

4.11 HYDROLOGY AND WATER QUALITY

This section provides a discussion of the existing hydrology and water quality environment and an analysis of potential impacts from implementation of the proposed project. This section summarizes information provided in the *Conceptual Drainage Report* (November 2009) and *Water Quality Management Plan* (April 2010). The *Conceptual Drainage Report* and *Water Quality Management Plan* prepared by RBF Consulting are included in Appendices K and L of this EIR.

4.11.1 Existing Environmental Setting

4.11.1.1 Surface Water

The project area is located within the San Juan Hydrologic Unit (HU). The San Juan HU is divided into Hydrologic Areas (HAs), which are then divided into Hydrologic Sub-Areas (HSAs). The project area is located in the Lower San Juan HSA of the Mission Viejo HA and the Prima Deshecha and Segunda Deshecha HSAs of the San Clemente HA. Specifically, the south segment of the proposed project is in the Segunda Deshecha HSA, the central segment is in the Prima Deshecha HSA, and the north segment is in the Lower San Juan HSA. The Camino Del Rio extension portion of the proposed project is in the Prima Deshecha HSA (San Diego Regional Water Quality Control Board [RWQCB] 1994). The Lower San Juan, Prima Deshecha, and Segunda Deshecha HSAs are shown on Figure 3.8 in Chapter 3, Project Description.

The downstream receiving waters for the project site are San Juan Creek, Prima Deshecha Cañada, and Segunda Deshecha Cañada.

The San Juan HU is a generally trapezoid-shaped area of 500 square miles, and includes the Cities of Laguna Beach, San Juan Capistrano, Dana Point, and San Clemente, and portions of unincorporated Orange County (County). The two major natural surface water bodies within the San Juan HU are San Juan Creek and San Mateo Creek HSAs (San Diego RWQCB 1994).

San Juan Creek divides the unincorporated communities of Dana Point and Capistrano Beach in Orange County. San Juan Creek originates at the Cleveland National Forest in the Santa Ana Mountains and terminates at the Pacific Ocean at Doheny Beach State Park (San Diego RWQCB 1994).

Prima Deshecha Cañada and Segunda Deshecha Cañada are the two main streams that flow through the City of San Clemente. Prima Deshecha Cañada originates near the Prima Deshecha Landfill and flows along Camino De Los Mares, underneath the San Diego Freeway (Interstate 5 [I-5]) and North El Camino Real, before discharging into the Pacific Ocean at Poche Beach. Segunda Deshecha Cañada flows through the Talega development, along Avenida Pico, under I-5 and North El Camino Real, before discharging into the Pacific Ocean at North Beach (County of Orange, 2009).

Surface Water Quality. As discussed in further detail below under 4.11.2, Regulatory Setting, Juan Creek is impaired for p,p'-Dichlorodiphenyldichloroethylene (DDE) and indicator bacteria. Prima Deshecha Cañada and Segunda Deshecha Cañada are impaired for phosphorus and turbidity.

4.11.1.2 Groundwater

The project site is located within the San Juan Valley Groundwater Basin, as designated by the California Department of Water Resources. The San Juan Valley Groundwater Basin is bounded on the west by the Pacific Ocean. The remainder of the groundwater basin is bound by Tertiary semipermeable marine deposits. Recharge to the San Juan Valley Groundwater Basin is derived from the percolation of flow in San Juan Creek, Oso Creek, and Arroyo Trabuco and infiltration of precipitation. Groundwater flows southwest toward the Pacific Ocean (California Department of Water Resources 2004).

At the project site, groundwater in the form of perched groundwater and/or seepage, with standing depths as shallow as 10 feet below ground surface (bgs), was observed in many borings drilled as part of the geotechnical investigation for the proposed project.

Groundwater Quality. Water in the San Juan Valley Groundwater Basin is primarily calcium bicarbonate or bicarbonate-sulfate based below the upper reaches of the valleys, and calcium-sodium sulfate or sulfate-chloride based near the coast. In general, total dissolved solids (TDS) content increased from below 500 milligrams per liter (mg/L) in the upper reaches of the valleys to near 2,000 mg/L near the coast. Groundwater is impaired by TDS in the western portion of the basin and fluoride near the springs in Thermal Canyon (California Department of Water Resources 2004).

4.11.1.3 Floodplains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06059C0526J (December 3, 2009), the project site crosses Zone A of the Prima Deshecha Cañada 100-year floodplain. Zone A is defined as “special flood hazard areas subject to inundation by the 1% annual change flood event; no base flood elevations determined.”

4.11.1.4 Drainage

In the south segment of the proposed project, the Talega and Forster Ranch developments include drainage systems that convey off-site runoff from the southern undeveloped portion of the project area. The Talega and Forster Ranch systems are tributary to Segunda Deshecha Cañada and Prima Deshecha Cañada watersheds, respectively. The central portion of the proposed project, through the Prima Deshecha Landfill, is undeveloped, with no humanmade drainage systems. Runoff in the central segment is tributary to the Prima Deshecha Cañada watershed. In the north segment of the proposed project, there are seven existing culverts along existing La Pata Avenue between the Landfill and the north project limits. These seven cross culverts are tributary to San Juan Creek.

4.11.2 Regulatory Setting

4.11.2.1 Federal Regulations

Clean Water Act. In 1972 the Federal Water Pollution Control Act (later referred to as the Clean Water Act [CWA]) was amended to require that the discharge of pollutants into waters of the United States from any point source be effectively prohibited unless the discharge is in compliance with a

National Pollutant Discharge Elimination System (NPDES) permit. In 1987, the CWA was again amended to require that the United States Environmental Protection Agency (EPA) establish regulations for the permitting of storm water discharges (as a point source) by municipal and industrial facilities and construction activities under the NPDES permit program. The regulations require that Municipal Separate Storm Sewer System (MS4) discharges to surface waters be regulated by an NPDES permit.

The CWA requires states to adopt water quality standards for water bodies and have those standards approved by the EPA. Water quality standards consist of designated beneficial uses for a particular water body (e.g., wildlife habitat, agricultural supply, fishing), along with water quality criteria necessary to support those uses. Water quality criteria are set concentrations or levels of constituents—such as lead, suspended sediment, and fecal coliform bacteria—or narrative statements that represent the quality of water that support a particular use. Because California had not established a complete list of acceptable water quality criteria for toxic pollutants, the EPA Region IX established numeric water quality criteria for toxic constituents in the form of the California Toxics Rule (CTR).

When designated beneficial uses of a particular water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as impaired. Once a water body has been deemed impaired, a total maximum daily load (TMDL) must be developed for each impairing water quality constituent. A TMDL is an estimate of the total load of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (often with a “factor of safety” included, which limits the total load of pollutants to a level well below that which could cause the standard to be exceeded). Once established, the TMDL is allocated among current and future dischargers into the water body.

