D.7 Hydrology and Water Quality

D.7.1 Environmental Setting for the Proposed Project

General Setting

The Proposed Project is located on the central coast of California adjacent to the Pacific Ocean and just west and south of the Irish Hills near San Luis Obispo. The climate is mild year round, with maximum temperatures averaging 69 degrees in October (the warmest month) and low temperatures averaging between 53 degrees in August and 42 degrees in January. Rainfall is highly seasonal, with 84 percent of the average annual 17 inches of precipitation falling between December and April.

Surface Water

Aside from the adjacent Pacific Ocean, Diablo Canyon Creek is the largest surface water feature within the project area. Diablo Canyon Creek drains a watershed of approximately 5 square miles in area in the Irish Hills. The creek passes through the DCPP site, at one point entering an underground culvert that passes beneath a transmission switchyard northeast of Units 1 and 2. The proposed transport route for the RSGs cross 16 small drainageways, the largest of which are Irish Canyon Creek, Pecho Creek, and Rattlesnake Creek. See Figure D.7-1 for a detailed map of these drainageways. All of these drainageways are smaller than Diablo Canyon Creek, and all drain from the Irish Hills to the Pacific Ocean. All three of these drainageways pass beneath the DCPP access road in culverts. Currently, none of these creeks have been declared impaired for water quality by the Regional Water Quality Control Board (RWQCB).

Floodplains

None of the small drainageways in the project area have been mapped for 100-year floodplain by the Federal Emergency Management Agency (FEMA). Based on a regional regression analysis (Waananen and Crippen, 1977), the 100-year discharge of Diablo Canyon Creek is approximately 1,000 cubic feet per second (cfs). In contrast to maximum flows, information provided in the Proponents Environmental Assessment indicates that dry season flows occur as a result of groundwater seepage. Flows tend to be on the order of 0.3 cfs.

FEMA has mapped a coastal flood zone in the vicinity of the DCPP facility. At the location of the power plant, the coastal flood elevation is 21 feet above mean sea level, which is approximately 64 feet below the elevation of DCPP Units 1 and 2.

Groundwater

There are no identified groundwater basins or subbasins beneath DCPP or the proposed RSG transport route as defined by the Department of Water Resources (DWR) or Central Coast Regional Water Quality Control Board (Central Coast RWQCB) (DWR, 2004 and SWRCB, 2004). Also, according to the United States Geological Survey (USGS), no significant aquifers exist in the area (USGS, 1995).

The nearest groundwater subbasin is "Cayucos Valley, Region 3 Subbasin 38," located over one mile north of DCPP. The subbasin is relatively small at 530 acres and has low pumping rates compared to larger subbasins in the region. The subbasin is not under a DWR monitoring program, and no contamination has ever been documented in groundwater samples collected and analyzed from the supply wells (DWR, 2003).

Groundwater is found in the narrow, relatively thin gravel alluvium along Diablo Canyon Creek, in fractures in the bedrock of the Obispo Formation, and along the contact that marks the top of bedrock and the base of some of the extensive terrace and alluvial fan deposits that flank the coast. The main groundwater table beneath the coastal terrace north and south of the DCPP site is controlled by sea level at the coastline and gradually rises beneath the hills southeast of the power plant site. According to PG&E's Updated Final Safety Analysis Report, groundwater has been historically encountered in the stream bed gravels of Diablo Canyon Creek on DCPP property. Additionally, several small, low-flow (less than 0.1 cfs) springs were encountered in 1972 during site preparation for DCPP. The groundwater quality is high in calcium carbonate (hard water) and high in dissolved residue. No other significant groundwater occurrences have been recorded within the project area (PG&E, 2004).

D.7.2 Applicable Regulations, Plans, and Standards

Federal and State Standards

Clean Water Act. The Clean Water Act (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 for industrial and construction activities is delegated to and administered by the nine RWQCBs.

