4.8 HYDROLOGY AND WATER QUALITY

The analysis contained in this section is based on a hydrologic report prepared by *Schaaf & Wheeler, Consulting Civil Engineers* in February 2006 for the proposed project. The report is found in Appendix J of this EIR.

4.8.1 Introduction and Regulatory Framework

This section of the EIR addresses the environmental impact(s) of the proposed project with regard to the issues of drainage, flooding, water quality, hydromodification, and groundwater. As explained in the following paragraphs, these issues are the subject of various regulatory programs that are designed to avoid adverse impacts that include the following: 1) human injury/loss of life; 2) property damage/loss; 3) harm to fisheries as well as terrestrial wildlife; 4) degradation of plant communities; 5) economic losses; and 6) reduction in quality of life, including effects on recreational activities such as boating and swimming. A discussion of the Water Supply Evaluation prepared for the project can be found in Section 4.11, *Utilities and Service Systems*.

Flooding

The 100-year flood is the standard design level of protection set by the Federal Emergency Management Agency (FEMA), which is responsible for administration of the National Flood Insurance Program (NFIP). The 100-year flood, sometimes referred to as the one-percent flood, has a one percent statistical probability of occurring in any year, or an average return period of 100 years over a long time. The occurrence of a 100-year flood does not change the probability of a 100-year flood occurring in succeeding years.

Water Quality

The federal Clean Water Act and California's Porter-Cologne Water Quality Control Act are the primary laws related to water quality. Regulations set forth by the U.S. Environmental Protection Agency (EPA) and the State Water Resources Control Board have been developed to fulfill the requirements of this legislation. EPA's regulations include the National Pollutant Discharge Elimination System (NPDES) permit program, which controls sources that discharge pollutants into waters of the United States (e.g., streams, lakes, bays, etc.). These regulations are implemented at the regional level by water quality control boards, which for the San José area is the San Francisco Bay Regional Water Quality Control Board (RWQCB).[31]

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPP), of which the City of San José is a participant, is a county-wide program and was developed in accordance with the requirements of the RWQCB's *San Francisco Bay Basin Water Quality Control Plan*, as well as the requirements of EPA's NPDES permit program.

[31]Historically, efforts to prevent water pollution have focused on "point" sources, meaning the source of the discharge was from a single location (e.g., a sewage treatment plant, power plant, factory, etc.). Recent efforts are focusing on pollution caused by "non-point" sources, meaning the discharge comes from multiple locations. The best example of this latter category is urban stormwater runoff, the source of which is a myriad of impervious surfaces (e.g., highways, rooftops, parking lots, etc.) that are found in a typical city or town.

Additional water quality control measures were approved in October 2001 (revised in 2005), when the RWQCB adopted an amendment to the NPDES permit for Santa Clara County. This amendment, which is commonly referred to as "C3" (referring to the applicable section of the permit amendment), requires all new and redevelopment projects that result in the addition or replacement of impervious surfaces totaling 10,000 square feet or more, to be designed with Best Management Practices (BMPs) that reduce stormwater pollution through source control measures and stormwater treatment measures. In turn, City of San José Policy Number 6-29 mandates compliance with the C3 regulations for projects that are located within its boundaries and specifies sizing for BMPs using hydraulic thresholds.

In practical terms, the C3 requirements seek to reduce water pollution by both reducing the *volume* of stormwater runoff and the *amount* of pollutants that are contained within the runoff. The methods used to achieve these objectives vary from site to site, but can include measures such as a reduction in impervious surfaces, on-site detention facilities, biofiltration swales, settlement/debris basins, etc.

Section 303(d) of the federal Clean Water Act requires that states develop a list of water bodies that do not meet water quality standards, establish priority rankings for waters on the list, and develop action plans, called Total Maximum Daily Loads (TMDLs), to improve water quality. Fisher Creek in the CVSP Development Area is a tributary to two water bodies that are listed by the RWQCB and the EPA as impaired: Coyote Creek and San Francisco Bay. Coyote Creek is impaired due to diazinon that is contained in urban runoff. San Francisco Bay is impaired due to chlordane, DDT, diazinon, dieldrin, mercury, and PCBs, all of which are constituents of urban runoff.

Hydromodification Management Plan: Pursuant to the C3 requirements, the Santa Clara Valley Urban Runoff Pollution Prevention Program prepared a Hydromodification Management Plan (HMP) for the purpose of determining how its member agencies plan to manage increases in the magnitude, volume, and duration of stormwater runoff from project sites, so as to protect streams from increased potential for erosion or other adverse impacts.[32] The control theory behind the HMP, which was approved by the RWQCB in 2005, is that downstream watercourses will not undergo any additional increased erosion potential if the "flow-duration" curve of stormwater runoff from a site is identical to the curve under existing runoff conditions. The HMP has determined that this standard is met if either the stream channel is determined to be geomorphologically stable or if post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10% of the pre-project two-year peak flow up to the pre-project 10-year peak flow.[33]

To implement the HMP, a Post-Construction HMP Policy (Policy #8-14) was adopted by the San José City Council on October 18, 2005. The HMP Policy applies to development projects located on sites equal to or exceeding 20 acres in size, and located in sub-watersheds that are less than 90% built out. Such projects are required to implement post-construction flow-control measures to reduce the volume, velocity, and duration of stormwater runoff, so that post-project runoff does not exceed pre-project conditions. The size and location of the CVSP project renders it subject to the requirements of the HMP Policy.

In addition to the above regulations, various policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating hydrologic impacts resulting from planned urban development within the City. All future development addressed by this EIR will be subject to the

[32]City Council Policy 6-29 mandates compliance with HMP requirements for projects located within the City of San José.
[33]Source: "Hydromodification Management Plan", Santa Clara Valley Urban Runoff Pollution Prevention Program, April 2005.

hydrologic policies listed in Chapter 4, *Goals and Policies*, of the City's General Plan, including the following:

- *Level of Service Policy #12*: New projects should be designed to minimize damage due to stormwater and flooding.
- *Water Resources Policy #1*: City and SCVWD should carefully regulate development in watershed areas.
- *Water Resources Policy* #2: Water resources should be used in a manner that does not deplete groundwater and conservation efforts should be encouraged.
- *Water Resources Policy #4*: Development should not be permitted in areas not served by sanitary sewer systems.
- *Water Resources Policy #5*: Groundwater recharge areas should be protected.
- *Water Resources Policy #7*: Proper construction and monitoring of facilities storing hazardous materials shall be required to prevent contamination of surface and groundwater.
- *Water Resources Policy #9*: City should take a pro-active role in implementation of the SCVURPPP.
- *Water Resources Policy #12*: Require specific construction and post-construction measures to control the quantity and improve the water quality of urban runoff.
- *Flooding Policy #1*: New development should be designed to provide protection from impacts of the 100-year flood.
- *Flooding Policy #7*: Development should provide adequate flood control retention facilities.

