2.8 HYDROLOGY AND WATER QUALITY

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
HYDROLOGY AND WATER QUALITY— Would the proposed project:				
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 of 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 of seiche, tsunami, or mudflow?	☐	☐	☒	☐

SETTING

INTRODUCTION

The proposed project would be located within the San Francisco Bay Hydrologic Basin in California. The proposed project route is in a heavily urbanized area in the city of San Francisco with few drainages. The average precipitation in the area is approximately 20 inches per year (Western Region Climate Center, 2003). The topography of the area varies from generally flat to steep areas around Potrero Hill. Elevations in the general area range from roughly sea level to 200 feet above mean sea level. The elevation varies approximately 25 feet over the proposed project route. The overall groundwater gradient generally flows from the higher elevations of Potrero Hill and Hunters Point to the lower flatter area of the Islais Creek Channel and eventually to the San Francisco Bay. The Islais Creek Channel flows eastward approximately through the center of the project area from under Interstate 280 to the San Francisco Bay (USGS, 2004). Local water features include the San Francisco Bay and the Islais Creek Channel. The San Francisco Bay is located less than 1,000 feet from the project area at either end of the route.

SAN FRANCISCO BAY

The San Francisco Bay (Bay) estuarine system conveys the waters of the Sacramento and San Joaquin rivers into the Pacific Ocean. Located on the central coast of California, the Bay system functions as the only drainage outlet for waters of the Central Valley (Regional Water Quality Control Board [RWQCB], 1995). The Bay supports estuarine habitat, industrial service supply, and navigation in addition to all of the uses supported by the streams flowing into the Bay (Essex Environmental, 2003).

San Francisco Bay is relatively shallow and subject to high rates of sediment input, transport, and redeposition. About 40 percent of the Bay is less than 6 feet deep and about 70 percent is less than 16 feet deep (City of San Francisco, 1994).

LOCAL WATER FEATURES

Surface water bodies that could potentially be affected by the proposed project include creeks and drainages surrounding San Francisco Bay over or beneath which the proposed 115 kV cable line would be installed. In the case of the proposed project route, the closest local water body is the Islais Creek Channel.

Islais Creek Channel

Islais Creek is a tidal inlet between Pier 80 and Pier 90. Historically, Islais Creek was the confluence of several forks (one of which is extant in Glen Canyon) that carried runoff from the southeastern portion of San Francisco and entered the San Francisco Bay just west of the western end of the existing tidal inlet (City of San Francisco, 1994).

Alterations to the drainage system resulted in the culverting of Islais Creek and channeling most of the stream flow into the City's combined sewer/storm drain system, which includes a series of outfalls at the tidal inlet (City of San Francisco, 1994). The creek is the natural drainage outlet for a basin that occupies nearly 5,000 acres (Essex Environmental, 2003) and is approximately 4,800 feet long and varies in width from 325 feet at the head on the western end to 650 feet at the mouth at the eastern end. The average depth is approximately 25 feet (City of San Francisco, 1994). Islais Creek has been completely paved over west of the northbound I-280. Portions of the former creek flow through underground piping that is used for local storm water and sewage conveyance (Essex Environmental, 2003).

PRECIPITATION AND INFILTRATION

The climate in the project area is considered semi-arid Mediterranean, characterized by dry, mild summers and moderately moist, cool winters. Most precipitation falls as rain in the winter and spring, with an average annual precipitation of 18 to 20 inches (Essex Environmental, 2003).

Regional development has played a main role in increasing both the amount of impervious surfaces and the rates of runoff. Surface water flows to the storm drains, which direct the water through the Islais Creek Transport and Storage System to the Southeast Water Pollution Control Plant (WPCP) where it is then treated (Essex Environmental, 2003). The WPCP is located near Third Street and Jerrold Avenue and treats wastewater from the eastern side of the City of San Francisco (San Francisco Public Utilities Commission [SFPUC], 2004). Leakage from the combined storm water/sewer water conveyance system may impact groundwater levels at some locations. Additionally, infiltration of the San Francisco Bay waters occur at some sewer outfalls, where gates and valves intended to prevent infiltration periodically malfunction and allow saltwater to enter the sewer system (Essex Environmental, 2003).