The receiving waters for the project site, as described in greater detail below, have constituents on the 303(d) list and are considered impaired; however, no TMDLs have been developed to address the impairments.

National Flood Insurance Act. The National Flood Insurance Act established the National Flood Insurance Program, which is based on the minimal requirements for floodplain management and is designed to minimize flood damage within special flood hazard areas. As discussed previously, the project site crosses Zone A of the Prima Deshecha Cañada 100-year floodplain according to the FEMA FIRM No. 06059C0526J (December 3, 2009).

4.11.2.2 State Regulations

California Porter-Cologne Water Quality Control Act. The federal CWA places the primary responsibility for the control of water pollution and for planning the development and use of water resources within the states, although it does establish certain guidelines for the states to follow in developing their programs.

California’s primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and the RWQCB broad powers to protect water quality and is the primary vehicle for implementation of California’s responsibility under the federal CWA. The Porter-

Cologne Act grants the SWRCB and RWQCB the authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require clean up of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil, or petroleum product.

Each RWQCB must formulate and adopt a water quality plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that an RWQCB may include in its region a regional plan with water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Water Quality Control Plan, Santa Ana River Basin. The San Diego RWQCB has adopted a Water Quality Control Plan (Basin Plan) for its region of responsibility, which includes the proposed project area. The RWQCB has delineated water resource area boundaries based on hydrological features. For purposes of achieving and maintaining water quality protection, specific beneficial uses have been identified for each of the hydrologic areas described in the Basin Plan. The Basin Plan also establishes implementation programs to achieve water quality objectives to protect beneficial uses and requires monitoring to evaluate the effectiveness of the programs. These objectives must comply with the State antidegradation policy (State Board Resolution No. 68-16), which is designed to maintain high-quality waters while allowing some flexibility if beneficial uses are not unreasonably affected.

Beneficial uses of water are defined in the Basin Plan as those necessary for the survival or well-being of humans, plants, and wildlife. The existing beneficial uses for San Juan Creek as designated by the RWQCB in the Basin Plan are listed below.

- **Agricultural Supply (AGR):** Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
- **Industrial Service Supply (IND):** Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
- **Contact Water Recreation (REC-1):** Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, waterskiing, skin diving, scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
- **Non-contact Water Recreation (REC-2):** Includes uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Warm Freshwater Habitat (WARM):** Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

- **Cold Freshwater Habitat (COLD):** Includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
- **Wildlife Habitat (WILD):** Includes water that supports terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

The existing beneficial uses for Prima Deshecha Cañada and Segunda Deshecha Cañada as designated by the RWQCB in the Basin Plan are listed below.

- AGR
- REC-2
- WARM
- WILD

The potential beneficial use for Prima Deshecha Cañada and Segunda Deshecha Cañada as designated by the RWQCB in the Basin Plan is listed below.

- REC-2

The existing beneficial uses of groundwater in the Lower San Juan HSA as designated by the RWQCB in the Basin Plan are listed below.

- **Municipal and Domestic Supply (MUN):** Includes uses of groundwater for community, military, municipal, or individual water supply systems, including but not limited to drinking water supply.
- AGR
- IND

The existing beneficial uses of groundwater in the Prima Deshecha HSA as designated by the RWQCB in the Basin Plan are listed below.

- MUN
- AGR

There are no beneficial uses of groundwater in the Segunda Deshecha HAS designated by the RWQCB in the Basin Plan.

The Basin Plan has established narrative and numeric water quality objectives for inland surface streams that include San Juan Creek, Prima Deshecha Cañada, and Segunda Deshecha Cañada. If water quality objectives are exceeded, the RWQCB can use its regulatory authority to require municipalities to reduce pollutant loads to the affected receiving waters. Relevant water quality objectives for the proposed project are shown in Table 4.11.1.

Table 4.11.1: Water Quality Objectives for All San Diego Region Inland Surface Waters

Constituent	Objective
Ammonia, unionized	Discharge of wastes shall not cause concentrations of unionized ammonia to exceed 0.025 mg/L.
Bacteria, Fecal Coliform	In waters designated for REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a log mean of 200/100 mL, nor shall more than 10 percent of total samples collected during any 30-day period exceed 400/100 mL. In waters designated for REC-2, but not REC-1, the average fecal coliform concentrations for any 30-day period shall not exceed 2,000/100 mL, nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000/100 mL.
Bacteria, E. Coli	In waters designated for REC-1, the steady state e. coli concentration shall not exceed 126/100 mL.
Bacteria, Enterococci	In waters designated for REC-1, the steady state enterococci concentration shall not exceed 33/100 mL.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses. The natural color of fish, shellfish, or other resources shall not be impaired.
Dissolved Oxygen	Dissolved oxygen levels shall not be less than 5.0 mg/L in inland surface waters with designated WARM beneficial use or 6.0 mg/L in inland surface waters designated COLD beneficial use. The annual mean dissolved oxygen concentration shall not be less than 7.0 mg/L more than 10 percent of the time.
Floating Materials	Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.
Oil and Grease	Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses
Pesticides	No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
pH	Changes in normal ambient pH levels shall not exceed 0.5 units in freshwaters with designated COLD or WARM beneficial uses. In inland surface waters, the pH shall not be depressed below 6.5 nor raised above 8.5.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to the extent that presents a hazard to human, plant, animal, or aquatic life.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Suspended and Settable Solids	Waters shall not contain suspended or settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Taste and Odor	Waters shall not contain taste or odor-producing substances in concentrations which cause a nuisance or that adversely affect beneficial uses.
Temperature	At no time or place shall the temperature at any COLD water be increased by more than 5°F above the natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: San Diego Regional Water Quality Control Board, Water Quality Control Plan for the San Diego Region, September 8, 1994.