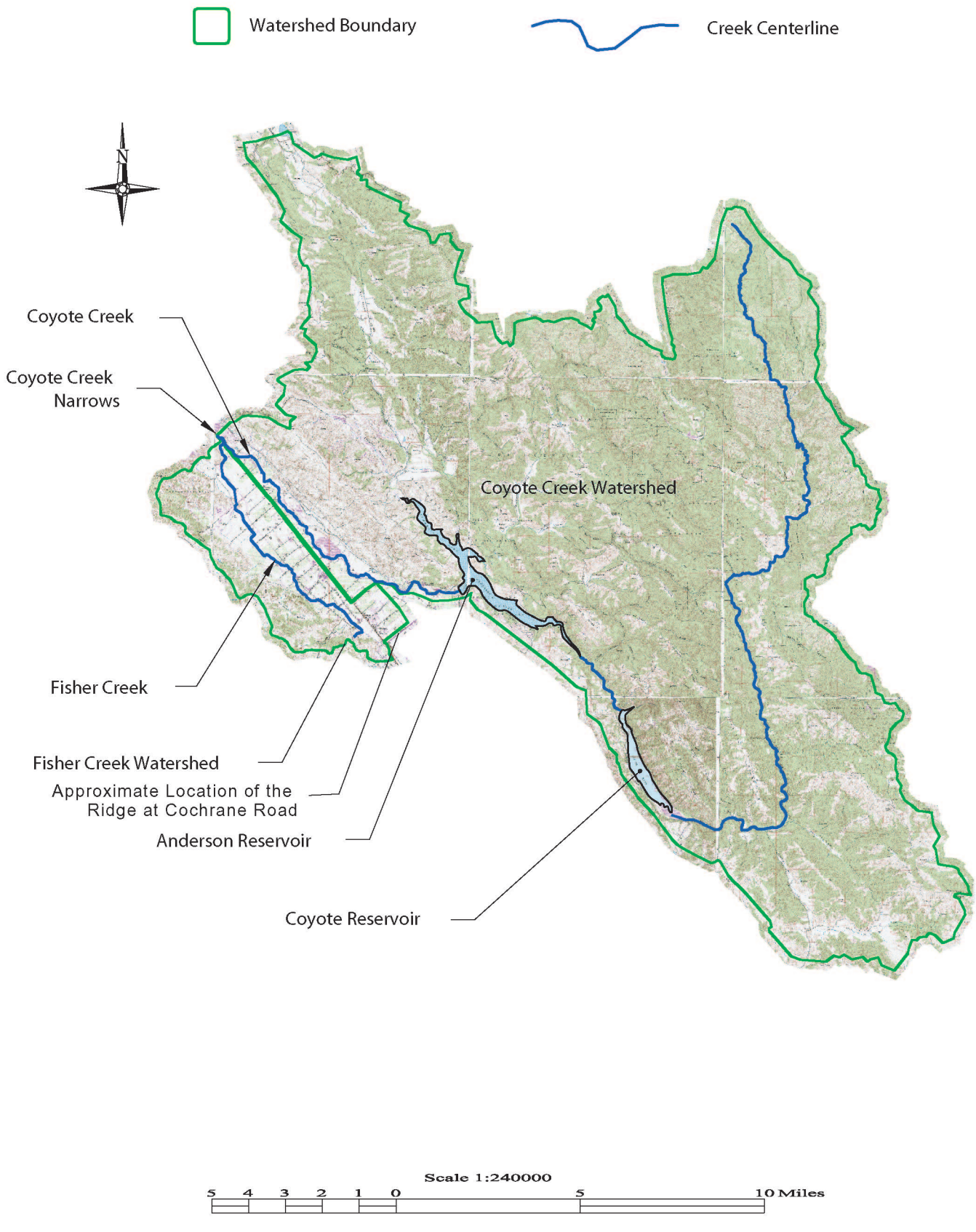
4.8.2 Existing Hydrologic Conditions

Coyote Valley is part of Coyote Creek's watershed, which is the largest watershed in Santa Clara County. Over 320 square miles of land area drains to San Francisco Bay via Coyote Creek and its tributaries. Within the Coyote Valley, the watershed is defined by two geologic features; the Coyote Narrows in the northern portion of the valley and a slight ridge near Cochrane Road to the south of the valley (refer to Figure 4.8-1). The Coyote Narrows is a geologic formation located to the east of Tulare Hill, where the Diablo Range and the Santa Cruz Mountains converge. The Narrows, which is also the general location of the convergence of Fisher Creek and Coyote Creek, controls the flow of water within Coyote Creek to the north towards San Francisco Bay. The dividing line between surface and groundwater that flows to the north and that which flows to the south through Morgan Hill and Gilroy (to the Pajaro River and Monterey Bay), is a slight geologic ridge near Cochrane Road to the south of the CVSP Area. Water flows within the valley from the southeast at Cochrane Road towards the northwest to the Coyote Narrows, which corresponds to the general elevation of the valley. The hydrologic features of the valley are described in detail below.

4.8.2.1 *Coyote Creek/Coyote Canal*

Coyote Creek has its headwaters in the Diablo Range, southeast of Gilroy. Coyote Creek is approximately 75 miles long and flows through the cities of Morgan Hill, San José, and Milpitas. The principal tributaries of Coyote Creek within the Santa Clara Valley are Lower Penitencia Creek, Upper Penitencia Creek, Silver Creek, and Fisher Creek. These tributaries, together with Coyote Creek, compose the major drainage network for the easterly portion of the Santa Clara Valley. Most of Coyote Creek's watershed is located in rugged, sparsely populated areas to the east of the Santa Clara Valley.

As it flows through the CVSP Area, Coyote Creek is an incised natural channel of sands and gravels that is somewhat perched (creek banks are higher than the surrounding ground) above its westerly



COYOTE & FISHER CREEK WATERSHEDS FIGURE 4.8-1

floodplain. Historically, Coyote Creek meandered throughout the Coyote Valley. In its present form, the creek is able to contain the majority of its discharge, even under estimated 100-year (one percent) flooding conditions. By comparing creek cross-sections taken under existing conditions to those taken in the late 1970s, it appears that the creek has shifted somewhat and may have even enlarged itself during flood events in intervening years. The SCVWD does not list this reach of Coyote Creek as one prone to streambed degradation.

The stream flow in Coyote Creek is regulated by Coyote and Anderson reservoirs, which have a combined storage capacity of approximately 115,000 acre-feet. Coyote Creek enters the Coyote Valley from the southeast at Anderson Reservoir. The creek crosses US 101 and meanders northward past Coyote Creek Golf Course to the Coyote Narrows. Several percolation ponds, operated by the SCVWD, are located along Coyote Creek to recharge the groundwater sub-basin, as shown on Figure 4.8-2. Abandoned quarry ponds, which are also used for groundwater recharge, are located along the creek in the southeastern portion of the CVSP area. Toward the northwest end of the valley, discontinuous basin deposits of clay tend to keep ponds, including the Metcalf Percolation Ponds and other low areas filled with perched groundwater, above the main saturated aquifer.

