D.12 Hydrology and Water Resources

D.12.1 Regional Setting and Approach to Data Collection

Climate and General Setting

The climates of western Arizona and southeastern California are characterized by hot, dry summers and mild to cold winters. Precipitation totals are low with occasional desert summer monsoon conditions over the eastern part of the route and seasonally heavy precipitation occurring during the winter months in the extreme western portion of the Proposed Project route. As indicated in Section D.11, Air Quality Table D.11-1 (Monthly Average Temperatures and Precipitation), average summer (June-August) high and low temperatures in the study area are 109°F and 57°F, respectively. Average winter (December-February) high and low temperatures in the study area are 73°F and 36°F. The average annual precipitation in the study area ranges from 3.98 inches (Blythe, California) to 10.67 inches (Grand Terrace, California). Over 75 percent of the annual precipitation in Grand Terrace occurs between December and March, whereas for Blythe and Buckeye, Arizona, the precipitation is divided into two distinct seasons: the summer monsoon and the winter storm season. Rainfall during the summer monsoon is characterized by brief, intense, local summer thunderstorms. Winter storms are more widespread, longer in duration, and generally with relatively lower rainfall temperatures.

Streams and Watercourses

Streams and watercourses along the route are primarily desert washes with no water during most of the year. With the exception of the Colorado River, flows for all natural watercourses along the route east of the Devers Substation are activated rarely and only in response to rainfall, particularly to the short, torrential rains that occur in the summer. West of the Devers, natural watercourses are more likely to have flowing water. Most of these watercourses originate in the San Bernardino Mountains, and they may be fed by snowmelt.

The desert washes are typically sandy or rocky bed streams lined on the sides with desert riparian vegetation. Where confined by hills, the washes can be stable and not subject to extensive lateral movement by erosion. Where not confined by hilly terrain, the washes can be very numerous across the alluvial plains downstream of desert mountains. Adjacent washes on these alluvial "fans" may all have the same mountain source, with flow from the mountains potentially entering many channels that run adjacent to each other. Flow in these alluvial plain washes is typically heavily laden with sediment, and erosion of the wash banks and shifting of channel beds is common. The desert valleys are generally wide and flat, with watercourses, particularly in areas with large drainage areas, being hundreds of feet wide. Flows on these washes are very shallow, although there is generally one or more incised channel. Channel bed material and sides in the valley bottoms can be very fine silts and clays, with potential for erosion on very large flows in the incised channels. Whereas there is some overlap in wash type, for purposes of this analysis, the desert washes are classified as "desert wash," "alluvial fan," or "desert valley wash."

The proposed route crosses some agricultural areas, particularly along the Colorado River. Irrigation canals constitute the predominant hydrologic feature in these areas. In the urban areas west of the Devers Substation, many of the natural drainage ways have been confined into concrete-lined channels or underground storm drains. Refer to Sections D.12.2.1 through D.12.3.5 for the specific locations of identified watercourses along the various proposed route segments.

Floodplains

Federal Emergency Management Agency (FEMA) floodplains are delineated for some of the watercourses crossed by the proposed route, but most are not delineated. The basic purpose of these maps is to show the predicted extent of the 100-year flood for insurance and floodplain management purposes. All of the natural watercourses along the route have floodplains, whether delineated or not. The absence of a delineated floodplain does not necessarily mean the flood or erosion hazard is nonexistent.

Groundwater

The portion of the route between the Harquahala Switchyard and Devers Substation is underlain by basin fill groundwater aquifers contained in unconsolidated alluvial deposits of Pliocene through Holocene age. The basin fill receives most of its groundwater recharge through the coarse sediments deposited in the alluvial fans. The aquifers are typically beneath the valleys that are separated by the desert mountains. West of Devers, most groundwater is in the Coastal Basin aquifers consisting of sand and gravels that might be interbedded with confining units of fine-grained material, such as silt and clay. The aquifers and confining units compose the aquifer system. With the exception of the area in the immediate vicinity to the Colorado River, where groundwater is approximately 10 feet below the ground surface, groundwater in the project area is typically 100 to 250 feet below the ground surface. Water enters these aquifers mainly through streambeds where the water table is lower than the water level in the stream (USGS, 2006b).

Water Quality

Water quality along the route is generally good. None of the waterbodies crossed by the route are listed as impaired[1] (SWRCB, 2006; ADEQ, 2006), although many of the streams crossed by the route in California drain to the Salton Sea, which is classified as impaired (SWRCB, 2006).

Data Collection

Data collection for this analysis was performed during a field visit to the proposed route, review of aerial photographs, review of topographic maps, and review of groundwater and water quality characteristics data from agency websites. Identification of surface water crossings was done using aerial photographs and available topographic maps. Water crossings identified are those that are readily identifiable by these means.

D.12.2 Environmental Setting for the Proposed Project – Devers-Harquahala

D.12.2.1 Harquahala to Kofa National Wildlife Refuge

Surface water resources along this segment of the route is typical of the desert washes portion of the route. There are at least 21 identified watercourse crossings, of which five are water supply and irrigation conduits, as shown in Table D.12-1. There are two desert valley wash crossings. All of the natural watercourses are typically dry. Groundwater resources are as described in Section D.12.1.

[1] The Clean Water Act Section 303(d) defines an "impaired" waterbody as one that has quality below the applicable water quality standards.

D.12.2.2 Kofa National Wildlife Refuge

Surface water resources along this segment of the route are typical of desert washes, as described in Section D.l2.1. There are at least 18 identified watercourses that would be crossed in this segment of the proposed route (see Table D.12-1). Groundwater resources are as described in Section D.12.1.

D.12.2.3 Kofa National Wildlife Refuge to Colorado River

This portion of the route contains at least 15 water crossings, all of which are either typical desert washes or desert valley washes, with the exception of the Colorado River (see Table D.12-1). This segment includes the Colorado River, which is the only natural river or stream east of the Devers Substation with permanent flow. The Colorado River is the dominant watercourse for all of Arizona, much of eastern and southern California, and large parts of Nevada, Colorado, and Utah.

Groundwater in this segment can typically be found between 100 and 200 feet below the ground surface; however, close to the Colorado River (approximately between MP 101.0 and 102.2), groundwater lies at an average depth of 10 feet below the ground surface (Palo Verde Irrigation District, 2006).

