10. HYDROLOGY AND WATER QUALITY—WATER QUALITY

1. INTRODUCTION

This section of the Draft EIR analyzes the Project's impacts on water quality, stream channel hydromodification, and groundwater recharge.[1] The analysis is based on information from the *Entrada South Water Quality Technical Report* (Water Quality Report) prepared by Geosyntec Consultants in October 2014, as well as the *Geotechnical Infiltration Evaluation Update for Vesting Tentative Tract Map No. 53295* (Infiltration Evaluation) prepared by R.T. Frankian & Associates in August 2013, both of which are included in **Appendix 5.10** of this Draft EIR. Additional information considered in this analysis includes the previously certified Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan (RMDP/SCP), which covers an area that includes the Entrada South Project Site, and other specified data and information, as discussed further below.[2]

The Water Quality Report assesses the potential impacts of the Project on water quality in receiving waters, both surface and groundwater, and the potential for post-development stormwater runoff to cause accelerated stream erosion and impact stream habitat.

The impact analysis takes into account Best Management Practices (BMPs) selected to be consistent with the Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit and the Los Angeles County Low Impact Development (LID) Manual. The Project design includes drainage, flood control, and water quality improvements such as storm drains, debris basins, water quality facilities, bank stabilization, and outlet structures in compliance with County drainage requirements and County MS4 Permit requirements. Control measures incorporated into the Project to address water quality and hydrologic impacts include site

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[1] *Hydromodification refers to changes to the runoff regime caused by land use modifications. Unless managed, hydromodification can cause channel erosion, migration or sedimentation, as well as biologic impacts to streams.*

[2] *Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, Final Joint Environmental Impact Statement and Environmental Impact Report, June 2010.*

design, source control, treatment control, and hydromodification control BMPs. Additional drainage-related improvements that would be implemented as part of the Project include the conveyance of runoff and installation of stormwater outlet structures and energy dissipaters.

2. ENVIRONMENTAL SETTING

a. Regulatory Setting

(1) Federal Regulations

(a) Clean Water Act

The Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), referred to as the Clean Water Act (CWA), requires NPDES permits for the discharge of pollutants to "waters of the United States" from any point source, and establishes U.S. Environmental Protection Agency (USEPA) regulations for the permitting of municipal and industrial stormwater discharges under the NPDES permit program. The CWA requires states to adopt water quality standards for receiving water bodies (i.e., those to which surface water runoff or other effluent is discharged) and to have those standards approved by the USEPA. 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 are prescribed concentrations or levels of constituents (e.g., lead, suspended sediment, or fecal coliform bacteria), or narrative statements which represent the quality of water that supports a particular use.

(i) CWA Section 303(d)—Total Maximum Daily Loads

When the designated beneficial uses of a particular receiving water body are compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as "impaired." Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, 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 to the water body.

Runoff from the Project Site discharges to Reach 5 of the Santa Clara River (River).[3] Water quality impairments within Reach 5 at approximately the Project Site and

[3] *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 LA Regional Water Board and one*
(Footnote continued on next page)

downstream from that location were considered when selecting the pollutants of concern for this water quality analysis. As shown in **Table 5.10-1**, CWA Section 303(d) Listings for the Santa Clara River Mainstem, on page 5.10-4, impairments for Reach 5 include chloride, coliform bacteria, and iron. Impairments for downstream reaches include chloride, coliform bacteria, total dissolved solids (TDS), toxicity, ChemA, Toxaphene, and nitrate.

The Los Angeles Regional Water Quality Control Board (LA Regional Water Board) has adopted TMDLs for nitrogen compounds (nitrate plus nitrite-nitrogen and ammonia), chloride, and indicator bacteria in its Water Quality Control Plan (Basin Plan), discussed below. The wasteload allocations for municipal stormwater discharges into Reach 5 of the River are summarized in **Table 5.10-2**, TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5, on page 5.10-5. Pollutant reductions are regulated through effluent limits prescribed in Publicly Owned Treatment Works and minor point source NPDES Permits, BMPs required in NPDES MS4 Permits, and California Water Resources Control Board (State Water Board) Management Measures for non-point source discharges.

established by the USEPA. Both of these reach classifications are used by the LA Regional Water Board and the USEPA in various documents, which at times is a source of confusion. This report uses the LA Regional Water Board reach numbers.

Table 5.10-1
CWA Section 303(d) Listings for the Santa Clara River Mainstem

River Reach or Tributary	Geographic Description and Distance from Project to Upstream End of Reach	Pollutants	TMDL Completion	Potential Sources
7	Bouquet Canyon Rd to above Lang Gaging Station (5 miles upstream)	Coliform Bacteria	TMDL Adopted 2012	Nonpoint and Point Sources
6	West Pier Hwy 99 to Bouquet Cyn. Rd (directly upstream of Project Site)	Chloride Coliform Bacteria Chlorpyrifos Diazinon Toxicity Iron Copper	TMDL Adopted 2005 TMDL Adopted 2012 Requires TMDL/2019 Requires TMDL/2019 Requires TMDL/2019 Requires TMDL/2021 Requires TMDL/2021	Nonpoint and Point Sources Nonpoint and Point Sources Source Unknown Source Unknown Source Unknown Source Unknown Nonpoint and Point Sources
5	Blue Cut Gaging Station to West Pier Hwy 99 (Project location)	Chloride Coliform Bacteria Iron	TMDL Adopted 2005 TMDL Adopted 2012 2021	Nonpoint and Point Sources Nonpoint and Point Sources Source Unknown
3	Freeman diversion dam to “A” street (25 miles)	Ammonia Chloride Total Dissolved Solids Toxicity	TMDL Adopted 2004 TMDL Adopted 2002 Requires TMDL/2015 Requires TMDL/2021	Nonpoint and Point Sources Nonpoint and Point Sources Source Unknown Source Unknown
1	Estuary to Highway 101 Bridge (30 miles)	Toxicity	Requires TMDL/2019	Source Unknown
--	Estuary (40 miles)	Coliform Bacteria ChemA Toxaphene Toxicity Nitrate	TMDL Adopted 2012 Requires TMDL/2019 Requires TMDL/2019 Requires TMDL/2019 Requires TMDL/2021	Nonpoint Source Source Unknown Nonpoint Source Source Unknown Source Unknown

Source: Geosyntec, 2014 (see Table 3-1 in the Water Quality Report).

Table 5.10-2
TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5

<table>
<tr><th>Impairing Pollutant</th><th>Numeric Water Quality Objective</th><th>Wasteload Allocation</th></tr>
<tr><td>Chloride</td><td>100 mg/L.</td><td>Wasteload allocations have been adopted for the Saugus Water Reclamation Plant (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 non-point sources are not a major source of chloride. The load allocations for non-point sources is 100 mg/L.</td></tr>
<tr><td>Nitrogen Compounds</td><td>The numeric target for nitrogen in this TMDL is based on achieving the existing nitrogen water quality objective of 5 mg/L NO_3-N + NO_2-N. (Note: the numeric target that is used to calculate the wasteload allocations includes a 10% margin of safety; thus the numeric target is 4.5 mg/L NO_3-N + NO_2-N.)
The water quality objective for ammonia in Reach 5 used in the nitrogen compounds TMDL was based on temperature and pH for different River segments within the reach:
<table><tr><th colspan="3">Ammonia Water Quality Objective (mg/L as N)[a]</th></tr><tr><th></th><th>1-Hour Average</th><th>30-Day Average</th></tr><tr><td>Reach 5 at County Line</td><td>3.4</td><td>1.2</td></tr><tr><td>Reach 5 below Valencia</td><td>5.5</td><td>2.0</td></tr><tr><td>Reach 5 above Valencia</td><td>4.8</td><td>2.0</td></tr></table></td><td>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)</td></tr>
</table>

Table 5.10-2 (Continued)
TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5

<table>
<tr><th>Impairing Pollutant</th><th>Numeric Water Quality Objective</th><th>Wasteload Allocation</th></tr>
<tr>
<td>Indicator Bacteria (Resolution R10-006)</td>
<td>
Numeric Targets:
<table>
<tr><th>Constituent</th><th>SCR Reach 5 Requirement</th></tr>
<tr><td>E. Coli
(Single Sample)</td><td>235/100 mL</td></tr>
<tr><td>E. Coli
(Geometric Mean)</td><td>126/100 mL</td></tr>
</table>
</td>
<td>
Wasteload allocations are given in terms of allowable exceedance days. The numeric targets may not be exceeded more than the number of allowable exceedance days allotted in the tables below.
Interim Allowable Exceedance Days
(Dry Weather and Wet Weather deadline March 21, 2016):
<table>
<tr><th rowspan="2">Time Period</th><th colspan="2">Annual Allowable Exceedance Days of the Single Sample Objective (days)</th></tr>
<tr><th>Daily Sampling</th><th>Weekly Sampling</th></tr>
<tr><td>Dry Weather</td><td>17</td><td>3</td></tr>
<tr><td>Wet Weather</td><td>61</td><td>9</td></tr>
</table>
Final Allowable Exceedance Days
(Dry Weather deadline March 21, 2023; Wet Weather deadline March 21, 2029):
<table>
<tr><th rowspan="2">Time Period</th><th colspan="2">Annual Allowable Exceedance Days of the Single Sample Objective (days)</th></tr>
<tr><th>Daily Sampling</th><th>Weekly Sampling</th></tr>
<tr><td>Dry Weather</td><td>5</td><td>1</td></tr>
<tr><td>Wet Weather</td><td>16</td><td>3</td></tr>
</table>
</td>
</tr>
</table>

[a] *The numeric targets are 10 percent smaller to incorporate a margin of safety.*

Source: Geosyntec, 2014 (see Table 3-2 in the Water Quality Report).

Upper Santa Clara River Chloride TMDL

Specific to chloride, the Regional Board has determined that high levels of chloride (salt) harm salt-sensitive avocado and strawberry crops along State Route 126 (SR-126) downstream of the Project. As noted, the Board has developed and adopted a chloride TMDL. The chloride TMDL is part of the Basin Plan.

As background, the Regional Board first adopted a TMDL for chloride in the Upper Santa Clara River in October 2002 (Resolution No. 2002-018). The Board amended the TMDL to revise the interim wasteload allocations (WLAs) and implementation schedule (Resolution 04-004). The amended TMDL was approved by the State Water Board and the USEPA and became effective on May 4, 2005. The chloride TMDL requires that chloride concentration levels in water reclamation plant effluent not exceed 100 mg/L.

At the time the TMDL was adopted and approved, there were key scientific uncertainties regarding the sensitivity of crops to chloride and the complex interactions between surface water and groundwater in the Upper Santa Clara River watershed. The TMDL recognized the possibility of revised chloride water quality objectives and included mandatory reconsiderations by the Regional Board to consider site specific objectives.[4] The TMDL required the County Sanitation Districts of Los Angeles County (County Sanitation Districts) to implement special studies and actions to reduce chloride from the Saugus and Valencia WRPs.

The TMDL special studies were conducted in a facilitated process in which stakeholders participated in scoping and reviewing the studies. This process resulted in an alternative TMDL implementation plan that addressed chloride impairment of surface waters and degradation of groundwater. The Alternative Water Resources Management (AWRM) program was first set forth by the Upper Basin water purveyors and United Water Conservation District (UWCD), the management agency for groundwater resources in the Ventura County portions of the Upper Santa Clara River watershed. The AWRM program increased chloride water quality objectives in certain groundwater basins and reaches of the Upper Santa Clara River watershed, decreased the chloride objectives in the eastern Piru Basin, and resulted in an overall reduction in chloride loading as well as water supply benefits.

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[4] *Los Angeles Regional Water Quality Control Board (LARWQCB), 2008. Upper Santa Clara River Chloride TMDL Reconsideration, Conditional Site Specific Objectives for Chloride, and Interim Wasteload Allocations for Sulfate and Total Dissolved Solids Staff Report. November 24, 2008, www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/69_New/2008_1203/Revised_Draft_Staff_Report.pdf, accessed March 3, 2015.*

A Groundwater and Surface Water Interaction (GSWI) model was developed to assess the linkage between chloride sources and instream water quality, and to quantify the assimilative capacity of Santa Clara River Reaches 4A, 4B, 5, and 6 and the groundwater basins underlying those reaches.[5] The model was then used to predict the effects of WRP discharges on chloride loading to surface water and groundwater under a variety of future hydrology, land use, and water use conditions. The model was used to assess the ability of the AWRM to achieve compliance with proposed conditional site-specific objectives under future water use scenarios within the Upper Santa Clara River watershed. The model was based on design capacities at Valencia WRP and Saugus WRP of 27.6 million gallons per day (mgd) and 6.5 mgd, respectively, for a total system design capacity of 34.1 mgd by year 2027.[6] The model predicted that the AWRM could achieve the proposed conditional site-specific objectives for chloride under both drought and non-drought conditions. In December 2008, the Regional Board revised the Upper Santa Clara River Chloride TMDL with the conditional chloride site-specific objectives (Resolution No. R4-2008-012). This TMDL revision became effective on April 6, 2010.

Wastewater generated by the Project would be treated by the Santa Clarita Valley Sanitation District's (Valley Sanitation District) Valencia Water Reclamation Plant (Valencia WRP). The Valencia WRP currently provides primary, secondary, and tertiary treatment for 21.6 mgd of wastewater and is discharging wastewater to the Santa Clara River pursuant to Order No. R4-2009-0074 (NPDES Permit No. CA0054216). In order to comply with the Upper Santa Clara River Chloride TMDL, the Valley Sanitation District will need to add facilities because the existing treatment processes do not provide chloride removal. The Valencia WRP's NPDES Permit includes requirements and deadlines for several implementation actions related to adding chloride removal facilities, including preparation of a Wastewater Facilities Plan and Programmatic EIR for facilities to comply with the final permit effluent limit of 100 mg/L. The County Sanitation District completed the Final Facilities Plan and EIR in 2013.[7]

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[5] *Los Angeles Regional Water Quality Control Board (LARWQCB), 2008. Upper Santa Clara River Chloride TMDL Reconsideration, Conditional Site Specific Objectives for Chloride, and Interim Wasteload Allocations for Sulfate and Total Dissolved Solids Staff Report. November 24, 2008, www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/69_New/2008_1203/Revised_Draft_Staff_Report.pdf, accessed March 3, 2015.*

[6] *Ibid.*

[7] *Santa Clarita Valley Sanitation District Chloride Compliance Facilities Plan and Environmental Impact Report (Final), October 2013, www.lacsd.org/wastewater/scvchloridecompliance/the_approved_chloride_compliance_plan_and_environmental_impact_report/final_santa_clarita_valley_sanitation_district_chloride_compliance_facilities_plan_and_eir.asp, accessed March 3, 2015.*

The Valley Sanitation District Board approved Alternative No. 2 in the Facilities Plan, a project consisting of UV disinfection, advanced treatment using reverse osmosis, and deep well injection for brine disposal. These facilities will be designed to achieve the 100 mg/L chloride final effluent limit in the NPDES Permit for the Valencia WRP. The Valley Sanitation District Board has requested from the LA Regional Water Board an extension of the 2015 deadline until 2019 to complete the chloride removal facilities. During this period, an interim effluent limitation for chloride in the NPDES Permit would be in effect.[8] The Valencia WRP discharges have been in compliance with this interim effluent limitation throughout the current NPDES Permit cycle. On July 7, 2014, the Valley Sanitation District also adopted a rate ordinance to fully fund the chloride removal facilities. The LA Regional Water Board is expected to proceed to amend the Basin Plan before the May 2015 deadline to extend the chloride removal facilities construction deadline to 2019.

(ii) Clean Water Act Sections 401, 402 and 404—Discharge of Fill or Dredge Materials

Under Section 401 of the CWA (33 U.S.C. Sections 1251, et seq.), every applicant for a federal permit for any activity that may result in a discharge of dredge or fill material to a water body must obtain a state water quality certification verifying that the proposed activity will comply with state water quality standards (i.e., beneficial uses, water quality objectives, and anti-degradation policy). The LA Regional Water Board issues Section 401 water quality certifications for the Los Angeles region.

The CWA also prohibits the discharge of pollutants to “waters of the United States” from any point source unless the discharge is in compliance with a NPDES permit. CWA Section 402 requires a NPDES permit for: the discharge of stormwater from MS4s serving urban areas with a population greater than 100,000; construction sites that disturb one acre or more; and industrial facilities. The LA Regional Water Board administers these permits with oversight by the State Water Board and USEPA Region IX.

Under Section 404 of the CWA, the U.S. Army Corps of Engineers (Corps) is authorized to permit the discharge of dredged and/or fill materials to “waters of the United States,” which includes both wetland and non-wetland aquatic habitats within the jurisdictional extent of rivers and streams defined by the ordinary high water mark and wetlands adjacent to “waters of the United States.” Section 404 permits can be issued as individual or general (nationwide or regional) permits. A CWA Section 404(b)(1) alternatives analysis is required for all individual permits.

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[8] *The chloride interim limit is equal to the sum of the State Water Project treated water supply chloride concentration plus 134 mg/L, expressed as a 12-month rolling average, not to exceed a daily maximum of 230 mg/L.*

Hydrologic conditions of concern addressed in this section include in-stream changes in sediment transport, erosion, sedimentation, and channel stability (i.e., hydromodification). There is a nexus between these concerns and the stream, habitat, and species protection programs administered by the Corps, U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW). And, as mentioned above, Section 404 of the CWA regulates the discharge of dredged and fill material into "waters of the United States," including wetlands. Activities in waters of the United States regulated under this program include fill 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 Corps have issued Section 404(b)(1) Guidelines (40 CFR 230) that regulate dredge and fill activities, including water quality aspects of such activities. Subpart C at Sections 230.20 thru 230.25 contains water quality regulations applicable to dredge and fill activities. Among other topics, these guidelines address discharges that 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.

(2) State Regulations

(a) Porter-Cologne Water Quality Control Act

The federal CWA places with the states the primary responsibility for the control of surface water pollution and for planning the development and use of water resources, although it 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 (California Water Code Sections 13000 et seq.) (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Board and the California Regional Water Quality Control Boards (Regional Water Boards) power and responsibility to adopt plans and policies, regulate discharges of waste to surface and groundwater, regulate waste disposal sites, and require cleanup of discharges of hazardous materials and other pollutants. Each of the Regional Water Boards must formulate and adopt a water quality control plan (known as a Basin Plan) for its region. The Basin Plan must conform to the policies set forth in the Porter-Cologne Act and established by the State Water Board in its state water policy. To implement state and federal law, the Basin Plan establishes beneficial uses for surface water 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 Regional Water Board may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

The LA Regional Water Board has developed a Basin Plan for the Los Angeles region, which guides conservation and enhancement of water resources and establishes beneficial uses for surface waters within the region. Beneficial uses and water quality objectives necessary to sustain those beneficial uses are designated for receiving waters (including both groundwater and surface waters).[9]

(b) California Toxics Rule

Because California did not establish a complete list of acceptable water quality criteria, the USEPA established the California Toxics Rule (CTR), a federal program that includes numeric water quality criteria for certain toxic constituents in receiving waters with human health or aquatic life designated uses (40 CFR 131.38). The CTR's numerical aquatic life criteria are expressed as short-term (acute) and long-term (chronic) averages. 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, therefore, are used in assessing Project impacts. For example, the average storm duration for all storms in the 40-year Newhall rain gauge record is 7.1 hours. Acute criteria represent the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (one hour) without 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.

In addition, discharges are subject to metals criteria, which are expressed as a function of receiving water hardness and must be calculated based upon the probable hardness values of the receiving waters for evaluation of toxicity criteria. At higher hardness values for the receiving water, copper, lead, and zinc are more likely to be complexed (bound with) components in the water column. This in turn reduces the bioavailability and resulting potential toxicity of these metals. The average wet weather hardness value of 198 milligrams per liter (mg/L) for calcium carbonate ($CaCO_3$) in Santa Clara River Reach 5 was used to approximate CTR criteria for metals.

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[9] *Water Quality Control Plan for the Los Angeles Region, California Regional Water Quality Control Board, Los Angeles Region 4, February 23, 1995.*

(c) Construction General Permit

Pursuant to CWA Section 402(p), the State Water Board issued a statewide general permit for stormwater discharges from construction sites [Water Quality Order 2009-0009-DWQ, State Water Board NPDES General Permit for Stormwater Discharges Associated with Construction Activity (NPDES No. CAR000002; adopted by the State Water Board on September 2, 2009)].

Under the Construction General Permit, discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or be covered by the Construction General Permit. Coverage under the Construction General Permit is accomplished by submitting a construction site risk assessment to determine appropriate coverage level; preparing a Stormwater Pollution Prevention Plan (SWPPP), including site maps, a Construction Site Monitoring Program, 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. The primary objective of the SWPPP is to identify and apply proper construction, implementation, and maintenance 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 set by the Construction General Permit.

(d) California Green Building Standards Code

The California Green Building Standards Code (CALGreen Code), Part 11 of the California Building Standards Code (Title 24), is designed to improve public health, safety, and general welfare by utilizing design and construction methods that reduce the negative environmental impact of development and encourage sustainable construction practices.

The CALGreen Code provides mandatory direction to developers of all new construction and renovations of residential and non-residential structures with regard to all aspects of design and construction, including but not limited to site drainage design, stormwater management, and water use efficiency. Required measures are accompanied by a set of voluntary standards designed to encourage developers and cities to aim for a higher standard of development.

(3) Regional Regulations

(a) Basin Plan

The LA Regional Water Board's Basin Plan, entitled the *Water Quality Control Plan for the Coastal Waters of Los Angeles and Ventura Counties*, provides numeric 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 groundwaters. 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."[10] The existing beneficial uses of Santa Clara River Reach 5 include industrial and agricultural water supply; groundwater recharge; contact and non-contact water recreation; warm freshwater, wildlife, and rare species habitat; and wetland ecosystems.

The Basin Plan also contains water quality criteria for groundwater basins. For example, the Basin Plan requires that "[g]round waters shall not contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses."[11] The existing beneficial use for groundwater at the Project Site is designated as municipal: community, military, or individual water supply systems including drinking water.

(b) General Dewatering Permit

The LA Regional Water Board has issued a General NPDES Permit and General Waste Discharge Requirements (WDRs) (Order No. R4-2013-0095, NPDES No. CAG994004) that governs construction-related dewatering discharges within the Project development areas (known as the General Dewatering Permit). This permit addresses discharges from temporary dewatering operations associated with construction and permanent dewatering operations associated with operations. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges.

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[10] *Los Angeles Regional Water Quality Control Board, Water Quality Control Plan: Los Angeles Region, p. 3-37, revised April 19, 2013.*

[11] *Ibid, p. 3-41.*

(4) County Regulations

(a) County of Los Angeles General Plan

As discussed in greater detail in **Section 5.11**, Land Use and Planning, of this Draft EIR, the County General Plan directs future growth and development in the County's unincorporated areas and establishes goals, policies, and objectives that pertain to the entire County. The current General Plan, adopted in 1980, includes a Conservation and Open Space Element that sets policy direction for the open space resources of the County, including water resources, and a Water and Wastewater Management Element that addresses the protection of water resources and infrastructure. Relevant policies focus on the protection of groundwater, watershed management, water conservation, and minimizing soil erosion and sedimentation.

As also discussed further in **Section 5.11**, Land Use and Planning, the County circulated a draft General Plan update, entitled Los Angeles County General Plan 2035 (Draft General Plan), in January 2014 and a Draft EIR addressing the Draft General Plan in June 2014. This Draft General Plan contains a new Conservation and Open Space Element that addresses water quality, among other water-related issues, with relevant goals regarding compliance with applicable MS4, General Construction, and NPDES permit requirements, as well as TMDL standards. Additionally, the draft Water and Wastewater Management Element calls for watershed management, the protection of natural groundwater recharge areas, and utilization of LID techniques.

The General Plan policy consistency analysis provided in **Section 5.11**, Land Use and Planning, indicates the Project would be consistent with relevant General Plan polices related to water quality.

(b) Santa Clarita Valley Area Plan: One Valley One Vision 2012

As also discussed in greater detail in **Section 5.11**, Land Use and Planning, of this Draft EIR, the recently updated Santa Clarita Valley Area Plan: One Valley One Vision 2012 (Area Plan) serves as a long-term guide for development in the Valley Planning Area over the next 20 years. The Area Plan ensures consistency between the General Plans of the County and the City of Santa Clarita (City) in order to achieve common goals and encourages the coordination of land use plans with public services and other departments or agencies. The Area Plan's Conservation and Open Space Element addresses open space and conservation issues pertaining to hydrology and water quality, among others. Goal CO-4.3 is to limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff at the source. Policies identified to achieve this goal include achieving TMDL standards for chlorides in the Santa Clara River, eliminating perchlorate contamination from the Whittaker-Bermite property,

and reducing water pollution from chemical fertilizers, herbicides, and pesticides in landscaping. In addition, the use of vegetated drainage courses and soft-bottom channels are encouraged to achieve water quality and habitat objectives, as set forth in the Safety Element.

The Area Plan policy consistency analysis provided in **Section 5.11**, Land Use and Planning, indicates the Project would be consistent with applicable Area Plan polices related to hydrology.

(c) County Development Monitoring System

The County General Plan includes provisions known as the Development Monitoring System (DMS) to give the County planning agency—the Regional Planning Commission and/or Department of Regional Planning—information about the existing capacity of available specified public services in the four major Urban Expansion Areas of the General Plan (Antelope Valley, Santa Clarita Valley, Malibu/Santa Monica Mountains, and East San Gabriel Valley).[12] The primary purpose of the DMS is to ensure that new development in Urban Expansion Areas will occur in a manner consistent with stated DMS policies and will pay for the expansion costs that it generates. To accomplish this purpose, the DMS is used to determine the availability of certain public services as well as to assess the potential for certain environmental hazards, including flood and erosion hazards, on an individual and cumulative basis; analyze the expansion costs to certain public service providers as well as the costs to reduce environmental hazards; and work towards ensuring that the expansion costs of new development are paid for by that development.

The environmental provisions contained within the DMS address flood hazards, which include erosion. Refer to **Section 5.9**, Hydrology and Water Quality—Hydrology, of this Draft EIR for a more detailed discussion of DMS, its applicability to the Project, and an analysis of Project compliance with DMS policies regarding flood hazards, including erosion potential. As discussed therein, the Project would not result in a significant environmental impact with respect to flood hazards, including erosion, and thus is consistent with County General Plan DMS policies as they relate to flood hazards.

(d) MS4 Permit

In 2012, the LA Regional Water Board issued a revised NPDES Permit and WDRs (Order No. R4-2012-0175; NPDES Permit No. CAS004001) under the Clean Water Act and

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[12] *See Resolution of the Board of Supervisors of the County of Los Angeles Relating to Plan Amendment Case No. SP 86-173, adopted on March 21, 1987.*

the Porter-Cologne Act for discharges of urban runoff in public storm drains in Los Angeles County (County). The Permittees are the County, the County Flood Control District, and 84 incorporated cities within the County's coastal watersheds. This permit regulates stormwater discharges from MS4s in the Project area.

(i) Watershed Management Program

The MS4 Permit details specific minimum control measures and requirements. In lieu of these requirements, the County, the County Flood Control District, and the City of Santa Clarita (City) have elected to prepare an Enhanced Watershed Management Program (Watershed Program) for the Upper Santa Clara River watershed that comprehensively evaluates opportunities within the participating Permittees' collective jurisdictional area in the watershed for collaboration on multi-benefit regional projects. These projects should retain stormwater runoff and all non-stormwater runoff for the drainage areas tributary to the projects to specified levels, while also achieving other benefits such as flood control and water supply, or include a "reasonable assurance" Analysis to demonstrate that applicable water quality-based effluent limitations and receiving water limitations will be achieved through implementation of other watershed control measures. The draft Watershed Program must be submitted to the LA Regional Water Board in June 2015. The County must continue to implement its existing stormwater management program until the Watershed Program is approved by the LA Regional Water Board's Executive Officer.

(ii) Planning and Land Development Program Requirements

The MS4 Permit details specific requirements for new development and significant redevelopment projects, including selection, sizing, and design criteria for LID, treatment control, and hydromodification control BMPs. These requirements (referred to herein as Project Performance Criteria) are as follows:

- Projects shall control pollutants, pollutant loads, and runoff volume emanating from a project site by controlling runoff from impervious surfaces through infiltration, bioretention, and/or rainfall harvest and use.
- Except where technically infeasible, projects shall retain the Stormwater Quality Design Volume (Design Volume) on-site. The Design Volume for the Project Site is 1.1 inches.
- Where it is technically infeasible to retain 100 percent of the Design Volume on-site, a project must biofilter 1.5 times the portion of the Design Volume that is not reliably retained on-site.