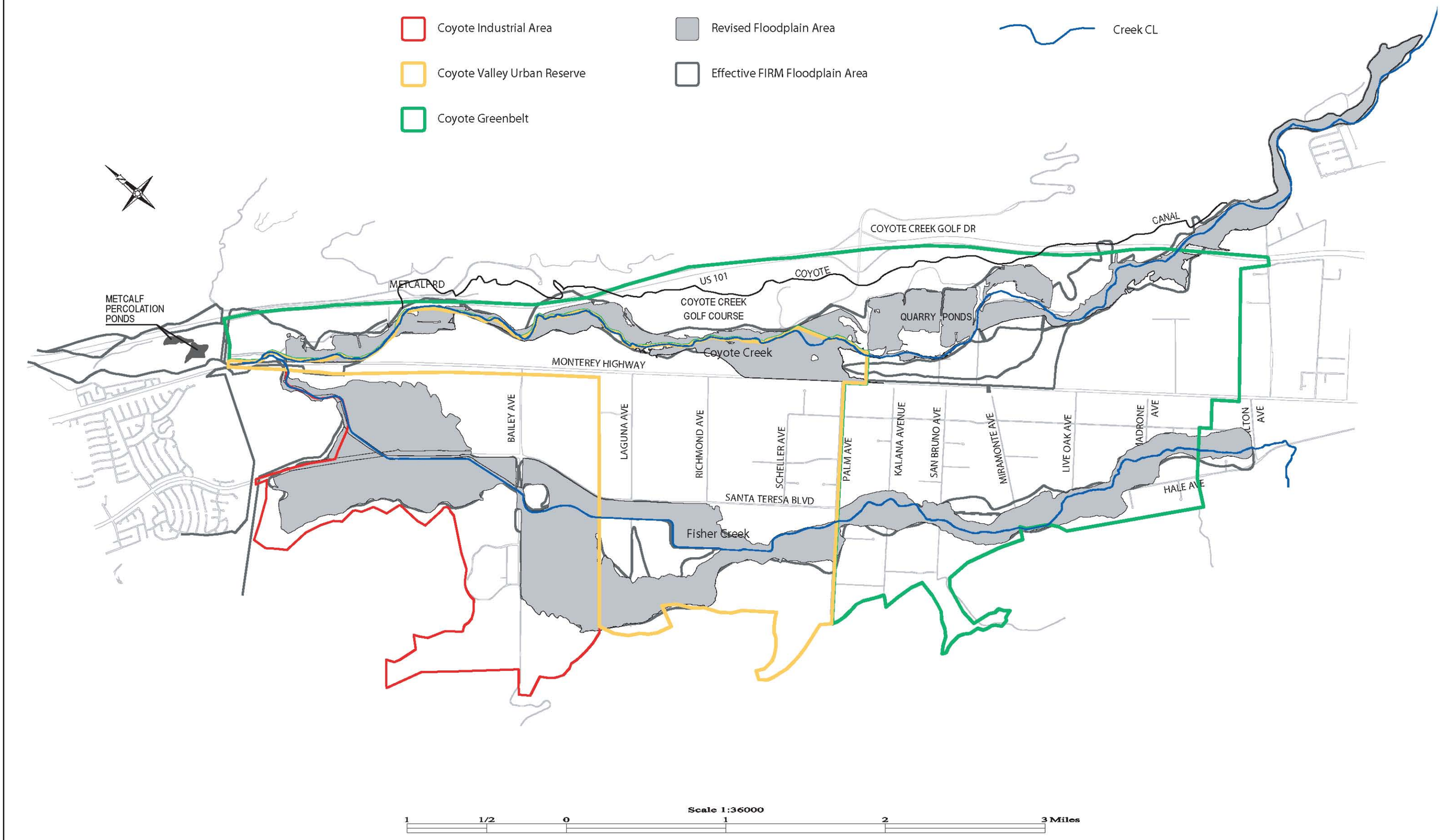
The Coyote Canal is located to the east of Coyote Creek and parallels US 101. This facility was built to help manage water resources in the valley, and in particular to convey water around Coyote Creek's recharge area between US 101 and Coyote Creek Golf Course. By diverting water from the recharge area during storm events or discharges from Anderson Reservoir, high groundwater levels in Coyote Valley were minimized. Historically, the canal also provided a way to prevent the loss of water supplies upstream of the Metcalf Percolation Ponds and the aquifer it recharges. The canal is not currently being used by the SCVWD for these purposes because it may be structurally unsound.

4.8.2.2 *Fisher Creek*

Fisher Creek is an eight mile long northerly flowing creek located in the central portion of the CVSP area, west of Santa Teresa Boulevard. Fisher Creek, which is part of the Coyote Creek watershed, drains approximately 16 square miles of undeveloped uplands and agricultural valley floor between Monterey Road and the Santa Cruz Mountains, from its origin in the vicinity of Cochrane Road in Morgan Hill in the south to its confluence with Coyote Creek at the Coyote Narrows in the north. Most of the CVSP area is located within the Fisher Creek drainage.

Historically, Fisher Creek is believed to have been located along the base of the Santa Cruz Mountains in the vicinity of the CVSP Development Area, terminating at Laguna Seca ("small dry lake"). In 1916, the creek was realigned as part of a project designed to improve flood control and drainage in northern Coyote Valley.[34] In about 1963, the creek was reconstructed as an approximately 30- to 50-foot wide, seven foot deep manmade earthen channel, generally privately owned and maintained for agricultural and hillside drainage. The channel reach from Monterey Road upstream to Bailey Avenue was constructed as a reclamation ditch to drain the low-lying areas in Laguna Seca. North of Bailey Avenue the channel has capacity for approximately the 10-year flood; south of Bailey Avenue existing channel capacity is for the 5-year flood or less. Fisher Creek is generally dry in the summer months south of Palm Avenue. North of Palm Avenue, the creek is fed by perched groundwater and is generally wet in the summer months.

[34] *Draft EIR for the North Coyote Valley Assessment District*, City of San José, August 1986.



SURFACE WATER RESOURCES & REGULATORY FLOODPLAINS

FIGURE 4.8-2

4.8.2.3 *Flooding Conditions*

During more extreme stormwater runoff events, Coyote Valley is prone to flooding along both Coyote Creek and Fisher Creek. The most recent flood occurred in 1997 when Anderson Reservoir spilled at its dam and Coyote Creek overflowed its banks. The Federal Emergency Management Agency (FEMA) has applied hydrologic and hydraulic models to produce Flood Insurance Rate Maps (FIRM) for Coyote Valley. As described in Appendix J, additional hydrologic modeling, subsequent infrastructure improvements, and FEMA policy changes were incorporated to update the mapped special flood hazard areas of the CVSP Area (Figure 4.8-2). As shown, areas within the CVSP Area are located within the 100-year floodplains of both Coyote and Fisher Creeks.

A system of flood control improvements was previously approved as part of the Coyote Valley Research Park (CVRP) project in the North Coyote Campus Industrial Area (refer to Section 2.8.1 of this EIR). The flood control system includes flood control basins (Detention Basins 1 and 2), and improvements to existing Fisher Creek as shown on Figure 2.0-15. These flood control improvements are currently under construction and are therefore included in the background conditions of the proposed CVSP project. Based on the planned flood control improvements for CVRP, FEMA issued a Conditional Letter of Map Revision (CLOMR) in May 2001.