DCPP currently operates under a discharge permit issued by the RWQCB, which allows for discharge of up to 2,760 million gallons of cooling and industrial process wastewater into the Pacific Ocean (RWQCB, 2003b). The State Water Resources Control Board (SWRCB) has adopted a Statewide General NPDES Permit that applies to all storm water discharges associated with construction activity. For those construction activities that disturb one acre or more, the General Permit requires all dischargers to:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water with the intent of keeping all products of erosion from moving offsite into receiving waters.
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation.
- Perform inspections of all BMPs.

Section 401 of the CWA requires that any activity which may result in a discharge 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.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The USACE issues individual site-specific or general (Nationwide) permits for such discharges.

Figure D.7-1. Drainageway Crossings Along RSG Transport Route
CLICK HERE TO VIEW

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Streambed Alteration Agreement. Section 1601 of the California Fish and Game Code requires an agreement between the Department of Fish and Game and a public agency proposing to substantially divert or obstruct the natural flow or effect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The criteria for the project area are contained in the Central Coast Region Water Quality Control Plan (see Basin Plan under Local Ordinances and Policies).

Local Ordinances and Policies

Water Quality Control Plan (Basin Plan) for the Central Coast Region. The Basin Plan for the Central Coast Region is administered by the SWRCB. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the Central Coast region, which includes the project site (Central Coast RWQCB, 1994).

The Basin Plan lists the beneficial uses of surface water and groundwater such as municipal drinking water supply, industrial water supply, agricultural irrigation and agricultural stock water supply, body contact recreation, other non-body contact recreation, aesthetic enjoyment, navigation, aquatic habitat, fish migration habitat, warm spawning habitat, and wildlife habitat. The Pacific Ocean at the location of the Proposed Project is covered by the Basin Plan, which has objectives for dissolved oxygen, pH, and radioactivity.

DCPP and the proposed RSG transport route do not overlie State of California-identified beneficial use groundwater basins or USGS-identified aquifers. Due to the proximity of the Pacific Ocean, the presence of saltwater intrusion typical of coastal settings, and the geologic conditions in the area, it is not likely that significant groundwater resources of beneficial quality exist. However, the Central Coast RWQCB considers any quantity or quality of groundwater to be of potential use (Kukol, 2004a).

D.7.3 Environmental Impacts and Mitigation Measures for the Proposed Project

D.7.3.1 Definition and Use of Significance Criteria

Hydrology and water quality impacts would be considered significant if the project:

- Violates any water quality standard or waste discharge requirement.
- Provides additional sources of polluted runoff, or otherwise degrades water quality to a point that would violate local, State or federal water quality standards.
- Depletes groundwater supplies or interferes with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level to a point that the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted.

- Alters the existing drainage pattern, including alteration of the course of a stream or river, in a manner that would cause flooding or result in erosion or siltation.
- Increases the rate or amount of surface runoff in a manner that would result in flooding, exceed the capacity of existing or planned stormwater drainage systems, or otherwise worsen the risk of flooding.
- Places within a 100-year flood hazard area structures that would be subject to flood damage or would impede or redirect flood flows to the detriment of adjacent property.
- Exposes people or structures to a risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or through inundation by seiche, tsunami, or mudflow.

D.7.3.2 Replacement Steam Generator Transport

RSG transport would involve offloading the generators from a barge at Port San Luis, possible temporary staging of the generators at Port San Luis in a parking lot, and transport of the generators to the DCPP by a towed, heavy-haul transporter with rubber tires. The route would be entirely on existing pavement. While traveling the Access Road, the transporter would cross the 16 small streams described in Section D.7.1 above and shown on Figure D.7-1. The crossings would be on the pavement over existing culverts that were designed and constructed for heavy loads between the Port and DCPP; therefore there would be no impacts during the transport on the Access Road. No disturbance of stream beds is anticipated. Refueling the equipment would take place at the power plant.

