5.9 Hydrology and Water Quality

5.9.1 Environmental Setting

The environmental setting relevant to hydrology and water quality is characterized by surface waters, floodplains, and groundwater resources.

Applicable Regulations

Federal

Clean Water Act (CWA). The CWA (33 U.S.C. Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCBs). The project area is within the jurisdiction of the Central Valley RWQCB.

- *Section 402* of the CWA authorizes the California State Water Resources Control Board (SWRCB) to issue NPDES General Construction Storm Water Permit (Water Quality Order 99 08 DWQ), referred to as the "General Construction Permit." Construction activities can comply with and be covered under the General Construction Permit provided that they meet the following requirements: Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off site into receiving waters; Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation; and Perform inspections of all BMPs. Projects that disturb one or more acres, including the Proposed Project, are required to obtain NPDES coverage under the Construction General Permits.
- *Section 401* of the CWA requires that any activity, including river or stream crossing during road, pipeline, or transmission line construction, which may result in discharges into a State waterbody, must be certified by the RWQCB. This certification ensures that the proposed activity does not violate State and/or federal water quality standards. The limits of non-tidal waters extend to the Ordinary High Water line, defined as the line on the shore established by the fluctuation of water and indicated by physical characteristics, such as natural line impressed on the bank, changes in the character of the soil, and presence of debris. The U.S. Army Corps of Engineers (USACE) may issue either individual, site-specific permits or general, nationwide permits for discharge into U.S. waters.
- *Section 404* of the CWA requires a permit for construction activities involving placement of any kind of fill material into waters of the U.S. or wetlands. A Water Quality Certification pursuant to Section 401 of the CWA is required for Section 404 permit actions. If applicable, construction would also require a request for Water Quality Certification (or waiver thereof) from the applicable RWQCB, which for actions under the Proposed Project would be the Central Valley RWQCB. When an application for a Section 404 permit is made the Applicant must show it has: taken steps to avoid impacts to wetlands or waters of the U.S. where practicable; minimized unavoidable impacts on waters of the U.S. and wetlands; and provided mitigation for unavoidable impacts.
- *Section 303(d)* of the CWA requires states to identify "impaired" water bodies as those which do not meet water quality standards. States are required to compile this information in a list and submit the

list to the USEPA for review and approval. This list is known as the Section 303(d) list of impaired waters. As part of this listing process, states are required to prioritize waters and watersheds for future development of Total Maximum Daily Load (TMDL) requirements. The SWRCB and RWQCBs have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, and to develop TMDL requirements.

National Flood Insurance Program (NFIP). The NFIP, implemented by the Congress of the United States in 1968, enables participating communities to purchase flood insurance. Flood insurance rates are set according to flood-prone status of property as indicated by Flood Insurance Rate Maps (FIRMs) developed by the Federal Emergency Management Agency (FEMA). FIRMs identify the estimated limits of the 100-year floodplain for mapped watercourses, among other flood hazards. As a condition of participation in the NFIP, communities must adopt regulations for floodplain development intended to reduce flood damage for new development through such measures as flood proofing, elevation on fill, or floodplain avoidance.

State

Porter-Cologne Water Quality Control Act. The SWRCB regulates water quality through the Porter-Cologne Water Quality Act of 1969, which contains a complete framework for the regulation of waste discharges to both surface waters and groundwater of the State. On the regional level, the project area is located within the jurisdiction of the Central Valley RWQCB, which is responsible for the implementation of State and federal water quality protection statutes, regulations and guidelines. The Central Valley Water Quality Control Plan (Basin Plan) provides direction for the management of the quality of the surface and groundwaters within the region. The Basin Plan lists the beneficial uses of water within the region, describes the water quality which must be maintained to allow those uses, describes the programs, projects, and other actions which are necessary to achieve the standards established in this plan, and summarizes plans and policies to protect water quality.

California Fish and Game Code. Section 1602 of the California Fish and Game Code protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the California Department of Fish and Game (CDFG) in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State, and requires any person, State, or local governmental agency, or public utility to notify the CDFG before beginning any activity that will: Substantially divert or obstruct the natural flow of any river, stream or lake; Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. A Streambed Alteration Agreement is required if the CDFG determines that any project activity could substantially adversely affect an existing fish and wildlife resource. The agreement includes measures to protect fish and wildlife resources while conducting a project.

California Water Code §13260. California Water Code §13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable RWQCB. Any actions related to the Proposed Project that would be applicable to California Water Code §13260 would be reported to the Central Valley RWQCB.

Local

The Proposed Project is located within Merced County; however, the CPUC has exclusive jurisdiction over the design, siting, installation, operation, maintenance, and repair of electric transmission facilities, pursuant to Article XII, Section 8 of the California Constitution. Therefore, the Proposed Project is not subject to local discretionary regulations. However, as part of the CEQA impact assessment, this analysis addresses the compatibility of the Proposed Project with local policies. In addition, PG&E would secure ministerial permits as required.

Following is a summary of goals and policies contained within the current County General Plan, the 2000 Merced County General Plan (County of Merced, 2000) relating to hydrogeology and water quality, as relevant to the Proposed Project.

Goal 2: *Soil, water, mineral, energy, historical, and air resources are properly managed*.

