This section has been revised in response to comments received on the Draft EIS/EIR (April 2009), and based on additional independent review by the lead agencies (U.S. Army Corps of Engineers and California Department of Fish and Game). The revised or additional text is shown in double-underline; deleted text is shown in ~~strikeout~~. Revised figures or tables (if applicable) are indicated by the addition of the following text to the figure or table title: **(Revised)** or **(New)**.

4.4.1 INTRODUCTION

This section provides an overview of the existing conditions for surface water and groundwater quality, and evaluates the potential direct, indirect, and secondary impacts of the proposed Project and alternatives to both surface water quality in the Santa Clara River Corridor from I-5 to approximately 3.5 miles downstream of the Specific Plan boundary to the area known as the "Dry Gap," and to groundwater quality. This section also evaluates direct impacts to water quality from both the proposed Project, which is comprised of the Newhall Ranch RMDP and the SCP, and its alternatives. Implementation of the proposed RMDP and SCP would indirectly facilitate County-approved development on the Specific Plan site, the VCC planning area, and in a portion of the Entrada planning area. Therefore, potential impacts to water quality from build-out of these areas are evaluated as indirect impacts. Impacts to surface water quality in the Santa Clara River Corridor and groundwater quality outside the footprint of the Project area are evaluated as secondary impacts.

The proposed Project's RMDP component consists of a resource management plan to be implemented in conjunction with the infrastructure required to implement the Specific Plan. The RMDP also includes a variety of infrastructure Project Design Features (PDFs)[1] and other infrastructure that would reduce, minimize, and avoid the impacts of development of the previously approved Specific Plan. The SCP component is a conservation and mitigation strategy for the spineflower that identifies measures for the conservation, permitting, and management of spineflower on the applicant's land holdings with known spineflower populations.

Impacts to surface water hydrology and flood control are evaluated in **Section 4.1**, Surface Water Hydrology and Flood Control. **Section 4.2**, Geomorphology and Riparian Resources, provides an overview of the existing conditions for geomorphology and riparian resources, and evaluates the potential hydraulic and hydromodification impacts on sensitive aquatic/riparian resources in the Santa Clara River Corridor and tributary drainages. Species-specific impacts in riparian and aquatic habitats are analyzed in **Section 4.5**, Biological Resources. Impacts to jurisdictional waters through direct removal, filling, hydrological interruption, or other means are assessed in **Section 4.6**, Jurisdictional Waters and Streams.

[1] Project Design Features (PDFs) for water quality include site design, source control, and treatment control Best Management Practices (BMPs) that will be incorporated into the Specific Plan projects and are considered a part of the projects for the impact analysis. The water quality PDFs are listed in **Table 4.4-12**.

4.4.1.1 Relationship of Proposed Project to Newhall Ranch Specific Plan Program EIR

This section (**Section 4.4**) provides a stand-alone assessment of the potentially significant water quality impacts associated with the proposed Project; however, the previously certified Newhall Ranch environmental documentation provides important information and analysis pertinent to this EIS/EIR. The Project components would require federal and state permitting, consultation, and agreements that are needed to facilitate development of the approved land uses within the Specific Plan site and that would establish spineflower preserves within the Project area, also facilitating development in the Specific Plan, VCC, and a portion of the Entrada planning area. Due to this relationship, the Newhall Ranch environmental documentation, findings, and mitigation, as they relate to water quality, are summarized below to provide context for the proposed Project and alternatives.

Section 4.11 of the Newhall Ranch Revised Draft EIR (March 1999) assessed the existing water quality conditions and potential impacts as a result of the Specific Plan's capacity to substantially degrade water quality levels, and identified mitigation measures for these impacts. In addition, Section 5.0 of the Revised Draft EIR (March 1999) analyzed and identified the water quality impacts and mitigation measures associated with construction and operation of the approved Water Reclamation Plant (WRP), which would treat the wastewater generated by the Specific Plan.

The Newhall Ranch Specific Plan Program EIR recommended implementation of Mitigation Measure SP-4.2-7 to ensure that water quality impacts would remain less than significant.[2] In addition, to lessen the water quality impacts resulting from construction and operation of the approved WRP, the Newhall Ranch Specific Plan Program EIR recommended implementation of Mitigation Measure SP-5.0-52 through SP-5.0-56. The Specific Plan and WRP mitigation measures are summarized below. The Board of Supervisors found that adoption of these mitigation measures would reduce the identified significant impacts of the Specific Plan and WRP to less-than-significant levels. The Newhall Ranch mitigation program was adopted by Los Angeles County in findings and in the revised Mitigation Monitoring Plans for the Specific Plan and WRP.

Table 4.4-1 summarizes the Specific Plan's and the WRP's water quality impacts, the applicable mitigation measures, and the significance findings after the mitigation is implemented.

[2] Reference to mitigation measures included in the Newhall Ranch Specific Plan Program EIR are preceded by "SP" in this EIS/EIR to distinguish them from other mitigation measures discussed herein.

Table 4.4-1
Impacts to Water Quality Caused by Implementation of the Specific Plan and WRP

Impact Description	Mitigation Measures (MM)	Finding After Mitigation
Specific Plan Water Quality Impacts - The Specific Plan would not degrade the water quality of the Saugus aquifer; in fact, the Specific Plan's injection of water from the Castaic Lake Water Agency into this aquifer generally would improve the water quality for its intended use, and result in a beneficial impact. The Specific Plan also would not degrade the water quality of the Alluvial aquifer. Finally, the Specific Plan would not significantly affect the water quality of the Santa Clara River as a result of pumping activities. Accordingly, water quality impacts would be less than significant.	• SP-4.2-7: The applicant for any subdivision map permitting construction must satisfy all applicable Los Angeles County requirements of the NPDES Program to the satisfaction of the County of Los Angeles Department of Public Works. These requirements currently include preparation of an Urban Storm Water Mitigation Plan (USWMP) and a Stormwater Management Pollution Prevention Plan (SWPPP) both of which must contain design features and BMPs appropriate and applicable to the subdivision. The County of Los Angeles Department of Public Works also must monitor compliance with those NPDES requirements.	Less than Significant
Specific Plan Cumulative Water Quality Impacts-The Specific Plan would result in less-than-significant cumulative impacts because all related projects would be required to meet Federal Clean Water Act standards (among others) for drinking water and site runoff.	• No mitigation recommended.	Less than Significant
WRP Water Quality Impacts - The WRP's discharges to the Santa Clara River would comply with the Water Quality Control (Basin Plan) for the Los Angeles Region (approved February 23, 1995). This compliance ensures that the WRP also would meet state and federal requirements for water quality. Therefore, impacts would be less than significant.	• SP-5.0-52: Requires creation of a new County sanitation district to administer operation of the WRP. • SP-5.0-53: Requires satisfaction of Title 22's standards, which regulate the use of reclaimed water. • SP-5.0-54: Requires the WRP to satisfy the State Regional Water Quality Control Board, Los Angeles Region, discharge limits for reclaimed water and water used to irrigate landscaped areas. • SP-5.0-55: Requires the WRP to obtain a National Pollutant Discharge Elimination System permit. • SP-5.0-56: Requires the sanitary sewer system to be designed and constructed for maintenance in accordance with applicable manuals, criteria, and requirements.	Less than Significant

Source: Newhall Ranch Revised Draft EIR (March 1999); Newhall Ranch Revised Additional Analysis (May 2003).

4.4.1.2 Relationship of Proposed Project to VCC and Entrada Planning Areas

4.4.1.2.1 VCC Planning Area

The SCP component of the proposed Project, if approved, would facilitate development in the VCC planning area. The VCC is reliant on the SCP and associated take authorizations, and would not be developed without the take authorizations due to grading constraints. The VCC planning area is the remaining undeveloped portion of the VCC commercial/industrial complex currently under development by the applicant. The VCC was the subject of an EIR certified by Los Angeles County in April 1990 (SCH No. 1987-123005). The applicant has recently submitted to Los Angeles County the last tentative parcel map (TPM No. 18108) needed to complete build-out of the remaining undeveloped portion of the VCC planning area. The County will require preparation of an EIR in conjunction with the parcel map and related project approvals; however, the County has not yet issued a Notice of Preparation (NOP) of the EIR or released the EIR. The previously certified VCC EIR (April 1990) did not address impacts relating to water quality, as there was no substantial evidence that water quality would be impacted from implementation of the VCC.

4.4.1.2.2 Entrada Planning Area

The applicant is seeking approval from Los Angeles County for planned residential and nonresidential development within the Entrada planning area. The SCP component of the proposed Project would designate an area within Entrada as a spineflower preserve. If approved, the SCP component would include take authorization of spineflower populations in Entrada that are located outside of the designated spineflower preserve area. Thus, the planned development within portions of the Entrada planning area is reliant on the SCP and associated take authorizations, and those portions would not be developed without the take authorizations. The applicant has submitted to Los Angeles County Entrada development applications, which cover the portion of the Entrada planning area facilitated by the SCP component of the proposed Project. However, as of this writing, the County has not yet issued a NOP of an EIR or released an EIR for Entrada. As a result, there is no underlying local environmental documentation for the Entrada planning area at this time.

4.4.2 METHODOLOGY

This EIS/EIR analyzes whether substantial additional sources of polluted runoff may result from the proposed Project or the alternatives based on the results of water quality modeling and qualitative assessments. PDFs for water quality impacts include site design, source control, and treatment control Best Management Practices (BMPs) that will be incorporated into the Specific Plan projects and are considered project components for impact analysis purposes. The water quality evaluations include the Project's implementation of proposed PDFs intended to avoid and minimize the potential for water quality impacts. Any increases in pollutant concentrations or loads in runoff resulting from the development of the proposed Project or alternatives are considered an indication of a potentially significant adverse water quality impact. The increase would then be assessed for significance. If loads and concentrations resulting from development are predicted to stay the same or to be reduced when compared with existing conditions, it is concluded that the proposed Project or alternatives would not cause a significant adverse impact to the ambient water quality of the receiving waters for that pollutant.

If pollutant loads or concentrations are expected to increase during the post-development and construction phases, impacts are assessed by evaluating compliance of the proposed Project and alternatives with applicable regulatory requirements. Further, post-development increases in pollutant loads and concentrations are evaluated by comparing the magnitude of the increase to relevant water quality benchmarks provided by applicable regulatory programs that are described below.

The description of existing surface water quality and the impact analysis utilizes the results of a technical analysis prepared by Geosyntec Consultants, Inc. (Geosyntec). The Geosyntec analysis is contained in a report entitled, Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan (Sub-Regional Plan) (April 2008). This Sub-Regional Plan sets forth the urban runoff management program that will be implemented for the Newhall Ranch Specific Plan subregion, consistent with the Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, and the Standard Urban Stormwater Mitigation Plan (SUSMP). Stormwater management, including planning water quality and hydromodification control, is central to assuring the long-term viability of beneficial uses, including important habitat systems and species dependent upon those systems. The Sub-Regional Plan assesses potential water quality and hydromodification impacts associated with the Specific Plan development, and proposes BMPs and other control measures to mitigate potential impacts and ensure beneficial uses. The Sub-Regional Plan is found in **Appendix 4.4** of ~~this~~ the Draft EIS/EIR.

The scope of the surface water and groundwater quality impact analysis corresponds with Santa Clara River Reach 5, which extends from I-5 to the "Blue Cut," and downstream within Reach 4 to the "Dry Gap" in the Santa Clara River (see **Figure 4.4-1**). The Santa Clara River is a perennial stream (contains water on a year-round basis) in the study reaches. Beginning about 3.5 miles downstream of the Los Angeles County/Ventura County jurisdictional boundary line, the river is dry most of the year, with water present only when rainfall events create sufficient stormwater runoff in the River. The "Dry Gap" starts at about 3.5 miles downstream of the Los Angels County/Ventura County line (western limit of the Project boundary) and extends downstream of the Piru Creek confluence with the Santa Clara River and the lower limit of the Piru groundwater basin, between the communities of Piru and Fillmore. [3] The Santa Clara River watershed is 1,634 square miles in area. The portion of the Santa Clara River watershed that is located generally upstream or east of the Los Angeles County/Ventura County line is approximately 640 square miles in size. The proposed Project area comprises 3.5 percent of the Santa Clara River watershed upstream of the Los Angeles County/Ventura County line and 1.4 percent of the total Santa Clara River watershed. Potential surface water quality impacts of the proposed Project are attenuated by the presence of the "Dry Gap" and the large size of the watershed.

The Santa Clara River Valley East groundwater basin underlies the Project area and extends downstream to below the Los Angeles County/Ventura County line (see **Figure 4.4-1**). The Piru groundwater basin lies to the west of the Santa Clara River Valley East groundwater basin and underlies the dry gap. On the

[3] GSI Water Solutions, Inc. prepared a report that evaluated the "Dry Gap" portion downstream of the Project area in a report entitled, Assessment of Future Surface Water Conditions in the Dry Gap of the Santa Clara River (April 2008). The GSI report is found in **Appendix 4.2** of this EIS/EIR.

upstream side of eastern limit of the Piru groundwater basin, the alluvial fill is thin and the underlying bedrock lies at a shallow depth. As a result, the water table is shallow, and little or no leakage occurs from the river to the underlying shallow groundwater. In contrast, on the downstream side of this boundary, in the Piru groundwater basin, the alluvium is thicker and the underlying bedrock is much deeper. As a result, the water table in the alluvium is deeper, and the alluvial sediments are able to rapidly infiltrate the entire flow of the river, thus the presence of the "Dry Gap."

4.4.3 REGULATORY SETTING

4.4.3.1 Federal

~~Federal~~ **Clean Water Act (33 U.S.C. §§ 1251, *et seq.*)**~~.~~

Section 402 of the Clean Water Act. In 1972, the Federal Water Pollution Control Act (later referred to as the Clean Water Act [CWA]) was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants into "waters of the United States" from any point source. As defined in the CWA, "waters of the United States" are surface waters, including rivers, lakes, estuaries, coastal waters, and wetlands, that are interstate waters used in interstate and/or foreign commerce, their tributaries, territorial seas at the cyclical high tide mark, and adjacent wetlands. In 1987, section 402 of the CWA was amended to require that the United States Environmental Protection Agency (USEPA) establish regulations for permitting of municipal and industrial stormwater discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. (See 55 Fed.Reg. 47990 (Nov. 16, 1990).) The regulations require that Municipal Separate Storm Sewer System (MS4) discharges to surface waters be regulated by a NPDES permit. An MS4 is a publicly-owned conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that are designed or used for collecting or conveying stormwater separately from wastewater.

In addition, CWA section 304(a) requires states to adopt water quality standards for receiving water bodies and to have those standards approved by the USEPA. These water quality standards consist of designated beneficial uses for a particular receiving water body (*e.g.*, wildlife habitat, agricultural supply, fishing, *etc.*), along with water quality criteria necessary to support those uses. Water quality criteria consist of either prescribed concentrations or levels of constituents, such as lead, suspended sediment, and fecal coliform bacteria, or narrative statements describing the quality of water that supports a particular beneficial use. Because California had not established a complete list of acceptable water quality criteria, USEPA established numeric water quality criteria for certain toxic constituents in surface waters with human health or aquatic life designated uses in the form of the California Toxics Rule (CTR). (40 C.F.R. § 131.38.) The final rule establishes ambient water quality criteria for priority toxic pollutants in the State of California.

Section 303(d) of the Clean Water Act. When designated beneficial uses of a particular receiving water body are compromised by impaired water quality, CWA section 303(d) 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 the impairing pollutant(s). A TMDL is an estimate of the total load

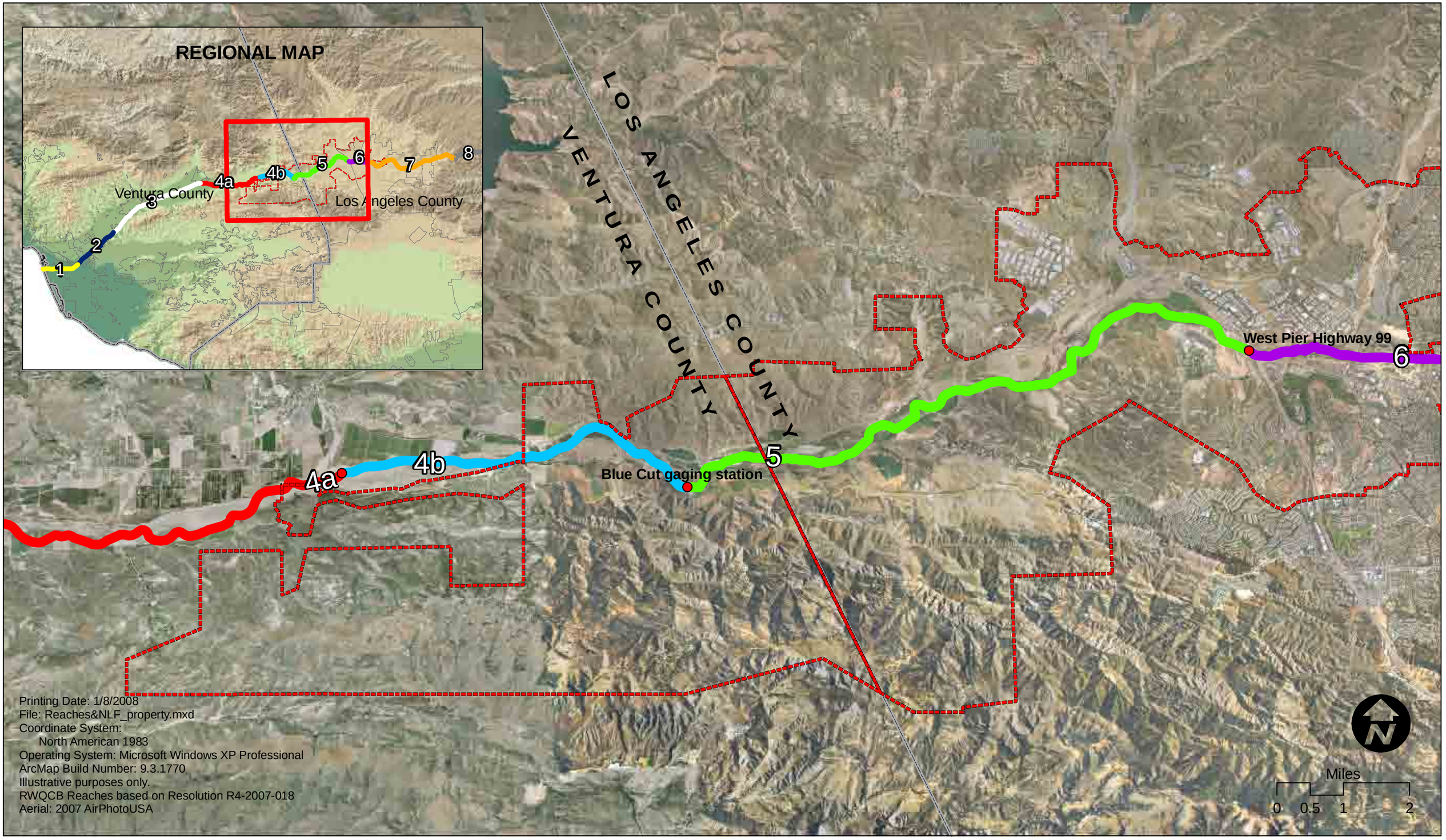


FIGURE 4.4-1

RWQCB Santa Clara River Reaches

RWQCB Reaches at Newhall Land Property

of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL allocates the loads among current and future pollutant sources for the impaired water body. The California 303(d) Listing Policy sets the rules for identifying the waters that do not meet water quality standards. The Policy distinguishes between three categories of waters that do not meet water quality standards. The categories are: (1) requiring TMDLs; (2) water quality limited segments being addressed by a TMDL that has been developed and approved by USEPA and the approved implementation plan is expected to result in full attainment of the standard within a specified time frame; and (3) water quality limited segments being addressed by an existing regulatory program that is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.

The Newhall Ranch Specific Plan development projects would discharge stormwater and runoff into Santa Clara River Reach 5,[4] either directly or through one of the following four tributaries to the River: Chiquito Canyon; San Martinez Grande Canyon; Long Canyon; and Potrero Canyon. **Table 4.4-2** lists the water quality impairments for the Santa Clara River, at and downstream of the Specific Plan location, as reported in the most recent (2006) CWA section 303(d) List of Water Quality Limited Segments. (see **Figure 4.4-1**, Santa Clara River Reach Boundaries)

[4] The River is divided into reaches for purposes of establishing beneficial uses and water quality objectives. However, there are two reach classifications, one established by the Los Angeles Regional Water Quality Control Board (RWQCB) and one established by the USEPA. Both of these reach classifications are used by the Los Angeles RWQCB and the USEPA in various documents, which at times is a source of confusion. This section uses the Los Angeles RWQCB reach numbers. Santa Clara River Reach 5, the Specific Plan area, is bounded downstream by the Blue Cut Gauging Station and upstream by the West Pier of Highway 99 (The Old Road).

Table 4.4-2
2006 CWA Section 303(d) Listings for the Santa Clara River Mainstem

River Reach or Tributary[1]	Geographic Description and Distance from Project to Upstream End of Reach	Pollutants	303(d) List Proposed TMDL Completion	Potential Sources
5	Blue Cut Gaging Station to West Pier Hwy 99 (Includes entire Project site)	High Coliform Count	2019	Nonpoint and Point Sources
3	Freeman diversion dam to "A" Street[2] (25 miles from Project site)	Total Dissolved Solids	2019	Nonpoint and Point Sources
1	Estuary to Highway 101 Bridge (30 miles from Project site)	Toxicity	2019	Source Unknown
-	Estuary (40 miles)	ChemA[3] Coliform Toxaphene	2019 2019 2019	Source Unknown Nonpoint Source Nonpoint Source

Notes:
[1] Santa Clara River reaches upstream of the Specific Plan area have not been included because they would not be affected by the Project.
[2] Reach 3 is downstream of the Dry Gap in Reach 4.
[3] ChemA suite of chlorinated legacy pesticides include: Aldrin, chlordane, Dieldrin, Endosulfan I/II, Endrin, gamma-BHC, heptachlor, heptachlor epoxide, and Toxaphene.
Source: Geosyntec, 2008

Table 4.4-3 lists the 2006 section 303(d) List of Water Quality Limited Segments addressed by USEPA approved TMDLs. States are required to submit the section 303(d) List and TMDL priorities to the USEPA for approval. The 2006 section 303(d) List was adopted by the State Water Resources Control Board (SWRCB) and approved for transmittal to the USEPA on October 25, 2006. The 2006 section 303(d) List was approved by EPA on June 28, 2007. Reach 5 of the Santa Clara River is listed for coliform bacteria, and for chloride as "being addressed" by an approved TMDL in the reach. Downstream segments of the River, below the Dry Gap in Reach 4,[5] are listed for total dissolved solids (TDS), toxicity, coliform bacteria, chlorinated legacy pesticides, and Toxaphene (a banned pesticide). TDS are materials in the water that will pass through a filter, consisting mainly of inorganic salts, small amounts of organic matter, and dissolved gases. Reach 3 is listed for ammonia and chloride as "being addressed" by an approved TMDL.

[5] Beginning about 3.5 river miles downstream of the Los Angeles County/Ventura County line and the Salt Creek tributary, the Santa Clara River flows through the Piru groundwater basin, which represents a "Dry Gap" where dry season surface flows are interrupted and streamflow is lost to groundwater. This dry ephemeral reach of the river extends beyond the mouth of Piru Creek. See **Figure 4.4-1**.

Table 4.4-3
2006 CWA Section 303(d) List of Water Quality Limited Segments
Being Addressed By USEPA Approved TMDLs

Waterbody Name	Pollutants	Potential Sources	EPA Approved TMDL
Santa Clara River Reach 5	Chloride	Nonpoint/Point Source	2005
Santa Clara River Reach 3	Ammonia Chloride	Nonpoint/Point Source Nonpoint/Point Source	2004 2002

Source: Geosyntec, 2008.

The Los Angeles RWQCB has adopted USEPA-approved TMDLs as part of the Water Quality Control Plan for the Los Angeles Region (Basin Plan). These include TMDLs for nitrogen compounds, including nitrate plus nitrite-nitrogen and ammonia, and chloride. The wasteload allocations[6] for stormwater discharges into Reach 5 of the Santa Clara River are summarized in **Table 4.4-4**. Pollutant reductions are regulated through effluent limits prescribed in Publicly Owned Treatment Works (POTW)[7] and minor point source NPDES permits, BMPs required in NPDES MS4 permits, and SWRCB management measures for nonpoint source discharges. The Los Angeles RWQCB has not yet adopted a TMDL for coliform bacteria in Reach 5.

Table 4.4-4
TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5

Impairing Pollutant	Numeric Water Quality Objective	Wasteload Allocation
Chloride (Resolution No. 03-008)	100 mg/L.	Wasteload allocations have been adopted for the Saugus WRP and the Valencia WRP. Other NPDES discharges contribute a minor chloride load. The wasteload allocation for these point sources is 100 mg/L. The source analysis indicates that nonpoint sources are not a major source of chloride. The load allocations for nonpoint sources is 100 mg/L.

[6] TMDLs allocate pollutant loadings among point sources (wasteload allocations) and nonpoint pollutant sources (load allocations).

[7] POTWs treat sewage, and are also known as wastewater treatment plants.

Table 4.4-4
TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5

Impairing Pollutant	Numeric Water Quality Objective	Wasteload Allocation
Nitrogen Compounds (Resolution No. 03-011)	The numeric target for NO_3-N + NO_2-N in the Nitrogen Compounds TMDL was based on achieving the existing water quality objective of 5 mg/L NO_3-N + NO_2-N. The numeric target that was used to calculate the wasteload allocations included a 10% margin of safety; thus the numeric target is 4.5 mg/L NO_3-N + NO_2-N (30-day average). The water quality objectives for ammonia in Reach 5 used in the Nitrogen Compounds TMDL are: TMDL Ammonia Water Quality Objective (mg/L as N) 1-hr average / 30-day average Reach 5 at County Line: 3.4 / 1.2 Reach 5 below Valencia: 5.5 / 2.0 Reach 5 above Valencia: 4.8 / 2.0	Concentration-based wasteloads are allocated to municipal, industrial, and construction stormwater sources regulated under NPDES permits. For stormwater Permittees discharging into Reach 5, the following wasteload allocations apply: 30-day average nitrate plus nitrite = 6.8 mg/L (NO_3-N + NO_2-N) 1-hour average ammonia = 5.2 mg/L (NH_3 as N) 30-day average ammonia = 1.75 mg/l (NH_3 as N)

Notes:
[1] Santa Clara River Reach 5, the Specific Plan area, is bounded downstream by the Blue Cut Gauging Station and upstream by the West Pier of Highway 99 (The Old Road).

Source: Geosyntec, 2008.

Section 404 of the Clean Water Act. Section 404 of the Clean Water Act is a program that regulates the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development (including physical alterations to drainages to accommodate storm drainage, stabilization, and flood control improvements), water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. The USEPA ~~and the Army Corps of Engineers (Corps) have~~ has issued section 404(b)(1) Guidelines (40 C.F.R. § 230) ~~that~~ concerning the selection and use of disposal sites ~~regulate dredge and fill activities~~, including water quality aspects of such activities. Subpart C at sections 230.20 through 230.25 contains water quality regulations applicable to dredge and fill activities. Among other topics, these guidelines address discharges which alter substrate elevation or contours, suspended particulates, water clarity, nutrients and chemical content, current patterns and water circulation, water fluctuations (including those that alter erosion or sediment rates), and salinity gradients. Compliance with section 404 of the CWA also is discussed in **Section 4.6**, Jurisdictional Waters and Streams, of this EIS/EIR.

Section 401 of the Clean Water Act. Under section 401 of the CWA, every applicant for a federal permit or license for any activity which may result in a discharge of dredge or fill material to a water body must obtain State Water Quality Certification (Certification) that the proposed activity will comply with state water quality standards (*i.e.*, beneficial uses, objectives, and anti-degradation policy). The Corps will not be able to finalize a section 404 permit until the applicant also receives a section 401 Certification from the Los Angeles RWQCB. The Los Angeles RWQCB will use this EIR/EIS, including information in this section, **Section 4.2**, Geomorphology and Riparian Resources, and in **Section 4.6**, Jurisdictional Waters and Streams, to support a determination regarding issuance of a section 401 Certification for the proposed Project.

California Toxics Rule. The California Toxics Rule (40 C.F.R. § 131.38) is a federal regulation issued by the USEPA that provides water quality criteria for toxic pollutants in waters with human health or aquatic life designated uses in California. Not all waters receiving flows from the Specific Plan area, such as the tributaries to the Santa Clara River, are specifically designated with human health or aquatic life uses. However, the Santa Clara River does have such designated uses, and the impact analysis in **Section 4.4** of the Draft EIS/EIR assumes that the Santa Clara River Reach 5 beneficial uses apply to all of the proposed project's receiving waters pursuant to the Basin Plan. Further explanation of designated uses is provided in the Basin Plan subsection below. Although CTR criteria do not apply directly to discharges of stormwater runoff, they can provide a useful benchmark to assess the potential impacts to the water quality of receiving waters from Specific Plan stormwater runoff discharges. Here, the freshwater aquatic life criteria are used as benchmarks to evaluate the potential impacts of stormwater runoff to the Project's receiving waters. The CTR also contains human health criteria which are derived for drinking water sources and for fish consumption only. Since the human health criteria are less stringent than the aquatic life criteria for the pollutants of concern for the proposed Project, the aquatic life criteria are used.

Freshwater aquatic life criteria for certain metals in the CTR are expressed as a function of hardness because hardness, and/or water quality characteristics that are usually correlated with hardness, can reduce the toxicities of some metals.[8] A hardness value of 250 mg/L as $CaCO_3$, the minimum value measured in the Santa Clara River at a monitoring station located immediately downstream of the Specific Plan boundary, is used to approximate CTR criteria for metals.[9]

The CTR also establishes two types of aquatic life criteria: acute and chronic. Acute criteria represent the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time without

[8] The toxicity of a chemical to an aquatic organism may vary according to attributes of the organism, chemical composition, and exposure environment, so that the chemical is more or less "bioavailable." Many chemicals exist in a variety of forms (chemical species), and such chemical speciation affects bioavailability because relative uptake rates can differ among chemical species and the relative concentrations of chemical species can differ among exposure conditions. Usually, metal toxicity is reduced by increased water hardness, which is composed of cations (primarily calcium and magnesium). In some cases, the apparent effect of hardness on toxicity might be partly due to complexation of the metal by higher concentrations of hydroxide and/or carbonate (increased pH and alkalinity) commonly associated with higher hardness.

[9] Average hardness value is generally higher, see **Tables 4.4-7** to **4.4-9**.

deleterious effects; chronic criteria equal the highest concentration to which aquatic life can be exposed for an extended period of time (four days) without deleterious effects. Due to the intermittent nature of stormwater runoff (especially in southern California), the acute criteria are considered to be more applicable to stormwater conditions than chronic criteria, and are used as benchmarks in assessing Project runoff. For example, the average storm duration in the 38-year Newhall gage rainfall record is 11.3 hours.

4.4.3.2 State

Fish and Game Code, Sections 1600 through 1605. The California Department of Fish and Game (CDFG) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code, sections 1600-1605 require the proponent of a project that may impact a river, stream, or lake to notify the CDFG before beginning the project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks and that support fish or other aquatic life. It also includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.

In addition, Fish and Game Code, section 1602 requires that any State or local governmental agency or public utility notify the CDFG of a project, prior to beginning construction, that will: (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. If the CDFG determines that the project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

Compliance Fish and Game Code, sections 1600-1605 also is described in **Section 4.6**, Jurisdictional Waters and Streams, of this EIS/EIR.

Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 *et seq.*). The federal CWA places the primary responsibility for the control of surface water pollution, and for planning the development and use of water resources, with the states. However, the CWA does establish certain guidelines for the states to follow in developing their programs and allows the USEPA to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and the Regional Water Quality Control Boards (RWQCBs) power to protect water quality. It is the primary vehicle for implementation of California's responsibilities under the federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges of waste to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (regional plan) for its region. The regional plan must conform to the policies set forth in the Porter-Cologne Act and established by the

SWRCB in its state water policy. To implement state and federal law, the regional plan establishes beneficial uses for surface and groundwater in the region, and sets forth narrative and numeric water quality standards to protect those beneficial uses. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Basin Plan. The Water Quality Control Plan for the Los Angeles Region (Basin Plan) (Los Angeles RWQCB, 1994, as amended) provides quantitative and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Los Angeles region. Specific criteria are provided for the larger, designated water bodies within the region, as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and groundwater. Those waters not specifically listed (generally smaller tributaries) are assumed to have the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary. In general, the narrative criteria require that degradation of water quality does not occur due to increases in pollutant loads that will adversely impact the designated beneficial uses of a water body. For example, the Basin Plan requires that "[i]nland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors." Water quality criteria apply within receiving waters as opposed to applying directly to runoff; therefore, water quality criteria from the Basin Plan are utilized as benchmarks to evaluate the potential ecological impacts of Project runoff on the receiving waters of the proposed Project.

The Basin Plan lists beneficial uses of major water bodies within this region (**Table 4.4-5**). The tributaries to the Santa Clara River within the Project are not specifically ~~designated with beneficial uses~~ listed in the Basin Plan, but Santa Clara River Reach 5 is listed and has specific beneficial uses assigned to it. For purposes of this analysis, the tributaries to the Santa Clara River within the proposed Project are assumed to have the same beneficial uses as the Santa Clara Reach to which they are tributary pursuant to the Basin Plan. As identified in **Table 4.4-5**, the existing beneficial uses of Santa Clara River Reach 5 include the following:

- MUN*: Conditional potential municipal and domestic water supply;
- IND: Industrial activities that do not depend primarily on water quality;
- PROC: Industrial activities that depend primarily on water quality;
- AGR: Agricultural supply waters used for farming, horticulture, or ranching;
- GWR: Groundwater recharge for natural or artificial recharge of groundwater;
- FRSH: Natural or artificial maintenance of surface water quantity or quality;
- REC1: Water contact recreation involving body contact with water and ingestion is reasonably possible;

- REC2: Non-contact water recreation for activities in proximity to water, but not involving body contact;
- WARM: Warm freshwater habitat to support warm water ecosystems;
- WILD: Wildlife habitat waters that support wildlife habitats;
- RARE: Waters that support rare, threatened, or endangered species and associated habitats ; and
- WET: Wetland ecosystem.

Table 4.4-5
Beneficial Uses of Receiving Waters

Water Body	MUN	IND	PROC	AGR	GWR	FRSH	REC1	REC2	WARM	WILD	RARE	WET[1]
Santa Clara River (Hydrologic Unit 403.51)	P*	E	E	E	E	E	E	E	E	E	E	E

Notes:

[1] Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

E - Existing beneficial use; P * - Asterisked MUN designations are conditional potential municipal water supply (MUN) designations.[10]

Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (Los Angeles RWQCB, 1994, as amended).

The Basin Plan also contains water quality criteria for groundwater basins. The Project area is within the Basin Plan's Castaic Valley and Saugus aquifer subbasin of the Santa Clarita Valley Groundwater Basin, East Subbasin. Beneficial uses for groundwaters for this subbasin are shown in **Table 4.4-6**.

[10] On December 5, 2001, the U.S. Federal District Court issued an order that effectively invalidated the USEPA's requirement that the asterisked municipal supply (MUN) designated uses (MUN* uses) in the Basin Plan be immediately enforced. (See letter dated February 15, 2002, from Alexis Strauss, USEPA Region IX, to Celeste Cantu, Executive Director, California SWRCB: ". . . waters identified with an ("*") in **Table 4.3-3** do not have an MUN as a designated use until such time as the State undertakes additional study and modifies its Basin Plan. ")

Table 4.4-6
Beneficial Uses of Groundwaters

Groundwater Basin	MUN
DWR 4.07 - Eastern Santa Clara Sub-basin: Castaic Valley and Saugus Aquifer	E

Notes:
E-Existing Beneficial Use.
MUN: Community, military, or individual water supply systems including, but not limited to, drinking water supply.

Source: Water Quality Control Plan for the Los Angeles Region (Basin Plan) (Los Angeles RWQCB, 1994, as amended).

NPDES General Permit and Waste Discharge Requirements for Discharges of Stormwater Associated with Construction Activity, Order No. 99-08-DWQ. Pursuant to CWA section 402, subdivision (p), requiring regulations for permitting certain stormwater discharges, the SWRCB issued a statewide general NPDES Permit for stormwater discharges from construction sites [(NPDES No. CAR000002) Water Quality Order 2009-0009-DWQ, SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction Activity (adopted by the SWRCB on September 2, 2009)].

Under the requirements of this Construction General Permit, discharges of stormwater from construction sites with a disturbed area of one or more acres (effective July 1, 2010) are required to either obtain individual NPDES permits for stormwater discharges or to be covered by the Construction General Permit. Coverage under the Construction General Permit is accomplished by completing a construction site risk assessment to determine appropriate coverage level; preparing a SWPPP, including site maps, a Construction Site Monitoring Program (CSMP), and sediment basin design calculations; for projects located outside of a Phase I or Phase II permit area, completing a post-construction water balance calculation for hydromodification controls; and completing a Notice of Intent. All of these documents must be electronically submitted to the SWRCB for General Permit coverage. The primary objective of the SWPPP is to identify and apply proper construction, implementation, and maintenance of BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction. The SWPPP also outlines the monitoring and sampling program required for the construction site to verify compliance with discharge Numeric Action Levels (NALs) set by the Construction General Permit.

~~Pursuant to the CWA section 402(p), requiring regulations for permitting of certain stormwater discharges, the SWRCB has issued a statewide general NPDES permit and waste discharge requirements for stormwater discharges from construction sites. (NPDES No. CAS000002; California Water Resources Control Board Resolution No. 2001-046; Modification of Water Quality Order 99-08-DWQ SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction Activity (adopted by the SWRCB on April 26, 2001).)~~

~~Under this permit, discharges of stormwater from construction sites with a disturbed area of one or more acres (effective March 2003) are required to either obtain individual NPDES permits for stormwater~~

~~discharges or be covered by the general permit. Coverage under the general permit is accomplished by completing and filing a Notice of Intent with the SWRCB. Each applicant under the general permit must ensure that a Stormwater Pollution Prevention Plan (SWPPP) is prepared prior to grading and implemented during construction. The primary objective of the SWPPP is to identify, construct, implement, and maintain BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction.~~

4.4.3.3 Local

Waste Discharge Requirements for Municipal Stormwater and Urban Runoff Discharges within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach (Order No. 01-182; NPDES No. CAS004001). In 2001, the Los Angeles RWQCB issued an NPDES permit and waste discharge requirements under the CWA and the Porter-Cologne Act for discharges of urban runoff in public storm drains in Los Angeles County. The Permittees are the Los Angeles County cities and the County (collectively "the Co-permittees"). This permit regulates stormwater discharges from MS4s in the Specific Plan subregion. The NPDES permit includes requirements for new development and significant redevelopment projects.

To implement the requirements of the NPDES permit, the Co-permittees have developed planning guidance and control measures that control and mitigate stormwater quality and quantity impacts to receiving waters as a result of new development and redevelopment. The Co-permittees are also required to implement other municipal source detection and elimination programs, as well as maintenance measures.

On March 8, 2000, the development planning program requirements, including the Standard Urban Stormwater Mitigation Plan (SUSMP) requirements (collectively, development planning program requirements, including Standard Urban Stormwater Mitigation Plan requirements, are referred to in this section as the SUSMP requirements) were approved by the RWQCB as part of the MS4 program to address stormwater pollution from new construction and redevelopment. The SUSMP contains a list of minimum BMPs that must be employed to infiltrate or treat stormwater runoff, control peak flow discharge, and reduce the post-project discharge of pollutants from stormwater conveyance systems. The SUSMP defines, based upon land use type, the types of practices that must be included and issues that must be addressed as appropriate to the development type and size. Compliance with SUSMP requirements is used as one method of evaluating project development impacts on surface water runoff.

One of the most important requirements within the SUSMP is the specific sizing criteria for stormwater treatment BMPs for new development and significant redevelopment projects. The SUSMP includes four alternative sizing criteria for volume-based BMPs, such as extended detention basins, and three alternatives sizing criteria for flow-based BMPs, such as vegetated swales.

Also, the SUSMP includes general design specifications for individual priority project categories. These include:

- Single-family hillside home;

- 100,000 square foot commercial developments;
- Restaurants;
- Retail gasoline outlets;
- Automotive repair shops; and
- Parking lots.

For example, commercial developments must have properly designed loading and unloading dock areas, repair and maintenance bays, and vehicle equipment wash areas. Parking lots have to be properly designed to limit oil contamination and have regular maintenance of parking lot stormwater treatment systems (*e.g.*, storm drain filters and biofilters).

Hydromodification and Peak Flow Control. Part 4, section D.1 of the MS4 permit notes that increased volume, velocity, and discharge duration of stormwater runoff from developed areas may accelerate downstream erosion and impair habitat-related beneficial uses in natural drainage systems. As a result, section D.1 stipulates that Permittees shall control post-development peak stormwater runoff discharge rates, velocities, and durations in natural drainage systems to prevent accelerated stream erosion and to protect stream habitat. Natural drainage systems are defined by the permit to include unlined or unimproved (not engineered) creeks, streams, or rivers, such as the Santa Clara River and its tributaries.

Further, under section D.1 of the MS4 permit, the County and its Co-permittees were required to develop and implement by February 1, 2005, numeric criteria for peak flow control in accordance with the findings of a required study analyzing the impacts on natural streams due to impervious development. The Los Angeles County Department of Public Works (DPW) and the Southern California Storm Water Monitoring Coalition had been conducting the study, but the study was not completed in time to meet the February 1st deadline. Therefore, on January 31, 2005, the County adopted and submitted to the Los Angeles RWQCB an Interim Peak Flow Standard to be in effect until such time as a final standard can be adopted based on a completed study.

The intent of the Interim Peak Flow Standard, as described by the County in the cover letter dated January 31, 2005, signed by Donald L. Wolfe transmitting the standard to Jonathan Bishop of the Los Angeles RWQCB, is to provide protection for natural streams to the extent supported by findings from the ongoing study, and consistent with practical construction practices.

The Interim Peak Flow Standard adopted by the County is as follows:

> The Peak Flow Standard shall require that all post-development runoff from a 2-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned, from a 2-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cubic feet per second. Discharge flow rates shall be calculated using the County of Los Angeles Modified Rational Method. The Peak Flow Standard shall also require that post-

development runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked, from the 50-year capital storm.

In the January 31, 2005 cover letter, the County notes that upon completion of the Peak Discharge Impact Study, new peak flow standards may be determined to be appropriate.

Pursuant to section 4.D(9) of the MS4 Permit, the Sub-Regional Plan (Geosyntec, 2008) provides an alternative performance standard for the Specific Plan projects to the Interim Peak Flow Standard. The Specific Plan projects will be conditioned to require, as a project design feature, sizing and design of hydraulic features as necessary to control hydromodification impacts in accordance with the Sub-Regional Plan.

Hydromodification impact analysis is provided in **Section 4.2**, Geomorphology and Riparian Resources, of this EIS/EIR.

General Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering (Order No. R4-2003-0111; NPDES No. CAG994004). The Los Angeles RWQCB has issued a general NPDES permit and general Waste Discharge Requirements (WDRs), which govern construction-related dewatering discharges within the RMDP area (the "General Dewatering Permit"). This permit addresses discharges from temporary dewatering operations associated with construction and permanent dewatering operations associated with development. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. The General Dewatering Permit authorizes such construction-related activities so long as all conditions of the permit are fulfilled. Compliance with the requirements of the General Dewatering Permit is used as one method to evaluate project construction-related impacts on surface water quality.

Los Angeles County Municipal Code. The Los Angeles County Municipal Code, ch. 12.80, requires that:

- No discharge enter the storm drain system unless such discharge:
    - Consists entirely of stormwater;
    - Consists of non-stormwater that is authorized by a NPDES permit issued by the USEPA, the state board, or a regional board; or
    - Is associated with emergency fire fighting activity.
- Construction activity not commence for which a permit is required without implementing all stormwater and runoff pollution mitigation measures required by such permit.
- All BMPs required as a condition of any permit for construction activity be maintained in full force and effect during the term of the project, unless otherwise authorized by the director.

- No BMP be installed or implemented that transfers pollutants to air, groundwater, surface soils and/or other media in a manner inconsistent with applicable environmental laws and regulations.

The DPW requires that all drainage improvements be maintained to ensure performance at their design levels. For those drainage facilities that will be maintained by the County, once that drainage facility has been installed the developer provides an easement to the DPW for maintenance. The DPW then assumes responsibility for maintaining these improvements as part of DPW routine maintenance program. The Project has incorporated environmental protection measures and a procedure to notify CDFG and the Corps for all maintenance activities (see RMDP, Section 3.5.2). The maintenance activities addressed include facilities such as dry extended detention basins, vegetated swales, and bioretention areas that are not under the jurisdiction of the Corps or CDFG, but would be required to comply with local regulations.

The Los Angeles Municipal Code, ch. 12.84, requires the use of low impact development ("LID") standards in development projects. This chapter applies to all development within the unincorporated area of the County after January 1, 2009, except for those developments that filed a complete discretionary or non-discretionary permit application with the Los Angeles County Department of Regional Planning, Public Works, or any County-controlled design control board, prior to January 1, 2009. Chapter 12.84 requires that applicable development projects:

- Mimic undeveloped stormwater and urban runoff rates and volumes in any storm event up to and including the "50-year capital design storm event," as defined by DPW;

- Prevent pollutants of concern from leaving the development site in stormwater as the result of storms, up to and including a water quality design storm event; and

- Minimize hydromodification impacts to natural drainage systems.

- To meet these standards, development projects that consist of five or more residential units, or nonresidential development, must comply with the following:

    - The excess volume (ΔV, defined as the post-developed runoff volume minus the pre-developed runoff volume for the 85^{th} percentile storm event) from each lot upon which such development is occurring must be infiltrated at the lot level, or in the alternative, the excess volume from the entire development site, including streets and public right-of-way, shall be infiltrated in sub-regional facilities. The tributary area of a sub-regional facility must be limited to five acres, but may be exceeded with approval of the Director of DPW. When infiltration of all excess volume is not technically feasible, on-site storage, reuse, or other water conservation uses of the excess volume is required and must be implemented as authorized by the Director of DPW.

DPW has developed a LID Standards Manual that outlines stormwater runoff quantity and quality control development principles, technologies, and design standards for achieving the LID standards of Chapter 12.84.

The LID Standards Manual requires that large-scale residential and nonresidential development projects prioritize the selection of BMPs to treat stormwater pollutants, reduce stormwater runoff volume, and

promote groundwater infiltration and stormwater reuse in an integrated approach to protecting water quality and managing water resources. The Manual states that BMPs should be implemented in the following order of preference:

- BMPs that promote infiltration.
- BMPs that store and beneficially use stormwater runoff.
- BMPs that utilize the runoff for other water conservation uses including, but not limited to, BMPs that incorporate vegetation to promote pollutant removal and runoff volume reduction and integrate multiple uses, and BMPs that percolate runoff through engineered soil and allow it to discharge downstream slowly.

If compliance with the above LID requirements is technically infeasible, in whole or in part, the project must incorporate design features demonstrating compliance with the LID requirements to the maximum extent practicable. The LID goals of increasing groundwater recharge, enhancing water quality, and preventing degradation to downstream natural drainage courses will be considered by DPW in the determination of infeasibility.

The LID Standards Manual outlines site conditions where infiltration may not be possible:

- Locations where seasonal high groundwater is within 10 feet of the surface.
- Within 100 feet of a groundwater well used for drinking water.
- Brownfield development sites or other locations where pollutant mobilization is a documented concern.
- Locations with potential geotechnical hazards as outlined in a report prepared and stamped by a licensed geotechnical engineer.
- Locations with natural, undisturbed soil infiltration rates of less than 0.5 inches per hour that do not support infiltration-based BMPs.
- Locations where infiltration could cause adverse impacts to biological resources.
- Development projects in which the use of infiltration BMPs would conflict with local, state or federal ordinances or building codes.
- Locations where infiltration would cause health and safety concerns.

The LID Standards Manual outlines where storage and reuse of the ΔV may not be possible:

- Projects that would not provide sufficient irrigation or (where permitted) domestic grey water demand for use of stored runoff due to limited landscaping or extensive use of low water use plant palettes in landscaped areas.

- Projects that are required to use reclaimed water for irrigation of landscaping.

- Development projects in which the storage and reuse of stormwater runoff would conflict with local, State or Federal ordinances or building codes.

- Locations where storage facilities would cause potential geotechnical hazards as outlined in a report prepared and stamped by a licensed geotechnical engineer.

- Locations where storage facilities would cause health and safety concerns.

4.4.4 EXISTING CONDITIONS

4.4.4.1 Santa Clara River Watershed

Climate. The climate in the Santa Clarita Valley is characterized as semiarid and warm. Summer months are dry with temperatures that can reach as high as 110º F, and winter months are cool with temperatures that can drop as low as 20º F. Much of the watershed upstream of the proposed Project area receives rainfall averaging about 18 to 25 inches per year. The long-term average precipitation is 17.83 inches (1931-2003). As throughout southern California, rainfall in the Santa Clara watershed alternates between wet and dry periods, a variation that is central to understanding the cultural and geomorphic histories of the upper watershed. Wet cycles tend to persist for several years, sometimes for periods of 6 or 8 years, during which rainfall, although variable, may average about 140 to 150 percent of the long-term average.

Santa Clara River. The Santa Clara River watershed comprises 1,624 square miles located in the Transverse mountain range of southern California. Elevations within the watershed range from sea level at the river mouth to 8,800 feet at the summit of Mount Pinos in the northwest corner of the watershed. The Santa Clara River generally flows from east to west from its headwaters near Acton to the Pacific Ocean near the City of Ventura, approximately 40 miles downstream of the Specific Plan area. The Santa Clara River transects the northern portion of the project site from east to west (Geosyntec, 2008).
The approximately 14,288-acre proposed Project area is part of the Santa Clara River hydrologic basin and associated watershed, and intersects 27 major and minor tributary drainage areas, all of which drain into the Santa Clara River. The proposed Project area comprises 3.5 percent of the Santa Clara River watershed upstream of the Los Angeles County/Ventura County Line and 1.4 percent of the total Santa Clara River watershed.

The reach of the Santa Clara River within and adjacent to the proposed Project area has multiple channels (morphologically termed *braided* channels). This kind of system is characterized by high sediment loads, high bank erodibility, and intense and intermittent runoff conditions. Combined with the relatively flat gradient of the River at this point (less than one percent), it has a high potential to aggrade (deposit sediment) at low flow velocities.

The Santa Clara River flows through a complex, tectonically-active trough. Some of the most rapid rates of geologically-current uplift in the world are reported from the Ventura anticline and San Gabriel Mountains, just to the northwest and southeast, respectively, of the River. Slopes are very steep, with local relief of 3,000 to 4,000 feet being common. These faults bring harder, more resistant sedimentary rocks over softer and younger sedimentary formations, but all formations are fundamentally soft and erodible. On either side of the faults, sandstone and mudstones prevail. The northeastern and southeastern corners of the watershed are underlain by deeply-weathered granitic and schistose rocks, which produce sands that are coarser than those of other rock units when they weather and erode. The San Gabriel fault crosses the valley, bringing slightly more resistant rock to the surface and creating a local base level reflected as a slight rise or "bump" on the River's longitudinal profile.