D.12.2.4 Palo Verde Valley (Colorado River to Midpoint Substation)

Other than the Colorado River, surface water in this segment of the proposed route is dominated by irrigation canals (see Table D.12-1). Natural drainage in this area is carried either in the irrigation canals or in channels that may also serve as irrigation return canals.

Groundwater in the Palo Verde Valley is hydraulically connected to the Colorado River and lies at an average depth of 10 feet below the ground surface (Palo Verde Irrigation District, 2006).

D.12.2.5 Midpoint Substation to Cactus City Rest Area

This portion of the route contains at least 23 identified surface water crossings, all of which may be classified as having the characteristics of alluvial fan washes, meaning the actual number of drainage crossings is much higher (see Table D.12-1). Groundwater resources for this segment are as described in Section D.12.1.

D.12.2.6 Cactus City Rest Area to Devers Substation

Eight water crossings are identified for this portion of the route (see Table D.12-1), all of which are classified as desert washes, but show characteristics of alluvial fans. Groundwater resources for this segment are the same as described in Section D.12.1.

Table D.12-1. Surface Water Crossings – Devers-Harquahala

Milepost	Description
Harquahala to Kofa National Wildlife Refuge	
E2.9 to E4.0	levee reservoir
E4.4	Granite Reef Aqueduct
E6.3	desert wash
E6.6	desert wash
E7.0	desert wash
E7.3	desert wash
E7.7	desert wash
E8.4	desert wash
E9.6	CAP Aqueduct
E10.8	desert wash
E11.1	desert wash
E11.3	desert wash
E11.5	desert wash
E11.9	desert wash
E12.6 to E12.8	desert wash
E13.7	desert wash
E14.3	CAP Aqueduct
E18.6	CAP Aqueduct
E30.3 to E31.0	CAP Aqueduct/Centennial Wash
E33.2	Yuma Tank Wash (desert valley wash)
E45.0	Upper Bouse Wash (desert valley wash)

Milepost	Description
Kofa National Wildlife Refuge	
E54	desert wash
E58.5 to E58.8	braided desert wash (desert valley wash)
E59.5	desert wash
E60.1	desert wash
E60.8	desert wash
E61.4	desert wash
E61.5	desert wash
E62.0	desert wash
E62.3	desert wash
E63.5	desert wash
E64.8	desert wash
E70.6	desert wash
E72.9 to E73.3	French Wash (desert valley wash)
E73.6	desert wash
E73.8	desert wash
E74.1	desert wash
E74.3	desert wash
E74.5 to E74.8	desert wash

Milepost	Description
Kofa National Wildlife Refuge to Colorado River	
E82.6	Tyson Wash (desert valley wash)
E82.8	Tyson Wash Braid (desert valley wash)
E85.3	desert wash
E88.7	desert wash
E90.4	La Paz Arroyo (desert valley wash)
E91.5	La Paz Arroyo (desert valley wash)
E93.6 to E93.7	desert wash
E94.1	desert wash
E95.3 to E95.5	Ehrenberg Wash (desert valley wash)
E96.5	desert wash
E97.3	Limekiln Wash (desert valley wash)
E96	desert wash
E98.9	desert valley wash
E99.0 to E99.1	desert valley wash
E101.5 to E102.2	Colorado River

Milepost	Description
Palo Verde Valley	
E102.2 to E102.4	Colorado River
E102.9	F Canal
E103.8	F Canal
E104.3	canal
E105.1	Eastside Drain
E106.0	canal
E106.9	C Canal
E107.4	canal
E107.7	canal
E108.6	C-05 Canal
E109.0	Westside Drain
E109.9	C-03 Canal
E110.5	canal
E111.0	canal
E111.4	Rannells Drain
E112.0	canal
E112.5	canal
E112.7	desert wash

Table D.12-1. Surface Water Crossings – Devers-Harquahala

Milepost	Description
Midpoint Substation to Cactus City Rest Area	
E127.9	alluvial fan wash
E141.0 to E145.0	Corn Springs Wash (alluvial fan wash)
E148.4	alluvial fan wash
E148.9	alluvial fan wash
E149.9	alluvial fan wash
E150.3	alluvial fan wash
E150.8	alluvial fan wash
E151.5 to E152.6	alluvial fan wash
E153.6	alluvial fan wash
E154.1	alluvial fan wash
E156.8	alluvial fan wash
E157.4	alluvial fan wash
E158.9	alluvial fan wash
E160.3	alluvial fan wash
E160.6	alluvial fan wash
E161.1 to E161.4	alluvial fan wash
E165.3	Red Cloud Wash (alluvial fan wash)
E167.7	alluvial fan wash
E170.9	alluvial fan wash
E172.3	alluvial fan wash
E181.9 to E185.5	Shavers Valley (alluvial fan braided wash)
E186.1	alluvial fan wash
E187.9	alluvial fan wash
Cactus City Rest Area to Devers Substation	
E189.1	desert wash
E191.1	Thermal Canyon (desert wash)
E193.9	desert wash
E194.3	desert wash
E194.8	desert wash
E195.6	desert wash
E211.3	Thousand Palms Canyon (desert wash)
E224.9	Mission Creek (desert wash)

Source: Field Visit Map Atlas, June 13, 2005; West of Devers Segment Aerial Photo Base Preliminary Arrangement, June 10, 2005; USGS Quad Maps via http://www.topozone.com; Delorme Southern and Central California Atlas & Gazetteer, 1998.

D.12.3 Environmental Setting for the Proposed Project – West of Devers

The climate of the project area west of Devers Substation results in more rainfall compared to east of the Devers Substation, and natural watercourses are more likely to have flowing water. Most of the watercourses in the West of Devers segments originate in the San Bernardino Mountains and can be fed by snowmelt in the winter. For example, the San Gorgonio River generally has flow in the winter months, with January and February being the highest, and little or no flow in the summer (USGS, 2006b). These streams are characterized by being relatively steep and rocky with high sediment loads and, particularly downstream of the mountain confinement, subject to lateral erosion.

D.12.3.1 Devers Substation to East Border of Banning

Fifteen water crossings are identified for this portion of the route (Table D.12-2), all of which are mountainous desert washes. The drainage pattern along this segment of the proposed route is generally north to south. Groundwater resources for this segment are the same as that described in Section D.12.1.

