3.10 HYDROLOGY AND WATER QUALITY

3.10.1 INTRODUCTION

This section describes existing surface and groundwater hydrology in the project area, including floodplain and stormwater issues and water quality; summarizes the regulations that govern hydrologic modification, protect water quality, and control floodplain development and stormwater management; and analyzes the potential effects to hydrology and water quality that could result from the implementation of the Proposed Action.

Sources of information used in this analysis include:

- Sierra Vista Specific Plan EIR prepared by the City of Roseville (City of Roseville 2010a);
- West Roseville Specific Plan EIR prepared by the City of Roseville (City of Roseville 2004);
- Sierra Vista Specific Plan Drainage and Stormwater Master Plan (Civil Engineering Solutions 2009);
- Geomorphic Assessment of the Sierra Vista Specific Plan Phase 1 (cbec, Inc., 2009); and
- California Department of Water Resources and Central Valley Regional Water Quality Control Board publications relevant to the project area.

Specific reference citations are provided in the text.

3.10.2 AFFECTED ENVIRONMENT

3.10.2.1 Regional Surface Water Hydrology

The project site is located in the Curry Creek watershed, a subwatershed of the Natomas Cross Canal watershed, which in turn is a part of the Sacramento River Basin (City of Roseville 2010a).

The Sacramento River Basin—the area drained by the Sacramento River—covers approximately 27,210 square miles (70,474 square kilometers), extending from the Cascade and Trinity Ranges in the north to the Sacramento–San Joaquin Delta in the south, and from the Coast Ranges in the west to the Sierra Nevada in the east. It includes all watersheds draining to the Sacramento River north of the Cosumnes River watershed, as well as the closed (interior drainage) Goose Lake Basin and the Cache and Putah Creek subwatersheds (Central Valley RWQCB 2009, City of Roseville 2009). Besides the Sacramento River, principal streams within the watershed include the Pit, Feather, Yuba, Bear, and American Rivers, tributary from the east; and Cottonwood, Stony, Cache, and Putah Creeks, tributary from the west. Important reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa (Central Valley RWQCB 2009). The City receives its water supply from Folsom Lake, which in turn receives water diverted from the American River. For the project's water supply effects, see **Section 3.15, Utilities and Service Systems.** The indirect effects of the project on fisheries from diverting American River water are addressed in **Section 3.4, Biological Resources.**

3.10.2.2 Regional Groundwater Hydrology

Overview

The project site is located in the North American subbasin of the Sacramento Valley groundwater basin. The North American subbasin has an area of almost 550 square miles (1,424 square kilometers) and is bounded on the north by the Bear River, on the south by the Sacramento River, on the west by the Feather River, and on the east by an artificial north-south line extending from the Bear River south to Folsom Lake, passing about 2 miles east of the City of Lincoln and approximately corresponding to the edge of the Sacramento Valley alluvial basin. The western portion of the subbasin comprises the flood basin of the Bear, Feather, Sacramento, and American Rivers and tributary drainages (City of Roseville 2004).

Groundwater in the North American subbasin is produced from two aquifer systems. The upper aquifer system consists of the Quaternary Victor, Fair Oaks, and Laguna Formations and is typically unconfined. The lower aquifer is primarily within the Mehrten Formation of Miocene age and is semi-confined (City of Roseville 2004). Average well yields are on the order of 800 gallons per minute (gpm) (3,028 liters per minute [lpm]) (California Department of Water Resources 2003). Total storage capacity in the North American subbasin is estimated at approximately 4.9 million acre-feet (maf) (0.6 million hectare-meter [mhm]), and recent data suggest that withdrawals of up to 95,000–97,000 acre-feet per year (afy) (11,718-11,965 hectare-meter per year [hmy]) are within the basin's safe yield. The majority of groundwater production occurs in the northern portion of the subbasin (City of Roseville 2004).

Groundwater Use

The upper aquifer has historically been pumped for agricultural use, while urban water providers have relied on the lower, semi-confined aquifer. There are no existing legal constraints that limit groundwater pumping (City of Roseville 2010a). The City and other participants in the West Placer Groundwater Management Plan (see **Regulatory Framework**) have publically stated their intent to manage their groundwater use consistent with the plan's objectives.

The City relies primarily on surface water for potable supply (see related discussion in **Section 3.15**), but groundwater provides additional short-term emergency or backup supply during dry years. The most recent use of groundwater was under drought conditions in 1991. Several private domestic supply wells and a number of agricultural irrigation wells are also located in unincorporated areas in the project vicinity. The City currently operates four groundwater supply wells. The City has plans to construct up to nine more wells to improve overall system reliability during drought and emergency conditions (City of Roseville 2010a).

The recent removal of the 1,754-acre (710 hectare) Reason Farms property from rice production has resulted in a sharp decrease in groundwater use in the project area. Prior to its 2003 acquisition by the City, 1,080 acres (437 hectares) of the Reason Farms property was in rice production, using an estimated 6,483 afy (800 hmy) of groundwater. The majority of the water applied for irrigation is presumed to have been lost via evapotranspiration with only about 2,632 afy (325 hmy) returning to the aquifer through infiltration. The Reason Farms property is now dry-farmed and planned for use as a storm water retention and flood control

facility**.** The facility is needed for peak flows corresponding with upstream flows on the Sacramento River. Construction is dependent on building permit activity, so it could be another 10 years before the basin is constructed. With rice farming and associated groundwater withdrawals halted, approximately 3,151 afy (389 hmy) of groundwater is being conserved, and is considered as banked by the City, to meet future needs consistent with designated beneficial uses (City of Roseville 2010a).