Flows in the Santa Clara River. Perennial streamflow in Santa Clara River Reach 5 is derived from discharges of treated effluent from two wastewater treatment plants and runoff from agricultural fields and existing urban areas. Discharges from agricultural land use are decreasing as some of these areas convert to urban use. There are two regional wastewater reclamation plants in the area operated by the County Sanitation Districts of Los Angeles County that discharge tertiary-treated wastewater to the Santa Clara River. The Saugus Water Reclamation Plant (WRP), located near Bouquet Canyon Road bridge, has a permitted dry weather average design capacity of 6.5 million gallons per day (mgd), creating surface flows from the outfall to near Interstate 5. The Valencia Water Reclamation Plant outfall is located immediately downstream of the Interstate 5 bridge and has a permitted dry weather average design capacity of 21.6 mgd, creating surface flows extending through the Project area and into the far eastern portion of Ventura County. The combined average treated discharge from both WRPs between January 2004 and June 2007 was approximately 20 mgd. (Geosyntec, 2008.)

Downstream of the Valencia WRP, the Santa Clara River is perennial past the Los Angeles County/Ventura County line to approximately Rancho Camulos. Flows in the River also can be affected by groundwater dewatering operations or by diversions for agriculture or groundwater recharge. Throughout the Santa Clara River channel, there are complex surface water/groundwater interactions where both gaining (surface flows are fed by groundwater) and losing (surface flows recharge groundwater) river segments are found. Downstream of the County line, however, the Santa Clara River flows through the Piru groundwater basin, which represents a "Dry Gap" where dry-season streamflow is lost to groundwater.

The Santa Clara River is underlain by several distinct alluvial groundwater basins including the Piru, Fillmore, and Santa Paula Basins. These basins are divided longitudinally by sills or ridges of bedrock that support areas of locally-high groundwater, including the area upstream from the County line (above the Piru Basin), and upstream from the mouth Sespe Creek (the transition between the Piru and Fillmore Basins). This locally-high groundwater sustains summer base flow and riparian vegetation within the Santa Clara River corridor even through relatively dry climatic cycles.

Flows in the Santa Clara River, as in most southern California streams, are highly episodic. Annual flow at the Los Angeles County/Ventura County line between 1953 and 1996 (this U.S. Geologic Survey (USGS) gage was not monitored after 1996) ranged between 253,000 acre-feet (1969) and 561 acre-feet (1961). Annual peak flows at the County line between 1953 and 1996 ranged from 68,800 cubic feet per

second (cfs) (1969) to 109 cfs (1960). Of note is that the second highest annual peak, 32,000 cfs in 1966, was less than half of the highest peak (68,800 in 1969). Annual peak flow in the Santa Clara River near Piru, approximately 3.5 miles downstream of the County line, ranged between 303 cfs (1997) and 32,000 cfs (2006) between 1997 and 2006. These large episodic events have a significant impact on the geomorphic characteristics of the Santa Clara River mainstem.

After studying the response of the River to several different anthropogenic and natural disturbances, Balance Hydrologics concluded that the Santa Clara River, as with many streams in semiarid southern California, is highly episodic. Concepts of "normal" or "average" sediment-supply and flow conditions have limited value in this "flashy" environment, where episodic storm and wildfire events have enormous influence on sediment and storm flow conditions. In these streams, a large portion of the sediment movement events can occur in a matter of hours or days. Other perturbations which can potentially affect channel geometry appear to have transitory or minor manifestations. For example, effects on Santa Clara River channel width of 1980s levee construction was barely discernible by 2005, probably mostly due to morphologic compensation associated with the storm events in the mid- to late-1990s. As a result, channel morphology, stability, and character of the Santa Clara River is almost entirely determined by the "reset" events that occur within the watershed.

4.4.4.2 Santa Clara River Tributaries

The existing drainages within the Specific Plan area consist of Castaic Creek and the drainage courses of: Chiquito Canyon; San Martinez Grande Canyon; Homestead Canyon; Off-Haul Canyon; Mid-Martinez Canyon; Unnamed Canyon A; Chiquito - Minor 1; Chiquito - Minor 2; Chiquito - Minor 3; Chiquito - Minor 4; Middle Canyon; Magic Mountain Canyon; Dead End Canyon; Exxon Canyon; Lion Canyon; Humble Canyon; Long Canyon; Ayers Canyon; Potrero Canyon; Salt Creek Canyon; Unnamed Canyon B; Unnamed Canyon C; Unnamed Canyon D; Unnamed Canyon 1; and Unnamed Canyon 2 (see **Figure 4.4-2**, Modified, Converted, and Preserved Tributary Drainages). Two unnamed drainage courses are located to the south of the Santa Clara River within the Entrada planning area. Also, Castaic Creek and Hasley Creek lie within the VCC planning area. Some of the tributaries have been mapped as blue-line streams by the USGS. While it is the intent of the USGS to indicate that blue-line streams are flowing perennial streams, in arid states such as California, and particularly in southern California, this is not always the case. For example, the blue-line stream in upper Potrero Canyon is an ephemeral drainage. Aside from the lower portions of Salt and Potrero Canyons, each of the tributaries within the Specific Plan area is classified as an intermittent or ephemeral drainage.

The majority of the tributaries' watersheds are characterized by both rugged and steeply developed foothills that have numerous smaller tributary canyons that dissect the watershed, connecting to the narrow alluvial valley associated with the main stem drainage.

San Martinez Grande Canyon. The 3.63 square mile (2,322-acre) San Martinez Grande Canyon watershed is a tributary to the northern bank of the Santa Clara River. The total length of the mainstem channel is approximately 5,170 feet, with an average overall slope of 1.9 percent. Approximately 382 acres (16.5 percent) of the San Martinez Grande Canyon watershed area is located within the RMDP boundary, with the majority being upstream and off site. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and predominantly are classified as being in hydrologic

soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California grassland and California sagebrush scrub.

The only man-made structure that currently influences the hydraulic operation is the roadway culvert crossing for SR-126, but this appears to have sufficient hydraulic capacity to minimize effects to the floodplain.

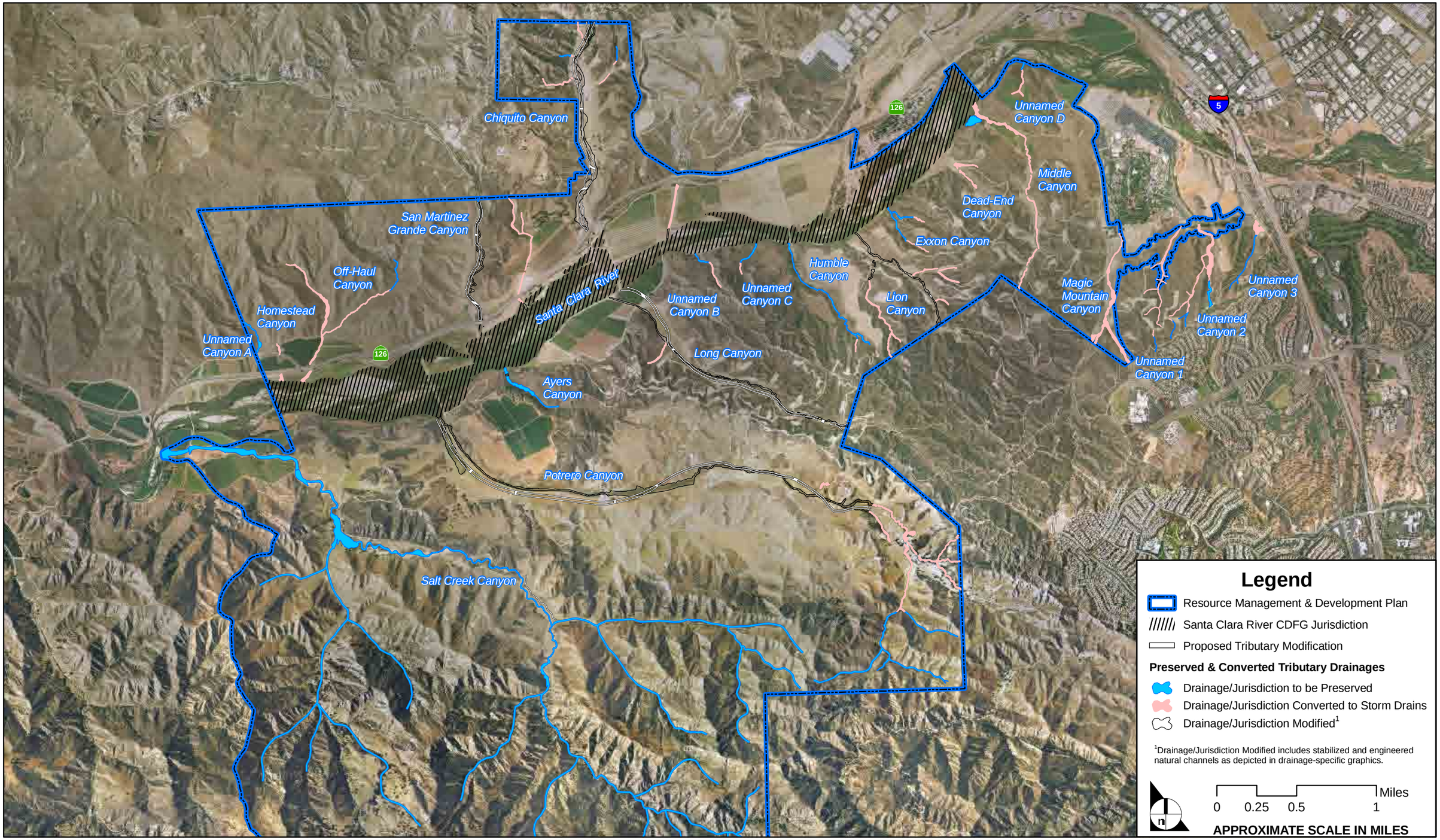
Long Canyon. The 1.99 square mile (1,271-acre) Long Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 9,829 feet, with an average overall slope of three percent. Approximately 821 acres (64.5 percent) of Long Canyon is located within the RMDP boundary, with the remainder being upstream off the project site. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and predominantly are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of disturbed land and chaparral.

Potrero Canyon. The 4.73 square mile (3,025-acre) Potrero Canyon watershed is a tributary to the north bank of the Santa Clara River. The total length of the mainstem channel is approximately 25,381 feet, with an average overall slope of 3.1 percent. Approximately 2,626 acres (87 percent) of Potrero Canyon is located within the RMDP boundary, with the remainder being upstream off the project site. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clays and are predominantly classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California annual grassland and agriculture.

There are no flood control improvements or dams within the watershed, other than several road culvert crossings that would influence the watershed response to rainfall events. The lower 50 percent of the Potrero Canyon watershed has been influenced through human activities that have relocated the existing active creek into an engineered earthen channel along the northern side of the canyon. The remaining upper portion of the drainage does not reflect as much of this influence since there appear to have been fewer historic farming operations impacting this portion of the natural creek channel.

Ayers Canyon. The 0.23 square mile (147 acre) Ayers Canyon watershed is a tributary to the southern bank of the Santa Clara River within RMDP boundary. The total length of the mainstem channel is approximately 2,464 feet, with an average overall slope of 4.4 percent. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and predominately are classified as being in hydrologic soil group "B/C" (moderate runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub (black sage) and agriculture.

Chiquito Canyon. The 4.85 square mile (3,106-acre) Chiquito Canyon watershed is a tributary to the northern bank of the Santa Clara River. The total length of the mainstem channel is approximately 7,605 feet with an average overall slope of 2.39 percent. Approximately 433 acres of the Chiquito Canyon watershed (13.9 percent) is within the RMDP boundary, with the majority being upstream in the developed Val Verde Community or off site. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and are predominantly classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and agriculture.



SOURCE: PACE - April 2008

FIGURE 4.4-2

MODIFIED, CONVERTED, AND PRESERVED TRIBUTARY DRAINAGES

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Chiquito Canyon - Minor 1. The 0.07 square mile (46 acre) Chiquito Canyon - Minor 1 watershed is a tributary to eastern bank of the Chiquito Canyon mainstem tributary. The total length of the mainstem channel is approximately 1,105 feet, with an average overall slope of 16.7 percent. Approximately 39 acres (85 percent) of the watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and are predominantly classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and agriculture.

Chiquito Canyon - Minor 2. The 0.05 square mile (29 acre) Chiquito Canyon - Minor 2 watershed is a tributary to the western bank of the Chiquito Canyon mainstem tributary. The total length of the mainstem channel is approximately 818 feet, with an average overall slope of 5.8 percent. Approximately 23 acres (80 percent) of the watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and are predominately classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and chamise chaparral.

Chiquito Canyon - Minor 3. The 0.05 square mile (34 acre) Chiquito Canyon - Minor 3 watershed is a tributary to the western bank of the Chiquito Canyon mainstem tributary. The total length of the mainstem channel is approximately 627 feet, with an average overall slope of 8.3 percent. The entire watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and chamise chaparral.

Chiquito Canyon - Minor 4. The 0.09 square mile (58 acre) Chiquito Canyon - Minor 4 watershed is a tributary to the western bank of the Chiquito Canyon mainstem tributary. The total length of the mainstem channel is approximately 1,482 feet, with an average overall slope of 6.1 percent. Approximately 57 acres (98 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams and are predominately classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and chamise chaparral.

Dead-End Canyon. The 0.19 square mile (124 acre) Dead-End Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 1,076 feet, with an average overall slope of 6.1 percent. The entire watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams and predominately are classified as being in hydrologic soil group "C" (high runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and disturbed land.

Exxon Canyon. The 0.03 square mile (16 acre) Exxon Canyon watershed is a tributary to the southern bank of the Santa Clara River within the RMDP boundary. The total length of the mainstem channel is approximately 2,193 feet, with an average overall slope of 9.2 percent. The entire watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Saugus

loam, and predominately are classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and disturbed land.

Homestead Canyon. The 0.12 square mile (75 acre) Homestead Canyon watershed is a tributary to the northern bank of the Santa Clara River. The total length of the mainstem channel is approximately 391 feet, with an average overall slope of 5.4 percent. The entire watershed area is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California annual grassland and agriculture. One thin strip of big sagebrush scrub is present lining the stream channel near the lower end.

Humble Canyon. The 0.41 square mile (261 acre) Humble Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 4,863 feet, with an average overall slope of seven percent. Approximately 253 acres (97 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The habitat types found in the upper reaches of the Humble Canyon watershed consist primarily of agriculture and chaparral.

Lion Canyon. The 0.84 square mile (539 acre) Lion Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 4,761 feet, with an average overall slope of 4.6 percent. Approximately 280 acres of the watershed (52 percent) of the watershed area is located within the RMDP boundary. The creek flows in a general east to west direction, similar in alignment to Long Canyon, and joins the Santa Clara River floodplain valley. Generally, the soils in the watershed are characterized as Castaic and Saugus soils with Saugus loam, and predominately are classified as being in hydrologic soil group "B/C" (moderate runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California Sagebrush scrub and Chaparral.

Magic Mountain Canyon. The 1.32 square mile (847 acre) Magic Mountain Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 4,813 feet, with an average overall slope of 3.4 percent. Approximately 178 acres (27 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic and Saugus soils and Castaic-Balcom silty clay loams, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and disturbed land.

Middle Canyon. The 0.53 square mile (340 acre) Middle Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 7,967 feet, with an average overall slope of 3.7 percent. Approximately 272 acres (80 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and predominately are classified as being in hydrologic soil group "C" (higher runoff

potential). This watershed is dominated by California sagebrush scrub, with small pockets of mixed chaparral and California grassland. The stream channel flows through California grassland, agricultural areas, alluvial scrub, and live oak woodland. A freshwater marsh is present at the Santa Clara River confluence.

Mid-Martinez Canyon. The 0.16 square mile (105 acre) Mid-Martinez Canyon watershed is a tributary to the northern bank of the Santa Clara River. The total length of the mainstem channel is approximately 3,729 feet, with an average overall slope of 6.5 percent. Approximately 67 acres (64 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Zamora loam, and predominately are classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and agriculture.

Off-Haul Canyon. The 0.92 square mile (587 acre) Off-Haul Canyon watershed is a tributary to the northern bank of the Santa Clara River. The total length of the mainstem channel is approximately 4,223 feet, with an average overall slope of 7.1 percent. Approximately 470 acres (80 percent) of the watershed is located within the RMDP boundary. The creek flows in a general north to south direction, similar in alignment to Grande Canyon and joining the Santa Clara River floodplain valley. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The upper reaches of Off-Haul Canyon drainage contain a mixture of California sagebrush scrub and alluvial scrub. Lower areas, in the vicinity of SR-126, are dominated by agricultural land.

Salt Creek Canyon. The 9.2 square mile (5,859 acre) Salt Creek Canyon watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 25,830 feet with an average overall slope of 3.4 percent. Approximately 3,808 acres (65 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Gaviota rocky sandy loam, and predominately are classified as being in hydrologic soil group "C/D" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of burned California sagebrush scrub and burned chaparral.

While the Salt Creek drainage is one of the largest found within the RMDP boundary, it was not subject to detailed hydrologic/hydraulic modeling because it is contained within the High Country Special Management Area (SMA), where no development ~~will occur~~ is proposed. Any potential impacts would be limited in nature and related to access and recreational use of the High Country, and might include footbridges and maintenance of existing farm roads. The Specific Plan includes a Visitor Serving land use designation, which allows for an access point to the High Country SMA/SEA 20. Approximately 1,993 feet of bank protection in non-jurisdictional uplands would be installed in conjunction with development of approved Visitor Serving uses as described in the Specific Plan.

As the Salt Creek watershed has been designated as permanent open space, no ~~significant impacts to this drainage area~~ changes that would affect water quality are anticipated from the proposed Project.

Unnamed Canyon A. The 0.70 square mile (445 acre) Unnamed Canyon A watershed is a tributary to the northern bank of the Santa Clara River in the RMDP area. The total length of the mainstem channel is

approximately 1,293 feet, with an average overall slope of 3.4 percent. Approximately 133 acres (29 percent) of the watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic-Balcom complex and silty clay loams, and are predominately classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California annual grassland and agriculture.

Unnamed Canyon B. The 0.05 square mile (29 acre) Unnamed Canyon B watershed is a tributary to the southern bank of the Santa Clara River in the RMDP area. The total length of the mainstem channel is approximately 1,574 feet with an average overall slope of 15.2 percent. The entire watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California annual grassland and chaparral.

Unnamed Canyon C. The 0.07 square mile (43 acre) Unnamed Canyon C watershed is a tributary to the southern bank of the Santa Clara River in the RMDP area. The total length of the mainstem channel is approximately 1,272 feet, with an average overall slope of 7.3 percent. The entire watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Castaic and Saugus soils, and predominately are classified as being in hydrologic soil group "C" (higher runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and agriculture.

Unnamed Canyon D. The 0.04 square mile (28 acre) Unnamed Canyon D watershed is a tributary to the southern bank of the Santa Clara River in the RMDP area. The total length of the mainstem channel is approximately 1,740 feet with an average overall slope of 11.6 percent. The entire watershed is located within the RMDP boundary. Generally, the soils in the watershed are characterized as Zamora loam from both the Castaic and Saugus formations, and predominately are classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush scrub and agriculture.

Unnamed Canyon 1 (Entrada). Unnamed Canyon 1 is located within the boundaries of the Entrada planning area. This 0.16 square mile (103 acre) watershed is a tributary to the southern bank of the Santa Clara River. The total length of the mainstem channel is approximately 2,020 feet with an average overall slope of 2.7 percent. The topography for the watershed varies from a maximum elevation of 1,427 feet in the headwaters to a low elevation of 1,160 feet near the mouth of the canyon at the Santa Clara River valley. Generally, the soils in the watershed are characterized as Castaic-Balcom silty clay loams and predominately are classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California sagebrush.

Unnamed Canyon 2 (Entrada). Unnamed Canyon 2 is located within the boundaries of the Entrada planning area. This 0.6 square mile (401 acre) watershed is a tributary located south of the Santa Clara River. The total length of the mainstem channel is approximately 3,126 feet with an average overall slope of 3.1 percent. The topography for the watershed varies from a maximum elevation of 1,858 feet in the headwaters to a low elevation of 1,161 feet near the mouth of the canyon at the Santa Clara River valley.

Generally, the soils in the watershed are characterized as Saugus loam, and are predominately classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of developed and disturbed land.

Castaic Creek. Castaic Creek is located within the boundaries of the VCC planning area. The 8.7 square mile (5,555.3 acre) Castaic Creek watershed is a tributary located north of the Santa Clara River. The total length of the mainstem channel is approximately 36,819 feet, with an average overall slope of 3.7 percent. The maximum elevation difference from the headwaters to the mouth of the creek at the Santa Clara River is 1,378 feet. Generally, the soils in the watershed are characterized as Saugus loam and are predominately classified as being in hydrologic soil group "B" (lower runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of California coastal sage scrub.

Hasley Creek. Hasley Creek is located within the boundaries of the VCC planning area. The 89.7 square mile (57,416 acre) Hasley Creek watershed is a tributary located north of the Santa Clara River. The total length of the mainstem channel is approximately 112,708 feet with an average overall slope of 2.2 percent. The maximum elevation difference from the headwaters to the mouth of the creek at the Santa Clara River is 2,430 feet. Generally, the soils in the watershed are characterized as Stonyford-Millsholm Family soils and are predominately classified as being in hydrologic soil group "D" (high runoff potential). The associated vegetative cover within the watershed varies, but primarily consists of Chamise chaparral.

4.4.4.3 Existing Surface Water Quality

Due to the size of the Project area and the highly variable nature of surface water quality in the Santa Clara River throughout the Project area, it was not appropriate to summarize water quality data for a single timeframe or location in order to establish baseline water quality conditions. As discussed above, flows in the Santa Clara River are highly episodic in nature and this characteristic can affect surface water quality considerably. The Newhall Ranch Tributary stormwater monitoring, Newhall Ranch WRP, and Los Angeles County monitoring data summarized below, however, are recent (2001 - 2007) and provide an accurate and reasonable characterization of existing water quality conditions that exist in the Project area. Newhall Ranch WRP and Los Angeles County monitoring data are used as benchmarks to compare estimated runoff pollutant concentrations in the post-development condition with runoff treatment PDFs to assess indirect impacts of the proposed Project to surface water quality in the Santa Clara River Corridor. Data collected by the USGS at the Ventura/Los Angeles County line, also summarized below, provides historical perspective of water quality within the Santa Clara River at the downstream Project boundary.

Monitoring Data Sources. In the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan (Geosyntec, 2008), wet and dry weather surface water quality in the Project area was characterized from available water quality monitoring data obtained from the following four sources:

1. **Newhall Ranch Tributary Stormwater Monitoring.** Stormwater samples were collected during two storm events in March 2001 at five monitoring locations (Stations A-E). The first storm had a rainfall depth of 0.2 inches over three hours; the second storm had a rainfall depth of 0.7 inches over ten hours measured at the Newhall rain gauge. Three of the five monitoring

stations were located at the mouths of the tributaries in Potrero Canyon (Station A), San Martinez Grande Canyon (Station B), and Middle Canyon (Station D). The other two monitoring stations were located on tributaries upstream from the mainstem of the Santa Clara River; one was just downstream of the community of Val Verde in Chiquito Canyon (Station E) and one was on an unnamed tributary in Long Canyon, 1/4-mile upstream of the 'Onion Field' (Station C). Aside from Station E, which is downgradient of existing residential development, the land uses in the areas tributary to the Stations A, B, C, and D are predominately open space with some agriculture and oil and gas operations. Although limited, this data is relevant in terms of characterizing the existing stormwater runoff within the Santa Clara River tributaries within the Project area as the conditions within these watersheds have not been altered since 2000. Four of the five tributaries (all but Middle Canyon) will receive post-developed flows from the Specific Plan area.

2. **Newhall Ranch WRP.** The Los Angeles RWQCB required pre-start-up water quality monitoring at upstream and downstream locations from the outfall of the approved Newhall Ranch WRP when preparing the NPDES permit and WDRs application for the WRP. Summarized wet weather monitoring data were collected from two stations in the Santa Clara River from the spring of 2004 until the spring of 2006: one station (NR1) is near the downstream boundary of the Specific Plan area, close to the proposed WRP outfall location, and the second (NR3) is about two and one-half miles further downstream. Five storms with rainfall depths ranging from 0.1 to 0.6 inch were sampled at NR1 and NR3 and one very large storm with a depth of 4.45 inches was sampled at NR3. Grab sampling methods were used.

3. **County Monitoring.** The County of Los Angeles conducts in-stream water quality monitoring on the mainstem of the Santa Clara River at a mass emission station located at The Old Road, at the upstream boundary of the Project area. Wet weather monitoring data are available from November 2002 through February 2007. Monitoring at the mass emission station included nineteen storm events. Composite samples were collected for most parameters, except grab sampling was used for bacteria, oil and grease, and cyanide analyses. The Santa Clara River Station is not automated so composite samples were obtained by sampling discretely every twenty minutes for the first three hours of the storm, and then mixing the discrete samples in the laboratory in proportion to the measured flow rates. The depth of eight of the ten storms was greater than the median storm depth for the Newhall rain gage (0.60 inches). In particular, two storm events were very large events, with total storm depths of 8.0 and 9.99 inches. The Los Angeles County monitoring data are the most current, and are the only source of wet weather monitoring in the Santa Clara River immediately upstream of the Project area.

4. **USGS Monitoring.** The USGS collected a large number of water quality data in the Santa Clara River near the Ventura/Los Angeles County line from 1951 through 1995. These data provide a historical perspective of wet weather water quality in the Santa Clara River immediately downstream of the Project area, but are not used to describe baseline water quality for the reasons described above.

Additional information regarding the wet weather water quality data described above and dry weather water quality data is provided by the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan.

Wet Weather Monitoring Data Summary. To facilitate interpretation, the wet weather water quality data were grouped into two categories depending on the depth of two day antecedent rainfall measured at the Newhall rain gauge:

- **0.1 - 1 inches.** Rainfall depths that would likely produce runoff volumes characteristic of more frequent, smaller storm events.
- **> 1 inch.** Rainfall depths that would likely produce runoff volumes characteristic of larger, less frequent storm events.

Table 4.4-7 and **Table 4.4-8** summarize the average values from wet weather monitoring data for the monitoring locations listed above.

Table 4.4-7
Average Wet Weather Monitoring Data for 2 Day Precedent Rainfall Between 0.1 and 1.0 Inches

Constituent	DPW Mass Emission Station	Specific Plan Area Tributary Monitoring					Newhall Ranch WRP Pre-Startup Monitoring		USGS Wet Weather Monitoring
	S29	Site A	Site B	Site C	Site D	Site E	NR1	NR3	USGS
TSS (mg/L)	845	835	41,100	36,000	5,650	6,645	58	112	2,291
TDS (mg/L)	458	7,380	2,825	190	160	205	855	1,076	1,437[1]
Hardness (mg/L)	249	2,225	1,205	147	59	107	387	475	773
Chloride (mg/L)	68	870	125	3	3	11	100	105	122
Total P (mg/L)	0.60	-	-	-	-	-	0.4	0.4	1.3
Nitrate-N (mg/L)	1.2	18[2]	3.0[2]	1.6[2]	15[2]	2.8[2]	3.2	3.0	2.1[2]
Nitrite-N (mg/L)	0.17	-	-	-	-	-	<0.005	<0.005	-
Ammonia-N (mg/L)	0.14	-	-	-	-	-	0.2	0.1	0.16
TKN (mg/L)	2.5	-	-	-	-	-	0.3	0.4	0.64
Dissolved copper (µg/L)	5.8	-	-	-	-	-	4.6	3.6	ND
Total copper (µg/L)	26	15	175	170	10	70	4.9	5.9	30
Dissolved lead (µg/L)	4.4	-	-	-	-	-	<0.07	<0.07	7.8
Total lead (µg/L)	5.9	6.1	54	95	7.6	37	1	0.8	ND

Table 4.4-7
Average Wet Weather Monitoring Data for 2 Day Precedent Rainfall Between 0.1 and 1.0 Inches

Constituent	DPW Mass Emission Station	Specific Plan Area Tributary Monitoring					Newhall Ranch WRP Pre-Startup Monitoring		USGS Wet Weather Monitoring
	S29	Site A	Site B	Site C	Site D	Site E	NR1	NR3	USGS
Dissolved zinc (µg/L)	12	-	-	-	-	-	12	8.7	10
Total zinc (µg/L)	54	40	330	330	30	225	18	15	150
Dissolved aluminum (µg/L)	894	-	-	-	-	-	27	19	-
Total aluminum (µg/L)	5,040	-	-	-	-	-	740	770	-
Diazinon (µg/L)	0.05	-	-	-	-	-	<0.01	<0.01	0.02
Chlorpyrifos (µg/L)	<0.05	-	-	-	-	-	<0.6	<0.6	-
Cyanide (mg/L)	<0.01	-	-	-	-	-	-	-	-
Fecal Coliform MPN/100mL	7,332	4,300	953	6,300	>81,200	81,200	87	258	427[3]
Total Coliform MPN/100mL	115,590	40,000	>160,000	125,000	>50,000	>81,200	284	549	-

Notes:

[1] Derived from Specific Conductance;
[2] Nitrate + Nitrite-N;
[3] CFU/100ml;
ND = non detected;
- = no or insufficient data.

Source: Geosyntec, 2008.

Table 4.4-8
Average Wet Weather Monitoring Data for 2-Day Precedent Rainfall of > 1 inch

	DPW Santa Clara River Mass Emission Station	Newhall Ranch WRP Pre-Startup Monitoring	USGS Wet Weather Monitoring
Constituent	**S29**	**NR3**	**11108500**
TSS (mg/L)	1,635	43,360	10,711
TDS (mg/L)	216	2,100	838[1]
Hardness (mg/L)	108	832	546
Chloride (mg/L)	24	46	61
Total P (mg/L)	0.42	13.4	1.0
Nitrate-N (mg/L)	0.80	1.4	1.7[2]
Nitrite-N (mg/L)	0.18	ND	
Ammonia-N (mg/L)	0.29	0.5	-
TKN (mg/L)	5.6	46	0.69
Dissolved copper (µg/L)	9.9	-	-
Total copper (µg/L)	26	-	-
Dissolved lead (µg/L)	3.3	-	ND
Total lead (µg/L)	17	-	ND
Dissolved zinc (µg/L)	26	-	-
Total zinc (µg/L)	110	-	-
Dissolved aluminum (µg/L)	1,086	-	-
Total aluminum (µg/L)	5,672	-	-
Diazinon (µg/L)	0.10	<0.01	-
Chlorpyrifos (µg/L)	<0.05	<0.6	-
Cyanide (µg/L)	200	-	-
Fecal Coliform (MPN/100 mL)	122,125	>1,600	2,700[3]
Total Coliform (MPN/100 mL)	295,000	>1,600	-

Notes:
[1] Derived from Specific Conductance;
[2] Nitrate + Nitrite-N;
[3] CFU/100ml;
ND = Not Detected in Sample;
- = no or insufficient data.
Source: Geosyntec, 2008.

The wet weather monitoring data indicate the following:

Total Suspended Solids. The total solids in a liquid sample consist of total dissolved solids and total suspended solids. Total dissolved solids (TDS, discussed below) are materials in the water that will pass through a filter with a 2.0 micrometer or smaller nominal average pore size, primarily inorganic salts (calcium, magnesium, potassium, sodium, chlorides, and sulfates); the material retained by the filter is the total suspended solids (TSS). It is generally expected that TSS concentrations in alluvial streams can be greatly elevated during storm runoff because of the combination of high sediment supply and a high capacity for in-stream transport and erosion. Average TSS concentrations in the Santa Clara River were sometimes very high due to the highly erodible, easily transportable, sandy alluvial soils and sediments, and average concentrations were much higher for the larger storms than the smaller storms. These results show the capacity of high flows in the Santa Clara River for sediment transport and are consistent with other data showing that large rainfall events result in a "reset" of the main channel. As concluded by Balance Hydrologics, concepts of "normal" or "average" sediment-supply and flow conditions have limited value in this "flashy" environment, where episodic storm and wildfire events have enormous influence on sediment and storm flow conditions. In the Santa Clara River, a large portion of sediment movement events can occur in a matter of hours or days.

Total Dissolved Solids. Stormwater monitoring data collected in the tributaries showed greatly differing TDS levels among the five monitoring stations. Measured TDS concentrations were very high at Sites A (Potrero Canyon) and B (San Martinez Grande Canyon), while TDS concentrations at the other three sites were low. Elevated TDS levels in runoff at Sites A and B are likely a result of the natural soil properties of the marine layers of the Pico formation and the high groundwater table conditions in these two canyons, suggesting that groundwater discharges to the channels contributed to the elevated TDS levels. These greatly differing dissolved solid (TDS) concentrations also are reflected in some of the components that make up the TDS (chloride and hardness) as described below.

Average concentrations of TDS in the Santa Clara River were moderate to high, ranging from 216 milligrams per liter (mg/L) to 2,100 mg/L. The Basin Plan objective for TDS in Santa Clara River Reach 5 is 1,000 mg/L. Much higher average concentrations were observed at the three downstream Santa Clara River stations Newhall Ranch WRP start-up monitoring and USGS station) compared with the upstream DPW station, likely due to their location downstream of Potrero Canyon and San Martinez Grande Canyon (Sites A and B), with their much higher salt content.

Hardness. Hardness is a measure of the multivalent metallic cations in water, principally calcium, magnesium, strontium, iron, and manganese. These cations are capable of reacting with soap to form precipitates and with certain anions to form scale. The hardness in water is derived largely from contact with soil and rock formations, and hardness affects the CTR values for certain metals, as discussed above. Waters with a hardness concentration from 150 mg/L to 300 mg/L as CaCO3 are considered hard; waters with a hardness concentration above 300 mg/L as CaCO3 are considered very hard.

The stormwater monitoring data for hardness were analogous to the data for TDS. Hardness concentrations were very high at the tributary Sites A and B, and low to moderate at the other three tributary sites. High hardness at Sites A and B are likely due to natural high levels of calcium and

magnesium in the local soils (such as lime and gypsum deposits), and the high groundwater table conditions in these two canyons, suggesting again that groundwater discharges contributed to the elevated hardness levels.

In the Santa Clara River, average hardness values were greater downstream than at the upstream DPW station and generally decreased with larger antecedent rainfall depth. This is most likely due to the influence of tributary inflows of high hardness waters (such as measured at Sites A and B), other groundwater inputs, and agricultural return flows that enter the Santa Clara River between these stations.

Chloride. Similar to TDS and hardness, monitoring data collected in the tributaries found very high chloride concentrations at Site A, high levels at Site B, and low concentrations at the remaining three sites. Overall, the average chloride concentrations during stormwater monitoring were highly variable and ranged between 3 mg/L and 125 mg/L, with the exception of the very high chloride concentrations detected at the mouth of Potrero Canyon (Site A). Average chloride concentration at the USGS station was about 61 mg/L for storm flows. The average chloride concentration observed in the larger storms at all of the Santa Clara River stations were lower than the Basin Plan objective for chloride of 100 mg/L, while the average chloride concentrations in the smaller storms were above the Basin Plan objective at the downstream monitoring stations.

Phosphorus. Recent wet weather monitoring (DPW mass emission station and Newhall Ranch WRP start-up monitoring) showed somewhat consistent total phosphorus levels of a magnitude of about 0.4 to 0.6 mg/L. An exception was the large storm sample (>1.0 inch) collected at station NR3, which measured 13.4 mg/L. This was likely due to the high concentration of total suspended solids measured during the same storm event, because total phosphorus is predominately found in the particulate-phase in stormwater runoff. Historical average total phosphorus concentrations at the USGS station were somewhat higher than recent results at 1.0 to 1.3 mg/L, and appeared to be somewhat independent of storm event size.

Nitrogen. Measured nitrate-nitrogen concentrations in the tributary stormwater monitoring were generally low (less than 3 mg/L) at three of the sites, and were elevated at Sites A and D (17.5 mg/L and 15.3 mg/L, respectively). The numeric target for nitrate plus nitrite-nitrogen in the Santa Clara River nitrogen compounds TMDL is 4.5 mg/L (30-day average), which is based on achieving the Basin Plan water quality objective of 5 mg/L. (Note that nitrate-nitrogen is typically an order of magnitude greater than nitrite-nitrogen in natural waters, as nitrite is converted to nitrate in aerobic conditions.) The Santa Clara River average nitrate-nitrogen concentrations were below this objective (0.8 mg/L to 3.2 mg/L). The average historical nitrate-N + nitrite-N concentrations at the USGS station were roughly similar, varying from 2.1 mg/L for lower storm flows to 1.7 mg/L for higher storm flows.

Average ammonia concentrations were low and ranged from 0.1 mg/L to 0.5 mg/L. The ammonia water quality objectives in the Santa Clara River nitrogen compounds TMDL range from 3.4 mg/L to 5.5 mg/L (one-hour average) and 1.2 mg/L to 2.0 mg/L (30-day average).

Average total Kjeldahl nitrogen concentrations, which is the measure of ammonia plus the organic forms of nitrogen, generally ranged from 0.3 mg/L to 5.6 mg/L. One exception was the concentration found in the large storm at NR3, which measured 46 mg/L. As with total phosphorus, the organic forms of

nitrogen in stormwater runoff are generally in the particulate-phase, and this result correlated with the high levels of total phosphorus and suspended solids measured during this same event.

Metals. Total copper, lead, and zinc measured at Sites B and C were much higher than the concentrations measured at Sites A and D. Concentrations at Site E fell in the middle of the measured range. Elevated total metal concentrations are often associated with elevated TSS levels, although this trend is not evident in the tributary monitoring data. The average total copper concentrations at Sites B, C, and E were greater than the CTR acute copper criterion. The average total copper concentrations ranged from 10 micrograms per liter (µg/L) to 175 µg/L; the CTR acute total copper criterion for a hardness concentration of greater than 400 mg/L is 52 µg/L. The average total lead and total zinc concentrations in all the tributaries were below the CTR acute criteria. The average total lead concentrations ranged from 6.1 µg/L to 95 µg/L; the CTR acute total lead criterion for a hardness concentration of greater than 400 mg/L is 480 µg/L. The average total zinc concentrations ranged from 30 µg/L to 330 µg/L; the CTR acute total zinc criterion for a hardness concentration of greater than 400 mg/L is 390 µg/L.

Average concentrations of dissolved and total copper measured in the Santa Clara River (3.6 µg/L to 9.9 µg/L, dissolved copper; 4.9 to 26 µg/L, total copper) were below the respective CTR acute criteria for the average hardness of 250 mg/L (32 µg/L, dissolved copper; 33 µg/L, total copper). Average concentrations of dissolved and total lead measured in the Santa Clara River (<0.07 µg/L to 4.4 µg/L, dissolved lead; 0.8 to 17 µg/L, total lead) were well below the respective CTR acute criteria for the average hardness of 250 mg/L (170 µg/L, dissolved lead; 260 µg/L, total lead). Average concentrations of dissolved and total zinc measured in the Santa Clara River (8.7 µg/L to 26 µg/L, dissolved zinc; 15 to 110 µg/L, total zinc) were all well below the respective CTR acute criteria for the average hardness of 250 mg/L (250 µg/L, dissolved zinc; 260 µg/L, total zinc).

Average dissolved aluminum concentrations showed a very wide range in the Santa Clara River, ranging from a low of 19 µg/L dissolved aluminum measured in small storms at station NR3 to 1,086 µg/L measured in large storms at the Los Angeles County mass emission station. Similarly, total aluminum ranged from a low of 740 µg/L dissolved aluminum measured in small storms at station NR1 to 5,672 µg/L measured in large storms at the Los Angeles County mass emission station. The National Ambient Water Quality Criteria (NAWQC) acute criterion for aluminum is 750 µg/L for a pH range of 6.5 to 9.0; the CTR does not include an aluminum criterion.

Pesticides. Chlorpyrifos was not detected in 19 samples taken at the County's mass emission station, while diazinon was detected in 8 of 19 samples, with an average concentration of 0.05 µg/L in small storms and 0.10 µg/L in the larger storms. Diazinon and chlorpyrifos were not detected further downstream in the Santa Clara River during Newhall Ranch WRP wet weather sampling, but were detected in the one wet weather sample in the historical USGS data. There is no CTR criterion for diazinon; the recommended NAWQC is 0.17 µg/L (acute). The diazinon criterion derived by the CDFG is 0.08 µg/L.

Cyanide. Cyanide was detected in six of 19 wet weather samples taken at the County's mass emission station. Concentrations of cyanide ranged from below 10 µg/L to 590 µg/L. The CTR criterion for freshwater acute aquatic life protection for cyanide is 22 µg/L.

Coliform Bacteria. Concentrations of total and fecal coliform bacteria in wet weather flows at all tributary monitoring stations and the County's mass emission station were very high, consistent with other stormwater data throughout the region, ranging from 87 Most Probable Number per 100 milliliters (MPN/100 mL) to 323,000 MPN/100 mL. Average bacteria concentrations at the lower stations were significantly lower, but still elevated, and more so during larger storms. In waters designated for water contact recreation (REC-1), the Basin Plan objective for fecal coliform in fresh water is: Fecal coliform density shall not exceed 200/100 ml (geometric mean) or 400/100 ml (single sample).~~a log mean of 200/100 mL (based on a minimum of not less than 10 percent of total samples during any 30-day period), nor shall more than 10 percent of the total number of samples during any 30-day period exceed 400/100 mL.~~

Dry Weather Monitoring Data Summary. Dry season base flows in the Santa Clara River through the proposed Project area are perennial. Dry season base flows may include contributions from natural groundwater flows; however, discharges from the upstream Saugus and Valencia WRPs contribute the majority of base flow. Discharges from the WRPs during dry weather conditions are a source of impairing pollutants in downstream reaches, including chloride, TDS, and nitrogen compounds. Dry weather water quality monitoring data in the Santa Clara River are available from DPW sampling at the Santa Clara River mass emission station, Newhall Ranch WRP pre-startup monitoring, and USGS water quality monitoring. **Table 4.4-9** summarizes the average values from dry weather monitoring data for these monitoring locations.

The dry weather monitoring data indicate the following:

TSS. Relatively high average TSS concentrations were observed, especially the historical data from USGS station, which may have included samples taken during times of higher erosion or larger dry weather flows. Average dry weather flow TSS concentrations observed by the Newhall Ranch WRP pre-startup monitoring were similar to those observed for small storms in wet weather monitoring. Average concentrations of TSS appeared higher at the upstream DPW mass emission station than at the downstream Newhall Ranch WRP pre-startup sites. Differences may be due to physical factors such as channel substrate material, local flow regime, and tributary influences.

Hardness, TDS and Chloride. The average concentrations of hardness, TDS, and chloride were more similar between the DPW mass emission station and Newhall Ranch WRP monitoring locations. However, the USGS County Line station historically recorded higher averages (approximately double) than the baseline data observed at the DPW mass emission station and Newhall Ranch WRP monitoring locations. The baseline data suggests that the water flowing in the Santa Clara River in the proposed Project area during dry weather is very hard with high levels of other dissolved salts, including chloride. The average concentrations of TDS in the baseline data ranged from 812 mg/L to 936 mg/L, below the Basin Plan objective for TDS in Santa Clara River Reach 5 (1,000 mg/L). Average chloride concentrations in dry weather flows ranged from 115 mg/L to 124 mg/L, above the Basin Plan objective of 100 mg/L.

Table 4.4-9
Summary of Average Dry Weather Monitoring Data in the Santa Clara River

Constituent	SCR Mass Emission Station	Newhall WRP Pre-Startup Monitoring		USGS Dry Weather Monitoring
	S29	*NR1*	*NR3*	*11108500*
TSS (mg/L)	200	66	128	349
Hardness (mg/L)	420	388	458	881
TDS (mg/L)	812	845	936	1541[1]
Chloride (mg/L)	115	120	124	140
Total P (mg/L)	0.26	0.5	0.5	1.13
Nitrate-N (mg/L)	1.2	2.8	2.9	4[2]
Nitrite-N (mg/L)	0.1	0.02	0.02	-
Ammonia-N (mg/L)	0.1	0.1	0.1	0.18
TKN (mg/L)	0.6	0.4	0.5	0.83
Dissolved copper (µg/L)	2.9	4	4.2	1.8
Total copper (µg/L)	15.2	5	6.5	20
Dissolved lead (µg/L)	<5.0	0.2	0.2	7.8
Total lead (µg/L)	1.8	0.9	1.4	ND
Dissolved zinc (µg/L)	6.4	11	10.7	15.8
Total zinc (µg/L)	20.7	15.4	19.5	45
Dissolved aluminum (µg/L)	-	170	289	-
Total aluminum (µg/L)	845	1,018	1,685	-
Diazinon (µg/L)	0.01	<0.01	<0.01	0.03
Chlorpyrifos (µg/L)	<0.05	-	-	-
Cyanide (mg/L)	<0.01	-	-	-
Fecal coliform (MPN/100 mL)	165	209	213	250[3]
Total coliform (MPN/100 mL)	3,626	961	1,207	-

Notes:
[1] Derived from Specific Conductance;
[2] Equals nitrate-N plus nitrite-N;
[3] CFU/100ml
- = no or insufficient data.

Source: Geosyntec, 2008.

Phosphorus and Nitrogen. The average concentrations for total phosphorus and nitrate in dry weather flows increased downstream, while ammonia and TKN concentrations were relatively consistent from upstream to downstream. All average nutrient concentrations were higher in the historical dataset.

Nutrient concentrations measured in dry weathers flows reflect the influence of the Saugus and Valencia WRPs. Lower average concentrations in the Newhall WRP startup monitoring compared with the data at the USGS gauge could be due to historically greater WRP nutrient discharge concentrations and/or less responsible use of fertilizers. Higher historic TKN concentrations could also be attributed to higher TSS concentrations, and hence particulate nutrients, observed at this site.

Metals. Concentrations of heavy metals in dry weather flows were generally low and, for the most part, reasonably similar. Total metal concentrations are related to TSS concentrations, and this is reflected in the difference between the historical data collected at the USGS site with higher TSS and the more recent data with lower TSS. Average dissolved copper concentrations were fairly similar and ranged from 1.8 - 4.2 µg/L. Average dissolved zinc concentrations were also fairly similar and ranged from 6.4 - 15.8 µg/L. Dissolved lead concentrations were slightly higher for the historical than the more recent datasets, and this is likely due to the widespread use of leaded gasoline prior to 1995.

Average concentrations of dissolved and total copper measured dry weather flows in the baseline data (2.9 µg/L to 4.2 µg/L, dissolved copper; 5 to 15.2 µg/L, total copper) were below the respective CTR chronic criteria for a hardness greater than 400 mg/L (29 µg/L, dissolved copper; 30 µg/L, total copper). Average concentrations of dissolved and total lead measured in dry weather flows (<5 µg/L to 2.5 µg/L, dissolved lead; 0.9 to 1.8 µg/L, total lead) were well below the respective CTR chronic criteria for a hardness greater than 400 mg/L (11 µg/L, dissolved lead; 19 µg/L, total lead). Average concentrations of dissolved and total zinc measured in dry weather flows (6.4 µg/L to 11 µg/L, dissolved zinc; 15.4 to 20.7 µg/L, total zinc) were all well below the respective CTR chronic criteria for a hardness greater than 400 mg/L (380 µg/L, dissolved zinc; 390 µg/L, total zinc).

Aluminum concentrations were only measured at the Newhall Ranch WRP Startup Monitoring stations. Average dissolved aluminum concentrations in the dry weather flows ranged from 170 µg/L to 289 µg/L. Total aluminum ranged from 1,018 µg/L to 1,685 µg/L. The National Ambient Water Quality Criteria (NAWQC) acute criterion for acid soluble aluminum is 750 µg/L for a pH range of 6.5 to 9.0; the CTR does not include an aluminum criterion.

Pesticides. Diazinon was detected at the upstream DPW site and historically at the USGS site in dry weather flows. The more extensive data set collected at NR-1 and NR-3 did not detect diazinon and this may be due to its recent phase-out by EPA for residential uses.

Cyanide. Cyanide was measured but not detected in dry weather flows at the DPW mass emission station.

Coliform Bacteria. The concentrations of indicator bacteria indicated highly variable but generally elevated fecal indicator bacteria concentrations in dry weather flows. The observed data were above the REC-1 Basin Plan objective for fecal coliform in fresh water is: Fecal coliform density shall not exceed 200/100 ml (geometric mean) or 400/100 ml (single sample). ~~(log mean of 200/100 mL (based on a minimum of not less than 10 percent of total samples during any 30-day period), nor shall more than 10 percent of the total number of samples during any 30-day period exceed 400/100 mL).~~

4.4.4.4 Existing Groundwater Quality

The Specific Plan area and the VCC and Entrada planning areas lie at the western end of the upper Santa Clara River hydrologic area, as defined by the California Department of Water Resources (DWR). The Santa Clara River Valley East Groundwater Subbasin lies within this hydrologic area and is the source of essentially all local groundwater used for water supply in the Santa Clarita Valley. The local groundwater supplies are obtained from relatively young surficial alluvial deposits and from an older geologic unit (the Saugus Formation) that underlies the alluvium and adjoining areas. The alluvium and the Saugus Formation are underlain by bedrock units consisting of the Pico Formation in the Project area and other geologic units in the eastern and northern portions of the Santa Clarita Valley. These deep bedrock units yield little water and are not considered viable for groundwater development.

The alluvial sediments lie within the portion of the Valley occupied by the Santa Clara River and also are present in side canyons that contain tributaries to the River. The alluvium consists of extensively interlayered and interfingered mixtures of gravel and sand, with variable amounts of cobbles and boulders and minor amounts of silt and clay. Due to the unconsolidated to poorly consolidated condition of the alluvium, and its lack of cementation, the alluvium has relatively high permeability and porosity. The groundwater flow direction in the Alluvial aquifer follows the topography of the Valley and its tributaries. Groundwater recharge occurs in the eastern, northern, and southern portions of the Valley. Natural mechanisms for groundwater discharge occur at the west end of the Valley and consist of discharge to the Santa Clara River, subsurface outflow beneath the River, and evapotranspiration by deep-rooted vegetation.

The Saugus Formation is present beneath the eastern portion of the Project area and most of the Santa Clarita Valley area east of the Project area. The upper subunits of the Saugus Formation consist of terrestrial sediments deposited in stream channels, floodplains, and alluvial fans by ancestral drainage systems. The upper subunits are a source of groundwater supply in the Santa Clarita Valley because of their productive nature and their good water quality. Deeper subunits of the Saugus Formation were deposited in a marine environment and are subsequently not used for water supplies because of their brackish water quality and fine-grained, low-permeability nature.

Faulting and folding of the Saugus Formation and the underlying bedrock units have created a bowl-shaped structure beneath the Santa Clarita Valley. The Saugus Formation and underlying bedrock generally dip downwards from the periphery of the Valley towards the deepest portion of the "bowl" beneath the central portion of the Valley. The thickness of the Saugus Formation also is controlled by the San Gabriel fault, which is present in the eastern and northern portions of the Valley. Because of its structure and its connection with the overlying Alluvial aquifer, groundwater flow in the Saugus Formation is generally towards the center of the bowl and also towards the western portion of the Santa Clara River. Like the Alluvial aquifer, the Saugus Formation is recharged in the eastern and other peripheral portions of the Santa Clarita Valley. Groundwater discharge from the Saugus Formation occurs at the west end of the Valley in the form of groundwater discharge into the overlying Alluvial aquifer, which in turn discharges to the River in the western end of the Valley.