Policies:

- **1.** The removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion and sedimentation should be minimized.
- **2**. Watersheds which are necessary for the replenishment of reservoirs and aquifers should be protected and preserved.
- **3**. Structures, utilities, or public facilities located within watershed recharge areas that are determined to be important should be designed and constructed in a manner to minimize or eliminate risk of erosion and impact on water quantity or quality.
- **4**. Flood control alterations to existing waterways which contain important riparian vegetation should avoid significant vegetation impacts and avoid soil loss through sensitive project design and implementation.
- **5.** Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these resources.
- **6**. Methods to prevent the depletion of groundwater resources and promote the conservation and reuse of water should be encouraged.
- **7**. The rehabilitation of irrigation systems and other waterworks to reduce the lost water, and improve the efficient use and availability of water should be promoted.
- **8**. Waste water disposal facilities that are determined to have the potential to contaminate the groundwater or surface water, on either a site-specific or cumulative basis shall not be approved by the County.
- **9**. In areas identified as having high groundwater and drainage problems, the development of intensive agricultural processing activities which have heavy waste water discharge characteristics should be avoided.
- **10**. Agricultural processing activities with high water use characteristics should not be located in rural areas where groundwater overdraft problems exist, unless said facility utilizes water recycling and conservation techniques that minimize effects of water use to the ground water table.
- **11**. Promote the development of community drainage systems to manage, control and reduce degradation of wetland and other riparian areas from urban runoff.

- **12**. New development should not be permitted within the service area of a water purveyor unless determined that an adequate quantity and quality of water will be available.
- **13**. Encourage water conservation in urban areas by using drought tolerant landscaping and by avoiding overwatering.

In addition to the above, following is a summary of goals and policies contained within the 2030 Merced County General Plan, Planning Commission Review Draft (County of Merced, 2011) relating to hydrogeology and water quality, as relevant to the Proposed Project.

Goal W-1: *Ensure a reliable water supply sufficient to meet the existing and future needs of the County.*

Policies:

- **Policy W-1.1: Countywide Water Supply (MPSP/IGC)**

  Ensure that continued supplies of surface and groundwater are available to serve existing and future uses by supporting water districts and agencies in groundwater management and water supply planning; requiring that new development have demonstrated long-term water supply; and assisting both urban and agricultural water districts in efforts to use water efficiently.

- **Policy W-1.2: Demonstrating Sufficient Water Supply for New Development**

  Require all new development within the adopted service area of a water purveyor to demonstrate adequate quantity and quality of water will be available prior to issuing building permits.

- **Policy W-1.7: Water Sufficiency Requirement (RDR)**

  Require new developments to prepare a detailed source water sufficiency study and water supply assessment per Title 22 and SB 610, consistent with any Integrated Regional Water Management Plan or similar water management plan. This shall include studying the effect of new development on the water supply of existing users, with public input.

- **Policy W-1.8: Single User Well Consolidation (IGC)**

  Encourage consolidation of single user wells into local water districts (with management plans) where feasible.

- **Policy W-1.10: Groundwater Overdraft Protection**

  Where a water supply source is nearby and accessible, encourage large water consumers to use available surface irrigation water (secondary water) for school athletic fields, sports complexes, and large landscape areas.

Goal W-2: *Protect the quality of surface and groundwater resources to meet the needs of all users.*

- **Policy W-2.1: Water Resource Protection (RDR)**

  Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these water resources.

- **Policy W-2.2: Development Regulations to Protect Water Quality (RDR)**

  Prepare updated development regulations, such as best management practices, that prevent adverse effects on water resources from construction and development activities.

- **Policy W-2.3: Natural Drainage Channels (RDR/MPSP)**

  Encourage the use of natural channels for drainage and flood control to benefit water quality and other natural resource values.

- **Policy W-2.7: NPDES Enforcement (RDR)**

  Monitor and enforce provisions of the U.S. Environmental Protection Agency National Pollution Discharge Elimination System (NPDES) program to control non-point source water pollution.

- **Policy W-2.8: Water Contamination Protection (RDR/MPSP)**

  Coordinate with the State Water Resources Control Board, Regional Water Quality Control Board, and other responsible agencies to ensure that sources of water contamination (including boron, salt, selenium and other trace element concentrations) do not enter agricultural or domestic water supplies, and will be reduced where water quality is already affected.

Goal NR-1: *Preserve and protect, through coordination with the public and private sectors, the biological resources of the County.*

Policies:

- **NR-1.4: Important Vegetative Resource Protection (SO)**

  Minimize the removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion, and sedimentation.

- **NR-1.12: Wetland Avoidance (RDR/PSR/MPSP)**

  Avoid or minimize loss of existing wetland resources by careful placement and construction of any necessary new public utilities and facilities, including roads, railroads, high speed rail, sewage disposal ponds, gas lines, electrical lines, and water/wastewater systems.

- **NR-1.18: San Joaquin River Restoration Program Support (MPSP/SO)**

  Monitor the San Joaquin River Restoration Program efforts to ensure protection of landowners, local water agencies, and other third parties.

Goal NR-3: *Facilitate orderly development and extraction of mineral resources while preserving open space, natural resources, and soil resources and avoiding or mitigating significant adverse impacts.*

Policies:

- **NR-3.2: Soil Erosion and Contamination (RDR)**

  Require minimal disturbance of vegetation during construction to improve soil stability, reduce erosion, and improve stormwater quality.

Goal HS-1: *Minimize the loss of life, injury, and property damage of County residents due to seismic and geologic hazards.*

Policies:

- **HS-1.3 Dam Inundation Areas (RDR)**

  Require all new structures located within dam inundation areas to conform to standards of dam safety as required by the State Division of Safety of Dams.

Regional Setting

The Proposed Project would be located in the San Joaquin Valley of central California, within the jurisdiction of the Central Valley RWQCB, and subject to the management direction of the Basin Plan for the Central Valley Region. Elevation of the project site ranges from approximately 180 to 110 feet above mean sea level (amsl) from Cressey Substation in the east to Gallo Substation in the west, respectively (PG&E, 2011). The surface topography is relatively flat with a slope of zero to one percent (PG&E, 2011).