- Bioretention and biofiltration systems must meet the design specifications provided in Attachment H to the MS4 Permit unless otherwise approved by the Regional Water Board Executive Officer.[13,14] Projects that discharge to a receiving water body impaired for nitrogen compounds must design and maintain biofiltration systems to achieve enhanced nitrogen removal capability.

- When evaluating the potential for on-site retention, each project must consider the maximum potential for evapotranspiration from green roofs and rainfall harvest and use.

- Technical infeasibility may result from conditions including:

  - An in-situ saturated soil infiltration rate less than 0.3 inch per hour (and it is not technically feasible to amend the in-situ soils to attain an infiltration rate necessary to achieve reliable performance of infiltration or bioretention BMPs in retaining the Design Volume on-site).

  - Depth to seasonal high groundwater is within 5 to 10 feet of the surface.

  - Locations within 100 feet of a groundwater well used for drinking water.

  - Brownfield development sites where infiltration poses a risk of causing pollutant mobilization.

  - Other locations at or near properties that are contaminated or store hazardous substances underground, where pollutant mobilization is a documented concern.

  - Locations with potential geotechnical hazards.

  - Smart growth, infill, or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with the on-site volume retention requirement.

- If a project complies with the Project Performance Standards via retention at an off-site location, then on-site treatment BMPs must be designed and implemented to meet specific benchmark effluent limitations contained in the MS4 Permit and to ensure that the treated discharge does not cause or contribute to an exceedance of water quality standards at the downstream MS4

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[13] *As defined in the MS4 Permit, a bioretention BMP may not include an underdrain. When a bioretention BMP is designed or constructed with an underdrain, it is regulated by the MS4 Permit as biofiltration.*

[14] *Biofiltration is defined in the MS4 Permit to include only systems designed to facilitate incidental infiltration or achieve the equivalent pollutant reduction as biofiltration BMPs with an underdrain (subject to Executive Officer approval). Biofiltration BMPs include bioretention systems with an underdrain and bioswales.*

outfall. These treatment BMPs may include sand filters or other proprietary BMPs with a demonstrated treatment efficiency equivalent to a sand filter. The sizing of a flow-through treatment BMP must be based on a rainfall intensity of 0.2 inch per hour or the 1-year, 1-hour rainfall intensity as determined from the most recent Los Angeles County isohyetal map, whichever is greater.

- Projects that discharge to natural drainage systems must implement hydrologic control measures (i.e., hydromodification controls) to prevent accelerated downstream erosion and to protect stream habitat. Hydromodification control in natural drainage systems must be achieved by maintaining the Erosion Potential in the natural drainage system at a value of 1, unless an alternative value can be shown to protect the natural drainage system from erosion, incision, and sedimentation and to prevent damage to stream habitat.

- Hydromodification control may include one or a combination of on-site, regional, or sub-regional hydromodification control BMPs, LID BMPs, or stream and riparian buffer restoration measures. Any in-stream restoration measure cannot adversely affect the beneficial uses of the natural drainage system.

- Natural drainage systems subject to the hydromodification control requirements in the MS4 Permit include all drainages that have not been improved (e.g., channelized or armored with concrete, shotcrete, or rip-rap) and drainage systems that are tributary to a natural drainage system, except as specifically exempted in the MS4 Permit. Exemptions include:

  - Projects that are replacement, maintenance or repair of a Permittee's existing flood control facility, storm drain, or transportation network.

  - Redevelopment projects in the urban core that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-project condition.

  - Projects that have any increased discharge directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q_{100}) of 25,000 cubic feet per second (cfs) or more, or other receiving water that is not susceptible to hydromodification impacts.

  - Projects that discharge directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts.

- Projects disturbing 50 acres or more within natural drainage systems are presumed to meet the hydromodification control Project Performance Criteria based on demonstration of one of the following conditions:

- The site infiltrates on-site at least the runoff from a 2-year, 24-hour storm event, or
- The runoff flow rate, volume, velocity, and duration for the post-development condition does not exceed the pre-development condition for the 2-year, 24-hour rainfall events. These conditions must be substantiated by hydrologic modeling acceptable to the Regional Water Board Executive Officer, or
- The Erosion Potential in the receiving water channel will approximate 1, as determined by a Hydromodification Analysis Study and the equation presented in Attachment J to the MS4 Permit.

The preliminary selection and sizing of facilities to meet the MS4 Permit's Project Performance Criteria is set forth in Section 5 of the Water Quality Report and addressed in the Hydrology Study provided in **Appendix 5.9**. Prior to issuance of a grading permit, facility sizing will be finalized by the Project engineer as part of the final hydrology study, which will be prepared and approved to ensure consistency with this analysis.

(e) Green Building Program

The County has a Green Building Program, which includes green building and drought-tolerant landscaping regulations, and has created an Implementation Task Force and Technical Manual, all of which are implemented through the Los Angeles County Green Building Standards Code (Title 31). Title 31 adopts and incorporates by reference specified provisions of the 2013 CALGreen Code.[15] The purpose of Title 31 is to facilitate sustainability via planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental air quality. Title 31 also references County Code Chapter 12.84, which provides LID requirements that address water conservation, discussed below. Title 31 is currently being revised to provide clarity for the development community, ensure consistency with the State and other local agencies, and advance sustainable construction standards in the County.

(i) Low Impact Development Ordinance and Manual

Chapter 12.84 of the County Code requires the use of LID BMPs in development projects within the County's unincorporated areas.[16] Public Works' LID Standards Manual

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[15] *The County's 2008 green building ordinances are being repealed, and the more recently adopted Title 31 requirements will apply to this Project.*

[16] *Chapter 12.84 was amended in September 2013 to conform to the requirements of the revised Los Angeles County MS4 Permit (Order No. R4-2012-0175).*

outlines stormwater runoff quantity and quality control development principles, technologies, and design standards for achieving the LID standards. The LID Standards Manual requires large scale residential and non-residential development projects to prioritize the selection of BMPs to retain 100 percent of the specified stormwater runoff design volume on-site through infiltration, evapotranspiration, stormwater runoff harvest and use, or a combination thereof, unless it is demonstrated that it is technically infeasible to do so. County Code Chapter 12.84 and the LID Standards Manual also contain requirements to fully mitigate off-site drainage impacts caused by hydromodification and changes in water quality, flow velocity, flow volume, and depth/width of flow, unless compliance is infeasible, and then the project must obtain written consent to the unmitigated impacts from the owner of every impacted downstream property.

(ii) County Drought-Tolerant Landscaping Requirements

Title 31 of the County Code requires that: turf areas in post-construction landscape designs not exceed 25 percent of the total landscaped area; non-invasive, drought-tolerant plant and tree species appropriate for the climate zone region be utilized in at least 75 percent of the total landscaped area; and hydrozoning irrigation techniques be incorporated. In addition, a water budget must be developed for landscape irrigation use that conforms to the California Department of Water Resources Model Water Efficient Landscape Ordinance.

(5) Previously Adopted Plans and Mitigation

(a) Newhall Ranch RMDP/SCP EIS/EIR

The Project Site is included in the project area for the Applicant's Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, shown in **Figure 3-5**, RMDP/SCP Project Area, in **Section 3.0**, Project Description, of this Draft EIR, which covers resource management for the Project and other nearby developments. As discussed in greater detail in **Section 3.0**, Project Description, of this EIR, the RMDP component of the Newhall Ranch RMDP/SCP project is a conservation, mitigation, and permitting plan for the long-term management of sensitive biological resources and development-related infrastructure in the Santa Clara River and tributary drainages within the 11,999-acre Newhall Ranch Specific Plan (Specific Plan) area and along the extension of Magic Mountain Parkway through the Project Site. The SCP component of the Newhall Ranch RMDP/SCP project is a conservation and management plan to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the San Fernando Valley spineflower (*Chorizanthe parryi ssp. Fernandina*) (spineflower), a federal candidate and a state-listed endangered plant species. The SCP encompasses the Specific Plan area, the Valencia Commerce Center planning area, and the Project Site, in

order to conduct conservation planning and preserve design on the Project Applicant's land holdings in Los Angeles County that contain known spineflower populations.

The Newhall Ranch RMDP/SCP project was the subject of a joint EIS/EIR (SCH No. 2000011025) by the Corps and CDFW.[17,18] At the time CDFW certified the EIR portion of the EIS/EIR in December 2010, it also adopted the Mitigation Monitoring and Reporting Plan (MMRP) for the RMDP/SCP project. This regulatory plan, required under CEQA, describes the mitigation measures, monitoring, and/or reporting plan for the Newhall Ranch RMDP/SCP project (including the Entrada South Project Site). CDFW adopted mitigation measures to reduce potential impacts to water quality resulting from implementation of the Newhall Ranch RMDP/SCP project (see Mitigation Measures (MM) RMDP/SCP WQ-1 and WQ-2 in **Appendix 2A**).

(i) Newhall Ranch Section 404 Permit

The Corps issued the Applicant the final CWA Section 404 permit (Permit No. SPL-2003-01264-AOA) for the Newhall Ranch RMDP/SCP project on October 17, 2012.[19] As part of that permit, the Corps imposed special conditions requiring the Applicant to mitigate all temporary construction impacts affecting waters of the United States, as well as to provide written notification to the Corps prior to initiation of various phases of grading and Project construction in waters of the United States.[20] In addition, the special conditions require the Applicant to clearly mark the limits of the workspace during all construction activities in waters of the United States; ensure all vehicle maintenance, staging, storage, and dispensing of fuel occurs in designated upland areas; and employ all standard BMPs to ensure toxic materials, silt, debris, or excessive erosion do not enter waters of the United States.[21] The special conditions also require the Applicant to install barriers prior to grading and to discharge only clean fill materials.[22]

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[17] *Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, Final Joint Environmental Impact Statement and Environmental Impact Report, June 2010.*

[18] *The California Department of Fish and Game was officially renamed the California Department of Fish and Wildlife as of January 1, 2013.*

[19] *See **Appendix 2F** of this Draft EIR for a copy of Newhall's final Section 404 permit and **Appendix 2D** for the associated Record of Decision (August 2011).*

[20] *See final Section 404 permit (October 17, 2012), Special Condition Nos. 3 and 4.*

[21] *See final Section 404 permit (October 17, 2012), Special Condition Nos. 8, 11, and 12.*

[22] *See final Section 404 permit (October 17, 2012), Special Condition Nos. 13 and 14.*

(ii) Newhall Ranch Section 401 Water Quality Certification

By federal law, no Section 404 permit can be issued until a CWA Section 401 water quality certification has been issued or waived by the Regional Water Board. On September 14, 2012, the LA Regional Water Board approved Order No. R4-2012-0139, which includes the Section 401 water quality certification and waste discharge requirements for the Newhall Ranch RMDP/SCP project. The Newhall Ranch waste discharge requirements do not directly apply to the Project; however, they serve as a benchmark for establishing the Project's LID Performance Standard.[23]

The Newhall Ranch Section 401 water quality certification prescribes the LID Performance Standard for the villages within Newhall Ranch (see General Conditions, Paragraph 10). The certification requires that projects conform to any aspects of the County MS4 Permit in effect at the time of water quality report preparation that are more stringent than the respective provisions of the certification. Currently, aspects of the MS4 Permit that are more stringent than the Newhall Ranch Section 401 water quality certification include the following:

- The MS4 Permit does not allow for 5 percent effective impervious area (as opposed to the Section 401 water quality certification, which does).
- The MS4 Permit defines biofiltration such that the storage volume provided in such systems cannot be less than the runoff from a 1.1 inch precipitation event for the project (as opposed to the Section 401 water quality certification, which is silent on the subject).
- The MS4 Permit establishes a soil infiltration rate infeasibility criterion of 0.3 inch per hour (as opposed to 0.5 inches per hour in the Section 401 water quality certification).

In other respects, the Newhall Ranch Section 401 water quality certification LID Performance Standard is equivalent to that required by the MS4 Permit described above. The LID Performance Standard, which is applicable to the Project, is summarized in Subsection 3.b.(2)(b)(ii), LID Performance Standard, below.

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[23] *See **Appendix 2E** of this Draft EIR for a copy of Newhall's final Section 401 Water Quality Certification (September 2012). As discussed in **Section 3.0**, Project Description, of this Draft EIR, the Project Site falls within the RMDP/SCP project area; and, thus, is subject to certain requirements set forth for that project.*

b. Existing Conditions

(1) Santa Clara River Watershed

The Project Site is located in the Santa Clara River Valley (River Valley), downstream of the City of Santa Clarita within Los Angeles County. The River watershed drains an area of 1,624 square miles in the Transverse mountain range of Southern California.[24] The Upper Santa Clara River watershed, which comprises approximately 650 square miles, is that portion of the watershed within the County. Elevations within the watershed range from sea level at the river mouth to 8,900 feet at the summit of Mount Pinos in the northwest corner of the watershed. The river is fed by numerous named stream tributaries, including Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River, as it flows westward from the Acton Basin, through a confined canyon (Soledad Canyon), through the Santa Clarita Valley (Valley), and finally through the River Valley in Ventura County, which eventually opens out across the Oxnard Plain before flowing into the Pacific Ocean near the City of Ventura, approximately 40 miles downstream of the Project Site.

(a) Climate

The Project region has a Mediterranean climate with cool, wet winters and hot, dry summers. The region's rainfall is characterized by highly variable annual rainfall, as recorded at the National Climatic Data Center (NCDC) Newhall rain gauge for water years 1969–2008. Analysis of the rainfall data indicates the average annual rainfall in the region is 18.3 inches; however, the average precipitation varies from less than 8 inches in dry years to over 33 inches in wet years. These wet and dry climatic changes are approximately decadal, with wet cycles sometimes persisting for periods of six or eight years, during which rainfall, although variable, may average about 140 to 150 percent of the long-term average. A detailed analysis of the region's rainfall is provided in Section 2.1.2 in the Water Quality Report.

(b) Santa Clara River

The River is perennial from the Valencia WRP, located just north of the Project Site, to a point approximately 3.5 miles downstream of the Los Angeles/Ventura County line near Rancho Camulos.[25] River flows can be affected by groundwater dewatering

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[24] *Stillwater Sciences, Geomorphic assessment of the Santa Clara River watershed: synthesis of the lower and upper watershed studies, Ventura and Los Angeles counties, California, 2011, www.ladpw.org/wmd/scr/docs/SCR_Geomorph%20Synthesis_SWS_2011_FINAL.pdf, accessed March 3, 2015.*

[25] *Newhall Ranch RMDP/SCP, Final EIS/EIR, Revised Section 4.4, June 2010.*

operations or diversions for agriculture or groundwater recharge. Throughout the River channel, complex surface water/groundwater interactions lead to areas of alternating gaining and losing river segments. In particular, downstream of the Los Angeles/Ventura County line, the River flows through the Piru groundwater basin where surface flows are lost to groundwater. This ephemeral reach of the River is referred to as the "Dry Gap," discussed in further detail below. Perennial flow generally returns downstream of the confluence with Hopper Canyon Creek and continues past Piru, Sespe, and Santa Paula Creeks, and into the Oxnard Plain.[26]

Artificial stream flow in the Upper Santa Clara River (i.e., that portion of the River within Los Angeles County) is derived from discharges of treated effluent from the Saugus and Valencia WRPs and runoff from agricultural fields and existing urban areas.[27] The Saugus WRP, located near Bouquet Canyon Road bridge, creates surface flows in the River from its outfall to near the I-5 bridge. The Valencia WRP outfall is located immediately downstream of the I-5 bridge and creates surface flows extending to the Dry Gap.

The existing River floodplain generally consists of a natural alluvial river system with a sand-bedded, braided channel and broad floodplain terraces.[28] Bed material in the River is mostly composed of non-cohesive sands and gravels. Bank erosion is due to flow impinging upon the banks. 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 through the Project area (average slopes range from 5 percent to 0.5 percent), it has a high potential to aggrade (deposit sediment) at low velocities.[29]

Most geologic materials in the watershed decompose mainly to silts and clays and to sand, with some coarser materials. Most sediment moved by the River and its main tributaries is fine, with less than 5 percent bedload-sized material (greater than

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[26] *Los Angeles Regional Water Quality Control Board, State of the Watershed—Report on Surface Water Quality: The Santa Clara River Watershed, November 2006, www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/Section%2010_References-Part%20I_COMPLETED.pdf, accessed March 3, 2015.*

[27] *Ibid.*

[28] *Stillwater Sciences, Assessment of Geomorphic Processes for the Upper Santa Clara River Watershed Los Angeles County, California, prepared for Ventura County Watershed Protection District, Los Angeles County Department of Public Works, and U.S. Army Corps of Engineers Los Angeles District, May 2011, www.ladpw.org/wmd/scr/docs/SCR_Geomorph%20Synthesis_SWS_2011_FINAL.pdf, accessed March 3, 2015.*

[29] *Newhall Ranch RMDP/SCP, Final EIS/EIR, June 2010*

0.25 millimeter, or about 0.01 inch in diameter). Some gravels and cobbles do occur within the beds of the stream and in their alluvium. Nonetheless, both the bed and the sediment transported by the River tend to be finer than in most Southern California watersheds.

As discussed in greater detail below, natural flows in the River, as in many Southern California streams, are highly episodic. For the gauged period between 1953 and 1996, annual flow at the Los Angeles/Ventura County line gauge 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 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). These large episodic events have a substantial effect on the geomorphic characteristics of the Santa Clara River mainstem.[30]

Balance Hydrologics concluded that the Santa Clara River is highly episodic after studying the response of the River to several different anthropogenic and natural disturbances.[31] 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 that potentially can 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 the first few years of the 21st century, 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.

Stillwater also describes sediment delivery from hillslopes and tributaries to the mainstem river as being dominated by extreme events associated with large, infrequent storms.[32] The episodic and extreme nature of discharge in the watershed results in the majority of sediment transport occurring in very short periods of time. For example, annual sediment discharge over the past several decades at the County line, Sespe Creek, and

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[30] *Newhall Ranch RMDP/SCP, Final EIS/EIR, Revised Section 4.4, June 2010.*

[31] *Balance Hydrologics, Assessment of Potential Impacts Resulting from Cumulative Hydromodification Effects, Selected Reaches of the Santa Clara River, Los Angeles County, California, 2005*

[32] *Stillwater Sciences, Geomorphic Assessment of the Santa Clara River Watershed, Synthesis of the Lower and Upper Watershed Studies Ventura and Los Angeles Counties, California, prepared for Ventura County Watershed Protection District, Los Angeles County Department of Public Works, and U.S. Army Corps of Engineers Los Angeles District, April 2011, www.ladpw.org/wmd/scr/docs/SCR_Geomorph%20 Synthesis_SWS_2011_FINAL.pdf, accessed March 3, 2015..*

Montalvo stream gauges (i.e., representing the Upper Santa Clara River, Sespe Creek, and Lower Santa Clara River watersheds) is estimated to have varied extensively. The three water years that contain the highest annual maximum instantaneous discharge at the Montalvo gauge account for nearly half of the total sediment yield out of the River. In contrast, most years have an annual total sediment yield less than 10 percent of the average annual total sediment yield. Unlike humid-region rivers, moderate discharges of intermediate recurrence thus do not carry the majority of the sediment load—the "dominant discharge" for the Santa Clara River is the largest discharge on record.

(i) Beneficial Uses

The Basin Plan lists beneficial uses of major water bodies within the region. Santa Clara River Reach 5 is listed and has specific beneficial uses assigned to it. The existing and potential beneficial uses of Santa Clara River Reach 5 are as follows:

- MUN: Community, military, or individual water supply systems including, but not limited to, drinking water supply (a potential beneficial use);
- 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;
- 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 ecosystems.

(ii) Dry Gap

The Dry Gap is underlain by the Piru Groundwater Basin, which begins about 0.7 stream mile below the Blue Cut gauging station at a point where the alluvium is thin and

underlain by non-water bearing rocks.[33] Under most flow conditions, all of the stream flow of the Santa Clara River from above the confluence with Piru Creek infiltrates into the Piru Groundwater Basin, so that there is no continuity of surface flow. Continuous surface flow between Blue Cut and Piru Creek often exists following large winter storms, during large releases from Castaic Lake, and in the winter and early spring of exceptionally wet years. The United Water Conservation District has estimated, using flow data collected over the past 50 years, that the River has continuous flows from the Los Angeles County line to the Pacific Ocean only 21.9 days year (6 percent of the year), with the vast majority falling in wet years.[34] Additional details regarding the Dry Gap are provided in Section 2.3.1, Water Quality Report.

(iii) Estuary

The Santa Clara River Estuary is located at the interface between the River and the Pacific Ocean, approximately 40 miles downstream of the Project Site. The Estuary is composed of a river channel that empties into a main lagoon impounded by a seasonally closed-mouth berm.[35] The mouth of the Estuary is typically open to the ocean during the winter and spring due to high flows following storms.[36] Lack of rainfall, lower river flows, and smaller surf result in the mouth closing during the summer and early fall. The main lagoon contains a network of channels and bars that are formed and reworked during storm events and subsequent tidal exchange while the mouth remains open.[37] A large amount of sediment passes through the Estuary and is discharged to the nearshore ocean, with coarser sediment contributing to the building of both offshore and nearshore deltas, which in turn supply sediment for subsequent mouth berm building and downcoast beach replenishment.

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[33] *McEachron, Murray, 2005. Description and Surface Water Modeling Capabilities of the Piru Basin Lower Santa Clara River Routing and Percolation Model. United Water Conservation District. December 9, 2005.*

[34] *McEachron, Murray, 2008. Letter to Antal Szijj, U.S. Army Corps of Engineers, Los Angeles District Regulatory Division, Ventura Field Office, from Murray McEachron, United Water Conservation District. Documentation of the Navigability of the Mainstem of the Santa Clara River. June 6, 2008.*

[35] *Stillwater Sciences, 2011c. Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County, California Final Synthesis Report. Prepared for City of Ventura. March 2011, www.cityofventura.net/files/file/public-works/rivers/Final%20Synthesis %20Report.pdf, accessed March 3, 2015.*

[36] *Los Angeles Regional Water Quality Control Board (LARWQCB), 2006. State of the Watershed—Report on Surface Water Quality The Santa Clara River Watershed. November 2006, www.swrcb.ca.gov/rwqcb4/ water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/Section%2010_ References-Part%20I_COMPLETED.pdf, accessed March 3, 2015.*

[37] *Stillwater Sciences, Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County, California Final Synthesis Report, prepared for City of Ventura, March 2011, www.cityofventura.net/files/file/public-works/rivers/Final%20Synthesis%20Report. pdf, accessed March 3, 2015.*

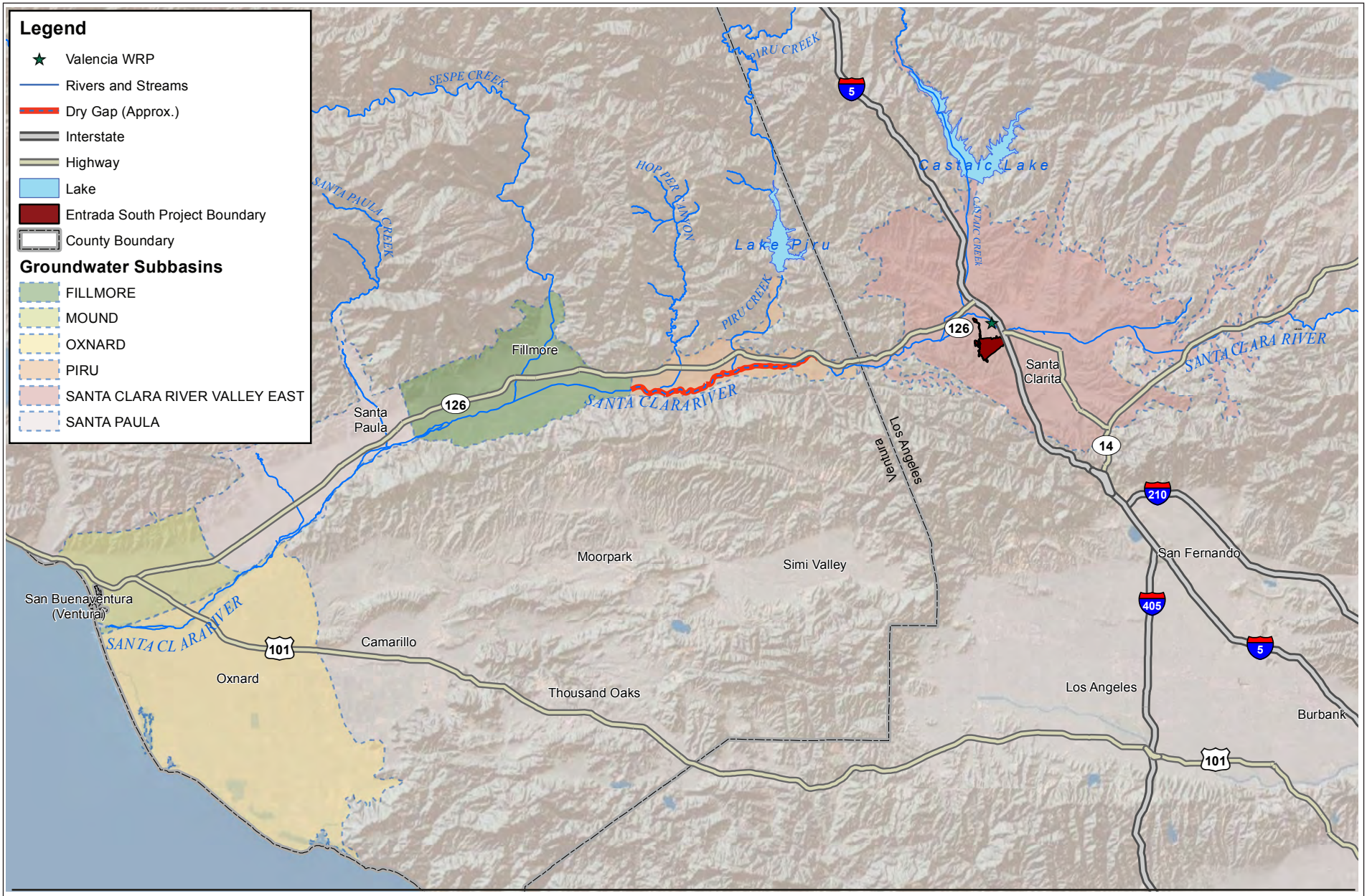
Analysis conducted by Stillwater of current and historical data shows that the relative rate of flows into and out of the Estuary varies inter-annually as well as over longer timescales, due to both natural and anthropogenic influences.[38] In general, the Santa Clara River flow is the dominant inflow to the Estuary from the fall through the spring, causing a relatively high mouth breaching and subsequent open-mouth frequency from November through June (i.e., the mouth is open greater than 50 percent of the time on average). During the summer months, the Ventura Water Reclamation Facility (VWRF) effluent discharge is the dominant inflow to the Estuary and the mouth breaching frequency is relatively low during most years (i.e., the mouth is closed greater than 50 percent of the time on average). When the mouth remains closed for long periods during dry conditions, the VWRF effluent discharge fills the Estuary to quasi-equilibrium "full" elevation that can be maintained for extended periods. The Estuary water balance developed for the Stillwater study period (October 2009 and September 2010) showed that approximately 80 percent of the total Estuary inflow and outflow volume occurred during and in the days following storm events. The water balance also showed that approximately 90 percent of the flow into the Estuary during closed-mouth periods from March through September 2010 came from the VWRF (effluent and pond percolation), indicating the relatively large role the VWRF plays in maintaining Estuary volume during the spring and summer months.

(c) Alluvial Groundwater Basins

As illustrated in **Figure 5.10-1**, Regional Groundwater Basins, on page 5.10-29, the Santa Clara River is underlain by several distinct alluvial groundwater basins—the Piru, Fillmore, and Santa Paula Basins in Ventura County, and the Santa Clara River Valley East Basin in Los Angeles County (Project location). These basins are divided longitudinally by sills or ridges of bedrock that support areas of locally-high (shallow) groundwater, including the area upstream from the County line (above the Piru Basin), and upstream from the mouth of Sespe Creek (the transition between the Piru and Fillmore Basins). This locally-high groundwater helps to sustain summer baseflow and riparian vegetation within the River corridor even through relatively dry climatic cycles.

