3.9 Hydrology and Water Quality

Table 3.9-1 Hydrology and Water Quality Checklist

Would the project:		Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a.	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b.	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)?	☐	☐	☒	☐
c.	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?	☐	☐	☒	☐
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 which 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 flood hazard delineation map?	☐	☐	☐	☒
h.	Place within a 100-year flood hazard area structures which 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.	Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

3.9.1 Setting

The project is located in three counties (Butte, Yuba, and Sutter) within the Sacramento River Basin and is under the jurisdiction of the Central Valley Regional Water Quality Control Board. Figure 3.9-1 shows the hydrological features crossed by the project route.

Butte County

The northern portion of the project route would be located approximately 3 miles southeast of Oroville in Butte County. The major surface water features in this area of Butte County that would not be crossed by

the project route include: Lake Oroville, to the northeast of the northern extent of the project, and the Feather River, which flows south out of Lake Oroville and parallels the project route to the west. The major surface water features that would be crossed by the project route include: Wyman Creek, Wyandotte Creek, North Honcut Creek, and South Honcut Creek. Wyman Creek flows from east to west and would be crossed by the project route south of Oroville. See Section 3.4, Biological Resources, for a description of wetland features that would be crossed and impacted by the project.

Wyandotte Creek flows from east to west and would be crossed by the project route several times between Palermo and its confluence with North Honcut Creek. North and South Honcut Creek flow from east to west and would be crossed several times by the project route at their confluence with Honcut Creek. The border between Butte and Yuba counties parallels South Honcut Creek. The minor surface water features that would be crossed by the project route are two unnamed streams located west of Palermo. According to the Clean Water Act Section 303(d) list of impaired waterbodies, the Feather River, Wyandotte Creak, and North and South Honcut Creek are not listed for any impairment (SWQRB 2009).