4.8.2.4 *Coyote Valley Sub-basin/Drainage Patterns*

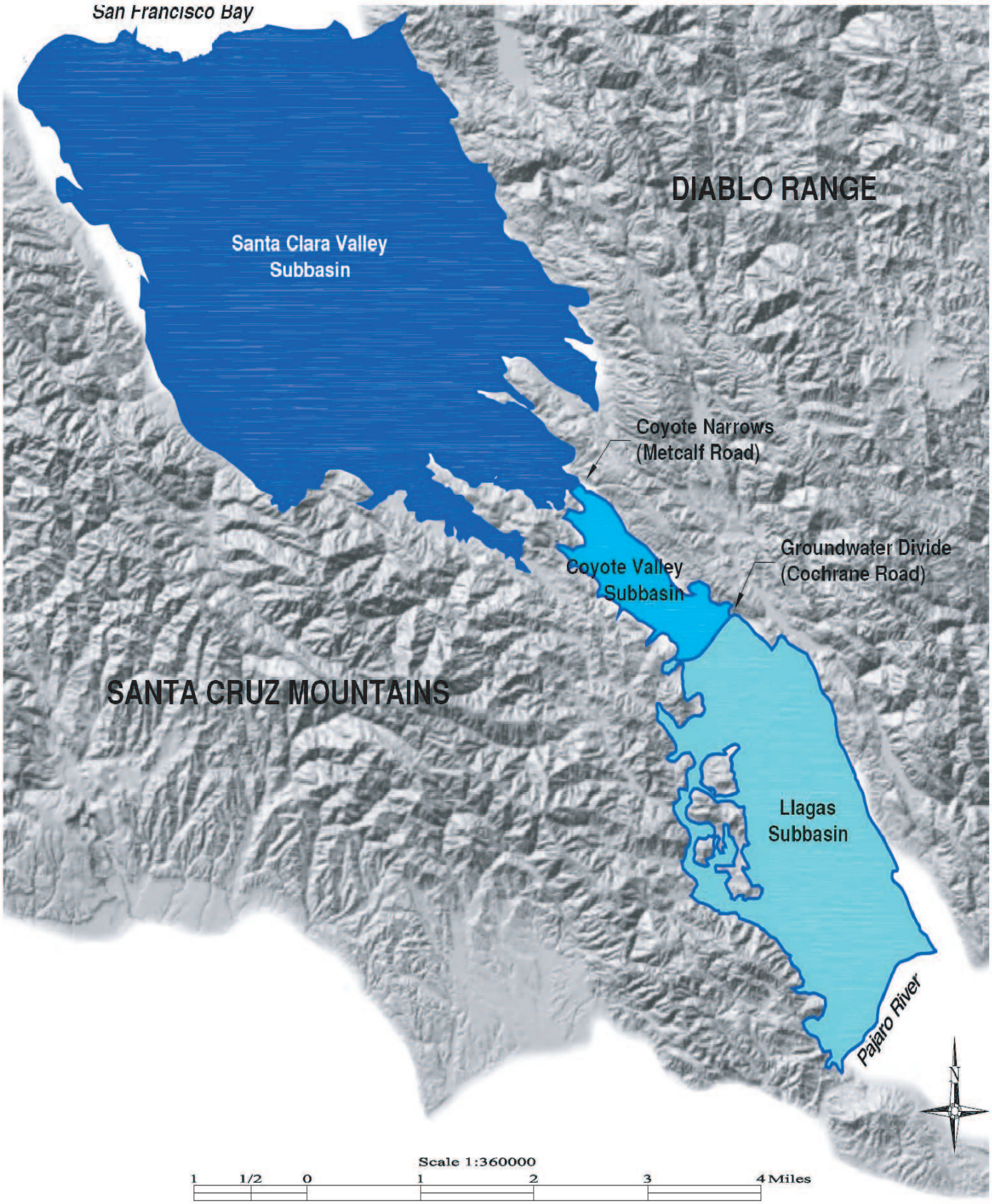
The Santa Clara County Groundwater Basin is made up of three sub-basins; the Coyote Valley, Santa Clara Valley, and Llagas Sub-basins, as shown on Figure 4.8-3. The Coyote Valley Sub-basin is roughly seven miles long and two miles wide, with a surface area of about 15 square miles. It is bounded by the previously described Coyote Narrows in the north and the ridge that separates the Coyote and Llagas Sub-basins near Cochrane Road in the south. The Coyote Valley Sub-basin is considered to be a tributary groundwater basin to the Santa Clara Valley Sub-basin, with subsurface flow through the Narrows.

Essentially, the valley floor is made up largely of permeable materials that allow for the free recharge of surface waters (resulting from direct runoff during storms) into the deeper water bearing layers. These valley fill materials include alluvial fans, older and younger alluvium, basin deposits, and stream deposits. Permeability throughout Coyote Valley is not necessarily uniform, and certain locations provide more natural groundwater recharge than others. For example, the bed of Coyote Creek is extremely permeable while the clay deposits of northern Coyote Valley have low infiltration rates, as described below.

As previously described, surface and groundwater within the Coyote Sub-basin generally flows to the north. The Union Pacific Railroad tracks and a concrete median barrier along Monterey Road tend to force flood waters from Coyote Creek to the north rather than allow them to continue naturally toward the west to Fisher Creek. Another hydrologic feature within the valley is Laguna Seca which is located in the northwestern portion of the valley. This low lying area near the Santa Teresa Hills, north of Bailey Avenue is subject to winter inundation when the Fisher Creek channel overflows. The flooding typically remains during wet winters when the groundwater table is especially high. Soils in this area are clay deposits. Water sits atop these deposits and cannot easily flow back to Fisher Creek and out of the valley.

4.8.2.5 *Groundwater Resources*

Groundwater levels in the Coyote Valley Sub-basin respond to changes in the balance between groundwater recharge and withdrawal, and indicate the relative amount of water stored in an aquifer at a given point in time. The SCVWD maintains groundwater elevation data for monitoring wells



GROUNDWATER SUB-BASINS FIGURE 4.8-3

dating back to 1937. The depth to groundwater within the valley ranges between 10 feet and 80 feet, with some water being at the surface in the northern portions of the valley during the spring. Groundwater levels in the sub-basin are very responsive to the stimuli of natural (i.e., rainfall) and artificial recharge (recharge ponds, etc.) and have been relatively stable over the years. The SCVWD estimates that the operational storage capacity of the sub-basin to be between 23,000 and 33,000 acre-feet. Thus, if water is not recharged to the sub-basin through rainfall, runoff and/or reservoir releases, the basin would run dry in three or four years with current average withdrawals of approximately 8,000 acre-feet per year.

The Coyote Valley Sub-basin is considered to be in "balance", meaning the volume of water entering the basin is more or less equal to the volume of water leaving the basin, over a specified period of time (usually a year). Should either the input or output of water from a basin fall out of balance, groundwater levels within the basin will rise or fall in response. Water is removed from the sub-basin by the following activities: 1) direct groundwater extractions (i.e., pumping); 2) subsurface outflow through the Coyote Narrows; 3) discharges to surface water (e.g., Fisher Creek); 4) direct consumption by plants, and the direct evaporation of surface water. Recharge components (water gains within the groundwater basin) include: 1) direct surface water recharge (natural and artificial); 2) deep percolation of precipitation and irrigation return water; and 3) septic system discharges to groundwater. These activities are described in detail in Appendix J.

4.8.2.6 *Groundwater Quality*

Overall, groundwater quality is good in Coyote Valley, with levels of most contaminants monitored below maximum level standards for the various beneficial uses of groundwater as defined by the Regional Water Quality Control Board. Two contaminants of concern in Coyote Valley are nitrates and perchlorate. These contaminants and the potential for them to be present in groundwater in the valley are described below.

Nitrates

Major sources of nitrates are fertilizers used in agriculture, and animal and human waste generation. Nitrates have been detected in wells in the Greenbelt Area of the Coyote Valley at levels above drinking water standards; however, nitrates within the CVSP Development Area were detected at levels well below drinking water standards. All public water supply wells meet drinking water standards.[35] Nitrate concentrations in wells tested within the Coyote Valley are shown on Figure 1-31 of Appendix J.

Perchlorate

Perchlorate is a chemical used in rocket fuel and highway flares. Perchlorate has been detected in the Llagas Sub-basin to the south of the Coyote Sub-basin, contaminating wells in southeast Morgan Hill, San Martin, and a few in northern Gilroy. The contamination has been traced to a highway flare manufacturing plant operated by Olin Corporation from 1956 to 1997 on Tennant Avenue in Morgan Hill. Perchlorate affects the function of the thyroid gland (pregnant women and infants are most at risk), and water contaminated with the chemical should be avoided for drinking and cooking.