As throughout Southern California, rainfall in the Santa Clara River watershed alternates between wet and dry periods, a variation that is central to understanding the geomorphic history of the watershed. Wet cycles tend to persist for several years, sometimes for periods of six or eight years, during which rainfall, although variable, may average about 140 to 150 percent of the long-term average. For the woody riparian vegetation along the banks and on islands in the braided channels, these are crucial periods for establishment and growth. During dry cycles, the roots of the riparian

[38] *Ibid.*



eyestone ENVIRONMENTAL

Figure 5.10-1
Regional Groundwater Basins

Source: Geosyntec Consultants, 2014.

vegetation must grow downward to the water table or perched zones, and where it cannot do so, this band of vegetation will die back.

The density, biomass, and location of vegetation in relation to the channel bottom are directly dependent upon the frequency of disturbance by flood flows.[39] Successional mule fat scrub occupies the active channel and is disturbed annually by flows. Channel-bottom habitat also includes all aquatic features, such as pools and flowing water, as well as most of the emergent wetlands in the River corridor because of the presence of water. In contrast, mature riparian forests are located above the active River channel and are only flooded during infrequent storm events, which allow large trees to become established between events.

Stands of vegetation are eroded by high flows, and newly vegetated areas are created where vegetation becomes established by seeds or buried stems.[40] Often during high flows, new sandbars are formed and old ones are destroyed. High flows can also change the alignment of the low-flow channel as well as the number and location of aquatic habitats of the River. In high-flow years, wetland vegetation along the margins of the low-flow channel and pools may increase. In high-flow years, this vegetation would be removed, but would likely become re-established during the spring and summer by natural colonization processes.

The aquatic habitats of the River are in a dynamic state of creation, development, disturbance, and destruction.[41] The amount of vegetation within the River corridor appears to have increased since the 1960s, likely due to the increased summer return flows from agricultural water and to year-round augmentation of base flows due to treated effluent discharge to the River from the Valencia and Saugus WRPs. However, this vegetation does not seem to provide enough erosion resistance to maintain a “stable” channel capable of withstanding regular “resets,” which occur at intervals averaging about a decade, or much less than the expected lifetime of the riparian woodlands that do get established.

(d) Surface Water Quality

Due to the highly variable nature of wet weather surface water quality in the River within the Project vicinity (i.e., Santa Clara River Reach 5), it is not appropriate to summarize water quality data for a single location in order to establish baseline water quality conditions. The data summarized below, however, is recent and current

[39] *Newhall Ranch RMDP/SCP, Final EIS/EIR, December 2010.*

[40] *Newhall Ranch RMDP/SCP, Final EIS/EIR, December 2010.*

[41] *Newhall Ranch RMDP/SCP, Final EIS/EIR, December 2010.*

(2001–2012) and provides an accurate and reasonable characterization of water quality conditions that currently exist in the Project area.

The existing wet and dry weather surface water quality in the Project area was characterized from available water quality monitoring data obtained from three sources: (1) tributary monitoring in Potrero Canyon, San Martinez Grande Canyon, Middle Canyon, Chiquito Canyon, and Long Canyon; (2) monitoring at locations upstream and downstream of the future Newhall WRP's outfall location in the Santa Clara River; and (3) Los Angeles County mass emission station (S29) in the upper end of Reach 5. Monitoring locations are shown in **Figure 5.10-2**, Project Vicinity and Monitoring Locations, on page 5.10-32. The wet weather water quality data obtained from these sources was separated by wet and dry years, and the detailed data analysis is discussed in Section 2.3.3 in the Water Quality Report.

The selected general constituents examined were total suspended solids (TSS), TDS, hardness, chloride, and total organic carbon (TOC). Also examined were the major nutrients of concern (nitrogen and phosphorous compounds); selected metals, including cadmium, copper, lead, and zinc; pesticides, including chlorpyrifos and diazinon; and fecal indicator bacteria. Existing concentrations for measured constituents in wet weather at the tributary monitoring stations are provided in **Table 5.10-3**, Concentrations for Measured Constituents from Tributary Monitoring, on page 5.10-33. Existing wet weather concentrations for the River for dry, normal, wet, and all years are provided in **Table 5.10-4**, Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5, on page 5.10-34. A summary of the data presented therein follows the tables.

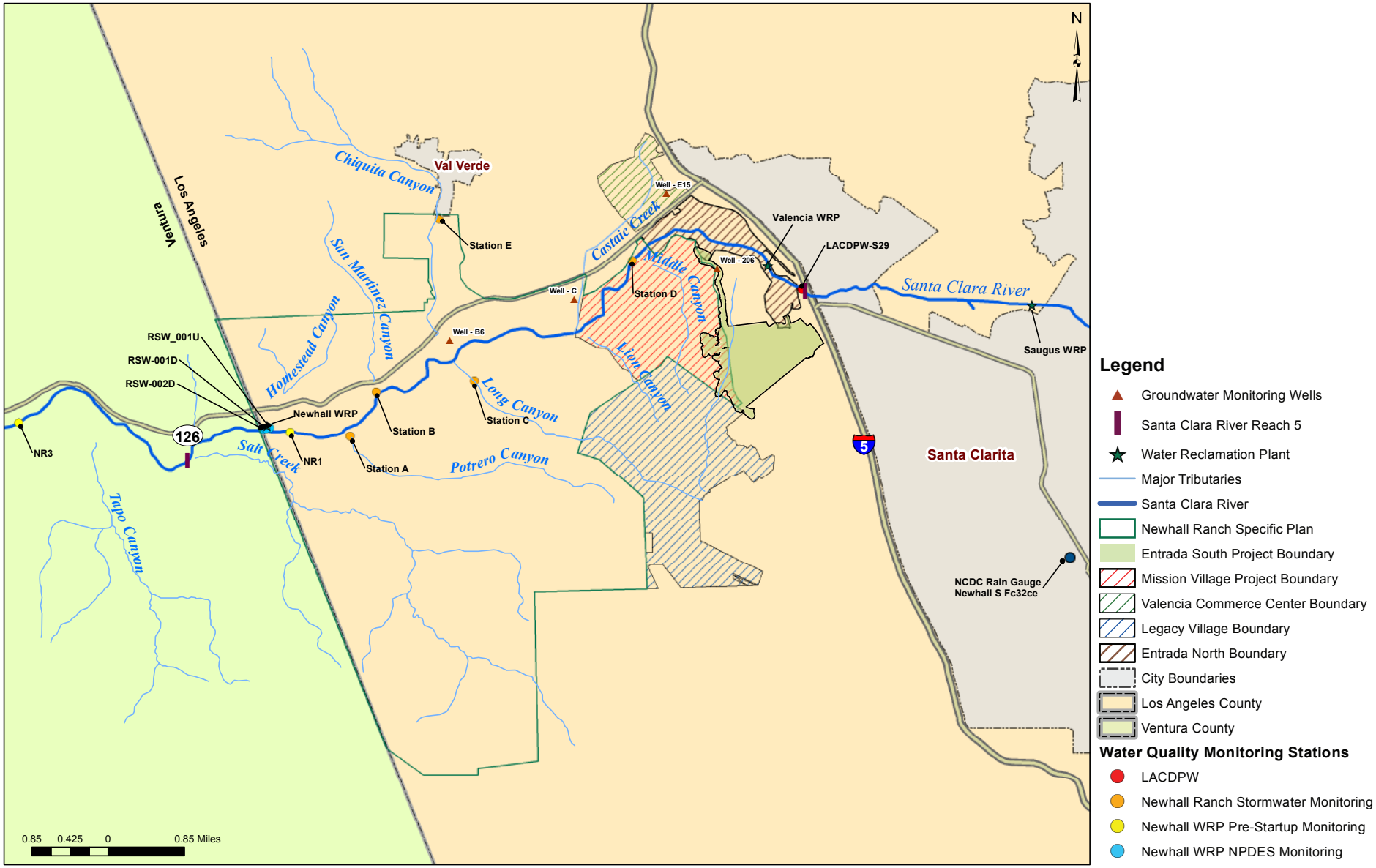


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Figure 5.10-2
Project Vicinity and Monitoring Locations

Source: Geosyntec Consultants, 2014.

Table 5.10-3
Concentrations for Measured Constituents from Tributary Monitoring

Constituent	Water Quality Standard	Site A Mouth of Potrero	Site B Mouth of San Martinez Grande	Site C Long Canyon Upstream of Onion Field	Site D Mouth of Middle Canyon	Site E Middle of Chiquito
General and Conventional Parameters						
TSS (mg/L)	[a]	835	41,100	36,000	5,650	6,645
TDS (mg/L)	1,000	**7,380**	**2,825**	190	160	205
Hardness (mg/L as CaCO3)	N/A	2,225	1,205	147	59	107
Chloride (mg/L)	100	**870**	**125**	3	3	11
Nutrients						
Nitrate (mg/L)	5	**17.5**	3	1.6	**15.3**	2.8
Metals						
Total Copper (µg/L)	See value in (parentheses) next to observed values[b]	15 (52)	175 (52)	**170** (21)	**10** (8.7)	**70** (15)
Total Lead (µg/L)		6.1 (480)	54 (480)	95 (140)	8 (43)	37 (92)
Total Zinc (µg/L)		40 (390)	330 (390)	**330** (170)	30 (78)	**225** (130)
Total Cadmium (µg/L)		0.3 (22)	11.2 (22)	2 (7.1)	0.4 (2.5)	1.9 (5.0)
Indicator Bacteria						
Total coliform (MPN/100ml)	N/A	38,700	>160,000	120,000	>89,400	>19,600
Fecal coliform (MPN/100ml)	N/A	3,300	590	4,200	>19,600	19,600

N/A = Not Applicable (there is no water quality standard for this constituent).

mg/L = milligrams per liter *µg/L = micrograms per liter* *MPN/100 ml = most probable number per 100 milliliters*

[a] *Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.*

[b] *Water quality standards for metals (copper, lead, zinc, and cadmium) are California Toxics Rule criteria for the observed hardness value at each location.*

Source: Geosyntec, 2014 (see Table 2-12 in the Water Quality Report).

Table 5.10-4
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
General and Conventional Parameters							
TSS (mg/L)	[b]	Dry	22	22	135	4,060	1,269
		Normal	22	22	26	3,270	565
		Wet	5	5	54	6,591	2,057
		All	49	49	9	6,591	937
TDS (mg/L)	1,000	Dry	22	22	128	708	328
		Normal	21	21	28	1,136	406
		Wet	5	5	134	908	544
		All	48	48	28	1,136	381
Hardness (mg/L as CaCO3)	N/A	Dry	22	22	70	370	172
		Normal	21	21	15	400	196
		Wet	5	5	90	464	296
		All	48	48	15	464	194
Chloride (mg/L)	100	Dry	22	22	9.1	118	45.0
		Normal	18	18	2.6	96.3	42.8
		Wet	3	3	9.3	115	46.6
		All	43	43	2.6	118	43.8
Total Organic Carbon (mg/L)	N/A	Dry	22	22	3.4	34.5	12.0
		Normal	18	18	4.0	25.5	11.3
		Wet	3	3	3.5	20.4	11.7
		All	43	43	1.9	34.5	11.0
Nutrients							
Dissolved Phosphorus (mg/L)	[c]	Dry	22	22	0.140	0.453	0.252
		Normal	18	17	<0.02	0.379	0.209
		Wet	3	3	0.100	0.200	0.160
		All	43	43	<0.02	0.453	0.221
Total Phosphorus (mg/L)	[c]	Dry	22	22	0.200	1.29	0.579
		Normal	21	21	0.220	1.17	0.445
		Wet	5	5	0.180	0.83	0.45
		All	48	48	0.180	4.50	0.568
Ammonia-N (mg/L)	4.1[d]	Dry	22	16	<0.1	1.35	0.209
		Normal	21	14	<0.005	1.09	0.242
		Wet	5	4	<0.03	0.34	0.219
		All	48	23	<0.005	1.35	0.227

Table 5.10-4 (Continued)
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
Nitrate-N (mg/L)	5[e]	Dry	22	18	<0.17	1.85	0.888
		Normal	21	14	<0.02	4.78	1.24
		Wet	5	5	0.76	3.49	1.82
		All	48	40	<0.03	4.78	1.13
Nitrite-N (mg/L)	5[f]	Dry	22	3	<0.01	0.998	0.080
		Normal	21	3	<0.005	0.867	0.068
		Wet	5	1	<0.03	0.430	0.093
		All	48	8	0.003	0.998	0.070
TKN (mg/L)	[c]	Dry	22	22	0.28	8.70	2.31
		Normal	21	20	<0.04	31.7	2.90
		Wet	5	5	0.43	3.32	1.62
		All	48	47	<0.04	31.7	2.40
Metals							
Dissolved Copper (µg/L)	25[f]	Dry	22	22	3.70	39.9	11.2
		Normal	19	15	<0.5	9.84	5.03
		Wet	3	3	5.90	22.6	15.2
		All	44	40	<0.5	39.9	8.25
Total Copper (µg/L)	26[f]	Dry	22	22	10.2	91.3	40.3
		Normal	19	16	<0.5	74.5	17.1
		Wet	4	4	5.20	28.0	17.1
		All	45	42	<0.5	91.3	26.1
Dissolved Lead (µg/L)	132[f]	Dry	22	16	<0.2	21.1	3.68
		Normal	19	8	<0.2	24.0	2.41
		Wet	3	1	<0.44	12.5	4.31
		All	44	25	<0.07	24.0	2.86
Total Lead (µg/L)	190[f]	Dry	22	22	1.73	110	25.0
		Normal	19	17	<0.2	71.6	10.8
		Wet	4	4	1.30	35.3	13.1
		All	45	42	<0.17	110	16.1
Dissolved Zinc (µg/L)	205[f]	Dry	22	20	<3.33	198	42.2
		Normal	19	17	<1	173	31.3
		Wet	3	3	10.2	29.7	17.3
		All	44	40	<1	198	32.9

Table 5.10-4 (Continued)
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
Total Zinc (µg/L)	210[f]	Dry	22	22	38.2	500	161
		Normal	19	19	10.9	298	77.2
		Wet	4	4	11.1	68.8	40.7
		All	45	45	10.9	500	104
Dissolved Iron (µg/L)	N/A	Dry	22	19	<33.33	12,700	1,472
		Normal	18	12	<50	4,350	549
		Wet	3	1	<100	3,635	1,245
		All	43	32	<50	12,700	938
Total Iron (µg/L)	N/A	Dry	22	22	1,100	49,000	19,222
		Normal	18	18	265	24,200	5,042
		Wet	3	3	988	34,956	21,115
		All	43	43	212	49,000	11,785
Dissolved Aluminum (µg/L)	N/A	Dry	22	12	<50	6,200	986
		Normal	19	10	<50	7,300	741
		Wet	3	2	<100	3,680	1,260
		All	44	23	<33	7,300	813
Total Aluminum (µg/L)	750[g]	Dry	22	22	171	27,600	8,862
		Normal	19	19	131	62,300	6,319
		Wet	3	3	450	19,650	10,148
		All	44	44	131	62,300	7,161
Dissolved Arsenic (µg/L)	340	Dry	22	22	0.850	3.66	1.66
		Normal	18	13	<0.2	2.28	1.14
		Wet	3	3	1.13	1.76	1.49
		All	43	38	<0.2	3.66	1.36
Total Arsenic (µg/L)	N/A	Dry	22	22	1.43	6.05	3.56
		Normal	18	16	<0.2	4.49	2.20
		Wet	3	3	2.26	5.17	3.5
		All	43	41	<0.2	6.05	2.78
Dissolved Cadmium (µg/L)	9[f]	Dry	22	8	<0.1	2.35	0.256
		Normal	18	0	<0.1	<0.1	<0.1
		Wet	3	1	<0.05	0.740	0.263
		All	43	9	<0.05	2.35	0.150

Table 5.10-4 (Continued)
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
Total Cadmium (µg/L)	9.5[f]	Dry	22	21	<0.1	3.47	0.988
		Normal	18	6	<0.1	1.26	0.214
		Wet	3	2	<0.05	1.27	0.752
		All	43	28	<0.05	3.47	0.577
Dissolved Chromium (µg/L)	943[f]	Dry	22	21	0.51	9.21	2.37
		Normal	18	13	<0.5	3.39	1.18
		Wet	3	3	1.16	1.69	1.47
		All	43	37	<0.5	9.21	1.65
Total Chromium (µg/L)	2,985[f]	Dry	22	22	3.23	46.4	18.4
		Normal	18	16	<0.5	43.7	8.19
		Wet	3	3	3.4	22.7	13.0
		All	43	41	<0.5	46.4	12.3
Dissolved Mercury (µg/L)	N/A	Dry	22	0	<0.1	<0.1	<0.1
		Normal	18	0	<0.1	<0.1	<0.1
		Wet	3	0	<0.45	<0.45	<0.45
		All	43	0	<0.03	<0.45	<0.45
Total Mercury (µg/L)	1.4[g]	Dry	22	1	<0.1	0.23	0.08
		Normal	18	1	<0.1	0.40	0.15
		Wet	3	0	<0.45	<0.45	<0.45
		All	43	1	<0.03	0.40	0.11
Dissolved Nickel (µg/L)	819[f]	Dry	22	22	1.76	20.6	7.80
		Normal	18	15	<0.5	11.8	4.57
		Wet	3	3	4.62	14.4	9.67
		All	43	40	<0.5	20.6	6.22
Total Nickel (µg/L)	821[f]	Dry	22	22	8.21	33.5	20.0
		Normal	18	17	<0.5	35.1	11.7
		Wet	3	3	15	19.5	16.7
		All	43	42	<0.5	35.1	15.0
Dissolved Selenium (µg/L)	N/A	Dry	22	10	<0.5	4.41	0.85
		Normal	18	4	<0.5	1.4	0.38
		Wet	3	1	<0.4	2.26	0.89
		All	43	14	<0.33	4.41	0.59

Table 5.10-4 (Continued)
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
Total Selenium (µg/L)	20	Dry	22	13	<0.5	4.62	1.07
		Normal	18	7	<0.5	1.73	0.60
		Wet	3	1	<0.4	3.04	1.15
		All	43	20	<0.33	4.62	0.80
Dissolved Silver (µg/L)	11[f]	Dry	22	1	<0.1	<0.1	<0.1
		Normal	18	0	<0.1	<0.1	<0.1
		Wet	3	0	<0.03	0.02	0.02
		All	43	1	<0.03	<0.1	<0.1
Total Silver (µg/L)	13[f]	Dry	22	10	<0.1	0.60	0.16
		Normal	18	0	<0.1	<0.1	<0.1
		Wet	3	2	<0.03	0.25	0.09
		All	43	11	<0.03	0.60	0.09
Pesticides and Cyanide							
Chlorpyrifos (µg/L)	0.02[h]	Dry	22	0	<0.02	<0.02	<0.02
		Normal	19	0	<0.02	<0.02	<0.02
		Wet	3	0	<0.05	<0.02	<0.02
		All	44	0	<0.003	<0.05	<0.05
Diazinon (µg/L)	0.08[h]	Dry	22	3	<0.003	0.082	0.009
		Normal	19	3	<0.003	0.430	0.042
		Wet	4	2	<0.01	0.410	0.113
		All	45	8	<0.003	0.430	0.031
Cyanide (µg/L)	22	Dry	22	6	<0.005	0.011	0.004
		Normal	20	7	<0.005	0.594	0.034
		Wet	4	1	<0.0095	0.010	0.005
		All	46	14	<0.001	0.594	0.017

Table 5.10-4 (Continued)
Wet Weather Water Quality Data for Measured Constituents in Santa Clara River Reach 5

Constituent	Water Quality Standard	Water Year	Santa Clara River Reach 5[a]				
			No. Samples	No. Detects	Min	Max	Average
Indicator Bacteria							
Total coliform (MPN/100 mL)[i]	N/A	Dry	22	22	17,000	2,400,000	146,926
		Normal	22	21	<1	1,600,000	64,918
		Wet	5	5	1,600	500,000	40,953
		All	49	48	<1	2,400,000	80,606
Fecal coliform (MPN/100 mL)[i]	N/A	Dry	22	22	230	240,000	13,889
		Normal	22	21	<1	500,000	13,484
		Wet	5	5	220	300,000	9,467
		All	49	48	<1	500,000	13,057
Fecal Enterococci (MPN/100 mL)[i]	[j]	Dry	22	22	800	1,600,000	40,578
		Normal	19	19	2,400	500,000	88,126
		Wet	3	3	90,000	300,000	181,104
		All	44	44	800	1,600,000	57,928

N/A = not applicable (there is no water quality standard for this constituent).

mg/L = milligrams per liter

µg/L = micrograms per liter

MPN/100 ml = most probable number per 100 milliliters.

[a] *Summary statistics for Santa Clara River Reach 5 include the LACDPW SCR Mass Emission Station S29 and the Newhall WRP station NR1 (2002-2013). Averages were calculated assuming non-detects were equivalent to half of the associated sample detection limit.*

[b] *Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.*

[c] *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*

[d] *4-day average, ELS present, average pH observed at Station S29 (7.3) and assumed temperature of 30 °C (temperature data are not available for SCR Reach 5).*

[e] *Water quality objective for nitrate+nitrite-N.*

[f] *Water quality standards for metals are acute (maximum one hour average concentration) California Toxics Rule (CTR) criteria for the average hardness value (194 mg/L) observed in SCR Reach 5 during wet weather. The dissolved and total chromium values are for chromium (III).*

[g] *USEPA National Recommended Ambient Water Quality Criteria (there is no CTR criterion).*

[h] *Criterion developed by the California Department of Fish and Wildlife.*

[i] *Bacteria averages are represented as Geometric Means.*

[j] *E. Coli shall not exceed a geometric mean of 126/100 mL nor a single sample limit of 235/100 mL.*

Source: Geosyntec, 2014 (see Table 2-13 in the Water Quality Report).

(i) Total Suspended Solids

Total suspended solids are a measure of the particulate matter suspended in water. Wet weather TSS concentrations ranged from 26 milligrams per liter (mg/L) to 6,591 mg/L, with an average of 1,012 mg/L in Santa Clara River Reach 5. Dry weather TSS ranged from <1 mg/L to 1,320 mg/L, and averaged 49.5 mg/L. TSS concentrations in wet weather are elevated due to the combination of high sediment supply and a high capacity for in-stream sediment transport.[42] The water quality objective for TSS in the Basin Plan is a narrative standard, which states, "water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses."

(ii) Total Dissolved Solids

Total dissolved solids are a measure of the dissolved cations (positive ions) and anions (negative ions) in water, primarily inorganic salts (calcium, magnesium, potassium, sodium, chlorides, and sulfates). TDS is an impairing pollutant in Reach 3 of the Santa Clara River, as listed in the State's CWA Section 303(d) list of impaired water bodies. The range of TDS concentrations in Reach 5 of the Santa Clara River during wet weather was 28 mg/L to 1,136 mg/L with an average of 390 mg/L. In dry weather, the TDS concentration in Reach 5 ranged from 504 mg/L to 2,806 mg/L, with an average of 844 mg/L. TDS is elevated in dry weather due to the influence of WRP discharges and groundwater inflows. The Basin Plan objective for Reach 5 is 1,000 mg/L, which was exceeded in both wet and dry weather in Santa Clara River Reach 5.

(iii) Chloride

Chloride comprises a large proportion of the TDS. High levels of chloride (salt) in Santa Clara River Reaches 3, 5, and 6 are causing impairment of listed beneficial uses for agricultural irrigation. Irrigation of salt-sensitive crops, such as avocados and strawberries, with water containing elevated levels of chloride can result in reduced crop yields. As a result, the State has ordered the Valley Sanitation District to reduce chloride levels in wastewater based on a determination that effluent from the Saugus and Valencia WRPs is harming downstream crops. In response to a State-mandated chloride limit, a Chloride TMDL was approved for these reaches. A summary of the Chloride TMDL is provided in **Table 5.10-2**, TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5 (see also Section 3.1.2 in the Water Quality Report.

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[42] *Balance Hydrologics, Assessment of Potential Impacts Resulting from Cumulative Hydromodification Effects, Selected Reaches of the Santa Clara River, Los Angeles County, California, 2005.*

Wet weather chloride concentrations in Santa Clara River Reach 5 ranged between 3 mg/L and 118 mg/L, with an average concentration of 44 mg/L. Average dry weather chloride concentrations in Reach 5 ranged from 46 mg/L to 140 mg/L, with an average concentration of 115 mg/L. The average wet weather concentration is less than the Basin Plan objective for Reach 5 (100 mg/L), however, the average dry weather concentration exceeds the objective. Chloride concentrations are generally higher in dry weather flows, reflecting the influence of reclamation plant discharges in dry weather.

(iv) Hardness

Hardness is a measure of cations in water, primarily calcium and magnesium, and is expressed as an equivalent concentration of calcium carbonate. Hardness measurements are important because the toxicity of metals decreases as hardness increases, which influences the associated water quality objectives. Hardness varied from 15.2 mg/L to 464 mg/L as $CaCO_3$ during wet weather and averaged 198 mg/L in Santa Clara River Reach 5. In dry weather, hardness ranged from 150 mg/L to 568 mg/L as $CaCO_3$ and averaged 330 mg/L in Reach 5. These concentrations are considered hard to very hard and were observed to be higher during dry weather flows because of the influence of reclamation plant discharges and groundwater inflows.

(v) Nutrients

Nutrients include phosphorus and nitrogen compounds. These are typically expressed as total or dissolved phosphorus and either nitrate, nitrite, ammonia, or total Kjeldahl nitrogen (TKN). The LA Regional Water Board has adopted a TMDL for certain nitrogen compounds (nitrate plus nitrite-nitrogen and ammonia) for the River. A summary of the Nitrogen Compounds TMDL is provided in **Table 5.10-2**, TMDL Wasteload Allocations for MS4 and Stormwater Sources to Santa Clara River Reach 5 (see also Section 3.1.2 in the Water Quality Report.

Dissolved phosphorus concentrations varied from <0.02 mg/L to 0.45 mg/L and averaged 0.23 mg/L in wet weather in Santa Clara River Reach 5. In dry weather, the range was <0.05 mg/L to 0.30 mg/L with an average concentration of 0.182 mg/L. The Basin Plan water quality objective for phosphorus is a narrative standard that 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." As the Regional Water Board has not identified the River as impaired for phosphorus, presumably dissolved phosphorus in wet and dry weather meets this standard.

Ammonia concentrations in wet weather ranged from <0.03 mg/L to 1.4 mg/L and averaged 0.23 mg/L in Santa Clara River Reach 5. In dry weather, ammonia

concentrations ranged from <0.005 mg/L to 0.81 mg/L, and averaged 0.10 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), which were not exceeded in wet or dry weather.

In Santa Clara River Reach 5, nitrate-N wet weather concentrations ranged from <0.01 mg/L to 4.8 mg/L and averaged 1.2 mg/L; nitrite-N concentrations ranged from 0.003 mg/L to 1.0 mg/L and averaged 0.08 mg/L. In Reach 5 dry weather, nitrate-N concentrations ranged from <0.005 mg/L to 4.9 mg/L and averaged 2.2 mg/L; nitrite-N concentrations ranged from <0.005 mg/L to 0.60 mg/L, and averaged 0.10 mg/L. The Basin Plan nitrate plus nitrite-N water quality objective for SCR Reach 5 is 5 mg/L. In general, nitrate and nitrite concentrations were higher during dry weather flows, but did not exceed the Basin Plan objective.

(vi) Metals

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.

The CTR acute freshwater criteria for dissolved copper, lead, zinc are 26, 140, and 210 micrograms per liter (µg/L), respectively (for the average wet weather hardness of 198 mg/L). For total copper, lead, and zinc, the CTR acute freshwater criteria are 27, 200, and 220 µg/L, respectively (for the same hardness). In Santa Clara River Reach 5 wet weather, some observed concentrations of dissolved copper (<0.5 µg/L to 39.9 µg/L) and total copper (<0.5 µg/L to 91.3 µg/L) exceeded the CTR acute criteria. Concentrations of dissolved and total lead (<0.2 µg/L to 24 µg/L for dissolved lead; <0.2 µg/L to 110 µg/L for total lead) were well below the respective CTR acute criteria. Concentrations of dissolved zinc (<1 µg/L to 198 µg/L) were below the CTR acute criteria for all samples except one measurement. Concentrations of total zinc ranged from 10.9 µg/L to 500 µg/L, with some data exceeding the CTR criteria. Concentrations of heavy metals in Santa Clara River Reach 5 dry weather flows were generally low and did not exceed the Basin Plan objectives.