3.10.2.3 Regional Water Quality

As discussed in **subsection 3.10.3**, each Regional Water Quality Control Board (RWQCB) is required to develop and periodically update a water quality control plan (basin plan) that designates beneficial uses for the major water bodies under its jurisdiction. Water quality standards must be adopted to protect the designated beneficial uses, and for water bodies that are impaired (affected by the presence of pollutants or contaminants), total maximum daily load (TMDL) programs are developed to limit pollutant input and ensure a return to standards. To identify water bodies in which TMDLs may be needed, each RWQCB maintains a Section 303(d) list of impaired water bodies. The Section 303(d) lists are periodically reviewed and updated so they reflect prevailing water quality conditions.

Table 3.10-1 shows the currently designated beneficial uses and listed impairments for water bodies in the project region. The US EPA approved California's 2008–2010 Section 303(d) list of impaired waters requiring TMDLs, including this list, on November 12, 2010.

Table 3.10-1
Designated Beneficial Uses and Listed Water Quality Impairments in Project Area

Water Body	Beneficial Uses	Listed Impairments
Curry Creek	None designated[1]	Placer and Sutter Counties: pyrethoids (urban runoff/storm sewers)
Pleasant Grove Canal	None designated[1]	None identified
Natomas Cross Canal	None designated[1]	Sutter County: mercury (resource extraction)
Sacramento River		
Below Chico	Irrigation, stock watering, water contact recreation, canoeing and rafting, warm freshwater habitat, cold freshwater habitat, cold-water migration, warm-water spawning, wildlife habitat	Knights Landing to Delta reach: mercury (resource extraction), unknown toxicity (source unknown), chlordane (agriculture), DDT (agriculture), dieldrin (agriculture), Polychlorinated biphenyls (PCBs) (source unknown)
Colusa Basin Drain to I Street Bridge (Sacramento)	Municipal and domestic supply, irrigation, water contact recreation, canoeing and rafting, other noncontact recreation, warm freshwater habitat, cold freshwater habitat, warm-water spawning, cold-water spawning, wildlife habitat, navigation	

Water Body	Beneficial Uses	Listed Impairments
Sacramento – San Joaquin Delta	Municipal and domestic supply, irrigation, stock watering, industry (process supply, service supply), water contact recreation, other noncontact recreation, warm and cold freshwater habitat, warm-water migration, cold-water migration, warm-water spawning, wildlife habitat, navigation	*Northern portion:* chlordane (agriculture), chlorpyrifos (agriculture, urban runoff/storm sewers), DDT (agriculture), diazinon (agriculture, urban runoff/storm sewers), dieldrin (agriculture), exotic species (source unknown), Group A pesticides (agriculture), mercury (resource extraction), PCBs (source unknown), unknown toxicity (source unknown) *Central portion:* chlorpyrifos (agriculture, urban runoff/storm sewers), DDT (agriculture), diazinon (agriculture, urban runoff/storm sewers), invasive species (source unknown), Group A pesticides (agriculture), mercury (resource extraction), unknown toxicity (source unknown) *Export area:* chlorpyrifos (agriculture, urban runoff/storm sewers), DDT (agriculture), diazinon (agriculture, urban runoff/storm sewers), electrical conductivity (agriculture), invasive species (source unknown), Group A pesticides (agriculture), mercury (resource extraction), unknown toxicity (source unknown)
Sacramento Valley groundwater	Municipal and domestic supply, agricultural supply (irrigation and stock watering), industry (process supply, service supply), unless specifically designated otherwise by the RWQCB	None identified

Sources: Central Valley RWQCB 2006, 2009a

[1] *The Central Valley RWQCB will evaluate the beneficial uses of these water bodies on a case-by-case basis. Water bodies that do not have beneficial uses designated are assigned the designation of municipal and domestic supply in accordance with the provisions of State Water Board Resolution No. 88-63. Exceptions listed in Resolution No. 88-63 may apply to these water bodies.*

3.10.2.4 Regional Flood Hazards

Flooding is the result of water flow that cannot be contained within the banks of natural or artificial drainage courses. Flooding can be caused by an excessive storm event, snow melt, blockage of watercourses by human as well as wildlife activity (e.g., beavers), dam failure, or a combination of these or other events. A flood event can cause injury or loss of property such as the flooding of structures, including homes and businesses; uplift vehicles and other objects; damage roadways, bridges, infrastructure, and public services; and cause soil instability, erosion, and land sliding.

Flooding presently occurs in the sump area upstream of the Natomas Cross Canal–Pleasant Grove Canal confluence when the Sacramento River rises above a flood stage of 37.0 feet at the Verona Gauge, and

additional runoff could increase the depth of flooding during this type of event (Civil Engineering Solutions 2009).