This area is separated into two hydrologic regions, the Tulare Lake Hydrologic Region, and the San Joaquin River Hydrologic Region. These regions are separated by an indistinct divide consisting of accumulated alluvium which interrupts the lengthwise slope of the Valley. The Tulare Lake Hydrologic Region is the southern region and drains internally except when rare flooding carries its water north across the divide into the San Joaquin River. Rivers within the Tulare Lake Hydrologic Region include the Kings, Kaweah, Tule, and Kern Rivers. The San Joaquin River Hydrologic Region comprises the northern San Joaquin Valley and drains toward the Sacramento–San Joaquin Delta by the San Joaquin River and its tributaries, including the Fresno, Merced, Tuolumne, and Stanislaus Rivers. (PG&E, 2011)

The San Joaquin River Hydrologic Region relies heavily on groundwater, which makes up approximately 30 percent of the annual supply for agricultural and urban uses; groundwater resources in the project area are described below, under "Groundwater."

Precipitation

The project area is characterized by a Mediterranean-type climate, typical of central California and the San Joaquin Valley. This climate zone has cool, wet winters and hot, dry summers. Winds typically blow from the northwest. Average annual precipitation rates range between 11 and 13 inches, with more than 95 percent of all rain falling between the months of October and April (CDFFP, 2000). Periods of abundant rainfall and prolonged droughts are frequent in the historical record.

Surface Water Bodies

No rivers or streams flow through the project site. Surface water bodies in the vicinity of the Proposed Project are:

- *Merced River.* The nearest surface water body to the project site is the Merced River, which passes within 0.75 to 0.95 miles (4,000 to 5,000 feet) to the north of Cressey Substation, the northeastern project terminus, and within 0.15 miles (800 feet) to the north of Gallo Substation, the southwestern project terminus.

  The Merced River is a major tributary of the San Joaquin River. Its headwaters are at an elevation of over 7,900 feet amsl at the foot of the Clark Range, part of the Sierra Nevada. The Merced River flows from its source through a series of canyons and gorges, meanders through Yosemite Valley and over drops such as Nevada and Vernal Falls, through Merced River Canyon, and into Lake McClure, which was formed by New Exchequer Dam. The Merced River continues westward onto the alluvial plain of the San Joaquin Valley where it meanders across the valley to join the San Joaquin River approximately 8.5 miles west of Gallo Substation. (PG&E, 2011)

  The drainage basin of the Merced River is located in the central Sierra Nevada and encompasses over 1,700 square miles between the Tuolumne River basin and the San Joaquin River. The majority of the Proposed Project is just south of the Lower Merced River Watershed, within the Chowchilla/Fresno Rivers Watershed (DWR, 2005a; DWR, 2005b). The western portion of the project site, including Gallo Substation, is within the Lower Merced River Watershed. (PG&E, 2011; DWR, 2005a)

- *Little John's Creek.* Little John's Creek, also known as Jones Drain, is a tributary of the Merced River, and it located in a relatively flat area between the Merced River and Cressey Substation, in the northern project area (PG&E, 2011).
- *California Aqueduct.* The project site is approximately 19 miles northeast of the California Aqueduct, at its closest point. The California Aqueduct conveys water for agricultural, industrial, and municipal users throughout its approximate 400-mile length, which extends from the Sacramento–San Joaquin Delta through the San Joaquin Valley, over the Tehachapi Mountains, and south to the Los Angeles Basin. (PG&E, 2011)

Although no rivers or streams flow through the project site, a number of manmade irrigation canals traverse the project site, as described below.

Irrigation Canals

There are a number of irrigation canals and drainage ditches in the project area, several of which are traversed by the project alignment; these are described below, generally presented from the eastern project area and proceeding towards the west.

- *Livingston Canal.* The Livingston Canal is a large, concrete-lined irrigation canal that crosses Arena Way and would be crossed by the Proposed Project in an east-west direction about 1,000 feet south of Mercedes Avenue. The Livingston Canal originates approximately three miles west of Arena Way where it adjoins the south bank of the Merced River. From its intersection with the project route, this canal extends south to wrap around the southern end of the former Castle Air Force Base, then heads northward to terminate near the northeast corner of the former base. The Livingston Canal measures over 20 miles in length and ranges in elevation from 48 to 157 feet amsl. It serves as a major conveyor of irrigation water for this area of Merced County. (PG&E, 2011)
- *King Lateral Canal* would be crossed by the project route at West Lane approximately 1,000 feet south of Cressey Substation.
- *Cressey Lateral Canal* would be crossed by the project route at Mercedes Avenue in a north-south direction near Santa Fe Avenue and the BNSF railroad.
- *Wakefield Lateral Canal* would be crossed by the project route at Arena Way in an east-west direction approximately 1,000 feet south of Eucalyptus Avenue.
- *Arena Canal* would be crossed by the project route at Arena Way in an east-west direction about 1,000 feet north of its intersection with SR-99; west of SR-99, the Arena Canal crosses Magnolia Avenue in a north-south direction about 2,000 feet west of Lincoln Boulevard, and intersects Lehner Lateral Canal to the south.
- *Lehner Lateral Canal* runs adjacent to Magnolia Avenue in the vicinity of Dwight Way, to the west of SR-99.
- *Unnamed Canal* would be crossed by the project route at Magnolia Avenue approximately 1,000 feet east of Washington Avenue, extends along the south side of Magnolia Avenue, then turns south and extends along the east side of Washington Boulevard.