STORM WATER MANAGEMENT

According to a review of the San Francisco Bureau of Engineering Hydraulic section (Essex Environmental, 2003), storm water runoff and sanitary sewage in the Islais Creek Transport and Storage System are conveyed together via Selby Street (from the southwest) and Marin Street (from the north) conveyance systems to the Southeast WPCP. During peak runoff, the capacity of the WPCP could be exceeded and excess runoff is routed around the WPCP via two underground pipes to the Islais Creek Channel (Essex Environmental, 2003).

FLOOD AND INUNDATION POTENTIAL

The City of San Francisco does not participate in the Federal Emergency Management Agency's (FEMA) floodplain identification program (National Flood Insurance Program [NFIP]) and no floodplains have been identified within San Francisco (Essex Environmental, 2003). However the low elevation and proximity to San Francisco Bay makes the project area subject to flooding in the unlikely event of a major tsunami (Essex Environmental, 2003).

GROUNDWATER QUALITY AND USE

Portions of the proposed project reside over the Islais Valley Groundwater Basin. The aerial extent, depth, storage capacity, and yield of this groundwater basin are unknown. Existing uses of the water in the basin, as listed by the RWQCB, include industrial processing and service. No known uses of groundwater have been identified; however, potential future uses have been identified for only non-potable uses due to the historic industrial development, high salinity, and density of contaminated sites (Essex Environmental, 2003).

Groundwater is expected to occur at depths between 5 and 15 feet below ground surface, with the shallowest water table near Islais Creek and San Francisco Bay. Near the Bay, groundwater levels may be tidally influenced; however, it generally flows east toward the Bay (Essex Environmental, 2003).

Leakage from the combined storm water/sewer water conveyance system has contributed to the poor water quality (salinity and fecal coliform levels) of shallow groundwater in the area. Additionally, infiltration of Bay waters occurs at some sewer outfalls, where gates and valves intended to prevent infiltration periodically malfunction and allow saltwater to enter the sewer system (Essex Environmental, 2003).

The project area has been impacted by historic industrial use (nearby hazardous material release sites, landfills, fill from various industrial locations), and contaminated groundwater has been documented at several nearby locations (see Section 2.7, *Hazards and Hazardous Materials*).

REGULATORY CONTEXT

This section describes federal, state, and local regulatory framework that governs hydrology and water quality.

FEDERAL

Under the federal Clean Water Act (CWA) of 1972, the U.S. Environmental Protection Agency (U.S. EPA) established the National Permit Discharge Elimination System (NPDES) program to protect water quality of receiving waters. Discharge of pollutants to receiving water bodies is required to be in compliance with the NPDES permit. Discharge of municipal and industrial wastewater as well as storm water is regulated under the NPDES permit requirements. The NPDES permit lists discharge prohibitions, effluent limitations, and other provisions or monitoring programs deemed necessary to protect water quality.

Under Section 303(d) of the Clean Water Act, states, territories and authorized tribes are required to develop lists of impaired waters. Impaired waters are waters that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans to improve water quality. This process includes development of Total Maximum Daily Loads (TMDL) that set discharge limits for non-point

source pollutants. The Ducheny Bill (AB 1740), passed June 30, 2000, requires the State Water Resources Control Board and its nine Regional Water Quality Control Boards to post this list and to provide an estimated completion date for each TMDL (SWRCB, 2003). The list is administered by the Regional Board, in this case, San Francisco Bay Regional Water Quality Control Board.

Islais Creek is included on the 2002 California 303(d) List for Impaired Water Bodies (RWQCB, 2003b) for ammonia, chlordane, dieldrin, endosulfan sulfate, hydrogen sulfide, petroleum aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) from industrial point sources and combined sewer overflow (RWQCB, 2003b).

STATE

In California, the U.S. EPA has delegated the implementation and enforcement of the NPDES program to the State Water Resources Control Board (SWRCB) and the California Regional Water Quality Control Boards (RWQCBs). The SWRCB shares authority for implementation of the federal CWA and the state Porter-Cologne Act with the RWQCBs (RWQCB, 1995).

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) regulates water quality in California and authorizes SWRCB and nine RWQCBs with implementation and enforcement of the regulations. The project area is regulated under the jurisdiction of the San Francisco Bay RWQCB.