D.12.3.2 Banning and Beaumont

This portion of the route contains 10 water crossings (Table D.12-2). It crosses the San Gorgonio River three times and is parallel to the river for approximately 3.5 miles. The regional terrain of this area consists of mountains and valleys with valley floors transitioning from desert to grasslands. The water crossings west of San Gorgonio River are mountain washes, which are in or adjacent to steep or mountainous terrain where the vegetation is typical of a grassland environment. Groundwater resources for this segment are the same as described in Section D.12.1.

D.12.3.3 Calimesa and San Timoteo Canyon

There are at least 11 water crossings in this segment of the proposed route (see Table D.12-2). The terrain of this area is generally mountainous. The proposed route is parallel to San Timoteo Canyon for 11 miles. Groundwater resources in this route segment are the same as those described in Section D.12.1.

D.12.3.4 San Bernardino Junction to Vista Substation

There is one surface water crossing of a mountain wash at Reche Canyon in this segment of the proposed route at MP V2.0. The setting along this segment of the proposed route is generally mountainous and urban. Groundwater resources applicable to this segment are as described in Section D.12.1.

D.12.3.5 San Bernardino Junction to San Bernardino Substation

There are two watercourse crossings in this segment of the proposed route (see Table D.12-2). The general setting of the area is urban with the exception of near the Scott Canyon crossing, which has some limited open space. The San Timoteo Wash is lined with concrete at the proposed route crossing. Groundwater resources for this segment are the same as described in Section D.12.1.

Table D.12-2. Surface Water Crossings – West of Devers

Milepost	Description
Devers Substation to East Border of Banning	
W0	desert wash
W0.3	desert wash
W1.4	desert wash
W2.4	Super Creek (desert wash)
W3.3 to W3.5	Whitewater River (desert wash)
W6.3	Cottonwood Canyon (desert wash)
W7.0	Stubbe Canyon Wash (desert wash)
W7.3	desert wash
W7.7	desert wash
W9.0	desert wash
W9.1	desert wash
W9.4	desert wash
W10.4	Lion Canyon (desert wash)
W11.0 to W11.3	Deep Canyon (desert wash)
W11.9 to W12.1	Millard Canyon (desert wash)

Milepost	Description
Banning and Beaumont	
W14.7 to W14.9	Potrero Creek (desert wash)
W15.2 to W15.4	San Gorgonio River
W16.8 to W17	San Gorgonio River
W17.6 to W18	San Gorgonio River
W18.7	mountain wash
W19.2	mountain wash
W19.6	Montgomery Creek (mountain wash)
W21.4	Smith Creek (mountain wash)
W23.7	Noble Creek (mountain wash)
W24.4	Little San Gorgonio Creek (mountain wash)

Milepost	Description
Calimesa and San Timoteo Canyon	
W29.6	San Timoteo Wash (mountain wash)
W30.2	mountain wash
W31.1	mountain wash
W33.0	mountain wash
W34.5	mountain wash
W35.2	mountain wash
W36.9	mountain wash
W37.3	mountain wash
W38.1	mountain wash
W39.5	mountain wash
W39.8	Scott Canyon (mountain wash)

Milepost	Description
San Bernardino Junction to San Bernardino Substation	
W40.4	Scott Canyon (mountain wash)
W41.6	San Timoteo Creek (drainage channel)

D.12.4 Applicable Regulations, Plans, and Standards

Federal

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 is delegated to and administered by the nine Regional Water Quality Control Boards (RWQCB). In Arizona, NPDES permitting authority is administered by the Arizona Department of Environmental Quality (ADEQ) under the Arizona Pollution Discharge Elimination System (AZPDES).

Projects that disturb one or more acres are required to obtain NPDES coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity in California, and the coverage under the General Permit for Discharge from Construction Activities in Arizona. The Construction General Permits require the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP describes Best Management Practices (BMPs) the discharger will use to protect storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a waterbody listed on the U.S. Environmental Protection Agency (EPA)'s 303(d) list for sediment.

Section 401 of the CWA requires that any activity, including river or stream crossings during transmission line construction that may result in a discharge into a State waterbody, must be certified by the applicable RWQCB in California and the ADEQ in Arizona. 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 (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues individual site-specific or general (Nationwide) permits for such discharges.

State

Arizona Title 49. Title 49 of the Arizona Revised Statutes is a codification of statutes relating specifically to the natural environment. Under Title 49, the ADEQ has the authority to administer water quality and environmental programs in the State of Arizona.

California 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.

California Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (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 water quality criteria for the portions of the project in California are governed by the Santa Ana and Colorado River Basin RWQCBs.

Regional and Local

Most counties and cities in Arizona and California have floodplain and drainage regulations that regulate floodplain development. These regulations generally prohibit floodplain development that will result in flooding of the development, and prohibit floodplain development that will result in adverse flooding impacts on other property. For instance, floodplain encroachments that raise water levels on other property are generally prohibited, as are diversions and concentrations of flow.

D.12.5 Significance Criteria and Approach to Impact Assessment

This section explains how impacts are assessed including the presentation of the significance criteria in Section D.12.5.1 on which impact determinations are based. Section D.12.5.2 lists the Applicant Proposed Measures relevant to hydrology and water resources impacts, and Section D.12.5.3 lists all impacts identified for the Proposed Project and alternatives.

D.12.5.1 Significance Criteria

Hydrology and water resources impacts will be considered significant if the project:

- Violates any water quality standards or waste discharge requirements, creates new sources of polluted runoff, or otherwise substantially degrades water quality.
- Substantially depletes groundwater supplies or interferes 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).
- Places within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise substantially alters 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 offsite.
- Substantially increases the rate or amount of surface runoff in a manner which would result in flooding on- or offsite, or otherwise creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems.
- Places 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.
- Results in or is subject to damage from inundation by seiche, tsunami, or mudflow.

D.12.5.2 Applicant Proposed Measures

Applicant Proposed Measures (APMs) were identified by SCE in its CPCN Application to the CPUC. Table D.12-3 presents the APMs that are relevant to this section. Impact analysis assumes that all APMs will be implemented as defined in the table; additional mitigation measures are recommended in this section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

Table D.12-3. Applicant Proposed Measures – Hydrology and Water Resources

APM No.	Description
APM W-1	During the first year following construction, potential soil erosion sites will be inspected by the Holder after each major rainstorm as access permits. For the purpose of this measure, a major rainstorm is defined as any singular storm where the total precipitation exceeds the arithmetic mean for similar events in the area and results in flooding. Examples include cloudbursts (high quantity, short duration) or storms where saturated soils produce runoff (high quantity, long duration).
APM W-2	Construction equipment will be kept out of flowing stream channels except when absolutely necessary to construct crossings.
APM W-3	Erosion control and hazardous material plans will be incorporated into the construction bidding specifications to ensure compliance.