Impact W-1: Offloading the generators at Port San Luis could disturb marine sediments or accidentally introduce contaminants to the ocean water

The transport barge would be brought to and secured at the water's edge at Port San Luis. There will be little or no clearance between the barge and the ocean bottom. The proximity of the barge to the bottom, with propeller wash from the tug boats, could disturb underwater sediments and locally reduce water quality. Materials used by vehicles in the offloading process (such as fuel and oil) could accidentally spill and enter ocean water.

According to preliminary surveys conducted by the Applicant, the ocean bottom at the point of offload is sandy. As described in the Section B, the area would be surveyed in more detail by a diver for sensitive marine life before the barge is positioned for offloading, and mats could be used to minimize disturbance to the sea floor (see Section B.3.1.2).

Disturbance of marine sediments is not considered a significant water quality impact because the bed is sandy, offloading would be done at high tide, and no dredging would be required. All marine sediment disturbance would be short-term from offloading activities and would not be likely to substantially degrade water quality.

Spills of materials used by offloading and transport equipment or vehicles could substantially degrade surface water quality, as described under Impacts H-1 (Heavy equipment fuel, oil, or hydraulic line leak or rupture could cause hazardous materials release) and H-2 (Heavy equipment maintenance could cause hazardous materials release) in Section D.6. Although this would be an unlikely occurrence and spills would likely be of small quantities, Mitigation Measures H-1a, H-1b, and H-2a proposed in Section D.6 would ensure that this impact remains less than significant (Class II).

Mitigation Measures for Impact W-1: Offloading the generators at Port San Luis could disturb marine sediments or accidentally introduce contaminants to the ocean water

Mitigation Measures H-1a (Implement DCPP Spill Response Procedures), H-1b (Conduct Routine Inspections and Maintenance of Transporter), and H-2a (Properly Handle Maintenance Waste) identified in Section D.6 would ensure that spill contamination does not cause a significant impact to water quality.

D.7.3.3 Replacement Steam Generator Staging and Preparation

Impact W-2: Construction and use of staging and preparation areas could result in disturbance of sediment or spill of materials that would contaminate stormwater

Staging and preparation would consist of the construction and use of temporary facilities on about two acres of land within the TSA at the DCPP site. The temporary facilities that would be built include a RSG storage facility, a temporary warehouse and laydown area, a personnel training and mock-up facilities area, an office and subcontractor facility, and a containment access facility. Stormwater draining to Diablo Canyon Creek and the Pacific Ocean could be contaminated by spilled materials during construction and use of these facilities. As noted above (Section D.7.2), construction of these facilities will require a SWPPP, which would ensure that soil and sediment disturbance is kept to a minimum and contained to the maximum extent possible. Similar to Impacts H-1 (Heavy equipment fuel, oil, or hydraulic line leak or rupture could cause hazardous materials release) and H-2 (Heavy equipment maintenance could cause hazardous materials release) described in Section D.6, mitigation would be necessary to ensure that spills are kept to a minimum and cleaned up in a timely manner should they occur. Mitigation Measures H-1a and H-2a would ensure that Impact W-2 would be less than significant (Class II).

Mitigation Measures for Impact W 2: Construction and use of staging and preparation areas could result in disturbance of sediment or spill of materials that would contaminate stormwater

Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste) would ensure that Impact W-2 would be less than significant.

D.7.3.4 Original Steam Generator Removal, Transport, and Storage

Impact W-3: Fuel or other contaminants associated with heavy equipment used during OSG removal, transport, and storage could spill and contaminate surface waters

Heavy equipment would be used in the removal and transportation of the original steam generators as well as during construction of the OSG Storage Facility. As described for Impacts H-1 (Heavy equipment fuel, oil, or hydraulic line leak or rupture could cause hazardous materials release) and H-2 (Heavy equipment maintenance could cause hazardous materials release) in Section D.6, fuel or other contaminants associated with heavy equipment used in this operation could spill and contaminate surface waters. Mitigation Measures H-1a and H-2a would reduce this impact to a less than significant level (Class II).