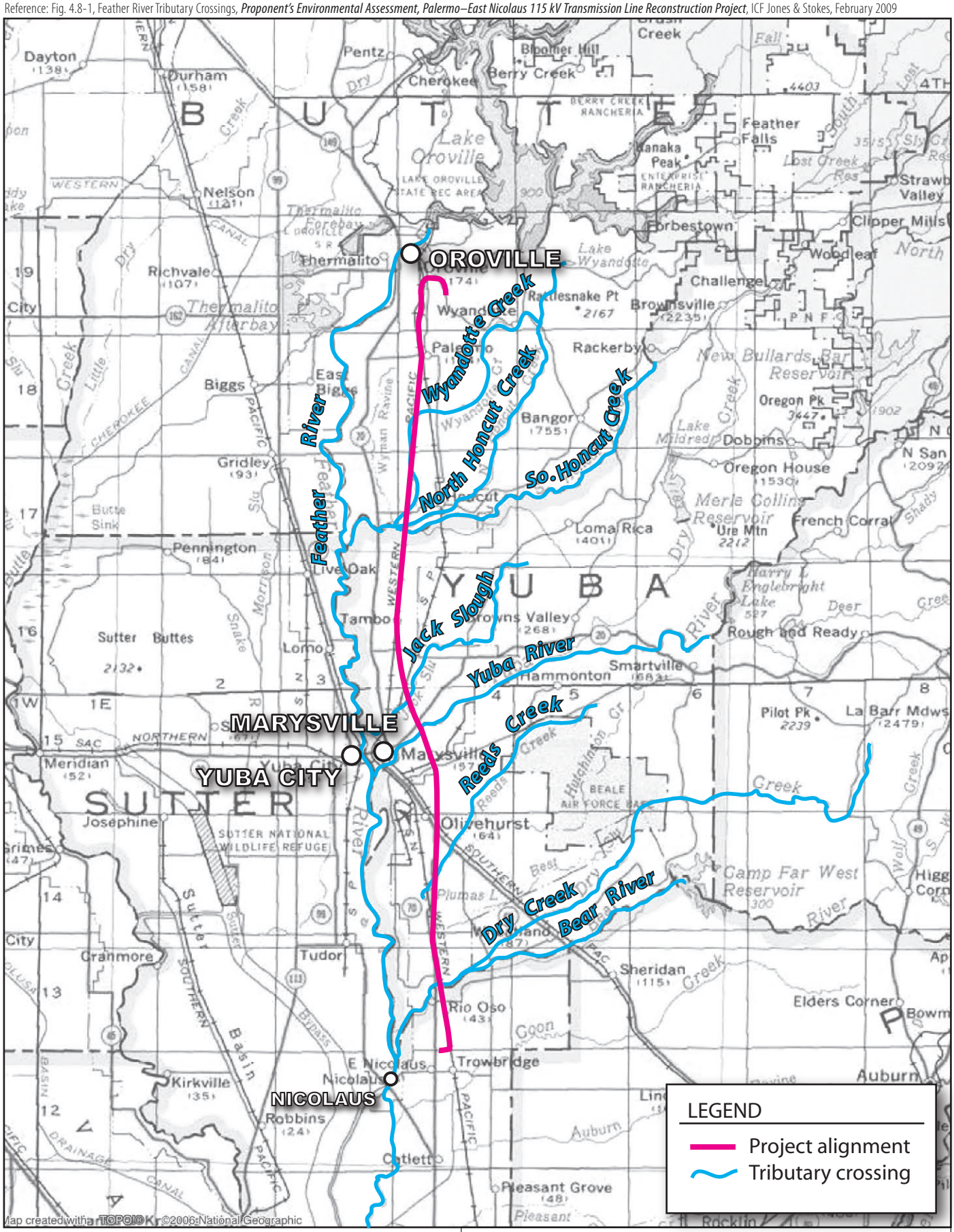
The northern portion of the project route would not be located within a groundwater basin identified by the California Department of Water Resources (DWR). The groundwater basin closest to the project area within Butte County is the Sacramento Valley Groundwater Basin, East Butte Subbasin (Basin Number 5-21.59), which is bound on its southeast side by the Feather River (DWR 2004). Groundwater data is not available due to the northern extent of the project route not being located within a groundwater basin identified by the DWR.

The project route would cross three Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps in Butte County (06007C0985D, 06007C0995C, 06007C1130C, and 06007C1150C). Near Oroville, the project would cross the 100-year floodplain of Wyman Creek on FIRM 06007C0985D (FEMA 2000). The project route would then continue south within the same floodplain and onto FIRM 06007C0995C (FEMA 1998a). According to FIRM 06007C0995C, the project route would leave the 100-year floodplain when Wyman Creek turns southwest away from the project route. The project route would then enter the floodplain of Wyandotte Creek just south of Honcut Road on FIRM 06007C1130C (FEMA 1998b). Continuing in the same 100-year floodplain, the project route would cross North Honcut Creek just north of the Butte and Yuba county border on FIRM 06007C1150C (FEMA 1998c).

Yuba County

The major surface water features within Yuba County that would be crossed by the project route include Jack Slough, Yuba River, Reeds Creek, and Best Slough. Jack Slough flows from east to west into the Feather River and would be crossed by the project route near Marysville. The Yuba River flows from east to west into the Feather River and would be crossed by the project route near Marysville. Reeds Creek flows from east to west into the Feather River and would be crossed by the project route south of Olivehurst. Best Slough flows from east to west into the Feather River and would be crossed by the project route south of Olivehurst. The border between Yuba and Sutter counties parallels the Bear River, which is also crossed by the project route. Ellis Lake is located approximately 2 miles east of the project route in Marysville.