Table D.12-3. Applicant Proposed Measures – Hydrology and Water Resources

APM No.	Description
APM W-4	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, will be used to prevent scour and/or inundation by a 100-year flood.
APM W-5	Towers will be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows.
APM W-6	Diversion dikes will be required to divert runoff around a tower structure if (a) the location in an active channel cannot be avoided; and (b) where there is a very significant flood scour/deposition threat, unless specifically exempted by the BLM Authorized Officer.
APM W-7	Runoff from roadways will be collected and diverted from steep, disturbed, or otherwise unstable slopes.
APM W-8	Ditches and drainage concourses will be designed to handle the concentrated runoff, will be located to avoid disturbed areas, and will have energy dissipations at discharge points.
APM W-9	Cut and fill slopes will be minimized by a combination of benching and following natural topography where possible.

D.12.5.3 Impacts Identified

Table D.12-4 lists the impacts identified for the Proposed Project and alternatives, along with the significance of each impact. Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (adverse, but less than significant), and Class IV (beneficial).

Table D.12-4. Impacts Identified – Hydrology and Water Resources

Impact No.	Description	Impact Significance
Proposed Project		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II
H-5	Excavation could degrade groundwater quality	Class III
H-6	Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion.	Class II
SCE Harquahala-West Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II
SCE Palo Verde Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II

Table D.12-4. Impacts Identified – Hydrology and Water Resources

Impact No.	Description	Impact Significance
Harquahala Junction Switchyard Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II
Desert Southwest Transmission Project Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II
H-5	Groundwater quality degradation through project-related excavation	Class III
Alligator Rock–North of Desert Center Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
Alligator Rock–Blythe Energy Transmission Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
Alligator Rock–South of I-10 Frontage Alternative		
H-1	Construction activity could degrade water quality due to erosion and sedimentation	Class III
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
Devers-Valley No. 2 Alternative		
H-2	Degradation of water quality through spill of potentially harmful materials used in construction	Class II
H-3	Increased runoff from new impervious areas resulting in flooding or increased erosion downstream	Class III
H-4	Water quality degradation caused by accidental releases of oil from project facilities	Class II
H-6	Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion.	Class II

D.12.6 Environmental Impacts and Mitigation Measures for the Proposed Project – Devers-Harquahala

This section presents discussion of impacts and mitigation measures for the 500 kV portion of the DPV2 Project. The discussion is divided into six geographic areas, three in Arizona and three in California. Within each area, both construction impacts and operational impacts are addressed.

D.12.6.1 Harquahala to Kofa National Wildlife Refuge

Construction Impacts

Impact H-1: Construction activity could degrade water quality due to erosion and sedimentation (Class III)

Construction of the overhead transmission line towers would require excavation and grading for construction of access roads, spur roads, and towers. Disturbance of soil during construction could result in soil erosion and lowered water quality through increased turbidity and sediment deposition into local streams.

APMs W-1 through W-3, and W-7 through W-9 (see Table D.12-3) are intended to reduce the amount of erosion and sedimentation that would result from construction. In addition, a Stormwater Pollution Prevention Plan (SWPPP) would be required in accordance with ADEQ guidelines. With the implementation of the APMs defined above and the required SWPPP, construction-related water quality degradation from soil erosion and sedimentation would be less than significant (Class III). No mitigation is required.

This impact would be the same for all of the proposed route segments and alternatives and therefore is not addressed further in the subsequent route segment discussions, with the exception of the Devers-Valley No. 2 Alternative (see Section D.12.9.1).

Impact H-2: Degradation of water quality through spill of potentially harmful materials used in construction (Class II)

Table B-6 in Section B (Project Description) lists the types of equipment that would be used during construction of the Proposed Project. Accidental spills or disposal of potentially harmful materials used during construction could occur during refueling or due to equipment damage. Spilled liquids could wash into and pollute surface waters or groundwater. Materials that could potentially contaminate the construction area due to spills or leaks include diesel fuel, gasoline, lubrication oil, hydraulic fluids, antifreeze, transmission fluid, lubricating grease, and other fluids.

APMs W-2 and W-3 (see Table D.12-3) were designed in part to reduce the potential for water quality degradation from spills and leaks during construction. However, even with the implementation of these APMs and the required SWPPP, construction-related water quality degradation could occur. This impact would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant. This impact is similar to Public Health and Safety Impact P-1 (Soil contamination as a result of improper handling and/or storage of hazardous materials during construction activities), which is discussed in Section D.10.6.1. This impact applies to all proposed route segments and alternatives.

Mitigation Measures for Impact H-2: Degradation of water quality through spill of potentially harmful materials used in construction

P-1a **Develop Hazardous Substance Control and Emergency Response Plan.**

P 1b **Conduct environmental training and monitoring program.**

P 1c **Ensure proper disposal of construction waste.**

P 1d **Maintain emergency spill supplies and equipment.**

Operational Impacts

Impact H-3: Increased runoff from new impervious areas resulting in flooding or increased erosion downstream (Class III)

Construction of tower foundations and access or spur roads could result in additional runoff through creation of impervious areas and compaction of soils. Impervious areas and compacted soils generally are less able to absorb rainfall, so increased flood peaks are a common occurrence in developed areas. Project construction may result in small local increases in runoff, but the total area affected by construction would be very small in comparison to the total watershed. Further, the area of this segment of the proposed route is very sparsely developed, and any small increase in runoff that could increase flooding is not likely to have an appreciable impact. Implementation of APM W-8 would ensure that the adverse affects associated with increased runoff from new impervious areas would be less than significant (Class III). No mitigation is required. This impact is the same for all of the proposed and alternative route segments and therefore is not addressed further under the other route segment discussions.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

This segment would include construction within the Harquahala Switchyard and the construction of a new series capacitor (MP E52.9). Oil from new electrical equipment at the Harquahala Switchyard and the Arizona series capacitor banks could be released accidentally, contaminating local surface water. Implementation of APM W-3 (see Table D.12-3) requires development of hazardous material plans that would minimize the potential for accidental releases to cause water quality degradation. This impact would be potentially significant (Class II); however, with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.6.1.