Irrigation canals in the project area provide an important source of water for the surrounding agricultural lands. Canals and irrigation ditches primarily include concrete or other hard structure banks with some un-vegetated dirt banks. Limited vegetation is present on dirt banks or in mud bottoms.

Wetlands

There are seasonal ponded areas, agricultural ditches, and irrigation canals within the project area. For the purposes of this analysis, irrigated pasture and cropland areas are not considered wetland or aquatic resources. Potential seasonal ponded areas in the project vicinity include the following:

- 1.6 acres within pastureland on the eastern side of the study area;
- 0.1 acres near the intersection of Mercedes Avenue and the Burlington Northern Santa Fe railroad tracks (an apparently man-made feature); and
- 0.06 acres within a developed area between a house site and cropland (PG&E, 2011).

During field reconnaissance conducted in support of the PEA for the Proposed Project, pooled water associated with recent rain events was observed in pastureland areas (PG&E, 2011). Wetland resources and potential seasonal ponded areas are discussed further in Section 5.4 (Biological Resources) of this MND / Initial Study.

Flooding Potential and Dam Failure Inundation Areas

As described above (see "Surface Water Bodies"), the project area is located to the south and southeast of the Merced River. FEMA-designated Flood Hazard Areas are discussed under "Applicable Regulations – Federal." The project route and vicinity are shown on FIRM number 06047C0175G, Panel 175 of 1225 (FEMA, 2008). As shown on this map, the Proposed Project is not located within a FEMA-designated Flood Hazard Area, although the Gallo Substation, at the project's eastern terminus, is immediately adjacent to the south of the Flood Hazard Area associated with Merced River. Cressey Substation, at the western end of the project alignment, is also located within one-half mile of the Flood Hazard Area associated with the Merced River.

There are eleven major dams either in or adjacent to Merced County with known populations in their respective inundation areas. The Safety Element of the Merced County General Plan indicates that the project area is located within the inundation area of McClure Reservoir, in the case of failure of McClure Dam. Virtually no urban area in Merced County is free from potential flooding in the event of a dam failure event. (County of Merced, 2010)

Groundwater

The Proposed Project is located within the Merced Subbasin of the San Joaquin Valley Groundwater Basin. This groundwater basin is not adjudicated (DWR, 2009). Non-adjudicated status means that overlying land owners may use the groundwater on an "equal and correlative" basis, such that all property owners above a common aquifer possess a shared right to reasonable use of the aquifer and a user cannot take unlimited quantities without regard to the needs of other users. Surplus groundwater may be appropriated for use on non-overlying lands, provided such use would not create overdraft conditions; permits are not required for the use of underlying groundwater, but the appropriation of surplus groundwater is subordinate to the correlative rights of overlying users.

The Merced Subbasin includes lands south of the Merced River between the San Joaquin River on the west and the crystalline basement rock of the Sierra Nevada foothills on the east. The southern boundary of the Merced Subbasin is marked in part by the Chowchilla River. Water bearing geologic units in the Merced Subbasin include consolidated rocks and overlying unconsolidated deposits characterized by the Ione Formation, the Valley Springs Formation, and the Mehrten Formation, summarized below (DWR, 2004).

- *Ione Formation.* This formation consists primarily of sandstone and kaolinitic clay with a maximum thickness of 200 feet, overlain by the late Miocene Valley Springs formation.
- *Valley Springs Formation.* This formation consists primarily of rhyolitic ash and clay with maximum thickness of 270 feet, which is conformably overlain by the Pliocene Mehrten formation.
- *Mehrten Formation.* This formation consists largely of andesitic tuff, sandstone, conglomerate, and claystone, and reaches a maximum thickness of 1,200 feet under the center of the San Joaquin Valley; this formation forms an important aquifer in the eastern part of the area and occurs under both confined and unconfined conditions.

Unconsolidated deposits within the Merced Subbasin are of Pliocene to recent age and overlie the consolidated rocks. They include continental deposits, lacustrine and marsh deposits, older alluvium, younger alluvium, and flood basin deposits. Water-yielding units in the unconsolidated deposits are the continental deposits and the older alluvium. The lacustrine and marsh deposits include the Corcoran Clay member of the Tulare formation, a layer of diatomaceous lacustrine clay underlying the western half of the Merced Subbasin at depths ranging from approximately 50 to 200 feet. The Corcoran Clay acts as an important confining layer in the area. A confined water body occurs in the unconsolidated deposits below the Corcoran Clay, and an unconfined water body occurs primarily in the unconsolidated deposits above and east of the Corcoran Clay. (DWR, 2004)

Groundwater flow in the Merced Subbasin generally occurs towards the southwest, following the regional dip of basement rock and sedimentary units. On average, the depth to groundwater increased by nearly 30 feet between 1970 and 2000. Water level declines have been more severe in the eastern portion of the Merced Subbasin. (DWR, 2004)

The total storage capacity of the Merced Subbasin is estimated to be 21,100,000 acre-feet to a depth of 300 feet, and an estimated 15,700,000 acre-feet to a depth of 300 feet was in storage in 1995, approximately 74 percent of total storage capacity. A detailed safe yield for the Merced Subbasin is not available, where "safe yield" is the maximum quantity of water that can be continuously withdrawn from a groundwater basin without resulting in an adverse effect. However, estimates conducted by the DWR indicate that the basin could be overdrafted by 265,000 AFY, where "overdraft" is the quantity of groundwater withdrawal that is more than the safe yield; this estimate assumes natural recharge of 47,000 AFY, applied water recharge of 243,000 AFY, urban extractions of 54,000 AFY, agricultural extractions of 492,000 AFY, other extractions of 9,000 AFY, and unknown quantities of artificial recharge, subsurface inflow, and subsurface outflow. (DWR, 2004)