REGIONAL

The water quality in the project area is under the jurisdiction of the San Francisco Bay RWQCB (Region 9). The RWQCB is responsible for protecting the beneficial uses of water resources in the Bay. The RWQCB adopted a Water Quality Control Plan (Basin Plan) in June 1995 and amended it in 2000. The Basin Plan sets forth implementation policies, goals, and water management practices in accordance with the Porter-Cologne Water Quality Control Act. The Basin Plan establishes both numerical and narrative standards and objectives for water quality specific to the Bay Area aimed at protecting aquatic resources. Discharges to the surface waters in the region are subject to the regulatory standards in the Basin Plan.

Construction Activity Permitting

The RWQCB administers the NPDES storm water-permitting program in the San Francisco Bay region. Construction activities on one acre or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). The General Construction Permit requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP is prepared before construction begins. The SWPPP must include specifications for Best Management Practices (BMPs) that would be implemented during construction of the proposed project to control degradation of surface water by preventing the potential erosion of sediments or discharge of pollutants from the construction area. The General Construction Permit program

was established by the RWQCB for the specific purpose of reducing impacts to surface waters that may occur due to construction activities. BMPs have been established by the RWQCB in the California Storm Water Best Management Practice Handbook (2003), and are recognized as effectively reducing degradation of surface waters to an acceptable level. Additionally, the SWPPP must describe measures to prevent or control runoff degradation after construction is complete, and identify a plan to inspect and maintain project elements.

Dewatering

Dewatering operations during excavation activities are regulated under State requirements for storm water pollution prevention and control. Discharge of non-storm water from a trench or excavation that contains sediments or other pollutants to sanitary sewer, storm drain systems, creek bed (even if dry), or receiving waters is prohibited. The RWQCB lists non-storm water discharge controls specifically for dewatering operations (RWQCB, 2003b). These control measures would be implemented by PG&E during construction activities in the project area during dewatering. Discharge of water resulting from dewatering operations would require an NPDES Permit, or a waiver (exemption) from the San Francisco Bay RWQCB, which would establish discharge limitations for specific chemicals, if present.

LOCAL

The Water Supply and Treatment Division of the San Francisco Public Utilities Commission (SFPUC) has the primary responsibility of storage, maintenance, quality control, and distribution of local drinking water supplies. The Division maintains and operates pipelines and several drinking water storage reservoirs that form the Hetch Hetchy water supply system throughout northern and central California.

The San Francisco Bureau of Engineering, Hydraulics Section manages storm water in the project area. Surface and groundwater quality in San Francisco is managed by the RWQCB (Essex Environmental, 2003). The existing storm water conveyance system would not be affected by the proposed project since the proposed project would result in negligible change in the drainage pattern or storm water runoff. See the discussion of impacts (d) and (e) below.

IMPACTS DISCUSSION OF HYDROLOGY AND WATER QUALITY

METHODOLOGY AND SIGNIFICANCE CRITERIA

The analyses of the potential intensity of impacts to hydrology and water quality included a review of available information, such as maps and published reports, that characterize the project area. Site specific surveys were not conducted by specialists to determine the water quality for the project area. To determine the level of significance of the impacts anticipated from the proposed project, the proposed project's effects were evaluated as provided under the revised CEQA guidelines. These guidelines are summarized in the checklist provided at the beginning of this section.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the impacts that would result from construction and operation of the proposed project on hydrology and water quality. The potential hydrology and water quality impacts are expected to result primarily from construction activities associated with the proposed project. Operation and maintenance of the 115 kV cable line would include minimal routine maintenance that would not adversely affect hydrology or water quality in the project area.

Impact HYD-1: The proposed project could result in adverse impacts to groundwater quality. This would be a less than significant impact with implementation of Mitigation Measure HYD-1.

Construction of the proposed project could potentially result in storm water runoff or storm water pollution as well as ground water impacts from trenching. Soils generated during construction would be stored temporarily on the project site and appropriate BMPs would be implemented to prevent runoff from the stockpiles. To minimize the exposure of sediments to runoff, PG&E would ensure that all trenches were backfilled or properly covered at the end of each workday. In cases where backfilling is not feasible, appropriate erosion control features would be implemented. Therefore, the proposed project would not violate any water quality standards or waste discharge requirements that would result in a less than significant impact.

If the construction were to continue beyond one year, PG&E would be required to submit an annual report to the RWQCB at the end of each construction year, describing the performance of the prescribed BMPs and measures to correct BMPs that failed. Upon completion of the proposed project, PG&E would be required to submit a Notice of Termination to the RWQCB to indicate that all phases of construction are complete. Implementation of the plan starts with the commencement of construction and continues though the completion of the proposed project. The SWPPP may include, but is not limited to description of construction materials, practices, and equipment storage and maintenance, a list of pollutants likely to contact storm water, estimate of the construction site area and percent impervious area, site specific erosion and sedimentation control measures, list of provisions to eliminate or reduce discharge of materials to storm water, and BMPs for fuel and equipment storage.