°F = degrees Fahrenheit

COLD = Cold Freshwater Habitat

mg/L = milligrams per liter

mL = milliliter

pH = percentage of hydrogen

REC-1 = Contact Water Recreation

REC-2 = Non-contact Water Recreation

WARM = Warm Freshwater Habitat

In addition, the Basin Plan has established site-specific water quality objectives. The site-specific objectives for surface waters in the Mission Viejo HA and San Clemente HA, which include San Juan Creek, Prima Deshecha Cañada, and Segunda Deshecha Cañada, are:

- TDS: 500 mg/L
- Chloride (Cl): 250 mg/L
- Sulfate (SO₄): 250 mg/L
- Sodium (Na): 60 mg/L
- Iron (Fe): 0.3 mg/L
- Manganese (Mn): 0.05 mg/L
- Methylene Blue Active Substances (MBAS): 0.5 mg/L
- Boron (B): 0.75 mg/L
- Turbidity: 20 nephelometric turbidity units (NTU)
- Color: 20 units
- Fluoride (F): 1.0 mg/L

The site specific objectives for groundwater in the Lower San Juan HSA, Prima Deshecha HSA, and Segunda Deshecha HSA are:

- TDS: 1,200 mg/L
- Chloride (Cl): 400 mg/L
- Sulfate (SO₄): 500 mg/L
- Sodium (Na): 60 mg/L
- Nitrate (NO₃): 45 mg/L for San Juan Creek HSA
10 mg/L for Prima Deshecha HSA and Segunda Deshecha HSA
- Iron (Fe): 0.3 mg/L
- Manganese (Mn): 0.05 mg/L
- Methylene Blue Active Substances (MBAS): 0.5 mg/L
- Boron (B): 0.75 mg/L
- Turbidity: 5 NTU
- Color: 15 units
- Fluoride (F): 1.0 mg/L

In addition, waters designated as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations (CCR) Title 22, which is incorporated by reference into the Basin Plan.

California Toxics Rule. The CTR provides water quality criteria for certain potentially toxic compounds for inland surface waters, enclosed bays, estuaries, and waters designated with human health or aquatic life uses. Although CTR criteria do not apply directly to the discharges of storm water runoff, the CTR criteria are utilized as benchmarks for toxics in urban runoff. The CTR and other water quality criteria and targets are used as benchmarks to evaluate the potential ecological impacts of storm water runoff to receiving waters. The CTR establishes acute and chronic surface water quality standards for certain water bodies. Acute criteria provide benchmarks for the highest permissible concentration below which aquatic life can be exposed for short periods of time without deleterious effects. Chronic criteria provide benchmarks for an extended period of time (i.e., for 4 days or more) without deleterious effects. The acute CTR criteria have a shorter relevant averaging period (less than 4 days) and provide a more appropriate benchmark for comparison for storm water flows.

CTR criteria are applicable to the receiving water body and therefore must be calculated based on the probable hardness values of the receiving waters. At higher hardness values for receiving waters, certain constituents, including copper, lead, and zinc, are more likely to be complexed (bound with) components in the water column. This, in turn, reduces the bioavailability and resulting potential toxicity of these metals.

Clean Water Act, Section 303, List of Water Quality Limited Segments. The 2006 list of impaired waters (303(d) list) was approved by SWRCB on October 25, 2006, and by the EPA on June 28, 2007. San Juan Creek was listed on the 2006 303(d) list as impaired for 'DDE and indicator bacteria. Prima Deshecha Cañada and Segunda Deshecha Cañada were listed on the 2006 303(d) listed as impaired for phosphorus and turbidity. There are no existing or proposed TMDLs for San Juan Creek, Prima Deshecha Cañada, or Segunda Deshecha Cañada.

Clean Water Act, Section 402, National Pollutant Discharge Elimination System. Direct discharges of pollutants into waters of the United States are not allowed, except in accordance with the NPDES program established in Section 402 of the CWA.

General Construction Permit. On September 2, 2009, the SWRCB adopted the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit); Order 2009-0009-DWQ; NPDES No. CAS000002 (not effective until July 1, 2010). In accordance with NPDES regulations, the State of California requires that any construction activity disturbing 1 acre or more of soil comply with the Construction General Permit. To obtain authorization for proposed storm water discharges pursuant to this permit, the landowner (discharger) is required to submit a Notice of Intent (NOI) to the SWRCB, prepare a Storm Water Pollution Prevention Plan (SWPPP), and implement best management practices (BMPs) detailed in the SWPPP during construction activities. Dischargers are required to implement BMPs meeting the technological standards of Best Available Technology (Economically Achievable) (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution. BMPs include programs, technologies, processes, practices, and devices that

control, prevent, or remove or reduce pollution. Permittees must also maintain BMPs and conduct inspection and sampling programs as required by the permit. Dischargers are also required to comply with monitoring and reporting requirements to ensure that discharges comply with the numeric action levels and numeric effluent limitations specified in the permit.

Certain discharges of non-storm water such as irrigation and pipe flushing/testing are permitted as long as the discharger implements BMPs and complies with the monitoring, sampling, and reporting requirements and the discharge does not cause or contribute to a violation of any water quality standard, violate any provision of the Construction General Permit, violate provisions of the Basin Plan, contain toxic constituents in toxic amounts, or violate numeric action levels and numeric effluent limitations.

The proposed project is subject to the Construction General Permit because it will disturb more than 1 acre of soil during the construction phase.

4.11.2.3 Local Plans and Regulations

County of Orange General Plan. The Resources Element of the Orange County General Plan includes the following policy for water quality that is applicable to the proposed project:

- **Water Resource Component Policy 5, Water Quality:** To protect water quality through management and enforcement efforts.

City of San Clemente General Plan. The Natural Hazards Element of the City of San Clemente General Plan includes the following goal for flooding that is applicable to the proposed project:

- **Flooding Goal:** Restricting of development in flood hazardous zones which lack adequate mitigation.

Please see Appendix N of this EIR for a summary of the project's General Plan consistency pursuant to California Environmental Quality Act (CEQA) Guidelines, California Code of Regulations (CCR) Section 15125(d).

Drainage and Flood Control. Drainage and flood control structures and improvements in the project vicinity are subject to review and approval by the County of Orange, City of San Clemente, or City of San Juan Capistrano. The regulatory and design frameworks pertaining to such facilities include the following:

- **County Regional Facilities:** Facilities owned, maintained, and operated by the County of Orange (County) with watersheds that cover at least 1,000 acres. County regional facilities must be designed to accommodate 100-year frequency storms as outlined in the Orange County Hydrology Manual.
- **County Subregional Facilities:** County facilities consisting of watersheds that range in size from 640 acres to 1,000 acres. Systems with tributary areas of 640 acres or greater must be designed for a 100-year frequency storm event as outlined in the Orange County Hydrology Manual.

- **City Local Facilities:** These are facilities with watersheds less than 640 acres that are owned and maintained by the cities. Facilities with tributary areas less than 640 acres must be designed for a 25-year frequency storm event as outlined in the Orange County Hydrology Manual.

General Waste Discharge Requirement (WDR) Permit for Groundwater Discharges. The San Diego RWQCB requires a permit for discharging wastes to surface waters from activities involving groundwater extraction. Under Order No. R9-2008-0002 (NPDES No. CAG919002), *General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region except for San Diego Bay*, permittees shall be required to monitor their discharges from groundwater extraction waste from construction, remediation, and permanent groundwater extraction projects to ensure that proposed effluent limitations for constituents are not exceeded.