Mitigation Measures for Impact W-3: Fuel or other contaminants associated with heavy equipment used during OSG removal, transport, and storage could spill and contaminate surface waters

Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste) would reduce this impact to a less than significant level.

Flood Hazards

The proposed OSG Storage Facility would be constructed adjacent to Diablo Canyon in an area upstream of the switchyard. Although there may a potential for flooding of this area from overflow of Diablo Creek, or from local drainage, flooding is likely to be shallow and infrequent. As a result, no adverse impact is anticipated from flooding.

D.7.3.5 Replacement Steam Generator Installation

Impact W-4: Fuel or other contaminants associated with heavy equipment used during RSG installation could spill and contaminate surface waters

Heavy equipment would be used in the installation and return to service of the RSGs. As described for Impacts H-1 (Heavy equipment fuel, oil, or hydraulic line leak or rupture could cause hazardous materials release) and H-2 (Heavy equipment maintenance could cause hazardous materials release) in Section D.6, fuel or other contaminants associated with heavy equipment used in this operation could spill and contaminate surface waters. Mitigation Measures H-1a and H-2a would ensure that this impact is reduced to a less than significant level (Class II).

Mitigation Measures for Impact W-4: Fuel or other contaminants associated with heavy equipment used during RSG installation could spill and contaminate surface waters

Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste) would reduce this impact to a less than significant level.

D.7.4 Environmental Impacts and Mitigation Measures for the Alternatives

D.7.4.1 Replacement Steam Generator Offloading Alternative

Offloading the RSGs at the DCPP Intake Cove could disturb marine sediments or accidentally introduce contaminants to the ocean water. This impact would be similar to the impact (Impact W-1) that would occur with the Proposed Project, and mitigation identified for the Proposed Project would reduce the impact to a less than significant level [Mitigation Measures H-1a (Implement DCPP Spill Response Procedures), H-1b (Conduct Routine Inspections and Maintenance of Transporter), and H-2a (Properly Handle Maintenance Waste)] (Class II).

D.7.4.2 Temporary Staging Area Alternatives

Impacts and mitigation measures for all TSA Alternatives are the same as described for the Proposed Project. Impacts would be potentially significant, but mitigable to less than significant levels (Class II) with implementation of Mitigation Measures H-1a and H-2a.

D.7.4.3 Original Steam Generator Storage Facility Location Alternatives

Impacts (Impact W-2) and mitigation measures related to water quality would be the same as the Proposed Project for all of the OSG Storage Facility Location Alternatives. Impacts would be potentially significant, but mitigable to less than significant levels (Class II) with Mitigation Measures H-1a and H-2a. Location-specific flood hazards are discussed below.

OSG Storage Facility Alternative A

OSG Storage Facility Alternative A would be constructed on top of fill that has been placed in Diablo Canyon. Diablo Canyon flow passes beneath the fill in a 10-foot culvert that is designed to convey the 500-year flood. The Probable Maximum Flood would overtop the fill, but would be conveyed around the facility in a channel designed for this purpose. No flooding impacts are expected.

OSG Storage Facility Alternatives B, C, and D

OSG Storage Facility Alternatives B, C, and D would all be located adjacent to Diablo Canyon Creek and outside the main flow path in the event of overtopping of the canyon fill. No adverse impacts related to flooding at OSG Storage Facility Alternatives B, C, or D were identified.