3.10.2.5 Project Site – Surface Water Hydrology and Water Quality

The major drainage features on the project site include Curry Creek and two tributary drainages—a small seasonal swale locally known as Federico Creek that drains into Curry Creek, and another unnamed tributary of Curry Creek that crosses the site to the north (**Figure 3.4-1** in **Section 3.4)** (City of Roseville 2010a). Other surface water features on the site include vernal pools and swales that pond seasonally.

Curry Creek is a small seasonal stream that drains an area of approximately 16.5 square miles (43 square miles), originating at an elevation of about 120 feet (37 meters) in Placer County and ultimately draining into the Pleasant Grove Canal. The Pleasant Grove Canal receives input from streams in both Placer and Sutter Counties, and drains to the Natomas Cross Canal, which in turn drains into the Sacramento River immediately south of its confluence with the Feather River, about 14 miles (23 kilometers) west of the City (City of Roseville 2010a). Curry Creek enters the project site from Fiddyment Road and crosses the southeast corner of the site, exiting the site near the proposed intersection of Market Road and Baseline Road. South of Baseline Road, the creek flows through the Placer Vineyard Specific Plan Area, reentering the Sierra Vista project site near Watt Avenue. Federico Creek—which receives flows from within the Sierra Vista project site as well as runoff from already-developed areas in the West Roseville Specific Plan area off site to the north—drains into Curry Creek to the west of the project site. From this confluence, Curry Creek flows generally northwest to its final exit from the site, about 3,000 feet (914 meters) north of Baseline Road (City of Roseville 2010a). The unnamed tributary flows west across the northern portion of the project site, and does not join Curry Creek within the site but farther downstream of the Federico and Curry confluence at a point west of the project site.

Curry Creek is the only perennial stream in the project area. Curry Creek receives increased runoff in the form of nuisance flows from developed lands located east of Fiddyment Road. Because of the input of these nuisance flows, Curry Creek experiences flows and/or ponded water throughout the year. The hydrology of the upstream reaches of Curry Creek has been further modified by beaver activity, creating ponded conditions that persist throughout the year (Gibson & Skordal 2011). The average slope of Curry Creek is 0.17 percent over the length of the creek. The channel mean maximum upper velocity is 2.5 feet per second (0.8 meter per second) for the 2-year flood event, and 3.5 feet per second (1.1 meters per second) for the 100-year flood event (cbec 2009). As noted in **Table 3.10-1**, Curry Creek is listed as an impaired water body as a result of elevated levels of pyrethroids in the creek water from urban runoff.

Federico Creek is an intermittent stream. The upper reaches of Federico Creek as well as its tributaries are generally narrow (3 feet to 6 feet [0.9 to 1.8 meters] wide) and incised less than 5 feet (1.5 meters). In its lower reaches, Federico Creek is incised 5 to 8 feet (1.5 to 2.4 meters) with widths ranging from 10 feet to 30 feet (3 to 9 meters) (Gibson & Skordal 2011). Federico Creek has an average slope of 0.19 percent.

3.10.2.6 Project Site - Flood Hazards

A small portion of the project site is within the FEMA-designated 100-year floodplain for Curry Creek, as shown in **Figure 3.10-1, 100-Year Floodplain** (City of Roseville 2010a). Areas along both Curry Creek and Federico Creek are located in the City's Regulatory Floodplain (also shown in **Figure 3.10-2, City of Roseville Regulatory Floodplain,** and discussed in more detail under **3.10.3, Regulatory Framework**).

The project site is also within the area that could be affected by flooding in the event of a failure of western dikes along Folsom Lake (Dikes Nos. 4, 5, and 6). The most likely disaster-related causes of dam failure in Placer County and the Roseville vicinity are earthquakes, excessive rainfall, and landslides (City of Roseville 2011). The National Inventory of Dams database considers these high-hazard structures (County of Placer 2005), meaning that loss of human life is considered likely in the event of a failure.