Alluvium. In terms of the aquifer system, there is no convenient long-term record of water quality (*i.e.*, water quality data in one or more single wells that spans several decades and continues to the present).

Thus, in order to examine a long-term record of water quality in the alluvium, individual records have been integrated from several wells completed in the same aquifer materials and in close proximity to each other to examine historical trends in general mineral groundwater quality throughout the basin. Based on these records of groundwater quality, wells within the alluvium have experienced historical fluctuations in general mineral content, as indicated by electrical conductivity (EC), which correlates with fluctuations of individual constituents that contribute to EC. However, the historic water quality data indicates that, on a long-term basis, there has not been a notable trend and, specifically, there has not been a decline in water quality within the alluvium.

Specific conductance within the alluvium exhibits a westward gradient, corresponding with the direction of groundwater flow in the alluvium. EC is lowest in the easternmost portion of the basin, and highest in the west, and generally exhibits an inverse correlation with precipitation and streamflow, with a stronger correlation in the easternmost portion of the basin where groundwater levels fluctuate the most. Wet periods have produced substantial recharge of higher quality (low EC) water, and dry periods have resulted in declines in groundwater levels, with a corresponding increase in EC (and individual contributing constituents) in the deeper parts of the alluvium.

The most notable groundwater quality issue in the alluvium is perchlorate contamination in a localized area situated about three miles east of the Project area. In 2002, one well (the Santa Clarita Water Division's Stadium Well), located near the former Whittaker-Bermite facility, was inactivated for municipal water supply due to detection of perchlorate slightly below the Notification Level. In early 2005, perchlorate was detected in a second well, the Valencia Water Company's Well Q2. In October 2005, Well Q2 was returned to service with wellhead perchlorate treatment under a permit from the California Department of Health Services (DHS). On-going monitoring in the alluvium north of the Whittaker-Bermite site (an ammunition manufacturing site) has shown no detections of perchlorate in any other Alluvial municipal water supply wells in this area.

Table 4.4-10 summarizes average metals, general chemistry, and organic compounds data for three Alluvial aquifer wells located in and near the Project area. One well is a municipal water supply well that belongs to the Valencia Water Company (E-15) and is located in the VCC planning area. Two Newhall Ranch agricultural Alluvial aquifer wells (C and B6) were monitored twice (once each in 2000 and 2001). These well locations are illustrated on **Figure 4.4-3**.

Laboratory testing indicates that all constituents tested were at acceptable levels for drinking water, for all tested wells, with the exception of sulfate and iron in the agricultural supply well B6. Specifically, the average sulfate concentration (360 mg/L) exceeded the Basin Plan objective of 350 mg/L and the average iron concentration (0.4 mg/L) exceeded the secondary drinking water standard of 0.3 mg/L in Alluvial Well B6.

Tests conducted for perchlorate at the Alluvial aquifer wells listed in **Table 4.4-10** indicated "non-detect," meaning no perchlorate was detected. Furthermore, no organic contaminants have been detected in any Alluvial aquifer wells.

Table 4.4-10
Groundwater Monitoring Data

Parameter	Units	Basin Plan Objective/Maximum Contaminant Level	Average Concentration			
			Alluvial Well E-15	Alluvial Well C	Alluvial Well B6	Saugus Well 206
Aluminum	µg/L	1,000[2]	ND	ND	ND	ND
Arsenic	µg/L	50[2]	n/a	ND	ND	n/a
Barium	mg/L	1[2]	ND	0.02	0.03	ND
Beryllium	µg/L	4[2]	ND	n/a	n/a	ND
Cadmium	µg/L	5[2]	ND	ND	ND	ND
Chromium	µg/L	50[2]	ND	ND	ND	ND
Copper	µg/L	1,000[3]	ND	ND	ND	ND
Iron	mg/L	0.3[3]	ND	0.1	**0.4**	ND
Manganese	µg/L	50[3]	ND	ND	ND	ND
Mercury, Total	µg/L	2[2]	n/a	ND	ND	n/a
Nickel	µg/L	100[2]	ND	ND	ND	ND
Selenium	µg/L	50[2]	n/a	ND	ND	n/a
Silver	µg/L	100[3]	NA	ND	ND	n/a
Thallium	µg/L	2[2]	NA	ND	ND	n/a
Zinc	µg/L	5,000[3]	ND	ND	ND	ND
Alkalinity as CaCO3	mg/L	-	226	255	295	221
Boron	mg/L	1.0[1]	0.48	0.39	0.48	n/a
Chloride	mg/L	150[1]	90	57	82	45
Color	Color unit	15[3]	ND	ND	5	ND
Cyanide, total	mg/L	0.15[2]	n/a	ND	ND	n/a
Fluoride	mg/L	2.0[2]	0.8	0.7	0.8	0.2
Hardness as CaCO3	mg/L	-	499	410	510	464
MBAS	mg/L	0.5[3]	n/a	ND	ND	n/a
Nitrate as NO3	mg/L	45[1]	18.5	9.5	10.6	20.9
Nitrite as N	mg/L	1[1]	ND	ND	ND	ND
Nitrate+Nitrite as N	mg/L	10[1]	3.6	2.1	2.4	4.7
Odor	TON	3[3]	1.1	ND	ND	1
Specific Conductance	umhos/cm	900-1600[(3)]	1317	1150	1400	1158
Sulfate	mg/L	350[1]	314	285	**360**	293
TDS	mg/L	1,000[1]	969	760	950	861
Turbidity	NTU	5[3]	0.4	0.35	1.4	0.2
Volatile Organic Chemicals (VOCs)	µg/L	variable	ND	ND	ND	ND
Synthetic Organic Chemicals (SVOCs)	µg/L	variable	ND	ND	ND	ND

Key: **Bold** **Exceeds Standard**

Notes:
- = no applicable basin plan objective or MCL
n/a = not analyzed
ND = none detected
[1] Los Angeles Basin Plan Regional Objectives for Groundwater (Table 3-10).
[2] California Department of Public Health Primary Drinking Water MCL (Title 22 CCR Table 64431-A and Table 64444-A).
[3] California Department of Public Health Secondary Drinking Water MCL (Title 22 CCR Table 64449-A and Table 64449-B).
Source: Geosyntec, 2008.

SOURCE: Geosyntec - December 2007

FIGURE 4.4-3

Groundwater Monitoring Well Locations

32-214•12/07

Saugus Formation. Similar to the Alluvial aquifer, groundwater quality in the Saugus Formation is a key factor in assessing that aquifer as a municipal and agricultural water supply. As with the Alluvial aquifer, long-term Saugus groundwater quality data is not sufficiently extensive (few wells) to permit any basin-wide analysis or assessment of pumping-related impacts on quality. Accordingly, EC has been chosen as an indicator of overall water quality, and records have been combined to produce a long-term depiction of water quality. Water quality in the Saugus Formation historically has not exhibited the precipitation-related fluctuations seen in the Alluvial aquifer, and based on the historical record over the last 50 years, groundwater quality in the Saugus Formation has exhibited a slight overall increase in EC.

Table 4.4-10, above, summarizes average metals, general chemistry, and organic compounds data for one Saugus aquifer wells located in and near the Project area. Saugus Well 206 is a municipal water supply well that belongs to the Valencia Water Company and is located in the RMDP project area (**Figure 4.4-3**). Laboratory testing indicates that all constituents tested were at acceptable levels for drinking water in Saugus Well 206.

As with the Alluvial aquifer, the most notable groundwater quality issue in the Saugus Formation is perchlorate contamination. Since 1997, four Saugus wells located near the former Whittaker-Bermite facility (about two miles east of the Specific Plan area) have been inactivated for water supply service due to the presence of perchlorate. A fifth well in that same location showed a detection of perchlorate below the DHS reporting level of 4 µg/L. To date, in the Saugus Formation, there have been no perchlorate detections in other active municipal-supply wells located down gradient (west) of the impacted wells. The development and implementation of a cleanup plan for the former Whittaker-Bermite facility and the impacted groundwater resources is being coordinated among the Castaic Lake Water Agency (CLWA), impacted purveyors, the California Department of Toxic Substances Control (DTSC), and the Corps. For the impacted groundwater, a Final Interim Remedial Action Plan for containment and extraction of perchlorate was completed and approved by DTSC in January 2006. Design of the treatment facilities and related pipelines also was completed in 2006. Construction of these facilities to implement the pump-and-treat program and to also restore inactivated well capacity is anticipated to conclude in mid-2008, with the facilities on line by fall 2008.

4.4.5 IMPACT SIGNIFICANCE CRITERIA

4.4.5.1 Surface Water Quality

Thresholds of significance for surface water quality impacts have been developed based on a review of the MS4 permit and Appendix G of the State CEQA Guidelines. In order to maintain consistency in the impact analysis, the Corps has agreed to use the criteria presented below for purposes of this EIS/EIR, although significance conclusions are not expressly required under NEPA.

A project would have a significant impact on water quality if the project would:

Significance Criterion 1: Violate any water quality standards or waste discharge requirements;

Significance Criterion 2: Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

Significance Criterion 3: Otherwise substantially degrade water quality.

The portion of Significance Criterion 2 relevant to stormwater conveyance is addressed in **Section 4.1**, Surface Water Hydrology and Flood Control.

4.4.5.2 Groundwater Quality

Thresholds of significance for evaluating groundwater quality impacts also have been developed based on Appendix G of the State CEQA Guidelines. The Corps also has agreed to use the criterion presented below for purposes of this EIS/EIR, although significance conclusions are not expressly required under NEPA.

Significant adverse impacts to groundwater are presumed to occur if the project would:

Significance Criterion 4: Through changes in surface water runoff quality and quantity and changes in groundwater recharge, result in a violation of any groundwater quality standards or waste discharge requirements or otherwise substantially degrade groundwater quality.

4.4.6 IMPACTS OF THE PROPOSED PROJECT AND ALTERNATIVES

The analysis of potential direct, indirect, and secondary impacts to water quality associated with construction and operation of the proposed Project and the alternatives is presented below. Impacts have been identified using the significance criteria applicable to assessing surface and groundwater quality described in the preceding section.

4.4.6.1 Impacts of Alternative 1 (No Action/No Project)

4.4.6.1.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts. Under this alternative, none of the proposed RMDP infrastructure would be provided and no changes to existing water quality conditions would occur. Alternative 1 would have no impacts to the existing surface water quality conditions and no direct impacts related to Significance Criteria 1 through 3 would result.

SCP Direct Impacts. Under this alternative, the SCP would not be adopted and the proposed spineflower preserves would not be established. Alternative 1 would have no direct impacts to the existing surface water quality conditions and no direct impacts related to Significance Criteria 1 through 3 would result.

4.4.6.1.2 Indirect Impacts to Surface Water

RMDP Indirect Impacts. Under this alternative, none of the proposed RMDP infrastructure required to implement the previously approved Newhall Ranch Specific Plan would be developed. Therefore, no Specific Plan build-out would occur. There would be no change to the existing land uses within the RMDP boundary, which consist of open space, agriculture, and oil and gas extraction (with associated access roads). No new additional mitigation would be required for the ongoing agricultural and oil and gas extraction activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Alternative 1 would have no significant indirect impacts regarding Significance Criteria 2 and 3.

SCP Indirect Impacts. Under this alternative, the SCP would not be adopted and development on the Specific Plan site and the VCC and Entrada planning areas would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Alternative 1 would have no significant indirect impacts regarding Significance Criteria 2 and 3.

4.4.6.1.3 Secondary Impacts to Surface Water Quality

RMDP Secondary Impacts. Under this alternative, none of the proposed RMDP infrastructure required to implement the previously approved Newhall Ranch Specific Plan would be developed. Therefore, no Specific Plan build-out would occur. There would be no change to the existing land uses within the RMDP boundary, which consist of open space, agriculture, and oil and gas extraction (with associated access roads). No additional mitigation would be required for the ongoing agricultural and oil and gas extraction activities, and these existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criterion 1 if these impacts are carried off-site in the Santa Clara River. Alternative 1 would have no significant secondary impacts regarding Significance Criteria 1 and 2.

SCP Secondary Impacts. Under this alternative, the SCP would not be adopted and development on the Specific Plan site and the VCC and Entrada planning areas would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criterion 1 if these impacts are carried off-site in the Santa Clara River. Alternative 1 would have no significant secondary impacts regarding Significance Criteria 1 and 2.

4.4.6.1.4 Direct Impacts to Groundwater

RMDP Direct Impacts. Under this alternative, none of the proposed RMDP infrastructure would be provided and no changes to existing water quality conditions would occur. Alternative 1 would have no impacts to the existing groundwater quality conditions and no direct impacts related to Significance Criterion 4 would result.

SCP Direct Impacts. Under this alternative, the SCP would not be adopted and the proposed spineflower preserves would not be established. Alternative 1 would have no direct impacts to the existing groundwater quality conditions and no direct impacts related to Significance Criterion 4 would result.

4.4.6.1.6 Indirect Impacts to Groundwater

RMDP Indirect Impacts. Under this alternative, none of the proposed RMDP infrastructure required to implement the previously approved Newhall Ranch Specific Plan would be developed. Therefore, Specific Plan build-out would not occur. There would be no change to the existing land uses within the RMDP boundary, which consist of open space, agriculture, and oil and gas extraction (with associated access roads). No additional mitigation would be required for the ongoing agricultural and oil and gas extraction activities, and these existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4.

SCP Indirect Impacts. Under this alternative, the SCP would not be adopted and development on the Specific Plan site and the VCC and Entrada planning areas would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4.

4.4.6.1.7 Secondary Impacts to Groundwater

RMDP Secondary Impacts. Under this alternative, none of the proposed RMDP infrastructure required to implement the previously approved Newhall Ranch Specific Plan would be developed. Therefore, no Specific Plan projects would be constructed. There would be no change to the existing land uses within the RMDP boundary, which consist of open space, agriculture, and oil and gas extraction (with associated access roads). No additional mitigation would be required for the ongoing agricultural and oil and gas extraction activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if impacted groundwater travels off-site.

SCP Secondary Impacts. Under this alternative, the SCP would not be adopted and development on the Specific Plan site and the VCC and Entrada planning areas would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if impacted groundwater travels off-site.

4.4.6.2 Impacts of Alternative 2 (Proposed Project)

4.4.6.2.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts. As described in **Section 2.0**, Project Description, and **Section 3.0**, Description of Alternatives, of this EIS/EIR, the RMDP component of the proposed Project consists of infrastructure in

the Santa Clara River and tributaries located on the Specific Plan site, which are needed to implement the approved Specific Plan. The RMDP infrastructure is comprised of various flood control features, stream bank protection (*i.e.*, buried soil cement, ungrouted rock rip-rap, open cell concrete interlocking systems, and/or gunite slope lining), drainage facilities, roads, building pads, pipeline and utility river crossings, nature trails, new and widened bridges, and the discharge outfall for the previously approved Newhall Ranch WRP~~;~~. It also includes the following elements: habitat restoration and enhancement, drainage preservation, geotechnical investigations, and ~~and drainage facility~~ maintenance activities~~. of the LACDPW.~~ Direct impacts to water quality resulting from the RMDP are described in the following paragraphs.

Short-Term Direct Impacts to Surface Water Quality. Installation of the RMDP infrastructure improvements could directly impact water quality during construction. The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality during the construction phase focus primarily on sediment (TSS and turbidity) and non-sediment related pollutants, such as nutrients, heavy metals, and certain pesticides, including 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, grading, and trenching for RMDP infrastructure. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Non-sediment-related pollutants that are also of concern during construction include construction materials (*e.g.*, paint), chemicals, liquid products, and petroleum products used in facility construction or the maintenance of heavy equipment; and concrete-related pollutants. These activities, outside of regulatory controls, would be significant under Significance Criteria 1 through 3 because the potential release of sediment and non-sediment related pollutants could violate water quality standards, provide additional sources of polluted runoff, and/or substantially degrade surface water quality. As discussed below, PDFs have been proposed and are required by Mitigation Measure WQ-1 that ~~will~~ would avoid and minimize the impacts of these activities such that significant water quality impacts would be reduced to a less-than-significant level.

Construction impacts due to proposed Project development would be minimized through compliance with the construction general permit (Order No. 99-08-DWQ). This permit requires the development and implementation of 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 the other potential construction-related pollutants. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. A SWPPP would be developed as required by, and in compliance with, the construction general permit and the County of Los Angeles' standard conditions. The permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology (BAT/BCT). BMPs that must be implemented under a construction SWPPP are equivalent to those BMPs that are described in detail (in the form of fact sheets) in the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook - Construction (CASQA, 2003), and discussed in more detail below. The construction general permit requires BMP selection, implementation, and maintenance during construction.

Construction of the in-stream elements within the RMDP boundary would require dewatering and non-stormwater related discharges. For example, excavation depths required for bank protection would be below the River bottom and frequently encounter groundwater that would need to be removed during the construction period. This could result in significant impacts under Significance Criteria 1 through 3, should the pumped groundwater be substantially degraded by construction-related pollutants as a result of dewatering activities. The dewatering activity would place shallow wells close to the excavation, drawing down the groundwater in the construction zone. Typically, soil composition within the dry streambed is such that the discharged dewatering flows would percolate quickly back into the ground from which they came. However, in some instances, the amount of discharged water may create sufficient flow during dewatering operations to form a continuous wetted channel from the work site to the Santa Clara River or a tributary.

In general, the construction general permit authorizes construction dewatering activities and other construction related non-stormwater discharges as long as they: (1) comply with Section A.9 of the permit;[11] (2) do not cause or contribute to violation of any water quality standards; (3) do not violate any other provisions of the permit; (4) are permitted pursuant to the Los Angeles RWQCB's general WDRs governing construction-related dewatering discharges; and (6) are not prohibited by a Basin Plan provision.

Proposed PDFs protect receiving waters from dewatering and construction related non-stormwater discharges. Such PDFs would include source control and treatment control BMPs in compliance with the Los Angeles RWQCB's general WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) governing construction-related dewatering discharges within the Project area or an individual WDR/NPDES permit specific to the Project dewatering activities. Typical BMPs for in-stream construction dewatering include infiltration of clean groundwater or on-site treatment using an engineered system designed to remove particulates, such as a weir tank, which allows sediment to settle out of suspension before the water is discharged. To avoid significant impacts to receiving waters from the dewatering discharge, discharged water would be allowed to "sheet-flow" from energy dissipaters soaking into the dry soils, or the discharge would be routed through a sprinkler field and sprayed over a large upland area adjacent to the river/streambed with the intent to percolate the entire discharge. Compliance with these WDRs constitutes a PDF, further assuring that the impacts of these discharges do not result in significant water quality impacts.

Implementation of erosion and sedimentation source control BMPs during the construction of the proposed RMDP infrastructure (as consistent with the BAT/BCT requirements of the construction general permit and the general WDRs in the dewatering general permit or individual WDR) would prevent

[11] Section A.9 of the construction general permit requires that non-stormwater discharges be eliminated or reduced to the extent feasible and that a qualified person be assigned the responsibility for ensuring that no materials other than stormwater are discharged in quantities which will have an adverse effect on receiving waters or stormdrain systems (consistent with BAT/BCT), and prohibits discharge of sediment-laden water (which will cause or contribute to an exceedance of the applicable Basin Plan objectives from a dewatering site or sediment basin into any receiving water or storm drain) without filtration or equivalent treatment.

significant erosion and sediment transport impacts and transport of other potential pollutants from the Project site during the RMDP construction phase.

The following PDFs/BMPs would be implemented to avoid and minimize significant water quality impacts due to construction activities in a riverbed, and to ensure that significant water quality impacts do not occur:

1. Silt settling basins, installed during the construction process, shall be located away from areas of ponded or flowing water to prevent discolored, silt-bearing water from reaching areas of ponded or flowing water during normal flow regimes.
2. Installation of bridges, culverts, or other structures shall not impair movement of fish or aquatic organisms. Bottoms of temporary culverts shall be placed at or below channel grades. Bottoms of permanent culverts shall be placed below channel grade.
3. Water containing mud, silt, or other pollutants from construction activities shall not be allowed to enter a flowing stream or be placed in locations that may be subject to normal storm flows during periods when storm flows can reasonably be expected to occur.
4. If a stream channel has been altered during the construction and/or maintenance operations, its low flow channel shall be returned as nearly as practical to pre-project topographic conditions without creating a possible future bank erosion problem, or a flat wide channel or sluice like area. The gradient of the streambed shall be returned to pre-project grade, to the extent practical, unless it is specified in the RMDP as a restoration area, or a new river bottom area.
5. Staging/storage areas for equipment and materials shall be located outside of areas of ponded or flowing water.
6. Vehicles shall not be driven or equipment operated in areas of ponded or flowing water, or where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as otherwise provided for in the CDFG section 1605 Agreement.
7. Any equipment or vehicles driven and/or operated within or adjacent to the stream shall be checked and maintained daily, to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life.
8. Stationary equipment such as motors, pumps, generators, and welders, located within the riverbed construction zone shall be positioned over drip pans. No fuel storage tanks are allowed in the riverbed.
9. The project would use best efforts to ensure that no debris, bark, slash, sawdust, rubbish, cement, or concrete or washings thereof, oil, petroleum products, or other organic material from any construction, or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into, State waters. When operations are completed, any excess materials or debris shall be removed from the work area.
10. No equipment maintenance shall be done within or near any stream where petroleum products or other pollutants from the equipment may enter these areas underflow.

Any CDFG streambed alteration agreement to be issued for the long-term operation of RMDP infrastructure would contain standard measures similar to those described above to minimize water quality impacts due to operation and maintenance activities in a riverbed.

Implementation of existing regulatory requirements would be adequate to ensure that discharges during the Project construction phase would not cause or contribute to any exceedance of water quality standards in receiving waters. Therefore, the development of proposed RMDP infrastructure, in compliance with the construction general permit from the SWRCB, dewatering WDRs from the Los Angeles RWQCB, and the requirements of Mitigation Measure SP-4.2-7 would reduce direct water quality impacts under Significance Criteria 1 through 3 to a less-than-significant level.

Long-Term Direct Impacts to Surface Water Quality. Following completion of construction activities, the temporary impact zone would be restored to channel grade and revegetated with native riparian and upland species. The RMDP infrastructure would be constructed from inert materials that would not generate pollutants of concern.

The proposed RMDP project component includes facility operation and maintenance activities associated with the various flood control improvements, stream bank protection, drainage facilities, and stormwater discharge outfalls. Maintenance of flood, drainage, and water quality protection facilities would involve the periodic inspection of the improvements ~~by the DPW~~ to ensure that the structures are intact, and to monitor vegetation growth and sediment buildup at or near the structures. These maintenance activities would ensure that the integrity of the structure is maintained and that planned conveyance capacity is present.

~~The DPW conducts a regular maintenance program to ensure that all flood control structures operate at their design standards.~~ For the RMDP component, this maintenance would include activities such as:

- Periodic removal of woody vegetation from riprap to protect its structural integrity;
- Periodic clearing of storm drain outlets to ensure proper drainage;
- Periodic removal of ponded water that causes odor and/or mosquito problems;
- As needed repairs and routine maintenance of bridges;
- As needed repairs of bank protection;
- As needed cleaning of detention and debris basins and removal of deposits per approved maintenance procedures; and
- Emergency maintenance activities.

These maintenance activities could result in significant impacts to water quality under Significance Criteria 1 through 3 by resulting in an uncontrolled release of construction- or maintenance-related substances.. However, compliance with regulatory requirements and Mitigation Measure SP-4.2-7 would

ensure that impacts from maintenance activities are less than significant under Significance Criteria 1 through 3 through the implementation of a SWPPP and applicable BMPs.

SCP Direct Impacts. The SCP addresses the management and conservation of the San Fernando Valley spineflower (*Chorizanthe parryi* ssp. *fernandina*; spineflower). It is a state-listed endangered species under the California Endangered Species Act and a federal candidate species under the federal Endangered Species Act. The SCP addresses the conservation of the spineflower throughout the Project area. Based on survey data collected since 2000, five core populations have been identified and form the basis of the five proposed preserve areas: Airport Mesa, Grapevine Mesa, San Martinez Grande, Potrero, and Entrada. Direct impacts to water quality resulting from the SCP are described in the following paragraphs. The goal of the SCP is to develop a management and preservation framework that provides for the long-term persistence of spineflower within the Project area containing known spineflower populations. This would be achieved by: (1) permanently protecting and managing a series of preserves, which include habitat for pollinators and dispersal agents and restoring degraded habitat; (2) connecting the preserves to permanently protected and managed open space areas; (3) including core occurrences of spineflower populations in order to maximize genetic diversity and overall population size; (4) providing restoration and introduction opportunities of additional occurrences, if necessary, as described in the SCP (Draft EIS/EIR, **Appendix 1.0**); and (5) providing suitable habitat within the preserve to accommodate natural evolutionary and ecological processes for the spineflower populations.

Short-Term Direct Impacts to Surface Water Quality. The proposed SCP is a conservation and permitting plan for an upland plant species, and would not authorize any construction activities. Therefore, no short-term direct impacts would result from implementation of the SCP relative to Significance Criteria 1 through 3.

Long-Term Direct Impacts to Surface Water Quality. A management and monitoring program has been developed to ensure long-term persistence of spineflower within the Project area. The SCP outlines specific management practices with regard to agriculture practices, appropriate signs around the preserves, erosion control methods, landscaping, construction activities near the preserves, and other activities. The SCP also includes specific monitoring measures and success criteria, as well as an adaptive management plan and funding requirements.

Preserve maintenance would be an important component of the SCP. Preserve maintenance would include controlling invasive herbaceous weeds; performing weed control and management as necessary to maintain the preserves in compliance with performance standards; removing accumulated trash; and repairing fencing, signage and other preserve-related components on a quarterly basis. In addition, maintenance would include controlling plant diseases and animal pests determined to be significant to the health and survival of the spineflower. As these maintenance activities may include the use of pesticides, they may impact water quality in the Project's receiving waters if not conducted properly.

The SCP indicates that weeding efforts shall consider the overall preserve goal, which is to promote the long-term survival of spineflower. Prior to applying herbicides, it shall be determined by the preserve manager that the proposed herbicide, when applied per the labeled directions, would not directly or indirectly affect spineflower plants, dormant seed or associated pollinators, or cause a significant or

prolonged decline. Weed control measures within the spineflower preserves shall be pre-approved by the preserve manager and CDFG in writing. Recommendations for herbicide use shall be prescribed by a Pest Control Advisor (PCA), and applied by a licensed or certified pesticide applicator, as required by law.

All weed control work shall be supervised by a qualified foreman capable of readily distinguishing weeds from native plants. Weed control work shall utilize Integrated Pest Management (IPM) techniques that focus on avoiding and minimizing potential weed invasion problems, by minimizing soil disturbance and quickly controlling any new populations of invasive weed species before they spread and colonize. When weed control work is determined to be necessary, the least damaging, most selective method(s) available shall be used.[12]

Pest control is not anticipated to be required in the preserve areas on a regular basis. However, it is possible that gophers, squirrels, rabbits, and other animals may need to be at least periodically controlled in preserve areas. In addition, if an herbivore is identified foraging on spineflower plants or plants installed during revegetation efforts and the damage is determined by the preserve manager or CDFG to be significant, it may need to be controlled. The control methods would be dependant on the species that needs control, however, pest control would utilize IPM techniques such as exclusionary fencing, rodent traps, fake owls, scarecrows, reflective silver ties, *etc*. Plant shelters and gopher cages may be used on new plantings in restoration areas. All control methods would be prescribed in writing by the preserve manager. IPM techniques involve the following series of pest management evaluations, decisions, and controls:

1. Pest identification;
2. Practices to prevent pest incidence and reduce pest buildup;
3. Monitoring to examine vegetation and surrounding areas for pests to evaluate trends and to identify when controls are needed;
4. Establishment of action thresholds that trigger control actions;
5. Pest control methods - cultural, mechanical, environmental, biological, and appropriate pesticides; and
6. Pesticide management - safety (*e.g.*, Material Safety Data Sheets, precautionary statements, protective equipment); regulatory requirements; spill mitigation; groundwater and surface water protection measures associated with pesticide use; and pesticide applicator certifications, licenses,

[12] IPM is the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazards to people, property, and the environment. (*Pesticides and Food: What "Integrated Pest Management" Means*, United States Environmental Protection Agency, available online at http://www.epa.gov/pesticides/food/ipm.htm (last visited April 1, 2009).

and training (*i.e.*, all pesticide applicators must be certified by the California Department of Pesticide Regulation).[13]

Insect control is not anticipated to be needed on a regular basis, but may be more likely once the surrounding areas are developed, especially along the urban fringes, and/or habitat restoration areas where establishing plants are more likely to become stressed and, therefore, predisposed to insect infestation. Although not expected, severe infestations of insects determined by the preserve manager or CDFG to be detrimental to the survival of a significant number of native plants or spineflower shall be controlled using the least toxic controls available, including sticky yellow insect strips, non-copper horticultural oils, and biological controls, such as ladybugs, damsel bugs, green lacewings and/or minute pirate bugs. As indicted above, all control methods would be prescribed in writing by the preserve manager and subject to the approval of CDFG at least two weeks in advance.

With implementation of the proposed IPM techniques described above and the IPM requirements of Mitigation Measure WQ-2, long-term surface water quality impacts from pesticide use at the proposed spineflower preserves would be less than significant relative to Significance Criteria 1 through 3.

4.4.6.2.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts. Implementation of the proposed RMDP component would facilitate build-out of the approved Newhall Ranch Specific Plan. Therefore, impacts to surface water quality associated with development of the Specific Plan are evaluated in this subsection as an indirect impact.

Short-Term Indirect Impacts to Surface Water Quality. The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality during the construction phase of the Specific Plan build-out focus primarily on sediment (TSS and turbidity) and certain non-sediment related pollutants, such as nutrients, heavy metals, and certain pesticides, including 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, grading, and trenching for infrastructure improvements. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Non-sediment-related pollutants that are also of concern during construction include construction materials (*e.g.*, paint); chemicals, liquid products, and petroleum products used in facility construction or the maintenance of heavy equipment; and concrete-related pollutants. These construction phase impacts could result in significant impacts to water quality under Significance Criteria 1 through 3 because the potential release of sediment and non-sediment related pollutants could violate water quality standards, provide additional sources of polluted runoff, or substantially degrade surface water quality. However, compliance with Mitigation Measures SP-4.2-7 and WQ-1 would ensure that impacts would be avoided or minimized to a less-than-significant level, and no further mitigation measures are required.

[13] See, *e.g.*, *Integrated Pest Management Principles*, United States Environmental Protection Agency, available online at http://www.epa.gov/opp00001/factsheets/ipm.htm (last visited April 1, 2009).

Construction impacts due to Specific Plan development, including the excavation of soil from borrow sites, would be minimized through a PDF that consists of compliance with the construction general permit. This permit requires the development and implementation of 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 the other potential construction-related pollutants. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. A SWPPP would be developed in compliance with the construction general permit and the County of Los Angeles' standard conditions. The permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the BAT/BCT level. The SWPPP developed to implement the PDF would include the following BMPs, as appropriate:

Erosion Control (BMPs numbered EC-3 through EC-7 and WE-1 in the Stormwater Best Management Practice Handbook - Construction [CASQA, 2003]):

1. Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded fiber matrices, and erosion control blankets (*i.e.*, rolled erosion control products).
2. Limiting the area and duration of exposure of disturbed soils.
3. Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
4. Vegetation stabilization through temporary seeding to establish interim vegetation.
5. Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.

Sediment Control:

6. Perimeter protection to prevent discharges through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, -5, -6, -8, and -9).
7. Storm drain inlet protection (SE-10).
8. Resource (Environmentally Sensitive Area) protection through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, -5, -6, -8, and -9).
9. Sediment capture through sediment traps, storm drain inlet protection, and sediment basins (SE-3, -10, and -2).
10. Velocity reduction through check dams, sediment basins, and outlet protection/ velocity dissipation devices (SE-2, -4, and -10).
11. Reduction in off-site sediment tracking through stabilized construction entrance/exit, construction road stabilization, and entrance/exit tire wash (TE-1, -2, and -3).

Waste and Materials Management:

12. Management of the following types of materials, products, and wastes: solid, sanitary, concrete, hazardous and equipment-related wastes (MW-1, -2, -4 through -10, and NS-8 through -10).

13. Protection of soil stockpiles through covers, the application of water or soil binders, and perimeter control measures (MW-3).

Non-Stormwater Management:

14. BMPs or good housekeeping practices to reduce or limit pollutants at their source before they are exposed to stormwater, including such measures as: water conservation practices, and vehicle and equipment cleaning and fueling practices (NS-1 through 16).

Training and Education:

15. Training of individuals responsible for SWPPP preparation, implementation, and permit compliance, including contractors and subcontractors.

16. Signage (bilingual, if appropriate) to address SWPPP-related issues (such as site clean up policies, BMP protection, washout locations, *etc*.).

Maintenance, Monitoring and Inspections:

17. Performing routine site inspections and inspections before, during (for storm events > 24 hours), and after storm events.

18. Implementing maintenance and repairs of BMPs as indicated by routine and storm-event inspections.

19. Preparation and implementation of a sampling and analysis plan for non-visible pollutants.

These additional construction site management BMPs would be implemented within the Specific Plan area during the dry season and wet season as follows:

Dry Season Construction Phase BMPs:

20. Wind erosion BMPs (dust control).

21. Soil roughening of graded areas (track walking, scarifying, sheepsfoot rolling, or imprinting)

22. Sediment control BMPs at the down gradient site perimeter and all operational storm drain inlets internal to the planning area.

23. Off-site tracking BMPs.

24. Appropriate waste management and materials pollution BMPs.

25. Appropriate non-stormwater BMPs to prevent or reduce the contamination of stormwater by construction activities and materials.

26. A "weather triggered" action plan to deploy standby erosion and sediment control BMPs to protect exposed portions of the site within 48 hours of a predicted storm event.

27. Sufficient standby BMP materials to implement the above action plan.

28. Deployment of post-construction erosion control BMPs as soon as practicable.

Wet Season Construction Phase BMPs:

29. Limiting the area and duration of exposure of disturbed soil areas. This may be accomplished by retention of natural vegetation in areas not scheduled for immediate grading, phasing the grading, and stabilizing disturbed areas quickly.

30. Implementation of an effective combination of erosion and sediment control measures on all disturbed areas.

Regulatory requirements applicable to the project construction phase require the implementation of BMPs consistent with BAT/BCT, as required by the construction general permit and the general WDRs in the dewatering general permit or individual WDR. Erosion and sediment transport and transport of other potential pollutants during the construction phase would be prevented through implementation of BMPs meeting BAT/BCT to prevent or minimize environmental impacts and to ensure that discharges during the construction phase would not cause or contribute to any exceedance of water quality standards in the receiving waters. These BMPs would assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as (and not limited to) nutrients, heavy metals, and certain pesticides, including legacy pesticides. In addition, compliance with BAT/BCT requires that BMPs used to control construction water quality impacts are updated over time as new water quality control technologies are developed and become available for use. Therefore, the PDF related to compliance with the construction stormwater permit BAT/BCT performance standards ensures that potential construction-related water quality impacts would not be significant under Significance Criteria 1 through 3.

During the construction phase of Specific Plan build-out, hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills, which would be a potentially significant impact under Significance Criterion 2. However, pursuant to the construction general permit, the construction SWPPP must include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the BAT/BCT standards. Polycyclic Aromatic Hydrocarbons (PAH) that are adsorbed by sediment during the construction phase would be effectively controlled *via* the erosion and sediment control BMPs. With implementation of the PDF discussed above, construction-related impacts resulting from the release of hydrocarbons on water quality are considered less than significant.

Transport of legacy pesticides adsorbed to existing site sediments as a result of historic farming operations may be a concern during the construction phase of development, which could be a potentially significant water quality impact under Significance Criteria 1 through 3. The construction SWPPP must contain sediment and erosion control BMPs pursuant to the construction general permit, and those BMPs must effectively control erosion and the discharge of sediment along with other pollutants per the BAT/BCT standards. With implementation of the PDF for sediment control BMPs, construction-related impacts associated with pesticides would be less than significant under Significance Criteria 1 through 3, and no mitigation measures are required.

During the construction phase, there is potential for an increase in trash and debris loads due to lack of proper contractor good housekeeping practices at the construction site. This is a potentially significant water quality impact under Significance Criterion 1. Per the construction general permit, the SWPPP for

the site would include BMPs for trash control (catch basin inserts, good housekeeping practices, *etc.*). PDFs requiring compliance with the construction stormwater permit requirements and meeting BAT/BCT ensures that water quality impacts from trash and debris would be less than significant.

Construction on the project sites may require dewatering and non-stormwater related discharges. For example, dewatering may be necessary if groundwater is encountered during grading or to allow discharges associated with testing of water lines, sprinkler systems and other facilities. Dewatering activities and non-stormwater related discharges could be a potentially significant impact to water quality under Significance Criteria 1 through 3 if the groundwater or non-stormwater related discharges contain pollutants at levels of concern. In general, the construction general permit authorizes construction dewatering activities and other construction related non-stormwater discharges as long as they: (1) comply with Section A.9 of the permit; (2) do not cause or contribute to violation of any water quality standards; (3) do not violate any other provisions of the permit; (4) do not require a non-stormwater permit as issued by the Los Angeles RWQCB; and (5) are not prohibited by a Basin Plan provision. Full compliance with applicable local, state and federal water quality standards by the applicant would assure that potential impacts from dewatering discharges are not significant, and no mitigation measures are required.

An additional PDF would be implemented to protect receiving waters from dewatering and construction related non-stormwater discharges. Such discharges would be implemented in compliance with the WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) or individual WDR issued for project dewatering, governing construction-related dewatering discharges within the Specific Plan development areas. Typical BMPs for construction dewatering include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on-site or transport off site for sanitary sewer discharge with local sewer district approval; and use of a sedimentation bag for small volumes of localized dewatering. Compliance with these WDRs assures the impacts of dewatering discharges would not be significant.

With implementation of the measures described above to minimize construction-related activities impacting receiving waters, the short-term, construction-related water quality impacts of Specific Plan build-out would not be significant under Significance Criteria 1 through 3. Impacts would be reduced to less than significant because the identified regulatory requirements would ensure that the construction activities would not violate water quality standards, provide additional sources of polluted runoff, and/or substantially degrade surface water quality.

Long-Term Indirect Impacts to Surface Water Quality. The Sub-Regional Plan (Draft EIS/EIR, **Appendix 4.4**) was developed by the applicant, consistent with the Los Angeles County MS4 permit and the SUSMP, to set forth the urban runoff management program that would be implemented for the Specific Plan subregion (Geosyntec, 2008). Stormwater management, including planning for water quality and hydromodification control, is central to assuring the long-term viability of beneficial uses, including important habitat systems and species dependent upon those systems. The Sub-Regional Plan (Geosyntec, 2008) assesses potential water quality impacts associated with the approved Specific Plan development and proposes control measures to address those potential impacts.

The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan is the first of three levels of stormwater plan preparation. These levels include the Sub-Regional Plan, which is a programmatic-level stormwater management plan that applies to the entire Newhall Ranch Specific Plan area (Tier 1); the Project Water Quality Technical Report, which would provide the project-level stormwater plan for each of the villages within the Specific Plan area (Tier 2); and the final SUSMP, which would be prepared prior to the recordation of any final subdivision map or the issuance of any grading or building permit, whichever comes first (Tier 3).

The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan and the water quality control measures specified in it complement the avoidance, minimization, mitigation, restoration, and enhancement measures required by the RMDP and evaluated in this EIS/EIR.

Prior to the approval of a stormwater plan for each project within the Specific Plan, a Project Water Quality Technical Report would be prepared consistent with the terms and content of the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan. The Project Water Quality Technical Report would provide more specific information and detail concerning how the provisions of the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan would be implemented within the area covered by the individual Project Water Quality Technical Report. At a minimum, each Project Water Quality Technical Report would provide supplemental and refined information concerning: (1) how site design, source control, and treatment control BMPs would be implemented at the project level for the area in question; (2) potential facility sizing and location within the subject project area; and (3) monitoring and operation and maintenance of stormwater BMPs within the relevant project area.

A final SUSMP would be prepared consistent with the terms and content of both the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan and Project Water Quality Technical Report that specifically identifies the BMPs to be used on site. The SUSMP would be submitted to the DPW for review prior to the recordation of any final subdivision map (except those maps for financing or conveyance purposes only) or the issuance of any grading or building permit (whichever comes first). The SUSMP would identify, at a minimum: (1) site design BMPS (as appropriate); (2) the source control BMPs; (3) treatment control BMPs; (4) hydromodification control BMPs; and (5) the mechanism(s) by which long-term operation and maintenance of all structural BMPs would be provided.

In order to assess the potential impacts of the Specific Plan development on surface water quality, the following assessment methods were utilized:

- A water quality model to predict average annual pollutant loads and concentrations for selected constituents for pre- and post-development conditions;
- Qualitative evaluations of constituents with insufficient data for modeling;
- Comparison of estimated runoff pollutant concentrations in the post-development condition with PDFs with benchmark receiving water quality criteria as provided in the Basin Plan, the CTR, and TMDL wasteload allocations; and

- Evaluation of whether the sizing of the structural treatment facilities would comply with regulatory requirements.

Surface Water Pollutants of Concern. Surface water pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water; elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein; or, the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna. The pollutants of concern for the water quality analysis are those that are anticipated or potentially could be generated by the proposed Project, or by the Specific Plan projects, at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those included in the Newhall Ranch Specific Plan, that exhibit these characteristics. Identification of the pollutants of concern also considered Basin Plan beneficial uses and water quality objectives, CTR criteria, and current section 303(d) impaired water listings and TMDLs in the Santa Clara River.

Table 4.4-11 lists the surface water pollutants of concern, the basis for their selection, and the level at which they would trigger Significance Criterion 1. Other constituents that are listed in the Basin Plan, but are not listed in **Table 4.4-11,** are not surface water pollutants of concern for the Project (Geosyntec, 2008).

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
Sediment: Total Suspended Solids (TSS) & Turbidity	Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of TSS, a common water quality analytical parameter (CASQA, 2003). Turbidity is a measure of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. Turbidity may be caused by a wide variety of suspended materials, which range in size from colloidal to coarse dispersions, depending upon the degree of turbulence. In lakes or other waters existing under relatively quiescent conditions, most of the turbidity will be due to colloidal and extremely fine dispersions. In rivers under flood conditions, most of the turbidity will be due to relatively coarse dispersions. Erosion of clay and	Narrative objective in the Basin Plan: "Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses." Basin Plan objective for turbidity: "Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Natural Turbidity Max Increase 0-50 NTU 20% > 50 NTU 10% Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Water Discharge Requirements."

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
	silt soils may contribute to in-stream turbidity. Organic materials reaching rivers serve as food for bacteria, and the resulting bacterial growth and other microorganisms that feed upon the bacteria produce additional turbidity. Nutrients in runoff may stimulate the growth of algae, which may also contribute to turbidity. Discharges of turbid runoff are primarily of concern during the construction phase of development.	
Nutrients: Ammonia, Nitrite, Nitrate, Total Nitrogen, and Total Phosphorus	Nutrients, including nitrogen and phosphorus, are the major plant nutrients used for fertilizing landscapes and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish (CASQA, 2003).	Basin Plan standards for ammonia: "In order to protect aquatic life, ammonia concentrations in receiving waters shall not exceed the values listed for the corresponding in-stream conditions in Tables 3-1 to 3-4." The criterion for ammonia in Tables 3-1 to 3-4 varies with pH and temperature; the criterion is lower for lower pH and temperature. The basin plan amendment for updated ammonia standards (dated 04/02, effective July 15, 2003) would be used.
		Santa Clara River Reach 5 is listed as having groundwater recharge as a beneficial use in the Basin Plan. Basin Plan standards for nitrogen: "Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N) or as otherwise designated in Table 3-8." Table 3-8 lists Santa Clara River Reach 5 with a water quality objective of 5 mg/L nitrate-N + nitrite-N. Resolution 03-011 (Los Angeles RWQCB, 08/2003) promulgates Nitrogen Compounds TMDLs for Santa Clara River Reach 5. The numeric target for NO3-N + NO2-N in the Nitrogen Compounds TMDL was based on achieving the existing water quality objective of 5 mg/L NO3-N + NO2-N. The numeric target that was used to calculate the wasteload allocations included a 10% margin of safety; thus the numeric target is 4.5 mg/L NO3-N + NO2-N (30-day average).

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
		The water quality objectives for ammonia in Reach 5 used in the Nitrogen Compounds TMDL are: TMDL Ammonia Water Quality Objective (mg/L as N) 1-hr Average / 30-day average Reach 5 at County Line 3.4 / 1.2 Reach 5 below Valencia 5.5 / 2.0 Reach 5 above Valencia 4.8 / 2.0 Narrative objective for biostimulatory substances in the Basin Plan: "Waters shall not contain biostimulatory substances in concentrations that promote algal growth to the extent that such growth causes nuisance or adversely affects beneficial uses."
Trace Metals: Aluminum, Copper, Lead, and Zinc	Trace metals are commonly found in stormwater. Many of the artificial surfaces of the urban environment (*e.g.*, galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they can be toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies (CASQA, 2003). Aluminum has been identified by the DPW as a constituent of concern for the Santa Clara River based on monitoring conducted at mass emission station S29 (LACDPW, 2005).	Narrative objective in the Basin Plan: "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. …" The CTR criteria are the applicable water quality objectives for protection of aquatic life (40 C.F.R. § 131.38). The CTR criteria are expressed for acute and chronic (four-day average) conditions; however, only acute conditions are applicable for stormwater discharges because the duration of stormwater discharge is typically less than four days in the Project area. CTR criteria are determined on the basis of hardness in the receiving water. In application of criteria to the Project, a hardness value of 250 mg/L, based on the minimum observed value at USGS monitoring station was used.

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
		CTR criteria at 250 mg/L hardness are as follows: Dissolved copper - 32 µg/L. Total lead - 260 µg/L. Dissolved zinc - 250 µg/L. The CTR does not include aluminum. The NAWQC contains an acute criterion for acid soluble aluminum (750 µg/L for a pH range of 6.5 to 9.0).
Chloride	Resolution No. R03-008, Amendment to the Water Quality Control Plan (Basin Plan) for the Los Angeles Region, to Incorporate a Total Maximum Daily Load for Chloride in the Upper Santa Clara River (07/03) states: "Elevated chloride concentrations are causing impairments of the water quality objective in Reach 5 and Reach 6 of the Santa Clara River. This objective was set to protect all beneficial uses; agricultural beneficial uses have been determined to be most sensitive, and not currently attained at the downstream end of Reach 5 and Reach 6 in the Upper Santa Clara River. Irrigation of salt sensitive crops such as avocados and strawberries with water containing elevated levels of chloride results in reduced crop yields. Chloride levels in groundwater are also rising."	The Basin Plan chloride objective for Reach 5 of the Santa Clara River is 100 mg/L. The TMDL wasteload allocation for MS4 discharges into Santa Clara River Reach 5 is 100 mg/L.
Pathogens (Fecal Coliform, Viruses, and Protozoa)	Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming (CASQA, 2003). Fecal and total coliform are frequently monitored indicator organisms of human pathogens. Human-related activities can increase coliform concentrations. Concentrations of coliform in stormwater also can be elevated due to the presence of coliform bacteria from natural sources.	Basin Plan objectives are based on the designated uses of the water body. Santa Clara River Reach 5 is listed with a REC1 beneficial use. Resolution No. 01-018 (Los Angeles RWQCB, 2001) amended the Basin Plan objectives for bacteria in waters with a contact recreation beneficial use. These standards for freshwaters are: Geometric Mean / Single Sample E. coli ≤ 126/100 mL / ≤ 235/100 mL Fecal Coliform ≤ 200/100 mL / ≤ 400/100 mL

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
Petroleum Hydrocarbons: Oil & Grease and Polycyclic Aromatic Hydrocarbons (PAHs)	Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal (CASQA, 2003). Hydrocarbons are hydrophobic (low solubility in water), have the potential to volatilize, and most forms are biodegradable. A subset of hydrocarbons, PAHs, can be toxic depending on the concentration levels, exposure history, and sensitivity of the receptor organisms. Of particular concern are those PAH compounds associated with transportation-related sources. Petroleum hydrocarbons are ubiquitous and used in a wide variety of applications. Potential sources are generally expected to increase with urban development and potentially during construction of the Project.	Narrative objective in the Basin Plan for oil & 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 beneficial uses." PAHs are a class of compounds. CTR values for individual PAHs are available for protection of human health only. There are no regulatory standards for PAHs for the protection of aquatic health.
Pesticides	Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds (CASQA, 2003). Pesticide loads may be present in runoff from developed areas due to pesticide use for urban landscaping.	Narrative objective in the Basin Plan: "Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the limiting concentrations specified in … Title 22 of the California Code of Regulations …." Title 22 contains maximum contaminant levels for a range of pesticides. CTR lists numeric objectives for some, but not all pesticides. There are no CTR criteria for diazinon and chlorpyrifos, but these pesticides, along with other toxic legacy pesticides such as Chlordane, Dieldrin, DDT, and Toxaphene, are now banned from most residential uses.
Trash and Debris	Gross Pollutants (trash, debris, and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites, and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape	Basin Plan narrative floating material objective: "Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause a nuisance or adversely affect beneficial uses."

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
	maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes, and estuaries sometimes causing fish kills (CASQA, 2003). During the construction phase, there is potential for an increase in trash and debris loads due to lack of proper contractor good housekeeping practices at the construction site.	Basin Plan narrative settleable materials objective: "Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses." Basin Plan narrative Biochemical Oxygen Demand (BOD_5) objective: "Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses." Basin Plan objectives for dissolved oxygen (DO): "At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations. The dissolved oxygen concentration of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges."
MBAS (Methylene blue activated substances)	MBAS are related to the presence of detergents in water. Positive results may indicate the presence of wastewater or be associated with urban runoff due to commercial and/or residential vehicle washing or other outdoor washing activities. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life.	Basin Plan objective for MBAS: "Waters shall not have MBAS concentrations greater than 0.5 mg/L in water designated (MUN)."
Cyanide	Cyanide has been identified by the Los Angeles County Department of Public Works as a constituent of concern for the Santa Clara River based on monitoring conducted at mass emission Station S29 (LACDPW, 2005). Cyanide is used in electroplating, metallurgy, and gold mining. It is also used to make synthetic fibers, plastics, dyes, pharmaceuticals, and pesticides, including fumigants. In addition, cyanide serves as a chemical intermediate in various production processes. Natural cyanides are produced by certain bacteria, fungi, and algae, and they are present in a number of plants and foods as cyanogenic glycosides. Man-made cyanides typically enter the environment from metal finishing and organic chemical industries. Other sources include iron and steel works, municipal waste burning, cyanide-containing pesticides, road deicers, and vehicle exhaust.	The CTR criteria are the applicable water quality objectives for protection of aquatic life (40 C.F.R. 131.38). The CTR criteria are expressed for acute and chronic (4-day average) conditions; however, only acute conditions are applicable for stormwater discharges because the duration of stormwater discharge is typically less than 4 days in the Project area. CTR freshwater aquatic life protection acute criteria is 22 µg/L.

Table 4.4-11
Surface Water Pollutants of Concern and Water Quality Standards

Pollutant of Concern	Rationale for Selection	Water Quality Standards
Bioaccumulation	Some Pollutants of concern in stormwater runoff such as metals or pesticides have the potential to bioaccumulate in aquatic organisms potentially affecting the health of those organism or other species higher up the food chain.	Although bioaccumulation is not a pollutant, it is a condition of concern. The Basin Plan objective for bioaccumulation is: "Toxic pollutants shall not be present at levels that would bioaccumulate in aquatic life to levels which are harmful to aquatic life or human health."