Municipal NPDES Permit. The County of Orange and the Cities of San Clemente and San Juan Capistrano are co-permittees for the Municipal NPDES Permit for the San Diego Region, Order No. R9-2009-0002 (NPDES No. CAS0108740), titled “Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District within the San Diego Region,” which was approved by the RWQCB on December 16, 2009.

To implement the requirements of the MS4 Permit, the co-permittees developed a 2003 Drainage Area Master Plan (DAMP) that includes a Model New Development and Redevelopment Program (Model Program). The DAMP is currently in the process of being updated to include the requirements of the 2009 permit. This Model Program provides a framework and a process for following the MS4 Permit requirements to incorporate watershed protection/storm water quality management principles into the co-permittees’ General Plan process, environmental review process, and development permit approval process.

Per the requirements in the DAMP and the MS4 Permit, the County has adopted a Local Implementation Plan (LIP) implementing the DAMP and MS4 Permit within the co-permittees’ jurisdictions. Using the LIP as a guide, the County will approve Water Quality Management Plans (WQMPs) for new development and redevelopment projects within its jurisdiction as part of the development plan and entitlement approval process. WQMPs for new development and significant redevelopment projects that fall under specific priority project categories must include Site Design and Source Control BMPs. Site-specific Treatment Control BMPs must be included for priority projects unless the project is specifically exempted or if the project is participating in an acceptable regional or watershed Treatment Control program. The priority project categories are those determined by the RWQCB to have the greatest potential to impact receiving waters with polluted runoff. The proposed project is considered a “priority” project because it consists of a roadway project that would create 5,000 or more square feet (0.1 acre) of new impervious surface.

One of the requirements for WQMPs pursuant to the County’s LIP program is that all priority new development and significant redevelopment projects are required to develop and implement a WQMP that addresses the following:

- Consideration of Site Design BMPs (as appropriate)
- Structural and nonstructural Site Design BMPs (as appropriate)
- Treatment Control BMPs (site-specific or regional, if applicable)
- The mechanisms by which long-term operation and maintenance of all Structural BMPs will be provided, as described in DAMP Section 7.6.6

Collectively, the proposed project's Site Design, Source Control, and Treatment Control BMPs are required to address the pollutants of concern identified for the project.

4.11.3 Methodology

Project impacts to hydrology and water quality were evaluated based on the proposed project's adherence to local, State, and federal standards; proposed land use; site design; and proposed BMPs for control of surface runoff and reduction of pollutants in runoff.

4.11.4 Thresholds of Significance

The impact significance criteria used for this analysis are based primarily on Appendix G of the CEQA Guidelines and the County of Orange *Local CEQA Procedures Manual* (2000). The project may be considered to have a significant effect related to hydrology or water quality if implementation would result in one of more of the following:

Threshold 4.11.1: Violate any water quality standards or waste discharge requirements.

Threshold 4.11.2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Threshold 4.11.3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on or off site.

Threshold 4.11.4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site.

Threshold 4.11.5: Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Threshold 4.11.6: Have a significant adverse impact on groundwater quality or otherwise substantially degrade water quality.

- Threshold 4.11.7:** Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Threshold 4.11.8:** Place structures within a 100-year flood hazard area which would impede or redirect flood flows.
- Threshold 4.11.9:** Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Threshold 4.11.10:** Inundation by seiche, tsunami, or mudflow.

4.11.5 Impacts and Mitigation

4.11.5.1 Less Than Significant Impacts

- Threshold 4.11.1:** Violate any water quality standards or waste discharge requirements.
- Threshold 4.11.6:** Have a significant adverse impact on groundwater quality or otherwise substantially degrade water quality.

Construction. The potential impacts of construction activities on water quality focus primarily on sediments, turbidity, and pollutants that might be associated with sediments (e.g., phosphorus and legacy pesticides). Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential mobilization by rainfall/runoff and wind. Such activities include removal of vegetation, site grading, and construction of the proposed structures. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Nonsediment-related pollutants that are also of concern during construction include waste construction materials; chemicals, liquid products, and petroleum products used in construction or the maintenance of heavy equipment; and concrete-related waste streams.

During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. There is also the potential for construction-related pollutants to be discharged into the City and County storm drains during construction activities of the proposed project. For instance, grading activities generate sediment, which has the potential to be washed into storm drains or tracked off site by construction trucks and heavy equipment. In addition, hazardous materials such as paints, solvents, and fuels are used as part of construction activities, and improper use or storage of these materials could affect the storm drain system.

As stated above, the County is required to comply with the State Construction General Permit. The Construction General Permit requires the County to develop and implement a SWPPP, which must include erosion and sediment control BMPs that would meet or exceed measures required by the Construction General Permit, as well as BMPs that control other potential construction-related pollutants. A SWPPP would be developed as required by, and in compliance with, the Construction General Permit. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. The Construction General Permit requires the SWPPP to include a menu of BMPs to be selected and implemented to address erosion and sediment

control as well as control of other potential construction site materials. The BMPs are based on the phase of construction and the weather conditions. BMPs on this menu are expected to include, but are not limited to:

- Revegetation of landscaped areas;
- Hydroseeding, mulching, or other erosion controls for inactive exposed areas;
- Sediment controls such as check dams, desilting basins, fiber rolls, and silt fencing;
- Catch basin inlet protection;
- Construction materials management; and
- Cover and containment of construction materials and wastes.

The SWPPP would address site-specific conditions related to project construction, identify the sources of sediment and other pollutants that may affect the quality of storm water discharges, and describe and ensure the implementation and maintenance of BMPs to reduce or eliminate sediment, pollutants adhering to sediment, and other nonsediment pollutants in storm water as well as non-storm water discharges. Compliance with the Construction General Permit has been determined by the SWRCB to ensure that water quality standards (protection of beneficial uses and adherence to water quality objectives) are adequately protected during the construction period.

BMPs consistent with BAT/BCT are required by the Construction General Permit to be implemented during the construction phase of the project. Erosion and sediment transport and transport of other potential pollutants (e.g., construction material-related pollutants) from the project site during the construction phase would be reduced or prevented through implementation of BMPs meeting BAT/BCT so as to prevent or minimize environmental impacts and to ensure that discharges during the construction phase of the project would not cause or contribute to any exceedance of water quality standards in the receiving waters. In addition, the SWPPP would contain programs for inspections of BMPs (to ensure proper installation and functionality), maintenance of BMPs, training of construction personnel, reporting requirements (for any potential exceedance of water quality standards and any potential noncompliance with the Construction General Permit), and a sampling program for potential nonvisible pollutants in storm water flows. Inspections of the site would be conducted in accordance with the SWPPP. Outside inspections of the site would be conducted at the discretion of the RWQCB under the authority of the Construction General Permit.