3.10.2.7 Project Site – Groundwater Levels and Groundwater Recharge

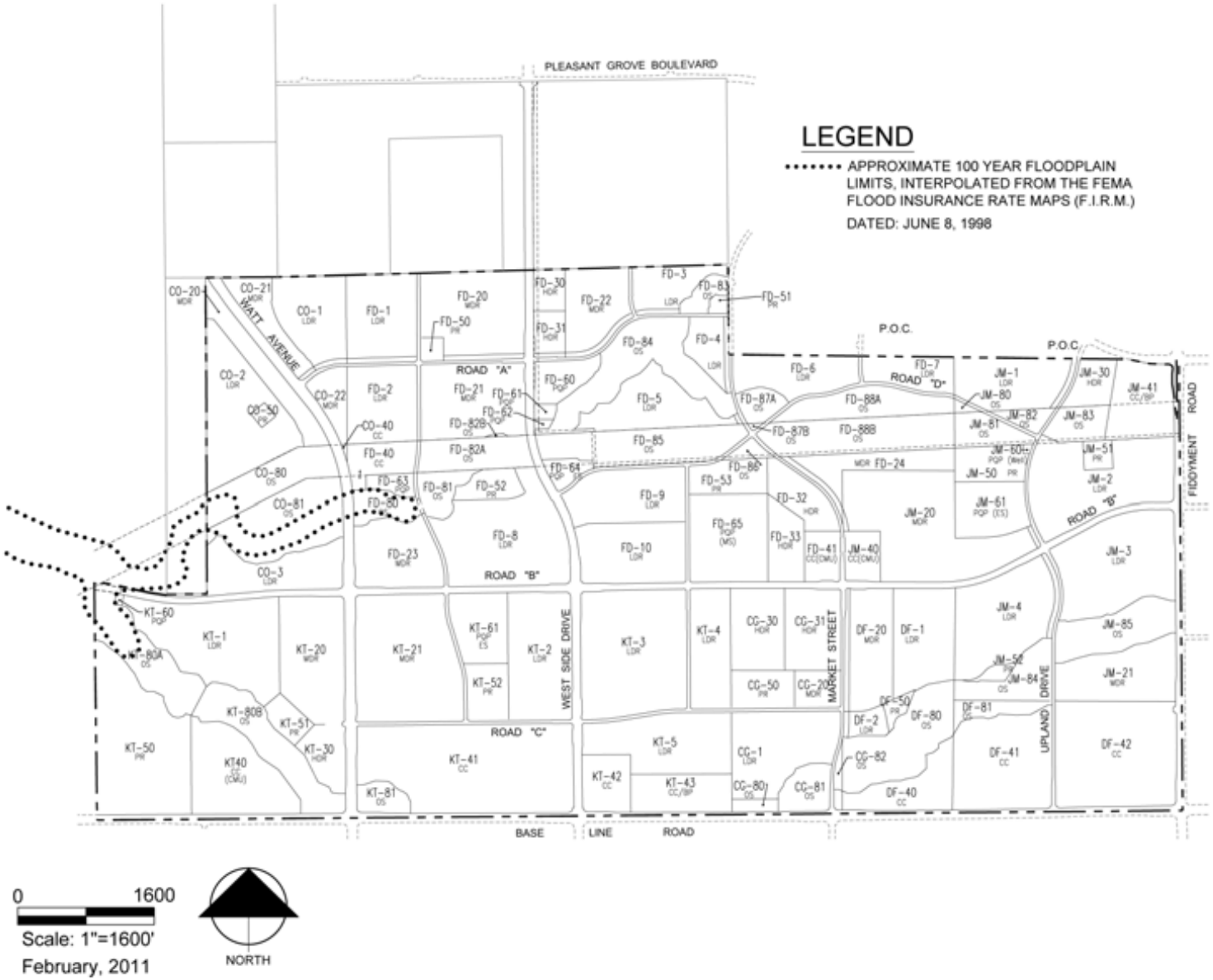
There are several private groundwater wells on the project site that serve agricultural uses. The California Department of Water Resources has monitored groundwater levels in the project region for the last several decades and has three monitoring wells in the project vicinity, which range in depth between 303 and 450 feet (92 and 137 meters). One is located adjacent to Pleasant Grove Creek immediately west of Fiddyment Road, the second is on Kaseberg Creek southeast of the intersection of Fiddyment Road and Phillip Road, and the third is on City property north of the project area (City of Roseville 2010a). According to exploratory boreholes at well sites north of the project site, the aquifer zone (Mehrten Formation) for drinking water was found at depths ranging from approximately 300 to 525 feet (91 to 160 meters) below ground surface (bgs) with thicknesses ranging from approximately 100 to 200 feet (30 to 61 meters) (MWH 2007). Monitoring data suggest that groundwater levels in the vicinity have been generally stable since about 1980, with local increases reported in the first well (MWH 2007).

The project site is not within a significant recharge area for the Sacramento Valley groundwater basin (City of Roseville 2004). Hardpan and claypan soils in the project area may further limit recharge in this portion of the basin (City of Roseville 2004).

3.10.2.8 Project Site – Geomorphologic Conditions of Creeks

According to the field reconnaissance conducted for the site by cbec, Inc., Curry and Federico Creeks show signs of degradation throughout the extent of the project site (cbec 2009). The report presents evidence that incised stream channels and over-steepened or excessively tall stream banks are prevalent on the project site. In addition, many of the stream banks consist of bare soils with excessively steep or vertical drops in the streambed, known as headcuts. Headcuts are a typical response of a degrading stream returning to equilibrium through vertical erosion and is an indication of stream instability (cbec 2009).