All hydrology and water quality impacts would be less than significant with implementation of identified mitigation measures HYD-1. There would be no change in existing operations and maintenance activities, which are currently in compliance with water quality regulations (Essex Environmental, 2003).

Mitigation Measure HYD-1: After installation of the duct bank, it shall be surrounded with an approved backfill or a fluidized thermal backfill consisting of a blend of sand, gravel, fly ash, and cement above the duct bank. Because the permeability of these materials may be low, a section of drainpipe shall be laid across the trench directly above the sections of the duct bank where concrete backfill has been used at approximately 100-foot intervals to allow groundwater to pass through these materials. Alternatively, gravel drains or other drainage measures may be installed across the cable line.

CHECKLIST IMPACT CONCLUSIONS

a) Proposed project construction could potentially result in localized increased sedimentation and reduced surface water quality. Surface runoff from excavation stockpiles could contain turbid water and sediment if stockpiles are not properly managed. However, since the proposed project is not located on sloped terrain, or adjacent to surface waterways, sedimentation would be controlled using standard engineering and construction practices. Materials removed from excavation would be stored on one of PG&E's construction yards or easements. As a part of the proposed project design, there would be no in-channel work in Islais Creek and construction best management practices would be implemented to minimize sediment transport to the creek. Construction of the proposed project would require the use of motorized heavy equipment, including trucks, cranes, backhoes, and air compressors. This equipment requires fuel and liquid replenishment in the form of gasoline, diesel, lubrication oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids. Surface water and/or groundwater quality could be impacted by an accidental release from a vehicle or motorized piece of equipment or by a release during concrete preparation or pouring for placement of backfill around the duct bank. Such spills could wash into nearby storm drains or infiltrate the soil and violate water quality standards or discharge requirements. However, the volume of material would be small. Implementation of standard construction procedures and precautions as discussed in Section 2.07, *Hazards and Hazardous Materials* would ensure that impacts from construction of the proposed project would be less than significant.

Shallow groundwater in the vicinity of the project area has high levels of total dissolved solids, turbidity, hardness, and can contain high salts concentrations. In general, the water quality in the area is non-potable and can damage pipes and pump equipment. Further, the groundwater recharges relatively rapidly. As a result, dewatering operations necessary for the proposed project would have a temporary effect, if any, on the localized drawdown of water level. Water levels are expected to recover over a short period of time following cessation of dewatering. The magnitude of dewatering proposed for the proposed project would not be long term; therefore the impacts would be minimal. Disposal of groundwater from dewatering would be performed in accordance with RWQCB requirements. Dewatered water would be discharged or collected and disposed of off-site in accordance with all applicable laws and regulations. If dewatered water is to be discharged to adjacent surface waterways, PG&E would obtain a permit from appropriate regulatory agencies.

For the reasons state above, the proposed project would result in less than significant impacts to water quality standards or waste discharge requirements.

b) Although the water table is expected to be below the depth of the trench, some seepage of infiltration water (e.g., leakage from the storm water conveyance system) could occur in the trench. If water accumulates in the trench during project construction, active and/or passive dewatering systems may be installed to allow construction to be completed under dry conditions. Dewatering activities may impact local groundwater levels during construction of the proposed project. The majority of groundwater beneath the city of San Francisco has overall poor quality due to the shallow depth of the water table, surface contaminants that

migrate to the water table, and salt water intrusion. Water quality along the bay margin is also of poor quality due the presence of artificial fill overlying bay mud. For these reasons, the city of San Francisco does not consider shallow groundwater a beneficial source of potable water. Additionally, groundwater dewatering would temporarily lower the groundwater levels in the immediate area. The proposed project would therefore not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Thus, the impact would be less than significant.