An increase in the in-stream dissolved copper concentration in the Santa Clara River where and when steelhead smolts are present may have a deleterious effect on the smolts, as discussed in the National Oceanic and Atmospheric Administration (NOAA) Technical Memorandum entitled *An Overview of Sensory Effects on Juvenile Salmonids Exposed to*

Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity.[43]

(vii) Pesticides

Pesticides (including herbicides, insecticides and fungicides) are chemical compounds commonly used to control insects, rodents, plant diseases, and weeds. Organochlorine pesticides are associated with persistent bioaccumulative pesticides (e.g., DDT and other legacy pesticides) that have been banned by the USEPA. Toxic organophosphorous pesticides include diazinon and chlorpyrifos whose uses also are being banned or restricted by the USEPA. The current pesticides of concern for surface water quality are pyrethrums, pyrethroids, carbaryl, malathion, and imidacloprid. The Santa Clara River estuary is listed as impaired for legacy pesticides, including organochlorine pesticides. Santa Clara River Reaches 6, 3, 1, and the estuary are also listed for toxicity, and pesticides could be a potential source of the toxicity.

Chlorpyrifos was not detected at any of the SCR monitoring stations. Diazinon was detected in about 20 percent of the SCR Reach 5 wet weather samples and in only 2 out of 83 dry weather samples. Some of the diazinon wet weather concentrations exceeded the recommended 0.08 µg/L acute criterion, and both of the dry weather concentrations exceeded the recommended 0.05 µg/L chronic criterion derived by the CDFW (there are no CTR criteria for diazinon). Wet weather concentrations ranged from <0.003 µg/L to 0.43 µg/L. In dry weather, diazinon ranged from <0.003 µg/L to 2.0 µg/L.

(viii) Pathogens

Pathogens such as viruses, bacteria, and protozoa that cause illness in humans are difficult to measure. Natural sources include bird and mammal excrement. Anthropogenic sources include leaking septic and sewer systems and pet wastes. Fecal indicator bacteria such as Total Coliform, Fecal Coliform and Enterococci are commonly measured instead, and their presence indicates the potential for fecal contamination and the possible presence of associated pathogenic organisms. Concentrations of total and fecal coliform bacteria in wet and dry weather flows in Santa Clara River Reach 5 were highly variable and sometimes very high. The Basin Plan objective for fecal indicator bacteria is that E. Coli shall not exceed a geometric mean of 126/100 milliliter (mL) nor a single sample limit

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[43] *Hecht, S.A., D.H. Baldwin, C.A. Mehane, T. Hawkes, S.J. Gross, and N.L. Scholz, An Overview of Sensory Effects on Juvenile Salmonids exposed to Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity, U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-83, October 2007, www.nmfs.noaa.gov/pr/pdfs/ consultations/copper_salmon_nmfsnwfsc83.pdf, accessed March 3, 2015.*

of 235/100 mL. The LA Regional Water Board has adopted in the Basin Plan an Indicator Bacteria TMDL for the River. A summary of the Bacteria TMDL is provided in Section 3.1.2 in the Water Quality Report.

(e) Groundwater Basin

The Santa Clara River is underlain by several distinct alluvial groundwater basins—the Piru, Fillmore, and Santa Paula Basins in Ventura County, and the Santa Clara River Valley East Basin in Los Angeles County (near the Project Site). The sole source of local groundwater for urban water supply in the Santa Clarita Valley is the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin). The existing beneficial use for groundwater in the Basin is designated as municipal (community, military, or individual water supply systems) including drinking water.

The Basin is comprised of two aquifer systems, the Alluvial aquifer and the Saugus Formation. The Alluvial aquifer generally underlies the River and several of its tributaries, while the Saugus Formation is present beneath much of the Valley, as shown in **Figure 5.10-3**, Groundwater Aquifers, on page 5.10-45. The Saugus Formation is recharged at the east end of the Valley and discharges into the overlying Alluvial aquifer. Eventually the Alluvial aquifer discharges into the River near the western end of the Valley. Additional information regarding the Alluvial aquifer and Saugus Formation is provided below.

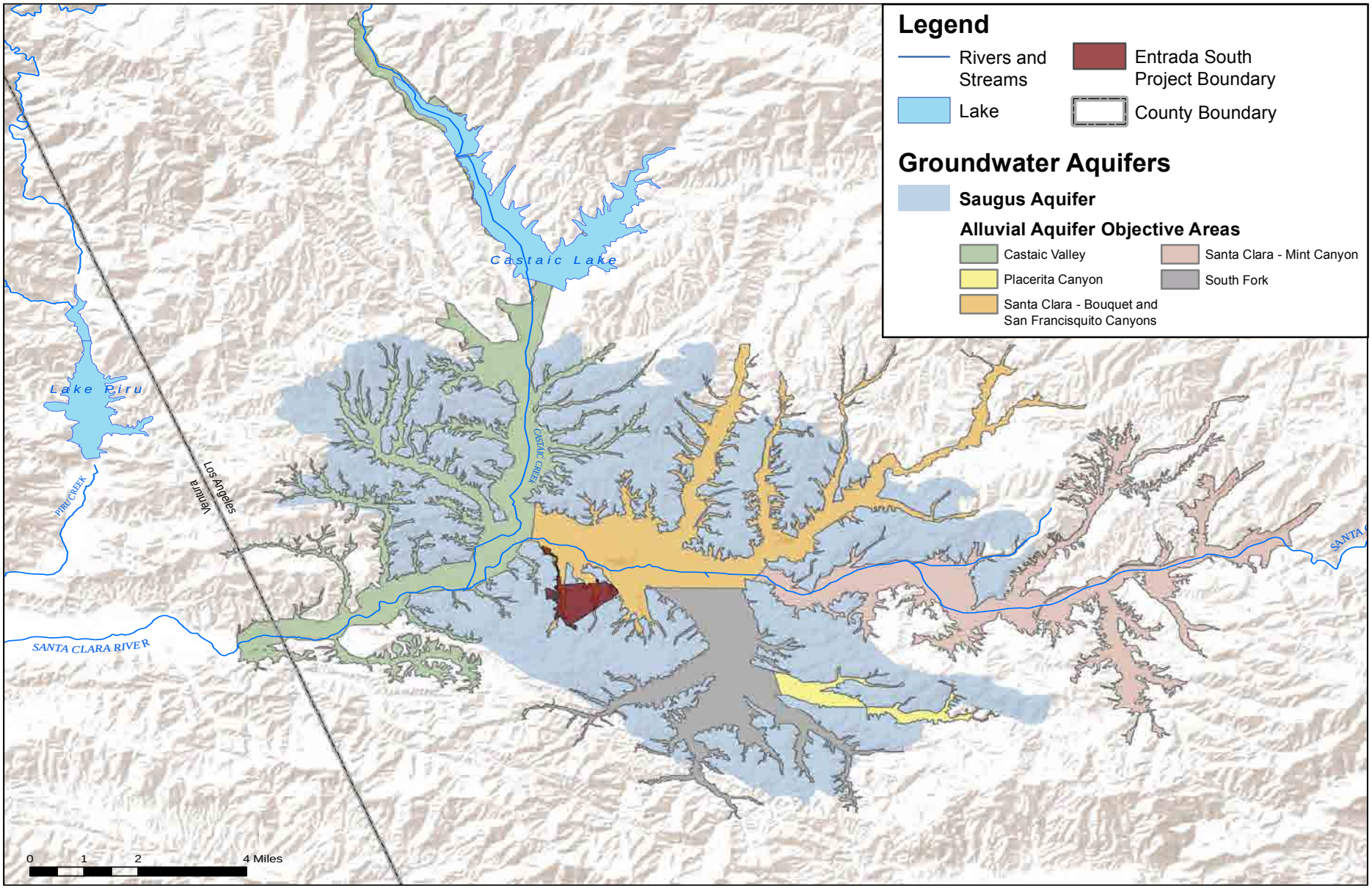

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Figure 5.10-3
Groundwater Aquifers

Source: Geosyntec Consultants, 2014.

(i) Alluvial Aquifer

Groundwater quality is a key factor in assessing the Alluvial aquifer as a municipal and agricultural water supply. Groundwater quality details and long-term conditions, examined by the integration of individual records from several wells in the same aquifer and in close proximity to each other, are discussed in the annual Water Reports and in CLWA's 2010 UWMP.[44] In summary, those conditions include no long-term overall trend and, most notably, no long-term decline in Alluvial groundwater quality. The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvial aquifer is a viable ongoing water supply source in terms of groundwater quality. The most notable groundwater quality issue in the Alluvium is perchlorate contamination (discussed further below).

Table 5.10-5, Groundwater Monitoring Data, on page 5.10-47 summarizes average metals, general chemistry, and organic compounds data for three Alluvial aquifer wells located in and near the Project location (see **Figure 5.10-2**, Project Vicinity and Monitoring Locations). One well (E-15) is a municipal water supply well owned by the Valencia Water Company (VWC), located in the Valencia Commerce Center area north of the Project Site. Two Newhall Ranch agricultural Alluvial aquifer wells (C and B6) were monitored twice (once each in 2000 and 2001).

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 5.10-5**, Groundwater Monitoring Data, indicated "non-detect," meaning no perchlorate was detected. Furthermore, no organic contaminants have been detected in any Alluvial aquifer wells.

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[44] *Castaic Lake Water Agency, 2010 Urban Water Management Plan (Final), June 2011, www.water.ca.gov/urbanwatermanagement/UWMP2010.cfm, accessed March 4, 2015.*

Table 5.10-5
Groundwater Monitoring Data

Parameter	Units	Basin Plan Objective/ MCL	Average Concentration			
			Alluvial Well E-15	Alluvial Well C	Alluvial Well B6	Saugus Well 206
Aluminum	µg/L	1,000[b]	ND	ND	ND	ND
Arsenic	µg/L	50[b]	N/A	ND	ND	N/A
Barium	mg/L	1[b]	ND	0.02	0.03	ND
Beryllium	µg/L	4[b]	ND	N/A	N/A	ND
Cadmium	µg/L	5[b]	ND	ND	ND	ND
Chromium	µg/L	50[b]	ND	ND	ND	ND
Copper	µg/L	1,000[c]	ND	ND	ND	ND
Iron	mg/L	0.3[c]	ND	0.1	**0.4**	ND
Manganese	µg/L	50[c]	ND	ND	ND	ND
Mercury, Total	µg/L	2[b]	N/A	ND	ND	N/A
Nickel	µg/L	100[b]	ND	ND	ND	ND
Selenium	µg/L	50[b]	N/A	ND	ND	N/A
Silver	µg/L	100[c]	NA	ND	ND	N/A
Thallium	µg/L	2[b]	NA	ND	ND	N/A
Zinc	µg/L	5,000[c]	ND	ND	ND	ND
Alkalinity as CaCO3	mg/L	—	226	255	295	221
Boron	mg/L	1.0[a]	0.48	0.39	0.48	N/A
Chloride	mg/L	150[a]	90	57	82	45
Color	Color unit	15[c]	ND	ND	5	ND
Cyanide, total	mg/L	0.15[b]	N/A	ND	ND	N/A
Fluoride	mg/L	2.0[b]	0.8	0.7	0.8	0.2
Hardness as $CaCO_3$	mg/L	—	499	410	510	464
MBAS	mg/L	0.5[c]	N/A	ND	ND	N/A
Nitrate as NO_3	mg/L	45[a]	18.5	9.5	10.6	20.9
Nitrite as N	mg/L	1[a]	ND	ND	ND	ND
Nitrate+Nitrite as N	mg/L	10[a]	3.6	2.1	2.4	4.7
Odor	TON	3[c]	1.1	ND	ND	1
Specific Conductance	umhos/cm	900–1,600[c]	1,317	1,150	1,400	1,158
Sulfate	mg/L	350[a]	314	285	**360**	293
TDS	mg/L	1,000[a]	969	760	950	861
Turbidity	NTU	5[c]	0.4	0.35	1.4	0.2
Volatile Organic Chemicals (VOCs)	µg/L	variable	ND	ND	ND	ND

Table 5.10-5 Continued)
Groundwater Monitoring Data

Parameter	Units	Basin Plan Objective/ MCL	Average Concentration			
			Alluvial Well E-15	Alluvial Well C	Alluvial Well B6	Saugus Well 206
Synthetic Organic Chemicals (SVOCs)	µg/L	variable	ND	ND	ND	ND

Bold *= Exceeds Standard*

— = No applicable basin plan objective or MCL

N/A = Not analyzed

ND = NONE detected

[a] *Los Angeles Basin Plan Regional Objectives for Groundwater (Table 3-10).*

[b] *California Department of Public Health Primary Drinking Water MCL (Title 22 CCR Table 64431-A and Table 64444-A).*

[c] *California Department of Public Health Secondary Drinking Water MCL (Title 22 CCR Table 64449-A and Table 64449-B).*

Source: Geosyntec, 2014 (see Table 2-27 in the Water Quality Report).

(ii) Saugus Formation

As discussed above for the Alluvium, groundwater quality is a key factor in assessing the Saugus Formation as a municipal and agricultural water supply. Long-term Saugus groundwater quality data are not sufficiently extensive to permit any sort of basin-wide analysis or assessment of pumping-related impacts on quality. However, the integration of individual records from several wells has been used to examine general water quality trends. Based on available data over the last 50 years, groundwater quality in the Saugus Formation has exhibited a slight overall increase in dissolved mineral content; although since 2005, these levels have been steadily dropping or remaining constant. Dissolved mineral concentrations in the Saugus Formation remain below the Secondary (aesthetic) MCL.[45]

Table 5.10-5, Groundwater Monitoring Data, summarizes average metals, general chemistry, and organic compounds data for one Saugus aquifer well located within the Project Site (see **Figure 5.10-2**, Project Vicinity and Monitoring Locations). Saugus Well

[45] *Castaic Lake Water Agency, 2012 Santa Clarita Valley Water Report, CLWA Santa Clarita Water Division, Los Angeles County Waterworks District 36, Newhall County Water District, Valencia Water Company, June 2013, http://dpw.lacounty.gov/wwd/web/Documents/Water%20Quality%20Reports/valverde2011.pdf, accessed March 3, 2015.*

206 is a municipal water supply well owned by the Valencia Water Company. 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 (discussed further below).

Groundwater quality has been monitored at four wells near the Project Site, including three within the Alluvial aquifer and one within the Saugus Formation (refer to **Figure 5.10-2**, Project Vicinity and Monitoring Locations). Laboratory testing indicates that all constituents tested in the Alluvial aquifer wells were at acceptable levels for drinking water, for all tested wells, with the exception of sulfate and iron in an agricultural supply well. 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 this well. Tests conducted for perchlorate in the Alluvial aquifer wells indicated none was detected. Furthermore, no organic contaminants have been detected in any Alluvial aquifer wells. All constituents tested were at acceptable levels for drinking water in the Saugus well. A more detailed discussion on groundwater quality is provided in Section 2.4.2 in the Water Quality Report.

Perchlorate, a chemical used in making rocket and ammunitions propellants, has been a groundwater quality constituent of concern in the Santa Clarita Valley since 1997 when it was originally detected in four wells operated by the Castaic Lake Water Agency (CLWA) purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility.[46] In late 2002, the contaminant was detected in a fifth well, an Alluvial well (Santa Clarita Water District (SCWD) Stadium Well) also located near the former Whittaker-Bermite site, and was immediately taken out of service. Perchlorate was detected again in early 2005 in a second Alluvial well (VWC Well Q2) near the former Whittaker-Bermite site, and in 2006 in very low concentrations (below the detection limit for reporting) in a Saugus well (Newhall County Water District (NCWD) Well NC-13) near one of the originally impacted wells. The maximum contaminant level (MCL) of six micrograms per liter (µg/L) was adopted by the California Department of Public Health (DPH) in 2007.

In August 2010, perchlorate was detected in VWC's Saugus Well 201.[47] Confirmation sampling in the months that followed confirmed the detection of perchlorate at concentrations that ranged from 5.7 to 12 µg/L. VWC removed Well 201 from service when perchlorate was first detected.

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[46] *Castaic Lake Water Agency, 2010 Urban Water Management Plan (Final), June 2011.*

[47] *Castaic Lake Water Agency, 2010 Urban Water Management Plan (Final), June 2011.*

To date, perchlorate has been detected in a total of eight wells, in both the Saugus Formation and the Alluvium. Two of these wells (SCWD Saugus 1 and Saugus 2) have been returned to service with DPH approval, utilizing approved perchlorate treatment. Two wells (VWC Well 157 and SCWD Stadium Well) were sealed and the capacity replaced with new wells. NCWD Well 11 was taken out of service. VWC Well Q2 had treatment installed in 2005; the treatment was then removed due to testing showing "non-detect," and the treatment removal was DPH-approved in 2007. Well Q2 remains in service. NCWD Well NC-13 is monitored annually; results always have been below the detection limit for reporting and the well remains in service. VWC Well 201 remains out of service pending evaluation of remediation alternatives.[48] Additional discussion of perchlorate contamination, containment, remediation, and water supply restoration is provided in **Section 5.21**, Utilities and Service Systems—Water Supply and Service, of this Draft EIR.

Recycled water in the Project vicinity currently is available from the Valencia WRP. The potential impacts on groundwater quality associated with the use of recycled water for irrigation purposes are addressed in this section.

(2) Project Site

The Project Site comprises 501.4 acres located within a 1,436-acre drainage area within the 1,634-square-mile Santa Clara River Watershed. The Project Site generally is comprised of vacant land, with limited agricultural uses in the northernmost portion, a small plant nursery used by the adjacent Six Flags Magic Mountain in the central portion, and abandoned oil wells and associated unpaved access roads scattered throughout the site. The former drill pads are generally level and often consist of areas of cut and fill. There is also soil scraping disturbance adjacent to Six Flags Magic Mountain theme park (Six Flags Magic Mountain) for fire suppression. Additionally, Southern California Edison and Southern California Gas Company have transmission corridors within easements along the southern portion of the site. The easements/transmission lines and associated access roads are actively maintained.

Four tributaries to the Santa Clara River drain through the Project Site: Magic Mountain Canyon, Unnamed Canyon 1, Unnamed Canyon 2, and Unnamed Canyon 3 (refer to **Figure 5.9-1**, Existing Tributary Drainage Features, in **Section 5.9**, Hydrology and Water Quality—Hydrology). Magic Mountain Canyon is an intermittent stream that flows seasonally, and the others contain ephemeral streams that only flow during rainy periods.

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[48] *Castaic Lake Water Agency, 2012 Santa Clarita Valley Water Report, CLWA Santa Clarita Water Division, Los Angeles County Waterworks District 36, Newhall County Water District, Valencia Water Company, June 2013, http://dpw.lacounty.gov/wwd/web/Documents/Water%20Quality%20Reports/valverde2011.pdf, accessed March 3, 2015,*

Currently, each of these tributary watersheds drains through a concrete channel or storm drain to the River. Additional information regarding the tributary watersheds is provided in Section 2.3.2 of the Water Quality Report.

The two existing reclamation plants discharging treated wastewater to the River upstream of the Project Site are shown in **Figure 5.10-2**, Project Vicinity and Monitoring Locations. The Saugus WRP is located 4 miles upstream from the Project Site, across Bouquet Canyon Road at Soledad Canyon Road, and the Valencia WRP is located just north of the Project Site along The Old Road. The Newhall Ranch WRP, proposed in conjunction with the Newhall Ranch Specific Plan, will be located downstream of the Project Site and will also discharge treated wastewater to the River.

3. ENVIRONMENTAL IMPACTS

a. Methodology

The methodology used to evaluate potential water quality impacts involved the following: (1) review applicable regulatory documents and resources; (2) evaluate how implementation of the Project may impact on-site and surrounding water quality taking into account regulatory compliance and applicable Project design features (PDFs); and, if significant impacts are identified, (3) evaluate whether adoption of the applicable mitigation measures and permit conditions set forth in the Newhall Ranch RMDP/SCP EIS/EIR, 404 Permit, and 401 water quality certification would mitigate the Project's impacts or whether additional Project-specific mitigation measures would be necessary. Information, regulations, and policies set forth by the applicable regulatory agencies and the County also were reviewed.

The analysis of construction and post-development (operational) phase water quality impacts, including hydromodification impacts, presented below takes into account the BMPs selected for compliance with the MS4 Permit and County LID Manual requirements and incorporated into the Project's design. As further explained below, the level of significance of identified water quality impacts is evaluated using a weight of evidence approach (rather than a decision based on any one individual significance criterion); considering significance criteria that include: a comparison between existing water quality and predicted Project runoff quality; compliance with MS4 Permit and construction and dewatering permit requirements; and reference to receiving water quality benchmarks, including TMDL wasteload allocations applicable to MS4 discharges and water quality objectives or criteria from the Basin Plan and CTR. A more detailed description of the impact analysis methodology for surface water and groundwater quality is provided in Section 4 and Section 6 of the Water Quality Report.

(1) Surface Water Quality

The surface water analysis evaluates whether sizeable additional sources of polluted runoff may result from the Project based on water quality modeling and qualitative assessments that take into account water quality BMPs. Increases in pollutant concentrations or loads in runoff resulting from the development of the Project Site are considered an indication of a potentially significant adverse water quality impact. If, however, 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 Project will 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, then for both the construction and post-development phases, potential impacts are assessed by evaluating compliance of the Project with applicable regulatory requirements of the MS4 Permit, the Construction General Permit, and the General Dewatering Permit. Further, post-development increases in pollutant loads and concentrations are evaluated by comparing the magnitude of the increase to relevant benchmarks, including receiving water TMDLs, receiving water quality objectives, and criteria from the Basin Plan and CTR, as described below.

(a) Receiving Water Benchmarks

Comparison of post-development water quality concentrations in the runoff discharge with benchmark TMDL waste load or load allocations for MS4 discharges establishes the likelihood that runoff would result in TMDL exceedances in receiving waters or would otherwise degrade receiving water quality. As stated, the TMDL, as the name suggests, is the sum of the individual load allocations for point, non-point, and natural sources that a water body may receive without exceeding the Basin Plan water quality objective. In determining load, the TMDL measures the sum of individual load allocations using pounds or tons. In contrast to load, the Basin Plan water quality objective focuses instead on concentrations in water measured in micrograms (µg) per volume of water (liter or “L”). So long as the sum of the load allocations from the source of the pollutants does not result in an exceedance of the Basin Plan water quality objective (measured in mg/L), there can be no degradation of water quality in the receiving waters, nor any contribution to potential pollutants to the receiving waters that would result in a significant water quality impact.

Comparison of post-development water quality concentrations in the runoff discharge with benchmark numeric and narrative receiving water quality criteria as provided in the Basin Plan and the CTR facilitates analysis of the potential for runoff to

result in exceedances of receiving water quality standards, adversely affect beneficial uses, or otherwise degrade receiving waters.

Water quality criteria are considered benchmarks for comparison purposes only, as such criteria apply within receiving waters as opposed to applying directly to runoff discharges. Narrative and numeric water quality objectives contained in the Basin Plan apply to the Project's receiving waters. Water quality criteria contained in the CTR provide concentrations that are not to be exceeded in receiving waters more than once in a three year period for those waters designated with aquatic life or human health related uses. Projections of runoff water quality are compared to the acute form of the CTR criteria, as stormwater runoff is associated with episodic events of limited duration, whereas chronic criteria apply to 4-day exposures which do not describe typical storm events in the Project area, which last seven hours on average. If pollutant levels in runoff are not predicted to exceed receiving water benchmarks, it is one indication that no significant impacts will result from project development.

(b) MS4 Permit Requirements for New Development

Satisfaction of MS4 Permit requirements for new development, including County LID Manual requirements, and satisfaction of construction-related requirements of the Construction General Permit and General Dewatering Permit, establish compliance with water quality regulatory requirements applicable to stormwater runoff.

The MS4 Permit requires that BMPs be implemented to reduce the discharge of pollutants in stormwater to the "maximum extent practicable." MS4 requirements are met when new development complies with the requirements set forth in the MS4 Permit and LID Manual. The effectiveness of stormwater controls are primarily based on two factors: (a) the amount of runoff that is captured by the controls; and (b) the selection of BMPs to address identified pollutants of concern. Selection and numerical sizing criteria for new development water quality controls are included in the MS4 Permit and the County LID Manual. If the Project BMPs meet MS4 requirements, including sizing for water quality controls and other BMPs consistent with the LID requirements, it indicates that no significant impacts will occur as the result of MS4 Permit compliance.

(c) Construction General Permit and General Dewatering Permit.

The Construction General Permit requires the development and implementation of a SWPPP that describes erosion and sediment control BMPs as well as material management/non-stormwater BMPs that will be used during the construction phase of development. The General Dewatering Permit addresses discharges from permanent or temporary dewatering operations associated with construction and development and includes provisions mandating notification, sampling and analysis, and reporting of

dewatering and testing-related discharges. To evaluate significance of construction phase Project water quality impacts, this section evaluates whether water quality control is achieved by implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT), as required by the Construction General Permit and the General Dewatering Permit.

(d) Water Quality Model

A water quality model was used to estimate pollutant loads and concentrations in Project stormwater runoff for certain pollutants of concern for pre- and post-development conditions. The water quality model is one of the few models that takes 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 using a Monte Carlo approach to develop estimates of mean annual loads and concentrations. For additional information regarding the water quality model utilized in the analysis, see Section 6 of the Water Quality Report.

(e) Pollutants of Concern

The pollutants of concern selected for the water quality analysis include those that potentially could be generated by the Project at substantial concentrations based on the proposed land uses. Identification of the pollutants of concern also considered the Basin Plan's designated beneficial uses and water quality objectives, CTR criteria, and current CWA Section 303(d) listings and TMDLs for the Santa Clara River, as well as pollutants that have the potential to cause toxicity or bioaccumulate in the receiving waters. Accordingly, the following pollutants were selected for analysis: sediment (total suspended solids and turbidity), nutrients, metals (copper, lead, zinc, and iron), chloride, pesticides, pathogens, petroleum hydrocarbons, trash and debris, bioaccumulation,[49] detergents, toxicity, and emerging contaminants. Detailed information about these pollutants and also those pollutants that were not considered of concern for the Project is provided in Section 4 of the Water Quality Report.

Of the pollutants of concern selected for analysis, the following were quantitatively modeled: total suspended solids, total phosphorus, nitrate, nitrite, ammonia, total and dissolved copper, total and dissolved iron, total lead, total and dissolved zinc, and chloride.

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[49] *Pollutants that are known to bioaccumulate include certain pesticides, certain metals (e.g., lead and mercury), PAHs, and certain synthetic organic compounds like polychlorinated biphenyls and dioxins. See www.epa.gov/pbt/pubs/cheminfo.htm, accessed March 3, 2015.*

A detailed description of the modeling methodology is provided in Appendix D of the Water Quality Report.

The remaining pollutants of concern typically lack the statistically reliable monitoring data required for the water quality model. Pollutants that could not be modeled were addressed qualitatively using information from literature and best professional judgment. Impacts from the following pollutants of concern were addressed qualitatively: turbidity, pesticides, pathogens, hydrocarbons, trash and debris, detergents, bioaccumulation, toxicity, and emerging contaminants.

(2) Groundwater Quality

Groundwater quality benchmarks for groundwater pollutants of concern were compared with post-development runoff water quality to establish the likelihood that runoff would result in a degradation of groundwater quality. Identification of the groundwater pollutants of concern for the Project considered the proposed land uses as well as pollutants with the potential to impair beneficial uses of the groundwater downstream of the Project Site. Nitrate plus nitrate was selected as the pollutant of concern for purposes of evaluating groundwater quality impacts because it potentially could be generated by the Project at concentrations that may impair beneficial uses of the groundwater downgradient of the Project Site. Human activities and land use practices can influence nitrogen concentrations in groundwater.