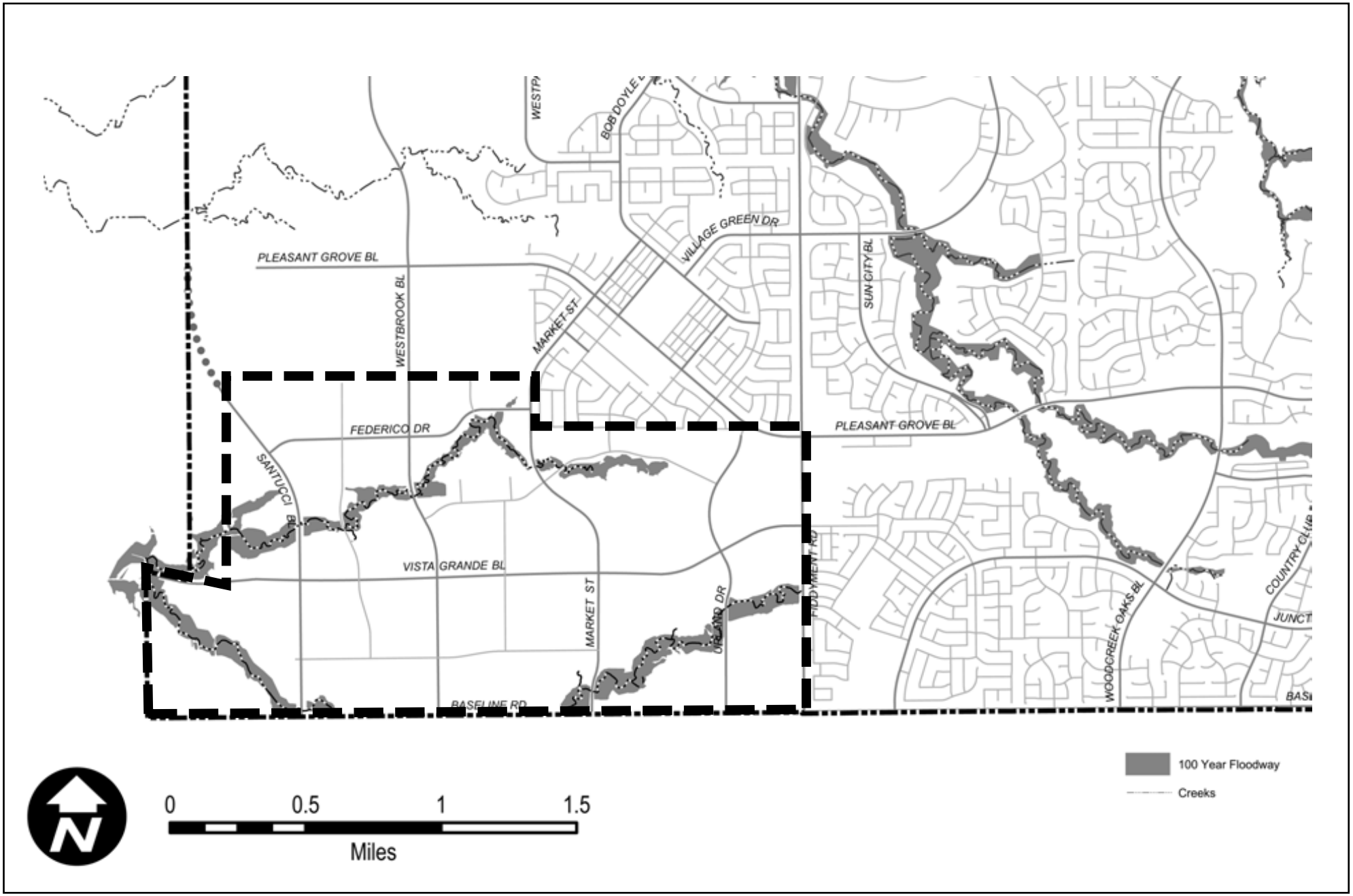
The prevalence of steep banks, incised channels, and bare geologic materials (i.e., lack of vegetation) are all signs of stream degradation on the project site and indicate that the stream channels are not in a state of equilibrium. The current problems were likely caused or exacerbated by the lack of upstream hydromodification measures, downstream headcuts, and historic agricultural practices that could have led to excessive erosion (cbec 2009).



SOURCE: MacKay & Somps, February 2011

FIGURE **3.10-1**

100-Year Floodplain



SOURCE: City of Roseville General Plan 2025 – August 2010

FIGURE **3.10-2**

City of Roseville Regulatory Floodplain

1061-001•05/11

3.10.2.9 Alternative 4 Site – Surface Water Hydrology, Water Quality, Flood Hazards, and Groundwater Conditions

The principal water body on the Alternative 4 site is the seasonal Curry Creek drainage, which crosses the northeast corner of the Alternative 4 site. Another small unnamed creek and its tributary traverse the central portion of the alternative site from east to west. Similar to the Proposed Action site, this site also contains some areas with concentrations of vernal pools that pond seasonally. Water quality, flood hazard, and groundwater conditions on the alternative site are substantially the same as on the project site.

3.10.3 REGULATORY FRAMEWORK – APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

3.10.3.1 Federal Regulations

Clean Water Act

The Clean Water Act (CWA) (33 USC 1251 et seq.) is the principal federal law protecting the quality and integrity of the nation's surface waters. The CWA offers a range of mechanisms to reduce pollutant input to waterways, manage polluted runoff, and finance municipal wastewater treatment facilities. Permit review serves as the CWA's principal regulatory tool; CWA regulation operates on the premise that discharges to jurisdictional waters are unlawful unless authorized by a permit. The following CWA sections are particularly relevant to the proposed project.

- Section 303 – water quality standards and implementation plans
- Section 401 – State Water Quality Certification or waiver
- Section 402 – National Pollutant Discharge Elimination System (NDPES)
- Section 404 – Discharge of dredged or fill materials into waters of the US.

CWA Section 404 is administered by the US Army Corps of Engineers (USACE), but the federal government delegate's implementation and enforcement authority for Sections 303 and 401–402 to the individual states. In California, they are the responsibility of the State Water Resources Control Board (SWRCB), which in turn delegates authority to the individual RWQCBs. The following paragraphs discuss Section 404 in more detail; additional information on Sections 401–402 and 303 is provided under **subsection 3.10.3.2** since these sections are administered by state agencies.