Other estimates of safe yield for the Merced Subbasin that were conducted in 1999 indicated that the basin may be affected by overdraft of 20,000 AFY, with estimated safe yield of 617,974 AFY and estimated extractions of 637,974 AFY. This analysis also noted that agricultural uses of water within the Merced Subbasin consumed an average of 1,272,000 AFY, and that the total average crop-water requirement comprised approximately 50 percent of groundwater use in the basin. Using current population trends determined by Merced County Association of Governments, this analysis noted that the urban population within the Merced Subbasin was expected to increase from 180,000 in 1996 to over 540,000 by 2030, resulting in an average daily urban water usage increase from 35.6 million gallons per day (MGD) in 1996 to 108 MGD in the year 2030. If groundwater remains the sole source of municipal supply over this time period, it is estimated that 72 new wells will be required to serve the Cities of Atwater, Livingston, and Merced and the University of California Merced campus. (SJRGA, 1999)

As described above, estimates of safe yield for the Merced Subbasin are not consistent. Considering all available data relevant to the Merced Subbasin, it is reasonable to assume that the basin is currently

affected by long-term overdraft conditions, primarily associated with agricultural uses for irrigation and urban uses for the expanding population base.

Water Quality

As described above, there are no rivers or streams on the project right-of-way, but the project route would cross man-made irrigation canals and drainage ditches. The nearest natural surface water body to the project site is the Merced River, which is within one mile of Cressey Substation and within one-quarter mile of Gallo Substation. Per the Basin Plan for the San Joaquin Region, beneficial uses designated for the Merced River include the following (Central Valley RWQCB, 1998):

- Municipal and Domestic Supply (proposed)
- Hydropower Generation (existing)
- Non-Contact Water Recreation (existing)
- Cold Freshwater Habitat (existing)
- Irrigation (existing)
- Water Contact Recreation (existing)
- Warm Freshwater Habitat (existing)
- Wildlife Habitat (existing)

Water quality objectives are determined according to these beneficial uses.

Water quality characteristic of the Merced Subbasin are primarily calcium-magnesium bicarbonate at the basin interior, sodium bicarbonate to the west, and calcium-sodium bicarbonate to the south. Small areas of sodium chloride and calcium-sodium chloride waters exist at the southwest corner of the basin. Total dissolved solids (TDS) values range from 100 to 3,600 mg/L, with a typical range of 200 to 400 mg/L. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 46 wells ranging from 150 to 424 mg/L, with an average value of 231 mg/L. (DWR, 2004)

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs (see Table 5.9-1), as well as any adopted mitigation measures identified by this Initial Study.

Table 5.9-1. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM Number	Issue Area
	Hazards and Hazardous Materials
APM GM-1	**Appropriate Design Measures Implementation.** Based on available references, sands and loamy sands are the primary soil types expected to be encountered in the graded and excavated areas as project construction proceeds. Potentially problematic subsurface conditions may include soft or loose soils. Where soft or loose soils are encountered during design studies or construction, appropriate measures will be implemented to avoid, accommodate, replace, or improve soft or loose soils encountered during construction. Such measures may include the following: ▪ Locating construction facilities and operation away from areas of soft and loose soil. ▪ Over excavating soft or loose soils and replacing them with non-expansive engineered fill. ▪ Increasing the density and strength of soft or loose soils through mechanical vibration and/or compaction. ▪ Treating soft or loose soils in place with binding or cementing agents. Construction activities in areas where soft or loose soils are encountered may be scheduled for the dry season, as necessary, to allow safe and reliable equipment access.

Table 5.9-1. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM HM-1	**Hazardous Substance Control and Emergency Response.** PG&E will implement its hazardous substance control and emergency response procedures as needed. The procedures identify methods and techniques to minimize the exposure of the public and site workers to potentially hazardous materials during all phases of project construction through operation. They address worker training appropriate to the site worker's role in hazardous substance control and emergency response. The procedures also require implementing appropriate control methods and approved containment and spill-control practices for construction and materials stored on site. If it is necessary to store chemicals on site, they will be managed in accordance with all applicable regulations. Material safety data sheets will be maintained and kept available on site, as applicable. Project construction will involve soil surface blading/leveling, excavation of up to several feet, and augering to a maximum depth of 20 feet in some areas. No known soil contamination was identified within the project site. In the event that soils suspected of being contaminated (on the basis of visual, olfactory, or other evidence) are removed during site grading activities or excavation activities, the excavated soil will be tested, and if contaminated above hazardous waste levels, will be contained and disposed of at a licensed waste facility. The presence of known or suspected contaminated soil will require testing and investigation procedures to be supervised by a qualified person, as appropriate, to meet state and federal regulations. All hazardous materials and hazardous wastes will be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. The hazardous substance control and emergency response procedures include, but are not limited to, the following: ▪ Proper disposal of potentially contaminated soils. ▪ Establishing site-specific buffers for construction vehicles and equipment located near sensitive resources. ▪ Emergency response and reporting procedures to address hazardous material spills. ▪ Stopping work at that location and contacting the County Fire Department Hazardous Materials Unit immediately if visual contamination or chemical odors are detected. Work will be resumed at this location after any necessary consultation and approval by the Hazardous Materials Unit. PG&E will complete its Emergency Action Plan Form as part of project tailboard meetings. The purpose of the form is to gather emergency contact numbers, first aid location, work site location, and tailboard information.
	Hydrology and Water Quality
APM WQ-1	**SWPPP or Erosion Control Plan Development and Implementation**. Following project approval, PG&E will prepare and implement a SWPPP, if required by state law, or erosion control plan to minimize construction impacts on surface water and groundwater quality. Implementation of the SWPPP or erosion control plan will help stabilize graded areas and reduce erosion and sedimentation. The plan will designate BMPs that will be adhered to during construction activities. Erosion and sediment control measures, such as straw wattles, covers, and silt fences, will be installed before the onset of winter rains or any anticipated storm events. Suitable stabilization measures will be used to protect exposed areas during construction activities, as necessary. During construction activities, measures will be in place to prevent contaminant discharge. The project SWPPP or erosion control plan will include erosion control and sediment transport BMPs to be used during construction. BMPs, where applicable, will be designed by using specific criteria from recognized BMP design guidance manuals. Erosion-minimizing efforts may include measures such as the following: ▪ Defining ingress and egress within the project site ▪ Implementing a dust control program during construction ▪ Properly containing stockpiled soils Erosion control measures identified will be installed in an area before construction begins during the wet season and before the onset of winter rains or any anticipated storm events. Temporary measures such as silt fences or wattles, intended to minimize sediment transport from temporarily disturbed areas, will remain in place until disturbed areas have stabilized. A copy of the SWPPP or erosion control plan will be provided to the CPUC prior to construction for recordkeeping. The plan will be updated during construction as required by the SWRCB.