(3) Hydromodification/Sediment Analysis

Urbanization modifies natural watershed and stream hydrologic and geomorphic processes by introducing increased volumes and duration of flow via increased runoff from impervious surfaces and drainage infrastructure. Potential changes to the hydrologic regime may include increased runoff volumes, frequency of runoff events, long-term cumulative duration, and increased peak flows. Urbanization may also introduce dry weather flows where only wet weather flows existed prior to development. These changes are referred to as “hydromodification.”

Hydromodification intensifies sediment transport and often leads to stream channel enlargement and loss of habitat and associated riparian species. Under certain circumstances, development can also cause a reduction in the amount of sediment supplied to the stream system and ultimately the ocean, which can lead to stream channel incision and widening. These changes also have the potential to impact downstream channels and habitat integrity. A project that increases runoff due to impervious surfaces and traps sediment from upland watershed sources creates compounding effects.

The effects of stream channel hydromodification resulting from wet weather flows were evaluated taking into account the Project's LID BMPs, which would also be effective for hydromodification control. The water quality model results comparing stormwater runoff volumes for existing and post-development (i.e., Project with BMPs) conditions were also used to evaluate the effect of the Project's LID BMPs. In order to quantitatively address impacts from dry weather flows, a monthly dry weather flow balance was performed on the LID and treatment control BMPs for the proposed Project.

b. Proposed Design Elements/Project Design Features

As discussed in **Section 3.0**, Project Description, of this Draft EIR, the Project would meet or surpass the requirements of Public Works and all applicable NPDES permits by providing drainage, flood control, and water quality features such as storm drains, debris basins, water quality facilities, and inlet and outlet structures. **Figure 3-16**, Project Drainage and Water Quality Plan, in **Section 3.0**, Project Description, depicts the Project's drainage and associated water quality infrastructure. As shown, the plan includes a comprehensive series of improvements designed to protect Project development.

BMPs incorporated into the Project to address surface water and groundwater quality and hydromodification impacts include erosion and sediment control BMPs to be implemented during the Project construction phase, and site design, source control, LID, treatment control, and hydromodification control BMPs to be implemented during the post-development (operational) phase.

(1) Construction Phase Controls

During the Project's construction phase, BMPs would be implemented in compliance with the State's Construction General Permit and the LA Regional Water Board's General Dewatering Permit. In accordance with the Construction General Permit, the Project would reduce or prevent erosion and sediment transport and the transport of other potential pollutants from the site through implementation of BMPs meeting BAT/BCT.[50] The BMPs to be implemented would be documented in the SWPPP. The following types of BMPs would be included in the SWPPP and implemented as-needed during construction:

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[50] *BAT/BCT are Clean Water Act technology-based standards that are applicable to construction site stormwater discharges. Federal law specifies factors relating to the assessment of BAT including: age of the equipment and facilities involved; the process employed; the engineering aspects of the application of various types of control techniques; process changes; the cost of achieving effluent reduction; non-water quality environmental impacts (including energy requirements); and other factors as the Administrator deems appropriate. Source: Clean Water Act Sections 304(b)(2)(B) and 304(b)(4)(B).*

- **Erosion control.** Vegetation and other materials (such as straw, fiber, stabilizing emulsion, etc.) placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

- **Sediment control.** Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

- **Waste and Materials Management.** Measures include covered storage and secondary containment for material storage areas, secondary containment for portable toilets, covered dumpsters, dedicated and lined concrete washout/waste areas, proper application of chemicals, and proper disposal of all manner of waste products including: solid, liquid, sanitary, concrete, hazardous, and equipment-related wastes.

- **Non-Stormwater Management.** Practices designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, water conservation practices, vehicle and equipment cleaning and fueling practices, street sweeping, and other actions.

- **Training and Education.** Training of individuals responsible for SWPPP implementation and permit compliance, including contractors and subcontractors, would include certification through the State Water Board for Qualified SWPPP Developers and Qualified SWPPP Practitioners.

- **Inspection, Maintenance, Monitoring and Sampling.** Includes site inspections before, during, and after storm events, implementing a Rain Event Action Plan prior to qualifying storm events, construction site monitoring plans to address leaks and spills of non-visible pollutants, and water quality sampling for turbidity and pH.

BMPs would also be implemented to protect the Project Site's receiving waters from dewatering and construction-related non-stormwater discharges. Such discharges would be implemented in compliance with the General Dewatering Permit. 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; or use of a sedimentation bag for small volumes of localized dewatering.

(2) Post-Construction (Operational) Phase Controls

(a) Source Control BMPs

The Source Control BMPs that have been incorporated into the Project are consistent with the County's LID Manual and the BMPs set forth in the Newhall Ranch RMDP/SCP EIS/EIR. The Project BMPs are listed in **Table 5.10-6**, LID Standards Manual Source Control Requirements and Corresponding Best Management Practices, on page 5.10-59.

Table 5.10-6
LID Standards Manual Source Control Requirements and Corresponding Best Management Practices

Source Control Requirement	Criteria/ Description	Corresponding Entrada South BMPs
S-1: Storm Drain Message and Signage	• All storm drain inlets and catch basins within the Project area must be marked 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 will be stenciled or labeled. • Signs will be posted in areas where dumping could occur. • The Los Angeles County Department of Public Works and/or Home Owners Associations will maintain stencils and signs.
S-2: Outdoor Material Storage Areas	• Where proposed Project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system measures to mitigate impacts must be included.	• Pesticides, fertilizers, paints, and other high risk materials used for maintenance of common areas, parks, commercial areas, and multifamily residential common areas will be kept in enclosed storage areas.
S-3: Outdoor Trash Storage and Waste Handling 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 will be covered and isolated from stormwater runoff.
S-4: Outdoor Loading/ Unloading Dock Areas	• 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 will be covered or designed to preclude run-on and runoff. • Direct connections to storm drains from depressed loading docks (truck wells) will be prohibited. • Drains or direct drainage from hydraulically-isolated loading dock areas will be connected to an approved sediment/oil/water separator system connected a discharge location as determined by LACDPW. A manual emergency spill diversion valve upstream of will be provided upstream of the separator.

Table 5.10-6 (Continued)
LID Standards Manual Source Control Requirements and Corresponding Best Management Practices

Source Control Requirement	Criteria/ Description	Corresponding Entrada South BMPs
S-5: Outdoor Vehicle/ Equipment Repair/ Maintenance Areas	• 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.	• Repair/maintenance bays will comply with the design requirements.
S-6: Outdoor Vehicle/ Equipment/ Accessory Wash Areas	• 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 will be self-contained or covered with a roof or overhang; will be equipped with a wash racks and with the prior approval of the sewering agency; will be equipped with a clarifier or other pretreatment facility; and will be properly connected to a sanitary sewer.
S-7: Fuel and Maintenance Area	• The fuel dispensing area must be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be 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 2 percent to 4 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 from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.	• Fueling areas will comply with design requirements.

Table 5.10-6 (Continued)
LID Standards Manual Source Control Requirements and Corresponding Best Management Practices

Source Control Requirement	Criteria/ Description	Corresponding Entrada South BMPs
S-8: Landscape Irrigation Practices	• Do not allow irrigation runoff from the landscaped area to drain directly to storm drain system. • Minimize use of fertilizer, pesticides, and herbicides on landscaped areas. • Plan sites with sufficient landscaped area and dispersal capacity (e.g., ability to receive irrigation water without generating runoff). • Consult a landscape professional regarding appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.	• Native and/or non-native/non-invasive, climate appropriate vegetation will be utilized within the development. • Landscape watering in common areas, commercial areas, multiple family residential areas, and in parks will use efficient irrigation technology utilizing evapotranspiration sensors to minimize excess watering. • The use of the parcel-based LID BMPs and regional infiltration/ biofiltration facilities will prevent the discharge of dry weather urban runoff from the Project. • Landscape and irrigation system design will comply with the design requirements or approved alternatives. • An Integrated Pest Management (IPM) Program will be implemented for common area landscaping in commercial areas and multi-family residential areas,
S-9: Building Materials Selection	• Wood that is pressure treated with arsenate, copper, and chromium compounds may be replaced with alternative building materials. • Minimize or avoid the use of copper and galvanized metals on buildings and in fencing. • Reduce the use of pesticides around foundations through the use of alternative barriers where feasible.	• Pressure treated wood that is treated with arsenate, copper, or chromium compounds may be replaced with alternative building materials. • The use of copper and galvanized metals on buildings and in fencing will be minimized or avoided. • The use of alternative barriers for termites will be considered.
S-10: Animal Care and Handling Facilities	• Site animal care and handling facilities away from the storm drain system and receiving waters. • Manage grazing to prevent impacts to receiving waters. • Manage horse access and horse waste to prevent pollutants from entering the storm drain system or receiving waters.	• The Project does not include animal care facilities, grazing, or horse access.
S-11: Outdoor Horticultural Areas	• Do not allow wash water from horticulture areas to drain directly to the storm drain system or receiving waters.	• Wash water from horticultural areas will not drain directly to the storm drain system or to receiving waters.

Table 5.10-6 (Continued)
LID Standards Manual Source Control Requirements and Corresponding Best Management Practices

Source Control Requirement	Criteria/ Description	Corresponding Entrada South BMPs
Minimize Stormwater Pollutants of Concern	• Incorporate a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in runoff to the Maximum Extent Practicable.	• The Project will include numerous source controls, including animal waste bag stations, street sweeping and catch basin cleaning, and installation of a car wash pad in multi-family residential areas. • An education program will be implemented that includes both the education of residents and commercial businesses regarding water quality issues. Topics will 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 will emphasize animal waste management, such as the importance of cleaning up after pets and not feeding pigeons, seagulls, ducks, and geese.

Source: Geosyntec, 2014.

(b) LID and Treatment Control BMPs

(i) Site Design BMPs

LID site design BMPs would occur at different spatial scales of development, including the sub-regional, Project, land use, and lot or parcel scales. **Table 5.10-7,** Entrada South Site Design Best Management Practices, on page 5.10-63 summarizes the specific site design BMPs incorporated into the Project.

Table 5.10-7
Entrada South Site Design Best Management Practices

Spatial Scale	Corresponding Site Design BMP
Sub-Region	The sub-regional planning area projects cluster development into villages. Approximately 66 percent of the sub-regional planning area will remain undeveloped Open Areas.
	A system of Open Areas will weave through the central portion of the sub-regional planning area. 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.
	The sub-regional planning area designates a total of 5,159 acres for the River Corridor and High Country Special Management Areas. These Special Management Areas are designed to protect the existing natural resources within Los Angeles County's Significant Ecological Areas SEA 20 and SEA 23.
	The 976-acre River Corridor Special Management Area is designed to protect the sensitive biological resources in SEA 23, which consists of the Santa Clara River corridor. The River Corridor Special Management Area is to be dedicated to the Center for Natural Lands Management, which will assume responsibility for management of this area.
	The largest land use designation in the sub-regional planning area is the 4,185-acre High Country Special Management Area. The High Country is located in the southern portion of the sub-region 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 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; this Joint Powers Authority will assume responsibility for management of this area.
	To enhance the wildlife corridor movement through the High Country Special Management Area, the 1,517-acre portion of the Salt Creek watershed situated in Ventura County, which is under the ownership of Newhall Land, will be dedicated to the public. This dedication area is west of Newhall Ranch, and will be managed in the same manner as the Newhall Ranch High Country Special Management Area.
	Two conservation easements of approximately 64 acres have been granted to CDFW for the purpose of conserving populations of spineflower that occur in the sub-regional planning area.
Village	Impervious areas will be minimized by incorporating landscaped areas into the Project. Based on the land use categories within the water quality model, approximately 136.5 acres of the 382.3 acre Entrada South tract map area (36 percent) would be open space or park.
	Project BMPs, including parcel-based and regional LID BMPs, will disconnect impervious areas and reduce flows to natural channels through infiltration and evapotranspiration.
	In areas not subject to mass grading, the smallest site disturbance area possible will be delineated and flagged and temporary storage of construction equipment will be restricted in these areas to minimize soil compaction on site. Site clearing and grading will be limited as necessary to allow development, allow access, and provide fire protection.
	A 27.2 acre Spineflower Preserve will be provided within the tract map site.

Table 5.10-7 (Continued)
Entrada South Site Design Best Management Practices

Spatial Scale	Corresponding Site Design BMP
	The large portion of Unnamed Canyon 3 will be stabilized and restored in its existing alignment.
Land Use	Streets, sidewalks, and parking lot aisles will be constructed to the minimum widths 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 will be constructed with open-jointed paving materials, granular materials, or other pervious materials.
	Native and/or non-native/non-invasive vegetation that requires less watering and chemical application will be utilized within the common area landscaping in commercial areas and multi-family residential areas.
	Impervious surfaces will be minimized in common area landscape design.
	Landscape watering in common areas, commercial areas, multiple family residential areas, and parks will use efficient reclaimed water irrigation technologies with centralized irrigation controls. Efficient irrigation for common area irrigation systems will include a combination of the following techniques: • Low volume irrigation systems will be used, including low volume sprinkler heads, drip emitters, and bubbler emitters, to minimize water use. • "Smart" irrigation controllers will be installed to control the amount of time irrigation systems are operated each day. These may include satellite controlled sensors or other equally effective technology.
Lot	Parcel-based LID BMPs (e.g., bioretention areas, porous pavement) will manage runoff from commercial, multi-family residential, institutional, recreational, and park land uses and will infiltrate and/or biofilter this runoff as feasible.
	Runoff from most sidewalks, walkways, trails, and patios will be directed into adjacent landscaping or to parcel-based LID BMPs.
	Landscape areas will be integrated into each lot as determined by zoning requirements, village setback/parkway standards, and design objectives.
	Home builders will be required to implement hydrologic source controls for rooftops, patios, patios and walkways to retain the LID design storm volume. Hydrologic source controls include but are not limited to directing rooftop runoff through landscaped areas, installing percolation trenches, and installing rain barrels.
	Building materials for roof gutters and downspouts will not include copper or zinc.

Source: Geosyntec, 2014 (see Table 5-2 in the Water Quality Report).

(ii) LID Performance Standard

The Project's LID Performance Standard complies with the provisions of both the County MS4 Permit and the Newhall WDR. Where the provisions in the two conflict, the more stringent provision has been applied.

The LID Performance Standard must be implemented as follows:

- Institutional, commercial, multi-family residential, recreation, and park land use parcels shall implement retention or biofiltration BMPs within the parcel footprint. Runoff from roofs, patios, and walkways in single-family residential parcels shall be dispersed over landscaped areas to retain runoff. Runoff from the remaining developed area and that which is not retained within the parcel footprints shall flow through the storm drain system to the regional infiltration/biofiltration facilities.

- Based on an assessment of feasibility, one of the following three BMP strategies shall be applied:

  a. If it is feasible to infiltrate all of the runoff produced from a 1.1 inch storm from the developed area, infiltration BMPs [Category 1] shall be used. Infiltration BMPs include bioretention (without an underdrain), permeable pavement, infiltration galleries, infiltration basins or trenches, or an equivalent infiltration BMP.

  b. If it has been demonstrated in the Water Quality Report provided in **Appendix 5.10** and the Hydrology Study provided in **Appendix 5.9** that the BMP strategy of subsection (a) of this condition is infeasible, and if the Project has low soil infiltration rates but no other technical infeasibility concerns exist, bioinfiltration BMPs [Category 2] shall be used. Bioinfiltration facilities are similar to bioretention facilities with an underdrain, but they include storage below the underdrain to maximize the volume infiltrated.

  c. If it has been demonstrated in the Water Quality Report provided in **Appendix 5.10** and the Hydrology Study provided in **Appendix 5.9** that the BMP strategies of subsections (a) and (b) above are infeasible, then biofiltration BMPs [Category 3] shall be used. Biofiltration facilities include bioretention with underdrains and planter boxes.

- Runoff from roadways shall be retained or biofiltered in retention or biofiltration BMPs sized to capture the design storm volume or flow, per the guidance in USEPA's *Managing Wet Weather with Green Infrastructure: Green Streets*.

- Regional facilities shall be designed to infiltrate or biofilter the runoff volume from the 1.1 inch design storm volume that has not been retained or biofiltered within parcels, single-family lots, or road rights-of-way. Four regional facilities have been proposed as part of the Project (referred to as Facilities A through D, shown in **Figure 5.10-4**, Regional and Parcel-Based LID BMP Drainage Areas, on page 5.10-66). Additionally, regional facilities shall be designed to provide extended detention treatment for the additional runoff volume required to provide 80 percent capture and treatment of the average annual runoff volume for the tributary area to the regional facility per the Specific Plan Sub-Regional Stormwater Mitigation Plan treatment performance standard.

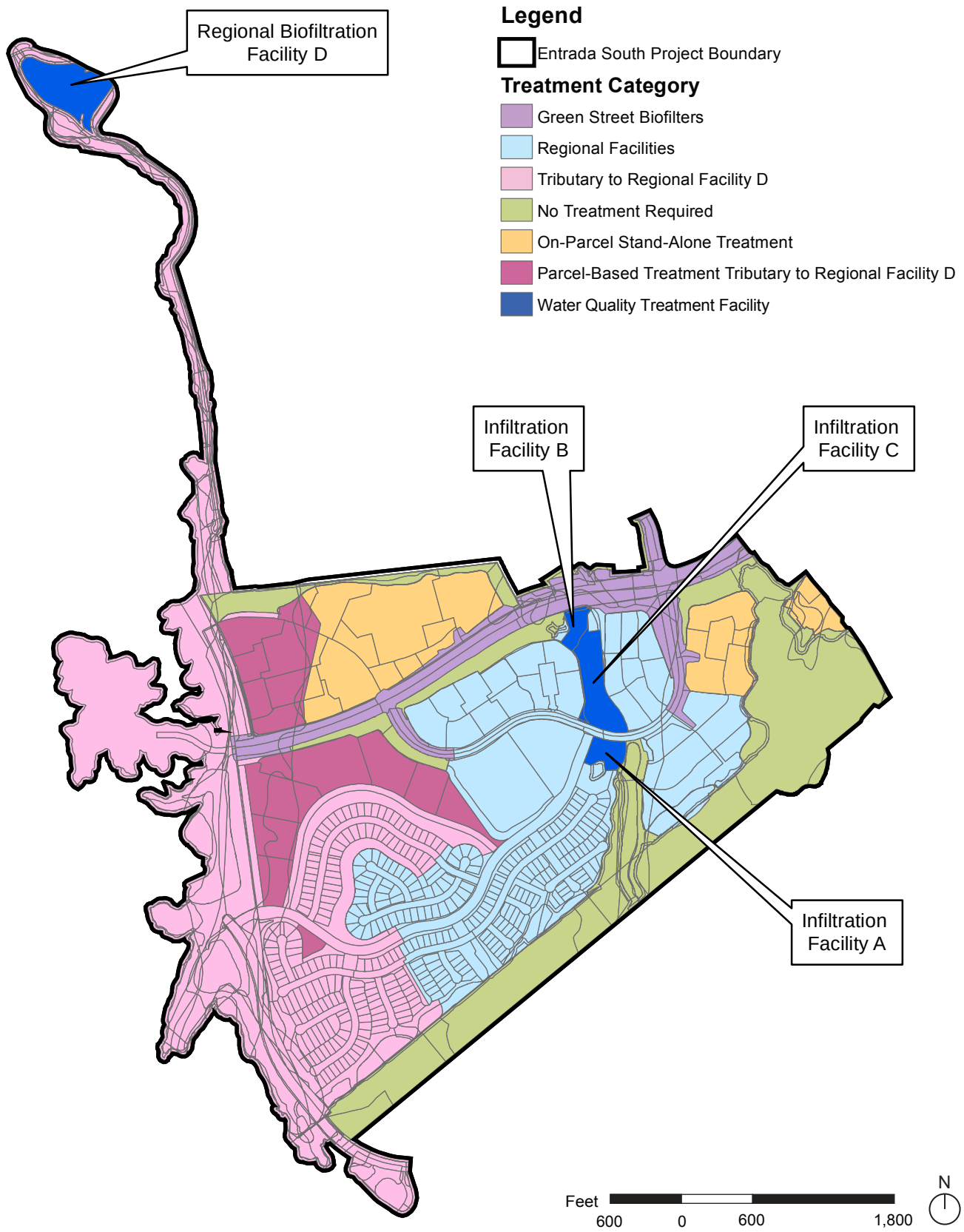

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Figure 5.10-4
Regional and Parcel-Based LID BMP Drainage Areas

Source: Geosyntec Consultants, 2014.

An assessment of feasibility was conducted to estimate which one of three BMP strategies could be applied on-site and whether the proposed regional infiltration/ biofiltration facilities would allow for infiltration. **Table 5.10-8**, LID and Treatment Control Best Management Practices for VTTM 53295, below and **Table 5.10-9**, LID and Treatment Control Best Management Practices for External Map Improvements Area, on page 5.10-68 list the LID and treatment control BMPs that would be implemented for the parcel-based categories, streets, and regional facilities for the Project (VTTM 53295 and the External Map Improvements areas).[51] **Figure 5.10-4**, Regional and Parcel-Based LID BMP Drainage Areas, illustrates the proposed LID BMPs for the Project.

Table 5.10-8
LID and Treatment Control Best Management Practices for VTTM 53295

Drainage Area	Area (acres)	LID BMP(s)[a]
Drainage Area A	71.1	Infiltration Facility A
Drainage Area B	19.3	Infiltration Facility B
Drainage Area C	35.1	Infiltration Facility C
Drainage Area D	102.1[b]	Regional Biofiltration Facility D, parcel-based LID BMPs, and single-family hydrologic source controls in tributary area
Stand-Alone Parcel-Based Category 1	1.1	Infiltration parcel-based BMPs
Stand-Alone Parcel-Based Category 2	40.9	Bioinfiltration parcel-based BMPs
Stand-Alone Parcel-Based Category 3	0.7	Biofiltration parcel-based BMPs
Green Streets Biofilter	22.5	Flow-based biofiltration BMPs
Total	**292.8**	

[a] **Figure 5.10-4,** Regional and Parcel-Based LID BMP Drainage Areas, illustrates the proposed LID BMPs for the Project.

[b] The area listed is the Project area that drains to Regional Facility D; additional areas within adjacent approved projects would also drain to the facility.

Source: Geosyntec, 2014 (see Table 5-3 in the Water Quality Report).

[51] *As described further in **Section 3.0**, Project Description, of this Draft EIR, the Project Site consists of the 382.3-acre tract map area (VTTM 53295) and a 119.1-acre area where supportive improvements and infrastructure (referred to as the External Map Improvements) would occur.*

Table 5.10-9
LID and Treatment Control Best Management Practices for External Map Improvements Area

Drainage Area	Area (acres)	Treatment BMP(s)
Magic Mountain Parkway extension to The Old Road (including Entertainment Drive)	6.1	Green Street Biofilters
Westridge Parkway Extension to "B" Drive	6.1	Regional Biofiltration Basin D
Access roads to Regional Facility D and debris basins	3.1	Regional Biofiltration Basin D
Commerce Center Drive	3.6	Regional Biofiltration Basin D, Green Street Biofilters
Water Tank and Booster Station	1.9	Regional Biofiltration Basin D
Water Quality Facility	5.7	Regional Biofiltration Basin D
Total	**26.5**	

Source: Geosyntec, 2014 (see Table 5-4 in the Water Quality Report).

(iii) Hydromodification Control BMPs

A series of progressive hydromodification control measures must be used within the Project Site to prevent and control hydromodification impacts to the Santa Clara River, as follows:

- Avoid, to the extent possible, the need to mitigate for hydromodification impacts by preserving natural hydrologic conditions and protecting sensitive hydrologic features, sediment sources, and sensitive habitats.
- Minimize the effects of development through site design practices (e.g., reducing connected impervious surfaces) and implementation of stormwater volume-reducing LID BMPs (Project-based hydrologic source control). Hydrologic source control measures include:
  - LID site design BMPs (discussed above); and
  - LID BMPs (discussed above), which will also serve as hydromodification source control BMPs. Parcel-based and regional LID BMPs would provide volume reduction ranging from incidental volume reduction in biofiltration BMPs (via evaporation and infiltration) up to full volume reduction of captured water in infiltration BMPs where soil and hydrogeologic conditions permit. In addition, these facilities will receive and eliminate dry weather flows.

(iv) BMP Operation and Maintenance

Depending on the type and location of each LID or treatment BMP control measure, either the County, a Landscape or Local Maintenance District, Geologic Hazard Abatement District, Home Owners Association (HOA), or other similar government or quasi-government agency will be responsible for operation and maintenance of regional BMPs. The HOA or commercial/business owners would be responsible for operation and maintenance of parcel-based BMPs such as bioretention placed in common area landscaping or parking lot islands. Homeowners would be responsible for maintenance of hydrologic source controls on single-family residential properties. Operation and maintenance activities would be conducted in compliance with maintenance requirements established in the Los Angeles County Stormwater BMP Design and Maintenance Manual.

(3) Regulatory Compliance Measures

Based on the applicable regulations and requirements previously discussed, the following compliance measures are incorporated into the Project:

- The Project shall comply with the Los Angeles Regional Water Quality Control Board MS4 Permit (Order No. R4-2012-0175; NPDES Permit No. CAS004001), the County of Los Angeles LID Ordinance, and the County of Los Angeles LID Standards Manual.

- The Project shall comply with the State Water Resources Control Board NPDES General Permit for Stormwater Discharges Associated with Construction Activity (Water Quality Order 2009-0009-DWQ, NPDES No. CAR000002). During the Project construction phase, the Applicant shall implement best management practices in compliance with the Construction General Permit and General Dewatering Permit. In accordance with the Construction General Permit, the Applicant shall prepare and implement a SWPPP based on the Project Risk Level that includes the following types of BMPs, which shall be meet the BAT/BCT performance standard: (1) erosion control; (2) sediment control; (3) waste and materials management; (4) non-stormwater management; (5) training and education; and (6) inspections, maintenance, monitoring, and sampling.

- By October 1 of each year, a separate erosion control plan for construction activities shall be submitted to Public Works describing the erosion control measures that will be implemented during the rainy season (October 1 through April 15).

- The Project shall comply with the Los Angeles Regional Water Quality Control Board General NPDES Permit and General WDRs for Dischargers of Groundwater from Construction and Project Dewatering (Order No. R4-2013-0095, NPDES No. CAG994004).

Additional hydrology-related regulatory compliance measures are listed in **Section 5.9**, Hydrology and Water Quality—Hydrology, of this Draft EIR.

(4) Project Design Features

In addition, the PDFs listed below are incorporated into the Entrada South (ES) Project's design, have been quantitatively factored into the analysis presented in this section, and will be included in the MMRP to ensure implementation.

PDF ES 5.10-1: Prior to the issuance of any grading or building permit (whichever comes first) and as part of the design level hydrology study and facilities plan, a final LID Plan shall be prepared consistent with the terms and content of the Water Quality Report provided in **Appendix 5.10** of this Draft EIR that specifically identifies the site design, source control, LID, treatment, and hydromodification control BMPs to be used on the Project Site. The source control BMPs shall include, but not be limited to, those identified in **Table 5.10-6**, LID Standards Manual Source Control Requirements and Corresponding Best Management Practices, of the Draft EIR (see Table 5-1 on page 93 of the Entrada South Water Quality Technical Report provided in **Appendix 5.10** of the Draft EIR). The site design BMPs shall include, but not be limited to, those identified in **Table 5.10-7**, Entrada South Site Design Best Management Practices (see Table 5-2 on page 98 of the Entrada South Water Quality Technical Report. The LID and treatment control BMPs shall include, but not be limited to, those identified in **Table 5.10-8**, LID and Treatment Control Best Management Practices for VTTM 53295, and **Table 5.10-9**, LID and Treatment Control Best Management Practices for External Map Improvements Area (see Table 5-3 and Table 5-4 on page 103 of the Entrada South Water Quality Technical Report).

PDF ES 5.10-2: For the post-construction (operational) phase, the Project shall implement the following LID BMP Performance Standard for runoff volume reduction and water quality treatment:

Project design features shall be selected and sized to retain the volume of stormwater runoff produced from a 1.1 inch storm event (LID design volume). When it has been demonstrated that 100 percent of the LID design volume cannot be feasibly infiltrated, then biofiltration shall be provided for 1.5 times the portion of the LID design volume that is not retained. Runoff from all impervious area shall be treated with effective treatment control measures that are selected to address the pollutants of concern and are sized to capture and treat 80 percent of the average annual runoff volume.

c. Significance Thresholds

Based on Appendix G of the CEQA Guidelines and other relevant criteria, the Los Angeles County Department of Regional Planning has determined that a project would have a potentially significant impact related to water quality based on the following criteria:

Threshold 5.10-1: Would the project violate any water quality standards or waste discharge requirements?