CWA Section 404 regulates the discharge (placement) of dredged and fill materials into waters of the US. Project proponents must obtain a permit from the USACE for any such discharge before proceeding with the proposed activity. This requires the preparation of a delineation of jurisdictional waters of the United States consistent with USACE protocols, in order to define the boundaries of the jurisdictional waters potentially affected by the project.

Jurisdictional waters include areas within the ordinary high water mark of a stream, including non-perennial streams that have a defined bed and bank, as well as any stream channel that conveys natural runoff, even if it has been realigned. They also include seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 40 CFR 230.3).

Section 404 permits may be issued only for the "least environmentally damaging practicable alternative" (LEDPA). That is, authorization of a proposed discharge is prohibited if there is a practicable alternative that would have less adverse impacts on wetlands and other waters and lacks other significant consequences. Applicants for a Section 404 permit must also obtain certification from the state that the activity will not adversely affect water quality, as required by CWA Section 401.

Safe Drinking Water Act

The Safe Drinking Water Act of 1974, amended in 1986 and again in 1996, is the cornerstone federal law protecting drinking water quality. It gives the US Environmental Protection Agency (EPA) authority to establish drinking water standards and to oversee the water providers (cities, counties, water districts, and agencies) who implement those standards, and also includes provisions for the protection of surface waters and wetlands in support of drinking water quality.

In California, the EPA delegates some of its Safe Drinking Water Act implementation authority to the California Department of Public Health's Division of Drinking Water and Environmental Management (DPH), which administers a wide range of regulatory programs relevant to potable water supply quality and safety.

Floodplain Management

The National Flood Insurance Act and the Flood Disaster Protection Act were passed in response to the rising cost of disaster relief, in 1968 and 1973 respectively (42 USC 4001 et seq.). Together, these acts reduce the need for large publicly funded flood control structures and disaster relief by restricting development on floodplains. FEMA administers the National Flood Insurance Program (NFIP) and issues flood insurance rate maps (FIRMs) delineating flood hazard zones for the areas participating in the program.

Executive Order 11988 (Floodplain Management), issued in 1977, addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding projects to avoid incompatible floodplain development, be consistent with the standards and criteria of the NFIP, and restore and preserve natural and beneficial floodplain values.

3.10.3.2 State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (Cal. Water Code, Division 7) established the SWRCB; divided the state into nine regions, each overseen by a Regional Water Quality Control Board (RWQCB); and gave the SWRCB and RWQCBs statutory authority to regulate water quality. Originally passed in 1969, the Porter-Cologne Act was amended in 1972 to extend the federal CWA authority to the SWRCB and RWQCBs (see **Clean Water Act** above). The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of the daily

implementation of water quality regulations is carried out by the nine RWQCBs. The following paragraphs summarize their principal responsibilities. The project area is within Region 5 and is under the jurisdiction of the Central Valley RWQCB.

Basin Plans and Water Quality Standards

The Porter-Cologne Act provides for the development and periodic review of water quality control plans (basin plans) that designate beneficial uses and water quality objectives for the state's principal water bodies and include programs to achieve water quality objectives. Each RWQCB prepares a basin plan for the waters under its jurisdiction in order to protect and enhance existing and potential beneficial uses. CWA Section 303 requires the states to adopt water quality standards for water bodies and have those standards approved by the US Environmental Protection Agency (EPA). Water quality standards consist of designated beneficial uses (e.g., wildlife habitat, agricultural supply, fishing, etc.) for a particular water body, along with water quality criteria necessary to support those uses. Specific objectives are provided for the larger water bodies within the region as well as general objectives for surface and groundwater. Basin plans are primarily implemented by using the CWA Section 402 NPDES permitting system to regulate waste discharges so that water quality objectives are met.

Water bodies that fail to meet water quality standards are considered impaired and, under CWA Section 303(d), are placed on a list of impaired waters for which a TMDL program must be developed to control input of 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. Once established, the TMDL is allocated among current and future pollutant sources to the water body. Contributions toward the TMDL limit are controlled through the issuance of waste discharge requirements under CWA Section 402.

Water Quality Certification

CWA Section 401 requires all applicants for other CWA permitting to meet requirements such that the RWQCB with jurisdiction can certify that the proposed activity will comply with specific sections of the CWA and will not adversely affect water quality. This is accomplished by implementing effluent limitations (waste discharge requirements or WDRs) and establishing a monitoring program to ensure that the limitations are met.

NPDES Program

Amendments to the CWA in 1972 created the National Pollutant Discharge Elimination System (NPDES) and rendered point-source discharge of pollutants to waters of the United States unlawful unless authorized under an NPDES permit. Further amendments in 1987 added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. The NPDES program provides for general permits that cover a number of similar or related activities, as well as individual permits covering a single project or activity. Each permit includes WDRs limiting the concentration of specific contaminants likely to be contained in the permitted discharge.

The SWRCB has elected to adopt a single statewide General Permit that applies to all storm water discharges associated with construction activity, except those on Tribal Lands, those in the Lake Tahoe Hydrologic Unit, and those from activities performed by the California Department of Transportation (Caltrans). The Construction General Permit requires all dischargers where construction activity disturbs 1 acre or more to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that specifies Best Management Practices (BMPs) to prevent construction pollutants from contacting storm water and control off-site delivery of sediment and other construction-related pollutants, eliminate or reduce non-storm water discharges to storm sewer systems and other jurisdictional waters, and inspect and monitor the success of all BMPs.