c) Ground disturbance caused by the proposed project would be limited to trenching activities between the Potrero and Hunters Point switchyards and small excavations associated with foundation construction for new structures at the switchyards. Neither switchyard would be expanded beyond the existing fence line for the modifications. There would be no ground disturbance at the two excavated materials storage and staging areas located near the switchyards. All ground disturbing activities would occur in previously disturbed areas. With the exception of a few small concrete footings in the switchyards, impervious surface material would not be installed over areas that are presently uncovered. Outside of the switchyards, all ground disturbing activities would be conducted in existing paved roadways, a parking lot, and a vacant lot. As a result, no new sources of runoff are expected, and there would be no impact to existing drainage patterns or surface runoff rates.

d) Because the proposed project would not alter existing drainage patterns through the alteration of a stream course no impacts would be expected to occur.

e) The proposed project would not create or contribute substantial runoff to the drainage system. As discussed in a) above, construction of the proposed project could potentially result in localized accelerated sedimentation and reduced surface water quality. Surface runoff from excavation stockpiles could contain turbid water and sediment. PG&E would be required to develop and implement a SWPPP, as required by the SWRCB and enforced by the San Francisco Bay RWQCB, because the proposed project would disturb over one acre of soil. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of storm water discharge, to implement control practices to reduce pollutants in storm water discharges, and to protect receiving water quality. PG&E must submit a Notice of Intent to the RWQCB prior to the start of construction and maintain a copy of the SWPPP at the job site at all times.

Implementation of the SWPPP, as would be required by the San Francisco Bay RWQCB, would ensure that the potential water quality impacts associated with the proposed construction remain less than significant.

f) Construction of the proposed 115 kV cable line would require trenching, installation of the cable line, junction boxes, and backfilling. Since the water table is expected to be deeper than the trench at most locations, low permeability trench backfill material is not expected to create a new barrier to groundwater flow. The maximum open trench length would be approximately 150 to 300 feet on each street. If the trench were extended below the water table, it could potentially limit groundwater flow. If a highly permeable backfill is used, it

could create a preferential pathway for groundwater, Bay water intrusion, or for the migration of existing subsurface contamination, which could potentially result in a significant impact.

g) The proposed project would not alter existing drainage patterns; therefore, it would not increase the rate or amount of runoff. The proposed project is not expected to cause flooding on- or off-site. The proposed project would not involve the construction of structures that could impede or redirect flows and therefore, no flooding would occur. Since no housing would be constructed as part of the proposed project, no residences would be placed within a 100-year flood hazard area. In addition, the proposed project would not expose people or structures to a significant risk of loss, injury, or death due to flooding. Therefore, there would be no impact.

h) The National Flood Insurance Program (NFIP) designates flood prone areas. There are no areas prone to surface flooding in San Francisco (City of San Francisco, 1997) and therefore, no impact would be expected.

i) The potential for inundation by a tsunami and/or a mudflow exists in the project area. However, since the proposed project is primarily underground and involves only a few aboveground structures, it would not expose the proposed project to the associated hazards. Further, the proposed project would not expose people or structures to the risk of loss, injury, or death involving flooding and therefore would result in no impact.

j) Due to the low elevation and proximity to San Francisco Bay, the project area would be subject to flooding in the unlikely event of a major tsunami; however, because of the low likelihood of this occurring, this is considered a less than significant impact.

REFERENCES – Hydrology and Water Quality

California Regional Water Quality Control Board, 1995. *San Francisco Bay Region Water Quality Control Plan*.

City of San Francisco Planning Department, 1997. An Element of the *Master Plan of the City of San Francisco*.

Essex Environmental, 2003. *PG&E Potrero to Hunters Point 115 kV Cable Project Proponents Environmental Assessment*. December 2003.

San Francisco Public Utilities Commission (SFPUC), 2004. http://sfwater.org/orgDetail.cfm/MO_ID/48 accessed June 20, 2004.

San Francisco Bay Regional Water Quality Control Board, 2003a. BMP 3-01: Non-Storm Water Discharge Control. Dewatering Operations. Attachment 6 to Water Quality Order 2003-0007-DWQ.

San Francisco Bay RWQCB, 2003b, 2002. CWA Section 303(d) List of Water Quality Limited Segment, http://www.swrcb.ca.gov/tmdl/docs/2002reg2303dlist.pdf. Approved by U.S. EPA July 2003.

U.S. Geologic Survey (USGS), 2004. Topographic Quadrant, San Francisco North and South Quadrants, accessed June 20, 2004.

Western Region Climate Center (WRCC), 2003. Comparative Data for the Western States. http://www.wrcc.dri.edu/COMPARATIVE.html accessed June 20, 2004.