Source: Geosyntec, 2008.

Water Quality Project Design Features. The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan (Draft EIS/EIR, **Appendix 4.4**) summarizes the water quality PDFs that would be incorporated into the Project. These PDFs include site design, source control BMPs, and treatment control BMPs incorporated into the proposed Project to effectively manage wet-weather and dry-weather water quality by limiting or managing pollutant sources (**Table 4.4-12**). Site design and source control BMPs are practices implemented to minimize runoff and the introduction of pollutants in stormwater runoff. Treatment controls are implemented to remove pollutants once they have been mobilized by runoff.

Table 4.4-12 below summarizes the Los Angeles County SUSMP requirements and the corresponding PDFs that would be incorporated during Specific Plan build-out.

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
1. Runoff Flow Control	Control post-development peak stormwater runoff discharge rates, velocities, and duration in natural drainage systems to prevent accelerated downstream erosion and to protect habitat related beneficial uses.[2] All post-development runoff from a two-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned,[3] from a two-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Discharge flow rates shall be calculated using the County of Los Angeles' modified rational method. Post-development runoff from the 50-year capital storm shall not	Hydromodification source controls include minimizing impervious surfaces through clustering development and using vegetated treatment control BMPs such as bioretention, vegetated swales, and extended detention basins to disconnect impervious surfaces and reduce runoff volumes through evapotranspiration and infiltration. Extended detention basins can provide hydromodification control as well as water quality treatment. In-stream stabilization techniques (grade control and drop structures) would be employed in the tributaries that would receive post-development Specific Plan project runoff to prevent accelerated erosion and to protect habitat related beneficial uses, per the RMDP. The Specific Plan tract maps would be conditioned to require, as a design feature, sizing

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
	exceed the predevelopment peak flow rate, burned and bulked,[4] from the 50-year capital storm. Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.	and design of hydraulic features as necessary to control hydromodification impacts in accordance with the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan.[5]
2. Conserve Natural Areas	Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition. Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection. Maximize trees and other vegetation at each site, planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.	The Specific Plan clusters development into villages. Approximately 70% (8,335 acres) of the Specific Plan site would remain undeveloped. Site clearing and grading would be limited as necessary to allow development, allow access, and provide fire protection. Native and/or nonnative/noninvasive vegetation would be utilized within the development. The final project stormwater system would include the use of the vegetated treatment BMPs, including bioretention (placed in common area landscaping in commercial and multi-family residential areas, roadway median strips, and parking lot islands (where applicable), vegetated swales, and extended detention basins.
	Promote natural vegetation by using parking lot islands and other landscaped areas. Preserve riparian areas and wetlands.	Riparian buffers would be preserved along the Santa Clara River Corridor and tributary drainages by clustering development upland and away from the River and tributary drainages.
3. Minimize Stormwater Pollutants of Concern	Minimize to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas, to the stormwater conveyance system as approved by the building official.	Treatment control BMPs would be selected to address the pollutants of concern for the Project. These BMPs are designed to minimize introduction of pollutants to the Maximum Extent Practicable (MEP). The Specific Plan projects would include numerous source controls, including animal waste bag stations, street sweeping and catch basin cleaning, an IPM program for common area landscaping in multi-family residential areas and commercial areas, use of native and/or nonnative/noninvasive vegetation, and installation of a car wash pad in multi-family residential areas. An education program would be implemented that includes both the education of residents and commercial businesses regarding water quality

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
		issues. Topics would include services that could affect water quality, such as carpet cleaners and others that may not properly dispose of cleaning wastes; community car washes; and residential car washing. The education program would emphasize animal waste management, such as the importance of cleaning up after pets and not feeding pigeons, seagulls, ducks, and geese. Vegetated treatment control BMPs would allow for infiltration of treated stormwater.
4. Protect Slopes and Channels	Project plans must include BMPs consistent with local codes and ordinances and the SUSMP requirements to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff: Convey runoff safely from the tops of slopes and stabilize disturbed slopes; Utilize natural drainage systems to the maximum extent practicable; Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable; Stabilize permanent channel crossings; Vegetate slopes with native or drought tolerant vegetation; Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion with the approval of all agencies with jurisdiction, (*e.g.*, the Corps and CDFG).	The Specific Plan projects would provide slope stabilization to areas with significant slopes. Natural slopes and native vegetation on slopes adjacent to the Santa Clara River would be preserved and/or restored and enhanced. Native plants would be used in all plant palettes placed on restored slopes. Project PDFs, including swales, bioretention areas, and water quality basins (hydrologic source controls), would reduce flows to natural channels through infiltration and evapotranspiration. The banks of the Santa Clara River at portions of this site would be stabilized primarily using buried bank stabilization per the Newhall Ranch RMDP. After the implementation of these measures and other flow control and volume reduction PDFs, the Santa Clara River would be capable of handling the expected flow regime with little or no erosion. All outlet points to the Santa Clara River and tributaries would include energy dissipaters. In-stream stabilization techniques would be employed in the tributaries that would receive post-development Specific Plan runoff to prevent accelerated erosion and to protect habitat related beneficial uses, per the Newhall Ranch RMDP. Geomorphic principles would be used to design stable, naturalistic drainages given the expected hydrologic and sediment regimes.
5. Provide Storm Drain System Stenciling and Signage	All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. Signs and prohibitive language	All storm drain inlets and water quality inlets would be stenciled or labeled. Signs would be posted in areas where dumping could occur. The County, a Landscape or Local Maintenance District (LMD), Home Owners Association

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
	and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area. Legibility of stencils and signs must be maintained.	(HOA), or other maintenance entity would maintain stencils and signs.
6. Properly Design Outdoor Material Storage Areas	Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system measures to mitigate impacts must be included.	Pesticides, fertilizers, paints, and other hazardous materials used for maintenance of common areas, parks, commercial areas, and multi-family residential common areas would be kept in enclosed storage areas.
7. Properly Design Trash Storage Areas	All trash containers must meet the following structural or treatment control BMP requirements: Trash container areas must have drainage from adjoining roofs and pavement diverter around the areas. Trash container areas must be screened or walled to prevent off-site transport of trash.	All outdoor trash storage areas would be covered and isolated from stormwater runoff.
8. Provide Proof of Ongoing BMP Maintenance	Applicant required to provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, and/or Conditional Use Permits.	Depending on the type and location of the BMP, either the County, a Landscape or Local Maintenance District (LMD), or Home Owners Association (HOA) will be responsible for maintenance. The County will have the right, but not the duty, to inspect and maintain the BMPs that are maintained by the HOA or LMD, at the expense of the HOA or LMD, if they are not being properly maintained.
9. Design Standards for Structural or Treatment Control BMPs	Post-construction structural or treatment control BMPs shall be designed to mitigate (infiltrate or treat) stormwater runoff using either volumetric treatment control BMPs or flow-based treatment control BMPs sized per listed criteria.	Stormwater treatment facilities would be designed to meet or exceed the sizing standards in the County; SUSMP. Volume-based treatment control BMPs for the Specific Plan projects would be designed to capture 80 percent or more of the annual runoff volume per criterion 2 of the MS4 permit. Flow-based BMPs would be sized using criteria 3, which would provide 80 percent capture of annual runoff volume per criteria of the MS4 permit. The size of the facilities would be finalized during the design stage by the project engineer with the final hydrology study, which would be

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
		prepared and approved to ensure consistency with this analysis prior to issuance of a final grading permit. Types of treatment control BMPs that would be employed include extended detention basins, bioretention, vegetated swales, cartridge media filtration, and a combination thereof.
10.B.1. Properly Design Loading/ Unloading Dock Areas (100,000 ft^2 Commercial Developments)	Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.	Loading dock areas would be covered or designed to preclude run-on and runoff. Direct connections to storm drains from depressed loading docks (truck wells) would be prohibited. Below grade loading docks for fresh food items would drain through a treatment control BMP applicable to the use, such as a catch basin insert. Loading docks would be kept in a clean and orderly condition through weekly sweeping and litter control, at a minimum and immediate cleanup of spills and broken containers without the use of water.
10.B.2. Properly Design Repair/ Maintenance Bays (100,000 ft^2 Commercial Developments)	Repair/maintenance bays must be indoors or designed in such a way that does not allow stormwater run-on or contact with stormwater runoff. Design a repair/maintenance bay drainage system to capture all wash water, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/ maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an industrial waste discharge permit.	Commercial areas would not have repair/maintenance bays, or the bays would comply with design requirements.
10.B.3. Properly Design Vehicle/ Equipment Wash Areas (100,000 ft^2 Commercial Developments)	Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.	Areas for washing/steam cleaning of vehicles would be self-contained or covered with a roof or overhang; would be equipped with a wash racks and with the prior approval of the sewering agency; would be equipped with a clarifier or other pretreatment facility; and would be properly connected to a sanitary sewer.

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
10.C. Properly Design Equipment/ Accessory Wash Areas (Restaurants)	Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer. If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.	Food preparation areas shall have either contained areas or sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the containment areas or sinks shall also be structurally covered to prevent entry of stormwater. Adequate signs shall be provided and appropriately placed stating the prohibition of discharging washwater to the storm drain system.
10.D. Properly design fueling area (Retail Gasoline Outlets)	The fuel dispensing area must be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited. The fuel dispensing areas must have a two to four percent slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (two meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus one foot (0.3 meter), whichever is less.	Retail gasoline outlets would comply with design requirements.

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
10.E.1. Properly design fueling area (Automotive Repair Shops)	See requirement 10.D. above.	Automotive repair shop fueling areas would comply with design requirements.
10.E.2. Properly design repair/maintenance bays (Automotive Repair Shops)	See requirement 10.B.2 above.	Automotive repair shop repair/maintenance bays would comply with design requirements.
10.E.3. Properly design vehicle/equipment wash areas (Automotive Repair Shops)	Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.	Vehicle/equipment wash areas at automotive repair shops would comply with design requirements.
10.E.4. Properly design loading/unloading dock areas (Automotive Repair Shops)	See requirement 10.B.1. above.	Automotive repair shop loading/unloading dock areas would comply with design requirements.
10.F.1. Properly Design Parking Area (Parking Lots)	Reduce impervious land coverage of parking areas. Infiltrate runoff before it reaches the storm drain system. Treat runoff before it reaches storm drain system.	Commercial and multi-family parking lots would incorporate bioretention facilities located in islands to promote filtration and infiltration of runoff. Stormwater runoff from parking lots would be directed to treatment control BMPs, including swales, water quality basins, bioretention areas, and/or catch basin media filters in compliance with SUSMP requirements.
10.F.2. Properly Design to Limit Oil Contamination and Perform Maintenance (Parking Lots)	Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used. Ensure adequate operation and maintenance of treatment systems, particularly sludge and oil removal.	See 10.F.1 above. Treatment of runoff in detention basins, bioretention areas, or catch basin inserts would be used to address oil and petroleum hydrocarbons from high-use parking lots. The HOAs or property owners would be responsible for operation and maintenance of treatment control BMPs that serve private parking lots.
13. Limitation of Use of Infiltration BMPs	Infiltration is limited based on design of BMP, pollutant characteristics, land use, soil conditions, and traffic. Appropriate conditions must exist to utilize infiltration to treat and reduce stormwater runoff for the project.	Per the Los Angeles RWQCB clarification letter (Los Angeles RWQCB, 2006), generally, the common pollutants in stormwater are filtered or adsorbed by soil, and unlike hydrophobic solvents and salts, do not cause groundwater contamination. In any case, infiltration of one to two inches of rainfall in semiarid areas like southern California where there is a high rate of evapotranspiration, presents minimal risks.

Table 4.4-12
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
		The proposed treatment control BMPs are not considered infiltration BMPS; they allow for infiltration of fully-treated runoff only.

Notes:

[1] SUSMP Requirements 10A (Single Family Hillside Home), 11 (Waiver), and 12 (Mitigation Funding) do not apply to the proposed Project and, therefore, are not listed in **Table 4.4-12**.

[2] This requirement is from Part 4, Section D.1 of the MS4 permit.

[3] Refer to **Section 4.1**, Surface Water Hydrology and Flood Control, for a description of "burned" conditions.

[4] Refer to **Section 4.1**, Surface Water Hydrology and Flood Control, for a description of "burned and bulked" conditions.

[5] Refer to **Section 4.2**, Geomorphology and Riparian Resources, for a description of hydromodification control features.

Source: Geosyntec, 2008.

Low Impact/Site Design BMPs. The purpose of low impact/site design BMPs is, to the extent feasible, to mimic the natural hydrologic regime. This low impact/site design philosophy is often referred to as "low impact development." The primary goals of low impact/site design BMPs are to maintain a landscape functionally equivalent to predevelopment hydrologic conditions and to minimize the generation of pollutants of concern.

Low impact/site design implementation for each Specific Plan project should account for the different spatial scales of development. These spatial scales are listed below, from larger to smaller scale:

- Ranch scale - the Newhall Ranch Specific Plan subregion;
- Village scale - Landmark Village, Mission Village, Homestead, and Potrero Valley projects;
- Land use scale - single family residential, multi-family residential, commercial, education, parks, and roadways within each project, and
- Lot or parcel scale - individual lots or parcels within each project.

Table 4.4-13 below lists the low impact/site design BMPs that would be implemented by the Specific Plan projects at each spatial scale.

Table 4.4-13
Newhall Land Low Impact/Site Design BMPs

Spatial Scale	Corresponding Low Impact/Site Design BMP
Ranch	The Specific Plan clusters development into Villages. Approximately 70% (8,335 acres) of the Specific Plan subregion would remain undeveloped. A system of Open Areas would weave through the central portion of the Specific Plan subregion. The Open Areas include community parks, prominent ridges, bluffs, slopes, creek beds, and utility and trail system easements, and would often function as a transition between development areas. The Open Areas are designed to protect significant landforms and natural resources, and to provide an opportunity to integrate the proposed development within its natural context. The Specific Plan Land Use Plan designates a total of 5,159 acres for the River Corridor and High Country SMAs. These SMAs are designed to protect the existing natural resources within Los Angeles County's Significant Ecological Areas (SEA) 20 and 23. The 976-acre River Corridor SMA is designed to protect the sensitive biological resources in SEA 23, which consists of the Santa Clara River Corridor. The River Corridor SMA is to be dedicated to the Center for Natural Lands Management (CNLM), and the CNLM would assume responsibility for management of this area. The largest land use designation of the Specific Plan Land Use Plan is the 4,185-acre High Country SMA. The High Country SMA is located in the southern portion of the subregion and includes oak savannahs, high ridgelines, and various canyon drainages, including Salt Creek (a regionally significant wildlife corridor that provides an important habitat link to the Santa Clara River). The High Country SMA is to be dedicated in fee to a joint powers authority, consisting of representatives from the County of Los Angeles, the city of Santa Clarita, and the Santa Monica Mountains Conservancy. To enhance the wildlife corridor movement through the High Country SMA, the 1,517-acre portion of the Salt Creek watershed situated in Ventura County, which is under the ownership of the applicant, would be dedicated to the public. This dedication area is west of Newhall Ranch, and would be managed in the same manner as the High Country SMA. Conservation easements would be granted to CDFG for the purpose of conserving populations of spineflower that occur on the Specific Plan subregion.
Village	Impervious areas would be minimized by incorporating landscaped areas into each Village. Significant portions of each Village area would remain as open space or parks. The Village-level stormwater treatment system would include the use of vegetated treatment BMPs, including bioretention, vegetated swales, and/or extended detention basins. In areas not subject to mass grading, the smallest site disturbance area possible would be delineated and flagged, and temporary storage of construction equipment would be restricted in these areas to minimize soil compaction on site. Site clearing and grading would be limited as necessary to allow development, allow access, and provide fire protection. Riparian buffers would be provided along the Santa Clara River Corridor and major tributaries by clustering development upland and away from the River and tributary drainages.

Table 4.4-13
Newhall Land Low Impact/Site Design BMPs

Spatial Scale	Corresponding Low Impact/Site Design BMP
Land Use	Streets, sidewalks, and parking lot aisles would be constructed to the minimum widths specified in the Specific Plan and in compliance with regulations for the Americans with Disabilities Act and safety requirements for fire and emergency vehicle access.
	Trails in reserve areas and some parks would be constructed with open-jointed paving materials, granular materials, or other pervious materials.
	Native and/or nonnative/noninvasive vegetation that requires less watering and chemical application would be utilized within the common area landscaping in commercial areas and multi-family residential areas.
	Impervious surfaces would be minimized in common area landscape design.
	Landscape watering in common areas, commercial areas, multi-family residential areas, and in parks would use efficient recycled water irrigation technologies with centralized irrigation controls.
Lot	Bioretention or vegetated swales would be placed within the road right-of-way in some locations.
	Runoff from most sidewalks, walkways, trails, and patios would be directed into adjacent landscaping or to vegetated swales.
	Bioretention areas or vegetated swales would collect and treat runoff from some of the industrial, commercial and multi-family residential areas. These bioretention areas would be located in parking lot islands and other on-site landscaped areas.
	Landscape areas would be determined by zoning requirements, Village setback/parkway standards, and design objectives.
	Porous pavement would be used in some parking and low traffic areas.
	Building materials for roof gutters and downspouts would not include copper or zinc.
	Home builders would be encouraged to direct rooftop runoff through landscaped areas.

Source: Geosyntec, 2008.

Treatment BMPs. The types of runoff treatment control BMPs that would be employed include but are not limited to the following: extended detention basins, bioretention, vegetated swales, and cartridge media filtration devices. These treatment control BMPs are effective for treating most of the pollutants of concern based on the California Stormwater Association Stormwater BMP Handbook for New Development and Redevelopment (2003) (see **Table 4.4-14** below). The stormwater treatment system, in combination with the site design and source control BMPs, would address all of the pollutants of concern.

Table 4.4-14
Treatment Control BMP Selection Matrix

Pollutant of Concern[1]	Treatment Control BMP Categories			
	Extended Detention Basins	Bioretention	Vegetated Swale	Media Filtration
Sediment	M	H	M	H
Nutrients	L	M	L	L
Trash	H	H	L	H
Trace Metals	M	H	M	H
Bacteria	M	H	L	M
Organics[2]	M	H	M	H

Notes:

H, M, L, indicates high, medium, and low removal efficiency.

[1] Chloride and MBAS are addressed with source control BMPs, as they are not treatable in typical stormwater treatment BMPs, aside through incidental infiltration.

[2] Includes pesticides and petroleum hydrocarbons.

Source: Geosyntec, 2008

The proposed treatment control PDFs are illustrated in **Figure 4.4-4**, Conceptual Illustration of a Dry Extended Detention Basin; **Figure 4.4-5**, Conceptual Illustration of a Bioretention Facility; **Figure 4.4-6**, Conceptual Illustration of a Vegetated Swale; **Figure 4.4-7**, Conceptual Illustration of a Filter Strip; and **Figure 4.4-8**, Conceptual Illustration of a StormFilter™ Media Filter. These treatment control BMPs are described in more detail below.

- Extended Detention Basins. Water quality basins are proposed in a variety of locations (**Figure 2.0-53**) and would incorporate dry extended detention to provide water quality treatment for storm flows. Dry extended detention basins are designed with outlets that detain the runoff volume from the water quality design storm (*i.e.*, 80 percent of the annual runoff volume) for some minimum time (in this case 48 hours) to allow particles and associated pollutants (phosphorus, trace metals, some pesticides, and other pollutants) to settle out. The water quality basins would also incorporate wetland vegetation in a low-flow channel in the bottom of the basin for the treatment of dry weather flows and small storm events. Wetland vegetation provides one of the most effective methods for pollutant removal. As runoff flows through the wetland vegetation, pollutant removal is achieved through settling and biological uptake of nutrients and dissolved pollutants within the wetland. These basins are not designed or anticipated to contain ponded, standing water for periods in excess of 48 hours.

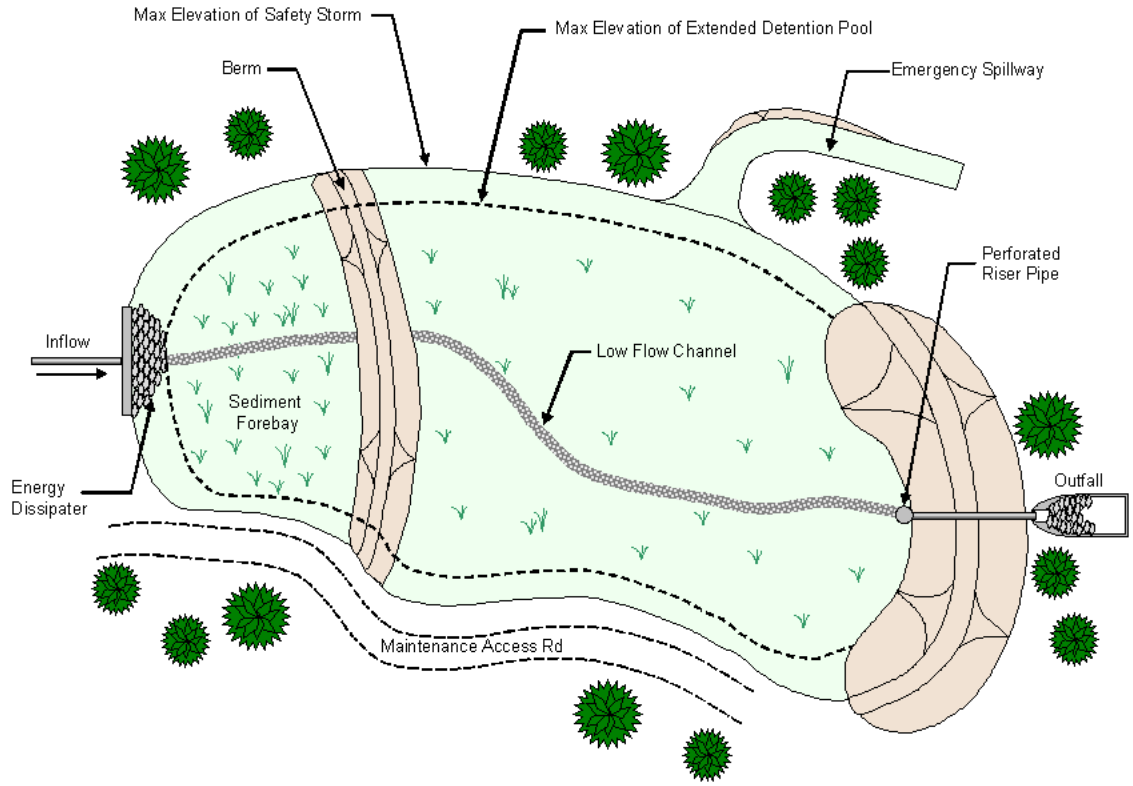
- Bioretention. Bioretention areas are vegetated (*i.e.*, landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and also provide for pollutant removal (*e.g.*, filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, as well as in vegetated swales, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants (*e.g.*, dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants utilize soil moisture and promote the drying of the soil through transpiration.

- Vegetated Swales. Vegetated swales are engineered, vegetation-lined channels that provide water quality treatment in addition to conveying stormwater runoff. Swales provide pollutant removal through settling and filtration in the vegetation (often grasses) lining the channels and also provide the opportunity for volume reduction through infiltration and evapotranspiration. Swales are most effective where longitudinal slopes are small (two percent or less), thereby increasing the residence time for treatment, and where water depths are less than the vegetation height.

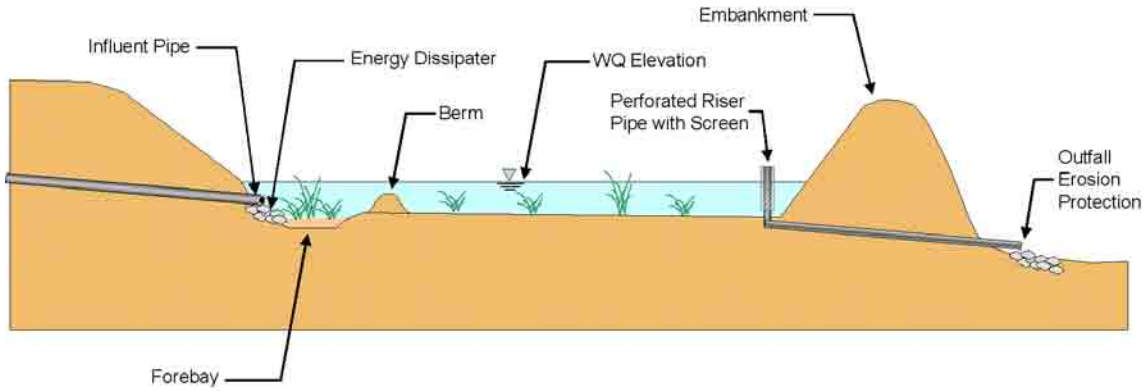
- Filter Strips. Filter strips provide for volume reduction and treatment of flows in a manner similar to a vegetated swale by routing runoff in the form of sheet flow through a strip of dense vegetation. Filter strips commonly are used as a buffer to protect sensitive areas that abut development.

- Media Filtration. For small drainage catchments where it is not possible to direct runoff to the vegetated treatment control BMPs listed above due to proposed project grading, media filtration (or equivalent) would be used. A proprietary media filter, such as the Stormwater 360 StormFilter®, is an example of this type of treatment. The StormFilter is a passive, flow-through stormwater media filtration system. The StormFilter typically is comprised of a vault (or catch basin for small drainage catchments) that houses rechargeable, media-filled cartridges that trap particulates and remove pollutants such as dissolved metals, nutrients, and hydrocarbons. During the filtering process, the treatment system also removes surface scum and floating oil and grease.

As detailed in the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan, volume-based treatment control BMPs for Specific Plan build-out, such as dry extended detention basins, would be sized to capture and treat 80 percent of the annual runoff volume, with a drawdown time of 48 hours. This methodology utilizes historical rainfall data with continuous simulation modeling to calculate the treatment volume for each treatment control BMP and is consistent with criterion 2 from the MS4 permit. Flow-based BMPs for Specific Plan build-out, such as vegetated swales, would be sized using a minimum rainfall intensity of 0.3 inches per hour, which would result in treatment of the same portion of runoff as treated using the volumetric standards (criterion 3 from the MS4 permit).



Plan View

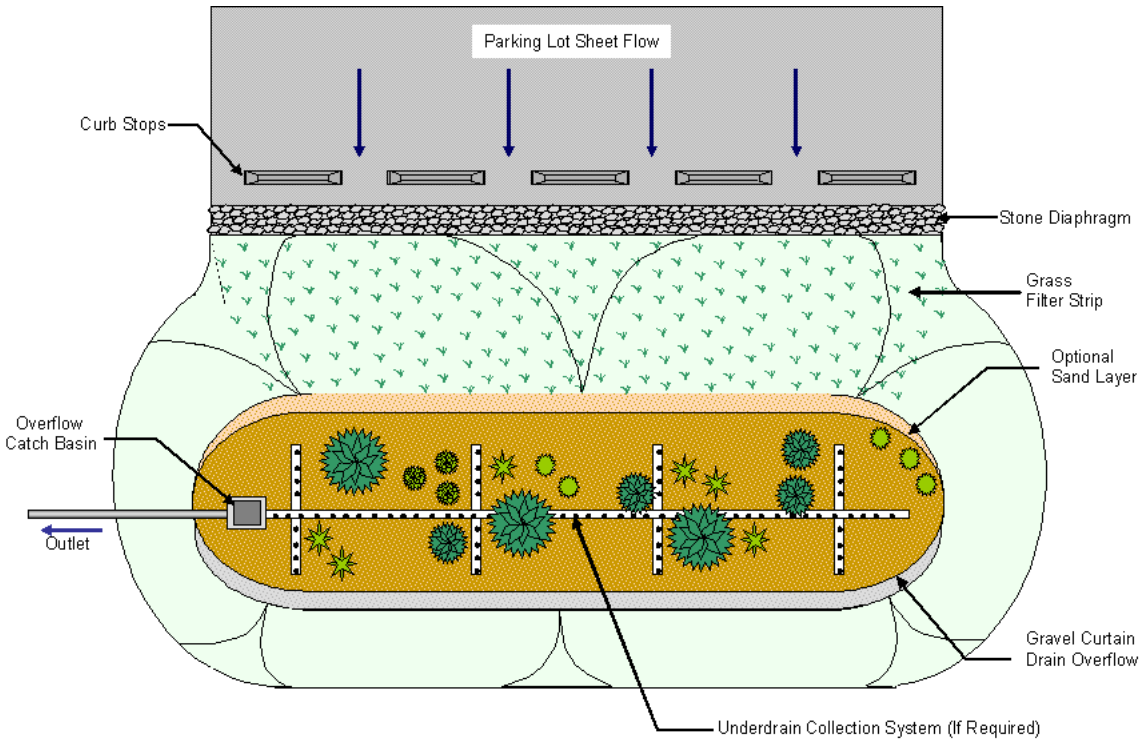


Profile

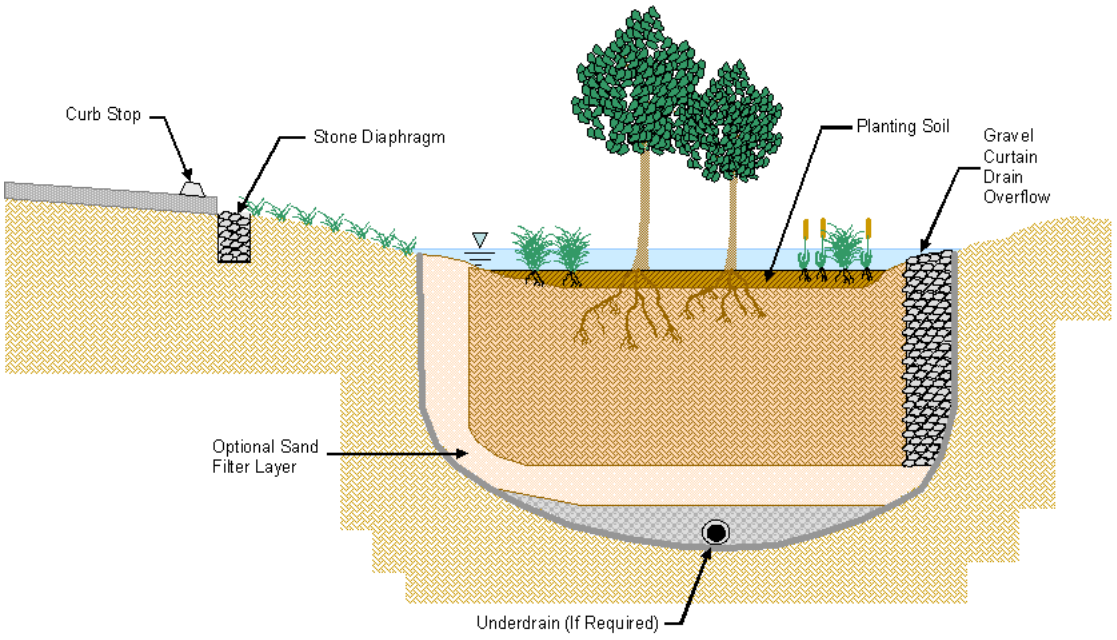
SOURCE: Geosyntec Consultants - November 2007

FIGURE **4.4-4**

Conceptual Illustration of a Dry Extended Detention Basin



Plan View



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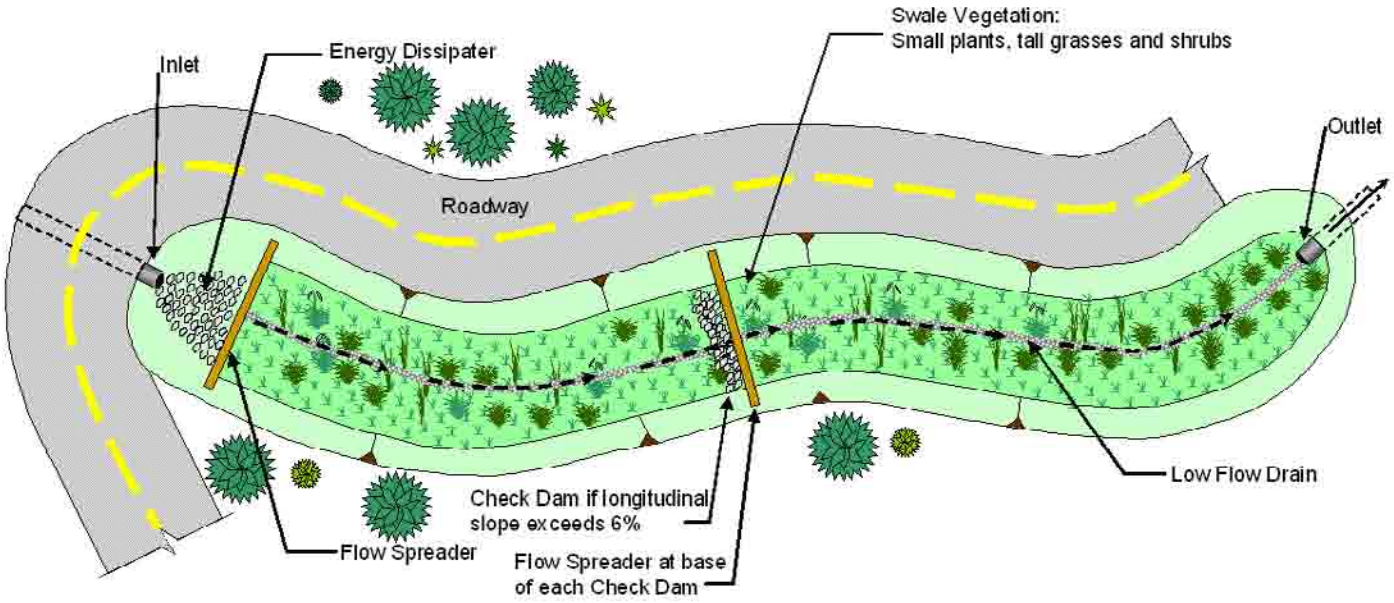
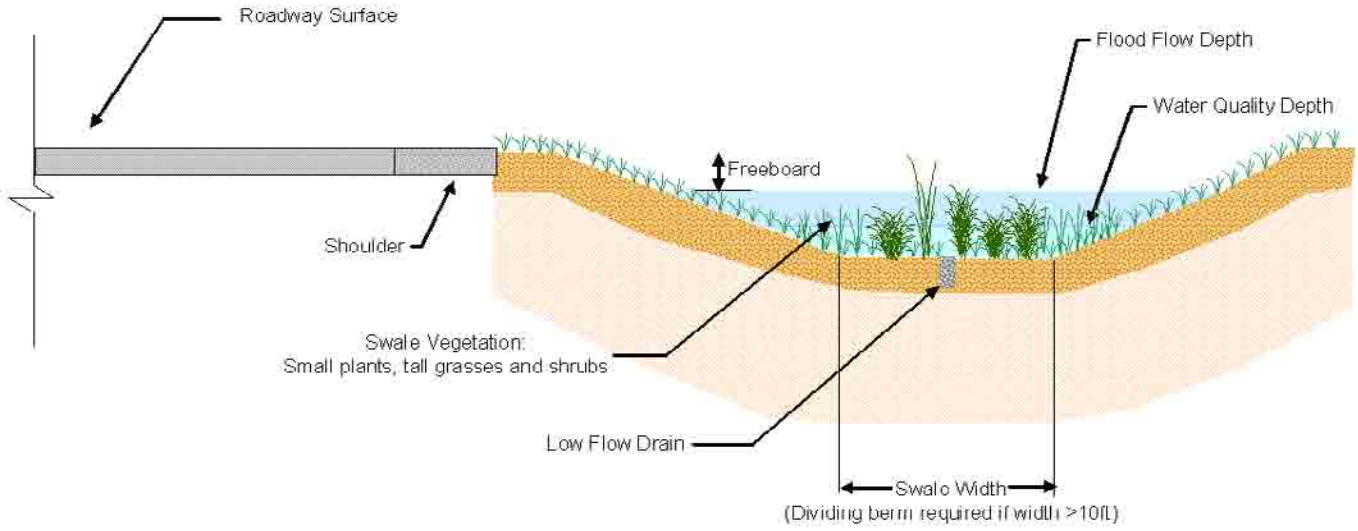
SOURCE: Geosyntec Consultants - November 2007

FIGURE **4.4-5**

Conceptual Illustration of a Bioretention Facility



Plan View



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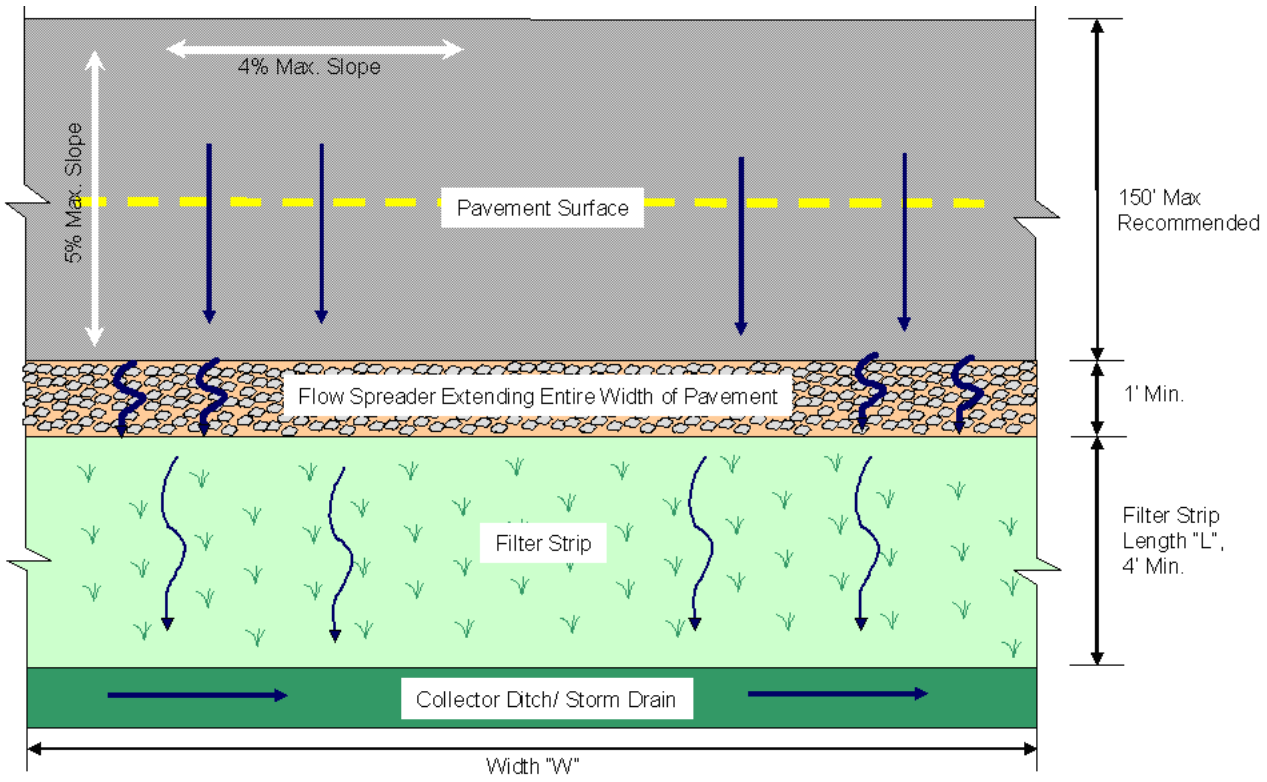
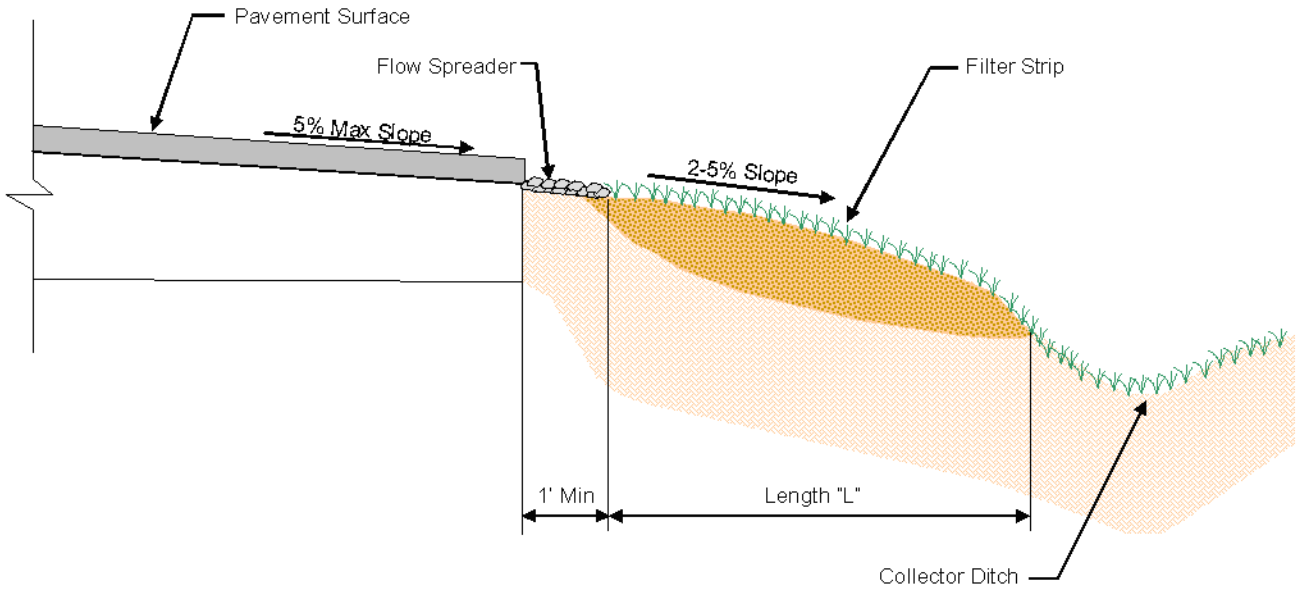
SOURCE: Geosyntec Consultants - November 2007

FIGURE **4.4-6**

Conceptual Illustration of a Vegetated Swale



Plan View



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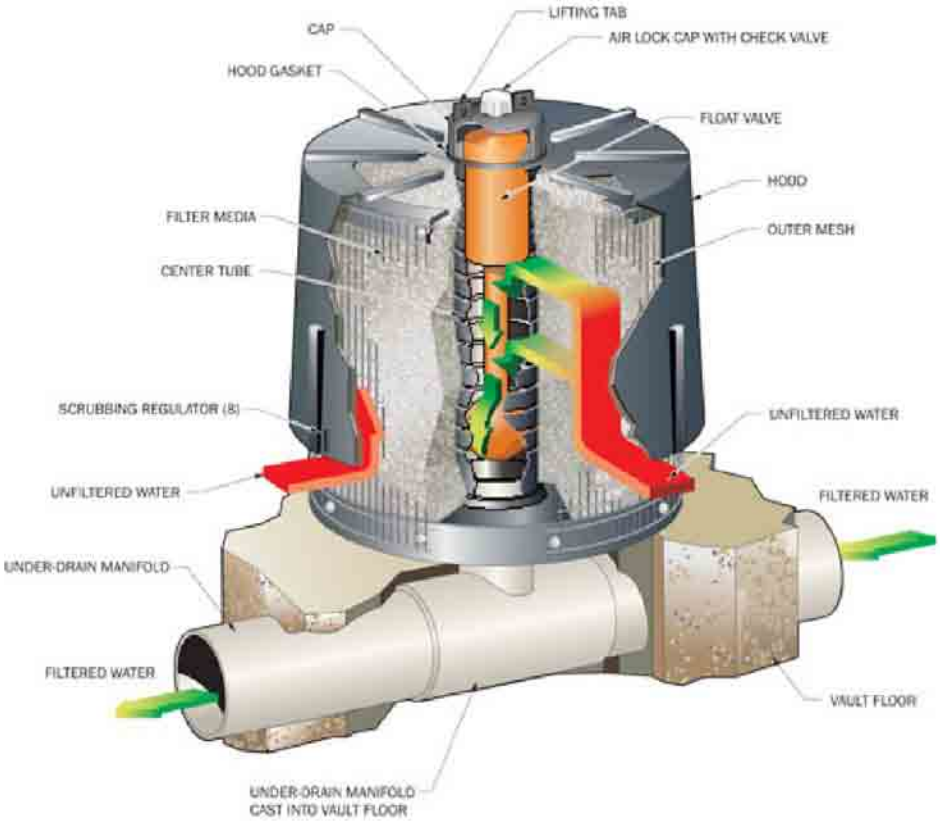
SOURCE: Geosyntec Consultants - November 2007

FIGURE **4.4-7**

Conceptual Illustration of a Filter Strip



StormFilter Media Cartridge

Example configuration of Catch Basin Storm Filter

SOURCE: Geosyntec Consultants - November 2007

FIGURE **4.4-8**

Conceptual Illustration of a Storm Filter™ Media Filter

Water Quality Modeling. A water quality model was developed and used to estimate pollutant loads and concentrations in Specific Plan stormwater runoff for certain pollutants of concern for both pre-development conditions (baseline stormwater runoff quality) and post-development conditions with proposed PDFs. Model results for each pollutant are evaluated by comparing estimated post-development and pre-development stormwater concentrations and loads. Also, estimated runoff pollutant concentrations in the post-development condition, with runoff treatment PDFs, are compared with benchmark receiving water quality criteria as provided in the Basin Plan and the CTR, TMDL waste load allocations, and instream water quality monitoring data. A detailed description of the water quality model is presented in the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan (see Draft EIS/EIR, **Appendix 4.4**). The water quality model is one of the few models that take into account the observed variability in stormwater hydrology and water quality. This is accomplished by characterizing the probability distribution of observed rainfall event depths, the probability distribution of event mean concentrations, and the probability distribution of the number of storm events per year. These distributions are then sampled randomly to develop estimates of mean annual loads and concentrations. Other pollutants of concern were addressed qualitatively using literature information and best professional judgment due to the lack of statistically reliable monitoring data for these pollutants. The following summarizes major features of the water quality model:

- Rainfall Data. The water quality model estimates the volume of runoff from storm events. The storm events were determined from 32 years (1969 - 2002) of hourly rainfall data measured at the National Climatic Data Center (NCDC) Newhall rain gauge that incorporates a wide range of storm events. The rainfall analysis that is incorporated in the water quality model requires rainfall measurements at one hour intervals and a period of record that is at least 20 to 30 years in length.

- Land Use Runoff Water Quality. The water quality model estimates the concentration of pollutants in runoff from storm events based on existing and proposed land uses. The pollutant concentrations for various land uses, in the form of Event Mean Concentrations (EMCs), were estimated from data collected in Los Angeles County. The Los Angeles County database was chosen for use in the model because: (1) it is an extensive and comprehensive database, (2) it contains monitoring data from land use specific drainage areas, and (3) the data is representative of the semiarid conditions in southern California.

- Pollutant Load. The pollutant load associated with each storm is estimated as the product of the storm event runoff times the EMC. For each year in the simulation, the individual storm event loads are summed to estimate the annual load. The mean annual load is then the average of all the annual loads.

- PDFs Modeled. The treatment PDFs included in the water quality modeling were dry extended detention basins, biofilters (vegetated swales, filter strips, or bioretention), and media filtration. Detention basins have been modeled as the water quality treatment PDF for the majority of the RMDP area, as this PDF represents the minimum level of treatment that *would* be provided during Specific Plan build-out. The model also only considers certain structural treatment PDFs and does not take into account the source control PDFs (*e.g.*, street sweeping and catch basin inserts) that

would also improve water quality. In this respect, the modeling results are conservative, *(i.e.*, tend to overestimate pollutant loads and concentrations*)*.

- Treatment Effectiveness. The water quality model estimates mean pollutant concentrations and loads in stormwater following treatment. The amount of stormwater runoff that is captured by the treatment BMPs was calculated for each storm event, taking into consideration the intensity of rainfall, duration of the storm, and duration between storm events. The mean effluent water quality for treatment BMPs was based on the International Stormwater BMP Database. The International Stormwater BMP Database was used because it is a robust, peer-reviewed database that contains a wide range of BMP effectiveness studies that are reflective of diverse land uses. An analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database showed a volume reduction on the order of 38 percent for biofilters and 30 percent for extended detention basins. Based on this analysis, a conservative estimate of 25 percent of the inflow to the vegetated swales and 20 percent of the inflow to extended detention basins was assumed to infiltrate and/or evapotranspire in the water quality model. These assumptions regarding volumetric losses were also used to assess the quantity of dry weather flows that would be captured in the treatment BMPs.

- BMP Effectiveness for Aluminum. BMP effectiveness studies in the International Stormwater BMP Database infrequently monitor aluminum; therefore, insufficient effluent data were available to model the removal effectiveness of treatment control BMPs for this water quality constituent. The total aluminum content of a water sample would be directly related to the concentrations of the suspended particulate matter. The aluminum content of the suspended solids is likely to directly reflect the composition of the source materials (*e.g.*, the catchment soils). Therefore, it would be expected and is assumed that total aluminum concentrations and loads would be reduced proportionally to removal of suspended solids by project BMPs. In order to estimate the reduction in total aluminum load and concentration (dissolved aluminum was assumed to pass through BMPs without removal), TSS removal was used as a surrogate.

- Bypass Flows. The water quality model takes into account conditions when the treatment facility is full and flows are bypassed.

- Representativeness to Local Conditions. The water quality model utilizes runoff water quality data obtained from tributary areas that have a predominant land use, and as measured prior to discharge into a receiving water body. Currently such data are available from stormwater programs in Los Angeles County, San Diego County, and Ventura County, although the amount of data available from San Diego County and Ventura County is small in comparison with the Los Angeles County database. Such data is often referred to as "end-of-pipe" data to distinguish it from data obtained in urban streams, for example.

The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan assesses potential water quality impacts associated with the approved Specific Plan development and proposes control measures to address those potential impacts. A technical memorandum prepared by Geosyntec (2008) incorporates the water quality modeling results for the Specific Plan area contained in the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan in combination with additional modeling for the RMDP area

outside of the Specific Plan boundary and the portions of the Entrada and VCC planning areas within the SCP area. The modeled Project area in the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan (7,003 acres) included the developed portion of the Specific Plan area and adjoining natural slopes and open space areas; High Country areas were not included. The High Country areas and additional area outside of the Specific Plan boundary within the RMDP are included in the water quality modeling conducted for the analysis of indirect impacts of the RMDP, presented below.

RMDP Post-Development Stormwater Runoff Impact Assessment for Modeled Pollutants of Concern. In this section, model results for each pollutant are evaluated in relation to the following: (1) comparison of post-development versus predevelopment stormwater quality concentrations and loads (indirect impacts for Significance Criterion 2); (2) comparison with MS4 permit, construction general permit, and general dewatering permit requirements for new development (indirect impacts for Significance Criterion 1); and (3) evaluation in light of receiving water benchmarks (indirect impacts for Significance Criteria 1 and 3). Pursuant to the third evaluation, estimated runoff pollutant concentrations in the post-development condition with PDFs are compared with benchmark receiving water quality criteria as provided in the Basin Plan and the CTR and TMDL wasteload allocations. The water quality criteria and wasteload allocations are considered benchmarks for comparison purposes only, as such criteria apply within receiving waters as opposed to applying directly to runoff discharges. However, the comparison provides useful information to evaluate potential impacts.