Threshold 5.10-2: Would the project generate construction or post-construction runoff that would violate applicable stormwater NPDES permits or otherwise significantly affect surface water or groundwater quality?

Threshold 5.10-3: Would the project conflict with the Los Angeles County Low Impact Development Ordinance (L.A. County Code, Title 12, Ch. 12.84)?

Threshold 5.10-4: Would the project result in point or nonpoint source pollutant discharges into State Water Resources Control Board-designated Areas of Special Biological Significance?

Threshold 5.10-5: Would the project use on-site wastewater treatment systems in areas with known geological limitations (e.g., high groundwater) or in close proximity to surface water (including, but not limited to, streams, lakes, or drainage courses)?

Threshold 5.10-6: Would the project site be located in an area having known water quality problems and proposing the use of individual water wells?

Threshold 5.10-7: Would the project's associated construction activities significantly impact the quality of groundwater and/or stormwater runoff to the stormwater conveyance system and/or receiving water bodies?

Threshold 5.10-8: Would the project's post-development activities potentially degrade the quality of stormwater runoff and/or would post-development non-stormwater discharges contribute potential pollutants to the stormwater conveyance system and/or receiving waterbodies?

Threshold 5.10-9: Would the project otherwise substantially degrade water quality?

Threshold 5.10-10: Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Threshold 5.10-11: Would the project add water features or create conditions in which standing water can accumulate that could increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use?

The Project Site is not located in close proximity to an area identified by the State Water Board as an Area of Special Biological Significance.[52] As such, no further analysis of Threshold 5.10-4 is necessary.

The Project's wastewater needs would be served by the Santa Clarita Valley Sanitation District. Therefore, there would be no on-site wastewater treatment systems for the Project. As such, no further analysis of Threshold 5.10-5 is necessary.

The potable water supply for the Project would be provided by the VWC; therefore the Project is not proposing the use of individual water wells. As such, no further analysis of Threshold 5.10-6 is necessary.

d. Project Impacts

Threshold 5.10-1: Would the project violate any water quality standards or waste discharge requirements?

Threshold 5.10-2: Would the project generate construction or post-construction runoff that would violate applicable stormwater NPDES permits or otherwise significantly affect surface water or groundwater quality?

Threshold 5.10-7: Would the project's associated construction activities significantly impact the quality of groundwater and/or stormwater runoff to the stormwater conveyance system and/or receiving water bodies?

Threshold 5.10-8: Would the project's post-development activities potentially degrade the quality of stormwater runoff and/or would post-development non-stormwater discharges contribute potential pollutants to the stormwater conveyance system and/or receiving waterbodies?

Threshold 5.10-9: Would the project otherwise substantially degrade water quality?

Project impacts with respect to Thresholds 5.10-1, 5.10-2, and 5.10-7 through 5.10-9 all relate to surface and groundwater quality and, therefore, are addressed in the following combined analysis. Impacts associated with construction-related activities are addresses first, followed by analysis of post-construction, or operational, impacts.

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[52] *State Water Resources Control Board, California's Areas of Special Biological Significance, www.waterboards.ca.gov/water_issues/programs/ocean/asbs_map.shtml, accessed March 3, 2015.*

(1) Construction

The analysis of potential impacts on water quality related to construction activities, construction materials, and non-stormwater runoff during the construction phase focuses primarily on sediment (TSS and turbidity) and certain non-sediment related pollutants. Construction-related activities primarily responsible for sediment releases are those that expose previously stabilized soils to potential mobilization by rainfall/runoff and wind. Such activities include the 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 derive from construction materials (e.g., paint, stucco, etc.); chemicals, liquid products, and petroleum products used in building construction or the maintenance of heavy equipment; concrete-related pollutants; and non-stormwater flows.

The Project's construction impacts will be minimized through compliance with the Construction General Permit and the general waste discharge requirements in the Dewatering General WDRs. Erosion and sediment transport, as well as the transport of other potential pollutants from the Project Site during construction, will be reduced or prevented through implementation of BMPs meeting BAT/BCT. These measures will prevent or minimize environmental impacts and ensure that any discharges during Project construction will not cause or contribute to a violation or an exceedance of water quality standards in the receiving waterbodies, or degrade or contribute pollutants resulting in an adverse significant impact.

The Construction General Permit requires the discharger to perform a risk assessment for the proposed development (with differing requirements based upon the determined risk level) and to prepare and implement a SWPPP, which must include erosion and sediment control BMPs that will meet or exceed measures required by the determined risk level, as well as BMPs that control the other potential construction-related pollutants. A Construction Site Monitoring Program that identifies monitoring and sampling requirements during construction is a required component of the SWPPP. Based on preliminary analysis, the Project will most likely be categorized as a Risk Level 2. BMPs required by the Construction General Permit will be incorporated assuming this level of risk; if final design analysis indicates that the Project will fall under Risk Level 3, the additional Level 3 permit requirements will be implemented as necessary, in compliance with regulatory requirements.

The Construction General Permit requires the SWPPP to include BMPs to be selected and implemented based on the determined project risk level to effectively control erosion and sediment to the BAT/BCT. The following types of BMPs must be implemented as-needed during construction:

(a) Erosion Control

- Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded and stabilized fiber matrices, compost blankets, and erosion control blankets (i.e., rolled erosion control products).
- Contain and securely protect stockpiled materials from wind and rain at all times, unless actively being used.
- Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
- Vegetative stabilization through temporary seeding and mulching to establish interim vegetation.
- Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.

(b) Sediment Control

- Perimeter protection to prevent sediment discharges (silt fences, fiber rolls, gravel bag berms, sand bag barriers, and compost socks).
- Storm drain inlet protection.
- Sediment capture and drainage control through sediment traps and sediment basins.
- Velocity reduction through check dams, sediment basins, and outlet protection/ velocity dissipation devices.
- Reduction in off-site sediment tracking through stabilized construction entrance/exit, construction road stabilization, and entrance /exit tire wash.
- Slope interruption at permit-prescribed intervals (fiber rolls, gravel bag berms, sand bag berms, compost socks, biofilter bags).

(c) Waste and Materials Management

- Management of the following types of materials, products, and wastes: solid, liquid, sanitary, concrete, hazardous and equipment-related wastes. Management measures include covered storage and secondary containment for material storage areas, secondary containment for portable toilets, covered dumpsters, dedicated and lined concrete washout/waste areas, proper application of chemicals, and proper disposal of all manners of wastes.

- Protection of soil, landscaping and construction material stockpiles through covers, the application of water or soil binders, and perimeter control measures.

- A spill response and prevention program will be incorporated as part of the SWPPP and spill response materials will be available and conspicuously located at all times on-site.

(d) Non-Stormwater Management

- 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, vehicle and equipment cleaning and fueling practices, and street sweeping. All such measures will be recorded and maintained as part of the project SWPPP.

- If construction dewatering or discharges from other specific construction activities such as water line testing, and sprinkler system testing are required, comply with the requirements of the Regional Water Board's General WDRs under Order No. R4-2013-0095 (NPDES No. CAG994004) governing construction-related dewatering discharges.

(e) Training and Education

- Inclusion of Construction General Permit defined "Qualified SWPPP Developers" (QSD) and "Qualified SWPPP Practitioners" (QSP). QSDs and QSPs shall have required certifications and shall attend State Board sponsored training.

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

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

(f) Inspections, Maintenance, Monitoring, and Sampling

- Performing routine site inspections and inspections before, during (for storm events > 0.5 inch), and after storm events.

- Preparing and implementing Rain Event Action Plans (REAPs) prior to any storm event with 50 percent probability of producing 0.5 inch of rainfall, including performing required preparatory procedures and site inspections.

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

- Implementation of the Construction Site Monitoring Plan for non-visible pollutants, if a leak or spill is detected.
- Sampling of discharge points for turbidity and pH, at minimum, three times per qualifying storm event and recording and retention of results.

Compliance with the General Construction Permit requires that prior to the issuance of preliminary or precise grading permits, the Applicant must provide the County with evidence that a Notice of Intent (NOI) to construct has been filed with the State Water Resources Control Board. Such evidence will consist of a copy of the NOI stamped by the State Water Board or RWQCB, or a letter from either agency stating that the NOI has been filed and a copy of the site's applicable Waste Discharge identification number.

Construction on the Project Site may require dewatering. In general, the Construction General Permit authorizes construction dewatering activities and other construction-related non-stormwater discharges as long as they: (a) comply with Section III.C of the Construction General Permit; (b) do not cause or contribute to a violation of any water quality standards; (c) do not violate any other provisions of the Construction General Permit; (d) do not require a non-stormwater permit as issued by some Regional Water Boards; and (e) are not prohibited by a Basin Plan provision.

BMPs will be implemented to protect receiving waters from dewatering and construction-related non-stormwater discharges. Such discharges will be implemented in compliance with the LA Regional Water Board's General WDRs governing construction-related dewatering discharges within the Project Site. 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; or use of a sedimentation bag for small volumes of localized dewatering.

All discharges from qualifying storm events will be sampled for turbidity and pH, and the results will be compared to Numeric Action Levels (250 NTU and 6.5-8.5, respectively) to ensure that BMPs are functioning as intended. If discharge sample results fall outside of these action levels, a review of causative agents and the existing site BMPs will be undertaken, maintenance and repair on existing BMPs will be performed, and/or additional BMPs will be provided to ensure that future discharges meet these criteria.

The construction-phase BMPs will assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as nutrients, heavy metals, and certain pesticides, including legacy pesticides. In addition, compliance with BAT/BCT requires that BMPs used to control construction water quality are updated over

time as new water quality control technologies are developed and become available for use. Therefore, compliance with the BAT/BCT performance standard ensures effective control of construction water quality impacts over time.

On this basis, with implementation of the aforementioned regulatory compliance measures, the impact of Project construction-related runoff is considered less than significant.

(2) Post-Construction (Operation)

(a) Surface Water Quality

Section 7 of the Water Quality Report contains the water quality model predictions for pre- and post-Project runoff volumes and the concentrations and loads for pollutants of concern in stormwater runoff; a comparison of post-Project pollutant concentrations to existing water quality, as well as to Basin Plan and CTR criteria; and a qualitative analysis of impacts for certain pollutants of concern. A summary of the analysis of stormwater runoff volumes and surface water quality pollutants of concern is provided below.

(i) Stormwater Runoff Volumes

Mean annual runoff volumes are expected to increase as a result of the Project due to the increase in impervious area associated with development of the Project Site, as well as the decrease in the infiltration capacity of existing site soils associated with compaction during construction (see Table 7-1 in the Water Quality Report). Relevant Project BMPs include site design, source control, LID, and treatment control BMPs in compliance with the MS4 Permit and LID Manual requirements. Most of the site design BMPs, especially the minimization of impervious area and the conservation of approximately 119 acres of open space areas within the tract map portion of the Project, reduce the impacts of the Project on increases in stormwater runoff volume. The LID BMPs would provide substantial runoff volume reduction via infiltration and evapotranspiration and, therefore, would provide hydromodification source control, as well as stormwater treatment. On this basis, impacts to stormwater runoff volumes associated with Project implementation would be less than significant.

(ii) Total Suspended Solids (Sediment)

<u>Comparison of Pre- and Post-Project Conditions</u>

As shown in **Table 5.10-10**, Predicted Average Annual TSS Concentration and Load, on page 5.10-78, average TSS concentration and loads are predicted to be less in the post-development condition than in the existing condition. Conversion from agriculture, mineral extraction, and open space, which have relatively high concentrations of TSS in

Table 5.10-10
Predicted Average Annual TSS Concentration and Load

Site Conditions	Average Annual TSS Concentration (mg/L)	Average Annual TSS Load (tons/yr)
Existing	231	20
Developed	45	13
Change	-186	-7

Source: Geosyntec, 2014 (see Table 7-2 in the Water Quality Report).

runoff, to urban land uses with LID BMPs, which would have a much lower concentration of TSS in runoff due to the effective removal of TSS in the LID BMPs, would reduce the average TSS concentration and loads in stormwater runoff from the Project Site. TSS load also is predicted to decrease with development despite increased runoff volumes.

Comparison with Water Quality Criteria

Table 5.10-11, Comparison of Predicted TSS Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5, on page 5.10-79 shows the predicted average annual TSS concentration in stormwater runoff under the Project compared to receiving water objectives and the range of observed concentrations in Santa Clara River Reach 5. As shown, the TSS concentration is predicted to be well below the observed average concentration in Reach 5.

Based on the comprehensive site design, source control, LID and treatment control strategy; the predicted decrease in TSS concentration and load; and the comparison with available in-stream data and Basin Plan benchmark objectives, potential impacts associated with TSS are predicted to be less than significant.

Table 5.10-11
Comparison of Predicted TSS Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Predicted Average Annual TSS Concentration (mg/L)	Los Angeles Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[a] Concentrations in Santa Clara River Reach 5 (mg/L)	Average Wet Weather[b] Concentration in Santa Clara River Reach 5 (mg/L)
45	Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses	N/A	26–6,591	1,012

N/A = Not applicable

[a] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[b] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

Source: Geosyntec, 2014 (see Table 7-3 in the Water Quality Report).

(iii) Total Phosphorus

Comparison of Pre- and Post-Project Conditions

As shown in **Table 5.10-12**, Predicted Average Annual Total Phosphorus Concentration and Annual Load, below, the average annual Total Phosphorous concentration is predicted to decrease as a result of the Project. This decrease can be attributed to higher event mean concentrations (EMCs) observed in monitoring data from agricultural and open space land uses (the existing condition for the Project Site) compared with urban land uses (representative of the post-development conditions). Total Phosphorous loads, however, are predicted to increase as a result of the predicted increase in runoff volume.

Table 5.10-12
Predicted 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	0.33	57
Developed	0.19	112
Change	-0.14	55

Source: Geosyntec, 2014 (see Table 7-4 in the Water Quality Report).

Comparison with Water Quality Criteria

There are no numeric objectives for Total Phosphorous 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." As shown in **Table 5.10-13**, Comparison of Predicted Total Phosphorus Concentration with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5, below, the predicted average annual Total Phosphorous concentration is below the observed average concentration in Santa Clara River Reach 5. As the average annual Total Phosphorous concentration in Project stormwater discharges is predicted to decrease and to be below the existing in-stream concentration, stormwater discharges from the Project are not expected to increase the in-stream concentration of Total Phosphorous; and, thus, would not promote (i.e., increase) algal growth in the Santa Clara River.

Table 5.10-13
Comparison of Predicted Total Phosphorus Concentration with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Predicted Average Annual Total Phosphorus Concentration (mg/L)	Los Angeles Basin Plan Water Quality Objectives	California Toxics Rule Criteria	Range of Observed[a] Concentrations in Santa Clara River Reach 5 (mg/L)	Average Wet Weather[b] Concentration in Santa Clara River Reach 5 (mg/L)
0.19	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	0.18–1.3	0.5

N/A = Not applicable

[a] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[b] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

Source: Geosyntec, 2014 (see Table 7-5 in the Water Quality Report).

Based on the comprehensive site design, source control, LID and treatment control strategy, the predicted decrease in average annual Total Phosphorous concentration, and the comparison with available in-stream monitoring data and the Basin Plan benchmark objective, potential impacts associated with Total Phosphorus are predicted to be less than significant.

(iv) Nitrogen Compounds

Comparison of Pre- and Post-Project Conditions

As shown in **Table 5.10-14**, Predicted Average Annual Nitrate + Nitrite Concentration and Load, below; **Table 5.10-15**, Predicted Average Annual Ammonia-N Concentration and Load, below; and **Table 5.10-16**, Predicted Average Annual Total Nitrogen-N Concentration and Load, on page 5.10-82, nitrogen compounds, nitrate plus nitrite, ammonia-N, and total nitrogen concentrations are all predicted to decrease in stormwater runoff as a result of the Project. These decreases can be attributed to higher EMCs observed in monitoring data from agricultural and open space land uses (i.e., existing conditions within the Project Site) compared with urban land uses (representative of post-development conditions) and low observed nitrate plus nitrite concentrations in effluent from LID BMPs. Average annual loads of nitrate plus nitrite, and total nitrogen in stormwater runoff are predicted to decrease even with an increase in runoff volume. The average annual load of ammonia in stormwater runoff is predicted to increase as a result of the Project. This can be attributed to the increase in runoff volume predicted for the post-development condition and a comparatively small reduction in the predicted average annual concentration.

Table 5.10-14
Predicted Average Annual Nitrate + Nitrite Concentration and Load

Site Conditions	Average Annual Nitrate-N + Nitrite-N Concentration (mg/L)	Average Annual Nitrate-N + Nitrite-N Load (lbs/yr)
Existing	1.3	243
Developed	0.7	396
Change	-0.6	153

Source: Geosyntec, 2014 (see Table 7-6 in the Water Quality Report).

Table 5.10-15
Predicted Average Annual Ammonia-N Concentration and Load

Site Conditions	Average Annual Ammonia Concentration (mg/L)	Average Annual Ammonia Load (lbs/yr)
Existing	0.3	55
Developed	0.3	146
Change	0	91

Source: Geosyntec, 2014 (see Table 7-7 in the Water Quality Report).

Table 5.10-16
Predicted 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	3.1	547
Developed	1.9	1,101
Change	-1.2	554

Source: Geosyntec, 2014 (see Table 7-8 in the Water Quality Report).

Comparison with Water Quality Criteria

Table 5.10-17, Comparison of Predicted Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5, on page 5.10-83 provides a comparison of predicted nitrogen compound concentrations with the Basin Plan objectives and observed concentrations. The average annual stormwater concentration of nitrate plus nitrite is predicted to be considerably less than the concentration-based wasteload allocation for Santa Clara River Reach 5 and the Basin Plan objective and below the observed average concentration of nitrate on its own. Likewise, the average annual stormwater concentration of ammonia is predicted to be considerably less than the TMDL wasteload allocation and the Basin Plan water quality objective for Santa Clara Reach 5 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." As shown in **Table 5.10-17**, Comparison of Predicted Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5, the predicted total nitrogen concentration is below the observed average concentration in Santa Clara River Reach 5 and, because the total nitrogen concentration in Project stormwater discharges is predicted to decrease, these discharges would not promote (i.e., increase) aquatic growth; therefore, Project discharges would comply with the narrative objective for biostimulatory substances in the Basin Plan.

As the concentrations of all of the nitrogen compounds are predicted to decrease with development, Project runoff is not expected to increase the concentration of these pollutants in the River. Based on the comprehensive site design, source control, LID and treatment control strategy, the predicted reduction or no change in runoff concentration, and the comparison with available in-stream monitoring data and benchmark Basin Plan

Table 5.10-17
Comparison of Predicted Nitrogen Compound Concentrations with Water Quality Objectives, TMDLs, and Observed Concentrations in Santa Clara River Reach 5

Nutrient	Predicted Average Annual Concentration (mg/L)	TMDL/Basin Plan Water Quality Objectives[a] (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[b] Concentrations in Santa Clara River Reach 5 (mg/L)	Average Wet Weather[c] Concentration in Santa Clara River Reach 5 (mg/L)
Nitrate + Nitrite-N	0.7	5	6.8[d]	<0.1–4.8[e]	1.2[e]
Ammonia-N	0.3	4.1[f]	1.75[g]	<0.03–1.4	0.2
Total Nitrogen	1.9	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	<0.04–32[h]	2.5[h]

N/A = Not applicable

[a] *There are no CTR criteria for nitrogen compounds.*

[b] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[c] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

[d] *Thirty-day average.*

[e] *Observed value for nitrate-N.*

[f] *Four-day average, ELS present, average pH observed at Station S29 (7.3) and assumed temperature of 30° C (temperature data are not available for SCR Reach 5).*

[g] *Thirty-day average in Reach 5 below Valencia.*

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

Source: Geosyntec, 2014 (see Table 7-9 in the Water Quality Report).

objectives and TMDL wasteload allocations, potential impacts associated with nitrogen compounds are predicted to be less than significant.

v) Metals

<u>Comparison of Pre- and Post-Project Conditions</u>

As shown in **Table 5.10-18,** Predicted Average Annual Dissolved Copper Concentration and Load, on page 5.10-84; **Table 5.10-19**, Predicted Average Annual Total

Copper Concentration and Load, on page 5.10-84; **Table 5.10-20**, Predicted Average Total Lead Concentration and Annual Load, on page 5.10-85; **Table 5.10-21**, Predicted Average Annual Dissolved Zinc Concentration and Load, on page 5.10-85; **Table 5.10-22**, Predicted Average Annual Total Zinc Concentration and Load, on page 5.10-85; and **Table 5.10-23**, Predicted Average Total Iron Concentration and Annual Load, on page 5.10-86, post-development loads of total and dissolved copper, total lead, and total zinc are predicted to increase compared to pre-development conditions; loads of dissolved zinc and total iron are predicted to decrease. Average annual concentrations of dissolved copper are predicted to increase slightly; total copper, total lead, total zinc, total iron, and dissolved zinc concentrations are predicted to decrease with development compared to pre-development conditions.

Table 5.10-18
Predicted Average Annual Dissolved Copper Concentration and Load

Site Conditions	Average Annual Dissolved Copper Concentration (µg/L)	Average Annual Dissolved Copper Load (lbs/yr)
Existing	6.2	1.1
Developed	7.1	4.2
Change	0.9	3.1

Source: Geosyntec, 2014 (see Table 7-10 in the Water Quality Report).

Table 5.10-19
Predicted Average Annual Total Copper Concentration and Load

Site Conditions	Average Annual Total Copper Concentration (µg/L)	Average Annual Total Copper Load (lbs/yr)
Existing	20.7	3.6
Developed	13.1	7.7
Change	-7.6	4.1

Source: Geosyntec, 2014 (see Table 7-11 in the Water Quality Report).

Table 5.10-20
Predicted Average Total Lead Concentration and Annual Load

Site Conditions	Average Annual Total Lead Concentration (µg/L)	Average Annual Total Lead Load (lbs/yr)
Existing	8.3	1.5
Developed	4.2	2.5
Change	-4.1	1.0

Source: Geosyntec, 2014 (see Table 7-12 in the Water Quality Report).

Table 5.10-21
Predicted Average Annual Dissolved Zinc Concentration and Load

Site Conditions	Average Annual Dissolved Zinc Concentration (µg/L)	Average Annual Dissolved Zinc Load (lbs/yr)
Existing	170	29.9
Developed	45	26.5
Change	-125	-3.4

Source: Geosyntec, 2014 (see Table 7-13 in the Water Quality Report).

Table 5.10-22
Predicted Average Annual Total Zinc Concentration and Load

Site Conditions	Average Annual Total Zinc Concentration (µg/L)	Average Annual Total Zinc Load (lbs/yr)
Existing	212	37.4
Developed	69	41.1
Change	-143	3.7

Source: Geosyntec, 2014 (see Table 7-14 in the Water Quality Report).

Table 5.10-23
Predicted Average Total Iron Concentration and Annual Load

Site Conditions	Average Annual Total Iron Concentration (µg/L)	Average Annual Total Iron Load (lbs/yr)
Existing	2,071	365
Developed[a]	761	336
Change	-1,310	-29

[a] *Effluent data for total iron are not available in the International BMP Database; total iron load in the developed condition is estimated by using TSS as a surrogate for calculating removal of particulate iron and assuming that there is no removal of dissolved iron via treatment in the BMP.*

Source: Geosyntec, 2014 (see Table 7-15 in the Water Quality Report).

Comparison with Water Quality Criteria

Comparison of the predicted runoff metal concentrations and the acute CTR criteria for total and dissolved copper, total lead, total and dissolved zinc, and total iron are shown in **Table 5.10-24**, Comparison of Predicted Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5, on page 5.10-87, along with the range of observed concentrations in Santa Clara River Reach 5. The CTR criteria are the applicable water quality objectives for protection of aquatic life. As shown therein, the comparison of the predicted trace metal concentrations in stormwater runoff in the post-developed condition to the benchmark CTR values shows that all of the trace metal concentrations are well below the benchmark water quality criteria. While the average annual dissolved zinc concentration is predicted to be higher than the average concentration observed in Santa Clara River Reach 5, the concentration and load are predicted to decrease in the post-developed “with Project” condition. The remaining metals are all predicted to be less than the observed average concentrations; and, thus, Project runoff is not expected to increase the concentration of metals in the Santa Clara River.

Based on the comprehensive site design, source control, LID and treatment control BMP strategy, and the comparison with the in-stream water quality monitoring data and benchmark water quality criteria, the Project will not have significant impacts resulting from trace metals.

Table 5.10-24
Comparison of Predicted Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Metal	Predicted Average Annual Concentration (µg/L)	California Toxics Rule Criteria[a] (µg/L)	Range of Observed[b] Concentrations in Santa Clara River Reach 5 (mg/L)	Average Wet Weather[c] Concentration in Santa Clara River Reach 5 (mg/L)
Dissolved Copper	7.1	25	<0.5–39.9	8.6
Total Copper	13.1	26	<0.5–91.3	27.3
Total Lead	4.2	190	<0.2–110	17.2
Dissolved Zinc	45	205	<1–198	35.2
Total Zinc	69	210	10.9–500	110
Total Iron	761	N/A	265–49,000	12,823

N/A = Not applicable

[a] *Hardness = 194 mg/L, based on average observed value in SCR Reach 5 (see Table 2-13). Lead criteria is for total recoverable lead. There is no CTR criterion for iron.*

[b] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[c] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

Source: Geosyntec, 2014 (see Table 7-16 in the Water Quality Report).

(vi) Chloride

Comparison of Pre- and Post-Project Conditions

As shown in **Table 5.10-25**, Predicted Average Annual Chloride Concentration and Load, on page 5.10-88, under the proposed Project, the annual average chloride concentration in stormwater runoff is predicted to decrease relative to existing conditions. In comparison, average annual chloride load is expected to increase as a result of the increase in total annual runoff volume predicted for the Project.

Table 5.10-25
Predicted Average Annual Chloride Concentration and Load

Site Conditions	Average Annual Chloride Concentration (mg/L)	Average Annual Chloride Load (tons/yr)
Existing	10	0.9
Developed	19	5.5
Change	9	4.6

Source: Geosyntec, 2014 (see Table 7-17 in the Water Quality Report).

Comparison with Water Quality Criteria

As shown in **Table 5.10-26**, Comparison of Predicted Chloride Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5, on page 5.10-89, average annual chloride concentrations in Project stormwater runoff are predicted to be below both the average observed condition and applicable regulatory criteria. Also shown therein is a comparison between the predicted chloride concentration in post-development Project runoff, the Los Angeles Basin Plan water quality objective, and observed concentrations in Santa Clara River Reach 5. As indicated, the predicted average annual chloride concentration in stormwater runoff from the Project area is below the average observed concentration for chloride, and is well below both 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). Thus, and as further explained below, Project runoff is not expected to increase the concentration of chloride in the Santa Clara River.

Based on the comprehensive site design, source control, LID and treatment control strategy, and comparison with benchmark receiving water criteria and in-stream monitoring data, the Project is not expected to have significant water quality impacts resulting from chloride in stormwater runoff.

Table 5.10-26
Comparison of Predicted Chloride Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5

Pollutant	Predicted Average Annual Concentration (mg/L)	Basin Plan Water Quality Objectives[a] (mg/L)	Wasteload Allocations for MS4 Discharges into the Santa Clara River Reach 5 (mg/L)	Range of Observed[b] Concentrations in Santa Clara River Reach 5 (mg/L)	Average Wet Weather[c] Concentration in Santa Clara River Reach 5 (mg/L)
Chloride	19	100	100	2.6–118	44

[a] *There is no CTR criterion for chloride.*

[b] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[c] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

Source: Geosyntec, 2014 (see Table 7-18 in the Water Quality Report).

Assessment of Potential Project Impacts on Instream Concentrations

The potential for Project runoff to impact in-stream pollutant concentrations is a function of: (1) the relative magnitudes of runoff volume and in-stream flow volume; and (2) the relative magnitude of runoff concentrations and in-stream concentrations. As such, two universal conditions exist under which the discharge from a Project would not increase in-stream concentration:

Condition 1: If the concentration of a constituent in Project runoff (C_P) is less than the concentration of the constituent in-stream (C_O), then discharges from the Project would result in a reduction of the in-stream concentration of that constituent; it would not be possible for the Project's discharges to cause an increase in the in-stream concentration.