Mitigation Measures for Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities

P-4a Prepare Spill Prevention, Countermeasure, and Control Plans.

D.12.6.2 Kofa National Wildlife Refuge

Construction Impacts

As described in Section D.12.6.1, Impact H-1 (Construction activity could degrade water quality due to erosion and sedimentation) and H-2 (Degradation of water quality through spill of potentially harmful materials used in construction) would occur on every route segment. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant. This impact is similar to Public Health and Safety Impact P-1 (Soil contamination as a result of improper handling and/or storage of hazardous materials during construction activities), which is discussed in Section D.10.6.2.

Operational Impacts

Impact H-3 (Increased runoff from new impervious areas resulting in flooding or increased erosion downstream) would occur on every route segment, and is addressed in Section D.12.6.1 above. This impact would be less than significant (Class III).

This segment would not include construction of a substation or switchyard that could result in an accidental release of oil, so Impact H-4 would not occur.

D.12.6.3 Kofa National Wildlife Refuge to Colorado River

Construction Impacts

As described in Section D.12.6.1, Impact H-1 (Construction activity could degrade water quality due to erosion and sedimentation) and H-2 (Degradation of water quality through spill of potentially harmful materials used in construction) would occur on every route segment. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant. This impact is similar to Public Health and Safety Impact P-1 (Soil contamination as a result of improper handling and/or storage of hazardous materials during construction activities), which is discussed in Section D.10.6.3.

Impact H-5: Excavation could degrade groundwater quality (Class III)

As described in Section D.12.2.3, this segment of the Proposed Project generally has groundwater between 100 and 200 feet, but near the Colorado River (between MP 101.0 and 102.2) groundwater is at only 10 feet. Excavation for tower foundations in shallow groundwater could contaminate groundwater if spills of hazardous materials were to occur in the excavation pits. However, discharge of spilled pollutants into these excavated areas would be minimized by the hazardous material plans required pursuant to APMs W-3 (see Table D.12-3). Impacts to groundwater would be less than significant (Class III) and mitigation measures are not required.

Operational Impacts

Impact H-3 (Increased runoff from new impervious areas resulting in flooding or increased erosion downstream) would occur on every route segment, and is addressed in Section D.12.6.1 above. This impact would be less than significant (Class III). This segment would not include construction of a substation or switchyard that could result in an accidental release of oil, so Impact H-4 would not occur.

D.12.6.4 Palo Verde Valley (Colorado River to Midpoint Substation)

Construction Impacts

Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental

training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Impact H-5: Excavation could degrade groundwater quality (Class III)

Excavation for tower foundations in shallow groundwater could contaminate groundwater if accidental material spills were to occur in the excavation pits. Groundwater in the Palo Verde Valley is hydraulically connected to the Colorado River and lies at an average shallow depth of 10 feet below the ground surface. However, discharge of spilled pollutants into these excavated areas would be minimized by the hazardous material plans required pursuant to APMs W-3 (see Table D.12-3). Impacts to groundwater would be less than significant (Class III) and mitigation measures are not required.

Operational Impacts

This segment would not include a substation or switchyard that could result in an accidental release of oil, therefore Impact H-4 would not occur. Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.6.5 Midpoint Substation

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur at the Midpoint Substation site because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3: Increased runoff from new impervious areas resulting in flooding or increased erosion downstream (Class III)

Construction of the Midpoint Substation could result in additional runoff through creation of impervious areas and compaction of soils. There may be a small local increase in runoff by this process, but the total area affected would be very small in comparison to the total watershed. Further, this area is very sparsely developed, and any small increase in runoff is not likely to have an appreciable impact. Implementation of APM W-8 would reduce the adverse local effects of this impact. This impact is less than significant (Class III). No mitigation is necessary.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from electrical equipment at the Midpoint Substation could be released accidentally and contaminate local surface water. However, implementation of APM W-3 requires development of hazardous material plans that would minimize this occurrence. However, this impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Preven-

tion, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.6.5.

D.12.6.6 Midpoint Substation to Cactus City Rest Area

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the Series Capacitor at Red Cloud Mine Road could be released accidentally and contaminate local surface water or groundwater. APM W-3 requires development of hazardous material plans that would minimize this occurrence. However, Impact H-4 would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.6.6.

D.12.6.7 Cactus City Rest Area to Devers Substation

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.6.8 Devers Substation

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur at the Devers Substation site because groundwater in the area is very deep. Impacts H-1 and H-2 have the potential to occur during construction of the Devers Substation upgrades, same as for the route segments that are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 has the potential to occur during construction of the Devers Substation upgrades, same as for the route segments that are addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the Devers Substation could be released accidentally and contaminate local surface water. However, implementation of APMs W-3 require development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.6.8.

D.12.7 Environmental Impacts and Mitigation Measures for the Proposed Project – West of Devers

D.12.7.1 Devers Substation to East Border of Banning

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-6: Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion (Class II)

Encroachment of a project structure into a water flow path could result in erosion damage to the encroaching structure. This impact would likely occur only if transmission line towers or other permanent project features were constructed in or closely adjacent to a watercourse. Although the project description states that watercourses would be avoided where possible, complete avoidance may be difficult in some areas. A review of detailed maps of the estimated proposed tower locations in this segment indicates that proposed Towers 201, 203, and 238 would be at risk to erosion damage.

APMs W-4 through W-6 were designed by SCE to avoid the adverse local effects related to floodplain encroachment by avoiding watercourses where possible, ensuring foundations are adequate to resist scour, and constructing diversion dikes in severe cases (see Table D.12-3). Although diversion dikes would protect the proposed structures, they could result in adverse impacts to adjacent property through diversion and concentration of flows. However, implementation of Mitigation Measure H-7a would ensure that diversion dikes be designed to avoid damage to adjacent properties. Impacts would be is less than significant (Class II).

Mitigation Measure for Impact H-6: Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion.

H-6a **Design diversion dikes to avoid damage to adjacent property.** Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes shall be designed to avoid increasing the risk of erosion or flooding onto adjacent areas where life or property could be threatened. Diversion dike designs shall be submitted to the CPUC and BLM for review and approval at least 60 days prior to construction.