Table 5.9-1. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM WQ-2	**Worker Environmental Awareness Program Development and Implementation**. The project's worker environmental awareness program will communicate environmental issues and appropriate work practices specific to this project. This awareness will include spill prevention and response measures, and proper BMP implementation. The training will emphasize site specific physical conditions to improve hazard prevention (such as identification of flow paths to nearest water bodies) and will include a review of all site specific water quality requirements, including applicable portions of erosion control and sediment transport BMPs, health and safety plan, and hazardous substance control and emergency response plan. A copy of the project's worker environmental awareness training will be provided to the CPUC for recordkeeping prior to the start of construction.

5.9.2 Environmental Impacts and Assessment

HYDROLOGY AND WATER QUALITY **Would the project:**	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater discharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table level (i.e., 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)?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on or off site?	☐	☐	☒	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?	☐	☐	☒	☐
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f. Otherwise substantially degrade water quality?	☐	☐	☐	☒
g. Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other hazard delineation map?	☐	☐	☐	☒
h. Place within 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒
i. 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.	☐	☐	☒	☐
j. Cause inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

a. Would the project violate any water quality standards or waste discharge requirements?

LESS THAN SIGNIFICANT IMPACT. The Proposed Project would comply with all applicable laws and regulations discussed in Section 5.9.1.

Accelerated soil erosion, downstream sedimentation, and reduced surface water quality could potentially occur during construction of the project due to the following activities: vehicular traffic on unpaved areas; excavation, augering, and grading of the project site; and oil disturbance at material laydown areas. Construction activities conducted when the ground is wet also create the potential for increased sediment runoff. These potential effects would not result in the violation of any water quality standards or waste discharge requirements through the implementation of APM WQ-1 (SWPPP or Erosion Control Plan Development and Implementation) and APM WQ-2 (Worker Environmental Awareness Program Development and Implementation). A project-specific SWPPP would be developed and implemented for compliance with the federal CWA, and for coverage under the NPDES Construction General Permit. If a SWPPP is not required under the CWA, the project Applicant would develop and implement an Erosion Control Plan per APM WQ-1 (SWPPP or Erosion Control Plan Development and Implementation). Construction of the project would also require the use of a variety of motorized heavy equipment, including transport trucks, graders, and drill rigs. An accidental release from a vehicle or motorized piece of equipment during construction or maintenance activities could potentially result in degradation or surface water and/or groundwater quality. These potential effects would not result in the violation of any water quality standard or waste discharge requirements through the Implementation of APM HM-1 (Hazardous Substance Control and Emergency Response) as well as APMs WQ–1 and WQ–2 (mentioned above).

b. Would the project 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 (i.e., 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)?

LESS THAN SIGNIFICANT IMPACT. As described in Section 5.9.1 (see "Groundwater"), the project area is underlain by the Merced Subbasin of the San Joaquin Valley Groundwater Basin. This is a non-adjudicated groundwater resource, where all property owners above the aquifer possess a shared right to reasonable use of the aquifer; permits are not required for use of underlying groundwater resources, but a user cannot take unlimited quantities without regard to the needs of other users. Also due to the non-adjudicated status of the Merced Subbasin, surplus groundwater may be appropriated for use on non-overlying lands, but only where the appropriation of surplus groundwater is subordinate to the correlative rights of overlying users, and such use would not result in overdraft conditions. Safe yield for the Merced Subbasin basin is not currently known; however, as discussed in Section 5.9.1 (see "Groundwater"), it is reasonably understood that the Merced Subbasin is currently affected by long-term overdraft conditions (SJRGA, 1999; DWR, 2004). Both the existing 2000 Merced County General Plan and the proposed 2030 Merced County General Plan Update identify goals and policies aimed to alleviate overdraft issues throughout the County (see Section 5.9.1, "Applicable Regulations – Local"). In addition, the Proposed Project is located within District 4 of the Merced Irrigation District (MID); in cooperation with the City of Merced, the MID manages groundwater resources within its service area per an existing Groundwater Management Plan, which aims to address issues including long-term overdraft and groundwater supply reliability (AMEC, 2008).