Reference: Fig. 4.8-1, Feather River Tributary Crossings, *Proponent's Environmental Assessment, Palermo–East Nicolaus 115 kV Transmission Line Reconstruction Project*, ICF Jones & Stokes, February 2009



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PALERMO–EAST NICOLAUS 115-KV TRANSMISSION LINE

Figure 3.9-1

Feather River Tributary Crossings

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The minor surface water features that would be crossed by the project route include Simmerly Slough and two unnamed canals. Simmerly Slough flows from east to west and would cross the project route north of Jack Slough. The two unnamed canals would cross the project route near the towns of Marysville and Olivehurst. According to the Clean Water Act Section 303(d) list of impaired waterways, there are no surface-water quality impairments in Yuba County (SWQRB 2009). See Section 3.4, Biological Resources, for further description of the minor wetland features that would be crossed and impacted by the project.

The project passes through two subbasins in Yuba County: the North Yuba Subbasin (Basin Number 5-21.60) and the South Yuba Subbasin (Basin Number 5-21.61). The North Yuba Subbasin is bounded on the north by Honcut Creek, in the east by the Sierra Nevada Mountains, on the south by the Yuba River, and on the west by the Feather River. The subbasin has a surface area of approximately 50,000 acres. The storage capacity of the subbasin is estimated at 620,000 acre-feet. The water bearing formations in the subbasin consist of continental deposits of Quaternary to Late Tertiary age. Groundwater levels in the subbasin were not specified but were said to be relatively constant from 1950 through 1990 (DWR 2006a). The North Yuba Subbasin has generally good groundwater quality. Total dissolved solids concentrations range from 149 milligrams per liter (mg/L) to 655 mg/L, with a median of 277 mg/L. The water chemistry in the area indicates a calcium magnesium bicarbonate or magnesium calcium bicarbonate groundwater. There are no documented impairments to the groundwater in the North Yuba Subbasin (DWR 2006a).

The South Yuba Subbasin is bounded on the north by the Yuba River, on the east by the Sierra Nevada Mountains, on the south by the Bear River, and on the west by the Feather River. The subbasin has a surface area of approximately 89,000 acres. The storage capacity of the basin is estimated at 1,090,000 acre-feet. The water bearing formations in the subbasin consist of continental deposits of Quaternary to Late Tertiary age. In the early 1960's groundwater levels in the subbasin showed a well-developed cone of depression with water levels at the center being just below sea level. By 1984, the groundwater level at the center of the cone of depression had fallen to 30 feet below sea level. This drop in groundwater level was attributed to the continued reliance on groundwater pumping in the subbasin. However, by 1990 the groundwater level at the center of the cone of depression had risen to 10 feet above sea level. According to DWR the groundwater levels continue to increase due to increasing surface water irrigation (DWR 2006b). The South Yuba Subbasin has generally good groundwater quality. Total dissolved solids concentrations are range from 141 milligrams per liter to 686 milligrams per liter, with a median of 224 milligrams per liter. The water chemistry in the area indicates a calcium magnesium bicarbonate or magnesium calcium bicarbonate groundwater. There are no documented impairments to the groundwater in the North Yuba Subbasin (DWR 2006b).

The project would cross seven Flood Insurance Rate Maps in Yuba County (0604270200C, 0604270280B, 0604270290B, 0604270295B, 0604270360B, 0604270370B, and 0604270450B). On FIRM 0604270200C and at the border between Butte and Yuba counties, the project route would be within the 100-year floodplain of South Honcut Creek (FEMA 1983). The project route would leave the 100-year floodplain 2000 feet south of South Honcut Creek. The project route would then run along the border between two flood zone areas of "minimal flooding" to the east (Zone C) and, to the west, an area that could be flooded with less than one foot of water (Zone B). On FIRM 0604270280B, the project route would cross into the 100-year floodplain of Simmerly Slough (FEMA 1982a).