D.12.7.2 Banning and Beaumont

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-6: Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion (Class II)

A review of detailed maps of the estimated proposed tower locations in this segment indicates that proposed Towers 260, 104, and 105 would be at risk to erosion damage. APMs W-4 through W-6 were designed by SCE to avoid the adverse local effects related to floodplain encroachment by avoiding watercourses where

possible, ensuring foundations are adequate to resist scour, and constructing diversion dikes in severe cases (see Table D.12-3). Although diversion dikes would protect the proposed structures, they could result in adverse impacts to adjacent property through diversion and concentration of flows. However, implementation of Mitigation Measure H-6a (Design diversion dikes to avoid damage to adjacent property) would result in less than significant impacts (Class II).

D.12.7.3 Calimesa and San Timoteo Canyon

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.7.4 San Bernardino Junction to Vista Substation

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the Vista Substation could be released accidentally and contaminate local surface water. However, implementation of APM W-3 requires development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.7.4.

D.12.7.5 San Bernardino Junction to San Bernardino Substation

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this segment because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the Vista Substation could be released accidentally and contaminate local surface water. However, implementation of APM W-3 requires development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.7.5.

D.12.8 Alternatives for Devers-Harquahala

D.12.8.1 SCE Harquahala-West Alternative

Environmental Setting

This alternative crosses three irrigation canals in an agricultural area west of Harquahala, then crosses the Tiger Wash, the Centennial Wash, the CAP Canal, and a series of small desert washes located about 500 to 1,000 feet apart from Milepost HW9 to HW21.1 (Table D.12-5). The Centennial Wash is typical of the desert valley washes in being wide and flat. The other washes are typical desert washes with sandy beds. Alluvial fan characteristics are not present, as the washes appear relatively stable. All of the natural watercourses are dry at most times. Groundwater resources for this alternative are the same as those described in Section D.12.1.

Table D.12-5. Surface Water Crossings – SCE Harquahala-West Alternative

Milepost	Description
HW1.1	canal
HW2.1	canal
HW3.1	canal
HW4.2	Tiger Wash (desert wash)
HW6.4	Centennial Wash (desert valley wash)
HW9	CAP Canal
HW9.0 to HW21.1	desert wash (every 0.1 to 0.2 miles)

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

There is no risk of damage to adjacent property from flood diversion (Impact H-6). Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the Harquahala could be released accidentally and contaminate local surface water. However, implementation of APM W-3 require development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.8.1.

D.12.8.2 SCE Palo Verde Alternative

Environmental Setting

This alternative crosses four large desert washes as well as a series of unnumbered smaller washes associated with the Old Camp Wash (Table D.12-6). All are typical desert washes with sandy bed and dry except after intense rainfalls. Groundwater resources are for this alternative are the same as described in Section D.12.1.

Table D.12-6. Surface Water Crossings – SCE Palo Verde Alternative

Milepost	Description
PV3	desert wash
PV3.8	desert wash
PV5.2	desert wash
PV8.1	desert wash
PV11.8 to PV12.6	Old Camp Wash (desert wash)

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

There is no risk of damage to adjacent property from flood diversion (Impact H-6). Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from new electrical equipment at the PVNGS Switchyard could be released accidentally and contaminate local surface water. However, implementation of APM W-3 requires development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.8.2.

D.12.8.3 Harquahala Junction Switchyard Alternative

Environmental Setting

The Harquahala Junction Switchyard would be located in an area of typical sand bed desert washes. Groundwater resources for this alternative are the same as described in Section D.12.1.

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

There is no risk of damage to adjacent property from flood diversion (Impact H-6).

Impact H-3: Increased runoff from new impervious areas resulting in flooding or increased erosion downstream (Class III)

Construction of the Harquahala Junction Switchyard could result in additional runoff through creation of impervious areas and compaction of soils. There may be a small local increase in runoff by this process, but the total area affected would be very small in comparison to the total watershed. Further, this area is very sparsely developed, and any small increase in runoff is not likely to have an appreciable impact. Implementation of APMs W-8 would reduce the adverse local effects of this impact. This impact is less than significant (Class III). No mitigation is necessary.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from electrical equipment at the Harquahala Junction Switchyard could be released accidentally and contaminate local surface water. However, implementation of APM W-3 requires development of hazardous material plans that would minimize this occurrence. This impact would be potentially significant (Class II) and mitigation measures are not required. This impact would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.8.3.

D.12.8.4 Desert Southwest Transmission Project Alternative

Environmental Setting

With the exception of reroutes near the Blythe and Alligator Rock areas, this alternative is identical to the proposed route. At Alligator Rock, where this alternative deviates from the path of the Proposed Project, there is one fewer watercourse crossing for this alternative due to the proximity of I-10. There are at least 30 identified water crossings (listed in Table D.12-1), all of which have characteristics off alluvial fans, meaning there are many other smaller crossings and the flow path could take almost any course. Groundwater resources are as described in Section D.12.1 for basin and range aquifers.

Construction Impacts

Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

There is no risk of damage to adjacent property from flood diversion (Impact H-6).

Impact H-3: Increased runoff from new impervious areas resulting in flooding or increased erosion downstream (Class III)

Construction of the Midpoint Substation that would be associated with this alternative could result in additional runoff through creation of impervious areas and compaction of soils. There may be a small local increase in runoff by this process, but the total area affected would be very small in comparison to the total watershed. Further, this area is very sparsely developed, and any small increase in runoff is not likely to have an appreciable impact. Implementation of APM W-8 would reduce the adverse local effects of this impact. This impact is less than significant (Class III). No mitigation is necessary.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from electrical equipment at the Midpoint Substation that would be associated with this alternative could be released accidentally and contaminate local surface water or groundwater. APM W-3 requires development of hazardous material plans that would minimize this occurrence. Impact H-4 would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.8.4.

Impact H-5: Groundwater quality degradation through project-related excavation (Class III)

Excavation for tower foundations in shallow groundwater could contaminate groundwater if accidental material spills were to occur in the excavation pits. Groundwater in the Palo Verde Valley is hydraulically connected to the Colorado River and lies at an average shallow depth of 10 feet below the ground surface. However, discharge of spilled pollutants into these excavated areas would be minimized by the hazardous material plans required pursuant to APM W-3 1 (see Table D.12-3). Impacts to groundwater would be less than significant (Class III) and mitigation measures are not required.

D.12.8.5 Alligator Rock–North of Desert Center Alternative

This alternative crosses an area that is primarily the lower end of alluvial fans originating in the Chuckwalla Mountains. During heavy rains flow on these alluvial fans could take almost any path, although there would be some concentrations due to the presence of the freeway. Groundwater resources are as described in Section D.12.1 for basin and range aquifers.