During construction of the Proposed Project, a water supply would be required for dust abatement. A water truck with a capacity of 4,000 gallons (0.01 acre-feet) would be used as needed for dust suppression during the construction period of April 2013 through January 2014. The volume of water required

to minimize dust that may be created by construction activities is expected to be less than the truck capacity on a typical day, and water use during construction would be dependent upon the activity, season, and weather (PG&E, 2012). Assuming that construction activities would occur on Monday through Friday during the noted period of April 2013 through January 2014, construction of the project would include less than 200 working days. As described in Section 5.9.1 (see "Precipitation"), average annual precipitation rates in the project area range between 11 and 13 inches, with more than 95 percent of all rain falling between the months of October and April; therefore, it is possible that precipitation events could occur during the construction period, alleviating the need to apply water for dust suppression. As noted above, it is not anticipated that the full capacity of a 4,000-gallon water truck would be required on each day of project construction, depending upon climate and the particular construction activity; however, in order to be conservative, it is assumed for the purposes of this analysis that construction of the project would require 4,000 gallons of water per day for 200 days, resulting in a total construction water requirement of roughly 1.97 acre-feet.

The Proposed Project's construction water would be obtained from local sources (PG&E, 2011). If the particular location along the project alignment where water is required for dust abatement is near an existing agriculture operation, PG&E may contact the agricultural operation and make arrangements to access their water source, which could be a private groundwater well within the Merced Subbasin (PG&E, 2011). The project Applicant may also contact the City of Livingston, and arrange for a meter to be put on a specific fire hydrant where a 4,000-gallon water truck would obtain water for the project and transport the water to the required location along the project route (PG&E, 2012). The purpose of the water meter on the fire hydrant would be to track the quantity of water used for the purposes of the project so that the Applicant may provide appropriate compensation to the City.

In summary, the Proposed Project's estimated construction water requirement of up to 1.97 acre-feet is considered minimal, and would not substantially inhibit implementation of existing groundwater management plans and goals in the area. The introduction of new impermeable surfaces and potential for increased soil compaction that would occur under the Proposed Project would be minimal (see further discussion under (e)), and would have no appreciable effect on groundwater recharge. Operation and maintenance of the Proposed Project would not require a water source. Potential impacts to groundwater resources associated with depletion of groundwater supply and/or alterations to groundwater recharge rates or patterns would be less than significant.

c. Would the project 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 off site?

LESS THAN SIGNIFICANT IMPACT. As described in Section 5.9.1, there are a number of irrigation canals and drainage ditches in the project area, several of which are traversed by the project alignment. All canals and drainage ditches would be protected during project construction, and no canals or drainage ditches would be disturbed by the Proposed Project. The project would not alter the course of any stream or river.

Construction of the Proposed Project would include ground-disturbing activities that could result in localized drainage pattern alterations, such as during installation of approximately 230 wood and/or light duty steel poles and approximately 11 tubular steel poles with concrete foundations, and the use of approximately one or two staging areas, to be established within the seven potential staging locations within the project area. Each construction staging area is anticipated to have a footprint of up to ten acres, and would be located on previously disturbed land. As described in Section 2.8.1, preparation for site use may include some grading or scraping to achieve an even grade. Although staging areas may be

graded to provide an even surface, substantial grade changes would not occur, and provisions of the project-specific SWPPP or Erosion Control Plan described above under (a) and required per APM WQ-1 would ensure that BMPs to reduce or avoid erosion and sedimentation effects would be implemented. Preparation of staging area sites may also include the placement of gravel or rock on the surface to address wet or muddy conditions, or for the purposes of dust suppression; following the completion of construction, the gravel or rock will be removed unless the property owner(s) requests that it is left in place. If the gravel or rock is removed, the resulting site condition would be comparable to pre-construction conditions; if the gravel or rock is not removed, it would likely provided increased protection from erosion and sedimentation potential, when compared to existing conditions.

As previously discussed, the project would occur in compliance with a SWPPP or Erosion Control Plan, per APM WQ-1 (SWPPP or Erosion Control Plan Development and Implementation); this plan would identify erosion control and sediment transport BMPs to be implemented during project construction in order to minimize or avoid potential adverse effects associated with ground-disturbing activities that may result in erosion or sedimentation. In addition, APM GM-1 (Appropriate Design Measures Implementation) would require the implementation of BMPs including the following, to address potentially problematic subsurface conditions characterized by soft or loose soils: locate construction facilities and operation away from areas of soft and loose soil; over excavate soft or loose soils and replace them with non-expansive engineered fill; increase the density and strength of soft or loose soils through mechanical vibration and/or compaction; treat soft or loose soils in place with binding or cementing agents. These BMPs would further minimize or avoid the potential for erosion or sedimentation to occur as a result of the project. The Proposed Project would alter existing drainage patterns, but such effects would be site-specific and would not result in substantial erosion or siltation on or offsite. Impacts would be less than significant.

d. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?

LESS THAN SIGNIFICANT IMPACT. As described above, the Proposed Project would not alter the course of any stream or river, and would not affect drainage ditches or irrigation canals in the area. Implementation of the project could create or contribute additional runoff water if it introduces substantial new impervious areas that increase the rate of runoff, or if it directly discharges runoff water in the project area. The project would introduce new impervious areas in the form of concrete tower foundations; as described in Table 4-2 (Summary of Approximate Pole Metrics), the new wood poles or light-duty steel poles that would be installed under the project would have a permanent footprint of 0.01 acres, while the tubular steel poles would have a permanent footprint of 0.006 acres. In total, this would result in a 0.016-acre permanent footprint, which is not anticipated to have any effect on the rate or amount of surface runoff in the area.