Note that the modeling results account for pollutant reductions in the treatment BMPs only (extended detention basins, biofilters, and media filtration) and do not account for the pollutant reductions that would occur due to source control PDFs and parking lot catch basin inserts. Because not all BMPs are modeled, the model results predict greater water quality impacts than are likely to occur from Specific Plan build-out.

Following the tables comparing post-development and predevelopment water quality loads and concentrations for each constituent (except runoff volume) is a table comparing the post-development with PDFs runoff quality to the benchmark water quality objectives and criteria and TMDL wasteload allocations for Santa Clara River Reach 5. Water quality observed in the Santa Clara River is also included on these tables to provide comparison to the modeled developed condition with PDFs runoff quality.

Runoff Volume. Runoff volume is assessed because runoff pollutant loads are a function of runoff volume.[14] **Table 4.4-15** shows the estimated change in stormwater runoff mean annual volumes. As shown, mean annual runoff volumes are expected to increase substantially with development. The increase can be explained by the change in percent imperviousness associated with urbanization. Runoff volume is directly proportional to percent imperviousness. PDFs include site design, source control BMPs, and treatment control BMPs in compliance with the SUSMP requirements. Most of the site design PDFs, especially the minimization of impervious area and the conservation of open space areas within the Specific Plan area, reduce the impacts of the proposed development on increases in stormwater runoff

[14] Pollutant load is equal to the pollutant concentration multiplied by the runoff volume.

volume. The treatment control PDFs would allow for some runoff volume reduction as well. Based on BMP monitoring data in the International Stormwater BMP Database, a 20 percent reduction in stormwater runoff volume was assumed to occur in the water quality basins and 25 percent volume reduction in vegetated swales. The modeling does not account for volume reductions that would occur in bioretention areas without underdrains or in basins designed for hydromodification control, which would significantly lessen the increase in post-development runoff volume.

Impacts of the increase in stormwater runoff volume to surface water hydrology and flood control are evaluated in **Section 4.1**. In addition, **Section 4.2** evaluates the potential hydromodification impacts of increased runoff volume.

Table 4.4-15
Estimated Average Annual Stormwater Runoff Volumes

Site Conditions	Average Annual Stormwater Runoff Volume (acre-ft)
Existing	1,302
Developed without PDFs	3,857
Developed with PDFs	3,356
Change with PDFs	2,054

Source: Geosyntec, 2008.

Total Suspended Solids. Table 4.4-16 shows the estimated average annual TSS concentration and loads. TSS concentration is predicted to decrease as a result of the Project. This decrease can be attributed to higher concentrations observed in monitoring data from agricultural and open space land uses (the existing condition for the site) compared with urban land uses (representative of post-development conditions). TSS load is also predicted to decrease with development despite increased runoff volumes.

Table 4.4-16
Estimated Average Annual TSS Concentration and Loads

Site Conditions	Average Annual TSS Concentration (mg/L)	Average Annual TSS Load (tons/yr)
Existing	326	577
Developed without PDFs	107	559
Developed with PDFs	76	345
Change with PDFs	-250	-232

Source: Geosyntec, 2008.

The estimated average annual TSS concentration in stormwater runoff from the total modeled area with PDFs is compared to water quality criteria and the range of observed concentrations in the Santa Clara River in **Table 4.4-17**. Estimated TSS load and concentration declines with development and is within the range of observed concentrations in Santa Clara River Reach 5. Based on the comprehensive site design, source control BMPs, and treatment control BMPs, and the comparison with available in-stream data and

Basin Plan benchmark objectives, the TSS in stormwater runoff would not result in a significant impact to water quality under Significance Criteria 1 through 3 and no mitigation measures are required.

Table 4.4-17
Comparison of Estimated TSS Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Estimated Developed Conditions w/ PDFs (mg/L)	Basin Plan Water Quality Objectives	CTR	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
76	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	N/A	32 - 6,591

Notes:
[1] Range of concentrations observed in the Santa Clara River (Stations S29, NR1, and NR3).
N/A = not applicable. There is no CTR criterion for TSS

Source: Geosyntec, 2008.

Total Phosphorus. Table 4.4-18 shows the estimated average total phosphorus (TP) concentration and annual loads. Because much of the TP load is associated with sediments and the sediment load and concentrations are predicted to decrease with development, the TP concentration and annual TP load are also predicted to decrease.

Table 4.4-18
Estimated Average Annual Total Phosphorus Concentration and Annual Load

Site Conditions	Average Annual Total Phosphorus Concentration (mg/L)	Average Annual Total Phosphorus Load (lbs/yr)
Existing	0.72	2,536
Developed without PDFs	0.33	3,471
Developed with PDFs	0.26	2,370
Change with PDFs	-0.46	-166

Source: Geosyntec, 2008.

There are no numeric objectives for TP in the Basin Plan. A narrative objective for biostimulatory substances in the Basin Plan states: "waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses." The estimated TP concentrations in project stormwater would be lower than existing conditions, therefore, project-related discharges would not promote (*i.e.*, increase) algal growth and would comply with the narrative objective for biostimulatory substances in the County Basin Plan. As shown in **Table**

4.4-19, the estimated total phosphorus concentration is at the low end of the range of observed concentrations in Santa Clara River Reach 5.

Table 4.4-19
Comparison of Estimated Total Phosphorus Concentration with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Estimated Developed Conditions w/ PDFs (mg/L)	Basin Plan Water Quality Objectives	CTR	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
0.26	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	N/A	0.18 - 13.4

Notes:
[1] Range of concentrations observed in the Santa Clara River (Stations S29, NR1, and NR3).
N/A = not applicable. There is no CTR criterion for total phosphorous.

Source: Geosyntec, 2008.

Based on the comprehensive site design, source control BMPs, and treatment control BMPs and the comparison with available in-stream monitoring data and Basin Plan benchmark objectives, potential impacts associated with total phosphorus are considered less than significant under Significance Criteria 1 through 3 and no mitigation measures are required.

Nitrogen Compounds. The estimated average nitrate-nitrogen plus nitrite-nitrogen, ammonia, and total nitrogen concentrations and annual loads are summarized in **Table 4.4-20** through **Table 4.4-22**, respectively. Nitrate + nitrite-nitrogen load and concentrations of all forms of nitrogen are predicted to decrease, while average annual ammonia and total nitrogen loads are predicted to increase. The decrease in concentrations can be attributed to higher nitrite-, nitrate-, and ammonia-nitrogen concentrations observed in monitoring data from agricultural land uses versus urbanized land uses, along with nitrogen reductions in the treatment control PDFs. Although ammonia and total nitrogen concentrations are predicted to decrease, ammonia and total nitrogen loads are predicted to increase due to the increase in runoff volume.

The predicted increase in loads of ammonia and total nitrogen in the RMDP area runoff are caused by the increase in runoff volume in combination with the runoff concentrations. However, nutrient concentration in the receiving water is the most important indicator for the Project, given that the Project's receiving waters are streams (moving waters) as opposed to lakes or other more static water bodies.

Table 4.4-20
Estimated Average Annual Nitrate-N + Nitrite-N Concentration and Load

Site Conditions	Average Annual Nitrate+Nitrite-Nitrogen Concentration (mg/L)	Average Annual Nitrate+Nitrite-Nitrogen Load (lbs/yr)
Existing	3.6	12,763
Developed without PDFs	0.9	9,002
Developed with PDFs	0.8	6,910
Change with PDFs	-2.8	-5,853

Source: Geosyntec, 2008.

Table 4.4-21
Estimated Average Annual Ammonia-N Concentration and Load

Site Conditions	Average Annual Ammonia-N Concentration (mg/L)	Average Annual Ammonia-N Load (lbs/yr)
Existing	0.50	1,756
Developed without PDFs	0.45	4,705
Developed with PDFs	0.43	3,906
Change with PDFs	-0.07	2,150

Source: Geosyntec, 2008.

Table 4.4-22
Estimated Average Annual Total Nitrogen-N Concentration and Load

Site Conditions	Average Annual Total Nitrogen Concentration (mg/L)	Average Annual Total Nitrogen Load (lbs/yr)
Existing	6.1	21,615
Developed without PDFs	3.1	32,430
Developed with PDFs	2.4	21,653
Change with PDFs	-3.7	38

Source: Geosyntec, 2008.

Estimated nitrogen compound concentrations are compared to Basin Plan objectives and observed concentrations in **Table 4.4-23**. Average annual stormwater concentration of ammonia is predicted to be considerably less than the wasteload allocation for Santa Clara River Reach 5 and the Basin Plan objective, and within the range of observed concentrations. Likewise, the average annual stormwater concentration of nitrate-N plus nitrite-N is predicted to be considerably less than the TMDL wasteload

allocation or the Basin Plan water quality objective, and within the range of observed concentrations for this reach of the Santa Clara River.

There are no numeric objectives for total nitrogen in the Basin Plan. A narrative objective for biostimulatory substances in the Basin Plan states: "waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses." The total nitrogen concentration in project stormwater discharges is predicted to decrease with development, and, as shown in **Table 4.4-23**, the estimated total nitrogen concentration is in the range of observed concentrations in Santa Clara River Reach 5. Therefore, Project runoff would not promote (*i.e.*, increase) aquatic growth in Santa Clara River Reach 5 and, therefore, would comply with the narrative objective for biostimulatory substances in the Basin Plan.

Table 4.4-23
Comparison of Estimated Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5

Nutrient	Estimated Developed Conditions w/ PDFs (mg/L)	Basin Plan Water Quality Objectives (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
Nitrate-N + Nitrite-N	0.8	5	6.8[2]	0.5 - 4.8
Ammonia-N	0.43	2.2[3]	1.75[4]	<0.005 - 1.1
Total Nitrogen	2.4	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	<0.04 - 46[5]

Notes:

1 Range of concentrations observed in the Santa Clara River (Stations S29, NR1, and NR3).

2 30-day average.

3 Four-day average, ELS present, 90th percentile pH and temperature pairing observed at USGS Monitoring Station 11108500.

4 30-day average in Reach 5 below Valencia.

5 Observed values for TKN (ammonia plus organic nitrogen).

Source: Geosyntec, 2008.

Given the predicted increase in ammonia and total nitrogen loads, impacts from ammonia and total nitrogen would be significant. Based on the implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, the comprehensive PDFs that would be provided including site design, source control BMPs, and treatment control BMPs, and the comparison with available in-stream

monitoring data and benchmark Basin Plan objectives and wasteload allocations, impacts associated with nitrogen compounds are considered less-than-significant under Significance Criteria 1 through 3.

Metals. Projected loads and concentrations for the trace metals copper, lead, zinc, and aluminum are presented in **Tables 4.4-24** through **4.4-27**. Except for aluminum and lead, the projections are for the dissolved form of the metal, as the dissolved form is regulated by the CTR criteria. Due to consistently low concentrations of dissolved lead in the available stormwater runoff data, it was not possible to develop reliable event mean concentration parameters for most land uses for modeling the dissolved fraction of lead. This constituent was, therefore, modeled as the total metal. The primary sources of trace metals in stormwater are typically commercially available metals used in transportation (*e.g.*, automobiles), buildings, and infrastructure. Metals are also found in fuels, adhesives, paints, and other coatings. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such as cadmium, chromium, and mercury, are typically not detected in urban runoff or are detected at very low levels.

Table 4.4-24
Estimated Average Annual Dissolved Copper Concentration and Load

Site Conditions	Average Annual Dissolved Copper Concentration (µg/L)	Average Annual Dissolved Copper Load (lbs/yr)
Existing	7.5	26
Developed without PDFs	9.3	98
Developed with PDFs	8.4	76
Change with PDFs	0.9	50

Source: Geosyntec, 2008.

Table 4.4-25
Estimated Average Total Lead Concentration and Annual Load

Site Conditions	Average Annual Total Lead Concentration (µg/L)	Average Annual Total Lead Load (lbs/yr)
Existing	8.4	29
Developed without PDFs	7.4	77
Developed with PDFs	6.4	58
Change with PDFs	-2.0	29

Source: Geosyntec, 2008.

Table 4.4-26
Estimated Average Annual Dissolved Zinc Concentration and Load

Site Conditions	Average Annual Dissolved Zinc Concentration (µg/L)	Average Annual Dissolved Zinc Load (lbs/yr)
Existing	73	259
Developed without PDFs	58	611
Developed with PDFs	38	348
Change with PDFs	-35	89

Source: Geosyntec, 2008.

Table 4.4-27
Estimated Average Annual Total Aluminum Concentration and Load

Site Conditions	Average Annual Total Aluminum Concentration (µg/L)	Average Annual Total Aluminum Load (lbs/yr)
Existing	816	2,891
Developed without PDFs	790	8,289
Developed with PDFs	567	5,177
Change with PDFs	-249	2,286

Source: Geosyntec, 2008.

Post-development trace metal loads and dissolved copper concentration are predicted to increase compared to predevelopment conditions; while total lead, dissolved zinc, and total aluminum concentrations are predicted to decrease. These results can be explained by the difference in concentrations observed in representative monitoring data from the pre-development agriculture and open space condition and the post-development urban condition (see further, Draft EIS/EIR, **Appendix 4.4**, Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan, Appendix B). Runoff volumes would increase with development and the change in land use would decrease runoff metals concentrations for most proposed land uses.

The predicted increase in trace metal loads in the RMDP area runoff ~~are~~ is caused by the increase in runoff volume in combination with the runoff concentrations. However, trace metal concentration in the receiving water is the most important indicator for the proposed Project, given that the Project's receiving waters are streams (moving waters) as opposed to lakes or other more static water bodies.

Proposed PDFs include site design, source control BMPs, and treatment control BMPs in compliance with the SUSMP requirements. Specific site design PDFs that would be implemented to minimize increases in trace metals include directing drainage from impervious areas to bioretention areas (*i.e.*, through soil adsorption) and the selection of building material for roof gutters and downspouts that do not

include copper or zinc. Source control PDFs that target metals include BMP maintenance and street sweeping private streets and parking lots (*i.e.*, through removal of fine sediment with elevated concentrations of trace metals). The extended detention basins, biofilters, and bioretention area treatment control BMPs also would reduce trace metals in the runoff from the proposed development. Only the effects of the treatment control PDFs are reflected in the model results.

A narrative objective for toxic substances in the Basin Plan states: "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."

The CTR criteria are the applicable water quality objectives for protection of aquatic life. The CTR criteria are expressed for acute and chronic (four-day average) conditions; however, only acute conditions were considered to be applicable for stormwater discharges because the duration of Project stormwater discharge is consistently less than four days. The CTR criteria are calculated on the basis of the hardness of the receiving waters. Lower hardness concentrations result in lower, more stringent CTR criteria. The minimum hardness value (250 mg/L as $CaCO_3$) observed in the Santa Clara River at the USGS Station 11108500 during wet weather was used as a conservative estimate; the mean observed hardness value was 660 mg/L as $CaCO_3$, which is a very high hardness level.

Comparison of the estimated runoff metal concentrations and the acute CTR criteria for dissolved copper, total lead, and dissolved zinc are shown in **Table 4.4-28**, along with the range of observed concentrations in Santa Clara River Reach 5. Although the trace metal loadings are predicted to increase and the estimated average concentration of dissolved zinc is above the observed range in Santa Clara River Reach 5, comparison of post-development conditions, including PDFs, to the benchmark CTR values shows that the dissolved copper, total lead, and dissolved zinc concentrations are below the benchmark CTR criteria. The estimated dissolved copper and total lead concentrations are within the range of observed concentrations in Santa Clara River Reach 5.

There is no CTR criterion for aluminum, although there is a NAWQC criterion (750 µg/L (acute) for a pH range of 6.5 to 9.0) in the form of acid soluble aluminum. It is not possible to compare the estimated aluminum concentration to this criterion directly, as the available monitoring data used for modeling are for either dissolved aluminum or total aluminum. Acid soluble aluminum (which is operationally defined as the aluminum that passes through a 0.45 µm membrane filter after the sample has been acidified to a pH between 1.5 and 2.0 with nitric acid) represents the forms of aluminum toxic to aquatic life or that can be converted readily to toxic forms under natural conditions. The acid soluble measurement does not measure forms of aluminum that are included in total aluminum measurement such as aluminum that is occluded in minerals, clays, and or is strongly adsorbed to particulate matter which are not toxic and are not likely to become toxic under natural conditions. The estimated mean total aluminum concentration (567 mg/L) is less than the NAWQC benchmark criterion for acid soluble aluminum, is predicted to decrease in the post-development condition, and is within the range of observed concentrations in Santa Clara River Reach 5.

Table 4.4-28
Comparison of Estimated Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Metal	Estimated Developed Conditions w/ PDFs (µg/L)	CTR Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 5 (µg/L)
Dissolved Copper	8.4	32	3.3 - 22.6
Total Lead	6.4	260	0.6 - 40
Dissolved Zinc	38	250	3 - 37
Total Aluminum	567	N/A	131 - 19,650

Notes:

[1] Hardness = 250 mg/L, based on minimum observed value at USGS Station 11108500. Lead criteria is for total recoverable lead. NAWQC aluminum criteria for pH 6.5 - 9.0.

[2] Range of concentrations observed in the Santa Clara River (Stations S29, NR1, and NR3).

N/A - not applicable.

Source: Geosyntec, 2008.

Given the predicted increase in trace metals loads and dissolved copper concentration, impacts from metals would be significant. With the implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, comprehensive PDFs, including site design, source control BMPs, treatment BMPs, and the comparison with the instream water quality monitoring data and benchmark water quality criteria, Specific Plan build-out would not have significant water quality impacts resulting from trace metals under Significance Criteria 1 through 3.

Chloride. Table 4.4-29 shows the estimated average annual chloride concentration and load. Due to the conversion from agricultural to urban land uses and the associated EMCs, annual chloride concentration is predicted to decrease when compared to the existing conditions, although the average annual chloride load is predicted to increase due to increased runoff volume.

Table 4.4-29
Estimated Average Annual Chloride Concentration and Load

Site Conditions	Average Annual Chloride Concentration (mg/L)	Average Annual Chloride Load (lbs/yr)
Existing	16	28
Developed without PDFs	13	68
Developed with PDFs	13	58
Change	-3	30

Source: Geosyntec, 2008.

The estimated chloride concentration in post-development project runoff is compared to the Basin Plan water quality objective and the range of observed concentrations in Santa Clara River Reach 5 in **Table 4.4-30**. The estimated average annual chloride concentration in stormwater runoff is at the low end of the range of observed concentrations for this pollutant and is well below the Santa Clara River Reach 5 Basin Plan water quality objective and the TMDL wasteload allocation for Santa Clara River Reach 5 (100 mg/L for both). This water quality impact under Significance Criteria 1 through 3 is considered less than significant. With the implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, comprehensive PDFs, including site design, source control BMPs, treatment control BMPs, and comparison with benchmark receiving water criteria and instream monitoring data, the Specific Plan projects impacts resulting from chloride under Significance Criteria 1 through 3 would be reduced to less-than-significant.

Table 4.4-30
Comparison of Estimated Chloride Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Pollutant	Estimated Developed Conditions w/ PDFs (mg/L)	Basin Plan Water Quality Objectives[1] (mg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 5 (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)
Chloride	13	100	3 - 121	100

Notes:

1 There are no CTR criteria for chloride.

2 Range of concentrations observed in the Santa Clara River (Stations S29, NR1, and NR3).

Source: Geosyntec, 2008.

RMDP Post-development Stormwater Impact Assessment for Pollutants and Basin Plan Criteria Addressed Without Modeling.

Turbidity. Turbidity is a measure of suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. Turbidity may be caused by a wide variety of suspended materials, which range in size from colloidal to coarse dispersions, depending upon the degree of turbulence.

In the post-development condition, placement of impervious surfaces would serve to stabilize soils and to reduce the amount of erosion that may occur from the Specific Plan projects during storm events, and would, therefore, decrease turbidity in the runoff. Project PDFs, including source controls (such as common area landscape management and common area litter control), and treatment control BMPs in compliance with the SUSMP requirements, would prevent or reduce the release of organic materials and nutrients (which might contribute to algal blooms) to receiving waters. As shown above, post-development nutrients in runoff are not expected to cause significant water quality impacts. With the implementation of the Project PDFs, construction-related controls and the requirements of Mitigation Measure WQ-1, runoff discharges from Specific Plan build-out would not cause increases in turbidity which would result in adverse affects to beneficial uses in the receiving waters. Based on these

considerations, the water quality impacts of Specific Plan build-out on turbidity would be reduced to less than significant under Significance Criteria 1 through 3.

Pathogens. Pathogens are viruses, bacteria, and protozoa that can cause gastrointestinal and other illnesses in humans through body contact exposure. Identifying pathogens in water is difficult as the number of pathogens is fairly small, requiring sampling and filtering large volumes of water to obtain a reliable result. Traditionally regulators have used fecal indicator bacteria (FIB), such as total and fecal coliform, enterococci, and *E. coli*, as indirect measures of the presence of pathogens, and by association, human illness risk. Early epidemiological studies (*i.e.*, studies that investigate human illness occurrence versus environmental factors such as water quality) that linked swimming-associated gastrointestinal symptoms to *E. coli* or enterococci in swimming waters for sewage-dominated receiving waters led to the development of the current recreational water quality criteria (USEPA, 1986). In contrast to receiving waters subject to sanitary discharges, only a few epidemiological studies have evaluated the health effects of exposure to water bodies subject to discharges from storm drains and these studies focused on the effects of dry weather urban flows on recreational exposure (*e.g.*, Haile *et al.*, 1999 and Colford *et al.*, 2005).

Factors That Affect FIB Concentrations

There are various confounding factors that affect the reliability of FIB as pathogen indicators. One primary factor is that there are numerous natural or non-anthropogenic (or "zoonotic") sources of FIB in developed watersheds and their receiving water bodies, including birds and other wildlife, soils, and plant matter. Anthropogenic sources may include domesticated animals and pets, poorly functioning septic systems, sewer system overflows or spills, cross-connections between sewer and storm drains, and the utilization of outdoor areas or storm drains for human waste disposal by people without access to indoor sanitary facilities. All of these sources can contribute to the concentrations of FIB, but not all the sources may pose a comparable human health risk (USEPA, 2009).

A second confounding factor is that FIB can multiply in the field if the substrate, temperature, moisture, and nutrient conditions are suitable (MEC, 2004). This is one potential reason that FIB concentrations do not always correlate with pathogens. For example, in a field study conducted by Schroeder *et al.* (2002), pathogens (in the form of viruses, bacteria, or protozoa) were found to occur in 12 of 97 soil samples, but the samples that contained pathogens did not correlate with the samples containing concentrations of FIB. Numerous other researchers have reported that bacteria presence and even regrowth was observed in various substrates such as beach sands, wrack line (accumulation of kelp in the inter-tidal area of beaches), inter/sub-tidal sediments, and material deposited in storm drains (MEC, 2004). FIB monitoring in the Santa Ana River indicates that the ubiquity of sources and potential regrowth far exceed the human sources of fecal bacteria generated by the entire population in the watershed (Surbeck, *et al.*, 2008). Regrowth of bacteria downstream of a package treatment plant utilizing ultraviolet (UV) radiation to disinfect dry weather flows in Aliso Creek was considered a prime factor in the rapid rebound of FIB concentrations downstream of the plant (Andersen, 2005).

A third confounding factor is that the persistence of FIB may differ from those of various pathogenic viruses, bacteria, protozoa. Viruses, for instance, are small, low in number, and difficult to inactivate, while protozoa may form protective cysts that are resistant to destruction and render them dormant but

capable of reactivating in the future. Therefore, while some indicator bacteria may die off in the water column due to ultraviolet disinfection or other unfavorable environmental conditions (including predation and antagonism), pathogens occasionally may persist longer (Haile, *et. al.*, 1999). So while the previously two described factors may result in indicator bacteria resulting in false positive indications of public health risk, there may also be instances when indicator bacteria result in false negative indications.

Current Research Efforts to Improve Recreational Water Quality Criteria

Given the concern about the adequacy of the current recreational water quality criteria, the USEPA is undergoing a comprehensive evaluation and revision of their current FIB-based recreational water quality criteria, with completion scheduled for 2012. To help initiate this effort, USEPA gathered 43 experts to identify research priorities needed to refine the existing criteria and transition to new methods (USEPA, 2007). The experts identified seven topics for research, including "scientifically defensible for applications in a wide variety of geographical locations and water types" and "protective of individuals exposed to recreational waters impacted by all sorts of pathogen sources including animal feces, stormwater, and sewage" (Boehm, *et al.*, 2009).

In a similar effort focused on inland waters, the Water Environment Research Federation (WERF) convened an expert panel to recommend a research program that would also support USEPA's intended revision of the water quality criteria (WERF, 2009).

Epidemiological Studies

Until recently, few epidemiological studies have tested the health effects of exposure to the receiving waters of direct and recent stormwater runoff, and these studies have found it difficult to link illness with stormwater sources. For instance, the Mission Bay epidemiological study (Colford, *et al.*, 2005) found that "only skin rash and diarrhea were consistently elevated in swimmers versus non swimmers, the risk of illness was uncorrelated with levels of traditional water quality indicators, and State water quality thresholds were not predictive of swimming-related illnesses." Various other researchers, as part of USEPA's pathogen research program, are now conducting epidemiological studies nationwide at fresh and salt water beaches that receive wastewater and/or stormwater discharges. In southern California, the Southern California Coastal Water Research Project (SCCWRP) has been conducting a multi-year study of public health risks at marine beaches, with a final report that is scheduled for late 2010. Until these various studies are completed, however, there is no reliable documentation of the health effects caused by exposure to stormwater based on epidemiological studies.

Effects of Land Use and Runoff on FIB Concentrations

Dry weather, non-storm stream flows from undeveloped watersheds tend to have lower concentrations of FIB than dry weather urban flows, although water quality standard exceedances still occur. For instance, a recent study by SCCWRP, which monitored 15 unimpaired natural southern California streams weekly during dry weather for a year, showed that about 18 percent of the samples exceeded daily and monthly bacterial indicator thresholds although concentrations from these unimpaired streams were one to two orders of magnitude lower than levels found in developed watersheds (Tiefenthaler, *et al.*, 2009). The study reported an average of the geometric means for *E. coli* in dry weather flows in each stream of 41

most probable number (MPN)/100 milliliter (mL). In comparison, the Los Angeles REC-1 Basin Plan objective for *E. coli* density is 126 MPN/100 mL (geometric mean).

During wet weather, stormwater runoff can mobilize indicator bacteria from a number of watershed and instream sources and, therefore, indicator bacteria concentrations tend to increase. For example, median stormwater runoff monitoring results for the open space land use category, as summarized by Stein, *et. al.* (2007), include *E. Coli* concentrations of about 5,400 MPN/100 mL from the 2001-2005 Los Angeles River Watershed Wet Weather Study, and 7,200 MPN/100 mL from the National Stormwater Quality Database (Pitt, *et al.*, 2003). Similarly, median open space land use stormwater runoff monitoring results include *E. coli* concentrations of 5,400 MPN/100 mL from the Stein, *et al.* (2007) study based on two flow-weighted average results, and 500 MPN/100 mL for fecal coliform from a 1994-2000 Los Angeles County (2000) study based on 21 grab samples. The monitoring data collected in the tributaries of the Santa Clara River showed a range of fecal coliform concentrations from 953 MPN/100 mL to greater than 81,200 MPN/100 mL (see **Table 4.4-7**).

Land use type and condition also affect runoff concentrations, and most studies show higher FIB concentrations in urban runoff than in open space runoff. Runoff from residential land uses from the Los Angeles River Watershed Wet Weather Study had a median *E. coli* concentration of about 6,300 MPN/100 mL and about 8,300 from the National Stormwater Quality Database (Table 5-2, Stein, *et. al*., 2007). The median value of four flow-weighted average results from the Stein, *et. al.* (2007) study was about 6,100 MPN/100mL for *E. coli* for the low density residential land use site. These data represent urban areas that in general do not have source and treatment controls and, therefore, are not indicative of runoff from the proposed Project build-out.

Runoff from agricultural watersheds involving horticulture and row cropping is known to similarly contain relatively high concentrations of FIB. Data from a stormwater drain serving an agricultural watershed with predominantly row crops in Ventura County showed median fecal coliform levels (approximately 7,000 MPN/100 mL) similar to that found for general urban runoff (Ventura County, 2005). Geometric mean concentrations of fecal and total coliform bacteria observed in wet weather flows at all tributary monitoring stations and in Santa Clara River Reach 5 ranged from 87 MPN/100 mL to 143,000 MPN/100 mL and 284 MPN/100 mL to 323,000 MPN/100 mL, respectively (**Table 4.4-8**). Agricultural land and open space areas likely share some of the same wildlife sources, but livestock may be present as well. These data indicate that wildlife, livestock, plants and/or soils can be a very important source of pathogens and/or FIB.

Project Design Features that Address Pathogen Indicators

The primary sources of pathogen indicators from the proposed Project development would likely be sediment, pet wastes, wildlife, and regrowth in the storm drain itself. Other sources of pathogens and pathogen indicators, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices.

The levels of bacteria in runoff from the proposed Project would be reduced by source controls and treatment controls. The most effective means of controlling specific bacteria sources, such as pet and other animal wastes, is through source control, specifically education of pet owners, education regarding

feeding (and, therefore, attracting) of waterfowl near waterbodies, and providing products and disposal containers that encourage and facilitate cleaning up after pets. These BMPs are specified as project source controls described in Table 4.4-12.

Although there are limited data on the effectiveness of different types of stormwater treatment to manage pathogen indicators, treatment processes that help reduce pathogen indicators include sunlight (ultraviolet light) degradation, sedimentation, and filtration.

Bioretention facilities that incorporate an amended soil media for filtration is an example of a type of stormwater treatment effective in addressing FIB. The City of Austin, Texas conducted a number of studies on the effectiveness of sedimentation/filtration treatment systems for treating stormwater runoff (City of Austin, 1990; CWP, 1996). Most of the structures were designed to treat one-half inch of runoff. Data from four sand filters indicated a range of removals from 37 percent to 83 percent for fecal coliform, and 25 percent to 81 percent for fecal streptococci. Research on the use of filtration to remove bacteria also has been conducted in Florida by the Southwest Florida Water Management District (Kurz, 1999). Significant reductions in total and fecal coliform bacteria and the other indicators were observed between inflow and outflow samples for sand filtration. Percent reductions were measured using flow-weighted sampling techniques. Total coliform bacteria removals were less than 70 percent, and fecal coliform bacteria reduction varied from 65 percent to 100 percent.

Similarly, where soil conditions are conducive to infiltration, LID practices and stormwater treatment facilities that allow for infiltration can reduce runoff volume and treat FIB by infiltration, which in turn reduces FIB loads. In a literature summary, USEPA reported typical pathogen removal for infiltration facilities as 65 to 100 percent (USEPA, 1993). These types of BMPs are specified in **Table 4.4-13** for incorporation into the Project as determined appropriate in the proposed Project water quality technical report to meet the treatment control design standards specified in the Newhall Ranch Specific Plan Subregional SWMP, which are based on achieving equivalent pollutant control and hydrologic control as specified the LID Ordinance and in the MS4 Permit/SUSMP Manual requirements for treatment of volume or flow of stormwater.

In summary, stormwater discharges from the proposed Project could potentially exceed the REC-1 Basin Plan standard for FIB and, therefore, impacts from FIB may be significant prior to mitigation, or the incorporation of FIB source and treatment controls as PDFs. However, the FIB concentrations in runoff from the Project would be reduced through the implementation of source and treatment control PDFs, which are incorporated as components of the proposed Project. The proposed Project build-out will incorporate a number of source controls specific to managing FIB, including education of pet owners, education regarding feeding (and, therefore, attracting) of waterfowl near waterbodies, and providing products and disposal containers that encourage and facilitate cleaning up after pets. The proposed Project will not include septic systems and the sewer system will be designed to current standards, which minimizes the potential for leaks. The proposed Project development, consistent with the MS4 permit requirements, includes a comprehensive set of source and treatment control PDFs, including treatment BMPs (*i.e.*, extended detention basins, bioretention, and media filtration), selected to manage pollutants of concern, including pathogen indicators. With these PDFs, proposed Project build-out would not result in substantial changes in pathogen levels, would not cause a violation of waste discharge requirements,

would not create runoff that would provide substantial additional sources of bacteria, or otherwise substantially degrade water quality in the receiving waters. Water quality impacts related to pathogens would be reduced to less than significant under Significance Criteria 1 through 3 with the implementation of proposed treatment BMPs and Mitigation Measure SP-4.2-7 (subsequent tract map development projects must comply with applicable County requirements, such as NPDES, Urban Storm Water Mitigation Plan, and a Storm Water Pollution Prevention Plan) and Mitigation Measure WQ-1 (subsequent tract map development projects must implement best management practices and project design features identified in a Standard Urban Stormwater Mitigation Plan).

~~*Pathogens*. Pathogens are viruses, bacteria, and protozoa that can cause illness in humans. Identifying pathogens in water is difficult as the number of pathogens is exceedingly small, thereby requiring sampling and filtering large volumes of water. Traditionally, water managers have relied on measuring "pathogen indicators" such as total and fecal coliform, as an indirect measure of the presence of pathogens (see further, **Appendix 4.4**, Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan, Appendix D). Although such indicators were considered reliable for sewage samples, indicator organisms are not necessarily reliable indicators of viable pathogenic viruses, bacteria, or protozoa in stormwater because coliform bacteria, in addition to being found in the digestive systems of warm-blooded animals, are also found in plants and soil. Certain pathogen indicators can multiply in the field if the substrate, temperature, moisture, and nutrient conditions are suitable. Paulsen and List summarize the debate over the use of pathogenic indicators and point out that scientific studies show no correlation between fecal coliform densities and gastrointestinal illness in swimmers, therefore, coliform may not indicate a significant potential for causing human illness. In a recent field study conducted by Schroeder *et al*., pathogens (in the form of viruses, bacteria, or protozoa) were found to occur in 12 of 97 samples taken, but the samples that contained pathogens did not correlate with the concentrations of indicator organisms. Most researchers who have correlated human illness to fecal indicator bacteria levels have conducted epidemiological studies in waters receiving point inputs of treated or raw sewage; few epidemiological studies have tested the health effects of exposure to water receiving direct and recent stormwater runoff. Thus there is no explicit documentation of the health effects of stormwater based on epidemiological studies.~~

~~There are numerous sources of pathogen indicators, including birds and other wildlife, as well as domesticated animals and pets, soils, and plant matter. Anthropogenic sources may include poorly functioning septic systems, cross-connections between sewer and storm drains, and the utilization of outdoor areas for human waste disposal by people without access to indoor sanitary facilities.~~

~~It is recognized that natural levels of bacteria are present in the Project's receiving waters and that control of such natural sources is not required nor desired by regulatory agencies. For example, the Los Angeles RWQCB TMDL for bacteria in the Malibu Creek watershed makes provisions for background levels of bacteria associated with natural sources. Bacteria TMDLs have not been developed for the Santa Clara River.~~

~~Data collected from undeveloped watersheds or watersheds with little development indicate that bacterial standards are often exceeded. For example, monitoring data obtained by the DPW for vacant land use showed a mean fecal coliform concentration of 1,397 MPN/100 mL in 21 samples (compared to the~~

~~REC1 water quality criteria of 400 MPN/100 mL). The USEPA has recognized that routine exceedances of ambient water quality criteria due to natural sources of pollution occur. In response, the USEPA has recommended changes to designated uses as the most appropriate way to address these situations. The monitoring data collected in the tributaries of the Santa Clara River showed a range of fecal coliform concentrations from 953 MPN/100 mL to greater than 81,200 MPN/100 mL (**Table 4.4-7**).~~

~~The USEPA has compiled an extensive database on stormwater data collected as part of its program to regulate stormwater. These data were drawn from 65 programs in 17 states throughout the United States. The data indicate that median fecal concentrations range from about 4,500 to 7,700 MPN/100 mL for a range of commercial and residential land uses, compared to a median value of around 3,000 MPN/100 mL for open space and vacant land. These data represent urban areas that in general do not have source and treatment controls, and, therefore, are not indicative of runoff from Specific Plan build-out.~~

~~Runoff from agricultural watersheds involving horticulture and row cropping is known to similarly contain high levels of indicator bacteria. Data from a stormwater drain serving an agricultural watershed with predominantly row crops in Ventura County showed similar median fecal coliform levels (~ 7,000 MPN/100 mL) to that found for general urban runoff. Agricultural land and open space areas likely share some of same wildlife sources, but farm animals may be present as well. These data indicate that wildlife, farm animals, plants and/or soils can be a very important source of pathogens and/or pathogen indicators, such as fecal coliform.~~

~~Additionally, a study conducted by PBS&J in coastal watersheds near Laguna Beach in Orange County found that indicator bacteria concentrations in receiving waters downstream from the developed/urban watersheds were not significantly different than concentrations in receiving waters downstream from undeveloped watersheds. Additional analysis conducted by Paulsen and List further supported these findings. These studies suggest that the development under the Specific Plan would not result in appreciable changes in pathogen levels in the receiving waters compared to the existing conditions. Mean concentrations of fecal and total coliform bacteria observed in wet weather flows at all tributary monitoring stations and in Santa Clara River Reach 5 ranged from 87 MPN/100 mL to 143,000 MPN/100mL and 284 MPN/100 mL to 323,000 MPN/100 mL, respectively (**Table 4.4-8**).~~

~~The primary sources of fecal coliform from the Specific Plan development would likely be sediment, pet wastes, wildlife, and regrowth in the storm drain itself. Other sources of pathogens and pathogen indicators, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices.~~

~~The levels of bacteria in runoff from the Specific Plan projects would be reduced by source controls and treatment controls. The most effective means of controlling pet wastes and wastes from human interaction with wildlife is through source control, specifically education of pet owners, education regarding feeding of waterfowl near water bodies, providing products and disposal containers that encourage and facilitate cleaning up after pets, and storm drain cleaning practices. These BMPs are described in **Table 4.4-12**.~~

~~Although there are limited data on the effectiveness of extended detention basins to treat pathogen indicators, the treatment processes known to be occurring in extended detention basins involve sunlight (ultraviolet light) degradation, sedimentation, and infiltration, all of which can reduce pathogen~~

~~concentrations and loads. Many of the proposed detention basins are to be located on relatively infiltrative soils and pathogen removal by filtration is a common and effective practice in wastewater treatment. The Center for Watershed Protection maintains a National Pollutant Removal Performance Database that indicates that removal performance for pathogen indicators in various types of extended detention basins ranged between 70 to 80 percent.~~

~~In addition to treatment by extended detention, bioretention areas and vegetated swales are proposed PDFs to be provided by the Specific Plan.. Bioretention relies on filtration through an amended sand soil layer for water quality treatment, while vegetated swales provide sediment removal through settling and allow for infiltration of low flows. Again, filtration and infiltration are effective means of treating pathogen indicators. The city of Austin, Texas conducted a number of studies on the effectiveness of sedimentation/filtration treatment systems for treating stormwater runoff. Most of the structures were designed to treat one-half inch of runoff. Data from four sand filters indicated a range of removals from 37 percent to 83 percent for fecal coliform, and 25 percent to 81 percent for fecal streptococci. Research on the use of filtration to remove bacteria also has been conducted in Florida by the Southwest Florida Water Management District. Significant reductions in total and fecal coliform bacteria and the other indicators were observed between inflow and outflow samples for sand filtration. Percent reductions were measured using flow-weighted sampling techniques. Total coliform bacteria removals were less than 70 percent, and fecal coliform bacteria reduction varied from 65 percent to 100 percent. In a literature summary, the USEPA reported typical pathogen removal for infiltration basins and trenches as 65 to 100 percent.~~

~~In summary, stormwater discharges from the proposed Project could potentially exceed the REC-1 Basin Plan standard for fecal coliform and, therefore, impacts from indicator bacteria under Significance Criteria 1 may be significant prior to mitigation. However, although such fecal indicator bacteria were considered reliable for sewage samples, indicator organisms are not necessarily reliable indicators of viable pathogenic viruses, bacteria, or protozoa in stormwater because coliform bacteria, in addition to being found in the digestive systems of warm-blooded animals, are also found in plants and soil. Potential post-development pathogen sources include natural sources, and it is recognized that natural levels of bacteria are present in the Project's receiving waters and that control of such natural sources is not required nor desired by regulatory agencies. Anthropogenic sources include leaking septic and sewer systems and pet wastes. The Specific Plan projects will not include septic systems and the sewer system will be designed to current standards which minimizes the potential for leaks. The Specific Plan development, consistent with the MS4 permit requirements, includes a comprehensive set of source and treatment control PDFs, including treatment BMPs (*i.e.* extended detention basins, bioretention and media filtration), selected to manage pollutants of concern, including pathogen indicators. With these PDFs, Specific Plan build-out would not result in substantial changes in pathogen levels in the receiving waters compared to existing conditions. Water quality impacts related to pathogens would be reduced to less-than-significant under Significance Criteria 1 through 3 with the implementation of proposed treatment BMPs and Mitigation Measures SP-4.2-7 and WQ-1.~~

Hydrocarbons. Various forms of hydrocarbons (oil and grease) are common constituents associated with urban runoff; however, these constituents are difficult to measure and are typically measured with grab

samples making it difficult to develop reliable EMCs for modeling. Based on this consideration, hydrocarbons were not modeled but are addressed qualitatively.

Hydrocarbons are a broad class of compounds, most of which are nontoxic. Hydrocarbons are hydrophobic (low solubility in water), have the potential to volatilize, and most forms are biodegradable. A subset of hydrocarbons, PAHs, such as fluoranthene, phenanthrene, pyrene, chrysene, and benzo(b)fluoranthene, can be toxic depending on the concentration levels, exposure history, and sensitivity of the receptor organisms. Of particular concern are those PAH compounds associated with transportation-related sources.

Although the concentration of hydrocarbons in runoff is expected to increase under post-development conditions due to the increase in roadways, driveways, parking areas, and vehicle use, PDFs, including source control BMPs and treatment control BMPs, are expected to prevent increases in hydrocarbon concentrations in Project runoff from leaving the project sites. Source control BMPs that address petroleum hydrocarbons include BMP maintenance and street sweeping private streets. The parking lot site design, source controls, treatment BMPs and vegetation and soils within the treatment control PDFs would adsorb the low levels of emulsified oils in stormwater runoff, reducing discharge of hydrocarbons and visible film in the discharge or the coating of objects in the receiving water.

The majority of PAHs in stormwater adsorb to the organic carbon fraction of particulate matter in the runoff, including soot carbon generated from vehicle exhaust. For example, a stormwater runoff study by Marslek *et al.* found that the dissolved-phase PAHs (in contrast to the PAHs adsorbed to particulate matter) represented less than 11 percent of the total concentration of PAHs. Consequently, the extended detention basins, bioretention areas, and vegetated swales proposed as treatment control PDFs, which are designed to remove particulate matter through settling, filtration, and infiltration, would be effective at treating PAHs.

Los Angeles County conducted PAH analyses on 27 stormwater samples, from a variety of land uses, from 1994 through 2000. For those land uses where sufficient samples were taken and were above detection levels to estimate statistics, the mean concentrations of individual PAH compounds ranged from 0.04 to 0.83 µg/L. The reported means were less than acute toxicity criteria available from the literature. Moreover, the Los Angeles County data do not account for any treatment, whereas the treatment in the proposed PDFs should result in a reduction in hydrocarbon concentrations inclusive of PAHs. This makes it very unlikely that significant water quality impacts would occur to the receiving water due to hydrocarbon loads or concentrations. On this basis, the post-development effects of the Specific Plan on petroleum hydrocarbon levels in the receiving waters can be reduced to less-than-significant under Significance Criteria 1 through 3 with implementation of Mitigation Measures SP-4.2-7 and WQ-1.

Pesticides. Pesticides can be of concern where past farming practices involved the application of persistent organochlorine pesticides. Legacy pesticides Chlordane, Dieldrin, DDT, and Toxaphene are of particular concern, as TMDLs have been established for these pesticides in the Santa Clara River estuary, approximately 40 miles downstream of the Specific Plan site. Historical pesticides should no longer be discharged in the watershed except in association with erosion of sediments to which these pollutants may have adhered in the past. The placement of impervious surfaces would stabilize soils and prevent their

transport from the development sites, reducing the potential for discharge of sediments to which historical pesticides may have adsorbed in predevelopment conditions.

In the post-development condition, pesticides would be applied to common landscaped areas and residential lawns and gardens. Pesticides that have been commonly found in urban streams include the organophosphate pesticides chlorpyrifos and diazinon. However, only zero to 13% of the samples in the County database had detectable levels of diazinon (depending on the land use), while levels of chlorpyrifos were below detection limits for all land uses in all samples taken between 1994 and 2000. Other pesticides presented in the database were seldom measured above detection limits. Furthermore, these data represent flows from areas without treatment controls, unlike the Specific Plan projects which incorporate treatment control PDFs.

Diazinon and chlorpyrifos are two pesticides of concern due to their potential toxicity in receiving waters. The USEPA banned all indoor uses of diazinon in 2002 and stopped all sales for all outdoor nonagricultural use in 2003.[15] With no agricultural uses planned for the proposed Specific Plan projects, diazinon would not be used at the Specific Plan site. The USEPA also has phased out most indoor and outdoor residential uses of chlorpyrifos and has stopped all nonresidential uses where children may be exposed. Use of chlorpyrifos in the Specific Plan area is not expected, with the possible exception of emergency fire ant eradications until such time as reasonable alternative products are available and only with appropriate application practices in accordance with the golf course and landscape pesticide management program.

Diazinon had long been one of the most commonly used pesticides on the market before its use was phased out. Although the USEPA's actions eliminated most urban diazinon uses by the end of 2004, phasing out diazinon likely has increased post-2004 reliance on alternative pesticides and encouraged new pesticides to enter the marketplace.

The San Francisco Regional Water Quality Control Board commissioned a study, called Insecticide Market Trends and Potential Water Quality Implications, to evaluate pesticide use trends as they relate to water quality. In 2003, on the basis of current and projected pesticide use and possible water quality risks, the report considered the pesticide alternatives of potential concern for water quality to be pyrethrums; pyrethroids (bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, and permethrin); carbaryl;

[15] Changes to the use of chlorpyrifos include reductions in the residue tolerances for agricultural use, phase out of nearly all indoor and outdoor residential uses, and disallowal of nonresidential uses where children may be exposed. Retail sales of chlorpyrifos were stopped by December 31, 2001, and structural (*e.g.,* construction) uses were phased out by December 31, 2005. Some continued uses will be allowed, for example public health use for fire ant eradication and mosquito control is permitted by professionals.

Permissible uses of diazinon also are restricted. All indoor uses are prohibited (as of 12/2002) and retailers were required to end sales for indoor use on December 2002. All outdoor nonagricultural uses were phased out by December 31, 2004. Therefore, it is likely that the USEPA ban will eliminate most of the use of diazinon within the Project area. The use of diazinon for many agricultural crops has been eliminated, while some use of this chemical will continue to be permitted for some agricultural activities.

malathion; and imidacloprid. A more recent study also identified lambda cyhalothrin (a pyrethroid) and fipronil among pesticides of interest.

The water quality risks posed by a pesticide relate to the quantity of the pesticide used, its runoff characteristics, and its relative toxicity in water and sediment. As urban diazinon applications are phased out, the use of some alternatives may inadvertently pose new water quality risks. Given what is known about alternative pesticide use trends, pyrethroids may be the alternatives that pose the greatest concerns for water quality. Although pyrethroids tend to be toxic to Ceriodaphnia dubia test organisms at concentrations in water comparable to diazinon, pyrethroids do not dissolve well in water but instead adhere well to surfaces, including particles in the environment. At equilibrium, pyrethroid concentrations in sediment are reported to be about 3,000 times greater than dissolved concentrations in water. Thus, BMPs targeting reductions and removal of sediment loads would be effective to reduce and remove pyrethroids as well.

Source control measures such as education programs for owners, occupants, and employees regarding the proper application, storage, and disposal of pesticides are the most effective methods for controlling the pesticides that would be used post-development. Treatment controls BMPs such as the use of extended detention basins (a design feature to be provided by the Project) are less practical because of the variety of pesticides and wide range of chemical properties that affect their ability to treat these compounds. However, most pesticides, including historical pesticides that may be present at the site, are relatively insoluble in water and, therefore, tend to adsorb to the surfaces of sediment, which would be stabilized with development, or, if eroded, would be settled or filtered out of the water column in the water quality treatment BMPs such as detention basins. Thus, treatment in the bioretention, vegetated swales, and extended detention basin should achieve removal of pesticides adsorbed to particulate matter from stormwater as TSS is reduced. For common area landscaping in commercial areas, multi-family residential areas, and parks, an IPM program would be incorporated. The goal of an IPM is to keep pest levels at or below threshold levels, reducing risk and damage from pest presence, while minimizing the risk from the pest control methods used. IPM programs achieve these goals through the use of low risk management options by emphasizing use of natural biological methods and the appropriate use of selective pesticides. IPM programs also minimize the potential for environmental impacts by implementing procedures that minimize intrusion and alteration of biodiversity in ecosystems.

While pesticides are subject to degradation, they vary in how long they maintain their ability to eradicate pests. Some break down almost immediately into nontoxic byproducts, while others can remain active for longer periods of time. While pesticides that degrade rapidly are less likely to adversely affect non-targeted organisms, in some instances it may be more advantageous to apply longer-lasting pesticides if it results in fewer applications or smaller amounts of pesticide use. As part of the IPM program, as required by proposed Mitigation Measure WQ-2, careful consideration would be made as to the appropriate type of pesticides for use on the Specific Plan site. While pesticide use is likely to occur due to maintenance of landscaped areas, particularly in the residential portions of the development, careful selection, storage and application of these chemicals for use in common areas per the IPM program would help prevent significant water quality impacts from occurring. Additionally, as discussed above, removal of sediments in the PDFs would also remove sediment-adsorbed pesticides.

Although pesticide quantities are expected to be in only a small percent of stormwater runoff, such an amount could be potentially significant under Significance Criteria 1 through 3. With the incorporation of proposed PDFs required by Mitigation Measure WQ-1, including site design, source control BMPs, and treatment control BMPs, pursuant to SUSMP requirements; and the use of an Integrated Pest Management program as required by proposed Mitigation Measure WQ-2, post-development water quality impacts associated with pesticides would be reduced to a less than significant level under Significance Criteria 1 through 3.

Trash and Debris. Urban development tends to generate significant amounts of trash and debris. Trash refers to any human-derived materials, including paper, plastics, metals, glass and cloth. Debris is defined as any organic material transported by stormwater, including leaves, twigs, and grass clippings. Debris can be associated with the natural condition. Trash and debris is often characterized as material retained on a 5-mm mesh screen. It contributes to the degradation of receiving waters by imposing an oxygen demand, attracting pests, disturbing physical habitats, clogging storm drains and conveyance culverts and mobilizing nutrients, pathogens, metals, and other pollutants that may be attached to the surface. Sources of trash in developed areas can be both accidental and intentional. During wet weather events, gross debris deposited on paved surfaces can be transported to storm drains, where it can be eventually discharged to receiving waters. Trash and debris also can be mobilized by wind and transported directly into waterways. Trash and debris can impose an oxygen demand on the water body as organic matter decomposes.