The project route would continue within the same 100-year floodplain and onto FIRM 0604270290B (FEMA 1982b). The project route would then cross the 100-year floodplain of Jack Slough on FIRM 0604270290B. On FIRM 0604270295B, the project route would cross the 100-year floodplain of the Yuba River (FEMA 1982c). Also on FIRM 0604270295B, the project route would enter the 100-year floodplain of Linda Drain and would leave on FIRM 0604270360B (FEMA 1982d). The project route

would then cross the 100-year floodplain of Olivehurst Drain. On the southern end of FIRM 0604270360B, the project route would enter the 100-year floodplain of Reeds Creek and would continue within the same floodplain on to FIRM 0604270370B. On FIRM 0604270370B, the project route would leave the 100-year floodplain of Reeds Creek (FEMA 1982e) and parallel the floodplains of Reeds Creek, Linda Drain, Western Pacific Interceptor Canal, and Best Slough through FIRM 0604270370B. The project route would then enter the floodplain of the Bear River on FIRM 0604270450B (FEMA 1982f).

Sutter County

The major surface water feature in Sutter County that would be crossed by the project route is the Bear River. The Bear River flows from east to west into the Feather River and borders Yuba and Sutter counties. Two minor surface water features that would be crossed by the project route include Ping Slough, which flows from east to west and would cross the project route south of the Bear River, and Yankee Slough, which flows from east to west into the Bear River and would cross the project route near its confluence with the Bear River. See Section 3.4, Biological Resources, for further description of the wetland features that would be crossed and impacted by the project. According to the Clean Water Act Section 303(d) list of impaired waterways, the Upper Bear River is listed as having a medium impairment for mercury. This impairment is suspected to be a result of resource extraction (a.k.a. abandoned mines) (SWQRB 2009).

After crossing Yankee Slough, the project would pass through the North American Subbasin (Basin Number 5-21.64). The North American Subbasin is bounded on the north by the Bear River, on the east by a north-south line extending from the Bear River to Folsom Lake, on the south by the Sacramento River, and on the west by the Feather River. The subbasin has a surface area of approximately 351,000 acres, and the storage capacity is estimated at 4.9 million acre-feet. The water bearing formations in the subbasin consist of unconsolidated continental deposits of Quaternary to Late Tertiary age. Groundwater levels in the Sutter County portion of the subbasin have generally been stable (DWR 2006c).

Groundwater quality in the North American Subbasin varies from good to marginal. When compared to applicable water quality standards and guidelines for drinking and irrigation water, elevated levels of total dissolved solids, chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron manganese, and arsenic are present in some areas of the subbasin. Total dissolved solids concentrations exceeding 1000 mg/L are found in an area extending from just south of Nicolaus to Verona. The water chemistry in the area indicates three groundwater types: a magnesium calcium bicarbonate or calcium magnesium bicarbonate; a magnesium sodium bicarbonate or sodium magnesium bicarbonate; and a sodium calcium bicarbonate or calcium sodium bicarbonate groundwater. There are three documented impairments to the groundwater in the North American Subbasin: the former McClellan Air Force Base (AFB), Union Pacific Railroad Yard in Roseville, and the Aerojet Superfund Site (DWR 2006c). The McClellan AFB is located approximately 20 miles south southeast of the southern end of the project route. The Union Pacific Railroad Yard is located approximately 18 miles southeast of the southern end of the project route. The Aerojet Superfund Site is located approximately 20 miles south of the southern end of the project route.

The project would cross two FEMA Flood Insurance Rate Maps in Sutter County (0603940710E and 0603940720E). The project route would within the 100-year floodplain of the Bear River on FIRM 0603940710E (FEMA 2008a) and leave on FIRM 0603940720E near East Nicolaus (FEMA 2008b).

Applicant Proposed Measures

The applicant has incorporated the following applicant proposed measures (APMs) into the project to minimize or avoid impacts on hydrology and water quality. See Chapter 1.0 for a full description of each APM that the applicant has incorporated into the project to avoid or minimize impacts on all resource areas.