Implementation of the Proposed Project may also reduce existing soil permeability as a result of compaction associated with the use of existing or new dirt roadways. Table 4-1 (Access Road Area) describes that new orchard dirt roads would be used for 0.2 miles, while existing dirt roads would be used for 3.6 miles; the potential for increased soil compaction to occur along these roads is not anticipated to result in increased surface runoff. In addition, as described in Section 2.8.3, rock and/or gravel may be applied to dirt roads used during construction in order to reduce damage and control dust; the use of rock and/or gravel on roadway surfaces would also reduce the rate of surface water runoff, thereby minimize the potential for flooding or flooding-related effects to occur on- or off-site.

During construction, water would be applied to the ground surface towards the purpose of dust abatement; this water would only be applied in quantities necessary to achieve dust suppression goals, and would not create active flow on the ground surface. No water would be discharged during project construction such that the project would contribute additional runoff to the surrounding area. During operation of the project, no water supply would be necessary, and the project would not discharge additional runoff to the area. The presence of new impermeable surfaces and increased soil compaction during project operation would have no appreciable effect on the rate or amount of runoff in the area. Any effect on surface runoff rates or patterns would be highly localized, and potential impacts associated with flooding on or offsite would be less than significant.

e. Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to provide substantial additional sources of polluted runoff?

LESS THAN SIGNIFICANT IMPACT. Existing stormwater drainage systems in the area are comprised of irrigation ditches and canals, as described in Section 5.9.1 (see "Surface Water Bodies: Irrigation Canals). As described above, the Proposed Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site; therefore, the project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. Polluted runoff could be introduced during project construction if an accidental leak or spill results in the release of hazardous materials such as motor oil or lubricating fluid, particularly during or immediately prior to a storm event. The SWPPP or Erosion Control Plan that would be implemented as part of the Proposed Project (per APM WQ-1, discussed above and presented in Section 4.8) would include BMPs to avoid hazardous materials spills, including but not limited to the installation of erosion control measures prior to construction begins and before the onset of winter rains or anticipated storm events; in addition, temporary measures such as silt fences or wattles, intended to minimize sediment transport from temporarily disturbed areas, would remain in place until disturbed areas have stabilized. The SWPPP or Erosion Control Plan would also identify locations for storage of hazardous materials during construction, as well as protective measures, notifications, and cleanup requirements for an incidental spill or other potential release of hazardous materials. In addition, APM WQ-2 (Worker Environmental Awareness Program Development and Implementation) and APM HM-1 (Hazardous Substance Control and Emergency Response) specify BMPs for the handling, storage, and disposal of hazardous materials, as well as worker awareness and emergency response training to ensure that any leak or spill is addressed to avoid or minimize the potential for water quality degradation to occur. With implementation of these APMs under the Proposed Project, any potential for the project to result in additional sources of polluted runoff would be less than significant.

f. Would the project otherwise substantially degrade water quality?

NO IMPACT. All potential water quality impacts associated with construction and operation of the Proposed Project are characterized in the above discussions; the Proposed Project would not otherwise substantially degrade water quality. No other water quality impact would occur.

g. Would the project place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

NO IMPACT. The Proposed Project would not include the construction of any housing, and would not introduce new flooding effects that would place housing within a 100-year floodplain. No impact would occur.

h. Would the project place within a 100-year floodplain structures that would impede or redirect flood flows?

NO IMPACT. The Proposed Project is not located within a FEMA-designated Flood Hazard Area, and would not introduce infrastructure that would impede or redirect flood flows to result in adverse effects. No impact would occur.

i. Would the project 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?

LESS THAN SIGNIFICANT IMPACT. As described in Section 5.9.1 (see "Flooding Potential and Dam Failure Inundation Area"), the project area is located within the inundation area of McClure Reservoir, in the case of failure of New Exchequer Dam, and virtually no urban area in Merced County is free from potential flooding in the event of a dam failure event (County of Merced, 2010). Approximately two-thirds of the Proposed Project, including Gallo Substation and the western two-thirds of the power line corridor, is located within New Exchequer Dam inundation area (PG&E, 2011). It is anticipated that the potentially affected areas of the project route would be temporarily flooded by the initial water surge following a catastrophic failure of New Exchequer Dam, but would not remain under flood waters (i.e., the project areas shown within the inundation area are ten or more feet higher in elevation than the mapped inundation area boundary) (PG&E, 2011). Project infrastructure would be designed in accordance with standard PG&E design standards, and with consideration to potential environmental hazards in the area; it is anticipated that in the event of temporary inundation due to a dam failure event, project infrastructure would not be subject to failure that could expose people or structures to a significant risk of loss, injury or death. Potential impacts of the Proposed Project associated with the failure of a levee or dam would be less than significant.

j. Would the project cause inundation by seiche, tsunami, or mudflow?

NO IMPACT. The Proposed Project is not located in proximity to an ocean or other body of water subject to tsunami, and would not result in inundation by tsunami. As described in Section 5.9.1 (see "Surface Water Bodies"), the Merced River is located within one mile of Cressey Substation and within 0.15 miles of Gallo Substation; however, the Merced River is not a confined body of standing water and is not considered subject to seiche events. In the case of a severe seismic event, a seiche could occur in McClure Reservoir behind New Exchequer Dam and, as described above, the project area is located within the inundation area associated with potential failure of New Exchequer Dam. A seiche event could contribute to the instability of New Exchequer Dam, and to potential failure of this dam, impacts of which are characterized above. The project alignment does traverse several irrigation canals, but these water bodies are not subject to inundation due to seiches because of their small size and non-confined nature. Project construction, operation and maintenance would not interfere with or affect these canals, and would not cause inundation by seiche. In addition, due to the relatively flat topography of the project area, it is not considered subject to mudflow, and the Proposed Project would not cause inundation by mudflow. Implementation of the Proposed Project would result in no impact associated with inundation by seiche, tsunami, or mudflow.

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