Groundwater dewatering is anticipated during construction, particularly during pile driving for the bridge structures. Dewatered groundwater may contain high levels of TDS or other contaminants that could be introduced to surface waters. Prior to the commencement of any discharges of extracted groundwater waste, the County would apply for coverage under San Diego RWQCB Order No. R9-2008-002 (General Waste Discharge Requirements for Groundwater Extraction) or subsequent update. The General Waste Discharge Requirements for Groundwater Discharge Permit requires permittees to conduct monitoring of dewatering discharges and adhere to effluent and receiving water limitations contained within the permit so that water quality of surface waters is ensured protection. Any dewatering activities shall be performed in accordance with the terms and conditions of the Order, and pollutant concentrations in the discharge shall not cause violation of any applicable water quality objectives for the receiving waters, including discharge prohibitions.

In addition, non-storm water dewatering may be required during construction. Construction dewatering on site also may be required if water has been standing and needs to be removed for construction, vector control, or other reasons. Discharges associated with the testing of sprinkler systems or other facilities could also be necessary from time to time during construction. In general, the General Construction Permit authorizes construction dewatering activities and other construction-related non-storm water discharges as long as:

- The discharge does not cause or contribute to violation of any water quality standards;
- The discharge does not violate any other provisions of the General Construction Permit;
- The discharge is not prohibited by the applicable Basin Plan;
- The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment;
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
- The discharge is monitored and meets the applicable Numeric Action Levels (NALs) and Numeric Effluent Limitations (NELs); and
- The discharger reports the sampling information in the Annual Report.

Any construction-related non-storm water discharges would be controlled in compliance with the Construction General Permit to ensure that the impacts of these discharges are appropriately addressed.

Based upon the factors discussed above and adherence to REG WQ-1, which requires compliance with the requirements of the Construction General Permit, and REG WQ-2, which requires compliance with the General Waste Discharge Requirements for Groundwater Discharge Permit, potential construction impacts related to violation of water quality standards or WDRs would be less than significant. No mitigation is required.

Operation. The proposed project would increase the impervious surface area, which would increase the volume of runoff and pollutant loading from the project alignment. The proposed project would result in an approximately 1.4 percent increase in peak flow and 1.1 percent increase in volume. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters.

The proposed project is classified as transportation development. Anticipated pollutants of concern for transportation projects include heavy metals, oil and grease, organic compounds (including petroleum hydrocarbons), sediments, and trash and debris. Potential pollutants of concern for transportation projects include nutrients, bacteria/viruses, pesticides, and oxygen-demanding substances. These constituents are typically found in runoff from transportation developments. Pollutants of concern and their impacts on water quality and aquatic habitat are described in more detail below.

- **Bacteria and Viruses:** Bacteria sampling and analysis are used to indicate relative levels of other pathogens such as viruses. Bacterial levels in urban runoff can exceed public health standards for water contact recreation. Bacteria levels in streams within natural watersheds also can exceed standards for water contact recreation. A common source of bacteria is animal excrement, and other sources include soils and plant materials.
- **Heavy Metals:** Bioavailable forms of trace metals are toxic to aquatic life. The most common metals found in urban runoff are lead, zinc, and copper. Other trace metals such as cadmium, chromium, and mercury are typically not detected or detected at very low levels in urban runoff. Sources of heavy metals in surface waters include emissions and deposits from automobiles, industrial wastewater, and common household chemicals.
- **Nutrients:** Nutrients are typically composed of phosphorus and/or nitrogen. Fertilizers are a main source of nitrogen and phosphorus in urban runoff. Other sources of phosphorus in runoff are lawn clippings and tree leaves that accumulate on streets and in gutters. Elevated levels in surface waters cause algal blooms and excessive vegetative growth. As nutrients are absorbed, the vegetative growth decomposes, utilizing oxygen in the process and reducing dissolved oxygen levels. Dissolved oxygen is critical for support of aquatic life. The ammonium form of nitrogen (found in wastewater discharges) converts to nitrite and nitrate in the presence of oxygen, which further reduces the dissolved oxygen levels in water.
- **Pesticides:** A pesticide is a chemical agent designed to control pest organisms. Pesticides can persist in the environment and can bioaccumulate (concentrate within the body) over several years, resulting in health problems for the affected organism.
- **Organic Compounds:** Organic compounds are carbon-based and are found in pesticides, solvents, and hydrocarbons. Elevated levels can indirectly or directly constitute a hazard to life or health. During cleaning activities, these compounds can be washed off into storm drains. Dirt, grease, and grime may adsorb concentrations that are harmful or hazardous to aquatic life.
- **Sediments:** Natural sediment loads are important to downstream environments by providing habitat, substrate, and nutrition; however, increased sediment loads can result in several negative effects to downstream environments. Excessive sediment can be detrimental to aquatic life by interfering with photosynthesis, respiration, growth, and reproduction. In addition, pollutants that adhere to sediment such as nutrients, trace metals, and hydrocarbons can have other harmful effects on the aquatic environment when they occur in elevated levels.
- **Trash and Debris:** Trash and debris can have a significant effect on the recreational value of a water body and aquatic habitat. It also can interfere with aquatic life respiration and can be harmful or hazardous to aquatic animals that mistakenly ingest floating debris.
- **Oxygen-demanding Substances:** Oxygen-demanding substances include plant debris (such as leaves and lawn clippings), animal wastes, and other organic matter. Microorganisms utilize dissolved oxygen during consumption of these substances, which reduces a water body's capacity to support aquatic life.
- **Petroleum Hydrocarbons:** Petroleum hydrocarbons include oil and grease, benzene, toluene, ethyl benzene, xylene (constituents in gasoline), and polyaromatic hydrocarbons. Sources of petroleum hydrocarbons include parking lots and roadways, leaking storage tanks, auto emissions, and improper disposal of waste oil. Some of these materials can be toxic to aquatic life at low concentrations.

The proposed project would be subject to the new development/significant redevelopment requirements of the County DAMP/LIP. The DAMP/LIP requires preparation of a WQMP and implementation of postconstruction BMPs to address pollutants of concern and hydrologic conditions of concern for a project's storm water runoff. Postconstruction BMPs are the practices, procedures, policies, prohibitions, schedules of activities, structures, or devices that are implemented to prevent or minimize pollutants coming in contact with precipitation, storm water runoff, or non-storm water flows in the postconstruction phase of development. BMPs are also structures or devices that remove pollutants from storm water runoff before it enters receiving waters or storm drain and sewer systems. BMPs are often categorized as either "Source Control," "Site Design," or "Treatment Control" BMPs.

As specified in REG WQ-3, the project would implement several Source Control and Treatment Control BMPs to reduce the discharge of pollutants of concern to the maximum extent practical. Site Design BMPs attempt to mimic a site's natural hydrologic regime by reducing impervious surface area, conserving natural areas, maintaining natural drainage courses, and minimizing clearing and grading. Site Design BMPs are not incorporated into the proposed project because, in order to construct a four-lane roadway, the impervious area and direct connection of impervious areas cannot be minimized.