Urbanization could significantly increase trash and debris loads if left unchecked, resulting in a significant impact to water quality per Significance Criteria 1 through 3. However, the PDFs, including source control and treatment BMPs, would minimize the adverse impacts of trash and debris. Source control BMPs such as street sweeping, public education, fines for littering, and storm drain stenciling can be effective in reducing the amount of trash and debris that is available for mobilization during wet and dry weather events. Common area litter control would consist of measures such as the use of covered trash receptacles, emptying of trash receptacles in a timely fashion, and noting trash violations by tenants/homeowners or businesses and reporting the violations to the owner/HOA for investigation. Catch basin inserts would be provided for parking lots. The PDFs would remove or prevent the release of floating materials (including solids, liquids, foam, or scum, from runoff discharges) and would prevent impacts on dissolved oxygen in the receiving water due to decomposing debris. With implementation of appropriate, post-development trash and debris control programs such as those described above and required by Mitigation Measure WQ-1, the associated water quality impacts would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

Methylene Blue Activated Substances (MBAS). MBAS, which is related to the presence of detergents in runoff, may be incidentally associated with urban development due to commercial and/or residential vehicle washing or other outdoor washing activities. The surfactants in detergents disturb the surface tension, which affects insects and can affect gills in aquatic life. This is a potentially significant impact to water quality.

The presence of detergents in Project runoff would be minimized through the source control PDFs, including a public education program on residential and charity car washing and the provision of a car

wash pad connected to a sanitary sewer in the multi-family residential areas. Other sources of MBAS, such as cross-connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. With the implementation of Mitigation Measures SP-4.2-7 and WQ-1 to minimize the potential for MBAS to enter surface water sources, the potential for MBAS to significantly impact the receiving waters of the Specific Plan projects would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

Cyanide. The information on cyanide levels in urban stormwater is relatively sparse. The incidence of detection of cyanide in urban stormwater is relatively low, except in some special cases. In the Nationwide Urban Runoff Project, cyanide was detected in runoff from approximately one quarter of the cities that participated in the monitoring program. Overall, cyanide was detected in 23 percent of the urban runoff samples collected (16 out of a total of 71 samples), at concentrations ranging from two to 33 µg/L. Of the 71 samples, only three percent (*i.e.*, two) exceeded the freshwater acute guideline of 22 µg/L. The predominant sources of cyanides found in urban runoff samples were reported to be products of gasoline combustion and anti-caking ingredients in road salts.

The detectable concentrations observed in the Santa Clara River at the mass emission station S29 (average of 37 µg/L) may be in part due to untreated urban stormwater runoff from the city of Santa Clarita. However, other sources are likely to be more significant. A potential source is cyanide from burnt catchments. For example, cyanide concentrations in runoff obtained from an area that had been burned in a wildfire that occurred in Tennessee and North Carolina averaged 49 µg/L. Higher cyanide concentrations were reported in runoff from a wildfire that occurred in New Mexico, with an average value of 80 µg/L.

Given the low level of cyanide in stormwater, cyanide is not expected to be a significant impact to water quality. In addition to the expected relatively low level of cyanide in untreated stormwater, cyanide in runoff from build-out of the Specific Plan would be readily removed by biological uptake, degradation by microorganisms, and by volatilization in the treatment PDFs, especially the dry extended detention basins. Therefore, with implementation of Mitigation Measures SP-4.2-7 and WQ-1 cyanide is not expected to significantly impact the receiving waters of the Specific Plan projects under Significance Criteria 1 through 3.

MS4 Permit Requirements for New Development as Defined in the SUSMP. PDFs include site design, source control, and treatment control BMPs in compliance with the SUSMP requirements, as described above and summarized in **Table 4.4-12**, above. Treatment control PDFs would treat runoff from the entire urban portion of the Specific Plan site. Sizing criteria contained in the MS4 permit and the SUSMP requirements would be met for all treatment control BMPs.

In summary, the proposed site design, source control, and treatment control PDFs have been selected based on:

- Effectiveness for addressing pollutants of concern in project runoff, reducing water quality impacts to less than significant;

- Sizing and outlet design consistent with the MS4 permit and SUSMP requirements;

- Additional design guidance consistent with the California BMP Handbook: New Development and Redevelopment, other literature, and best professional judgment;

- Hydrologic and water quality modeling to verify performance;

- Meeting mean annual percent capture criteria contained in the California BMP New Development Manual; and

- Providing specific operations and maintenance requirements to inspect and maintain the facilities consistent with the California BMP Handbook: New Development and Redevelopment.

On this basis, the PDFs to be included during Specific Plan build-out would meet the MS4 permit requirements for new development.

Low Impact Development Requirements for New Development as Defined in the Los Angeles County LID Ordinance and LID Standards Manual. PDFs include low impact/site design BMPs, as summarized in **Table 4.4-13**, above. The Sub-Regional Plan and the water quality control measures specified in it will reduce stormwater runoff volume and promote groundwater infiltration in an integrated approach to protecting water quality and managing water resources in compliance with the Los Angeles County LID Ordinance and LID Standards Manual requirements.

The following hydrologic source controls, included as PDFs, will limit impervious area and disconnect imperviousness to avoid and minimize water quality and hydromodification impacts:

- Low Impact/Site Design BMPs. Low impact/site design PDFs that promote infiltration and help to reduce runoff volumes include the clustering of development into village areas, leaving large amounts of undeveloped open space within the Newhall Ranch Specific Plan subregion, routing of impervious area runoff to vegetated areas, use of permeable pavements, use of native and/or non-native/non-invasive vegetation in landscaped areas, and the use of efficient irrigation systems in common area landscaped areas.

- Treatment Controls. The project's treatment control PDFs have been selected to promote infiltration and evapotranspiration. The treatment control PDFs, including bioretention areas, vegetated swales, filter strips, and extended detention basins, will incorporate vegetation to promote pollutant removal and runoff volume reduction through infiltration and evapotranspiration. Subregional extended detention basins will also incorporate infiltration trenches and dry wells to promote infiltration of treated flows where natural soil infiltration rates do not support infiltration. Collectively, these vegetated treatment facilities are expected to provide significant reduction in wet weather runoff volume and to eliminate dry weather flows. In addition, those flows that are not infiltrated in the PDFs will flow, after treatment, to the Santa Clara River, whose channel is predominantly natural and consists of vegetation and coarse-grained sediments (rather than concrete). The porous nature of the sands and gravels forming the streambed will allow for significant infiltration to occur to the underlying groundwater.

~~The treatment control PDFs will be sized to infiltrate, evapotranspire, and/or capture and detain the water quality design volume in compliance with the LID Ordinance and LID Standards Manual, the MS4 permit and the SUSMP requirements.~~ The low impact/site design BMPs and treatment control PDFs would be sized to infiltrate, evapotranspire, and/or capture and detain 80 percent of the average annual runoff volume, which is the performance standard established in the Sub-Regional Plan. This performance standard is equivalent to or exceeds the LID goals and volumetric runoff retention requirements of the DPW LID Manual when applied to the Project (Geosyntec, 2010).

On this basis, the PDFs to be included during Specific Plan build-out would meet the low impact development requirements for new development.

Pollutant Bioaccumulation. Certain pollutants have the potential to accumulate in treatment BMP vegetation and soils, potentially increasing the risk of exposure to wildlife and the food chain. Factors that could affect the extent of potential bioaccumulation include:

- The bioavailability of the pollutant;
- Conditions in the soils (*e.g.*, pH, acid-volatile sulfide concentration, organic content) that affect the form and bioavailability of the pollutant;
- The efficiency by which pollutants in the soils enter the plant community, the storage of these pollutants in plant tissues that are edible, and the utilization of the plants as a food source by animals;
    - The type of habitats, organisms attracted to these habitats, and their feeding habits; and
    - System design and maintenance.

The primary pollutants of concern with regard to bioaccumulation are mercury and selenium. However, as indicated by the water quality monitoring conducted by LACDPW at the Santa Clara River mass emission station S29, selenium and mercury are not naturally present at levels of concern in this watershed. Since these pollutants would not be introduced during Specific Plan build-out, bioaccumulation of selenium and mercury is not expected.

The potential for bioaccumulation impacts from the Specific Plan's project treatment control facilities, such as bioretention, vegetated swales, and extended detention basins, would be minimal. Since the tributary areas to the BMPs are largely impervious, very little coarse solids and associated pollutants are expected to be generated. The vegetation in the facilities would trap sediments and pollutants in the soils, which contain bacteria that metabolize and transform trace metals, thereby reducing the potential for these pollutants to enter the food chain. The facilities do not provide open water areas and are not likely to attract waterfowl.

Bioaccumulation of pollutants in the Santa Clara River would not be significant due to the low estimated concentrations of pollutants such as trace metals, which are predicted to be below the benchmark CTR criteria in the treated runoff. Also, sediments in the Santa Clara River are transported downstream in the wet season by storm flows, and, therefore, do not accumulate.

On this basis, the potential for bioaccumulation and adverse effects on waterfowl and other species is considered less-than-significant under Significance Criteria 3.

Dry Weather Runoff. Pollutants in dry weather flows are of concern because dry weather flow conditions occur throughout a large majority of the year, and because some of the TMDLs in downstream reaches of the Santa Clara River are applicable for dry weather conditions (*e.g.*, nutrients and chloride).

Dry weather flows are typically low in sediment because the flows are relatively low and coarse suspended sediment tends to settle out or is filtered out by vegetation. As a consequence, pollutants that tend to be associated with suspended solids (*e.g.*, phosphorus, some bacteria, some trace metals, and some pesticides) are typically found in very low concentrations in dry weather flows and not considered a significant water quality impact. In contrast, potentially significant impacts, prior to mitigation, could occur from constituents that tend to be dissolved (*e.g.*, nitrate and trace metals), or constituents that are so small as to be effectively transported (*e.g.*, pathogens and oil and grease).

In order to minimize the potential generation and transport of dissolved constituents, landscaping in public and common areas would utilize drought tolerant vegetation that requires little watering and chemical application. Landscape watering in common areas, commercial areas, multi-family residential areas, and in parks would use efficient irrigation technology utilizing evapotranspiration sensors to minimize excess watering.

In addition, educational programs and distribution of materials (source controls) would emphasize appropriate car washing locations (at commercial car washing facilities or the car wash pad in the multi-family residential areas) and techniques (minimizing usage of soap and water), encourage low impact landscaping and appropriate watering techniques, swimming pool dechlorination and discharge procedures, and discourage driveway and sidewalk washing. Illegal dumping would be discouraged by stenciling storm drain inlets and posting signs that illustrate the connection between the storm drain system and the receiving waters and natural systems downstream.

The bioretention areas, vegetated swales, and the extended detention basins would provide treatment for and infiltrate dry weather flows and small storm events. Water cleansing is a natural function of vegetation, offering a range of treatment mechanisms. Sedimentation of particulates is the major removal mechanism. However the performance is enhanced as plant materials allow pollutants to come in contact with vegetation and soils containing bacteria that metabolize and transform pollutants, especially nutrients and trace metals. Plants also take up nutrients in the soil through their root system. Some pathogens would be removed through ultraviolet light degradation. Any oil and grease would be effectively adsorbed by the vegetation and soil within the low flow wetland vegetation. Dry weather flows and small storm flows would infiltrate into the bottom of the basin after receiving treatment in the low flow wetland vegetation.

The treatment control PDFs would infiltrate or evapotranspire all expected dry weather runoff. It is expected that no dry weather discharge would occur to the Santa Clara River or tributaries. A special exception to the complete infiltration of dry weather flows in the treatment control PDFs would occur if it is desired to direct treated dry weather flows from the treatment control PDFs to mitigation habitat adjacent to the tributaries in order to support that habitat. In that case, the treatment PDFs may be lined,

and treated dry weather flows would be directed to and fully contained within the mitigation habitat. With the implementation of proposed source control PDFs, Mitigation Measures SP-4.2-7 and WQ-1 to reduce the amount of dry weather runoff, and treatment control PDFs that capture and treat the dry weather runoff that does occur, the impact from dry weather flows is considered less-than-significant under Significance Criteria 1 through 3.

Summary of Indirect Surface Water Quality Impacts of Stormwater Runoff from Specific Plan Build-Out. While runoff ammonia, total nitrogen, trace metals, and chloride loads and dissolved copper concentration are predicted to increase, concentrations of all modeled constituents (except for dissolved copper) are predicted to decrease under Specific Plan build-out conditions when compared to existing conditions. This predicted decrease in concentration can be attributed to higher concentrations observed in monitoring data from agricultural and open space land uses (the existing condition for the site) compared with urban land uses (representative of post-development conditions). The modeled concentrations in runoff from developed areas with PDFs are below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. These pollutants are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with SUSMP, construction general permit, and general dewatering permit requirements.

Concentrations of hydrocarbons and MBAS are expected to increase, while concentrations of pathogens, pesticides, trash and debris, and cyanide may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters under the requirements of Significance Criteria 1 through 3 due to the implementation of a comprehensive site design, source control BMPs, and treatment control BMPs in compliance with the MS4 permit and SUSMP requirements. Therefore, after application of the BMPs and PDFs described in the preceding section and required by Mitigation Measures SP-4.2-7 and WQ-1, potential impacts from Specific Plan build-out on receiving water quality would not be significant under Significance Criteria 1 through 3.

RMDP Newhall Ranch WRP Impact Assessment. Wastewater generated by the Specific Plan build-out will be treated in the Newhall Ranch Water Reclamation Plant (WRP). The Newhall Ranch WRP was analyzed at the project-level in the Court approved and certified Newhall Ranch Specific Plan Program EIR (May 2003).

The Newhall Ranch WRP treatment facility is further described in the individual NPDES Permit and Waste Discharge Requirements (WDRs) for the Newhall Ranch WRP (Order No. R4-2007-0046, effective October 27, 2007). Treatment at the WRP will consist of screening, activated sludge secondary treatment with membrane bioreactors, nitrification/denitrification, ultraviolet disinfection, and partial reverse osmosis. The initial design capacity of the WRP would be 2 million gallons per day (MGD) to accommodate the initial phases of the Newhall Ranch Specific Plan, including Landmark Village, and would be incrementally increased to 6.8 MGD to accommodate the sewage generated by the build-out of Specific Plan.

Treated effluent from the Newhall Ranch WRP would be used to supply distribution of recycled water throughout the Specific Plan area in the form of irrigation of landscaping and other approved uses. In an

average rainfall year, all tertiary treated wastewater from the Newhall Ranch WRP would be recycled for irrigation and other non-potable uses, except in the wet weather months. During these months in average rainfall years, approximately 286 to 1,025 acre-feet of tertiary-treated wastewater would not be needed to meet estimated non-potable demand and, therefore, would be discharged to the Santa Clara River. During years 1 and 2 of the Newhall Ranch WRP operation, the WRP would operate at a maximum of 2 MGD, with an estimated average discharge flow rate of 0.2 MGD during the five month period of November through March. No sooner than year 3, the WRP would be expanded to 6.8 MGD, with an approximate average discharge flowrate of 0.6 MGD during this five month wet period. Therefore, discharge periods would coincide with peak wet months when dilution capacity is maximal (*i.e.*, instream flows are highest). The average November through March instream flowrate at USGS station 11109000 (Newhall Bridge, approximately 2.5 miles downstream of the County line), is 188 cfs (121 mgd) based on measured average daily flow data for water years 1977-2006. Newhall WRP effluent would represent less than one percent of this average volume.

The NPDES Permit contains effluent limitations that would control the amount of conventional, non-conventional, and toxic pollutants discharged to the receiving waters. These effluent limits are a combination of technology-based limits (per 40 C.F.R. section 122.44(a)) and water quality-based limits (per 40 C.F.R. section 122.44(d)). Concentration-based effluent limitations contained in the NPDES Permit are listed in **Table 4.4-31** below. Mass-based effluent limitations contained in the draft permit, but not listed in **Table 4.4-31**, are derived by multiplying the proposed concentration limitation by the permitted flow of 2.0 mgd. These mass-based limits would be modified accordingly as the phased plant upgrades approach completion following an anti-degradation analysis demonstration conducted by Newhall Land, and upon certification and approval of increased treatment plant capacity.

Additional water quality-based effluent limits are included in the permit for toxicity in the WRP effluent and for temperature, pH, dissolved oxygen, fecal coliform, turbidity, toxicity, and other pollutants in the receiving water. Groundwater-based effluent limitations are proposed for coliform bacteria, chemical constituents, radionuclides, nitrate-N + nitrite-N, and taste or odor producing substances.

Title 22 of the California Code of Regulations (title 22) specifies California's Wastewater Reclamation Criteria (WRC) and all recycled water in California must meet or exceed these criteria to assure protection of receiving water quality. These criteria apply to the treatment processes; treatment performance standards, such as removal efficiencies and effluent water quality; process monitoring programs, including type and frequency of monitoring; facility operation plans; and necessary reliability features. The Newhall Ranch WRP discharges would be required to comply with the WRC through the issuance of a separate order.

As is discussed in the draft Newhall Ranch WRP NPDES Permit Fact Sheet (page F-14), the Upper Santa Clara River chloride wasteload allocations (WLAs) are expressed on a concentration basis derived from and equivalent to the existing water quality objective for Reaches 5 and 6 of the Santa Clara River, thereby providing direct protection for agricultural supply, the most sensitive beneficial use. Under the TMDL Implementation Plan, a special study was conducted to confirm that the concentration-based WLA

Table 4.4-31
Effluent Limitations in the Newhall Ranch WRP NPDES Permit

Parameter	Units	Effluent Limitations		
		Average Monthly	Average Weekly	Maximum Daily
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	20	30	45
Total Suspended Solids	mg/L	15	40	45
pH	standard unit	6.5 - 8.5 (instantaneous minimum and maximum)		
Settleable solids	mL/L	0.1	-	0.3
Oil and Grease	mg/L	10	-	15
Total dissolved solids	mg/L	1,000	-	-
Chloride	mg/L	100 [1]	-	-
Sulfate	mg/L	400	-	-
Boron	mg/L	1.5	-	-
Total ammonia (NH_3 as N)	mg/L	1.93 [2]	-	3.87 [3]
Nitrate-N + Nitrite-N	mg/L	5	-	-
Nitrite-N	mg/L	0.9	-	-
Detergents (as MBAS)	mg/L	0.5	-	-
Total residual chlorine	mg/L	-	-	0.1
Antimony	µg/L	6	-	-
Arsenic	µg/L	10	-	-
Copper	µg/L	22	-	44
Lead	µg/L	13	-	26
Mercury	µg/L	0.051	-	0.10
Nickel	µg/L	100	-	-
Selenium	µg/L	4.1	-	8.2
Zinc	µg/L	5,000	-	-
Cyanide	µg/L	4.2	-	8.5
Acrylonitrile	µg/L	0.66		1.3
Tetrachloroethylene	µg/L	5	-	-
Bis(2-ethylhexyl)phthalate	µg/L	4	-	-
p-Dischlorobenzene (1,4-Dichlorobenzene)	µg/L	5	-	-
Lindane	µg/L	0.2	-	-
4,4-DDE	µg/L	0.00059	-	-
Iron	µg/L	300	-	-

Notes:
[1] This is the water quality objective for chloride in the current Basin Plan. This effluent limitation is consistent with the assumptions of the Chloride TMDL for the Santa Clara River, Resolution No. 2002-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Include a TMDL for Chloride in the Santa Clara River (Chloride TMDL) and applies immediately. However, if a chloride site-specific objective (Chloride SSO) is adopted for the reach of the Santa Clara River in which Newhall Ranch WRP will discharge, then the permit may be reopened by the Los Angeles RWQCB to make the necessary changes, following USEPA approval of the Chloride SSO.
[2] This is the monthly average effluent limit calculated according to the Implementation Plan for ammonia in the Basin Plan, which specifies how to translate the Ammonia WQO into a final effluent limit, consistent with the assumptions of the Santa Clara River Nitrogen Compounds TMDL, Resolution No. 03-011.
[3] This is the daily maximum effluent limit calculated according to the Implementation Plan for ammonia in the Basin Plan, which specifies how to translate the Ammonia WQO into a final effluent limit, consistent with the assumptions of the Santa Clara River Nitrogen Compounds TMDL, Resolution No. 03-011.
Source: Los Angeles RWQCB

of 100 mg/L chloride is protective of this beneficial use. A concentration-based WLA also accommodates future growth and provides beneficial uses protection from chloride loads that were in place at the time of the TMDL development. Protection of beneficial uses from additional chloride loads that were not assigned wasteload allocations is provided by using the WLAs as effluent limits in permits for new and future sources, such as the Newhall Ranch WRP.

Further stated in the Newhall Ranch WRP NPDES Permit Fact Sheet (page F-14), the Staff Report for the TMDL, dated August 21, 2002, states: "[a] concentration-based target accommodates future growth by allowing increased mass as long as it is accompanied by additional flow…. " The Fact Sheet finds that water quality would not be degraded if concentration-based wasteload allocations that are equivalent to the water quality objectives are assigned to new facilities at the end of pipe. The Fact Sheet also states that studies regarding the effect of additional chloride load on groundwater basins underlying the Upper Santa Clara River are underway and scheduled for completion by November 2007 (Fact Sheet page F-15). Initial results from these studies show that discharges at effluent limits of 100 mg/L chloride would not degrade groundwater quality. Results from these studies may be used to revise the effluent limits through modification of the NPDES permits for all dischargers discharging at 100 mg/L if necessary.

Similarly, concentration-based effluent limitations contained in the NPDES Permit for nitrogen compounds, established per the *Santa Clara River Nitrogen Compounds TMDL*, are protective of water quality in the Santa Clara River.

Water quality-based effluent limitations are included in the NPDES Permit for pathogen indicator bacteria as follows:

- E.coli density shall not exceed 126/100 mL (geometric mean) or 235/100 mL (single sample);
- Fecal coliform density shall not exceed 200/100mL (geometric mean) or 400/100 mL (single sample).

These receiving water limitations are based on Resolution No. 01-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation, and, therefore, are protective of beneficial uses in the Santa Clara River.

Based on required compliance with State and Federal water quality requirements, as discussed and analyzed in the project-level analysis contained in the Newhall Ranch Specific Plan Program EIR and the information above, and the implementation of previously adopted Mitigation Measures SP-5.0-52 through 5.0-56, which are related to the construction and operation of the WRP, potential impacts from the Newhall Ranch WRP on receiving water quality would not be significant under Significance Criteria 1 through 3.

SCP Indirect Impacts to Surface Water Quality. Implementation of the proposed SCP would indirectly facilitate previously approved urban development within the Specific Plan site, and on portions of the VCC and Entrada planning areas. Potential surface water quality impacts of Specific Plan build-out are evaluated above.

Short-Term Indirect Impacts to Surface Water Quality. The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality during the construction phase of the Specific Plan build-out focus primarily on sediment (TSS and turbidity) and certain non-sediment related pollutants, such as nutrients, heavy metals, and certain pesticides, including 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, grading, and trenching for infrastructure improvements. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Non-sediment-related pollutants that are also of concern during construction include construction materials (*e.g.*, paint); chemicals, liquid products, and petroleum products used in facility construction or the maintenance of heavy equipment; and concrete-related pollutants. These construction phase impacts could result in significant impacts to water quality under Significance Criteria 1 through 3, but impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures SP-4.2-7 and WQ-1.

Construction impacts due to Specific Plan development, including the excavation of soil from borrow sites, would be minimized through a PDF that consists of compliance with the construction general permit. This permit requires the development and implementation of 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 the other potential construction-related pollutants. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. A SWPPP would be developed in compliance with the construction general permit and the County of Los Angeles' standard conditions. The permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the BAT/BCT level. The SWPPP developed to implement the PDF would include the following BMPs, as appropriate:

Erosion Control (BMPs numbered EC-3 through EC-7 and WE-1 in the Stormwater Best Management Practice Handbook - Construction [CASQA, 2003]):

1. Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded fiber matrices, and erosion control blankets (*i.e.*, rolled erosion control products).
2. Limiting the area and duration of exposure of disturbed soils.
3. Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
4. Vegetation stabilization through temporary seeding to establish interim vegetation.
5. Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.

Sediment Control:

6. Perimeter protection to prevent discharges through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, -5, -6, -8, and -9).
7. Storm drain inlet protection (SE-10).

8. Resource (Environmentally Sensitive Area) protection through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, -5, -6, -8, and -9).

9. Sediment capture through sediment traps, storm drain inlet protection, and sediment basins (SE-3, -10, and -2).

10. Velocity reduction through check dams, sediment basins, and outlet protection/ velocity dissipation devices (SE-2, -4, and -10).

11. Reduction in off-site sediment tracking through stabilized construction entrance/exit, construction road stabilization, and entrance/exit tire wash (TE-1, -2, and -3).

Waste and Materials Management:

12. Management of the following types of materials, products, and wastes: solid, sanitary, concrete, hazardous and equipment-related wastes (MW-1, -2, -4 through -10, and NS-8 through -10).

13. Protection of soil stockpiles through covers, the application of water or soil binders, and perimeter control measures (MW-3).

Non-Stormwater Management:

14. BMPs or good housekeeping practices to reduce or limit pollutants at their source before they are exposed to stormwater, including such measures as: water conservation practices, and vehicle and equipment cleaning and fueling practices (NS-1 through 16).

Training and Education:

15. Training of individuals responsible for SWPPP preparation, implementation, and permit compliance, including contractors and subcontractors.

16. Signage (bilingual, if appropriate) to address SWPPP-related issues (such as site clean up policies, BMP protection, washout locations, *etc*.).

Maintenance, Monitoring and Inspections:

17. Performing routine site inspections and inspections before, during (for storm events > 24 hours), and after storm events.

18. Implementing maintenance and repairs of BMPs as indicated by routine and storm-event inspections.

19. Preparation and implementation of a sampling and analysis plan for non-visible pollutants.

These additional construction site management BMPs would be implemented within the VCC and Entrada planning areas during the dry season and wet season as follows:

Dry Season Construction Phase BMPs:

20. Wind erosion BMPs (dust control).

21. Soil roughening of graded areas (track walking, scarifying, sheepsfoot rolling, or imprinting)

22. Sediment control BMPs at the down gradient site perimeter and all operational storm drain inlets internal to the planning area.

23. Off-site tracking BMPs.

24. Appropriate waste management and materials pollution BMPs.

25. Appropriate non-stormwater BMPs to prevent or reduce the contamination of stormwater by construction activities and materials.

26. A "weather triggered" action plan to deploy standby erosion and sediment control BMPs to protect exposed portions of the site within 48 hours of a predicted storm event.

27. Sufficient standby BMP materials to implement the above action plan.

28. Deployment of post-construction erosion control BMPs as soon as practicable.

Wet Season Construction Phase BMPs:

29. Limiting the area and duration of exposure of disturbed soil areas. This may be accomplished by retention of natural vegetation in areas not scheduled for immediate grading, phasing the grading, and stabilizing disturbed areas quickly.

30. Implementation of an effective combination of erosion and sediment control measures on all disturbed areas.

Regulatory requirements applicable to the project construction phase require the implementation of BMPs consistent with BAT/BCT, as required by the construction general permit and the general WDRs in the dewatering general permit or individual WDR. Erosion and sediment transport and transport of other potential pollutants during the construction phase would be prevented through implementation of BMPs meeting BAT/BCT to prevent or minimize environmental impacts and to ensure that discharges during the construction phase would not cause or contribute to any exceedance of water quality standards in the receiving waters. These BMPs would assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as (and not limited to) nutrients, heavy metals, and certain pesticides, including legacy pesticides. In addition, compliance with BAT/BCT requires that BMPs used to control construction water quality impacts are updated over time as new water quality control technologies are developed and become available for use. Therefore, implementing Mitigation Measures SP-5.2-7 and WQ-1, which require the use of PDFs related to compliance with the construction stormwater permit BAT/BCT performance standards, would reduce construction-related water quality impacts to a less-than-significant level under Significance Criteria 1 through 3.

During the construction phase of VCC and Entrada build-out, hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills, which would be a potentially significant impact under Significance Criterion 2. However, pursuant to the construction general permit, the construction SWPPP must include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the BAT/BCT standards. Polycyclic Aromatic Hydrocarbons (PAH) that are adsorbed by sediment during the construction phase would be effectively controlled *via* the erosion and sediment control BMPs. For these reasons, with the use of PDFs required

by Mitigation Measures SP-5.2-7 and WQ-1, construction-related impacts from hydrocarbons on water quality would be reduced to less–than-significant. Transport of legacy pesticides adsorbed to existing site sediments as a result of historic farming operations may be a concern during the construction phase of development, which would be a potentially significant water quality impact under Significance Criteria 1 through 3. The construction SWPPP must contain sediment and erosion control BMPs pursuant to the construction general permit, and those BMPs must effectively control erosion and the discharge of sediment along with other pollutants per the BAT/BCT standards. With implementation of the PDF for sediment control BMPs, and Mitigation Measures SP-5.2-7 and WQ-1, construction-related impacts associated with pesticides would be reduced to less-than-significant under Significance Criteria 1 through 3.

During the construction phase, there is potential for an increase in trash and debris loads due to lack of proper contractor good housekeeping practices at the construction site. This is a potentially significant water quality impact under Significance Criterion 1. Per the construction general permit, the SWPPP for the site would include BMPs for trash control (catch basin inserts, good housekeeping practices, *etc.*). Mitigation Measures SP-5.2-7 and WQ-1 require compliance with the construction stormwater permit requirements and meeting BAT/BCT. These measures ensure that water quality impacts from trash and debris would be reduced to a less-than-significant level.

Construction on the project sites may require dewatering and non-stormwater related discharges. For example, dewatering may be necessary if groundwater is encountered during grading or to allow discharges associated with testing of water lines, sprinkler systems and other facilities. Dewatering activities and non-stormwater related discharges could be a potentially significant impact to water quality under Significance Criteria 1 through 3 if the groundwater or non-stormwater related discharges contain pollutants at levels of concern. In general, the construction general permit authorizes construction dewatering activities and other construction related non-stormwater discharges as long as they: (1) comply with Section A.9 of the permit; (2) do not cause or contribute to violation of any water quality standards; (3) do not violate any other provisions of the permit; (4) do not require a non-stormwater permit as issued by the Los Angeles RWQCB; and (5) are not prohibited by a Basin Plan provision. Full compliance with applicable local, state and federal water quality standards, and the requirements of (Mitigation Measures SP-4.2-7, SP-5.0-54, and WQ-1 would reduce impacts from dewatering discharges to a less-than-significant-level.

An additional PDF would be implemented to protect receiving waters from dewatering and construction related non-stormwater discharges. Such discharges would be implemented in compliance with the WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) or individual WDR issued for project dewatering governing construction-related dewatering discharges within the Project development areas. Typical BMPs for construction dewatering include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on-site or transport off site for sanitary sewer discharge with local sewer district approval; and use of a sedimentation bag for small volumes of localized dewatering. Compliance with these WDRs assures that the impacts of dewatering discharges would not be significant.

With implementation the measures described above to minimize construction-related activities impacting receiving waters, the short-term, construction-related water quality impacts of VCC and Entrada build-out would be significant under Significance Criteria 1 through 3..

Long-Term Indirect Impacts to Surface Water Quality.

***VCC Planning Area*.** Within the VCC planning area, no potentially significant water quality impacts were identified in the VCC EIR (April 1990), and the County did not adopt any mitigation measures in that regard.

The VCC planning area incorporates approximately 321 acres planned for 178 acres of commercial development. Treatment control BMPs for runoff treatment included in the water quality impact analysis water quality model prepared for the proposed Project include biofilters (vegetated swales, filter strips, or bioretention areas) (Geosyntec, 2008).

Table 4.4-32 below shows the estimated changes in stormwater runoff volume and mean annual loads for the modeled pollutants of concern for the VCC planning area. **Table 4.4-33** below shows the estimated changes in concentration in stormwater runoff for the VCC planning area.

Table 4.4-32
Estimated Average Annual Runoff Volume and Pollutant Loads for the VCC Project

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/ PDFs
Volume	acre-ft	51	241	192	141
TSS	tons/yr	12.2	21	9.6	-2.6
Total Phosphorus	lbs/yr	68	234	186	118
Nitrate-N + Nitrite-N	lbs/yr	220	411	231	11
Ammonia-N	lbs/yr	81	576	464	383
Total Nitrogen	lbs/yr	564	2,226	1,068	504
Dissolved Copper	lbs/yr	2.0	7.0	3.6	1.6
Total Lead	lbs/yr	1.3	6.1	2.5	1.2
Dissolved Zinc	lbs/yr	26	97	30	4
Total Aluminum	lbs/yr	173	1,181	582	409
Chloride	tons/yr	1	14	11	10

Source: Geosyntec, 2008

Table 4.4-33
Estimated Average Annual Pollutant Concentrations for the VCC Project

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/ PDFs
TSS	mg/L	175	65	37	-138
Total Phosphorus	mg/L	0.49	0.4	0.36	-0.13
Nitrate-N + Nitrite-N	mg/L	1.5	0.6	0.4	-1.1
Ammonia-N	mg/L	0.58	0.9	0.89	0.31
Total Nitrogen	mg/L	4.0	3.4	2.0	-2.0
Dissolved Copper	µg/L	14	11	7	-7
Total Lead	µg/L	9.5	9.3	4.9	-4.6
Dissolved Zinc	µg/L	189	148	57	-132
Total Aluminum	µg/L	1,241	1,804	1,114	-127
Chloride	mg/L	20	43	43	23

Source: Geosyntec, 2008.

With the exception of TSS load, runoff volume and pollutant loads are predicted to increase under proposed conditions for the VCC planning area, when compared to existing conditions. TSS loads are predicted to decrease. With the exception of ammonia and chloride, pollutant concentrations are expected to decrease under proposed conditions, when compared to existing conditions. Ammonia and chloride concentrations are predicted to increase. With the PDFs required by Mitigation Measure WQ-1, the impacts to water quality of the VCC project would be reduced to a less-than-significant level.

The estimated average annual TSS, nutrient, and chloride concentrations in stormwater runoff from the total modeled VCC planning area are compared to water quality criteria in **Table 4.4-34** below. Although nutrient and chloride loads are predicted to increase with development, concentrations of nutrients and chloride are predicted to decrease, with the exception of ammonia. Concentrations of TSS, nutrients, and chloride are predicted to be below all benchmark criteria. Concentrations of TSS, total phosphorus, ammonia, total nitrogen, and chloride are predicted to be within the range of concentrations observed in Santa Clara River Reach 5; nitrate plus nitrite-nitrogen is predicted to be below the observed concentrations. With the implementation of Mitigation Measure WQ-1, including the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, the predicted decrease in runoff concentrations, and the comparison with Basin Plan benchmark objectives, impacts from the VCC planning area on TSS, nutrient, and chloride receiving water quality would be reduced to a less than significant level under Significance Criteria 1 through 3.

Table 4.4-34
Comparison of Estimated Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5

Nutrient	Estimated Developed Conditions w/ PDFs (mg/L)	Basin Plan Water Quality Objectives (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
TSS	37	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	NA	32 - 6,591
Total Phosphorus	0.4	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	0.18 - 13.4
Nitrate-N + Nitrite-N	0.4	5	6.8[2]	0.5 - 4.8
Ammonia-N	0.9	2.2[3]	1.75[4]	<0.005 - 1.1
Total Nitrogen	2	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	<0.04 - 46[5]
Chloride	43	100	100	3 - 121

Notes:

[1] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).

[2] 30-day average.

[3] Four-day average, ELS present, 90th percentile pH and temperature pairing observed at USGS Monitoring Station 11108500.

[4] 30-day average in Reach 5 below Valencia.

[5] Observed values for TKN (ammonia plus organic nitrogen).

Source: Geosyntec, 2008.

Comparison of the estimated runoff metal concentrations for the VCC planning area and the acute CTR criteria for dissolved copper, total lead, dissolved zinc, and total aluminum are shown in **Table 4.4-35** below. The comparison of the post-developed with PDFs condition to the benchmark CTR values shows that all of the trace metal concentrations are predicted to be below the benchmark CTR criteria.

There is no CTR criterion for aluminum, although there is a NAWQC criterion (750 µg/L (acute) for a pH range of 6.5 to 9.0) in the form of acid soluble aluminum. It is not possible to compare the estimated aluminum concentration to this criterion directly, as the available monitoring data used for modeling are for either dissolved aluminum or total aluminum. Acid soluble aluminum (which is operationally defined as the aluminum that passes through a 0.45 µm membrane filter after the sample has been acidified to a pH between 1.5 and 2.0 with nitric acid) represents the forms of aluminum toxic to aquatic life or that can be converted readily to toxic forms under natural conditions. The acid soluble measurement does not measure forms of aluminum that are included in total aluminum measurement such as aluminum that is occluded in minerals, clays, and or is strongly adsorbed to particulate matter which are not toxic and are not likely to become toxic under natural conditions. Although the estimated mean total aluminum concentration (1,114 mg/L) is greater than the NAWQC benchmark criterion for acid soluble aluminum, the total aluminum concentration is predicted to decrease in the post-development condition and is within the range of observed concentrations in Santa Clara River Reach 5.

Table 4.4-35
Comparison of Estimated Trace Metal Concentrations for the VCC Planning Area with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Metal	Estimated Average Annual Concentration (µg/L)	CTR Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 5 (µg/L)
Dissolved Copper	7	32	3.3 - 22.6
Total Lead	5	260	0.6 - 40
Dissolved Zinc	57	250	3 - 37
Total Aluminum	1,114	N/A	131 - 19,650

Notes:
[1] Hardness = 250 mg/L, based on minimum observed value at USGS Station 11108500. Lead criteria is for total recoverable lead. There is no CTR criterion for aluminum.
[2] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).

Source: Geosyntec, 2008.

Estimated concentrations of dissolved copper and total lead are within the range of observed concentrations in Santa Clara River Reach 5; the estimated mean concentration for dissolved zinc is above the observed range. The water quality impacts from zinc would be significant under Significance Criteria 1 through 3. However, with the implementation of Mitigation Measures SP-4.2-7 and WQ-1, including comprehensive site design, source control BMPs, and treatment control BMPs, , potential impacts, after treatment *via* PDFs, from trace metals from the VCC planning area would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

As discussed above for the Specific Plan post-development stormwater impact assessment for pollutants addressed without modeling, concentrations of hydrocarbons and MBAS are expected to increase, while concentrations of pathogens, pesticides, trash and debris, and cyanide may increase under proposed conditions when compared to existing conditions, which could be a significant impact to water quality under Significance Criteria 1 through 3. However, none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements. Therefore, with implementation of the proposed PDFs required by Mitigation Measures SP-4.2-7 and WQ-1, potential impacts from the VCC planning area on hydrocarbons, pathogens, pesticides, and trash and debris receiving water quality would be reduced to less than significant under Significance Criteria 1 through 3.

Entrada Planning Area. The proposed SCP also would establish the Entrada Preserve Areas. This preserve would encompass approximately 27.0 acres located in the southeastern corner of the Entrada planning area. Although no development would occur upon implementation of the proposed SCP in the Entrada planning area, indirect impacts associated with Entrada development are reasonably foreseeable. Such development is reasonably foreseeable because the applicant is pursuing land use entitlements with Los Angeles County for the Entrada planning area. The planned land uses adjacent to the Entrada Preserve Area include proposed residential uses to the west and open space to the north and southwest. Areas immediately to the south of the Entrada Preserve Area would remain dedicated to the existing golf course and residential uses, and the planned western extension of Magic Mountain Parkway would be located north of the Entrada Preserve Area. Treatment control BMPs for runoff treatment included in the water quality impact analysis water quality model prepared for this analysis included extended detention basins, biofilters, media filters, and retention lake, which are the treatment control PDFs that would be included in the Entrada project.

Table 4.4-36 below shows the predicted changes in stormwater runoff volume and mean annual loads for the modeled pollutants of concern for the portion of Entrada planning area within the SCP boundary. **Table 4.4-37** below shows the predicted changes in concentration in stormwater runoff for the Entrada planning area.

Runoff volume and all pollutant loads with the exception of TSS and dissolved zinc are predicted to increase under proposed conditions for the Entrada planning area when compared to existing conditions. TSS and dissolved zinc loads are not predicted to change under proposed conditions. Concentrations of all pollutants with the exception of ammonia and chloride are predicted to decrease under proposed conditions when compared to existing conditions. Ammonia and chloride concentrations are predicted to increase. With the implementation of PDFs required by Mitigation Measure WQ-1, the impacts to water quality of the Entrada project would be reduced to a less-than-significant level.

Table 4.4-36
Estimated Average Annual Runoff Volume and Pollutant Loads for a Portion of the Entrada Planning Area

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/ PDFs
Volume	acre-ft	54	217	194	140
TSS	tons/yr	11	23	11	0
Total Phosphorus	lbs/yr	38	186	123	85
Nitrate-N + Nitrite-N	lbs/yr	144	554	326	182
Ammonia-N	lbs/yr	37	300	217	180
Total Nitrogen	lbs/yr	371	1,846	1,099	728
Dissolved Copper	lbs/yr	1.7	6.0	4.3	2.6
Total Lead	lbs/yr	0.8	4.1	2.7	1.9
Dissolved Zinc	lbs/yr	21	46	21	0
Total Aluminum	lbs/yr	131	449	261	130
Chloride	tons/yr	0.5	5.0	4.4	3.9

Source: Geosyntec, 2008.

Table 4.4-37
Estimated Average Annual Pollutant Concentrations for the Entrada Planning Area

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/PDFs
TSS	mg/L	143	77	42	-101
Total Phosphorus	mg/L	0.26	0.32	0.23	-0.03
Nitrate-N + Nitrite-N	mg/L	1.0	0.94	0.6	-0.4
Ammonia-N	mg/L	0.25	0.51	0.41	0.16
Total Nitrogen	mg/L	2.5	3.1	2.1	-0.4
Dissolved Copper	µg/L	12	10	8	-4
Total Lead	µg/L	5.6	6.9	5.2	-0.4
Dissolved Zinc	µg/L	141	77	39	-102
Total Aluminum	µg/L	884	759	494	-390
Chloride	mg/L	7	17	17	10

Source: Geosyntec, 2008.

The estimated average annual TSS, nutrient, and chloride concentrations in stormwater runoff from the total modeled Entrada planning area are compared to water quality criteria in **Table 4.4-38** below. Although loads of these pollutants are predicted to increase with development, the concentrations are predicted to be below all benchmark criteria. With the implementation of Mitigation Measure WQ-1, including comprehensive site design, source control BMPs, and treatment control BMPs, the predicted decrease in runoff concentration impacts from the Entrada project on TSS, nutrient, and chloride receiving water quality would be reduced to a less than significant level under Significance Criteria 1 through 3.

Table 4.4-38
Comparison of Estimated Nitrogen Compound Concentrations for the Entrada Planning Area with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5

Nutrient	Estimated Average Annual Concentration (mg/L)	Basin Plan Water Quality Objectives (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
TSS	42	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	NA	32 - 6,591
Total Phosphorus	0.2	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	0.18 - 13.4
Nitrate-N + Nitrite-N	0.6	5	6.8[2]	0.5 - 4.8
Ammonia-N	0.4	2.2[3]	1.75[4]	<0.005 - 1.1
Total Nitrogen	2	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	<0.04 - 46[5]
Chloride	17	100	100	3 - 121

Notes:
[1] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).
[2] 30-day average.
[3] Four-day average, ELS present, 90th percentile pH and temperature pairing observed at USGS Monitoring Station 11108500.
[4] 30-day average in Reach 5 below Valencia.
[5] Observed values for TKN (ammonia plus organic nitrogen).

Source: Geosyntec, 2008.

Comparison of the estimated runoff metal concentrations for the Entrada planning area and the acute CTR criteria for dissolved copper, total lead, dissolved zinc, and total aluminum are shown in **Table 4.4-39** below. The water quality impacts from zinc would be potentially significant under Significance Criteria 1 through 3. A comparison of the post-developed conditions, including proposed PDFs, to the benchmark CTR values shows that all of the trace metal concentrations are predicted to be below the benchmark water quality criteria.

There is no CTR criterion for aluminum, although there is a NAWQC criterion (750 µg/L (acute) for a pH range of 6.5 to 9.0) in the form of acid soluble aluminum. It is not possible to compare the estimated aluminum concentration to this criterion directly, as the available monitoring data used for modeling are for either dissolved aluminum or total aluminum. Acid soluble aluminum (which is operationally defined as the aluminum that passes through a 0.45 µm membrane filter after the sample has been acidified to a pH between 1.5 and 2.0 with nitric acid) represents the forms of aluminum toxic to aquatic life or that can be converted readily to toxic forms under natural conditions. The acid soluble measurement does not measure forms of aluminum that are included in total aluminum measurement such as aluminum that is occluded in minerals, clays, and or is strongly adsorbed to particulate matter which are not toxic and are not likely to become toxic under natural conditions. The estimated mean total aluminum concentration (494 mg/L) is less than the NAWQC benchmark criterion for acid soluble aluminum, is predicted to decrease in the post-development condition, and is within the range of observed concentrations in Santa Clara River Reach 5.

With the implementation of Mitigation Measure WQ-1, including the comprehensive site design, source control BMPs, and treatment control BMPs, the predicted decrease in runoff concentrations, and the comparison with Basin Plan benchmark objectives, potential impacts from the portion of the Entrada planning area on trace metals receiving water quality would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

Table 4.4-39
Comparison of Estimated Trace Metal Concentrations for the Entrada Planning Area with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Metal	Estimated Average Annual Concentration (µg/L)	California Toxics Rule Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 5 (µg/L)
Dissolved Copper	8	32	3.3 - 22.6
Total Lead	5	260	0.6 - 40
Dissolved Zinc	39	250	3 - 37
Total Aluminum	494	N/A	131 - 19,650

Notes:

[1] Hardness = 250 mg/L, based on minimum observed value at USGS Station 11108500. Lead criteria are for total recoverable lead. There is no CTR criterion for aluminum.

[2] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).

Source: Geosyntec, 2008.

As discussed above for the Specific Plan post-development stormwater impact assessment for pollutants addressed without modeling, concentrations of hydrocarbons and MBAS are expected to increase, while concentrations of pathogens, pesticides, trash and debris, and cyanide may increase under proposed conditions when compared to existing conditions, which could be a significant impact to water quality under Significance Criteria 1 through 3. However, none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements. Therefore, with implementation of Mitigation Measure WQ-1, impacts from the Entrada planning area on hydrocarbons, pathogens, pesticides, and trash and debris receiving water quality would be reduced to a less than significant level under Significance Criteria 1 through 3.

4.4.6.2.3 Secondary Impacts to Surface Water Quality

Impacts to surface water quality in the Santa Clara River Corridor outside the footprint of the Project area are evaluated as secondary impacts.

RMDP Secondary Impacts. As the potential short-term, construction-related direct and indirect water quality impacts of the RMDP would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary, the short-term secondary impacts to water quality in the Santa Clara River also would be reduced to a less-than-significant level.

Similarly, with the implementation of Mitigation Measures SP-4.2-7 and WQ-1, the comprehensive site design, source control BMPs and treatment control BMPs, and full compliance with regulatory requirements, long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan build-out on receiving water quality would be reduced to a less than significant level under Significance Criteria 1 through 3.

SCP Secondary Impacts. As the potential short-term, construction-related direct water quality impacts of the SCP and short-term indirect impacts of the SCP would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary, the short-term secondary impacts to water quality in the Santa Clara River also would be less than significant. . No further mitigation measures are required.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), and treatment control BMPs, as well as compliance with regulatory requirements would assure that potential long-term direct and indirect impacts from SCP maintenance activities and development of the VCC and Entrada projects on receiving water quality would not be significant under Significance Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River also would be reduced to a less than significant level with the implementation of proposed mitigation measures.

4.4.6.2.4 Direct Impacts to Groundwater

RMDP Direct Impacts.

Short-Term Impacts to Groundwater Quality. Pollutants that are of concern to groundwater during construction relate to construction materials and non-stormwater flows and include construction materials (*e.g.*, paint); chemicals, liquid products, and petroleum products used in facility construction or the maintenance of heavy equipment; and concrete-related pollutants. Prior to implementing the BMPs identified below, such impacts to groundwater are considered significant under Significance Criterion 4.

Construction impacts to groundwater due to Project development would be minimized through compliance with the construction general permit Order No. 99-08-DWQ). This permit requires the development and implementation of a SWPPP, which must include BMPs that control potential construction-related pollutants. A SWPPP would be developed in compliance with the required construction general permit, the County of Los Angeles' standard conditions, and consistent with Mitigation Measure SP-4.2-7. The construction general permit requires BMP selection, implementation, and maintenance during construction.

The following BMPs would be implemented to minimize groundwater quality impacts due to construction activities in a riverbed:

- Any equipment or vehicles driven and/or operated within or adjacent to the stream shall be checked and maintained daily, to prevent leaks of materials that could introduced to groundwater.

- Stationary equipment such as motors, pumps, generators, and welders, located within the riverbed construction zone shall be positioned over drip pans. Fuel storage tanks shall have secondary containment.

- The applicant would use its best efforts to ensure that no debris, bark, slash, sawdust, rubbish, cement, or concrete or washings thereof, oil, petroleum products, or other organic material from any construction, or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the state, including groundwater. When operations are completed, any excess materials or debris shall be removed from the work area.

- BMPs identified in a SWPPP must be implemented during equipment maintenance to prevent petroleum products or other pollutants from the equipment from contaminating soils and/or groundwater.

Construction of the in-stream elements within the RMDP would require dewatering. For example, excavation depths required for bank protection would be below the River bottom and frequently encounter groundwater that would need to be removed during the construction period. The dewatering activity would place shallow wells close to the excavation, drawing down the groundwater in the construction zone. Typically, soil composition within the dry streambed is such that the discharged dewatering flows would percolate quickly back into the ground from which they came. These dewatering flows do not pose a risk to groundwater quality, and, are considered a less-than-significant impact under

Significance Criterion 4. No further mitigation measures are required. Such discharges would be implemented in compliance with the Los Angeles RWQCB's general WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) governing construction-related dewatering discharges within the Project area or an individual WDR/NPDES permit specific to the Project dewatering activities and in conjunction with the requirements of Mitigation Measure SP-4.2-7. Typical BMPs for in-stream construction dewatering include infiltration of clean groundwater or on-site treatment using an engineered system designed to remove particulates, such as a weir tank, which allows sediment to settle out of suspension before the water is discharged. To minimize impacts to receiving waters from the dewatering discharge, discharged water would be allowed to "sheet-flow" from energy dissipaters soaking into the dry soils, or the discharge would be routed through a sprinkler field and sprayed over a large upland area adjacent to the river/streambed with the intent to percolate the entire discharge. Compliance with these WDRs constitutes a PDF, further assuring that the impacts of these discharges are less than significant.

Implementation of BMPs during the construction of the proposed RMDP infrastructure improvements consistent with the BAT/BCT requirements of the construction general permit and the general WDRs in the dewatering general permit or individual WDR would reduce or prevent transport of potential pollutants to groundwater during the RMDP construction phase. Implementation of existing regulatory requirements would be adequate to ensure that discharges during the Project construction phase would not cause or contribute to any exceedance of groundwater quality standards. Therefore, with the implementation of proposed PDFs, and Mitigation Measures SP-4.2-7 and WQ-1, including compliance with applicable permits and implementation of BMPs, the impacts of proposed RMDP infrastructure facilities would be reduced to a less-than-significant level and would not result in significant direct groundwater quality impacts under Significance Criterion 4.

Long-Term Impacts to Groundwater Quality. Following completion of construction activities, the temporary impact zone would be restored to channel grade and revegetated with native riparian and upland species as appropriate. As the RMDP infrastructure improvements would be constructed from inert materials that would not generate pollutants of concern, there would be no long-term direct impacts to groundwater from the RMDP components.