Effective July 1, 2010, all dischargers are required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ, adopted on September 2, 2009. The new Construction General Permit includes augmented requirements for the SWPPP, including a visual monitoring program, a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs, and a sediment-monitoring plan if the site discharges directly to a water body that is 303(d)–listed for sediment.

In addition, all new undertakings that are over 1 acre in size and that are not already covered by the current stormwater permit must identify the project as a Risk Level 1, 2, or 3 project, based on the project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters). Risk Level 2 and 3 projects must prepare a Rain Event Action Plan (REAP) applicable to every event where there is a forecast of 50 percent or greater probability of measurable precipitation (0.01 inch or more).

Under the new permit, existing and new projects will also have to comply with post-construction water balance requirements that become applicable in September 2012. The previous Construction General Permit (99-08-DWQ) required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. The new Construction General Permit requires dischargers to replicate the pre-project runoff water balance for the smallest storms up to the 85th percentile storm event, or the smallest storm event that generates runoff, whichever is larger. The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapotranspiration and infiltration using a combination of non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). The new Construction General Permit also requires dischargers to maintain pre-development drainage densities and concentration times in order to protect channels, and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

Senate Bill 1938

Senate Bill (SB) 1938 (Cal. Water Code Chapter 603), signed into law in 2002, requires public agencies seeking state funding for groundwater projects to develop and implement a groundwater management plan. SB 1938 is intended to ensure planning for the state's larger groundwater basins as well as those not specifically discussed in the California Department of Water Resources' official summary, Bulletin 118 (*California's Groundwater*) (California Department of Water Resources 2003).

Required components of the groundwater management plan include an inventory of water supplies and uses in the region, Basin Management Objectives (BMOs) to protect and enhance the groundwater basin, a plan to involve other local agencies and stakeholders in cooperative planning, along with a public information plan, and monitoring protocols to ensure that BMOs are being met.

3.10.3.3 Local Plans, Policies, and Ordinances

City of Roseville

City General Plan

Floodplain Designation Policy

Flood safety is a primary concern in the City of Roseville. The current General Plan accordingly requires the 100-year floodplain to be designated on the City land use map, based on the best available floodplain information. Within the 100-year floodplain, the floodway fringe is defined as the area along the boundary of the floodplain where complete obstruction would not result in more than a 1-foot rise in the water surface elevation. The remainder of the floodplain is considered to constitute the floodway, where floodwaters typically have the highest velocity. Development within the 100-year floodplain is regulated as follows (City of Roseville 2010b).

- **Infill areas** – No development is permitted within the 100-year floodway. Development may be permitted within the floodway fringe.
- **Remainder of the City (specific plan areas and North Industrial Area)** – In general, development is not permitted anywhere within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to the floodway fringe and would not result in *any* off-site increase in the water surface elevation.

Subject to the approval of the City's Public Works Director, designation of the floodplain can be terminated where the 100-year floodplain narrows to a width of 200 feet (61 meters) or less and where the associated drainage area is less than 300 acres (121 hectares) (City of Roseville 2010b). Additional discussion of the City's Regulatory Floodplain is provided in the **City Design Standards** section.

Flood Safety and Water Resources Goals

The City General Plan includes the following goals related to flood hazards:

Goal 1: Minimize the potential for loss of life and property due to flooding.

Goal 2: Pursue flood control solutions that are cost effective and minimize environmental impacts.

The general plan also includes policies and implementation measures for these goals.

Additional General Plan guidance applies to water resources, including water quality and groundwater recharge, as stated in the following goals.

Goal 1: Continue to improve surface water quality and accommodate water flow increases.

Goal 2: Enhance the quantity and quality of groundwater resources.

City Ordinances

The City's Urban Stormwater Quality Management and Discharge Control Ordinance (Chapter 14.20 of Title 14 of the Roseville Municipal Code) establishes a regulatory framework for construction and post-construction stormwater management. Pursuant to the ordinance, the City adopted its *Stormwater BMP Guidance Manual for Construction* (City of Roseville Department of Public Works) in March 2007, followed by its *Stormwater Quality Design Manual for the Sacramento and South Placer Regions* (Sacramento Stormwater Quality Partnership and the City of Roseville 2007) in May 2007. The City's Flood Damage Prevention Ordinance (Chapter 9.80 of the Roseville Municipal Code) establishes a regulatory framework to promote public health and safety, and to minimize public and private losses due to flood conditions in specific areas of Roseville. The Grading Ordinance (Chapter 16.20 of the Roseville Municipal Code) contains standards for erosion control during construction. It also prohibits grading during wet weather and generally protects drainageways from disturbance, as well as requiring prompt revegetation of areas disturbed by grading.

City of Roseville Stormwater Management Program

The City's Stormwater Management Program (SWMP) establishes priorities and sets forth a comprehensive suite of activities and strategies that represent the City's minimum control measures and BMPs intended to address NPDES Phase II requirements for stormwater management. The goal of the SWMP is to reduce pollutant levels in stormwater to the maximum extent practicable. To that end, it identifies approaches, measures, and standards for the following types of controls identified in the General Permit (City of Roseville 2010a).