Source Control BMPs are measures that focus on reducing or eliminating runoff and controlling sources of pollutants during operation of the project. Source control BMPs include measures designed to prevent pollution at the source, that is, to prevent storm water from contacting potential pollutants. Source Control BMPs are generally simple, low-maintenance, cost-effective, and are broadly applicable. Source Control BMPs considered for the proposed project are listed in Table 4.11.2.

Treatment BMPs utilize treatment mechanisms to remove pollutants that have entered storm water runoff. The proposed project would implement Treatment Control BMPs to target roadway pollutants of concern. Six extended detention basins are proposed that would target sediment, nutrients, metals, bacteria, trash, oil and grease, and organics. Three of the extended detention basins may be substituted with bioretention BMPs, whose pollutant removal efficiencies would equal or exceed that of the extended detention basin. In addition, Low Impact Development (LID) BMPs are proposed at 16 locations along the proposed roadway that would target heavy metals, phosphorus, nitrogen, sediment, oil and grease, and bacteria. LID BMPs may include bioretention areas with underdrains, vegetated bioswales, landscaped areas with detention, bioretention planter boxes, or other LID biofiltration BMPs. Proposed BMPs will be designed to meet the requirements of Order No. R9-2009-0002. Proposed locations of the Treatment Control BMPs are shown in Figure 3.8, presented previously in Chapter 3.

With implementation of Source Control and Treatment Control BMPs that target roadway constituents of concern, as specified in REG WQ-3, impacts related to violation of water quality standards or WDRs from operation of the proposed project would be less than significant. No mitigation is required.

Table 4.11.2: Source Control BMPs

Identifier	Name	Project-Specific Application
Routine Nonstructural BMPs		
N3	Common Area Landscape Management	Ongoing maintenance would be consistent with the County Water Conservation Resolution or city equivalent. In addition, fertilizer and/or pesticide usage would be consistent with the County Management Guidelines for Use of Fertilizers (DAMP Section 5.5), or the city equivalent. Landscape areas would be inspected weekly for trash and debris, and waste would be disposed of. Irrigation systems would be inspected monthly. To avoid overwatering of vegetation, if excessive runoff is observed, the automatic timers would be adjusted.
N4	BMP Maintenance	The county and/or city would be responsible for the inspection and maintenance of structural BMPs within their boundaries. This includes being responsible for restenciling of catch basins as required.
N7	Spill Contingency Plan	The CASC Program would be utilized to address any spills that may occur. The city's emergency spill response plan would be utilized if the spill occurs outside of the CASC Program. A spill response kit that contains absorbent materials would be maintained in accordance with county and/or county and city ordinances.
N11	Common Area Litter Control	Landscape areas within the public right-of-way would include the removal of trash as part of the normal landscape maintenance process. Trash removal would occur weekly within the public right-of-way, which includes the parkways and drainage facilities. Additionally, the appropriate county and/or city would be responsible for weekly street sweeping.
N12	Employee Training	<p>Employees of the county and city or employees of contractors working for the county or city would be trained in regards to the importance of water quality issues. Employees would be trained for inspection, maintenance, and recordkeeping of the following BMPs on site:</p> <ul style="list-style-type: none"> • Source Control BMPs • Treatment Control BMPs <p>County and/or city employees and contractors would be periodically trained on the proper maintenance practices for components of this project. Street maintenance, storm drain maintenance, and landscaped area maintenance would all be part of the training to reduce potential sources of pollutants.</p> <p>The education of applicable employees for water quality orientation implementing the WQMP would be conducted within 30 days of the employee's start-up date. Refresher training would be conducted annually.</p>
N14	Common Area Catch Basin Inspection	The appropriate county and/or city would be responsible for inspecting and maintaining the drainage facilities within the project area. This would include the inspection and, if necessary, the cleaning of the storm drain system prior to the storm season, but no later than October 1 each year. The catch basins would be inspected monthly for trash and debris and other obstructions and cleaned as necessary. In addition, cleaning would occur in the late summer/early fall, prior to the onset of the rainy season.
N15	Street Sweeping Private Streets and Parking Lots	Streets would be swept weekly and prior to the storm season, but no later than October 15 each year.

Table 4.11.2: Source Control BMPs

Identifier	Name	Project-Specific Application
Routine Structural BMPs		
-	Provide storm drain system stenciling and signage	All storm drain inlets and catch basins, constructed or modified, within the project area, would be stenciled or labeled. The storm drain inlets would be appropriately stamped with “No Dumping, Drains to Ocean” stenciling or plaques. Signs that prohibit illegal dumping would be posted at public access points along channels and creeks within the project area. The legibility of the storm drain signage would be inspected once per year and relabeled/ restenciled as necessary to ensure legibility,
-	Use efficient irrigation systems and landscape design, water conservation, smart controllers, and source control	The timing and application methods of irrigation water would minimize the runoff of excess irrigation water into the storm water conveyance system. Any landscaping installed would be vegetated with deep-rooted, drought-tolerant species selected for erosion control. The irrigation systems would be inspected on a monthly basis, and the irrigation heads and timing would be adjusted if necessary.
-	Protect slopes and channels and provide energy dissipation	Storm water BMPs would be included to decrease the potential for erosion of slopes and/or channels. All vegetated swale and channel improvements would have appropriate inlet or discharge to energy dissipaters to minimize the erosion.
-	Incorporate requirements applicable to individual priority project categories (from San Diego RWQCB NPDES Permit)	The proposed project would comply with all applicable NPDES requirements.
-	Hillside landscaping	Hillside areas that are disturbed by project development would be landscaped with plant species selected for erosion control. The landscaped areas would be inspected weekly for trash, debris, and irrigation connections.

Source: Water Quality Management Plan for La Pata Avenue and Camino Del Rio Extension (November 16, 2009).