The initial area of plume investigation was bound by Tennant Avenue on the north, Masten Avenue to the south, between Monterey Highway on the west and Center Avenue to the east. At one time, it was believed that the contaminated groundwater flowed only southeast from the site of initial contamination (Coyote Valley is about two miles to the northwest). However, more recent

[35] *SCVWD Groundwater Management Plan 2001*, p. 41.

information indicates that the chemical can migrate north in some gradients or sections.[36] The perchlorate situation is being closely monitored by the SCVWD, Central Coast Regional Water Quality Control Board (CCRWQCB), Santa Clara County Department of Agriculture and Environmental Management, and other responsible agencies. A Clean-up and Abatement Order, which addresses the overall clean-up strategy and goals for remediation, has been issued by the CCRWQCB.[37] An additional study is being prepared by the SCVWD to determine if perchlorate in the Llagas Sub-basin is of man-made or natural origin and if there is a non-zero background level. This study should be complete in early 2008.

4.8.3 Hydrologic Impacts

4.8.3.1 *Thresholds of Significance*

For the purposes of this project, a hydrologic impact is considered significant if the project would:

- violate any water quality standards or waste discharge requirements; or
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted); or
- 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; or
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site; or
- create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or
- otherwise substantially degrade water quality; or
- place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; or
- place structures within a 100-year flood hazard area, such that flood flows would be impeded or redirected; or
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- be subject to inundation by seiche, tsunami, or mudflow.

The proposed project would result in the conversion of land that is currently vacant, fallow, or in agricultural production to urban uses, thereby upsetting the existing hydrologic balance in Coyote Valley. Urban uses contain significantly more hardscaped areas which are impermeable and result in an increase in stormwater runoff and less groundwater recharge. Other hydrologic impacts from urbanization include increased water demands and changes in water quality. These impacts are all described in the section below.

[36] Lawrence Livermore National Laboratory, *California Aquifer Susceptibility: A Contamination Vulnerability Assessment for the Santa Clara and San Mateo County Groundwater Basins*, 2002, p. 17.
[37] County of Santa Clara Department of Agriculture and Environmental Management, *Quarterly Report on Perchlorate Contamination in South County Ground Water Supply*, February 15, 2007.

Therefore, based on hydrological modeling, the project includes a drainage and flood control system that would mitigate the project's hydrologic impacts to a less than significant level. These components are described in detail in Section 2.7 of this EIR. The intent of the drainage and flood control system is to preserve effective floodplain storage within Coyote Valley so that areas downstream are not adversely impacted during major stormwater runoff events. These components of the project, as well as the improvements currently under construction, as previously described, would be in place prior to the construction of urban uses in the valley and therefore project impacts assume their construction, as described below.

4.8.3.2 *Flooding Impacts within the Development Area*

Development in or near a natural floodplain has the potential to change that floodplain and affect flooding further downstream. The proposed project would relocate and restore Fisher Creek to its more historic alignment based on a review of historic topographical and parcel maps, and geologic information. Runoff from the western hills and valley floor would be conveyed through natural creek riparian corridors and drainage improvements toward Laguna Seca for flood relief prior to Coyote Creek discharge.

Fisher Creek

The proposed realignment and restoration of Fisher Creek has been designed to preserve existing flood control storage in the Fisher Creek floodplain, correct existing flooding problems in the CVSP Development Area, accommodate additional runoff generated from newly urbanized areas, and to restore the biological functions and values of the creek. In order to determine design discharges for the creek, the FEMA-approved model was used assuming a design 24-hour storm event and including runoff from tributary watersheds outside of the Plan Area. These design discharges are shown in Table 4.8-1, below and are for locations along the proposed creek alignment. As described in Appendix J, the model was modified to reflect increased impervious surfaces within the CVSP Development Area to reflect the proposed land uses assuming that drainage and flood control system described previously is constructed.

Table 4.8-1
DESIGN DISCHARGES OF FISHER CREEK (In CFS)*

Location	10-year Discharge	100-year Discharge
Palm Avenue	820	1,430
Bailey Avenue	1,620	2,890
Santa Teresa Boulevard	960	1,250
Coyote Creek (Confluence)	1,420	1,830

*CFS = Cubic feet per Second

With the CVRP flood control improvements, currently under construction, the existing Fisher Creek channel north of Bailey Avenue will remain in its existing location and configuration to avoid impacts to wetlands and the riparian corridor. A bypass channel will be constructed between Bailey Avenue and Santa Teresa Boulevard in the historic alignment along the western hills, in a configuration that matches the CVSP Fisher Creek realignment plan. Flows exceeding the capacity of the downstream creek channel would overflow into Laguna Seca, thereby controlling the flow in Fisher Creek downstream of Santa Teresa Boulevard during peak runoff periods. Water stored in Laguna Seca would be metered back into Fisher Creek through the basin outfall and a culvert restriction currently under construction. The proposed CVSP project would have no more

impervious surfaces or runoff than the previously approved CVRP project. Therefore, flood control improvements previously approved for the CVRP project (and currently under construction) will have enough capacity proportionately for the runoff expected from similar drainage areas within the CVSP project.

The proposed focal lake and urban canal described in Section 2.7 of this EIR would also serve to provide additional flood storage during significant stormwater events. With Fisher Creek flood flows confined to the creek's realigned and restored channel and existing channel (north of Bailey Avenue), CVSP development would not result in flooding within the CVSP Area. The proposed flood control system is part of the proposed project and its construction would be phased in advance of related urban uses; therefore, CVSP development would not result in flooding within the Development Area.

Impact H/WQ-1: The proposed project has been designed to include a flood control system that would reduce impacts associated with placing urban uses within the Fisher Creek floodplain to a less than significant level. **[Less than Significant Impact]**

Coyote Creek

While the proposed project includes a 100-foot riparian corridor setback from Coyote Creek, some development is proposed within the 100-year floodplain of Coyote Creek. Development within the floodplain would be required to be placed on fill meeting NFIP regulations and the City of San José's flood hazard ordinance. A detailed HEC-RAS analysis using published 100-year discharge shows that the proposed CVSP floodplain encroachment increases base flood water surface elevations in Coyote Creek by up to 0.8 feet. When defining regulatory floodways, FEMA does not consider any flood surface increase of less than one foot as a significant impact. While the CVSP development in the floodplain would be filled above the increased water surface elevation, one structure on the Coyote Creek Golf Course property (a refurbished maintenance building in the Greenbelt Area) could be impacted by a slight increase in flood depth. This structure, however, is already subject to 100-year inundation.

Fill used to raise building pads would be engineered fill compacted in accordance with FEMA regulations (generally 95 percent relative compaction), but would not be considered an artificial levee requiring three feet of freeboard. However, because Coyote Creek is a perched channel (banks are higher than the surrounding ground surface), some measure of freeboard (one or two feet) would be provided above the 100-year water surface.

With the exception of the one maintenance structure located in the Greenbelt, the area of the CVSP project within the Coyote Creek floodplain would be safely elevated above the 100-year floodplain and fill placed in the floodplain would not affect water surfaces in other locations by more than one foot. For these reasons, the project would not result in significant flooding impacts associated with development within the Coyote Creek floodplain.