D.7.4.4 Original Steam Generator Offsite Disposal Alternative

Disposal of the OSG at an offsite licensed disposal facility would likely cause no additional adverse hydrologic or water quality impacts. Transportation of the OSG to the offsite facility would cause spill-related impacts similar to those identified in Section D.6 for transport of the RSGs [Impacts H-1 (Heavy equipment fuel, oil, or hydraulic line leak or rupture could cause hazardous materials release) and H-2 (Heavy equipment maintenance could cause hazardous materials release)] (Class II). These impacts could be mitigated to a less than significant level by Mitigation Measures H-1a (Implement DCPP Spill Response Procedures), H-1b (Conduct Routine Inspections and Maintenance of Transporter), and H-2a (Properly Handle Maintenance Waste).

D.7.5 Environmental Impacts of the No Project Alternative

The No Project Alternative would likely involve several new gas turbine power plants plus the transmission lines to distribute the power. It is reasonable to conclude that the hydrology/water quality impacts of several new power plants would be substantially greater than those identified for the Proposed Project because the construction involved with building new power plants, which would involve a much larger scale of construction than does the Proposed Project. Construction of new power plants or other energy infrastructure (e.g., windmill farms) would require much larger project footprints than the Proposed Project. Approximately 25 to 30 acres of land are needed to construct and operate a typical 500 MW combined cycle power plant (CEC, 2002), which would be one of the more likely replacements for the generation lost at DCPP under the No Project Alternative (see Section C.6). Such large footprints require substantial excavation and earth movement, which would likely result in detrimental effects on nearby streams and water bodies as a result of related erosion, sedimentation, and altered water courses. In addition, the greater amounts of construction activity would substantially increase the construction equipment used and therefore the associated risk of a fuel or other chemical (e.g., oil, etc.) spill that could affect local water quality.

The larger scale of construction activity resulting from the No Project Alternative would be expected to cause substantially greater impacts than the Proposed Project.

D.7.6 Mitigation Monitoring, Compliance, and Reporting Table

Table D.7-1 shows the mitigation monitoring, compliance, and reporting program for Hydrology and Water Quality.

Table D.7-1. Mitigation Monitoring Program – Hydrology and Water Quality

IMPACT W-1	Offloading the generators at Port San Luis could disturb marine sediments or accidentally introduce contaminants to the ocean water (Class II)
MITIGATION MEASURE	Implement Mitigation Measures H-1a (Implement DCPP Spill Response Procedures), H-1b (Conduct Routine Inspections and Maintenance of Transporter), and H-2a (Properly Handle Maintenance Waste).
Location	As in Mitigation Measures H-1a, H-1b, and H-2a (see Table D.6-5)
Monitoring / Reporting Action	As in Mitigation Measures H-1a, H-1b, and H-2a (see Table D.6-5)
Effectiveness Criteria	As in Mitigation Measures H-1a, H-1b, and H-2a (see Table D.6-5)
Responsible Agency	CPUC
Timing	During all steam generator replacement activities
IMPACT W-2	Construction and use of staging and preparation areas could result in disturbance of sediments or spill of materials that would contaminate stormwater (Class II)
MITIGATION MEASURE	Implement Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste).
Location	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Monitoring / Reporting Action	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Effectiveness Criteria	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Responsible Agency	CPUC
Timing	During all steam generator replacement activities
IMPACT W-3	Fuel or other contaminants associated with heavy equipment used during OSG removal, transport, and storage could spill and contaminate surface waters (Class II)
MITIGATION MEASURE	Implement Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste).
Location	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Monitoring / Reporting Action	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Effectiveness Criteria	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Responsible Agency	CPUC
Timing	During all steam generator replacement activities
IMPACT W-4	Fuel or other contaminants associated with heavy equipment used during RSG installation could spill and contaminate surface waters (Class II)
MITIGATION MEASURE	Implement Mitigation Measures H-1a (Implement DCPP Spill Response Procedures) and H-2a (Properly Handle Maintenance Waste).
Location	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Monitoring / Reporting Action	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Effectiveness Criteria	As in Mitigation Measures H-1a and H-2a (see Table D.6-5)
Responsible Agency	CPUC
Timing	During all steam generator replacement activities

D.7.7 References

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