BMPs = best management practices

CASC = Countywide Area Spill Control

DAMP = Drainage Area Master Plan

NPDES = National Pollutant Discharge Elimination System

RWQCB = Regional Water Quality Control Board

WQMP = Water Quality Management Plan

Threshold 4.11.2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

The proposed project is not located in a groundwater recharge area. As discussed above, some groundwater dewatering may be required during construction activities. However, dewatering activities would be temporary, and the volume of groundwater removed would not be substantial. Based on the proposed use of the project site, groundwater withdrawal would not be required during operation of the project. The proposed project would increase the impervious surface area and result in a net increase in total runoff volume. This volume is runoff that would not be infiltrated into the ground; however, aquifer recharge would not be affected by the change in volume of storm water runoff at the site due to the existing low infiltration rates. Soils along the road alignment consist primarily of Type C and D soils with low infiltration potential and high runoff potential, thus groundwater recharge is likely already low in the existing condition. Therefore, the increase in impervious surface would not substantially reduce groundwater infiltration compared to existing conditions. *Therefore, impacts to groundwater supplies would be less than significant, and no mitigation is required.*

Threshold 4.11.7: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

The proposed project is a roadway project, and does not include the construction of housing. Therefore, the proposed project would not place housing within a 100-year flood hazard area. Although the project may change the 100-year flood hazard area, the boundaries of the new 100-year floodplain would not include areas of existing housing. *Because the proposed project would not place housing within 100-year floodplain, no impacts to housing associated with a 100-year flood hazard area would occur, and no mitigation is required.*

Threshold 4.11.9: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

According to the San Clemente General Plan, the project alignment is not located in an inundation zone for a levee or dam. As a result, the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding. *Therefore, the potential for inundation by flooding as a result of the failure of a dam or levee is not significant. No mitigation is required.*

4.11.5.2 Potentially Significant Impacts

Threshold 4.11.3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on or off site.

A comprehensive surface drainage/storm drain system has been developed to collect and convey runoff on the project site into the existing and planned City and County storm drain system. Storm water runoff from the proposed roadway would be collected and conveyed by reinforced concrete pipes and interceptor drains. In addition, three extended detention basins are proposed to reduce flows to existing conditions. These three extended detention basins may be substituted with biofiltration BMPs. These three basins would also serve as water quality BMPs, as described below. The proposed drainage system is shown on Figure 3.7, previously presented in Chapter 3, Project Description. The proposed storm drain system would be sized to accommodate runoff from future land uses in the tributary watershed in the built-out condition.

The project has the potential to impact downstream siltation or erosion at one location within the land fill area. There would be minor alteration of the stream within the landfill area due to construction of the proposed landslide mitigation buttress system. The buttress fill would relocate portions of the channel. The proposed La Pata Avenue cross culverts within the landfill area would slightly alter the drainage pattern within the watershed. *Therefore, the potential to impact erosion is significant and requires mitigation.*

Soft-bottom channels proposed on the north and south side of the gravity buttress fill within the landfill would converge to join the existing stream just west of the proposed fill. The soft-bottom channels would be designed with energy-dissipating drop structures to minimize impacts to erosion and siltation. The channels would continue to pass bulked flows as in the existing conditions. Riprap is proposed at the downstream end where the two channels converge to act as an energy dissipater and slow down flow velocities to existing conditions. In addition, the proposed cross culverts have been sized for bulked flows and include rock riprap at the outlets and inlets to provide energy dissipation and to minimize sediment impacts. During final design, the hydrology analysis would need to be updated utilizing the current Orange County hydrology manual and should include a stability analysis to ensure a stable channel design and conformance with the Hydrologic Conditions of Concern (HCOC) requirements, thus minimizing erosion potential. This study would require analysis of smaller storm events and may require an additional detention basin within the conceptual grading footprint. *With implementation of Mitigation Measure 4.11-1, which requires a final hydrologic analysis and preparation of a stability analysis, the erosion and siltation impact from drainage alteration would be reduced to a less than significant level.*

Threshold 4.11.4: **Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site.**

Threshold 4.11.5: **Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.**

As discussed above, the proposed project would increase the impervious surface area, which would increase the volume of runoff from the project alignment. The proposed project would result in an approximately 1.4 percent increase in peak flow and 1.1 percent increase in volume.

For the existing storm drain lines EX-1, EX-2 and EX-3 within the San Juan Creek Watershed the project results in net increase in flows of 5.2 percent, 8.5 percent, and 2.1 percent, respectively. These existing culverts and the downstream drainage systems have sufficient capacity to convey the project condition flows. Refer to Figure 3.7 in Chapter 3 for the locations of the storm drains.

The project has the potential to impact existing downstream facilities, including Talega Line B within the Segunda Deshecha watershed, the Forster Ranch facilities within the Prima Deshecha watershed, and Line EX-7 within the San Juan Creek Watershed, which could result in downstream flooding. However, there are three extended detention basins included as part of the project to reduce flows to existing conditions. In addition, the BMPs would be designed to meet LID requirements and the interim hydromodification requirements in Order No. R9-2009-0002. To ensure that these extended detention basins adequately accommodate the increased flow, the final hydrologic analysis would include an expanded analysis of the basins during final design. The analysis would be expanded to include additional storm events and ensure the northernmost basin conforms to the Talega Runoff Management Plan. *With implementation of Mitigation Measure 4.11-1, which requires a final hydrologic analysis, the flooding impact from drainage alteration and storm drain capacity would be reduced to a less than significant level.*

Threshold 4.11.8: Place structures within a 100-year flood hazard area which would impede or redirect flood flows.

The proposed improvements would result in modification of the 100-year Prima Deshecha Cañada floodplain at the roadway crossing and the proposed grading for the buttress fill. An 84-inch RCP is proposed at the crossing, which would assure that the 100-year flood would be contained within the culvert underneath the roadway.

A soft-bottom, 8x8-foot trapezoidal channel is proposed on the south side of the proposed buttress fill. This channel would create a longitudinal encroachment into the existing Zone A. However, the flood-carrying capacity of the channel would be maintained. The proposed project has the potential to increase 100-year flood elevations due to development if the channel within a 100-year flood hazard area. A FEMA Conditional Letter of Map Revision (CLOMR) would be required prior to issuance of a grading permit and a FEMA Letter of Map Revision (LOMR) would be required after the drainage structures are constructed. *With implementation of Mitigation Measure 4.11-2, which requires verification of the changes resulting from the project, confirmation that potential floodplain impacts are less than significant, and the issuance of an LOMR, impacts to the 100-year floodplain would be reduced to a less than significant level, and no further mitigation is required.*

Threshold 4.11.10: Inundation by seiche, tsunami, or mudflow.

The project alignment is not located in the vicinity of any large bodies of water; therefore, the potential for inundation by seiche is not significant. According to the San Clemente General Plan, the proposed project is not in the potential tsunami hazard area; therefore, the potential for inundation by tsunami is not significant.