Impact H/WQ-2: The proposed project would not result in significant flooding impacts associated with development within the Coyote Creek floodplain. **[Less than Significant Impact]**

4.8.3.3 *Flooding Impacts Outside of the CVSP Area*

Hydrologic modeling prepared for the original City of San José Flood Insurance Study (1982) was modified to include updated work for the Fisher Creek watershed, under both existing and post-development conditions. A 72-hour, 100-year design storm was simulated to be consistent with

established hydrology for Coyote Creek. As shown on Figure 2-8 of Appendix J, with the implementation of the proposed flood control system, including the improvements included in the CVRP project, flood flows in Coyote Creek downstream of its confluence with Fisher Creek would be very similar to the existing condition. Because Coyote Creek's drainage area dominates Fisher Creek's, and adequate floodplain storage would be maintained in Fisher Creek and the components of the flood control system, there is very little impact to Coyote Creek's downstream hydrograph.

The point of initial flooding on Coyote Creek between its confluence with Fisher Creek and the San Francisco Bay is located at William Street, approximately 11 miles north of Coyote Valley. Table 2-6 in Appendix J shows the predicted 100-year discharges for Coyote Creek at William Street with and without CVSP development, using hydrologic modeling per the SCVWD. The results show that development of the CVSP would not have an adverse impact on 100-year discharges at the William Street location. The CVSP project, therefore, would not result in significant flooding downstream of the CVSP Area.

Impact H/WQ-3: The proposed project would not result in flooding impacts downstream of the CVSP Area. **[Less than Significant Impact]**

4.8.3.4 *Impacts to Groundwater Resources*

Impacts to groundwater resources would occur from extracting groundwater from the basin for use by the project and by reducing groundwater recharge with the construction of impervious development. The extraction of groundwater without recharge can lead to land subsidence that can necessitate the construction of levees, dikes, and flood control facilities to protect properties from flooding.

The conversion of land from agricultural to urban uses, including jobs and housing, would increase water demands. Increased volumes of water could, therefore, be extracted from the Coyote Valley Groundwater Sub-basin as a result of the project. Further, urban development would reduce groundwater recharge by creating more impervious surfaces, eliminating septic systems, and reducing irrigation which returns water to the aquifer.

Up to about 8,000 acre-feet per year of water has been historically extracted from the groundwater basin for existing uses within the CVSP Area, the majority of which is used for agriculture. Existing aggregate water demands, including demands for recycled water, within the Coyote Valley Groundwater Sub-basin total approximately 11,000 acre-feet per year.[38] An evaluation of Water Supply Analyses prepared by three potential Coyote Valley water purveyors per Senate Bill 610 regulations was prepared for the project and is described in detail in Section 4.11, *Utilities and Service Systems*. Ultimate water demands within the entire Coyote Valley Groundwater Sub-basin are based on proposed land uses, housing, population, and other data are anticipated to be approximately 22,500 acre-feet per year, including recycled water, or approximately double existing demand.

Without additional recharge, the Coyote Valley Groundwater Sub-basin can only provide for three to five years of the increased demand after CVSP build-out, since the aquifer's operational storage is thought to be within the range of 23,000 to 33,000 acre-feet, as previously described. Declining groundwater elevations in Coyote Valley would decrease subsurface flow through Coyote Narrows to the Santa Clara Valley Sub-basin to the north, which partially depends upon this flow for groundwater recharge. Discharge to Fisher Creek would also be reduced, thereby potentially

[38] City of San José, *Water Supply Evaluation*, October 2006. This includes recycled water used by the Metcalf Energy Center.

affecting riparian plant species and crops which rely on a base flow in Fisher Creek.
The City of San José has evaluated Water Supply Assessments prepared by three public water systems that might serve water to the CVSP Development Area for the project, in accordance with SB 610, that identify potential sources of water for recharging the groundwater basin. As described in detail in Section 4.11, *Utilities and Service Systems*, the Water Supply Evaluation (WSE) prepared for the project has determined that the CVSP project would not create a demand for water that cannot be met through supplies that are projected to be available to the SCVWD and potential water retailers (Appendix M). The SCVWD will require that groundwater recharge occur within the valley to the extent that groundwater subsidence will not occur. The SCVWD has determined that all water used for groundwater recharge in the CVSP Area must be advanced treated recycled water (reverse osmosis and ultraviolet light disinfection). For this reason, the proposed project would not result in impacts associated with groundwater extraction.

Impact H/WQ-4: Through groundwater extraction, the proposed project would result in a reduction in groundwater elevations throughout the CVSP, affecting discharge to Fisher Creek and subsurface flows through the Coyote Narrows to the northern Santa Clara Valley Sub-basin. The project will be required by the SCVWD to recharge groundwater resources, as described in the Water Supply Evaluation prepared for the project (Appendix M). Through the proposed recharge, impacts to groundwater resources would be less than significant. **[Less than Significant Impact]**

4.8.3.5 *Water Quality Impacts during Construction*

Implementation of the CVSP would include the construction of new land uses and associated infrastructure, including roadways and bridges, elements of the flood control system, and other infrastructure throughout the Development Area. The construction phase would involve excavation and grading activities, including construction of two new bridges over Coyote Creek and new bridges over relocated and existing Fisher Creek. All of the proposed construction has the potential to degrade water quality in nearby creeks since the storm drainage system discharges to those waterways. The degradation could take the form of increased sedimentation and/or erosion, as well as adverse effects on wildlife if fuels/lubricants from equipment enter the water.

Impact H/WQ-5: The proposed project would result in significant water quality impacts during construction. **[Significant Impact]**

4.8.3.6 *Long-Term Water Quality Impacts from Development*

Stormwater volume would be increased within the Development Area because of the conversion of pervious surfaces to impervious surfaces as a result of the proposed project. It is difficult to estimate the effects of urban development on surface water quality, because historic or current surface water quality data is not available to establish existing conditions within the Coyote Valley. Agricultural runoff water flows in lower Fisher Creek most of the year. This runoff potentially contains nitrogen, phosphorus, fertilizers, pesticides, and sediment, as is evidenced by the unnaturally overgrown stream channel.

Pollutants in post-project stormwater would eventually drain into existing and future waterways including Fisher Creek, Coyote Creek, San Francisco Bay, and the proposed focal lake and urban canal. Hydrocarbons, grease, oil, and heavy metals from automobiles are typical runoff pollutants generated from impervious road, driveway, and parking lot surfaces. Building roofs also generate hydrocarbons from atmospheric deposition, and heavy metals from roofing materials. In addition, pesticides, and nutrients (from fertilizers and other landscape maintenance products) detergents,

coliform bacteria (from pet waste), and trash are all common stormwater pollutants that can be expected from the proposed development. Although contaminants expected as a result of urban development would be partially offset by decreased agricultural runoff, water quality impacts from the proposed development would be significant.

Impact H/WQ-6: The proposed project would result in the long-term degradation of the quality of existing and future surface water resources. **[Significant Impact]**

4.8.3.7 *Water Quality Impacts to Future Development*

As previously described, perchlorate contamination is an issue in the neighboring Llagas Groundwater Sub-basin. While perchlorate has not been detected to date in any wells extracting water from the Coyote Valley Groundwater Sub-basin, changes in pumping rates or patterns could potentially induce more water to flow across the groundwater head ridge that separates the Coyote Basin from the Llagas Basin. As described above under impacts to groundwater resources, additional pumping within the Coyote Basin will require additional recharge of the basin. This groundwater recharge, which will be required of the project by the SCVWD will reduce the potential for contaminated groundwater from the Llagas Basin to migrate north into the Coyote sub-basin. In addition, as previously described, there is a geologic ridge that separates the Coyote and Llagas Sub-basins near Cochrane Road in the south.