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

In this segment, there is no risk of damage to adjacent property from flood diversion (Impact H-6). Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.8.6 Alligator Rock–Blythe Energy Transmission Alternative

Environmental Setting

This alternative crosses three identified watercourses, all of which are desert washes with alluvial fan characteristics. Groundwater resources are as described in Section D.12.1 for basin and range aquifers.

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

On this segment, there is no risk of damage to adjacent property from flood diversion (Impact H-6). Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.8.7 Alligator Rock–South of I-10 Frontage Alternative

Environmental Setting

The setting for this alternative is the same as for the Desert Southwest Alternative in the Alligator Rock area.

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impacts H-1 and H-2 would occur on every route segment, and are addressed in Section D.12.6.1 above. Impact H-1 would be less than significant (Class III) and no mitigation is required. However, Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Operational Impacts

There is no risk of damage to adjacent property from flood diversion (Impact H-6). Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

D.12.9 Alternatives for West of Devers

D.12.9.1 Devers-Valley No. 2 Alternative

Environmental Setting

This alternative crosses 22 natural watercourses, including several crossings of the San Gorgonio River in locations where the river is in a braided condition with potential for flow to follow several channel paths (see Table D.12-7. Groundwater resources are the same as described in Section D.12.1.

Table D.12-7. Surface Water Crossings – Devers-Valley No. 2 Alternative

Milepost	Description
DV0.6	desert wash
DV0.9	desert wash
DV1.95	desert wash
DV2.5	Garnet Wash
DV4.2	Whitewater River
DV4.4	desert wash
DV6.2 to DV6.75	San Gorgonio River
DV7.3	desert wash
DV13.2 to DV13.4	San Gorgonio River
DV14.8 to DV15.15	San Gorgonio River
DV15.5	mountain creek
DV18.6 to DV18.7	Montgomery Creek
DV19.4	Montgomery Creek
DV20.4	Smith Creek
DV20.65	mountain creek
DV20.75	Smith Creek
DV21.35 to DV22	Smith Creek
DV24.05	Potrero Creek
DV28.6	Lamb Canyon
DV29	mountain creek
DV31.5	San Jacinto River
DV35.3	valley creek

Construction Impacts

Groundwater quality degradation (Impact H-5) would not likely occur along this alternative because groundwater in the area is very deep. Impact H-2 would occur on every route segment, and is addressed in Section D.12.6.1 above. Impact H-2 would be potentially significant (Class II), but with the implementation of Mitigation Measures P-1a (Develop Hazardous Substance Control and Emergency Response Plan), P-1b (Conduct environmental training and monitoring program), P-1c (Ensure proper disposal of construction waste), and P-1d (Maintain emergency spill supplies and equipment) it would be reduced to less than significant.

Impact H-1: Construction activity could degrade water quality due to erosion and sedimentation (Class II)

Impact H-1 applies as described in Section D.12.6.1. However, this alternative is particularly sensitive for the reason that a portion of this alternative is on Forest Service land in areas of very steep terrain. There is a concern that construction of the power line would result in increased erosion in these areas, with long-term adverse water quality impacts. Implementation of the Applicant Proposed Measures and the required SWPPP would address short-term construction impacts. However, long-term impacts may still occur in some sensitive areas because of the steepness of the terrain. Implementation of Mitigation Measure H-1a would reduce potentially significant impacts to less than significant levels (Class II).

Mitigation Measure for Impact H-1: Water quality degradation through soil erosion and sedimentation from construction activity and access roads.

H-1a **Restore disturbed soil with re-vegetation or construction of permanent erosion-control structures.** Soil disturbance at towers and access roads shall be the minimum necessary and designed to prevent long-term erosion through revegetation or construction of permanent erosion control structures according to plans to be reviewed and approved by the U.S. Forest Service. Copies of the final approved plans shall be submitted to the CPUC/BLM for their files.

Operational Impacts

Impact H-3 would occur on every route segment, and is addressed in Section D.12.6.1 above.

Impact H-4: Water quality degradation caused by accidental releases of oil from project facilities (Class II)

Oil from electrical equipment at the Devers and Valley Substations could be released accidentally and contaminate local surface water or groundwater. APM W-3 requires development of hazardous material plans that would minimize this occurrence. Impact H-4 would be potentially significant (Class II), but with the implementation of Public Health and Safety Mitigation Measure P-4a (Prepare Spill Prevention, Countermeasure, and Control Plans) this impact would be reduced to less than significant. This impact is similar to Impact P-4 (Soil contamination from accidental spill or release of hazardous materials during project operations and maintenance), which is discussed in Section D.10.9.

Impact H-6: Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion (Class II)

A review of detailed maps of the estimated proposed tower locations of this alternative indicates that Towers DV-27, DV-28, DV-54, DV-60, DV-72, DV-79, DV-81, and DV-82 would be at risk for erosion damage. APMs W-4 through W-6 were designed by SCE to avoid the adverse local effects related to floodplain encroachment by avoiding watercourses where possible, ensuring foundations are adequate to resist scour, and constructing diversion dikes in severe cases (see Table D.12-3). Although diversion dikes would protect the structures, they could result in adverse impacts to adjacent property through diversion and concentration of flows. However, implementation of Mitigation Measure H-6a (Design diversion dikes to avoid damage to adjacent property) would result in less than significant impacts (Class II).

D.12.10 Environmental Impacts of the No Project Alternative

The No Project Alternative is defined in Section C.6. The No Project Alternative includes the assumption that existing transmission lines and power plants would continue to operate. The effects that these facilities cause on the existing environment would not change, so no new impacts would occur from continuing operation of the existing transmission lines and power plants. Also, under the No Project Alternative, the proposed DPV2 project would not be constructed, so the impacts associated with construction and operation of the project would not occur. These potential impacts avoided would include: water quality degradation through erosion, excavation, and hazardous materials spills; increased runoff, and encroachment of project structures in floodplains.

The first component of the No Project Alternative is the continuation of ongoing demand-side actions, including energy conservation and distributed generation. These actions would result in limited or no impacts to hydrology and water resources.

The second component of the No Project Alternative is the continuation of supply-side actions, resulting in potentially increased generation within California or increased transmission into California to serve anticipated growth in electricity consumption. The impacts of new power plants and new transmission lines to hydrology and water resources would be approximately the same, depending on the locations of the project, as those that would occur under the Proposed Project.