In the event of intense rainfall or fire-flood sequences, debris flows may emanate from large natural slope areas adjacent to the road. However, in most cases, the roadway will be buffered from these debris flows due to the fact that (1) debris flows are most often confined to natural drainages, and

(2) the natural drainages typically intersect the project at the toe of proposed roadway fill slopes. In these cases, the roadway surface is elevated sufficiently high such that debris flow inundation should not occur. In some cases, natural slopes or drainages descend directly to the roadway or roadway cut slope and therefore may pose a debris flow hazard. Potential debris flow hazards in these areas would be quantified during final design and recommendations of the analysis would be incorporated into final design. Potential recommendations could include oversized perimeter drainage devices (i.e., brow ditches) or debris basins. *With implementation of Mitigation Measures 4.11-3, which requires compliance with the recommendations of detailed analysis, impacts related to mudflow would be reduced to below a level of significance.*

4.11.5.3 Mitigation Measures

The following measures are required for impacts related to hydrology, flooding, and mudflow:

- 4.11-1** During final design, a final hydrologic analysis shall be prepared in accordance with the current Orange County Hydrology Manual. The final hydrologic analysis shall include a stability analysis to ensure a stable channel design for the soft-bottom channels proposed on the north and south sides of the buttress fill. The soft-bottom channel design shall conform with the Hydrologic Conditions of Concern (HCOC) requirements. The final hydrologic analysis shall also expand the analysis of the extended detention basins to be used for flood control. The basin analysis shall be expanded to include additional storm events and ensure the northernmost basin conforms to the Talega Runoff Management Plan.
- 4.11-2** During final project design, and prior to the issuance of any grading permits, the County of Orange shall submit final detailed applications, certification forms, hydraulic analyses, and fee payment to the Federal Emergency Management Agency (FEMA) to obtain a Letter of Map Revision (LOMR). The drainage structures within the Prima Deshecha Cañada 100-year floodplain shall not be constructed until the LOMR is approved by FEMA.
- 4.11-3** During final design and prior to the issuance of grading permits, the County of Orange Director of Public Works shall ensure that a mudflow analysis is prepared for the proposed project (all three segments) for areas where natural slopes or drainages descend directly to the roadway or roadway cut slope. The mudflow analysis shall quantify the potential debris flow hazards and provide recommendations, such as oversized perimeter drainage devices (i.e., brow ditches) or debris basins, to accommodate potential debris. The County of Orange Director of Public Works shall ensure that the recommendations of the mudflow analysis are incorporated into final design of the proposed project.

The following regulatory requirements would be implemented with the proposed project and would reduce or avoid impacts related to water quality:

- REG WQ-1** Prior to and during construction, the County of Orange shall comply with the requirements of the *National Pollutant Discharge Elimination System (NPDES)*

General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit); Order 2009-0009-DWQ; NPDES No. CAS000002 and any subsequent permit as they relate to construction activities. This shall include submission of a *Notice of Intent* (NOI) to the State Water Resources Control Board (SWRCB) at least 30 days prior to the start of construction, preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) and submission of a *Notice of Termination* (NOT) to the Santa Ana RWQCB upon completion of construction and stabilization of the site. Prior to construction activities and after the final design phase and environmental determinations, a construction SWPPP, and a water quality monitoring and reporting program shall be developed for the project. The construction phase SWPPP shall be designed to identify potential pollutant sources associated with construction activities; identify non-storm water discharges; and identify, implement, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants associated with the construction site.

REG WQ-2 The County of Orange shall comply with the provisions of the *General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region except for San Diego Bay*, National Pollutant Discharge Elimination System (NPDES) No. CAG919002, Order No. R9-2008-0002, as they relate to the discharge of non-storm water dewatering wastes for the project. This will include submitting to the San Diego Regional Water Quality Control Board (RWQCB) an application and required fees for authorization to discharge at least 60 days prior to the start of construction and notice of termination within 30 days at completion of dewatering activities.

REG WQ-3 The County of Orange shall comply with the requirements of the Orange County Drainage Area Management Plan (DAMP) and Local Implementation Plan (LIP) as they relate to hydrology and water quality. Project-specific Source Control and Treatment Control best management practices (BMPs) contained in the Final Water Quality Management Plan (WQMP) shall be incorporated into final design. The BMPs shall be properly designed and maintained to target pollutants of concern and reduce runoff from the project site. The WQMP shall include an operations and maintenance plan for the prescribed Treatment Control BMPs to ensure their long-term performance.

4.11.6 Cumulative Impacts

Cumulative development in the project area is a continuation of the existing urban pattern of development that has already resulted in extensive modifications to watercourses in the area. The area's watercourses have been channelized, and drainage systems have been put into place to respond to the past urbanization that has occurred in this area. For all cumulative analysis related to hydrology and water quality, the cumulative projects being considered include all potential projected development discharging to the San Juan Hydrologic Unit. Because cumulative hydrology and water quality impacts are caused by build out of properties that increase impervious area and pollutant loads, cumulative development is considered to be the build out of the San Juan HU over an extended period of time, resulting in development of all available parcels.

New development and redevelopment can result in increased urban pollutants in dry weather and storm water runoff from project sites. Each project must comply with NPDES permitting requirements and include BMPs to avoid impacts to water quality and local hydrology in compliance with local ordinances and plans adopted to comply with the MS4 Permit (DAMP and LIP) and other permits (e.g., De Minimus Permit, General Construction Permit). Each project must consider impaired receiving waters and annual TMDL loads for receiving waters. The TMDL program is designed to identify all constituents that adversely affect the beneficial uses of waterbodies and then identify appropriate reductions in pollutant loads or concentrations from all sources so that the receiving waters can maintain/attain the beneficial uses in the Basin Plan. Thus, by complying with TMDLs, the project contribution to overall water quality improvement in the watershed in context of the regulatory program is designed to account for cumulative impacts.

The proposed project would convert undeveloped land to a roadway. As discussed in detail above in Section 4.11.4, Thresholds of Significance, the proposed project includes a series of Source Control and Treatment Control BMPs that would reduce pollutant concentrations to less than significant levels. In addition, implementation of Mitigation Measures 4.11-1 and 4.11-2 would ensure that project volume and flows are reduced to levels that can be accommodated by the downstream storm drain systems to minimize flooding and erosion impact. As also discussed above, the change in volume of storm water runoff at the site would not affect aquifer recharge.

Regional programs and BMPs such as TMDL programs, the DAMP/LIP, and the MS4 Permit Program have been designed under an assumption that the San Juan HU will continue the pattern of urbanization. The regional control measures contemplate cumulative effects of proposed development. Many of the regional permits are currently being updated to include more stringent requirements and are anticipated to be in effect by the time the proposed project is under construction. The proposed project would be required to comply with the regulations in effect at the time the grading permits are issued. Compliance with these regional programs and the General Construction Permit constitutes compliance with programs intended to address cumulative hydrological and water quality impacts. Therefore, the project's contribution to cumulative water quality and hydrology impacts would be less than significant.

4.11.7 Level of Significance After Mitigation

As discussed above, no mitigation measures are required for water quality impacts, which would be less than significant with compliance with existing plans, programs, and regulations.

With implementation of Mitigation Measures 4.11-1, 4.11-2, and 4.11-3 hydrologic, flooding, and mudflow impacts would be reduced to less than significant levels.