Condition 2: If the load of a constituent in Project runoff (L_P) decreases with development, but the volume of runoff from the Project increases (V_P), then the Project would be expected to result in a reduction of the in-stream concentration of that constituent regardless of in-stream volumes or concentrations. It would be impossible for the project to result in an increase in the in-stream concentration by reducing load but adding volume.

The comparison of the predicted average annual pollutant concentration in Project runoff in the post-developed condition to the observed in-stream concentrations, as shown

in **Table 5.10-26**, Comparison of Predicted Chloride Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5, shows that chloride concentrations are predicted to be below the observed average wet weather in-stream concentration (Condition 1). On this basis, the Project would be expected to result in a reduction of the in-stream concentrations of chloride.

In addition, as to chlorides, the Valencia WRP must comply with its NPDES wastewater discharge permit, which contains a chloride effluent limitation protective of water quality and beneficial uses in the Santa Clara River and will not result in the impairment of surface or groundwater quality. Additionally, the Santa Clarita Valley Sanitation District has adopted an implementation plan and schedule that incorporates chloride source reduction actions and chloride load reduction through advanced treatment (i.e., reverse osmosis) of the Valencia WRP effluent that will mitigate the effect of chloride accumulation in surface and groundwater. On this basis, the impact of the Project's wastewater discharges on chloride would be less than significant.

(vii) Pesticides

Pesticides in runoff may or may not increase in the post-development phase as a result of applications in and around buildings and in vegetated areas. However, proposed pesticide management practices, including source control, removal in LID BMPs, and advanced irrigation controls, in compliance with the requirements of the MS4 Permit and the County LID Manual, will minimize the presence of pesticides in runoff. Stormwater discharges from the Project are not expected to increase the in-stream concentration of pesticides. On this basis, the impact related to pesticides would be less than significant.

(viii) Pathogens

Post-development pathogen sources include both natural and anthropogenic sources. Removal of agricultural operations and a reduction in open space within the Project area would reduce the bacteria produced by farming activities and wildlife. The Project would not include septic systems, and the sewer system would be designed to current standards, thus minimizing the potential for leaks. As such, pet wastes would be the primary source of concern. Project BMPs would include source controls, LID BMPs, and treatment controls which together would help reduce pathogen indicator levels in stormwater runoff. The Project would incorporate a number of source controls specific to managing pathogen sources, including education of pet owners, education regarding feeding (and therefore attracting) waterfowl near waterbodies, and providing products and disposal containers that encourage and facilitate cleaning up after pets. Furthermore, the Project would comply with all MS4 Permit provisions incorporating the Bacteria TMDL wasteload allocations and implementation plan. On this basis, the Project's impact with respect to pathogens and pathogen indicators would be less than significant.

(ix) Petroleum Hydrocarbons

Petroleum hydrocarbon concentrations will likely increase with Project implementation because of vehicular emissions and leaks. In stormwater runoff, petroleum hydrocarbons are often associated with soot particles that can combine with other solids in the runoff. Such materials are subject to treatment in the proposed LID BMPs. Source control BMPs incorporated in compliance with the MS4 Permit and LID Manual requirements would also minimize the presence of hydrocarbons in runoff. On this basis, the impact related to petroleum hydrocarbons would be less than significant.

(x) Trash and Debris

Trash and debris in runoff are likely to increase in post-development if left unchecked. However, the Project BMPs, including source control and LID BMPs incorporated in compliance with the MS4 Permit and LID Manual requirements, would minimize the adverse impacts of trash and debris. Source controls such as street sweeping, public education, fines for littering, covered trash receptacles, and storm drain stenciling are effective in reducing the amount of trash and debris potentially mobilized during wet weather. Trash and debris would be captured in catch basin inserts in commercial area parking lots and in the LID BMPs. On this basis, the Project's water quality impact due to trash and debris would be less than significant.

(xi) Methylene Blue Activated Substances

The presence of soap in runoff from the Project Site would be controlled through source control BMPs, including a public education program on residential and charity car washing and the provision of a centralized car wash area directed to the sanitary sewer system in the multi-family residential areas. Other sources of soap, such as cross connections between sanitary and storm sewers, are unlikely given modern sanitary sewer installation methods and inspection and maintenance practices. Therefore, the Project's impact with respect to methylene blue activated substances would be less than significant.

(xii) Toxicity

The available literature indicates that acute and chronic aquatic toxicity impacts are largely related to pesticides, and, as discussed above, the Project's water quality impact associated with pesticides would be less than significant. Impacts from other pollutants that may affect acute and chronic toxicity (i.e., metals and petroleum hydrocarbons) would also be less than significant. Based on the incorporation of source control, LID and treatment control BMPs pursuant to MS4 Permit and LID Manual requirements to address pollutants that may cause acute and chronic toxicity, Project impacts associated with toxicity would be less than significant. There is some concern, however, that dissolved metals—namely copper—may have so-called "sublethal" effects on juvenile southern

steelhead. This particular issue is addressed below. As the analysis indicates, the Project's discharge of dissolved copper is not expected to have significant lethal or sublethal effects on steelhead.

Toxic Olfactory Impacts to Southern Steelhead

Southern steelhead (*Oncorhynchus mykiss*) are not expected to occur in the Project area as: (1) the Project Site does not support suitable spawning substrate and cool water temperatures required for spawning; and (2) the Project is upstream from the "Dry Gap," an area in which the Santa Clara River, except in very high flow periods, does not flow on the surface, eliminating the possibility of fish migration upstream through the area. However, southern steelhead are known to occur in the lower Santa Clara River and a subset of Ventura County tributaries.[53] An increase in the in-stream dissolved copper concentration in the Santa Clara River where and when steelhead smolts (juveniles) are present may have a deleterious effect on the smolts. A NOAA Technical Memorandum (NOAA Memo) states that salmonid behavior, specifically predator avoidance, can be disrupted at concentrations of dissolved copper that are at or slightly above ambient background concentrations (i.e., those levels existing prior to Project development). [54,55]

In the NOAA Memo, a benchmark concentration approach was used to estimate the thresholds for dissolved copper's sublethal effects on juvenile salmon. The benchmark concentrations were derived from experiments using dechlorinated, soft municipal water, which is very low in dissolved organic carbon; dissolved organic carbon reduces the bioavailability of dissolved copper in surface waters and, hence, blocks its toxic effects on smolts. Significantly, the NOAA Memo stresses the importance of evaluating site-specific water quality parameters such as dissolved organic carbon levels and water hardness to determine their potential to impede olfactory toxicity. In that regard, sampling has shown that, unlike the water used in the laboratory experiments relied on in the NOAA Memo, the Santa Clara River has a dissolved organic carbon concentration that is sufficient to either limit or completely protect the olfactory response of juvenile steelhead from the effect of dissolved copper at the concentration predicted in the Project's discharges.

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[53] *Newhall Ranch RMDP/SCP, Final EIS/EIR, December 2010.*

[54] *Hecht, S.A., D.H. Baldwin, C.A. Mehane, T. Hawkes, S.J. Gross, and N.L. Scholz, An Overview of Sensory Effects on Juvenile Salmonids exposed to Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity, U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-83, October 2007.*

[55] *Southern steelhead is taxonomically a salmonid.*

Also of note, since the NOAA Memo was released, studies conducted for the Oregon Department of Transportation and the Federal Highway Administration found that more than 99 percent of the copper in highway stormwater runoff is not bioavailable and, therefore, not toxic to fish. Based on this finding, these studies concluded that the copper in highway stormwater runoff was several orders of magnitude below the inhibitory levels cited in the NOAA Memo.[56,57] Given that these findings were made with "raw" stormwater that had not been treated with LID BMPs, the methods employed in the toxicity studies referenced in the NOAA Memo likely over-predicted actual impacts by a significant margin.

Since publication of the NOAA Memo, scientists have developed an olfactory effect based model, termed the olfactory Biotic Ligand Model, which considers the influence of dissolved organic carbon, hardness, and receiving water cations and anions on the bioavailability of metals and other toxins. Data derived from this model supports the conclusion that the Project will not have significant sublethal effects on steelhead. Specifically, the olfactory Biotic Ligand Model predicts that the concentrations required to impair salmon/steelhead olfaction would be 40 to 80 times greater than that expected to be discharged from the Project (see **Table 5.10-18**, Predicted Average Annual Dissolved Copper Concentration and Load; **Table 5.10-27**, Copper Concentrations That Would Inhibit the Olfaction of 50 Percent of the Exposed Steelhead Smolt Population (IC50) Santa Clara River Reach 5, on page 5.10-94; and **Table 5.10-28**, Range of Copper Concentrations That Would Inhibit the Olfaction of 50 Percent of the Exposed Steelhead Smolt Population (IC50) for the Santa Clara River Reach 3, on page 5.10-94).

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[56] *Nason, Jeffrey A., et al., Copper Speciation in Highway Stormwater Runoff as Related to Bioavailability and Toxicity to ESA-listed Salmon, No. FHWA-OR-RD-11-11, 2011; available at www.oregon.gov/odot/td/tp_res/docs/reports/2011/spr663copperspec.pdf, accessed March 3, 2015.*

[57] *Oregon Department of Transportation, Research Section, and Nason, J. A., Sprick, M. S., & Bloomquist, D. J., Determination of Copper Speciation in Highway Stormwater Runoff Using Competitive Ligand Exchange-Adsorptive Cathodic Stripping Voltammetry, Water Research, 46(17): 5788-5798, 2012; available at www.ncbi.nlm.nih.gov/pubmed/22921394, accessed March 4, 2015.*

Table 5.10-27
Copper Concentrations That Would Inhibit the Olfaction of 50 Percent of the Exposed Steelhead Smolt Population (IC_{50}) Santa Clara River Reach 5

Statistic	IC_{50} (µg/L)
Average	237.0
Median	167.6
Maximum	740.9
Minimum	45.0
Standard Deviation	169.3
Coefficient of Variation	71%

Source: Geosyntec, 2014 (Table 7-24 in the Water Quality Report).

Table 5.10-28
Range of Copper Concentrations That Would Inhibit the Olfaction of 50 Percent of the Exposed Steelhead Smolt Population (IC_{50}) for the Santa Clara River Reach 3

Statistic	IC_{50} (µg/L)
Average	488.7
Median	279.2
Maximum	3,758.1
Minimum	104.4
Standard Deviation	693.1
Coefficient of Variation	1.4

Source: Geosyntec, 2014 (Table 7-26 in the Water Quality Report).

As previously shown, the average annual dissolved copper concentration in stormwater runoff from the Project after treatment in the LID BMPs is predicted to be well below the copper water quality criteria for aquatic life protection in the CTR (see **Table 5.10-18**, Predicted Average Annual Dissolved Copper Concentration and Load). Also, as previously shown, the predicted average annual dissolved copper concentration in stormwater runoff from the Project is less than the observed average concentration in the Santa Clara River (see **Table 5.10-24**, Comparison of Predicted Trace Metal Concentrations with Water Quality Criteria and Observed Concentrations in Santa Clara River Reach 5); therefore, Project runoff is not expected to increase the concentration of dissolved copper in the Santa Clara River. For additional detailed information regarding

Southern steelhead and dissolved copper, see Section 7.2.7 of the Water Quality Report provided in **Appendix 5.10** of the Draft EIR.

Based on the analysis provided in the Water Quality Report and summarized above, the work presented in the NOAA Memo is not expected to be representative of actual project conditions since the NOAA Memo does not assess the environmental factors that contribute to reduced dissolved copper toxicity. Taking these factors into account, the Project's discharges are not expected to significantly impact juvenile steelhead downstream of the Project.

One other fact regarding the NOAA Memo bears mentioning: in January 2012, NOAA and National Marine Fisheries Service adopted a Recovery Plan for the Southern California Distinct Population Segment of the southern steelhead, which covers the steelhead in the Santa Clara River, its tributaries, and its estuary.[58] Although the Recovery Plan includes a special "threats analysis" and cites more than 900 technical studies and scientific articles, it does not rely on or reference the 2007 NOAA Memo.[59]

(xiii) Constituents of Emerging Concern

Concentrations of constituents of emerging concern in stormwater runoff are expected to be reduced via treatment in the Project's LID BMPs, which would include unit processes to filter, adsorb, and biologically transform such constituents in stormwater runoff. The Valencia WRP treatment processes, including the reverse osmosis process that will be installed to comply with the chloride TMDL, will include favorable removal efficiencies of constituents of emerging concern that might be present in the Project's wastewater. Additionally, the Valencia WRP's NPDES Permit is protective of the beneficial uses, water quality, and aquatic life in the Santa Clara River. Therefore, potential impacts associated with constituents of emerging concern would be less than significant.

(xiv) Bioaccumulation

Bioaccumulative pollutants that are present in stormwater runoff from the Project may have the potential to accumulate in LID BMP vegetation and soils, potentially increasing the risk of exposure to wildlife and the food chain. Tests indicate that the

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[58] *The NOAA's National Marine Fisheries Service is the federal agency responsible for the stewardship of the nation's living marine resources and their habitat. Source: www.nmfs.noaa.gov/aboutus.htm, accessed March 19, 2015.*

[59] *In December 2013, NOAA and NMFS also adopted a Recovery Plan for the South-Central Distinct Population Segment of the southern steelhead. This Recovery Plan also did not rely on or reference the 2007 NOAA Memo.*

strongest negative correlation is between amphipod survival and pesticides (PCBs and DDT). As PCBs and DDT are not anticipated to be present in Project runoff, the major pollutant class of concern is pyrethroid pesticides. As discussed above, proposed pesticide management practices, including source control, removal in LID BMPs, and advanced irrigation controls, in compliance with the requirements of the MS4 Permit and the County LID Manual, would minimize the presence of pyrethroid pesticides in runoff.

Additionally, mercury and selenium may be of concern if present in runoff from the Project. However, mercury sources include fossil fuel power plant emissions and exposed tailings at former mercury mines, neither of which is present at the Project Site. Selenium naturally occurs in some geologic formations and can leach under certain conditions and enter receiving waters via springs and seeps. However, selenium is not naturally present at levels of concern in the Project's watershed. Thus, bioaccumulation of mercury and selenium are not of concern for the Project.

The potential for bioaccumulation impacts from the proposed parcel-based and regional LID BMPs would be minimal. The vegetation and soil media in the LID BMPs will trap sediments and pollutants in the soils, which contain bacteria that metabolize and transform pollutants, reducing the potential for these pollutants to enter the food chain. The facilities would not provide open water areas and are not likely to attract waterfowl. Bioaccumulation of pollutants in the Santa Clara River is not of concern due to the low concentrations of pollutants, below the benchmark Basin Plan objectives and CTR criteria predicted in the treated runoff.

On this basis, the potential for bioaccumulation in the Project BMPs or in the Santa Clara River and associated adverse effects on waterfowl and other species would be less than significant.

(xv) Dry Weather Runoff

As previously indicated, MS4 Permit and LID-compliant BMPs would be incorporated into the Project to address dry weather flows. It is expected that no dry weather discharge to the Santa Clara River will occur. On this basis, impacts from dry weather flows would be less than significant (see also Water Quality Report, pages 152–153).

(b) Groundwater Quality

Discharge from the Project's developed areas to groundwater could occur in three ways: (1) general infiltration of irrigation water; (2) infiltration of urban runoff in the proposed LID BMPs after treatment; and (3) infiltration of urban runoff, after treatment in the Project BMPs, in the Santa Clara River, which is the primary recharge zone for groundwater in the Project area. Groundwater quality would be fully protected through

implementation of the Project's site design, source control, LID, and treatment control BMPs prior to discharge of runoff to groundwater.

Stormwater infiltration poses few significant risks to underlying aquifers, as most pollutants carried by typical urban stormwater adsorb to soils, accumulating in the upper layers. Metals, pathogens, hydrocarbons, and numerous organic compounds will either: (1) adsorb to soil particles; (2) volatilize at the surface; or (3) degrade by microbial processes in surface and sub-surface soil layers.[60]

As previously explained, the potential pollutant of concern with respect to groundwater is nitrate plus nitrite. The Basin Plan's groundwater quality objective for nitrate plus nitrite is 10 mg/L. This objective is more stringent than the combined 11 mg/L objective of nitrate-nitrogen alone (10 mg/L) and nitrite-nitrogen alone (1 mg/L). The predicted nitrate plus nitrite concentration in runoff after treatment in the BMPs is 0.7 mg/L, which is well below the groundwater quality objective. Therefore, infiltration of post-development stormwater runoff would not cause significant groundwater quality impacts.

Treated effluent from the Valencia WRP would be used to supply the distribution of recycled water to the Project Site for irrigation of landscaping and other approved uses. The effluent limitation contained in the Valencia WRP's NPDES Permit for nitrate plus nitrite-N is 6.8 mg/L (average monthly), and the limitation for nitrite-N is 0.9 mg/L (average monthly). Thus, the Project's irrigation water supply, on average, will be below the groundwater quality objectives of 10 mg/L for nitrate plus nitrite-N and 1 mg/L for nitrite-N. On this basis, infiltration of irrigation water would not cause significant groundwater quality impacts. The Project's impact on groundwater quality would be less than significant.

With respect to chloride, mineral quality in groundwater is largely influenced by the mineral assemblage of soils and rocks. Elevated mineral concentrations could impact beneficial uses; however, the minerals listed in the Basin Plan, including chloride, are not believed to be pollutants of concern due to the anticipated runoff concentrations and the expected mineral concentrations in irrigation (recycled) water, which, as shown in **Table 5.10-29**, Comparison of Basin Plan Mineral Groundwater Objectives with Mean Measured Values in Los Angeles County Urban Runoff and Anticipated Irrigation Water Quality, on page 5.10-98, are below the Basin Plan ground water objective.

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[60] *Los Angeles and San Gabriel Rivers Watershed Council, Los Angeles Basin Water Augmentation Study Phase II Final Report, August 2005, www.usbr.gov/lc/socal/reports/LASGwtraugmentation/AppA.pdf, accessed March 3, 2015.*

Table 5.10-29
Comparison of Basin Plan Mineral Groundwater Objectives with Mean Measured Values in Los Angeles County Urban Runoff and Anticipated Irrigation Water Quality

Mineral	Los Angeles Basin Plan Groundwater Quality Objective[a] (mg/L)	Range of Mean Concentrations in Urban Runoff[b] (mg/L)	Anticipated Average Concentration in Recycled Water[c] (mg/L)
Total Dissolved Solids	1,000	53–237	684
Sulfate	350	7–35	173
Chloride	150	4–50	119
Boron	1.0	0.2–0.3	0.57

[a] *Eastern Santa Clara–Castaic Valley*
[b] *LACDPW, 2000. Includes all monitored land uses.*
[c] *SCVSD, 2013b. Values are average Valencia WRP effluent quality in 2011.*
Source: Geosyntec, 2014 (see Table 4-2 in the Water Quality Report).

Specific to chloride, as shown in **Table 5.10-29**, Comparison of Basin Plan Mineral Groundwater Objectives with Mean Measured Values in Los Angeles County Urban Runoff and Anticipated Irrigation Water Quality, the anticipated average concentration in recycled water is 119 mg/L, concentrations in urban runoff range between 4-50 mg/L, and the Basin Plan groundwater quality objective is 150 mg/L. Thus, the Project's impact on groundwater quality relative to chloride would be less than significant.

With respect to groundwater recharge, the total groundwater recharge for the Project was calculated using the results from the water quality model. Total Project recharge was calculated as a combination of three sources: (1) precipitation on pervious areas; (2) LID BMP infiltration; and (3) irrigation. The total Project recharge for existing and developed conditions, calculated as the sum of the three recharge sub-totals is provided in **Table 5.10-30**, Summary of Total Average Annual Project Recharge, on page 5.10-99.

As shown in **Table 5.10-30**, Summary of Total Average Annual Project Recharge, although precipitation recharge is predicted to decrease in the developed condition by 70 acre-feet per year (afy) due to the increase in impervious area, the predicted increase in recharge due to infiltration of stormwater runoff in the LID BMPs (122 afy) and the incidental recharge associated with irrigation of landscaped areas (40 afy) would increase ground water recharge overall by 92 afy or 46 percent over existing recharge. Therefore, the Project's impact on groundwater recharge is less than significant.

Table 5.10-30
Summary of Total Average Annual Project Recharge

Average Annual Recharge Estimate	Existing (ac-ft)	Developed (ac-ft)
Precipitation Recharge	175	105
LID BMP Recharge	0	122
Irrigation Recharge	22	62
Total Recharge	**197**	**289**

Source: Geosyntec, 2014 (see Table 7-29 in the Water Quality Report).

Threshold 5.10-3: Would the project conflict with the Los Angeles County Low Impact Development Ordinance (L.A. County Code, Title 12, Ch. 12.84)

Project BMPs include site design, source control, LID and treatment control BMPs in compliance with the County's LID Ordinance requirements, as described above and discussed in greater detail in Section 5 of the Water Quality Report. LID and treatment control BMPs will collect and retain and/or biotreat runoff from the entire developed portion of the Project Site. Sizing criteria contained in the MS4 Permit, LID Ordinance, and the LID Manual requirements will be met for all LID BMPs.

Section 7.5.2 in the Water Quality Report includes a runoff retention analysis to evaluate the Project's conformance with its LID Performance Standard. The analysis demonstrates that the Project BMPs conform to the LID Performance Standard by using a combination of retention and biofiltration BMPs. As such, the Project would not conflict with the County's LID ordinance, and no impact would result.

Threshold 5.10-10: Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Development typically increases impervious surfaces on formerly undeveloped (or less developed) landscapes, reducing the capture and infiltration of rainfall. The result is that, as a watershed develops, a larger percentage of rainfall becomes runoff during any given storm. In addition, runoff reaches the stream channel more efficiently due to the development of storm drain systems, so that the peak discharge rates for rainfall events and floods are higher for an equivalent event than they were prior to development. Further, the introduction of irrigation and other dry weather flows can change the seasonality of

runoff reaching natural receiving waters. These changes, in turn, affect the stability and habitat of natural drainages, including the physical and biological character of these drainages. This process is called "hydromodification" and its effects relative to water quality are addressed in this section.[61] Hydromodification related impacts also are addressed in **Section 5.4**, Biological Resources, and **Section 5.9**, Hydrology and Water Quality–Hydrology, of this Draft EIR. Additional detailed information regarding hydromodification effects relative to water quality is available in Section 7.7 of the Water Quality Report.

As discussed in more detail in **Section 5.9**, Hydrology and Water Quality—Hydrology, of this Draft EIR, the proposed drainage system would collect and convey runoff from the Project Site (as well as from upstream off-site locations within the tributary watershed through the Project Site) via a series of open channels and storm drains flowing to the River, with overall drainage patterns similar to existing conditions. No post-development stormwater flows would be discharged to natural River tributaries within the Project Site. Therefore, this analysis focuses on the potential for hydromodification impacts to the River as a result of the proposed Project. Impacts are addressed under both wet weather and dry weather conditions.

(a) Wet Weather Impacts

The County MS4 Permit exempts projects from hydromodification control requirements that discharge directly or via a storm drain into the River because the Regional Water Board has determined that large rivers like the Santa Clara River are not susceptible to hydromodification impacts. Nevertheless, the Project's site design and LID BMPs, especially open space retention and infiltration BMPs, would minimize increases in runoff volume from the developed area, which is the preferred method for controlling hydromodification impacts from new development.[62] Concentrated flows would be mitigated with energy dissipaters at the discharge points to the Santa Clara River. For these reasons, direct hydromodification impacts of the Project on the Santa Clara River would be less than significant.

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[61] *SCCWRP, 2005, Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams, Technical Report 450, April 2005, ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/450_peak_flow.pdf, accessed March 3, 2015.*

[62] *SCCWRP, 2005, Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams, Technical Report 450, April 2005, ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/450_peak_flow.pdf, accessed March 3, 2015.*

Disconnecting impervious areas from the drainage network and adjacent impervious areas is a key approach to protecting channel stability. Several hydrologic source controls incorporated into the Project limit impervious area and disconnect imperviousness:

- **Site Design.** Site design, including the following site design features, help reduce the increase in runoff volume by: (i) preservation of 74 percent of the Newhall Ranch sub-regional planning area in open space and 54 percent of the Entrada South tract map area in open space and parks; (ii) use of native and drought tolerate plants in landscaped areas; and (iii) use of efficient irrigation systems in common area landscaped areas. These measures help to protect the stability and avoid and minimize direct impacts to the Santa Clara River.

- **LID BMPs.** The Project's LID BMPs also serve as hydromodification source control BMPs. Parcel-based and regional LID BMPs provide volume reduction ranging from incidental volume reduction in biofiltration BMPs (via evaporation) up to full volume reduction of captured water in infiltration BMPs where soil and hydrogeological conditions permit. Collectively, these LID BMPs are expected to provide significant reduction in wet weather runoff. In addition, these facilities also will receive and eliminate dry weather flows.

The increase in impervious surfaces within the Project area is predicted to increase the average annual stormwater runoff volume from the Project area by approximately 153 afy, after accounting for the estimated volume reductions in the LID BMPs (see Table 7-1 in the Water Quality Report). The LID BMPs are estimated to reduce the increase in average annual stormwater runoff volume by approximately 122 afy, which is a 36 percent reduction of the predicted average post-development stormwater runoff volume without the LID BMPs.

Energy dissipation at storm drain outfalls would provide erosion protection in areas where discharges have the potential to cause localized stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River.

In summary, although Project runoff volumes, flow rates, and durations will increase, potential impacts of hydromodification (i.e., the potential to cause erosion, siltation, or channel instability) will be minimized by the Project BMPs. The Project's site design and LID BMPs will minimize increases in runoff volume from the developed area, the preferred method for controlling hydromodification impacts from new development.[63] Potential in-

[63] *SCCWRP, 2005, Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams, Technical Report 450, April 2005, ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/450_peak_flow.pdf, accessed March 3, 2015.*

stream impacts of increased volumes, rates, and flow durations will be managed and mitigated with energy dissipaters at the discharge points to the River. For these reasons, the wet weather hydromodification impacts of the Project on the Santa Clara River are considered less than significant.

(b) Dry Weather Impacts

Source control and LID BMPs will prevent the discharge of dry weather urban runoff from the Project. These BMPs include:

- The use of native and/or non-invasive, climate appropriate vegetation and smart irrigation controls.
- The use of the parcel-based LID BMPs, including infiltration, bioinfiltration, and biofiltration BMPs placed in common area landscaping in commercial, multi-family residential, institutional, recreational, and park areas, roadway median strips, and parking lot islands (where applicable) and regional infiltration/ biofiltration facilities incorporating natural vegetation.

In order to quantitatively address dry weather impacts, a dry weather water balance was performed. Based on the water balance, it is predicted that all dry weather flows would be infiltrated or removed by evapotranspiration in the Project LID and treatment control BMPs, which also provide hydrologic source control. As noted above, the Project includes numerous source controls that reduce dry weather flow generation at the source, such as education programs, use of native and/or non-invasive, climate appropriate vegetation, and smart irrigation systems in multi-family residential areas. As a result, no appreciable change in seasonality of flows is anticipated to result from Project development. Based on the comprehensive site design, source control, LID and treatment control strategy, and considering that dry weather flows would not be discharged to the River, the Project's hydromodification impact on the River during dry seasons would be less than significant. (For additional information regarding the dry weather analysis, refer to Section 7.7.2 of the Water Quality Report.)

Additionally, although the Project uses would result in new wastewater flows to the Valencia WRP which discharges to the River, during dry weather months the Project's demand for recycled water (i.e., for irrigation purposes) from Valencia WRP would be at its highest and would offset any increase in flows.[64] Therefore, the Project's hydromodification

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[64] *See Figure 8 in the water demand technical memorandum by GSI Water Solutions, Inc., provided in* ***Appendix 5.21B****, which shows the seasonality of the Project's recycled water demand as compared to its recycled water supply (i.e., wastewater flows to the WRP).*

impact on the River during dry seasons due to wastewater discharges also would be less than significant. (For additional information on wastewater generation, refer to **Section 5.22**, Utilities and Service Systems—Wastewater, of this Draft EIR.)