The proposed RMDP project component includes facility operation and maintenance activities associated with the various flood control improvements, stream bank protection, drainage facilities, and stormwater discharge outfalls. Impacts from these maintenance activities could be significant under Significance Criterion 4.

Any section 1605 agreement to be issued to the applicant for the long-term operation of RMDP infrastructure would contain standard measures similar to those described above to minimize groundwater quality impacts due to RMDP operation and maintenance activities. Full compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1, would ensure that impacts from maintenance activities are reduced to a less-than-significant level under Significance Criterion 4.

SCP Direct Impacts.

Short-Term Direct Impacts to Groundwater Quality. The proposed SCP is a conservation and permitting plan for an upland plant species, and would not authorize any construction activities that would

have the potential to result in groundwater quality impacts. Therefore, no short-term direct impacts would result from implementation of the SCP relative to Significance Criterion 4, and no mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. The proposed SCP is a management and monitoring program developed to ensure long-term persistence of spineflower within the Project area. The SCP outlines specific management practices with regard to agriculture practices, appropriate signs around the preserves, erosion control methods, landscaping, construction activities near the preserves, and other activities. The SCP includes specific monitoring measures and success criteria, as well as an adaptive management plan and funding requirements.

Maintenance would include controlling plant diseases and animal pests determined to be significant to the health and survival of the spineflower. As these maintenance activities may include the use of pesticides, they may impact groundwater quality per Significance Criterion 4 if not conducted properly.

The SCP indicates that weeding efforts shall consider the overall preserve goal, which is to promote the long-term survival of spineflower. Prior to applying herbicides, it shall be determined by the preserve manager that the proposed herbicide, when applied per the labeled directions, would not directly or indirectly affect spineflower plants, or dormant seed or associated pollinators or cause a significant or prolonged decline. Weed control measures within the spineflower preserves shall be preapproved by the preserve manager and CDFG in writing. Recommendations for herbicide use shall be prescribed by a PCA, and applied by a licensed or certified pesticide applicator, as required by law.

All weed control work shall be supervised by a qualified foreman capable of readily distinguishing weeds from native plants. Weed control work shall utilize IPM techniques that focus on avoiding and minimizing potential weed invasion problems, by minimizing soil disturbance and quickly controlling any new populations of invasive weed species before they spread and colonize. When weed control work is determined to be necessary, the least damaging, most selective method(s) available shall be used.

Pest control is not anticipated to be required in the preserve areas on a regular basis. However, it is possible that gophers, squirrels, rabbits, and other animals may need to be at least periodically controlled in preserve areas. In addition, if an herbivore is identified foraging on spineflower plants or plants installed during revegetation efforts and the damage is determined by the preserve manager or CDFG to be significant, it may need to be controlled. The control methods would be dependant on the species that needs control, however, pest control would utilize IPM techniques. Impetus would be placed on using controls such as exclusionary fencing, rodent traps, fake owls, scarecrows, reflective silver ties, *etc.* Plant shelters and gopher cages may be used on new plantings in restoration areas.

Insect control is not anticipated to be needed on a regular basis, but may be more likely once the surrounding areas are developed, especially along the urban fringes, and/or habitat restoration areas where establishing plants are more likely to become stressed and, therefore, predisposed to insect infestation. Although not expected, severe infestations of insects determined by the preserve manager or CDFG to be detrimental to the survival of a significant number of native plants or spineflower shall be controlled using the least toxic controls available, including sticky yellow insect strips, non-copper horticultural oils, and biological controls such as ladybugs, damsel bugs, green lacewings and/or minute pirate bugs. All

control methods would be prescribed in writing by the preserve manager and subject to the approval of CDFG at least two weeks in advance.

Based upon the above discussion, direct groundwater quality impacts of the SCP would be related to occasional use of pesticides, and long-term groundwater quality impacts from pesticide use. The groundwater quality impacts would be less than significant relative to Significance Criterion 4 based on the utilization of IPM techniques required by Mitigation Measure WQ-2..

4.4.6.2.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts.

Short-Term Indirect Impacts to Groundwater Quality. Pollutants that are of concern to groundwater during construction relate to construction materials and non-stormwater flows and include construction materials (*e.g.*, paint); chemicals, liquid products, and petroleum products used in facility construction or the maintenance of heavy equipment; and concrete-related pollutants. Prior to implementing the BMPs described below, such impacts to groundwater could be significant under Significance Criterion 4.
Construction impacts to groundwater due to Specific Plan build-out would be minimized through compliance with the construction general permit (Order No. 99-08-DWQ). This permit requires the development and implementation of a SWPPP, which must include BMPs that control potential construction-related pollutants. A SWPPP would be developed as required by, and in compliance with, the construction general permit and the County of Los Angeles' standard conditions. The construction general permit requires BMP selection, implementation, and maintenance during construction. The following BMPs that would be implemented during construction would protect groundwater:

Waste and Materials Management:

1. Management of the following types of materials, products, and wastes: solid, sanitary, concrete, hazardous and equipment-related.

Non-stormwater Management:

2. BMPs to reduce pollutants at their source before they are exposed to stormwater, including such measures as: water conservation practices, and vehicle and equipment cleaning and fueling practices.

Training and Education:

3. Training of individuals responsible for SWPPP preparation, implementation, and permit compliance, including contractors and subcontractors.
4. Signage (bilingual, if appropriate) to address SWPPP-related issues (such as site clean up policies, BMP protection, washout locations, *etc*.).

Maintenance, Monitoring and Inspections:

5. Performing routine site inspections and inspections before, during (for storm events > 24 hours), and after storm events.

6. Implementing maintenance and repairs of BMPs as indicated by routine and storm-event inspections.

7. Preparation and implementation of a sampling and analysis plan for non-visible pollutants.

In addition, mitigation *via* 1600 agreement conditions would apply as discussed above. Dewatering relating non-stormwater discharges would be implemented in compliance with the Los Angeles RWQCB's general WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas. Typical BMPs for in-stream construction dewatering include infiltration of clean groundwater or on-site treatment using an engineered system designed to remove particulates, such as a weir tank, which allows sediment to settle out of suspension before the water is discharged. To minimize impacts to receiving waters from the dewatering discharge, discharged water would be allowed to "sheet-flow" from energy dissipaters soaking into the dry soils, or the discharge would be routed through a sprinkler field and sprayed over a large upland area adjacent to the river/streambed with the intent to percolate the entire discharge. Compliance with these WDRs and Mitigation Measure SP-4.2-7 reduces the impacts of these discharges to a less-than-significant level.

Implementation of BMPs during the construction of the Specific Plan projects consistent with the BAT/BCT requirements of the construction general permit and the general WDRs in the dewatering general permit or individual WDR would reduce or prevent transport of potential pollutants to groundwater during the Specific Plan construction phase. Implementation of existing regulatory requirements would be adequate to ensure that discharges during the construction phase would not cause or contribute to any exceedance of groundwater quality standards. Therefore, compliance with applicable permits and agreements, including proposed PDF BMPs, and the implementation of Mitigation Measures SP-4.2-7 and WQ-1, would ensure that Specific Plan build-out would not result in significant short-term indirect groundwater quality impacts under Significance Criterion 4.

Long-Term Indirect Impacts to Groundwater Quality. The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan sets forth the urban runoff management program that would be implemented for the Specific Plan subregion (Geosyntec, 2008). Stormwater management, including planning for groundwater quality protection, is central to assuring the long-term viability of beneficial uses, including important habitat systems and species dependent upon those systems. The Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan assesses potential groundwater quality impacts associated with the approved Specific Plan development and proposes control measures to address those potential impacts.

Groundwater Pollutants of Concern. Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance in runoff, including dry weather flows. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria also are filtered out by soils. More mobile constituents such as chloride and nitrate would have a greater potential for infiltration. The pollutants of concern for this groundwater quality

analysis are those that are anticipated or potentially could be generated by Specific Plan build-out at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those included in the Specific Plan, as well as pollutants that have the potential to impair beneficial uses of the groundwaters below the Specific Plan subregion.

Nitrate+nitrite-N was chosen as the pollutant of concern for purposes of evaluating groundwater quality impacts based upon the above considerations (Geosyntec, 2008). High nitrate levels in drinking water can cause health problems in humans. Human activities and land use practices can influence nitrogen concentrations in groundwaters. For example, irrigation water containing fertilizers can increase levels of nitrogen in groundwater. This is a potentially significant indirect impact under Significance Criterion 4.

Other potential groundwater pollutants that are not pollutants of concern for the proposed Project include bacteria, chemical constituents and radioactivity, taste and odor, and mineral quality. The Basin Plan contains numeric criteria for bacteria in drinking water sources. As bacteria are removed through straining in soils (for example, as with septic tank discharges), incidental infiltration of runoff in the treatment PDFs is not expected to affect bacteria levels in groundwater. The WRP will include a disinfection process to reduce bacteria below levels of concern, and, therefore, bacteria in irrigation water are not expected to impact groundwater. Drinking water limits for inorganic and organic chemicals that can be toxic to human health in excessive amounts and radionuclides are contained in Title 22 of the California Code of Regulations. These chemicals and radionuclides are not expected to occur in the Specific Plan project's runoff. Title 22 specifies California's Wastewater Reclamation Criteria (WRC) and the Specific Plan WRP's recycled water must meet or exceed these criteria. These criteria apply to the treatment processes; treatment performance standards, such as removal efficiencies and effluent water quality; process monitoring programs, including type and frequency of monitoring; facility operation plans; and necessary reliability features. The Basin Plan contains a narrative objective for taste and odor that cause a nuisance or adversely affect beneficial uses. Undesirable tastes and odors in groundwater may be a nuisance and may indicate the presence of a pollutant(s). Odor associated with water can result from natural processes, such as the decomposition of organic matter or the reduction of inorganic compounds, such as sulfate. Other potential sources of odor causing substances, such as industrial processes, will not occur as part of the proposed Project. Therefore, taste and odor-producing substances are not pollutants of concern. Mineral quality in groundwaters is largely influenced by the mineral assemblage of soils and rocks that it comes into contact with. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan are not believed to be pollutants of concern due to the anticipated runoff concentrations and the expected mineral concentrations in WRP irrigation water, which are below the Basin Plan groundwater objectives. As required by the CWA, the Newhall Ranch WRP discharge permit (Mitigation Measure SP-5.0-55) includes effluent limitations that are protective of receiving water quality and designated beneficial uses. Effluent limits in the WDR were developed based on the most stringent of applicable technology-based and water quality-based standards, including Basin Plan surface and groundwater objectives, CTR criteria, and applicable TMDL waste load allocations. Therefore, these constituents are not considered pollutants of concern for the proposed Project and no mitigation measures are required.

Specific Plan Post-Development Groundwater Assessment. Discharge from Specific Plan build-out to groundwater would occur in three ways: (1) through general infiltration of irrigation water; (2) through

incidental infiltration of urban runoff in the proposed treatment control PDFs after treatment; and (3) infiltration of urban runoff, after treatment in the PDFs, in the Santa Clara River and tributaries, which is the primary recharge zone for groundwater in the Santa Clara Valley. Groundwater quality would be protected through implementation of the Specific Plan's site design, source control, and treatment control PDFs prior to discharge of runoff to groundwater.

Per the Los Angeles RWQCB clarification letter, generally, the common pollutants in stormwater are filtered or adsorbed by soil, and, unlike hydrophobic solvents and salts, do not cause groundwater contamination. In any case, infiltration of one to two inches of rainfall in semiarid areas like Southern California where there is a high rate of evapotranspiration presents minimal risks.

The Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L (which is more stringent than the objective for nitrate-nitrogen alone (10 mg/L) and for nitrite-nitrogen alone (1 mg/L)). The estimated nitrate-nitrogen plus nitrite-nitrogen concentration in runoff after treatment in the Project PDFs is 0.6 mg/L, which is well below the groundwater quality objective.

Wastewater generated by Specific Plan build-out would be treated in the Newhall Ranch WRP. Treatment at the Newhall Ranch WRP would consist of screening; activated sludge secondary treatment with membrane bioreactors; nitrification/denitrification; ultraviolet disinfection; and partial reverse osmosis. Discharges from the Newhall Ranch WRP treatment facility are permitted by a NPDES permit and WDRs issued by the Los Angeles RWQCB in October 2007. Treated effluent from the Newhall Ranch WRP would be used to supply distribution of recycled water throughout the Specific Plan area in the form of irrigation of landscaping and other approved uses. The Newhall Ranch WRP permit contains effluent limitations that would control the amount of conventional, nonconventional, and toxic pollutants discharged to the receiving waters. These effluent limits are a combination of technology-based limits (40 C.F.R. § 122.44(a)) and water quality-based limits (40 C.F.R. § 122.44(d)). The effluent limitation contained in the Newhall Ranch WRP Permit for nitrate-N plus nitrite-N is 5 mg/L and the limitation for nitrite-N is 0.9 mg/L (average monthly).

As the Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L and is 1 mg/L for nitrite-nitrogen, the Newhall Ranch WRP irrigation water supply that would serve the Project would be well below the groundwater quality objectives.

Therefore, after treatment *via* the PDFs described above, and implementation of Mitigation Measures SP-4.2-7 and WQ-1, build-out of the Specific Plan would not result in significant long-term indirect groundwater quality impacts under Significance Criterion 4. No further mitigation measures are required.

SCP Indirect Impacts. Implementation of the proposed SCP would indirectly facilitate previously approved urban developments within the Specific Plan area, and on portions of the VCC and Entrada planning areas. Groundwater quality impacts of the Specific Plan development are evaluated above.

Short-Term Indirect Impacts to Groundwater Quality. Pollutants that are of concern to groundwater during construction relate to construction materials and non-stormwater flows and include construction materials (*e.g.*, paint); chemicals, liquid products, and petroleum products used in facility construction or

the maintenance of heavy equipment; and concrete-related pollutants. Such impacts to groundwater quality are potentially significant under Significance Criterion 4.

Construction impacts to groundwater due to VCC and Entrada project development would be minimized through compliance with the construction general permit (Order No. 99-08-DWQ). This permit requires the development and implementation of a SWPPP, which must include BMPs that control potential construction-related pollutants. A SWPPP would be developed as required by, and in compliance with, the construction general permit and the County of Los Angeles' standard conditions. The construction general permit requires BMP selection, implementation, and maintenance during construction. The following BMPs that would be implemented during construction would protect groundwater:

Waste and Materials Management:

1. Management of the following types of materials, products, and wastes: solid, sanitary, concrete, hazardous and equipment-related wastes.

Non-stormwater Management:

2. BMPs to reduce pollutants at their source before they are exposed to stormwater, including such measures as: water conservation practices, vehicle and equipment cleaning and fueling practices.

Training and Education:

3. Training of individuals responsible for SWPPP preparation, implementation, and permit compliance, including contractors and subcontractors.
4. Signage (bilingual, if appropriate) to address SWPPP-related issues (such as site clean up policies, BMP protection, washout locations, *etc*.).

Maintenance, Monitoring and Inspections:

5. Performing routine site inspections and inspections before, during (for storm events > 24 hours), and after storm events.
6. Implementing maintenance and repairs of BMPs as indicated by routine and storm-event inspections.
7. Preparation and implementation of a sampling and analysis plan for non-visible pollutants.

Dewatering related non-stormwater discharges would be implemented in compliance with the Los Angeles RWQCB's general WDRs (under Order No. R4-2003-0111; NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas. Typical BMPs for in-stream construction dewatering include infiltration of clean groundwater or on-site treatment using an engineered system designed to remove particulates, such as a weir tank, which allows sediment to settle out of suspension before the water is discharged. To minimize impacts to receiving waters from the dewatering discharge, discharged water would be allowed to "sheet-flow" from energy dissipaters soaking into the dry soils, or the discharge would be routed through a sprinkler field and sprayed over a large upland area adjacent to the river/streambed with the intent to percolate the entire discharge.

Compliance with these WDRs constitutes a PDF, further assuring that the impacts of these discharges are less than significant.

Implementation of BMPs during the construction of the VCC and Entrada projects consistent with the BAT/BCT requirements of the construction general permit and the general WDRs in the dewatering general permit or individual WDR would reduce or prevent transport of potential pollutants to groundwater during the Specific Plan construction phase. Implementation of existing regulatory requirements would be adequate to ensure that discharges during the construction phase would not cause or contribute to any exceedance of groundwater quality standards. Therefore, after full compliance with applicable permits and agreements, the implementation of Mitigation Measure WQ-1 and the proposed PDF BMPs discussed above, the short-term indirect groundwater quality impacts under Significance Criterion 4 would be reduced to a less-than-significant level.

Long-Term Indirect Impacts to Groundwater Quality. Implementation of the proposed SCP would indirectly facilitate previously approved urban developments within the Specific Plan area, and on portions of the VCC and Entrada planning areas. Potential groundwater quality impacts of the Specific Plan development are evaluated above. Similar to the Specific Plan area, indirect impacts to groundwater are a potentially significant impact under Significance Criterion 4.

Discharge from the VCC and Entrada projects to groundwater would occur in three ways: (1) through general infiltration of irrigation water; (2) through incidental infiltration of urban runoff in the treatment control BMPs that would be required consistent with regulatory requirements, after treatment; and (3) infiltration of urban runoff, after treatment in the PDFs, in the Santa Clara River, which is the primary recharge zone for groundwater in the Santa Clara Valley. Groundwater quality would be fully protected through implementation of the VCC and Entrada projects' site design, source control, and treatment control PDFs prior to discharge of runoff to groundwater.

Per the Los Angeles RWQCB clarification letter, generally, the common pollutants in stormwater are filtered or adsorbed by soil, and, unlike hydrophobic solvents and salts, do not cause groundwater contamination. In any case, infiltration of one to two inches of rainfall in semiarid areas like Southern California where there is a high rate of evapotranspiration presents minimal risks.

The Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L (which is more stringent than the objective for nitrate-nitrogen alone (10 mg/L) and for nitrite-nitrogen alone (1 mg/L)). The estimated nitrate-nitrogen plus nitrite-nitrogen concentration in runoff after treatment in the project BMPs is 0.4 mg/L - 0.6 mg/L, which is well below the groundwater quality objective.

Irrigation water for the VCC and Entrada projects is anticipated to be recycled water. As required by the CWA, the discharge permit for the WRP that would supply the recycled water would include effluent limitations that are protective of surface receiving water quality and designated beneficial uses. As the surface water quality Basin Plan objective for nitrate-nitrogen plus nitrite-nitrogen is 5 mg/L and the WRP discharge permit would be conditioned to meet this criteria, the WRP irrigation water supply that would serve the VCC and Entrada projects would be well below the groundwater quality objective of 10 mg/L.

Therefore, after treatment *via* the PDFs described above and the implementation of Mitigation Measures WQ-1, build-out of VCC and a portion of the Entrada planning area would not result in significant long-term indirect groundwater quality impacts under Significance Criterion 4.

4.4.6.2.6 Secondary Impacts to Groundwater Quality

Impacts to groundwater quality outside the footprint of the Project area are evaluated as secondary impacts.

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect groundwater quality impacts of the RMDP would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality also would be less than significant.

Similarly, with the implementation of Mitigation Measure WQ-1, the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, and compliance with regulatory requirements, the long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan build-out on groundwater quality would be reduced to a less than significant level under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality also would be less than significant. No further mitigation measures are required.

SCP Secondary Impacts. There are no potential short-term, construction-related direct groundwater quality impacts of the SCP and short-term indirect impacts would not be significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa Clara River also would be less than significant.

Similarly, PDFs required by Mitigation Measure WQ-1, including the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance) and treatment control BMPs, and compliance with regulatory requirements, would ensure that potential long-term direct and indirect impacts from SCP maintenance activities and development of the VCC and Entrada projects on receiving water quality would be reduced to a less than significant level under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality in the downstream portions of the Santa Clara River also would be less than significant. No further mitigation measures are required.

4.4.6.2.7 Total Impacts - Alternative 2

Direct Impacts.

Short-Term Direct Impacts to Surface Water and Groundwater Quality. Installation of the RMDP infrastructure could directly impact water quality during construction. Without regulatory controls, these impacts could be significant under the requirements of Significance Criteria 1 through 4. The proposed SCP is a conservation and permitting plan for an upland plant species, and would not authorize any construction activities. Therefore, no short-term direct impacts would result from implementation of the SCP relative to Significance Criteria 1 through 4. Proposed PDFs, as required by Mitigation Measure WQ-1, including implementation of existing regulatory requirements, would be adequate to ensure that

discharges during the Project construction phase would not cause or contribute to any exceedance of surface water or groundwater quality standards in receiving waters. Therefore, after compliance with proposed mitigation, the construction general permit from the SWRCB and dewatering WDRs from the Los Angeles RWQCB, the development of proposed RMDP infrastructure would result in less-than-significant direct water quality impacts under Significance Criteria 1 through 4.

Long-Term Direct Impacts to Surface Water and Groundwater Quality. RMDP and SCP maintenance activities could result in significant impacts to surface water and groundwater quality under Significance Criteria 1 through 4. However, compliance with regulatory requirements and the utilization of proposed IPM techniques for SCP maintenance activities as required by Mitigation Measure WQ-2, would ensure that potential impacts from maintenance activities would be less than significant under Significance Criteria 1 through 4.

Indirect Impacts.

Short-Term Indirect Impacts to Surface Water and Groundwater Quality. The potential impacts of construction activities, construction materials, and non-stormwater runoff on water quality during the construction phase of the Specific Plan, VCC, and Entrada planning areas build-out could result in significant impacts to water quality under Significance Criteria 1 through 4. Implementation of existing regulatory requirements and the requirements of Mitigation Measure SP-4.2-7 would be adequate to ensure that discharges during the Project construction phase would not cause or contribute to any exceedance of surface water or groundwater quality standards in receiving waters. Therefore, after compliance with proposed mitigation, the construction general permit from the SWRCB and dewatering WDRs from the Los Angeles RWQCB, the build-out of the Specific Plan, VCC, and Entrada planning areas would result in less-than-significant direct water quality impacts under Significance Criteria 1 through 4.

Long-Term Indirect Impacts to Surface Water and Groundwater Quality. Alternative 2 would facilitate the development of a total of 22,610 residential dwelling units on the Specific Plan and Entrada sites, and approximately 9.4 million square feet (msf) of nonresidential uses on the Specific Plan, Entrada, and VCC sites.

Table 4.4-40 below shows the predicted changes in stormwater runoff volume and mean annual loads for the modeled pollutants of concern for the Specific Plan, VCC, and Entrada planning areas. **Table 4.4-41** below shows the predicted changes in concentration in stormwater runoff for the Specific Plan, VCC, and Entrada planning areas.

Runoff volume and all pollutant loads, with the exception of TSS and nitrate + nitrite-N, are predicted to increase under proposed conditions for the Specific Plan, VCC, and Entrada planning areas when compared to existing conditions. Concentrations of all pollutants, with the exception of dissolved copper, are predicted to decrease under proposed conditions when compared to existing conditions. Dissolved copper concentration is predicted to increase. ~~Thus~~However, with the proposed Project's PDFs, and implementation of Mitigation Measures WQ-1 to ensure their implementation, the impacts to water quality of the proposed Project would be reduced to a less-than-significant level.

Table 4.4-40
Estimated Average Annual Runoff Volume and Pollutant Loads for Specific Plan, VCC, and Entrada Planning Areas

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/ PDFs
Volume	acre-ft	1,408	4,315	3,742	2,334
TSS	tons/yr	600	603	366	-234
Total Phosphorus	lbs/yr	2,642	3,891	2,679	37
Nitrate-N + Nitrite-N	lbs/yr	13,127	9,966	7,468	-5,659
Ammonia-N	lbs/yr	1,873	5,580	4,587	2,714
Total Nitrogen	lbs/yr	22,550	36,502	23,820	1,270
Dissolved Copper	lbs/yr	30	111	84	54
Total Lead	lbs/yr	32	87	64	32
Dissolved Zinc	lbs/yr	307	753	399	92
Total Aluminum	lbs/yr	3,194	9,918	6,020	2,826
Chloride	tons/yr	31	87	74	43

Source: Geosyntec, 2008.

Table 4.4-41
Estimated Average Annual Pollutant Concentrations for the Specific Plan, VCC, and Entrada Planning Areas

Parameter	Units	Existing Conditions	Developed Conditions w/out PDFs	Developed Conditions w/ PDFs	Change w/PDFs
TSS	mg/L	313	103	72	-241
Total Phosphorus	mg/L	0.69	0.33	0.26	-0.43
Nitrate-N + Nitrite-N	mg/L	3.4	0.8	0.7	-2.7
Ammonia-N	mg/L	0.49	0.48	0.45	-0.04
Total Nitrogen	mg/L	5.9	3.1	2.3	-3.6
Dissolved Copper	µg/L	7.9	9.5	8.3	0.4
Total Lead	µg/L	8.3	7.4	6.3	-2.0
Dissolved Zinc	µg/L	80	64	39	-41
Total Aluminum	µg/L	834	845	591	-243
Chloride	mg/L	16	15	15	-1

Source: Geosyntec, 2008.

The estimated average annual TSS, nutrient, and chloride concentrations in stormwater runoff from the total Project area are compared to water quality criteria in **Table 4.4-42** below. Although loads of total phosphorus, ammonia, total nitrogen, and chloride are predicted to increase with build-out of the Specific Plan, VCC, and Entrada planning areas, the concentrations are predicted to be below all benchmark

criteria and within the range of observed concentrations in Santa Clara River Reach 5. With the implementation of Mitigation Measure WQ-1, the comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, the predicted decrease in runoff concentrations, and the comparison with Basin Plan benchmark objectives and existing water quality, potential impacts, after treatment *via* PDFs, from the total Project on TSS, nutrient, and chloride receiving water quality would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

Table 4.4-42
Comparison of Estimated Nitrogen Compound Concentrations for the Specific Plan, VCC, and Entrada Planning Areas with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5

Nutrient	Estimated Average Annual Concentration (mg/L)	Basin Plan Water Quality Objectives (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[1] Concentrations in Santa Clara River Reach 5 (mg/L)
TSS	72	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	NA	32 - 6,591
Total Phosphorus	0.26	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	0.18 - 13.4
Nitrate-N + Nitrite-N	0.7	5	6.8[2]	0.5 - 4.8
Ammonia-N	0.45	2.2[3]	1.75[4]	<0.005 - 1.1
Total Nitrogen	2.3	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	NA	<0.04 - 46[5]
Chloride	15	100	100	3 - 121

Notes:
[1] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).
[2] 30-day average.
[3] Four-day average, ELS present, 90th percentile pH and temperature pairing observed at USGS Monitoring Station 11108500.
[4] 30-day average in Reach 5 below Valencia.
[5] Observed values for TKN (ammonia plus organic nitrogen).
Source: Geosyntec, 2008.

Comparison of the estimated runoff metal concentrations and the acute CTR criteria for dissolved copper, total lead, and dissolved zinc are shown in **Table 4.4-43**, along with the range of observed concentrations

in Santa Clara River Reach 5. Although the trace metal loadings are predicted to increase and the estimated average concentration of dissolved zinc is above the observed range in Santa Clara River Reach 5, the comparison of the post-developed with PDFs condition to the benchmark CTR values shows that the dissolved copper, total lead, and dissolved zinc concentrations are below the benchmark CTR criteria. The estimated dissolved copper and total lead concentrations are within the range of observed concentrations in Santa Clara River Reach 5.

There is no CTR criterion for aluminum, although there is a NAWQC criterion (750 µg/L (acute) for a pH range of 6.5 to 9.0) in the form of acid soluble aluminum. It is not possible to compare the estimated aluminum concentration to this criterion directly, as the available monitoring data used for modeling are for either dissolved aluminum or total aluminum. Acid soluble aluminum (which is operationally defined as the aluminum that passes through a 0.45 µm membrane filter after the sample has been acidified to a pH between 1.5 and 2.0 with nitric acid) represents the forms of aluminum toxic to aquatic life or that can be converted readily to toxic forms under natural conditions. The acid soluble measurement does not measure forms of aluminum that are included in total aluminum measurement such as aluminum that is occluded in minerals, clays, and or is strongly adsorbed to particulate matter which are not toxic and are not likely to become toxic under natural conditions. The estimated mean total aluminum concentration (591 mg/L) is less than the NAWQC benchmark criterion for acid soluble aluminum, is predicted to decrease in the post-development condition, and is within the range of observed concentrations in Santa Clara River Reach 5.

Table 4.4-43
Comparison of Estimated Trace Metal Concentrations for the Specific Plan, VCC, and Entrada Planning Areas with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Metal	Estimated Average Annual Concentration (µg/L)	California Toxics Rule Criteria[1] (µg/L)	Range of Observed[2] Concentrations in Santa Clara River Reach 5 (µg/L)
Dissolved Copper	8.3	32	3.3 - 22.6
Total Lead	6.3	260	0.6 - 40
Dissolved Zinc	39	250	3 - 37
Total Aluminum	591	N/A	131 - 19,650

Notes:

[1] Hardness = 250 mg/L, based on minimum observed value at USGS Station 11108500. Lead criteria is for total recoverable lead.

[2] Range of concentrations observed in the Santa Clara River during wet weather (Stations S29, NR1, and NR3).

Source: Geosyntec, 2008.

Given the predicted increase in trace metals loads and dissolved copper concentration, impacts from metals from the total Project would be significant; however, with the implementation of proposed PDFs required by Mitigation Measure WQ-1, including the comprehensive site design, source control BMPs, and treatment BMPs and the comparison with the instream water quality monitoring data and benchmark

water quality criteria, build-out of the Specific Plan, VCC, and Entrada planning areas would not have significant water quality impacts resulting from trace metals under Significance Criteria 1 through 3..

For the qualitatively assessed pollutants of concern, concentrations of hydrocarbons and MBAS are expected to increase, while concentrations of pathogens, pesticides, trash and debris, and cyanide may increase under proposed conditions when compared to existing conditions, which could be a significant impact to water quality under Significance Criteria 1 through 3. However, none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of PDFs required by Mitigation Measure WQ-1, including a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements. Therefore, impacts, from build-out of the Specific Plan, VCC, and Entrada planning areas on hydrocarbons, pathogens, pesticides, trash and debris, MBAS, and cyanide receiving water quality would be reduced to a less-than-significant level under Significance Criteria 1 through 3.

The Basin Plan groundwater quality objective for nitrate-nitrogen plus nitrite-nitrogen is 10 mg/L (which is more stringent than the objective for nitrate-nitrogen alone (10 mg/L) and for nitrite-nitrogen alone (1 mg/L)). The estimated nitrate-nitrogen plus nitrite-nitrogen concentration in runoff after treatment from the total Project area is 0.7 mg/L, which is well below the groundwater quality objective.

Irrigation water for the Specific Plan, VCC, and Entrada projects is anticipated to be recycled water. As required by the CWA, the discharge permit for the WRP that would supply the recycled water would include effluent limitations that are protective of surface receiving water quality and designated beneficial uses. As the surface water quality Basin Plan objective for nitrate-nitrogen plus nitrite-nitrogen is 5 mg/L and the WRP discharge permit would be conditioned to meet these criteria, the WRP irrigation water supply that would serve the proposed Project would be well below the groundwater quality objective of 10 mg/L.

Therefore, through the implementation of the proposed PDFs described above and the requirements of Mitigation Measure WQ-1, the build-out of the Specific Plan, VCC, and Entrada projects would not result in significant long-term indirect groundwater quality impacts under Significance Criterion 4.

Secondary Impacts. As the potential short-term, construction-related direct and indirect water quality impacts of the RMDP and SCP would be reduced to a less-than-significant level under Significance Criteria 1 through 4 within the Project boundary, the short-term secondary impacts to water quality in the Santa Clara River also would be reduced to a less-than-significant level.

Similarly, the PDFs required by Mitigation Measure WQ-1, including comprehensive site design, source control BMPs, and treatment control BMPs, and compliance with regulatory requirements, would ensure that potential long-term direct and indirect impacts from RMDP and SCP maintenance activities and Specific Plan, VCC, and Entrada planning areas build-out on receiving water quality would not be significant under Significance Criteria 1 through 4. Therefore, the long-term secondary impacts to water quality in the Santa Clara River and groundwater also would be less than significant.

4.4.6.3 Impacts of Alternative 3 (Elimination of Planned Potrero Bridge and Additional Spineflower Preserves)

Alternative 3 would result in the elimination of some of the proposed RMDP infrastructure for the Specific Plan area, when compared to the proposed Project, and would increase the size of proposed spineflower preserves from approximately 167.6 to 221.8 acres. Subsequent development on the Specific Plan site, and VCC and Entrada planning areas would be reduced, as Alternative 3 would facilitate the development of a total of 21,558 residential dwelling units on the Specific Plan and Entrada sites, and approximately 9.33 msf of nonresidential uses on the Specific Plan, Entrada, and VCC sites, and the net acreage/pad for residential, non-residential, and public facilities uses would be reduced by 310 acres (approximately 8 percent). Additional information regarding this alternative is provided in **Section 3.0**, Description of Alternatives, of this EIS/EIR.

4.4.6.3.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts.

Short Term Direct Impacts to Surface Water Quality. Alternative 3 would result in a reduction in improvements when compared to Alternative 2. Based on the finding that the impacts of the RMDP construction on surface water quality would be less than significant for Alternative 2 with implementation of Mitigation Measures SP-4.2-7 and WQ-1 regulatory requirements and proposed PDF measures, the short-term direct impacts of Alternative 3 project construction on surface water quality also would be reduced to a less-than-significant level (as described for Alternative 2) under Significance Criteria 1 through 3.

Long-Term Direct Impacts to Surface Water Quality. As fewer infrastructure improvements are proposed in Alternative 3, as compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on surface water quality would be reduced to less than significant for Alternative 2 with implementation of Mitigation Measures SP-4.2-7 and WQ-1, PDF measures and BMPs, the long-term direct impacts of Alternative 3 project operation and maintenance on surface water quality also would be less than significant (as described for Alternative 2), under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 3 differs from Alternative 2 in that there would be an additional 54 acres of spineflower preserves. Implementation of the Alternative 3 SCP would not result in development and, therefore, there would be no short-term direct impacts to surface water quality under Significance Criteria 1 through 3, and no further mitigation measures are required.

Potential long-term water quality impacts of the SCP would be related to the occasional use of pesticides, which would likely increase slightly with the increased preserve area, but would be less than significant (as described for Alternative 2) relative to Significance Criteria 1 through 3 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.3.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts to Surface Water Quality. Implementation of the RMDP component of Alternative 3 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 3 would provide 452 fewer residential units and result in a 67,000 square foot reduction in nonresidential uses on the Specific Plan site when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Surface Water Quality. Alternative 3 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Specific Plan project construction on surface water quality would be less than significant for Alternative 2 after application of Mitigation Measures SP-4.2-7 and WQ-1, and proposed PDF measures, the short-term indirect impacts of Alternative 3 project construction on surface water quality also would be less than significant after implementation of required PDFs (as described for Alternative 2), under Significance Criteria 1 through 3 and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Specific Plan development area in Alternative 3 would decrease the predicted increase in runoff ammonia, trace metal, and chloride loads that would result from Alternative 2. As concentrations of all modeled constituents (except for dissolved zinc) are predicted to decrease under Alternative 2 when compared to existing conditions, concentrations are predicted to also decrease under Alternative 3. The modeled concentrations in runoff are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. Water quality impacts of Alternative 3 would be minimized and less than significant with implementation of a comprehensive site design, source control, and treatment control strategy and compliance with the MS4 permit and SUSMP requirements (Mitigation Measure SP-4.2-7).

Under Alternative 3, long-term, indirect impacts to surface water would be slightly reduced when compared to Alternative 2. Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under Alternative 3 conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit requirements and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from Alternative 3 would not be significant after implementation of Mitigation Measures SP-4.2-7 and WQ-1, under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of Alternative 3 would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the VCC and Entrada planning areas. Potential water quality impacts of the Specific Plan development are evaluated above. Alternative 3 would result in approximately 3.40 msf of nonresidential development in the VCC planning area, same as the development that would occur under Alternative 2. Alternative 3 would result in approximately 1,125 residential units and 0.45 msf of nonresidential units on a portion of the Entrada planning area. Alternative 3 would result in 600 fewer residential units and the same amount of nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Surface Water Quality. Based on the similar amount of development proposed for the VCC planning area and the reduction in development area proposed for the Entrada planning area in Alternative 3, when compared to Alternative 2, and the finding that the impacts of VCC and Entrada construction on surface water quality would be less than significant for Alternative 2, given applicable regulatory requirements and PDFs, the potential short-term indirect impacts of Alternative 3 on surface water quality also would be less than significant under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Entrada development under Alternative 3 would decrease the predicted increase in pollutant loads and ammonia and chloride concentrations when compared to Alternative 2. As concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 2 after the implementation of Mitigation Measures SP-4.2-7 and WQ-1 when compared to existing conditions, concentrations of all modeled constituents (except for ammonia and chloride) also are predicted to decrease under Alternative 3. The modeled concentrations in runoff from developed areas with PDFs are predicted to be below all benchmark water quality objectives and criteria (except total aluminum for the VCC planning area) and TMDL wasteload allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with MS4 permit and SUSMP requirements. Although the estimated mean total aluminum concentration is greater than the NAWQC benchmark criterion for acid soluble aluminum, the concentration is predicted to decrease in the post-development condition and is within the range of observed concentrations in Santa Clara River Reach 5.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements.

Therefore, long-term indirect impacts on surface water quality from build-out of the VCC and Entrada projects under Alternative 3 would not be significant, after implementation of Mitigation Measures SP-4.2-7 and WQ-1, required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

4.4.6.3.3 Secondary Impacts to Surface Water

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect water quality impacts of Alternative 3 would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP construction activities also would be reduced to a less-than-significant level.

Similarly, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, and compliance with regulatory requirements, would assure that long-term direct and indirect impacts from Alternative 3

maintenance activities and Specific Plan build-out on receiving water quality would not be significant under Significance Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP operation and maintenance and Specific Plan build-out also would be reduced to a less-than-significant level.

SCP Secondary Impacts. Under Alternative 3, short-term, construction-related direct water quality impacts of the SCP, and short-term indirect impacts would not be significant as described for Alternative 2, under Significance Criteria 1 through 3. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative.

Similarly, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), and treatment control BMPs, and compliance with regulatory would assure that long-term direct and indirect impacts from SCP maintenance activities and development of the Specific Plan, VCC and Entrada projects on receiving water quality would not be significant, after PDF implementation (as described for Alternative 2), under Significance Criteria 1 through 3 for Alternative 3. Therefore, the long-term secondary impacts to surface water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative, and no further mitigation measures are required.

4.4.6.3.4 Direct Impacts to Groundwater Quality

RMDP Direct Impacts.

Short Term Direct Impacts to Groundwater Quality. Alternative 3 would result in a reduction in improvements when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, the short-term direct impacts of Alternative 3 construction on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. Fewer RMDP infrastructure improvements are proposed in Alternative 3 when compared to Alternative 2. After regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, less operation and maintenance would be required. Based on the finding that the impacts of the RMDP operation and maintenance on groundwater quality would be less than significant for Alternative 2, after regulatory compliance and PDFs, the long-term direct impacts of Alternative 3 operation and maintenance on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 3 differs from Alternative 2 in that there would be an additional 54 acres of spineflower preserves. Implementation of Alternative 3 would not result in development and, therefore, there would be no short-term direct impacts to groundwater quality caused by the SCP under Significance Criterion 4. Long-term groundwater quality impacts of the SCP would be related to the

occasional use of pesticides, which may increase slightly with the increased preserve area, but would be less than significant relative to Significance Criterion 4 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.3.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 3 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 3 would provide 452 fewer residential units and result in a 67,000 square foot reduction in nonresidential uses when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Groundwater Quality. Alternative 3 would result in a reduction in development area p when compared to Alternative 2. Based on the finding that the impacts of Specific Plan project construction on groundwater quality would be less than significant for Alternative 2, after regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, the short-term indirect impacts of RMDP Alternative 3 project construction on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 3 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan projects on groundwater quality would be less than significant for Alternative 2, after applying proposed PDFs and Mitigation Measures SP-4.2-7 and WQ-1, the long-term indirect impacts of Alternative 3 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of Alternative 3 would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the VCC and Entrada planning areas. Potential groundwater quality impacts of Specific Plan build-out are evaluated above. Alternative 3 would result in approximately 600 fewer residential units and the same amount of nonresidential square footage when compared to Alternative 2.

Short-Term Indirect Impacts to Groundwater Quality. Alternative 3 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of VCC and Entrada construction on groundwater quality would be less than significant for Alternative 2, given regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1 and implementation of proposed PDFs, the short-term indirect impacts of Alternative 3 on groundwater quality also would be less than significant after implementation of required PDFs (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 3 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of the VCC and Entrada projects on groundwater quality would be less than significant for Alternative 2, after applying Mitigation Measures SP-4.2-7 and WQ-1, and proposed PDFs, the long-term indirect impacts of

Alternative 3 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

4.4.6.3.6 Secondary Impacts to Groundwater

RMDP Secondary Impacts. The short-term, construction-related direct and indirect water quality impacts of Alternative 3 would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area, due to the RMDP construction activities also would be less than significant.

Similarly, the comprehensive site design, source control BMPs, and treatment control BMPs, and compliance with Mitigation Measures SP-4.2-7 and WQ-1, would assure that long-term direct and indirect impacts from Alternative 3 maintenance activities and Specific Plan build-out on groundwater quality would not be significant under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality, due to the RMDP operation and maintenance and Specific Plan build-out, also would not be significant, and no further mitigation measures are required.

SCP Secondary Impacts. Short-term, construction-related direct groundwater quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under Significance Criterion 4 under Alternative 3. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area also would be less than significant for this alternative.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), treatment control BMPs, and compliance with Mitigation Measures SP-4.2-7 and WQ-1, would assure that long-term direct and indirect impacts from SCP maintenance activities and development of the Specific Plan, VCC and Entrada projects on groundwater quality would not be significant, after PDF implementation (as described in Alternative 2) under Significance Criterion 4 for Alternative 3. Therefore, the long-term secondary impacts to groundwater quality also would not be significant for this alternative, and no further mitigation measures are required.

4.4.6.3.7 Total Impacts - Alternative 3

Alternative 3 would result in a reduction in development area when compared to Alternative 2. Based on the findings that the potential short- and long-term direct, indirect, and secondary impacts of the total Project on surface water and groundwater quality would be less than significant for Alternative 2 with implementation of Mitigation Measures SP-4.2-7 and WQ-1, and proposed PDF measures, the short- and long-term direct, indirect, and secondary impacts of Alternative 3 on surface water and groundwater quality also would be less than significant under Significance Criteria 1 through 4, and no further mitigation measures are required.

4.4.6.4 Impacts of Alternative 4 (Elimination of Planned Potrero Bridge and Addition of VCC Spineflower Preserve)

Alternative 4 would result in the elimination of additional RMDP infrastructure, when compared to the proposed Project, and would increase the size of proposed spineflower preserves from 167.6 to 259.9

acres. Under this alternative, no development would be facilitated on the VCC planning area, and subsequent development on the Specific Plan site would be reduced. In total, Alternative 4 would facilitate the development of 21,846 residential dwelling units on the Specific Plan site and Entrada planning area, and approximately 5.93 msf of nonresidential uses on the Specific Plan site and on a portion of the Entrada planning area, and the net acreage/pad for residential, non-residential, and public facilities uses would be reduced by 475.4 acres (approximately 12 percent). Additional information regarding this alternative is provided in **Section 3.0**, Description of Alternatives, of this EIS/EIR.

4.4.6.4.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts.

Short Term Direct Impacts to Surface Water Quality. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on surface water quality would be less than significant for Alternative 2 given the implementation of Mitigation Measures SP-4.2-7 and WQ-1 and the proposed PDF measures, the short-term direct impacts of Alternative 4 project construction on surface water quality also would be less than significant (as described for Alternative 2), under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Direct Impacts to Surface Water Quality. As fewer infrastructure improvements are proposed in Alternative 4, when compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on surface water quality would be less than significant for Alternative 2 with implementation of the proposed PDF measures and BMPs and Mitigation Measures SP-4.2-7 and WQ-1, the long-term direct impacts of Alternative 4 project operation and maintenance on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 4 differs from Alternative 2 in that there would be an additional 91 acres of spineflower preserves. Implementation of Alternative 4 would not result in development and, therefore, there would be no short-term direct impacts to surface water quality under Significance Criteria 1 through 3, and no further mitigation measures are required.

Potential long-term water quality impacts of the SCP would be related to the occasional use of pesticides, which would likely increase slightly with the increased preserve area, but would be less than significant as described in Alternative 2 relative to Significance Criteria 1 through 3 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.4.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts to Surface Water Quality. Implementation of the RMDP component of Alternative 4 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 4 would provide 164 fewer residential units and result in a 67,000 square foot reduction in nonresidential uses on the Specific Plan site when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Surface Water Quality. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Specific Plan project construction on surface water quality would be less than significant for Alternative 2 after the application of Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF, measures, the short-term indirect impacts of Alternative 4 project construction on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Specific Plan development area in Alternative 4 would decrease the predicted increase in runoff ammonia, trace metal, and chloride loads that would result from Alternative 2. As concentrations of all modeled constituents (except for dissolved zinc) are predicted to decrease under Alternative 2, when compared to existing conditions, concentrations are predicted to also decrease under Alternative 4. The modeled concentrations in runoff are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. Water quality impacts of Alternative 4 would be minimized and less than significant with implementation of a comprehensive site design, source control, and treatment control strategy and compliance with the MS4 permit and SUSMP requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under Alternative 4 conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit requirements, SUSMP requirements and the implementation of Mitigation Measures SP-4.2-7 and WQ-1. Therefore, long-term indirect impacts on surface water quality from Alternative 4 would not be significant, after implementation of required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Indirect Impacts. Under Alternative 4, the SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential water quality impacts of the Specific Plan development are evaluated above. Under Alternative 4, no development would be facilitated on the VCC planning area, and approximately 1,125 residential units and 0.45 msf of nonresidential units on a portion of the Entrada planning area would be facilitated. Alternative 4 would result in 600 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Surface Water Quality. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Entrada construction on surface water quality would be less than significant for Alternative 2, given the implementation of Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDFs, the potential short-term indirect impacts of Alternative 4 on surface water quality also would be less than significant, after implementation of required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. Under this alternative, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Alternative 4 would have no significant indirect impacts regarding Significance Criteria 1 through 3, and no further mitigation measures are required.

The decrease in Entrada development in Alternative 4 would decrease the predicted increase in pollutant loads and ammonia and chloride concentrations when compared to Alternative 2. As concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under proposed Alternative 2, when compared to existing conditions after the application of PDFs, concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 4. The modeled concentrations in runoff from developed areas with PDFs are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with MS4 Permit and SUSMP requirements.

For the Entrada planning area, concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a Mitigation Measure WQ-1, comprehensive site design, source control BMPs, and treatment control BMPs in compliance with the MS4 permit and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from the Entrada project build-out under Alternative 4 would not be significant after implementation of required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

4.4.6.4.3 Secondary Impacts to Surface Water

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect water quality impacts of Alternative 4 would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP construction activities also would be reduced to a less-than-significant level.

Similarly, the comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from Alternative 4 on receiving water quality would not be significant under Significance Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to RMDP operation and maintenance and Specific Plan build-out also would be reduced to a less-than-significant level.

SCP Secondary Impacts. Under Alternative 4, short-term, construction-related direct water quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2),under Significance Criteria 1 through 3. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative.

Similarly, the comprehensive site design, source control (including the IPM strategy for SCP maintenance), and treatment control strategy, compliance with regulatory requirements, and the requirements of Mitigation Measures SP-4.2-7 and WQ-1 would assure that long-term direct from SCP maintenance activities and development of the Specific Plan and Entrada projects on receiving water quality would not be significant after PDF implementation (as described for Alternative 2), under Significance Criteria 1 through 3 for Alternative 4. Therefore, the long-term secondary impacts to surface water quality in the Santa Clara River beyond the boundaries of the Project area from these activities and development also would be less than significant, and no further mitigation measures are required.

Under Alternative 4, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities. The existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criteria 1 if indirect impacts occur and these impacts are carried off-site in the Santa Clara River.

4.4.6.4.4 Direct Impacts to Groundwater Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Groundwater Quality. Based on the reduction in improvements proposed in Alternative 4, as compared to Alternative 2, and the finding that the impacts of RMDP construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance and the implementation of Mitigation Measures SP-4.2-7 and WQ-1 and PDFs, the short-term direct impacts of Alternative 4 on groundwater quality also would be less than significant (as described for Alternative 2), under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. Fewer RMDP infrastructure improvements are proposed in Alternative 4, as compared to Alternative 2. After regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on groundwater quality would be less than significant for Alternative 2, the long-term direct impacts of Alternative 4 on groundwater quality also would be less than significant (as described for Alternative 2), under Significance Criterion 4, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 4 differs from Alternative 2 in that there would be an additional 92 acres of spineflower preserves. Implementation of Alternative 4 would not result in development, and, therefore, there would be no short-term direct impacts to groundwater quality caused by the SCP under Significance Criterion 4, and no further mitigation measures are required.

Long-term groundwater quality impacts of the SCP would be related to the occasional use of pesticides, which may increase slightly with the increased preserve area, but would be less than significant relative to Significance Criterion based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.4.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 4 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 4 would provide 164 fewer residential units and result in a 67,000 square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Groundwater Quality. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan project construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, the implementation of Mitigation Measures SP-4.2-7 and WQ-1 and implementation of the proposed PDFs, the short-term indirect impacts of Alternative 4 on groundwater quality also would be less than significant (as described for Alternative 2), under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan projects on groundwater quality would be less than significant for Alternative 2 after applying regulatory compliance, implementing Mitigation Measures SP-4.2-7 and WQ-1, and proposed PDFs, the long-term indirect impacts of Alternative 4 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of the Alternative 4 SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning areas. Potential groundwater quality impacts of the Specific Plan development are evaluated above. Alternative 4 would not facilitate development on the VCC planning area and would result in approximately 600 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Groundwater Quality. Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of VCC and Entrada construction on groundwater quality would be less than significant for Alternative 2 given regulatory compliance, the requirements of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, the short-term indirect impacts of Alternative 4 on groundwater quality also would be less than significant after implementation of proposed PDFs (as described for Alternative 2) under Significance Criterion 4.

Long-Term Indirect Impacts to Groundwater. Under Alternative 4, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consist of open space and agriculture. No new additional mitigation would be required for the

ongoing agricultural activities, although the existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4.

Based on the reduction in development area of Entrada proposed in Alternative 4 compared to Alternative 2, and the finding that the impacts of the Entrada project on groundwater quality would be less than significant for Alternative 2, after regulatory compliance, implementing Mitigation Measures SP-4.2-7 and WQ-1 and proposed PDFs, the long-term indirect impacts of Alternative 4 on groundwater quality also would be less than significant (as described for Alternative 2), under Significance Criterion 4, and no further mitigation measures are required.

4.4.6.4.6 Secondary Impacts to Groundwater

RMDP Secondary Impacts. The short-term, construction-related direct and indirect water quality impacts of RMDP Alternative 4 would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area due to the RMDP construction activities also would be less than significant.

Similarly, the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, and full compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan build-out on groundwater quality would not be significant under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality due to the RMDP operation and maintenance and Specific Plan build-out also would not be significant, and no further mitigation measures are required.