Impact H/WQ-7: The proposed project includes the recharge of groundwater which will preclude the intrusion of perchlorate into the Coyote sub-basin. **[Less than Significant Impact]**

4.8.3.8 *Impacts from Stream Erosion*

Development in or near a natural floodplain has the potential to change that floodplain by increasing stream discharges (relative to the undeveloped state) and affecting the balance of sediment transport so that bed or bank erosion within the stream begins or worsens. Current guidelines for HMP implementation require that pre- and post-urbanized flow-duration curves must be matched using continuous rainfall simulation and a threshold discharge for erosion in receiving waters. Projects located in areas that drain to stream channel segments that are unlikely to erode or experience impacts from increase flows (i.e., stable channel segments) are exempt from HMP requirements. Therefore, Fisher Creek and Coyote Creek are described separately below.

Fisher Creek

As previously described, the proposed project includes a storm drainage system that includes the realignment and restoration of Fisher Creek. Improvements to Fisher Creek have been designed to create a geomorphologically stable channel providing flood protection and the diverse ecology and habitat opportunities characteristic of a stable channel. Some of the features include multi-stage channel design with a low flow channel, floodplain, public access, and habitat corridors. Therefore, post-project discharges into Fisher Creek would not increase erosion or cause other adverse effects downstream of the project site.

Impact H/WQ-8: The proposed project would not increase erosion or cause other adverse effects associated with post-project discharges into Fisher Creek. **[Less than Significant Impact]**

Coyote Creek

Procedures outlined in the SCVURPPP HMP Report (as described in Appendix J), were utilized to examine Coyote Creek hydrology downstream of its confluence with Fisher Creek to determine if CVSP development would affect its flow-duration characteristics. HMP guidelines allow for the post-development curve to exceed the pre-development curve by up to 10 percent over 10 percent of the length of the curve. While the post-development condition curve exceeds the pre-development condition curve by an average of only 2.5 percent (eight cfs); it occurs over more than 10 percent of the curve. However, it should be noted that releases from Anderson Reservoir dominate the low flow regime in Coyote Creek to the extent that the variance in reservoir releases is nearly double the post-development variance in Coyote Creek flow expected to be generated by the proposed CVSP development. As described in the SCVURPPP HMP Report, mitigating hydromodification impacts from urbanization will not address problems generated from other sources of impacts, such as dams and reservoirs.[39]

Although Coyote Creek is not listed by the SFRWQCB as an impaired stream with respect to sediment TMDLs,[40] the SCVURPPP HMP Report does not exempt Coyote Creek from hydrograph modification management. It should be noted that extensive research done by the San Francisco Estuary Institute, as described in Appendix J, indicates that Coyote Creek is relatively stable in channel form, both laterally and in bed elevation. The research did not identify specific creek locations with impaired bed or bank stability under lower flow regimes (i.e., less than 10-year return period). If it can be demonstrated that the risk of erosion due to increased runoff from CVSP is minimal, or in-stream measures can be provided to control that erosion, an on-site HMP would not be required.

The SCVWD is currently working with regulatory and trustee agencies to improve habitat for steelhead trout and Chinook salmon on three waterways in Santa Clara County, including Coyote Creek, as part of the Fisheries and Aquatic Habitat Collaborative (FACHE) agreement. Stream flows, depths, and water temperatures will be maintained in Coyote Creek year-round to enhance spawning and rearing habitat of salmonids. Operational changes that would be required at Anderson Reservoir to meet the requirements of the FACHE agreement have not yet been finalized.

As part of this analysis and as described in Appendix J, a preliminary analysis was undertaken to determine the approximate sizes and locations of potential HMP basins within the Coyote Valley. It was determined that the placement of large HMP basins within the Development Area that meet all of the HMP requirements would not be possible. The SCVWD has determined that groundwater recharge with direct urban runoff is undesirable in the CVSP Development Area due to the shallow depths to groundwater and sensitivity to infiltration by polluted substances. However, without infiltration (that is, all HMP basins would need to be lined), most basins would not drain within the required three to five days, creating significant vector control (mosquito) issues.

In summary, the proposed CVSP development would not substantially modify the low flow characteristics of Coyote Creek partially due to the dominance of releases from Anderson Reservoir. While not finalized, it is believed that the FACHE settlement will require the SCVWD to modify future reservoir operations, potentially resulting in increased low flows within the creek. As previously described, it has been determined that HMP basins placed within the CVSP Development Area would not be able to comply with all HMP requirements including time to drain which could result in impacts to residents associated with increased mosquito populations. Finally, the

[39] SCVURPPP HMP Report, pages 3-20.
[40] California Department of Environmental Protection, SFRWQCB, *Total Maximum Daily Loads (TMDL) and the 303(d) List of Impaired Water Bodies*.

determination that Coyote Creek may be a stable creek channel could exempt the project from HMP requirements.

For all of these reasons it has been determined that a standard approach to meeting HMP requirements may not be appropriate for the proposed development. According to the SCVWD, there is a location on Coyote Creek downstream of the CVSP Area that is experiencing substantial creek bank incising due to the recent construction of the Silicon Valley Boulevard Bridge over Coyote Creek.[41] Improvements to this reach of the creek could include regrading the channel on the south side of the bridge. It is believed that the property that would be affected by these improvements is owned by the City of San José. These improvements would further support the determination that Coyote Creek may be a stable creek channel which would exempt the project from HMP requirements.

It should be noted that the BMP design features included in the project to reduce stormwater quality impacts (treatment ponds and vegetated bioswales etc.) would serve to provide some ancillary HMP storage as well.

Impact H/WQ-9: According to the requirements of the SCVURPPP HMP, the proposed project would technically exceed the threshold for changes to the flow-duration curve for Coyote Creek downstream of its confluence with Fisher Creek. However, as previously described, there is no analytical or physical evidence that the proposed CVSP development would worsen Coyote Creek erosion. In addition, it has been determined that HMP basins, if they were proposed, would not be able to comply with all HMP requirements. The project could be required to make a fair share contribution towards identified in-stream improvements for Coyote Creek prior to project implementation. For these reasons, the project would not result in significant impacts associated with Coyote Creek erosion. **[Less than Significant Impact]**

4.8.3.9 *Dam Failure, Seiche, Tsunami, and Mudflow*

As previously described in this section, the project has been designed to provide protection against 100-year flooding in conformance with all National Flood Insurance Program requirements. Nowhere in the Development Area would this flood protection rely upon an artificial levee or floodwall.

While the CVSP Area would be subject to deep inundation should Anderson Dam fail catastrophically, the dam has been designed and constructed to withstand maximum credible earthquakes, and is inspected twice a year by the SCVWD in the presence of representatives from the California Division of Safety of Dams and the Federal Energy Regulatory Commission. Dam failure could damage property and structures and pose a severe hazard to public safety within Coyote Valley; however, the probability of such failure is extremely remote and therefore not considered a significant hazard.[42]

Impact H/WQ-10: The failure of Anderson Dam is considered extremely remote; therefore, impacts associated with dam failure would be less than significant. **[Less than Significant Impact]**

[41] Personal communication with Scott Katric, SCVWD, January 2007.
[42] *Draft EIR iStar General Plan Amendment and PD Zoning Project*, City of San José, October 2005.

Earthquakes have the ability to generate seiches (the resonant oscillation of water in an enclosed body of water) and tsunamis (commonly known as tidal waves). Should a seiche occur on Anderson Reservoir, it would be contained by the dam and any overflow would enter the spillway to Coyote Creek. Given the location of the site on the east side of the Santa Cruz Mountains and the distance to the ocean, the probability of a tsunami is remote.