APM HYDRO-1: Prepare and implement a storm water pollution prevention plan

APM HYDRO-2: Develop and implement a spill prevention control and countermeasure plan

APM HYDRO-3: Perform a drainage study and comply with setback requirements and county standards

3.9.2 Environmental Impacts and Mitigation Measures

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

LESS THAN SIGNIFICANT. Construction activities that would disturb the ground surface—including grading for new and existing access roads, drilling holes for transmission towers, and demolition and construction of concrete pads for footings of the new towers—could result in soil erosion and sedimentation. In addition, construction activities associated with the proposed tower removal and new tower installation, conductor replacement, crossing structure installation, and access road improvements can introduce hydrocarbons, fluids, lubricants, and other toxic substances from construction equipment into the surrounding environment. Approximately 0.054 acres of permanent fill would be placed where 56 new structure footings are proposed for placement in wetlands or other waters, and 26.75 acres would be temporarily impacted due to ground disturbance near aquatic features located within designated work area boundaries, temporary project roadways, or where existing tower footings already located in wetlands or other waters are to be removed. Impacts to water quality could be significant.

The General Construction Permit requires preparation of a Storm Water Pollution Prevention Plan (SWPPP) that describes erosion and sediment control measures that would be implemented for the project. APM HYDRO-1 indicates that the applicant or its contractor would prepare and implement an SWPPP as part of the project. The SWPPP would include a list of best management practices to control erosion from disturbed areas and reduce runoff. In addition, vegetative cover would be established on the disturbed areas as soon as possible after disturbance. The SWPPP would be designed to achieve the goals and objectives pertaining to the protection of water quality from the general plans for Butte, Yuba, and Sutter counties as well as for the City of Oroville.

APM HYDRO-2 indicates that the applicant or its contractor would develop and implement a Spill Prevention Control and Countermeasure Plan (SPCCP) to minimize the potential for and effects of spills of hazardous, toxic, or petroleum substances during all construction activities. The SPCCP would be included in the SWPPP prior to construction activities. In addition, the applicant indicates they would routinely inspect the construction areas to verify that the control measures specified in the SPCCP are properly implemented and maintained. The applicant would notify its contractors immediately if there were a noncompliance issue and would require compliance.

Impacts related to water quality or waste discharge are not anticipated for operation or maintenance activities associated with the project. Implementation of the SWPPP and SPCCP would reduce potentially significant impacts associated with construction-related erosion, sedimentation, and introduction of hazardous materials or toxic substances to a less than significant level. Therefore, impacts under this criterion would be less than significant.

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 (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)?

LESS THAN SIGNIFICANT. Construction activities associated with the project would not include significant water use or increases in impervious surfaces. In addition, operation and maintenance activities would not include significant water use. Therefore, the project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge, and impacts under this criterion would be less than significant. For more information about water use, refer to Section 3.17, Utilities and Service Systems.

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. As described under significance criteria "a" (above), construction activities that would disturb the ground surface, potentially resulting in soil erosion, include grading for new and existing access roads, drilling holes for transmission towers, and demolition and construction of concrete pads for footings. Approximately 0.054 acres of permanent fill and 26.75 acres of temporary impacts due to ground disturbance near aquatic features would occur. Implementation of the best management practices detailed in the SWPPP (APM HYDRO-1)—particularly the erosion control measures—would minimize the potential for the project to substantially alter the existing drainage pattern along the project route in a manner that would result in substantial erosion or siltation onsite or offsite. Additional requirements related to aquatic feature permitting under Section 404 and 401 of the CWA and Section 1600 of the California Fish and Game Code, as described in Section 3.4, Biological Resources, of this document, would reduce impacts to less than significant.

The applicant or its contractor would also complete a drainage study (APM HYDRO-3) for all of the areas that require grading and new roadways and areas in the 100-year floodplain where tower footings would be installed. The study would include calculations for potential increases in stormwater runoff from project activities including drainage improvements to minimize the risk of flooding in downstream areas due to project activities. The applicant would then incorporate the recommendations for the drainage study into construction plans and comply with county standards for construction in 100-year floodplains.

