO		1238.843	2688.512	960.998			90.599	2.489
	ROCs		112.622	537.702	320.333			18.910	0.495
	NOx		2702.930	5645.875	2455.885			130.818	5.468
	SOx		225.244	537.702	213.555			4.234	0.490
	PM10		168.933	134.426	160.166			6.068	0.235

Assumptions:

64 days = Three months of five-day weeks

Approximately 130 haul trips would be required

Sources:

Tables A9-8-B and -C, A9-5-K-6 and A9-5-L *SCAQMD CEQA Air Quality Handbook*

Appendix J of AP-42, USEPA AP-42