D.12.11 Mitigation Monitoring, Compliance, and Reporting Table

Table D.12-8 presents the mitigation monitoring table for Hydrology and Water Resources.

Table D.12-8. Mitigation Monitoring Program – Hydrology and Water Resources

IMPACT H-1	Water quality degradation through soil erosion and sedimentation from construction activity and access roads
MITIGATION MEASURE	H-1a: Restore disturbed soil with re-vegetation or construction of permanent erosion-control structures. Soil disturbance at towers and access roads shall be the minimum necessary and designed to prevent long-term erosion through revegetation or construction of permanent erosion control structures according to plans to be reviewed and approved by the U.S. Forest Service. Copies of the final approved plans shall be submitted to the CPUC/BLM for their files.
Location	Forest Service land in areas of steep terrain
Monitoring / Reporting Action	CPUC/BLM to verify implementation
Effectiveness Criteria	Disturbed soils are re-vegetated or construction of permanent erosion control structures are installed
Responsible Agency	CPUC, BLM
Timing	After construction
IMPACT H-2	Degradation of water quality through spill of potentially harmful materials used in construction (Class II)
MITIGATION MEASURE	P-1a: Develop Hazardous Substance Control and Emergency Response Plan. A Hazardous Substance Control and Emergency Response Plan shall be prepared for the project, and a copy shall be kept onsite (or in vehicles) during construction and maintenance of the project. SCE shall document compliance by submitting the plan to the CPUC or BLM, as appropriate, for review and approval at least 60 days before the start of construction.
Location	All locations along the proposed and alternative routes.
Monitoring / Reporting Action	Review plan, observe construction activities.
Effectiveness Criteria	Contamination is cleaned up as required.
Responsible Agency	CPUC, BLM
Timing	Prior to construction
MITIGATION MEASURE	P-1b: Conduct environmental training and monitoring program. An environmental training program shall be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper Best Management Practice (BMP) implementation, to all field personnel prior to the start of construction. The training program shall emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of potentially hazardous substances) and shall include a review of all site-specific plans, including but not limited to, the project's Storm Water Pollution Prevention Plan and the Hazardous Substances Control and Emergency Response Plan. SCE shall document compliance by (a) submitting to the CPUC or BLM, as appropriate, for review and approval an outline of the proposed Environmental Training and Monitoring Program, and (b) maintaining for monitor review a list of names of all construction personnel who have completed the training program. Best Management Practices, as identified in the project Storm Water Pollution Prevention Plan and the Hazardous Substances Control and Emergency Response Plan, shall be implemented during the construction of the project to minimize the risk of an accidental release and provide the necessary information for emergency response.
Location	All locations along the proposed and alternative routes.
Monitoring / Reporting Action	Review documentation of training

Table D.12-8. Mitigation Monitoring Program – Hydrology and Water Resources

Effectiveness Criteria	Training and monitoring programs educate project staff and workers regarding all regulatory plan requirements.
Responsible Agency	CPUC, BLM
Timing	Prior to and during construction
MITIGATION MEASURE	P-1c: Ensure proper disposal of construction waste. All construction and demolition waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, shall be removed to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
Location	All locations along the proposed and alternative routes.
Monitoring / Reporting Action	Observe construction activities for compliance
Effectiveness Criteria	Construction wastes are disposed of properly
Responsible Agency	CPUC, BLM
Timing	During construction
MITIGATION MEASURE	P-1d: Maintain emergency spill supplies and equipment. Hazardous material spill kits shall be maintained at all construction sites for small spills. This shall include oil-absorbent material, tarps, and storage drums to be used to contain and control any minor releases. Emergency spill supplies and equipment shall be kept adjacent to all work areas and staging areas, and shall be clearly marked. Detailed information for responding to accidental spills and for handling any resulting hazardous materials shall be provided in the project's Hazardous Substances Control and Emergency Response Plan.
Location	All locations along the proposed and alternative routes.
Monitoring / Reporting Action	Observe construction sites and activities for compliance
Effectiveness Criteria	Emergency spill supplies are available at the construction sites
Responsible Agency	CPUC, BLM
Timing	During construction
IMPACT P-4	Water quality degradation caused by accidental releases of oil from project facilities (Class II)
MITIGATION MEASURE	P-4a: Prepare Spill Prevention, Countermeasure, and Control Plans. To minimize, avoid, and/or clean up unforeseen spill of hazardous materials during operation of the proposed facilities, SCE shall update or prepare, if necessary, the Spill Prevention, Countermeasure, and Control plan for each substation, series capacitors, and the switchyard. SCE shall document compliance by providing a copy of the Spill Prevention, Control, and Countermeasures plans to the CPUC or BLM, as appropriate, for review and approval at least 60 days before the start of operation.
Location	All proposed, as well and existing, and alternative substations, switching stations, and series compositor banks.
Monitoring / Reporting Action	Observe construction sites and activities for compliance
Effectiveness Criteria	Excavated soils containing industrial contaminants are properly handled and disposed of.
Responsible Agency	CPUC, BLM.
Timing	During construction
IMPACT H-6	Encroachment into a floodplain or watercourse by permanent aboveground project features resulting in flooding, flood diversions, or erosion (Class II).
MITIGATION MEASURE	H-6a: Design diversion dikes to avoid damage to adjacent property. Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes shall be so designed as to avoid increasing the risk of erosion or flooding onto adjacent property where life, existing improvements or land values could be threatened. Diversion dike designs shall be submitted to the CPUC and BLM for review and approval at least 60 days prior to construction.

Table D.12-8. Mitigation Monitoring Program – Hydrology and Water Resources

Location	Any tower in or adjacent to a watercourse and requiring diversion dikes to protect the tower from the watercourse.
Monitoring / Reporting Action	Dike designs shall be submitted to the CPUC/BLM for review and approval. CPUC/BLM to take steps to ensure compliance. Steps may include requesting modifications to the plans, seeking approval from appropriate local, State or federal agencies, or consulting with adjacent landowners.
Effectiveness Criteria	Dike design is approved by CPUC/BLM.
Responsible Agency	CPUC, BLM
Timing	Plans to be approved prior to tower construction.

D.12.12 References

ADEQ (Arizona Department of Environmental Quality). 2006. 2004 303(d) List, Assessment Categories, and TMDL Schedule. http://www.azdeq.gov/environ/water/assessment/305-04.html. Accessed February 7.

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