Threshold 5.10-11: Would the project add water features or create conditions in which standing water can accumulate that could increase habitat for mosquitoes and other vectors that transmit diseases such as the West Nile virus and result in increased pesticide use?

Compliance with Los Angeles County Code and MS4 Permit requirements would preclude standing water conditions that could increase habitat for mosquitoes and other vectors. The Project's water quality BMPs would also be designed to preclude the potential for standing water to occur within the Project Site. Additionally, any water features that may be introduced as part of the Project would comply with all regulatory requirements related to standing water limitations. As a result, the Project would not add water features or create conditions in which standing water can accumulate that would result in conditions necessitating increased pesticide use. On this basis, the Project's impact related to mosquito and other vector habitat would be less than significant. Further discussion of water quality impacts related to pesticides is provided above.

4. CUMULATIVE IMPACTS

a. Cumulative Impact Study Area

To determine the study area for the analysis of the Project's cumulative water quality impacts, Geosyntec reviewed the related projects list and land use assumptions set forth in **Section 4.2**, Cumulative Impact Analysis Methodology, of this Draft EIR. This list, however, proved less useful for purposes of analyzing the Project's contribution to water quality impacts because the list includes a number of projects that are located far away from Santa Clara River Reach 5 and its tributaries and, as a result, would contribute minimally to any impact on these water bodies. Therefore, Geosyntec and County staff determined that the cumulative study area, for purposes of analyzing water quality, should include only those development projects whose stormwater drains or would drain into Reach 5 of the Santa Clara River. Reach 5 extends from roughly I-5 (east of the Project Site) to just west of the Los Angeles/Ventura County line. The study area includes the approximately 1,500 acres of tributary watershed area in which the Project Site is located, as well as the Newhall Ranch Specific Plan area.

The Santa Clara River Reach 5 study area allows a quantitative assessment of the Entrada South Project's contribution to cumulative water quality impacts on a scale small enough for that contribution to be measured in a meaningful way. In other words, the study area is not so large that the Project's contribution to the overall cumulative impact is

quantitatively diluted to the point of statistical insignificance. To this end, a quantitative analysis was completed based on water quality modeling for Entrada South in conjunction with the following related projects within Reach 5: Related Project No. 1, Mission Village; Related Project No. 2, Landmark Village; Related Project No. 3, Legacy Village; Related Project No. 4, Homestead South; Related Project No. 5, Entrada North; Related Project No. 6, Potrero Village; Related Project No. 7, Homestead North; and Related Project Nos. 8 and 9, Valencia Commerce Center. These projects, described more fully below, were selected for quantitative analysis because: (1) they represent nearly all of the cumulative development within the study area; and (2) technical data from these projects is readily available, as each is part of the Applicant's Westside development program.

The following is a description of each of the cumulative projects, in addition to the proposed Project, that have been included in the cumulative model:

- The Newhall Ranch Specific Plan allows for a broad range of residential, mixed-use, and non-residential land uses to be developed within five villages (Landmark Village (VTTM 053108), Mission Village (VTTM 061105), Homestead South (VTTM 060678), Homestead North (VTTM 072830), and Potrero Village (VTTM 060911).

- The proposed Entrada North (VTTM 071377) site is located north of Entrada South and immediately west of I-5. A portion of the Entrada North site is located southwest of the intersection of I-5 and SR-126 (at Castaic Junction) north of the River, and the remaining portion lies north of Magic Mountain Parkway between I-5 and Six Flags Magic Mountain, south of the River. The Entrada North project involves development of multi-family residential units and commercial/retail uses on approximately 454 acres.

- The proposed Legacy Village project is located southwest of Entrada South, bordering Mission Village and Homestead South and adjacent to the existing communities of Stevenson Ranch and Westridge. The 1,764-acre Legacy Village project involves the construction of residential areas and commercial space. Over 1,000 acres of open space will be incorporated into this development, including 50 acres of parks, recreation, and trails.

- The remaining unbuilt portions of the Valencia Commerce Center are located approximately 0.5 mile upstream of the confluence of Castaic Creek and the Santa Clara River. Approximately 3.6 million square feet of building floor area will be developed over the next five to ten years. Additionally, bank stabilization improvements to Castaic Creek and Hasley Creek would be constructed in conjunction with these remaining phases of the project.

The analysis that follows addresses impacts to surface water quality, climate change (as it relates to water quality), groundwater quality, and hydromodification/sediment transport.

b. Surface Water Quality

The analysis of cumulative surface water quality impacts included water quality modeling. The model assumptions were very conservative in terms of the feasibility of implementing infiltration BMPs; the model assumes that the proportion of runoff that will be infiltrated is equivalent to the proportion of developed area that is feasible for infiltration. At the project level, it is likely that areas feasible for infiltration will be infiltrating runoff opportunistically from surrounding areas that are not feasible for infiltration, resulting in infiltration of a higher proportion of runoff than is accounted for in the cumulative model. Additionally, the model assumes that open space is compacted 25 percent in the post-development condition, an assumption used for uniformity in the model that will result in an overestimation of runoff volumes in the post-development condition.

The combined effect on modeled stormwater pollutant loads and concentrations of the Newhall Ranch Specific Plan (Mission Village, Landmark Village, Homestead South, Potrero Village, and Homestead North), Entrada North, Entrada South, Legacy Village, and the Valencia Commerce Center projects is summarized in **Table 5.10-31**, Predicted Average Annual Combined Pollutant Loads, on page 5.10-106 and **Table 5.10-32**, Predicted Average Annual Combined Pollutant Concentrations, on page 5.10-107. Also listed in these tables is an estimate of the Newhall Ranch WRP effluent loads and concentrations, and the combination of predicted stormwater runoff and Newhall Ranch WRP effluent loads and concentrations. Valencia WRP effluent is not included as the Valencia WRP effluent quality is not expected to change as a result of the Project or the cumulative development because the quality of the wastewater generated by the Project, and cumulative development is not expected to be different from the quality of the wastewater currently treated at the Valencia WRP.

As shown in **Table 5.10-31**, Predicted Average Annual Combined Pollutant Loads, when considered cumulatively, average annual volumes and loads of ammonia; total nitrogen; dissolved copper and zinc; total copper, zinc, and iron; and chloride are predicted to increase over existing conditions, while pollutant loads are expected to decrease for TSS, total phosphorus, nitrate-N + nitrite-N, and total lead.

As shown in **Table 5.10-32**, Predicted Average Annual Combined Pollutant Concentrations, average annual pollutant concentrations from the combined projects are predicted to decrease or remain unchanged relative to existing conditions for all modeled parameters except chloride.

As shown in **Table 5.10-33**, Comparison of Predicted Average Annual Combined Pollutant Concentrations with Water Quality Criteria and Observed Concentrations, on page 5.10-108, the predicted increases in pollutant concentrations, including chloride, are

Table 5.10-31
Predicted Average Annual Combined Pollutant Loads

Modeled Parameter	Units	Stormwater Existing Conditions	Stormwater Developed Conditions	Stormwater Change	Newhall Ranch WRP Effluent[a]	Total Discharge[b]	Total Change[c]
Volume	acre-ft	1,620	4,037	2,417	1,025	5,062	3,442
Total Suspended Solids	tons	677	420	-257	3.5	424	-254
Total Phosphorus	tons	2.8	1.0	-1.8	0[d]	1.0	-1.8
Nitrate-N + Nitrite-N	tons	8.2	4.3	-3.9	3.6	7.9	-0.3
Ammonia-N	tons	1.0	1.2	0.2	1.4	2.6	1.6
Total Nitrogen	tons	13	10	-3	6.1	16	3.1
Dissolved Copper	lbs	39	78	39	21	99	60
Total Copper	lbs	141	134	-7	21[e]	155	14
Total Lead	lbs	44	42	-2	0.3[e]	42	-2
Dissolved Zinc	lbs	429	472	43	106	578	149
Total Zinc	lbs	518	670	152	106[e]	776	258
Total Iron	lbs	5,980	11,039	5,059	167	11,206	5,226
Chloride	tons	44	88	44	139	227	183

[a] *Wet weather WRP Effluent loads were calculated based on an assumption of 1,025 acre-feet of discharge per year at the concentrations listed in Table 7-31.*

[b] *Total Discharge = Stormwater Developed Conditions + WRP Effluent.*

[c] *Total Change = Stormwater Change + Annual WRP Effluent.*

[d] *Total phosphorus is not included in Valencia monitoring or in the Newhall WRP Permit effluent limits; it has been shown be reduced to negligible levels in tertiary-treated wastewater treatment plant effluent (EPA, 2007).*

[e] *WRP loads for total metals were conservatively assumed to be equivalent to dissolved metals loads as total metals effluent data were not available.*

Source: Geosyntec, 2014 (see Table 7-30 in the Water Quality Report).

not anticipated to be significant because all of the predicted concentrations are: (a) well below Basin Plan benchmark water quality standards and TMDL wasteload allocations; and (b) within the observed range of concentrations in Santa Clara River Reach 5.

Table 5.10-32
Predicted Average Annual Combined Pollutant Concentrations

Modeled Parameter	Units	Stormwater Existing Conditions	Stormwater Developed Conditions	Stormwater Change	Newhall Ranch WRP Effluent[a]	Total Discharge[b]	Total Change[c]
Total Suspended Solids	mg/L	307	77	-230	2.5	62	-245
Total Phosphorus	mg/L	1.3	0.2	-1.1	0[d]	0.1	-1.2
Nitrate-N + Nitrite-N	mg/L	3.7	0.8	-2.9	2.6	1.2	-2.5
Ammonia-N	mg/L	0.4	0.2	-0.2	1.0	0.4	0
Total Nitrogen	mg/L	5.8	1.9	-3.9	4.4	2.4	-3.4
Dissolved Copper	µg/L	8.8	7.1	-1.7	8	7.2	-1.6
Total Copper	µg/L	32	12	-20	8	11	-21
Total Lead	µg/L	10	3.8	-6.2	0.1	3.0	-7
Dissolved Zinc	µg/L	97	43	-54	38	42	-55
Total Zinc	µg/L	118	61	-57	38	56	-62
Total Iron	µg/L	1,357	1,006	-351	60	814	-543
Chloride	mg/L	9.9	8.0	-1.9	100	33	23

[a] *Wet weather WRP Effluent concentrations are equal to Valencia WRP average effluent concentrations in 2008 (total nitrogen, copper, lead, and zinc; see Appendix A) and 2011 (SCVSD, 2013b), except chloride, which was assumed to be equal to the effluent limit in the Newhall WRP NPDES Permit (R4-2013-0180) (100 mg/L).*

[b] *Total Discharge Concentration = Total Discharge Load / Total Discharge Volume (from **Table 5.10-29**, Predicted Average Annual Combined Pollutant Loads)*

[c] *Total Change = Total Discharge - Stormwater Existing Conditions*

[d] *Total phosphorus is not included in Valencia monitoring or in the Newhall WRP Permit effluent limits; it has been shown be reduced to negligible levels in tertiary-treated wastewater treatment plant effluent (EPA, 2007)*

Source: Geosyntec, 2014 (see Table 7-31 in the Water Quality Report).

As to ammonia and dissolved zinc, while the average annual ammonia and dissolved zinc runoff concentrations are predicted to be higher than the average concentrations observed in Santa Clara River Reach 5, the concentrations are predicted to remain the same and decrease, respectively, in the post-developed condition relative to the existing condition (see **Table 5.10-33**, Comparison of Predicted Average Annual Combined Pollutant Concentrations with Water Quality Criteria and Observed Concentrations). The

Table 5.10-33
Comparison of Predicted Average Annual Combined Pollutant Concentrations with Water Quality Criteria and Observed Concentrations

Modeled Parameter	Units	Predicted Average Annual Concentration	TMDL WLA/ LA Basin Plan Water Quality Objectives	California Toxics Rule Criteria[a]	Range of Observed[b] Concentrations in Santa Clara River Reach 5	Average Wet Weather[c] Concentration in Santa Clara River Reach 5
Total Suspended Solids	mg/L	62	[d]	N/A	26–6,591	1,012
Total Phosphorus	mg/L	0.1	[e]	N/A	0.18–1.3	0.5
Nitrate-N + Nitrite-N	mg/L	1.2	6.8[f]/5	N/A	<0.1–4.8[g]	1.2[g]
Ammonia-N	mg/L	0.4	1.75[h]/4.1[i]	N/A	<0.03–1.4	0.2
Total Nitrogen	mg/L	2.4	[d]	N/A	<0.04–32[j]	2.5[j]
Dissolved Copper	µg/L	7.2	N/A	25	<0.5–39.9	8.6
Total Copper	µg/L	11	N/A	26	<0.5–91.3	27.3
Total Lead	µg/L	3.0	N/A	190	<0.2–110	17.2
Dissolved Zinc	µg/L	42	N/A	205	<1–198	35.2
Total Zinc	µg/L	56	N/A	210	10.9–500	110
Total Iron	µg/L	814	N/A	N/A	265–49,000	12,823
Chloride	mg/L	33	100	N/A	2.6–118	44

N/A = Not applicable

[a] *Hardness = 194 mg/L, based on average observed value in SCR Reach 5 (see Table 2-13). Lead criteria is for total recoverable lead.*

[b] *Range of concentrations observed in Santa Clara River Reach 5 during wet weather (see Table 2-13).*

[c] *Average concentration observed in Santa Clara River Reach 5 during wet weather for all years (see Table 2-13).*

[d] *Water shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.*

[e] *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.*

[f] *Nitrate + nitrite-N TMDL WLA is 6.8 mg/L (30-day average).*

[g] *Observed value for nitrate-N.*

[h] *TMDL WLA is 1.75 mg/L (30-day average) in Reach 5 below Valencia.*

[i] *4-day average, ELS present, average pH observed at Station S29 (7.3) and assumed temperature of 30°C (temperature data are not available for SCR Reach 5).*

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

Source: Geosyntec, 2014 (see Table 7-32 in the Water Quality Report).

remaining pollutants are all predicted to be less than the observed average concentrations. Therefore, the cumulative discharges are not expected to increase the pollutant concentrations in the Santa Clara River.

As previously discussed, these quantitative data reflect predicted combined pollutant levels for the Newhall Ranch Specific Plan, Legacy Village, Entrada North, Entrada South, and Valencia Commerce Center projects. In addition, it is noted that other related projects in the surrounding area, although more distant from Reach 5, may have the potential to result in increases in runoff volumes and pollutant loads and concentrations that could affect water quality in Reach 5 and downstream. However, such related projects, after implementation of required treatment measures, likely would have pollutant concentrations in runoff similar to those predicted for the projects quantified above, as they would be subject to the same water quality regulations and controls. Also, because the pollutant concentrations set forth in **Table 5.10-32**, Predicted Average Annual Combined Pollutant Concentrations, are well below the Basin Plan benchmark water quality thresholds and TMDL wasteload allocations and within the observed range of concentrations in Reach 5 of the River (see **Table 5.10-33**, Comparison of Predicted Average Annual Combined Pollutant Concentrations with Water Quality Criteria and Observed Concentrations), a potential incremental increase in pollutant concentrations in runoff from the other, non-modeled projects is not expected to result in any cumulative violation of established water quality thresholds. Therefore, the Entrada South Project will not result in a cumulatively considerable contribution to a significant cumulative impact on surface water quality.

As previously stated, Entrada South and the other projects in the cumulative impact study area would be subject to state, regional, and County requirements, such as MS4 Permit and LID Manual requirements; Construction General Permit requirements; General Dewatering Permit requirements; and benchmark Basin Plan water quality objectives, CTR criteria, and TMDLs wasteload allocations, which are designed to assure that regional development does not adversely affect water quality. Any future urban development occurring in the cumulative impact study area also must comply with these requirements. Future projects would be evaluated individually to determine appropriate BMPs and treatment measures to avoid or mitigate impacts to water quality. In addition, the County or City (as appropriate) would review all construction projects on a case-by-case basis to ensure that local and regional drainage surface water quality is protected. Therefore, based on the data above and with compliance with all applicable laws, rules, and regulations, no significant cumulative impacts to surface water quality are anticipated.

c. Climate Change

Within the context of long-term cumulative impacts, consideration also is given to climate change. A warming climate, in general, is expected to increase water temperatures and modify regional patterns of precipitation, and these changes can have direct effects on

water quality.[65] In general, water quality is sensitive to temperature and water quantity. As temperature increases, the ability of water to hold dissolved oxygen declines. Nutrients in the water enhance biological productivity of algae and plants, which increases oxygen concentration by day, but at night these producers consume oxygen. Increased stream flows during extreme events can dilute nutrient concentrations; however, higher flows can also flush out excess nutrients. The overall balance of these competing effects in a changing climate is not yet known.

While precipitation projections do not show a clear trend in the future, an ensemble of twelve climate models shows a trend of decreasing runoff for Southern California between the end of the 20th and 21st centuries.[66] A decrease in runoff would increase the percentage of runoff that is captured and treated in stormwater BMPs, which are sized per the current MS4 Permit requirements. In this scenario, the effect of climate change would be an improvement of water quality in Project receiving waters.

d. Groundwater Quality

As discussed above, the anticipated quality of stormwater runoff discharges from the Project's developed areas and irrigation to groundwater will not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the groundwater quality standards. By extrapolating these results to existing and proposed development in the watershed, as listed in **Table 4.2-1**, Related Projects, in **Section 4.2**, Cumulative Impact Analysis Methodology, of this Draft EIR, and after having reviewed adopted plans and reports, it is concluded that no adverse cumulative effects would occur to groundwater. Therefore, the Project's incremental effects on groundwater quality when considered together with the effects of other projects in the area are not expected to be significant.

As previously discussed, the Project's discharges to groundwater, both during construction and post-development, would comply with adopted regulatory requirements designed by the Regional Water Board to assure that regional development does not adversely affect water quality. These requirements include MS4 Permit and LID Manual requirements; Construction General Permit requirements; General Dewatering Permit requirements; and Basin Plan benchmark groundwater quality objectives. Any future urban

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[65] *U.S. Climate Change Science Program, The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity, 2008, www.usda.gov/oce/climate_change/SAP4_3/CCSPFinalReport.pdf, accessed March 3, 2015.*

[66] *CDM Smith, Climate Change Handbook for Regional Water Planning, Prepared for USEPA Region 9 and California Department of Water Resources, November 2011, www.water.ca.gov/climatechange/CCHandbook.cfm, accessed March 4, 2015.*

development occurring in the River watershed also must comply with these requirements. Therefore, based on compliance with the adopted regulatory requirements designed to protect beneficial uses of water bodies, cumulative groundwater quality impacts would be less than significant.

With respect to groundwater recharge, as detailed in Section 7.9.3 of the Water Quality Report, the Project's cumulative impact on groundwater recharge is considered less than significant for the following reasons:

- A number of studies, including those by the Upper Santa Clara River watershed water purveyors, have documented long-term stability of groundwater levels in both the Alluvial aquifer and the Saugus Formation aquifer.
- This long-term stability (several decades) has occurred simultaneously with urban growth, as well as two extended periods of successive dry years.
- Calibrated models of surface water and groundwater interactions for the period 1979 to 2011 confirm that even with growth and increased water use, groundwater levels in the Upper Santa Clara River aquifers have been relatively stable, indicating that recharge of the aquifers has kept pace with groundwater extraction.
- Future GSWI model scenarios incorporating planned development, including the Project and cumulative impact analysis area projects, through 2030 indicate continued long-term stability of aquifer water levels.

e. Hydromodification/Sediment Analysis

The Los Angeles County MS4 Permit exempts projects from hydromodification control requirements that discharge directly or via a storm drain into a waterway that has a 100-year peak flow (Q_{100}) of 25,000 cfs or more, or other receiving waters that are not susceptible to hydromodification impacts. The 100-year peak flow, or Q_{100}, in the River at the Project location is 58,207 cfs, and, therefore, the Project is exempt from hydromodification control requirements for direct discharges to the River.[67] Furthermore, discharges to the River from the Project are not expected to cause channel instability (as discussed below).

Balance Hydrologics assessed the potential effects of the planned cumulative urbanization within the River upstream of the County line (the upper watershed) on channel

[67] *Newhall Ranch RMDP/SCP, Final EIS/EIR, December 2010.*

morphology by examining historical changes in the Santa Clara River channel pattern in response to different types of major disturbance using historical rainfall and other relevant records and aerial channel photography. The findings of this analysis are summarized below. (A copy of the Balance Hydrologics report is included in the Water Quality Report.)

The Santa Clara River is a dynamic, episodic system. Understanding the magnitude of geomorphic change over the course of recent history in response to natural and human disturbances in the watershed is a key factor in assessing the potential response to future urbanization within the watershed. For example, the report examines the construction of Castaic Dam in 1974 (affecting approximately 30 percent of the River watershed above Castaic Creek), which cut off a significant supply of sediment to the River. This change, however, does not appear to have had an effect on the channel dimensions of the Santa Clara River mainstem. The width of the active corridor and the general form of the channel are generally consistent before and after construction of the dam. It appears that the River had enough buffering capacity to absorb this change. The report finds that the depletion of sediment supply to the mainstem, which typically would be expected to cause erosive effects, did not, in fact, result in those effects, perhaps because reductions in sediment were offset by additional available sediment stored in the basin in the upper watershed as a result of movement along the San Gabriel fault.

Similarly, the report examines the amount of vegetation within the Santa Clara River corridor, which appears to have generally increased since the 1960s, likely due to the increase in available summer flows due to the Valencia and Saugus WRPs' discharges. However, this vegetation does not seem to provide enough erosion resistance to maintain a "stable" channel capable of withstanding regular "resets," which are described as large events that completely alter the form of the River channel that occur at intervals averaging about a decade, or much less than the expected lifetime of the riparian woodlands that do get established. Despite heavy vegetation on the channel banks near the Project area and in areas of groundwater upwelling, the stream still responds to large events by a general widening and/or shift of the active channel within the River corridor.

After studying the response of the river to several different anthropogenic and natural disturbances, the report concludes that the Santa Clara River, as with many streams in semi-arid 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 the channel width of 1980s levee construction is barely discernible by the first few years of the 21st century, 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.

Additional study of the Santa Clara River has been performed by Pacific Advanced Civil Engineering, Inc., which prepared a comprehensive fluvial analysis for River through Santa Clara River Reach 5 for the County Department of Public Works (Public Works). A river fluvial analysis is the study of the river bed and bank sediment movement over time as a result of flow in the river and changes in the tributary watershed.

The fluvial analysis had three distinct components:

1. Analysis of long term trends of river bed and bank sediment build-up (aggredation) or removal (degradation) was performed. More than 80 years of available historic topographic mapping of the river indicated no real trend of aggredation or degradation in the study reach, consistent with Balance Hydrologics' conclusions.

2. General (capital storm event) aggredation/degradation calculations were performed to determine the expected fluvial response of the river to the Public Works design storm event (>140,000 cfs). U.S. Army Corps of Engineers computer modeling software (SAM) was used to evaluate existing and proposed project conditions. Only minor variations in the fluvial response were shown in the modeling.

3. Local aggredation/degradation resulting from river curvature, existing and proposed bridges, river bed material, and various other components were considered and estimates of aggredation and degradation were calculated.

To complete the fluvial analysis, long-term, general, and local aggredation/ degradation components were added together to obtain the total aggredation/degradation for each River section within the study reach.

One of the purposes for the fluvial analysis, which has been approved by Public Works, was to provide a level of understanding of the Santa Clara River Reach 5 fluvial mechanics related to existing conditions and proposed Specific Plan development conditions to identify any potential project impacts. The fluvial analysis showed very little change in the pre- and post-development conditions and, therefore, concluded that there is no potential adverse impact to the fluvial mechanics of the river.

In conclusion, the Project will include a number of hydrologic source control BMPs to substantially reduce any contribution to potential cumulative hydromodification impacts to the Santa Clara River. Likewise, other future related projects within the watershed are anticipated to implement hydromodification controls in the MS4 Permit requirements. These measures are designed to prevent and mitigate project-specific and cumulative hydromodification impacts.

Within the Reach 5 watershed, major perturbations (e.g., urbanization, dam construction, levee construction, decadal changes in climate, and increases in woody vegetation) do not appear to have had a significant impact on the geomorphic expression of the River. Large "re-set" events (those which are typically not as affected by increases in impervious area) have episodically completely altered the form of the River channel. These events, occurring on average once every ten years, are a dominant force in defining channel characteristics. The geomorphic dominance of "re-set" events determines the geomorphic character of the River, and the River's response to anthropogenic perturbations, including hydromodification impacts associated with development, is expected to be minimal in light of the "re-set"-driven nature of the channel. Due to these episodic "re-sets," "unraveling" of the Santa Clara River mainstem due to hydromodification associated with cumulative urban development within the watershed, as is seen in many smaller Southern California watersheds, is not expected to occur. The "re-set" events appear to adequately buffer changes that may occur in short-term sediment transport.[68]

Based upon these considerations, the fact that the Project incorporates hydromodification source BMPs, that future development projects within the watershed will control flow under the MS4 Permit, and that large-scale changes naturally occur in the Santa Clara River in response to major episodic events, which overshadow development-related hydromodification impacts, no significant cumulative hydromodification impact would occur and the Project's contribution to cumulative hydromodification impacts to the Santa Clara River would be less than significant. Additional information regarding the Project's cumulative hydromodification impacts relative to water quality is presented in Section 7.9.2 of the Water Quality Report.

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[68] *These conclusions are confirmed by the PACE Fluvial Study with respect to development of the Newhall Ranch Specific Plan. Source: PACE, Newhall Ranch Habitat Management Plan River Drainage Analyses, Draft Floodplain Hydraulics Impacts Assessments for the Santa Clara River, 2006.*

5. MITIGATION MEASURES

a. Newhall Ranch RMDP/SCP Mitigation Measures

With implementation of PDF ES 5.10-1 and PDF ES 5.10-2 and other Project attributes, combined with compliance with applicable regulatory requirements, including appropriate BMPs, Project-level impacts with regard to surface water quality, groundwater quality, and stream channel hydromodification would be less than significant; therefore, no mitigation measures are required. Cumulative impacts also would be less than significant; and, thus, no mitigation measures would be required.

However, CDFW previously adopted mitigation measures to ensure implementation of the Project Applicant's design commitments that minimize water quality-related impacts in connection with its adoption of the Newhall Ranch RMDP/SCP EIS/EIR. A number of the RMDP/SCP mitigation measures also apply to the Project. If the status of the RMDP/SCP EIS/EIR is unresolved or set aside in the pending litigation at the time the County considers the Project EIR for certification, this EIR recommends that the County adopt the companion Entrada South (ES) mitigation measures set forth below, as applicable, to ensure implementation of the water quality-related Project features. Those RMDP/SCP mitigation measures that are not applicable to the Project are listed in **Appendix 2B** with an explanation as to why they do not apply. Any italicized text provided in the parentheticals below provides necessary updated information and/or clarification, as needed.

MM ES 5.10-1/RMDP/SCP 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. (*PDF ES 5.10-1 implements the substantive requirements contained in this mitigation measure. Note: The final SUSMP is now referred to as the LID Plan per the County LID Manual. Reference to "this EIS/EIR" refers to the RMDP/SCP EIS/EIR.*)

MM ES 5.10-2/RMDP/SCP 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).

(PDF ES 5.10-1 implements the substantive requirements contained in this mitigation measure. Reference to Section 4.4 refers to the Water Quality section of the RMDP/SCP EIS/EIR.)

b. Entrada South Project-Level Mitigation Measures

With implementation of PDFs ES 5.10-1 and ES 5.10-2, combined with implementation of MM ES 5.10-1/RMDP/SCP WQ-1 and MM ES 5.10-2/RMDP/SCP WQ-2

and adherence to applicable regulatory requirements, including implementation of appropriate BMPs, Project-level impacts with regard to surface water quality, groundwater quality, and stream channel hydromodification/sediment transport would be less than significant. Therefore, no additional mitigation measures are required.

6. LEVEL OF SIGNIFICANCE AFTER MITIGATION

As indicated above, with implementation of PDFs ES 5.10-1 and ES 5.10-2, combined with implementation of MM ES 5.10-1/RMDP/SCP WQ-1 and MM ES 5.10-2/ RMDP/SCP WQ-2 and adherence to applicable regulatory requirements, including implementation of appropriate BMPs, Project-level and cumulative impacts on surface water quality, groundwater quality, and stream channel hydromodification/sediment transport would be less than significant.