SCP Secondary Impacts. Short-term, construction-related direct groundwater quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under Significance Criterion 4 under Alternative 4. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area also would be less than significant for this alternative.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), treatment control BMPs, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would assure that long-term direct and indirect impacts from SCP maintenance activities and development on the Specific Plan site and Entrada planning areas on groundwater quality would not be significant, after PDF implementation (as described for Alternative 2), under Significance Criterion 4 for Alternative 4, and no further mitigation measures are required.

Under Alternative 4, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if indirect groundwater impacts occurred and impacted groundwater traveled off-site.

4.4.6.4.7 Total Impacts - Alternative 4

Alternative 4 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential short- and long-term direct, indirect, and secondary impacts of the total Project on surface water and groundwater quality would be less than significant for Alternative 2 with the implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF, the short- and long-term direct, indirect, and secondary impacts of Alternative 4 on surface water and groundwater quality also would be less than significant under the requirements of Significance Criteria 1 through 4, and no further mitigation measures are required.

4.4.6.5 Impacts of Alternative 5 (Widen Tributary Drainages and Addition of VCC Spineflower Preserve)

Alternative 5 would result in the elimination of additional RMDP infrastructure, and would increase the size of proposed spineflower preserves from 167.6 to 338.6 acres. Under this alternative, no additional development would be facilitated on the VCC planning area, and subsequent development on the Specific Plan and Entrada sites would be reduced. In total, Alternative 5 would facilitate the development of 21,155 residential dwelling units on the Specific Plan site and Entrada planning area, and approximately 5.87 msf of nonresidential uses on the Specific Plan site and on a portion of the Entrada planning area, and the net acreage/pad for residential, non-residential, and public facilities uses would be reduced by 568.5 acres (approximately 15 percent). Additional information regarding this alternative is provided in **Section 3.0**, Description of Alternatives, in this EIS/EIR.

4.4.6.5.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Surface Water Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on surface water quality would be less than significant for Alternative 2, , the potential short-term direct impacts of Alternative 5 project construction on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3.

Long-Term Direct Impacts to Surface Water Quality. As fewer infrastructure improvements are proposed in Alternative 5, when compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on surface water quality would be less than significant for Alternative 2 with the implementation of regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1, the long-term direct impacts of Alternative 5 on project operation and maintenance on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 5 differs from Alternative 2 in that there would be an additional 171 acres of spineflower preserves. Implementation of the Alternative 5 SCP would not result in development

and, therefore, there would be no short-term direct impacts to surface water quality under Significance Criteria 1 through 3, and no further mitigation measures are required.

Potential long-term water quality impacts of the SCP would be related to the occasional use of pesticides, which would likely increase slightly with the increased preserve area, but would be less than significant (as described in Alternative 2) relative to Significance Criteria 1 through 3 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.5.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 5 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 5 would provide 689 fewer residential units and result in a 135,000 square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Surface Water Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. After application of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1,and implementation of proposed PDF measures, the impacts of Specific Plan construction on surface water quality would be less than significant for Alternative 2. Therefore, the short-term indirect impacts of Alternative 5 on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Specific Plan development area in Alternative 5 would decrease the predicted increase in runoff ammonia, trace metal, and chloride loads that would result from Alternative 2. As concentrations of all modeled constituents (except for dissolved zinc) are predicted to decrease under Alternative 2, when compared to existing conditions, concentrations are predicted to also decrease under Alternative 5. The modeled concentrations in runoff are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. Water quality impacts of Alternative 5 would be minimized and less than significant with implementation of Mitigation Measures SP-4.2-7 and WQ-1, a comprehensive site design, source control, treatment control strategy, and compliance with the MS4 permit and SUSMP requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under Alternative 5 conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to implementation of Mitigation Measures SP-4.2-7 and WQ-1, a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit requirements and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from the Specific Plan projects in Alternative 5 would not be significant under Significance Criteria 1 through 3 after implementation of required PDFs (as described for Alternative 2).

SCP Indirect Impacts. Under Alternative 5, the SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential water quality impacts of the Specific Plan development are evaluated above. Under Alternative 5, no

development would be facilitated on the VCC planning area, and approximately 959 residential units and 0.45 msf of nonresidential units on a portion of the Entrada planning area would be facilitated. Alternative 5 would result in 766 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Surface Water Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Entrada construction on surface water quality would be less than significant for Alternative 2, given applicable regulatory requirements, the requirements of Mitigation Measures SP-4.2-7 and WQ-1,and implementation of the proposed PDFs, the potential short-term indirect impacts of Alternative 5 project construction on surface water quality also would be less than significant, after implementation of required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. Under this alternative, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Alternative 5 would have no significant indirect impacts regarding Significance Criteria 1 through 3, and no further mitigation measures are required.

The decrease in Entrada development area in Alternative 5 would decrease the predicted increase in pollutant loads and ammonia and chloride concentrations, when compared to Alternative 2. As concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 2, when compared to existing conditions after the application of PDFs, concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 5. The modeled concentrations in runoff from developed areas with PDFs are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with MS4 permit and SUSMP requirements.

For the Entrada planning area, concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of Mitigation Measure WQ-1, a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from the Entrada planning area in Alternative 5 would not be significant under Significance Criteria 1 through 3 after implementation of required PDFs (as described for Alternative 2), and no further mitigation measures are required.

4.4.6.5.3 Secondary Impacts to Surface Water

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect water quality impacts of Alternative 5 would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP construction activities also would be reduced to a less-than-significant level.

Similarly, the comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would assure that long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan projects on receiving water quality would not be significant under Significance Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP operation and maintenance and Specific Plan build-out also would be reduced to a less-than-significant level, and no further mitigation measures are required.

SCP Secondary Impacts. Under Alternative 5, short-term, construction-related direct water quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under Significance Criteria 1 through 3. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative.

Similarly, the comprehensive site design, source control (including the IPM strategy for SCP maintenance), and treatment control strategy, and compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct impacts from SCP maintenance activities and development of the Specific Plan and Entrada projects on receiving water quality would not be significant after PDF implementation (as described in Alternative 2) under Significance Criteria 1 through 3 for Alternative 5. Therefore, the long-term secondary impacts to surface water quality in the Santa Clara River beyond the boundaries of the Project area from these activities and development also would be less than significant, and no further mitigation measures are required.

Under Alternative 5, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criterion 1 if indirect impacts occur and these impacts are carried off-site in the Santa Clara River.

4.4.6.5.4 Direct Impacts to Groundwater Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Groundwater Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on groundwater quality would be less than significant for Alternative 2 after regulatory

compliance, implementing Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term direct impacts of Alternative 5 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. Fewer RMDP infrastructure improvements are proposed in Alternative 5 when compared to Alternative 2. , After regulatory compliance, implementing Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on groundwater quality would be less than significant for Alternative 2, the long-term direct impacts of Alternative 5 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 5 differs from Alternative 2 in that there would be an additional 171 acres of spineflower preserves. Implementation of the Alternative 5 SCP would not result in development and, therefore, there would be no short-term direct impacts to groundwater quality caused by the SCP under Significance Criterion 4.

Long-term groundwater quality impacts of the SCP would be related to the occasional use of pesticides, which may increase slightly with the increased preserve area, but would be less than significant relative to Significance Criterion 4 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.5.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 5 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 5 would provide 689 fewer residential units and result in a 135,000 square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Groundwater Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan project construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, the requirements of Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term indirect impacts of Alternative 5 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan projects on groundwater quality would be less than significant for Alternative 2 after applying Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDFs, the long-term indirect impacts of Alternative 5 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of the Alternative 5 SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential groundwater quality impacts of the Specific Plan development are evaluated above. Alternative 5 would not facilitate development on the VCC planning area and would result in approximately 766 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Groundwater Quality. Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of VCC and Entrada construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, the implementation of Mitigation Measure WQ-1, and implementation of the proposed PDFs, the short-term indirect impacts of Alternative 5 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Under Alternative 5, development within the VCC would not be facilitated. There would be no change to the existing land uses within this area, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4.

Based on the reduction in development area of Entrada proposed in Alternative 5 compared to Alternative 2, and the finding that the impacts of the Entrada project on groundwater quality would be less than significant for Alternative 2 after applying PDFs, the long-term indirect impacts of Alternative 5 on groundwater quality also would be less than significant under Significance Criterion 4 after implementation of required PDFs (as described for Alternative 2).

4.4.6.5.6 Secondary Impacts to Groundwater

RMDP Secondary Impacts. The short-term, construction-related direct and indirect water quality impacts of Alternative 5 would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area due to the RMDP construction activities also would be less than significant.

Similarly, the comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and full compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from Alternative 5 maintenance activities and Specific Plan build-out on groundwater quality would not be significant under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality due to the RMDP operation and maintenance and Specific Plan build-out also would not be significant, and no further mitigation measures are required.

SCP Secondary Impacts. Short-term, construction-related direct groundwater quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under

Significance Criterion 4 under Alternative 5. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area also would be less than significant for this alternative.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), and treatment control strategy BMPs, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from SCP maintenance activities and development of the Specific Plan and Entrada projects on groundwater quality would not be significant under Significance Criterion 4 after PDF implementation (as described for Alternative 2).

Under Alternative 5, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if indirect groundwater impacts occurred and impacted groundwater traveled off-site. Alternative 5 would have no significant secondary impacts regarding Significance Criterion 4, and no further mitigation measures are required.

4.4.6.5.7 Total Impacts - Alternative 5

Alternative 5 would result in a reduction in development area when compared to Alternative 2. Based on the reduction in improvements proposed in Alternative 5 and the finding that the short- and long-term direct, indirect, and secondary impacts of the total Project on surface water and groundwater quality would be less than significant for Alternative 2 with implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDF measures, the short- and long-term direct, indirect, and secondary impacts of Alternative 5 on surface water and groundwater quality also would be less than significant under Significance Criteria 1 through 4, and no further mitigation measures are required.

4.4.6.6 Impacts of Alternative 6 (Elimination of Planned Commerce Center Drive Bridge and Maximum Spineflower Expansion/Connectivity)

Alternative 6 would result in additional reductions in the RMDP infrastructure, and would increase the size of proposed spineflower preserves from 167.6 to 891.2 acres. Under this alternative, no additional development would be facilitated on the VCC planning area, and subsequent development on the Specific Plan site would be reduced. In total, Alternative 6 would facilitate the development of 20,212 residential dwelling units on the Specific Plan site and Entrada planning area, and approximately 5.78 msf of nonresidential uses on the Specific Plan site and on a portion of the Entrada planning area, and the net acreage/pad for residential, non-residential, and public facilities uses would be reduced by 813 acres (approximately 21 percent). Additional information regarding this alternative is provided in **Section 3.0**, Description of Alternatives, of this EIS/EIR.

4.4.6.6.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Surface Water Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on surface water quality would be less than significant for Alternative 2 given regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDF measures, the short-term direct impacts of Alternative 6 project construction on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3.

Long-Term Direct Impacts to Surface Water Quality. As fewer infrastructure improvements are proposed in Alternative 6, when compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on surface water quality would be less than significant for Alternative 2 given implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures and BMPs, the long-term direct impacts of Alternative 6 on project operation and maintenance on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 6 differs from Alternative 2 in that there would be an additional 724 acres of spineflower preserves. Implementation of the Alternative 6 SCP would not result in development and, therefore, there would be no short-term direct impacts to surface water quality under Significance Criteria 1 through 3.

Potential long-term water quality impacts of the SCP would be related to the occasional use of pesticides, which would likely increase slightly with the increased preserve area, but would be less than significant (as described for Alternative 2), relative to Significance Criteria 1 through 3 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.6.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 6 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 6 would provide 1,098 fewer residential units and result in a 216,000 square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Surface Water Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan build-out on surface water quality would be less than significant for Alternative 2 after application of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures, the short-term indirect impacts of Alternative 6 on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Specific Plan development area in Alternative 6 would decrease the predicted increase in runoff ammonia, trace metal, and chloride loads that would result from Alternative 2. As concentrations of all modeled constituents (except for dissolved zinc) are predicted to decrease under Alternative 2, when compared to existing conditions, concentrations are predicted to also decrease under Alternative 6. The modeled concentrations in runoff are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. Water quality impacts of Alternative 6 would be minimized and less than significant with implementation of a comprehensive site design, source control, and treatment control strategy and compliance with the MS4 permit and SUSMP requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under Alternative 6 conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit requirements and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from the Specific Plan build-out under Alternative 6 would not be significant under Significance Criteria 1 through 3 after implementation of required PDFs (as described for Alternative 2)..

SCP Indirect Impacts. Under Alternative 6, the SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential water quality impacts of the Specific Plan development are evaluated above. Under Alternative 6, no development would be facilitated on the VCC planning area, and approximately 425 residential units and 0.45 msf of nonresidential units on a portion of the Entrada planning area would be facilitated. Alternative 6 would result in 1,300 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Surface Water Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Entrada construction on surface water quality would be less than significant for Alternative 2, given implementation of applicable regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDFs, the potential short-term indirect impacts of Alternative 6 on surface water quality also would be less than significant under Significance Criteria 1 through 3 after implementation of required PDFs (as described for Alternative 2), and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. Under this alternative, development within the VCC would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Altemative 6 would have no significant indirect impacts regarding Significance Criteria 1 through 3, and no further mitigation measures are required.

The decrease in Entrada development area under Alternative 6 would decrease the predicted increase in pollutant loads and ammonia and chloride concentrations, when compared to Alternative 2. As concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 2, when compared to existing conditions after the application of PDFs, concentrations of all modeled constituents (except for ammonia and chloride) are also predicted to decrease under Alternative 6. The modeled concentrations in runoff from developed areas with PDFs are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with MS4 permit and SUSMP requirements.

For the Entrada planning area, concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements, and Mitigation Measures SP-4.2-7 and WQ-1). Therefore, long-term indirect impacts on surface water quality from the Entrada project build-out under Alternative 6 would not be significant, after implementation of required PDFs (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

4.4.6.6.3 Secondary Impacts to Surface Water

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect water quality impacts of Alternative 6 would be reduced to a less-than-significant level under Significance Criteria 1 through 3 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP construction activities also would be reduced to a less-than-significant level.

Similarly, the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from Alternative 6 maintenance activities and Specific Plan build-out on receiving water quality would not be significant under Significance Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to the RMDP operation and maintenance and Specific Plan build-out also would be reduced to a less-than-significant level, and no further mitigation measures are required.

SCP Secondary Impacts. Under Alternative 6, short-term, construction-related direct water quality impacts of the SCP, and short-term indirect impacts would not be significant under Significance Criteria 1 through 3. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative.

Similarly, the comprehensive site design, source control (including the IPM strategy for SCP maintenance), and treatment control strategy, compliance with regulatory requirements, and Mitigation

Measures SP-4.2-7 and WQ-1, would assure that long-term direct from SCP maintenance activities and development of the Specific Plan and Entrada projects on receiving water quality would not be significant, after PDF implementation (as described in Alternative 2), under Significance Criteria 1 through 3 for Alternative 6. Therefore, the long-term secondary impacts to surface water quality in the Santa Clara River beyond the boundaries of the Project area from these activities and development also would be less than significant, and no further mitigation measures are required.

Under Alternative 6, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criterion 1 if indirect impacts occur and these impacts are carried off-site in the Santa Clara River.

4.4.6.6.4 Direct Impacts to Groundwater Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Groundwater Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1 and implementation of the proposed PDFs, the short-term direct impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. As fewer RMDP infrastructure improvements are proposed in Alternative 6, as compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of the RMDP operation and maintenance on groundwater quality would be less than significant for Alternative 2, the long-term direct impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 6 differs from Alternative 2 in that there would be an additional 724 acres of spineflower preserves. Implementation of the Alternative 6 SCP would not result in development and, therefore, there would be no short-term direct impacts to groundwater quality caused by the SCP under Significance Criterion 4, and no further mitigation measures are required.

Long-term groundwater quality impacts of the SCP would be related to the occasional use of pesticides, which may increase slightly with the increased preserve area, but would be less than significant relative to Significance Criterion 4 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.6.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 6 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 6 would provide 1098 fewer residential units and result in a 216,000 square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Groundwater Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan project construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term indirect impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan build-out on groundwater quality would be less than significant for Alternative 2 after applying regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDFs, the long-term indirect impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of the Alternative 6 SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential groundwater quality impacts of the Specific Plan development are evaluated above. Alternative 6 would not facilitate development on the VCC planning area and would result in approximately 1,300 fewer residential units and 3.4 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Groundwater Quality. Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of VCC and Entrada construction on groundwater quality would be less than significant for Alternative 2 given regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term indirect impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Under Alternative 6, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4, and no further mitigation measures are required.

Based on the reduction in development area of Entrada proposed in Alternative 6 compared to Alternative 2, and the finding that the impacts of the Entrada project on groundwater quality would be less than significant for Alternative 2 after applying regulatory requirements, Mitigation Measure WQ-1, and the proposed PDFs, the long-term indirect impacts of Alternative 6 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

4.4.6.6.6 Secondary Impacts to Groundwater

RMDP Secondary Impacts. The short-term, construction-related direct and indirect water quality impacts of Alternative 6 would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality due to the RMDP construction activities beyond the boundaries of the Project area also would be less than significant.

Similarly, the comprehensive site design, source control BMPs, and treatment control BMPs, and compliance with regulatory requirements would assure that long-term direct and indirect impacts from Alternative 6 maintenance activities and Specific Plan projects on groundwater quality would not be significant under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality due to the RMDP operation and maintenance and Specific Plan build-out would also not be significant, and no further mitigation measures are required.

SCP Secondary Impacts. Short-term, construction-related direct groundwater quality impacts of the SCP, and short-term indirect impacts would not be significant (as described in Alternative 2) under Significance Criterion 4 under Alternative 6. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area also would be less than significant for this alternative.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), and treatment control BMPs, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from SCP maintenance activities and development of the Specific Plan and Entrada projects on groundwater quality would not be significant under Significance Criterion 4 after proposed PDF implementation (as described for Alternative 2).

Under Alternative 6, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within these areas, which consist of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if indirect groundwater impacts occurred and impacted groundwater traveled off-site.

4.4.6.6.7 Total Impacts - Alternative 6

Alternative 6 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the short- and long-term direct, indirect, and secondary impacts of the total Project on surface water and groundwater quality would be less than significant for Alternative 2, with

implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures, the short- and long-term direct, indirect, and secondary impacts of Alternative 6 on surface water and groundwater quality also would be less than significant under the requirements of Significance Criteria 1 through 4, and no further mitigation measures are required.

4.4.6.7 Impacts of Alternative 7 (Avoidance of 100-Year Floodplain, Elimination of Two Planned Bridges, and Avoidance of Spineflower)

Alternative 7 would result in a substantial reduction in the RMDP infrastructure, when compared to the proposed Project, and would increase the size of proposed spineflower preserves from 167.6 to 660.6 acres. Under this alternative, no development would be facilitated on the VCC planning area, and subsequent development on the Specific Plan site would be reduced. In total, Alternative 7 would facilitate the development of 17,323 residential dwelling units on the Specific Plan site and Entrada planning area, and approximately 3.82 msf of nonresidential uses on the Specific Plan site and on a portion of the Entrada planning area, and the net acreage/pad for residential, non-residential, and public facilities uses would be reduced by 1,497 acres (approximately 39 percent). Additional information regarding this alternative is provided in **Section 3.0**, Description of Alternatives, of this EIS/EIR.

4.4.6.7.1 Direct Impacts to Surface Water Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Surface Water Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the r finding that the impacts of RMDP construction on surface water quality would be less than significant for Alternative 2, given implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures, the short-term direct impacts of Alternative 7 project construction on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Direct Impacts to Surface Water Quality. As fewer infrastructure improvements are proposed in Alternative 7 compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of RMDP operation and maintenance on surface water quality would be less than significant for Alternative 2 with implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures and BMPs, the long-term direct impacts of Alternative 7 project operation and maintenance on surface water quality also would be less than significant (as described for Alternative 2), under Significance Criteria 1 through 3, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 7 differs from Alternative 2 in that there would be an additional 493 acres of spineflower preserves. Implementation of the Alternative 7 SCP would not result in development and, therefore, there would be no short-term direct impacts to surface water quality caused by the SCP under Significance Criteria 1 through 3.

Potential long-term water quality impacts of the SCP would be related to the occasional use of pesticides, which would likely increase slightly with the increased preserve area, but would be less than significant (as described in Alternative 2) relative to Criteria 1 through 3 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.7.2 Indirect Impacts to Surface Water Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 7 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 7 would provide 4,414 fewer residential units and result in a 1.79 million square foot reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Surface Water Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Specific Plan project construction on surface water quality would be less than significant for Alternative 2 after application of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDF measures, the short-term indirect impacts of Alternative 7 on surface water quality also would be less than significant (as described for Alternative 2) under Significance Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. The decrease in Specific Plan development area in Alternative 7 would decrease the predicted increase in runoff ammonia, trace metal, and chloride loads that would result from Alternative 2. As concentrations of all modeled constituents (except for dissolved zinc) are predicted to decrease under Alternative 2, when compared to existing conditions, concentrations are predicted to also decrease under Alternative 7. The modeled concentrations in runoff are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River. Water quality impacts of Alternative 7 would be minimized and less than significant with implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, a comprehensive site design, source control, and treatment control strategy and compliance with the MS4 permit and SUSMP requirements.

Concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under Alternative 7 conditions, when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit requirements, SUSMP requirements and Mitigation Measures SP-4.2-7 and WQ-1. Therefore, long-term indirect impacts on surface water quality from Alternative 7 would not be significant, after implementation of required PDFs (as described for Alternative 2) under Criteria 1 through 3, and no further mitigation measures are required.

SCP Indirect Impacts. Under Alternative 7, the SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential water quality impacts of the Specific Plan development are evaluated above. Under Alternative 7, no development would be facilitated on the VCC planning area, and approximately 852 residential units and 51,000 square feet of nonresidential units on a portion of the Entrada planning area would be facilitated.

Alternative 7 would result in 873 fewer residential units and 3.8 msf less nonresidential square footage in the Entrada and VCC planning areas when compared to Alternative 2.

Short-Term Indirect Impacts to Surface Water Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of Entrada construction on surface water quality would be less than significant for Alternative 2 given applicable regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the potential short-term indirect impacts of Alternative 7 on surface water quality also would be less than significant, after implementation of required PDFs (as described for Alternative 2) under Criteria 1 through 3, and no further mitigation measures are required.

Long-Term Indirect Impacts to Surface Water. Under this alternative, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to surface water quality related to Significance Criterion 1. Alternative 7 would have no significant indirect impacts regarding Significance Criteria 1 through 3, and no further mitigation measures are required.

The decrease in Entrada development area under Alternative 7 would decrease the predicted increase in pollutant loads and ammonia and chloride concentrations, when compared to Alternative 2. As concentrations of all modeled constituents (except for ammonia and chloride) are predicted to decrease under Alternative 2, when compared to existing conditions after the application of PDFs, concentrations of all modeled constituents (except for ammonia and chloride) are also predicted to decrease under Alternative 7. The modeled concentrations in runoff from developed areas with PDFs are predicted to be below all benchmark water quality objectives and criteria and TMDL wasteload allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, summarized in **Table 4.4-12**, and compliance with MS4 permit, SUSMP requirements and Mitigation Measure WQ-1.

For the Entrada planning area, concentrations of hydrocarbons are expected to increase, while concentrations of pathogens, pesticides, and trash and debris may increase under proposed conditions when compared to existing conditions, but none of the qualitatively assessed constituents are expected to significantly impact receiving waters due to implementation of regulatory requirements, Mitigation Measure WQ-1, a comprehensive site design, source control, and treatment control strategy in compliance with the MS4 permit and SUSMP requirements. Therefore, long-term indirect impacts on surface water quality from build-out of the Entrada project under Alternative 7 would not be significant under Criteria 1 through 3 after implementation of required PDFs (as described for Alternative 2), and no further mitigation measures are required.

4.4.6.7.3 Secondary Impacts to Surface Water

RMDP Secondary Impacts. The potential short-term, construction-related direct and indirect water quality impacts of Alternative 7 would be reduced to a less-than-significant level under Criteria 1 through 3 within the Project boundary. Therefore, the short-term secondary impacts to water quality in the Santa

Clara River beyond the boundaries of the Project area due to the RMDP construction activities also would be reduced to a less-than-significant level.

Similarly, the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, and compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan build-out on receiving water quality would not be significant under Criteria 1 through 3. Therefore, the long-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area due to RMDP operation and maintenance and Specific Plan build-out also would be reduced to a less-than-significant level, and no further mitigation measures are required.

SCP Secondary Impacts. Under Alternative 7, short-term, construction-related direct water quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under Criteria 1 through 3. Therefore, the short-term secondary impacts to water quality in the Santa Clara River beyond the boundaries of the Project area also would be reduced to a less-than-significant level under this alternative.

Similarly, the comprehensive site design, source control (including the IPM strategy for SCP maintenance), and treatment control strategy, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct from SCP maintenance activities and development of the Specific Plan and Entrada projects on receiving water quality would not be significant, after PDF implementation (as described for Alternative 2), under Criteria 1 through 3 for Alternative 7. Therefore, the long-term secondary impacts to surface water quality in the Santa Clara River beyond the boundaries of the Project area from these activities and development also would be less than significant, and no further mitigation measures are required.

Under Alternative 7, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to surface water quality related to Significance Criterion 1 if indirect impacts occur and these impacts are carried off-site in the Santa Clara River.

4.4.6.7.4 Direct Impacts to Groundwater Quality

RMDP Direct Impacts.

Short-Term Direct Impacts to Groundwater Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of RMDP construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term direct impacts of Alternative 7 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Direct Impacts to Groundwater Quality. As fewer infrastructure improvements are proposed in Alternative 7 when compared to Alternative 2, less operation and maintenance would be required. Based on the finding that the impacts of the RMDP operation and maintenance on groundwater quality would be less than significant for Alternative 2, the long-term direct impacts of Alternative 7 on groundwater quality also would be less than significant (as described for Alternative 2), under Significance Criterion 4, and no further mitigation measures are required.

SCP Direct Impacts. Alternative 7 differs from Alternative 2 in that there would be an additional 493 acres of spineflower preserves. Implementation of the Alternative 7 SCP would not result in development and, therefore, there would be no short-term direct impacts to groundwater quality caused by the SCP under Significance Criterion 4.

Long-term groundwater quality impacts of the SCP would be related to the occasional use of pesticides, which may increase slightly with the increased preserve area, but would be less than significant relative to Significance Criterion 4 based on the utilization of IPM techniques identified in the SCP management and monitoring program.

4.4.6.7.5 Indirect Impacts to Groundwater Quality

RMDP Indirect Impacts. Implementation of the RMDP component of Alternative 7 would indirectly facilitate previously approved urban development within the Specific Plan area. Alternative 7 would provide 4,414 fewer residential units and result in a 1.79 msf reduction in nonresidential uses within the Specific Plan area when compared to the proposed Project (Alternative 2).

Short-Term Indirect Impacts to Groundwater Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan project construction on groundwater quality would be less than significant for Alternative 2 after regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of the proposed PDFs, the short-term indirect impacts of RMDP Alternative 7 project construction on groundwater quality also would be less than significant (as described in Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of Specific Plan projects on groundwater quality would be less than significant for Alternative 2 after applying required regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, the proposed PDFs, the long-term indirect impacts of Alternative 7 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

SCP Indirect Impacts. Implementation of the Alternative 7 SCP would indirectly facilitate previously approved urban development within the Specific Plan area, and on portions of the Entrada planning area. Potential groundwater quality impacts of the Specific Plan development are evaluated above. Alternative 7 would not facilitate development on the VCC planning area and would result in approximately 873 fewer residential units and 3.8 msf less nonresidential square footage when compared to Alternative 2.

Short-Term Indirect Impacts to Groundwater Quality. Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential impacts of VCC and Entrada construction on groundwater quality would be less than significant for Alternative 2 given regulatory compliance, Mitigation Measures SP-4.2-7 and WQ-1, and implementation of proposed PDFs, the short-term indirect impacts of Alternative 7 on groundwater quality also would be less than significant under the requirements of Significance Criterion 4 after implementation of required PDFs (as described for Alternative 2), and no further mitigation measures are required.

Long-Term Indirect Impacts to Groundwater. Under Alternative 7, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant indirect impacts to groundwater quality related to Significance Criterion 4, and no further mitigation measures are required.

Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the impacts of the Entrada project on groundwater quality would be less than significant for Alternative 2, after applying PDFs, the potential long-term indirect impacts of Alternative 7 on groundwater quality also would be less than significant (as described for Alternative 2) under Significance Criterion 4, and no further mitigation measures are required.

4.4.6.7.6 Secondary Impacts to Groundwater

RMDP Secondary Impacts. The short-term, construction-related direct and indirect water quality impacts of Alternative 7 would be less than significant under Significance Criterion 4 within the Project boundary. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area due to the RMDP construction activities also would be less than significant.

Similarly, the comprehensive site design, source control, and treatment control strategy summarized in **Table 4.4-12**, and full compliance with regulatory requirements and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from RMDP maintenance activities and Specific Plan build-out on groundwater quality would not be significant under Significance Criterion 4. Therefore, the long-term secondary impacts to groundwater quality due to the RMDP operation and maintenance and Specific Plan build-out also would not be significant and no mitigation measures are required.

SCP Secondary Impacts to Groundwater Quality. Short-term, construction-related direct groundwater quality impacts of the SCP, and short-term indirect impacts would not be significant (as described for Alternative 2), under Significance Criterion 4 under Alternative 7. Therefore, the short-term secondary impacts to groundwater quality beyond the boundaries of the Project area also would be less than significant for this alternative.

Similarly, the comprehensive site design, source control BMPs (including the IPM strategy for SCP maintenance), treatment control BMPs, compliance with regulatory requirements, and Mitigation Measures SP-4.2-7 and WQ-1 would ensure that long-term direct and indirect impacts from SCP

maintenance activities and development of the Specific Plan and Entrada projects on groundwater quality would not be significant, after PDF implementation (as described for Alternative 2) under Significance Criterion 4 for Alternative 7. Therefore, the long-term secondary impacts to groundwater also would not be significant for Alternative 7, and no further mitigation measures are required.

Under Alternative 7, development within the VCC planning area would not be facilitated. There would be no change to the existing land uses within this area, which consists of open space and agriculture. No new additional mitigation would be required for the ongoing agricultural activities, and these existing uses may result in adverse but less-than-significant secondary impacts to groundwater quality related to Significance Criterion 4 if indirect groundwater impacts occurred and impacted groundwater traveled off-site.

4.4.6.7.7 Total Impacts - Alternative 7

Alternative 7 would result in a reduction in development area when compared to Alternative 2. Based on the finding that the potential short- and long-term direct, indirect, and secondary impacts of the total Project on surface water and groundwater quality would be less than significant for Alternative 2 with implementation of regulatory requirements, Mitigation Measures SP-4.2-7 and WQ-1, and the proposed PDF measures, the short- and long-term direct, indirect, and secondary impacts of Alternative 7 on surface water and groundwater quality also would be less than significant under the requirements of Significance Criteria 1 through 4, and no further mitigation measures are required.

4.4.7 MITIGATION MEASURES

4.4.7.1 Mitigation Measures Already Required by the Adopted Newhall Ranch Specific Plan EIR

The County of Los Angeles previously adopted mitigation measures to ensure that water quality impacts within the Specific Plan area were reduced to less-than-significant levels as part of its adoption of the Newhall Ranch Specific Plan and WRP. These measures are found in the previously certified Newhall Ranch Specific Plan Program EIR and the adopted Mitigation Monitoring Plans for the Specific Plan and WRP (May 2003), and are summarized above in **Table 4.4-1**. In addition, these mitigation measures are set forth in full below, and preceded by "SP," which stands for Specific Plan.

Specific Plan

SP-4.2-7 The applicant for any subdivision map permitting construction shall satisfy all applicable requirements of the NPDES Program in effect in Los Angeles County to the satisfaction of the County of Los Angeles Department of Public Works. These requirements currently include preparation of an Urban StormWater Mitigation Plan (USWMP) containing design features and Best Management Practices (BMPs) appropriate and applicable to the subdivision. In addition, the requirements currently include preparation of a Stormwater Management Pollution Prevention Plan (SWPPP) containing design features and BMPs appropriate and applicable to the subdivision. The County of Los

Angeles Department of Public Works shall monitor compliance with those NPDES requirements.

Water Reclamation Plant

SP-5.0-52 A new County sanitation district shall be formed to administer operation of the Newhall Ranch water reclamation plant. The district shall encompass the entire Newhall Ranch Specific Plan site.

SP-5.0-52(b) The applicant shall initiate a request to the new County sanitation district formed for the Newhall Ranch Specific Plan site to adopt an ordinance prohibiting the installation and use of self-regenerating water softeners within the new sanitation district prior to connection of the first residential unit to the sanitary sewer system.

SP-5.0-53 The Newhall Ranch water reclamation plant shall be designed and operated to satisfy the requirements of Title 22 of the California Administrative Code, which regulates reuse of reclaimed water.

SP-5.0-54 The Newhall Ranch water reclamation plant shall be designed and operated to satisfy the California Regional Water Quality Control Board, Los Angeles Region discharge limits for reclaimed water discharged to the Santa Clara River and for the irrigation of landscaped areas.

SP-5.0-55 The Newhall Ranch water reclamation plant shall obtain a National Pollutant Discharge Elimination System permit from the California Regional Water Quality Control Board, Los Angeles Region for reclaimed water discharged to the Santa Clara River and for the irrigation of landscaped areas.

SP-5.0-56 All facilities of the sanitary sewer system will be designed and constructed for maintenance by the County of Los Angeles Department of Public Works and County Sanitation Districts of Los Angeles County, and/or the new County sanitation district or similar entity in accordance with their manuals, criteria, and requirements.

4.4.7.2 Mitigation Measures Already Required by the Adopted VCC EIR

The previously certified VCC EIR (April 1990) did not address impacts related to water quality. However, as noted in **Subsection 4.4.1.2.1**, above, additional environmental review will be conducted by Los Angeles County with respect to the VCC planning area, because the applicant recently submitted the last tentative parcel map for build-out of the VCC planning area. Additional mitigation can and should be adopted by Los Angeles County if build-out of the VCC project area were to result in significant impacts to water quality within the VCC planning area.

4.4.7.3 Mitigation Measures Relating to the Entrada Planning Area

The County of Los Angeles has not yet prepared or released a draft EIR for the proposed development within the portion of the Entrada planning area that would be facilitated by approval of the SCP

component of the proposed Project. As a result, there are no previously adopted mitigation measures for the Entrada planning area. However, the adoption and implementation of measures similar to those previously adopted for the Specific Plan area and/or recommended for the proposed Project would ensure that potential impacts to water quality within the Entrada planning area are reduced to the extent feasible.

4.4.7.4 Additional Mitigation Measures Proposed by this EIS/EIR

The analysis provided above determined that with implementation of applicable regulatory requirements and proposed PDFs, the proposed Project and alternatives would not result in significant water quality impacts. However, proposed Mitigation Measure WQ-1 is proposed for Alternatives 2 through 7 to further ensure that the water quality-related impacts remain less-than-significant, and to facilitate the implementation of a mitigation monitoring program that addresses water quality-related requirements. This proposed mitigation measure is to be implemented in addition to those previously adopted by the County of Los Angeles in connection with its approval of the Specific Plan and WRP projects. This measure is preceded by "WQ," to designate that it is water quality-related mitigation.

This mitigation requirement applies to all development on the Specific Plan site, and development on the portions of the VCC and Entrada project sites included in the Project area. This mitigation measure will ensure that short- and long-term water quality impacts of the proposed Project and alternatives remain less than significant.

WQ-1 Prior to the recordation of any final subdivision map (except those maps for financing or conveyance purposes only) or the issuance of any grading or building permit (whichever comes first), a final SUSMP shall be prepared consistent with the terms and content of both the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan and Project Water Quality Technical Report that specifically identifies the BMPs to be used on site. The SUSMP shall be submitted to the DPW for review. The SUSMP shall identify, at a minimum: (1) site design BMPS (as appropriate); (2) the source control BMPs; (3) treatment control BMPs; (4) hydromodification control BMPs; and (5) the mechanism(s) by which long-term operation and maintenance of all structural BMPs would be provided. The BMPs identified in the SUSMP shall include, as applicable, but not be limited to, the PDFs set forth in **Table 4.4-12** of this EIS/EIR and duplicated below.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
1. Runoff Flow Control	Control post-development peak stormwater runoff discharge rates, velocities, and duration in natural drainage systems to prevent accelerated downstream erosion and to protect habitat related beneficial uses.[2] All post-development runoff from a two-year, 24-hour storm shall not exceed the predevelopment peak flow rate, burned,[3] from a two-year, 24-hour storm when the predevelopment peak flow rate equals or exceeds five cfs. Discharge flow rates shall be calculated using the County of Los Angeles' modified rational method. Post-development runoff from the 50-year capital storm shall not exceed the predevelopment peak flow rate, burned and bulked,[4] from the 50-year capital storm. Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.	Hydromodification source controls include minimizing impervious surfaces through clustering development and using vegetated treatment control BMPs such as bioretention, vegetated swales, and extended detention basins to disconnect impervious surfaces and reduce runoff volumes through evapotranspiration and infiltration. Extended detention basins can provide hydromodification control as well as water quality treatment. In-stream stabilization techniques (grade control and drop structures) would be employed in the tributaries that would receive post-development Specific Plan project runoff to prevent accelerated erosion and to protect habitat related beneficial uses, per the RMDP. The Specific Plan tract maps would be conditioned to require, as a design feature, sizing and design of hydraulic features as necessary to control hydromodification impacts in accordance with the Newhall Ranch Specific Plan Sub-Regional Stormwater Mitigation Plan.[5]
2. Conserve Natural Areas	Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition. Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection. Maximize trees and other vegetation at each site, planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Promote natural vegetation by using parking lot islands and other landscaped areas. Preserve riparian areas and wetlands.	The Specific Plan clusters development into villages. Approximately 70% (8,335 acres) of the Specific Plan site would remain undeveloped. Site clearing and grading would be limited as necessary to allow development, allow access, and provide fire protection. Native and/or nonnative/noninvasive vegetation would be utilized within the development. The final project stormwater system would include the use of the vegetated treatment BMPs, including bioretention (placed in common area landscaping in commercial and multi-family residential areas, roadway median strips, and parking lot islands (where applicable), vegetated swales, and extended detention basins. Riparian buffers would be preserved along the Santa Clara River Corridor and tributary

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
		drainages by clustering development upland and away from the River and tributary drainages.
3. Minimize Stormwater Pollutants of Concern	Minimize to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas, to the stormwater conveyance system as approved by the building official.	Treatment control BMPs would be selected to address the pollutants of concern for the Project. These BMPs are designed to minimize introduction of pollutants to the Maximum Extent Practicable (MEP). The Specific Plan projects would include numerous source controls, including animal waste bag stations, street sweeping and catch basin cleaning, an IPM program for common area landscaping in multi-family residential areas and commercial areas, use of native and/or nonnative/noninvasive vegetation, and installation of a car wash pad in multi-family residential areas. An education program would be implemented that includes both the education of residents and commercial businesses regarding water quality issues. Topics would include services that could affect water quality, such as carpet cleaners and others that may not properly dispose of cleaning wastes; community car washes; and residential car washing. The education program would emphasize animal waste management, such as the importance of cleaning up after pets and not feeding pigeons, seagulls, ducks, and geese. Vegetated treatment control BMPs would allow for infiltration of treated stormwater.
4. Protect Slopes and Channels	Project plans must include BMPs consistent with local codes and ordinances and the SUSMP requirements to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff: Convey runoff safely from the tops of slopes and stabilize disturbed slopes; Utilize natural drainage systems to the maximum extent practicable; Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable;	The Specific Plan projects would provide slope stabilization to areas with significant slopes. Natural slopes and native vegetation on slopes adjacent to the Santa Clara River would be preserved and/or restored and enhanced. Native plants would be used in all plant palettes placed on restored slopes. Project PDFs, including swales, bioretention areas, and water quality basins (hydrologic source controls), would reduce flows to natural channels through infiltration and evapotranspiration.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
	Stabilize permanent channel crossings; Vegetate slopes with native or drought tolerant vegetation; Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion with the approval of all agencies with jurisdiction, (*e.g.*, the Corps and CDFG).	The banks of the Santa Clara River at portions of this site would be stabilized primarily using buried bank stabilization per the Newhall Ranch RMDP. After the implementation of these measures and other flow control and volume reduction PDFs, the Santa Clara River would be capable of handling the expected flow regime with little or no erosion. All outlet points to the Santa Clara River and tributaries would include energy dissipaters. In-stream stabilization techniques would be employed in the tributaries that would receive post-development Specific Plan runoff to prevent accelerated erosion and to protect habitat related beneficial uses, per the Newhall Ranch RMDP. Geomorphic principles would be used to design stable, naturalistic drainages given the expected hydrologic and sediment regimes.
5. Provide Storm Drain System Stenciling and Signage	All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area. Legibility of stencils and signs must be maintained.	All storm drain inlets and water quality inlets would be stenciled or labeled. Signs would be posted in areas where dumping could occur. The County, a Landscape or Local Maintenance District (LMD), Home Owners Association (HOA), or other maintenance entity would maintain stencils and signs..
6. Properly Design Outdoor Material Storage Areas	Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system measures to mitigate impacts must be included.	Pesticides, fertilizers, paints, and other hazardous materials used for maintenance of common areas, parks, commercial areas, and multi-family residential common areas would be kept in enclosed storage areas.
7. Properly Design Trash Storage Areas	All trash containers must meet the following structural or treatment control BMP requirements: Trash container areas must have drainage from adjoining roofs and pavement diverter around the areas.	All outdoor trash storage areas would be covered and isolated from stormwater runoff.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
	Trash container areas must be screened or walled to prevent off-site transport of trash.	
8. Provide Proof of Ongoing BMP Maintenance	Applicant required to provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, and/or Conditional Use Permits.	Depending on the type and location of the BMP, either the County, a Landscape or Local Maintenance District (LMD), or Home Owners Association (HOA) will be responsible for maintenance. The County will have the right, but not the duty, to inspect and maintain the BMPs that are maintained by the HOA or LMD, at the expense of the HOA or LMD, if they are not being properly maintained.
9. Design Standards for Structural or Treatment Control BMPs	Post-construction structural or treatment control BMPs shall be designed to mitigate (infiltrate or treat) stormwater runoff using either volumetric treatment control BMPs or flow-based treatment control BMPs sized per listed criteria.	Stormwater treatment facilities would be designed to meet or exceed the sizing standards in the County; SUSMP. Volume-based treatment control BMPs for the Specific Plan projects would be designed to capture 80 percent or more of the annual runoff volume per criterion 2 of the MS4 permit. Flow-based BMPs would be sized using criteria 3, which would provide 80 percent capture of annual runoff volume per criteria of the MS4 permit. The size of the facilities would be finalized during the design stage by the project engineer with the final hydrology study, which would be prepared and approved to ensure consistency with this analysis prior to issuance of a final grading permit. Types of treatment control BMPs that would be employed include extended detention basins, bioretention, vegetated swales, cartridge media filtration, and a combination thereof.
10.B.1 Properly Design Loading/ Unloading Dock Areas (100,000 ft^2 Commercial Developments)	Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.	Loading dock areas would be covered or designed to preclude run-on and runoff. Direct connections to storm drains from depressed loading docks (truck wells) would be prohibited. Below grade loading docks for fresh food items would drain through a treatment control BMP applicable to the use, such as a catch basin insert.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
		Loading docks would be kept in a clean and orderly condition through weekly sweeping and litter control, at a minimum and immediate cleanup of spills and broken containers without the use of water.
10.B.2. Properly Design Repair/ Maintenance Bays (100,000 ft^2 Commercial Developments)	Repair/maintenance bays must be indoors or designed in such a way that does not allow stormwater run-on or contact with stormwater runoff. Design a repair/maintenance bay drainage system to capture all wash water, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/ maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an industrial waste discharge permit.	Commercial areas would not have repair/maintenance bays, or the bays would comply with design requirements.
10.B.3. Properly Design Vehicle/ Equipment Wash Areas (100,000 ft^2 Commercial Developments)	Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.	Areas for washing/steam cleaning of vehicles would be self-contained or covered with a roof or overhang; would be equipped with a wash racks and with the prior approval of the sewering agency; would be equipped with a clarifier or other pretreatment facility; and would be properly connected to a sanitary sewer.
10.C. Properly Design Equipment/ Accessory Wash Areas (Restaurants)	Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer. If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.	Food preparation areas shall have either contained areas or sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the containment areas or sinks shall also be structurally covered to prevent entry of stormwater. Adequate signs shall be provided and appropriately placed stating the prohibition of discharging washwater to the storm drain system.
10.D. Properly design fueling area (Retail Gasoline Outlets)	The fuel dispensing area must be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.	Retail gasoline outlets would comply with design requirements.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
	The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited. The fuel dispensing areas must have a two to four percent slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (two meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus one foot (0.3 meter), whichever is less.	
10.E.1. Properly design fueling area (Automotive Repair Shops)	See requirement 10.D. above.	Automotive repair shop fueling areas would comply with design requirements.
10.E.2. Properly design repair/maintenance bays (Automotive Repair Shops)	See requirement 10.B.2 above.	Automotive repair shop repair/maintenance bays would comply with design requirements.
10.E.3. Properly design vehicle/equipment wash areas (Automotive Repair Shops)	Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.	Vehicle/equipment wash areas at automotive repair shops would comply with design requirements.
10.E.4. Properly design loading/unloading dock areas (Automotive Repair Shops)	See requirement 10.B.1 above.	Automotive repair shop loading/unloading dock areas would comply with design requirements.
10.F.1. Properly Design Parking Area (Parking Lots)	Reduce impervious land coverage of parking areas. Infiltrate runoff before it reaches the storm drain system. Treat runoff before it reaches storm drain system.	Commercial and multi-family parking lots would incorporate bioretention facilities located in islands to promote filtration and infiltration of runoff. Stormwater runoff from parking lots would be directed to treatment control BMPs, including swales, water quality basins, bioretention areas, and/or catch basin media filters in compliance with SUSMP requirements.

Table 4.4-12 (*Duplicate*)
Standard Urban Stormwater Mitigation Plan Requirements and Corresponding Specific Plan Project Design Features

SUSMP Requirement[1]	Criteria/ Description	Corresponding Specific Plan PDFs
10.F.2. Properly Design to Limit Oil Contamination and Perform Maintenance (Parking Lots)	Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used. Ensure adequate operation and maintenance of treatment systems, particularly sludge and oil removal.	See 10.F.1 above. Treatment of runoff in detention basins, bioretention areas, or catch basin inserts would be used to address oil and petroleum hydrocarbons from high-use parking lots. The HOAs or property owners would be responsible for operation and maintenance of treatment control BMPs that serve private parking lots.
13. Limitation of Use of Infiltration BMPs	Infiltration is limited based on design of BMP, pollutant characteristics, land use, soil conditions, and traffic. Appropriate conditions must exist to utilize infiltration to treat and reduce stormwater runoff for the project.	Per the Los Angeles RWQCB clarification letter (Los Angeles RWQCB, 2006), generally, the common pollutants in stormwater are filtered or adsorbed by soil, and unlike hydrophobic solvents and salts, do not cause groundwater contamination. In any case, infiltration of one to two inches of rainfall in semiarid areas like southern California where there is a high rate of evapotranspiration, presents minimal risks. The proposed treatment control BMPs are not considered infiltration BMPS; they allow for infiltration of fully-treated runoff only.

Notes:

[1] SUSMP Requirements 10A (Single Family Hillside Home), 11 (Waiver), and 12 (Mitigation Funding) do not apply to the Project and are, therefore, not listed in **Table 4.4-12**.

[2] This requirement is from Part 4, Section D.1 of the MS4 permit.

[3] Refer to **Section 4.1**, Surface Water Hydrology and Flood Control, for a description of "burned" 4

[4] Refer to **Section 4.1**, Surface Water Hydrology and Flood Control, for a description of "burned and bulked" conditions.

[5] Refer to **Section 4.2**, Geomorphology and Riparian Resources, for a description of hydromodification control features.

Source: Geosyntec, 2008.

Proposed Mitigation Measure WQ-2 has been provided to ensure that an Integrated Pest Management program is implemented as proposed, and to facilitate the implementation of a mitigation monitoring program.

WQ-2 Prior to issuance of a building permit, and as a part of the design level hydrology study and facilities plan, the project applicant shall submit to the Department of Regional Planning a Landscape and Integrated Pest Management Plan, identified in this **Section 4.4**, which shall be designed to meet the standards set forth below.

A Landscape and Integrated Pest Management Plan shall be developed and implemented for common area landscaping within the Specific Plan, Entrada, and VCC Project that addresses

integrated pest management (IPM) and pesticide and fertilizer application guidelines. IPM is a strategy that focuses on long-term prevention or suppression of pest problems (*i.e.*, insects, diseases and weeds) through a combination of techniques including: using pest-resistant plants; biological controls; cultural practices; habitat modification (Techniques 1 – 6 below); and the limited use of pesticides according to treatment thresholds, when monitoring indicates pesticides are needed because pest populations exceed established thresholds (Technique 7). The Landscape and Integrated Pest Management Plan will address the following components:

1. Pest identification.
2. Practices to prevent pest incidence and reduce pest buildup.
3. Monitoring to examine vegetation and surrounding areas for pests to evaluate trends and to identify when controls are needed.
4. Establishment of action thresholds that trigger control actions.
5. Pest control methods - cultural, mechanical, environmental, biological, and appropriate pesticides.
6. Fertilizer management - soil assessment, fertilizer types, application methods, and storage and handling.
7. Pesticide management – safety (*e.g.*, Material Safety Data Sheets, precautionary statements, protective equipment); regulatory requirements; spill mitigation; groundwater and surface water protection measures associated with pesticide use; and pesticide applicator certifications, licenses, and training (*i.e.*, all pesticide applicators must be certified by the California Department of Pesticide Regulation).

4.4.8 SUMMARY OF SIGNIFICANCE FINDINGS

Using the significance criteria identified above, it has been determined that the proposed Project and alternatives would not result in significant water quality impacts after applying the required PDFs, BMPs, regulatory requirements, and above mitigation measures.

Table 4.4-44 presents a summary of the significance criteria relating to each of the Project alternatives, and the reduced level of impact that would be achieved for each alternative by applying the above mitigation measures.

Table 4.4-44
Summary of Significant Water Quality Impacts - Pre- and Post-Mitigation

Significance Criteria	Applicable Mitigation Measures	Planning Area	Impact of Alternatives - Pre/Post-Mitigation						
			Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
1: Violate any water quality standards or waste discharge requirements.	WQ-1 WQ-2	NRSP	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		VCC	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		Entrada	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
2: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	WQ-1 WQ-2	NRSP	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		VCC	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		Entrada	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
3: Otherwise substantially degrade water quality.	WQ-1 WQ-2	NRSP	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		VCC	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		Entrada	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
4: Through changes in surface water runoff quality and quantity and changes in groundwater recharge, result in a violation of any groundwater quality standards or waste discharge requirements or otherwise substantially degrade groundwater quality.	WQ-1 WQ-2	NRSP	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		VCC	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M
		Entrada	NI	SI/M	SI/M	SI/M	SI/M	SI/M	SI/M

Notes:
SI/M = Significant Impact, but mitigated to less-than-significant level
NI = No Impact, and no mitigation required

4.4.9 SIGNIFICANT UNAVOIDABLE IMPACTS

As shown in **Table 4.4-44**, above, the proposed Project and alternatives would not result in any significant water quality impacts.