The CVSP Development Area lies below the 15 percent slope line on flat land that is not subject to seismically induced landsliding (refer to Section 4.7, *Geology*). Therefore, people or structures would not be affected by mudflow as a result of an earthquake.

Impact H/WQ-11: The probability of a seiche, tsunami, or mudflow affecting the Coyote Valley is considered remote; therefore, impacts associated with these seismically-induced natural occurrences would be less than significant. **[Less than Significant Impact]**

4.8.4 Mitigation and Avoidance Measures for Hydrology and Water Quality Impacts

4.8.4.1 *Construction Phase Mitigation Measures*

The following measures are included in the project and will reduce construction-related water quality impacts to a less than significant level. These measures apply to locations where construction will occur:

MM H/WQ-5.1: Prior to construction of any phase of the project, the City of San José shall require that the applicants prepare Stormwater Pollution Prevention Plans (SWPPPs) and submit Notices of Intent to the State Water Resources Control Board to control the discharge of stormwater pollutants including sediments associated with construction activities. Along with these documents, Erosion Control Plans will be required. The Erosion Control Plans shall include Best Management Practices (BMPs) as specified in the California Stormwater Best Management Practice Handbook for reducing impacts on the City's storm drainage system from construction activities. The SWPPP shall include control measures during the construction period for:

- Soil stabilization practices
- Sediment control practices
- Sediment tracking control practices
- Wind erosion control practices and
- Non-stormwater management, waste management, & disposal control practices.

MM H/WQ-5.2: Prior to issuance of grading permits, all applicants shall be required to submit copies of the Notices of Intent and Erosion Control Plans as required by the Grading Ordinance and City policy, to the City Project Engineer, Department of Public Works. The applicants shall also be required to maintain copies of the most current SWPPPs on-site and provide copies to any City representative or inspector on demand.

MM H/WQ-5.3: Each phase of development shall comply with the City's Grading Ordinance, including erosion- and dust-control during site preparation, and with the City's Zoning Ordinance requirement for keeping adjacent streets free of dirt and mud during construction.

4.8.4.2 *Long-term Water Quality Mitigation Measures*

The following mitigation measures are included in the project and will reduce long-term water quality impacts to a less than significant level.

MM H/WQ-6.1: Permanent BMPs required to be used on-site over the long-term may include, but are not limited to the following: 1) underground vaults, 2) oversized pipes, 3) vegetated filter strips, 4) vegetated swales, 5) flow-through planter boxes; 6) median filtration devices; 7) green roofs; 8) permeable pavements, and/or 9) other design techniques and Treatment Control Measures (TCMs) that reduce impermeable surfaces. The project applicants shall defer to the California Stormwater Quality Association's Stormwater Best Management Practice Handbook for New Development and Redevelopment (January 2003) for the design and sizing of extended detention basins. Basin depths should optimally range from two to five feet with side slopes of 4:1 (horizontal:vertical) or flatter.

MM H/WQ-6.2: The final design of all on-site detention basins, including but not limited to locations, sizes, depths, and side slopes, shall require review by the City and approval by the Directors of Planning, Building & Code Enforcement and Public Works. Detention basins and other water quality features within public street right-of-ways must first be reviewed and approved by the City and maintained by the City. This will ensure that the final design of specific development projects not only meets the requirements of City Council Policies 6-29 and 8-14, but also addresses related issues such as groundwater protection, dual use, safety, visual and aesthetic considerations, vector control, the capacity of receiving pipelines, and provisions for emergency release of water.

MM H/WQ-6.3: To ensure all stormwater BMPs are maintained for the life of the specific developments, maintenance and monitoring plans shall be developed at the building permit stage to the satisfaction of the Director of Planning, Building & Code Enforcement. The maintenance and monitoring plans shall be implemented to ensure that all stormwater treatment BMPs will be permanently maintained by the Homeowner's Association(s), or equivalent, for the life of the development, to the satisfaction of the Director of Planning, Building & Code Enforcement.

MM H/WQ-6.4: Maintenance techniques listed in Landscape Maintenance Techniques for Pest Reduction (prepared by the Santa Clara Valley Urban Runoff Pollution Prevention Program) shall be utilized. This will minimize the amount of pesticides that will be contained in stormwater runoff by restricting the types and amounts of pesticides used.

MM H/WQ-9.1: Consolidated regional stormwater detention basins proposed for the CVSP Area for water quality impacts shall be used for HMP purposes to the extent possible.

MM H/WQ-9.2: A reach of Coyote Creek that may be threatened by changes in the low flow regime as a result of the CVSP development has been identified by the SCVWD near Silicon Valley Boulevard. The proposed project shall be required to make a fair share contribution, in-lieu of on-site water quality mitigation, towards identified creek stability projects prior to implementation of the CVSP.

4.8.5 Conclusions regarding Hydrology and Water Quality Impacts

Impact H/WQ-1: The proposed project has been designed to include a flood control system that would reduce impacts associated with placing urban uses within the Fisher Creek floodplain to a less than significant level. **[Less than Significant Impact]**

Impact H/WQ-2: The proposed project would not result in significant flooding impacts associated with development within the Coyote Creek floodplain. **[Less than Significant Impact]**

Impact H/WQ-3: The proposed project would not result in flooding impacts downstream of the CVSP Area. **[Less than Significant Impact]**

Impact H/WQ-4: Through groundwater extraction, the proposed project would result in a reduction in groundwater elevations throughout the CVSP, affecting discharge to Fisher Creek and subsurface flows through the Coyote Narrows to the northern Santa Clara Valley Sub-basin. However, the project will be required by the SCVWD to recharge groundwater resources with advanced treated recycled water, as described in the Water Supply Evaluation prepared for the project (Appendix L). Therefore, impacts to groundwater resources would be less than significant. **[Less than Significant Impact]**

Impact H/WQ-5: The proposed project would result in significant water quality impacts during construction. Implementation of the mitigation and avoidance measures identified above (MM H/WQ-5.1 through 5.3) would reduce these short-term impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**

Impact H/WQ-6: The proposed project would result in the long-term degradation of the quality of existing and future water resources. Implementation of the mitigation and avoidance measures identified above (MM H/WQ-6.1 through 6.4) would reduce these long-term impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**

Impact H/WQ-7: The proposed project includes the recharge of groundwater which will preclude the intrusion of perchlorate from the Llagas Sub-basin into the Coyote Valley Sub-basin. **[Less than Significant Impact]**

Impact H/WQ-8: The proposed project would not increase erosion or cause other adverse effects associated with post-project discharges into Fisher Creek. **[Less than Significant Impact]**

Impact H/WQ-9: According to the requirements of the SCVURPPP HMP, the proposed project would exceed the threshold for changes to the flow-duration curve for Coyote Creek downstream of its confluence with Fisher Creek. Stormwater treatment basins proposed for the CVSP Area for water quality impacts shall be used for HMP purposes to the extent possible (MM H/WQ 9.1 and 9.2). The proposed project will be required to make a fair share contribution towards creek stability projects identified by the SCVWD. **[Less than Significant Impact]**

Impact H/WQ-10: The failure of Anderson Dam is considered extremely remote; therefore, impacts associated with dam failure would be less than significant. **[Less than Significant Impact]**

Impact H/WQ-11: The probability of a seiche, tsunami, or mudflow affecting the Coyote Valley is considered remote; therefore, impacts associated with these seismically-induced natural occurrences would be less than significant. **[Less than Significant Impact]**