Additional impacts related to the alteration of existing drainage patterns are not anticipated for any operation or maintenance activity associated with the project. Therefore, impacts under this criterion 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 which would result in flooding on- or off-site?

LESS THAN SIGNIFICANT. Construction activities include the replacement of existing towers. Although the footprint of the replacement towers is slightly larger than the existing towers, the replacement towers are not anticipated to substantially alter existing drainage patterns of the site or area due to the small increase in permanent fill (i.e., 0.054 acres). Temporary impacts include approximately 27 acres of ground disturbance and potential changes in existing drainage patterns. Temporary impacts would be

spread out along the linear footprint of the project work areas; therefore, no one area would have drainage patterns altered. Additionally, the measures as outlined above under item "c" would reduce impacts under this criterion to less than significant levels.

e. Would the project 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?

LESS THAN SIGNIFICANT. The project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. The applicant would perform a drainage study to determine potential increases in runoff water and incorporate the study's recommendation to comply with local county standards (APM HYDRO-3). Therefore, impacts under this criterion would be less than significant.

f. Would the project otherwise substantially degrade water quality?

LESS THAN SIGNIFICANT. As described under significance criteria "a" (above), construction activities that would disturb the ground surface, potentially resulting in soil erosion, include grading for new and existing access roads, drilling holes for transmission towers, and demolition and construction of concrete pads for footings of the new towers. In addition, construction activities associated with the proposed tower removal and new tower installation, conductor replacement, crossing structure installation, and access road improvements can introduce hydrocarbons, fluids, lubricants, and other toxic substances from construction equipment into the surrounding environment.

As a result, impacts to water quality could be significant under this criterion; however, with the implementation of both the SWPPP (APM HYDRO-1) and SPCCP (APM HYDRO-2), potentially significant impacts associated with construction-related erosion, sedimentation, and introduction of hazardous materials or toxic substances would be reduced to a less than significant level. Additionally, impacts related to water quality are not anticipated for operation and maintenance activities associated with the project. Therefore, impacts under this criterion would be less than significant.

g. Would the project 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?

NO IMPACT. No housing construction would occur as part of this project. Therefore, construction and operation of the project would result in no impact under this criterion.

h. Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

LESS THAN SIGNIFICANT. A large portion of the project route would be located within a FEMA-designated Flood Hazard Area. Since new poles would replace existing poles, no new structures would be placed within the FEMA-designated Flood Hazard Area that would impede or redirect flood flows. Although the project is located within a FEMA-designated Flood Hazard Area, new poles would be engineered to withstand stresses associated with their proximity to the waterways (APM HYDRO-3). Therefore, construction and operation of the project would result in a less than significant impact under this criterion.

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. A large part of the project area is within a 100-year flood hazard zone and could expose structures to flooding, including flooding as a result of the failure of a levee or dam. The Thermalito Diversion Dam is located in Oroville, California, five miles upstream from the northern end of the project route. With the implementation of APM HYDRO-3, the new structures constructed within the 100-year flood hazard zone would be engineered to withstand stresses associated with flooding. County standards for construction in the 100-year floodplains would be incorporated into design engineering. Therefore, construction and operation of the project would result in a less than significant impact under this criterion.

j. Inundation by seiche, tsunami, or mudflow?

LESS THAN SIGNIFICANT. There is a very low probability of exposure of people and structures to a seiche, tsunami, or mudflow since the large bodies of water closest to the project area are the Thermalito Diversion Dam, which is approximately 5 miles to the north of the project, and the Pacific Ocean, which is about 90 miles away (Google Earth 2009). Most of the project area is also located on relatively flat ground. Therefore, construction and operation of the project would result in a less than significant impact under this criterion.

References

Google Earth. 2009. Google Earth 5.0 (Web Application). http://earth.google.com. Accessed June 18, 2009.

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