- Public outreach and involvement
- Detection and elimination of illicit discharges
- Construction runoff management
- Runoff control and quality for new development and redevelopment
- Municipal operations stormwater control

The State Water Resources Control Board (SWRCB) granted the City its permit coverage on July 2004.

City of Roseville Design Standards

The City's Design Standards were developed to provide direction for the design and construction of improvements that will be transferred to the City for maintenance and/or operation. These include but are not limited to drainage and water supply facilities. The intent is to ensure that facilities used by the public (including facilities such as storm drain systems that protect the public safety) are developed in a consistent and coordinated manner.

Of particular relevance to the analyses in this section, the Design Standards stipulate methods for the hydraulic modeling required to design stormwater drainage infrastructure as well as design and performance standards for various types of features. Key provisions are identified below.

- In general, all residential lots must have a minimum pad elevation of 1 foot (0.3 meter) above the 100-year water surface elevation, and all commercial sites must have minimum finished floor

elevations of 1 foot above the 100-year surface elevation. The 100-year surface elevation level is determined based on the assumption that all storm drains are inoperative and all upstream areas are fully developed. This requires the Design Engineer to provide an overland release for all projects or provide storage for the 100-year storm frequency. Parking lots and storage areas may be no more than 1.5 feet (0.5 meter) below the 100-year water surface elevation.

- The City's Regulatory Floodplain, defined in the General Plan Safety Element (see **City General Plan** above) is distinguished from the FEMA flood 100-year flood hazard area. For watersheds larger than 300 acres (121 hectares), the City's Regulatory Floodplain is generally equivalent to the area inundated by the 100-year flood event assuming buildout of the drainage basin. Residential lots developed within or adjacent to the City's Regulatory Floodplain must have pad elevations a minimum of 2 feet (0.6 meter) above the City's 100-year flood elevation. Non-residential projects within the Regulatory Floodplain must have finished floor elevations a minimum of 2 feet (0.6 meter) above the City's 100-year flood elevation. In areas where the 100-year flood depths are less than 8 feet (2.4 meters), these minimum freeboard requirements are increased to 3 feet (0.9 meter).
- If a project proposes fill or other significant improvements within the City's Regulatory Floodplain, a hydraulic study is required to determine the effect of the encroachment. Encroachments cannot be approved if they would result in any off site increase in water surface elevation.
- Drainage systems must be designed to accommodate the ultimate development of the entire upstream watershed under the 10-year peak storm discharge. For other facilities, such as streets, bridges, open channels, and buildings, additional requirements that relate to the 25-year and 100-year peak storm discharges apply.
- The design of stormwater detention and retention basins must conform to the latest edition of the Placer County Flood Control and Water Conservation District (PCFCD) Stormwater Management Manual (Placer County 1994), and must allow 2-year storm event flows to bypass the basin. Basin layout and design must minimize maintenance effort and costs.

Placer County Flood Control and Water Conservation District

The PCFCD was formed in 1984. Its primary purpose is to protect lives and property from flood effects through comprehensive, coordinated flood prevention planning. In support of this goal, the PCFCD implements regional flood control projects, conducts hydrologic and hydraulic modeling to better understand County watersheds, and develops and implements master plans for County watersheds. It also provides information and technical support relevant to flood control to the County, cities, and developers. The PCFCD operates and maintains the County flood warning system, reviews proposed development projects for compliance with PCFCD standards, and provides technical support for Office of Emergency Services activities.

The PCFCD Stormwater Management Manual (SWMM) (Placer County 1994) contains policy, guidance, and specific standards for evaluating hydrologic and hydraulic impacts of new development in the context of regional stormwater issues. When stormwater detention or retention facilities are used to mitigate downstream increases in stormwater flows due to development, the SWMM requires that post-project peak flows be reduced by comparison with pre-project peak flows. The objective flow is determined by estimating the predevelopment peak flow rate and subtracting 10 percent of the difference between the estimated pre-

and post-development peak flow rates. The objective flow shall never be less than 90 percent of the estimated predevelopment flow.

Western Placer Groundwater Management Plan

The Western Placer Groundwater Management Plan (WPCGMP) (MWH 2007) was developed by the Cities of Roseville and Lincoln in partnership with the Placer County Water Agency and the California American Water Company in response to Senate Bill (SB) 1938 requirements. The goal of the plan is to "maintain the quality and ensure the long term availability of groundwater to meet backup, emergency, and peak demands without adversely affecting other groundwater uses within the WPCGMP area."

3.10.4 SIGNIFICANCE THRESHOLDS AND ANALYSIS METHODOLOGY

3.10.4.1 Significance Thresholds

Council on Environmental Quality (CEQ) guidance requires an evaluation of a proposed action's effect on the human environment. The USACE has determined that the Proposed Action or its alternatives would result in significant effects related to hydrology and water quality if the Proposed Action or an alternative would:

- Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site;
- Place housing or structures within a 100-year floodplain or place structures that would impede or redirect flood flows;
- 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;
- During and post construction, create substantial additional sources of polluted runoff that could affect water quality;
- Cause an exceedance of applicable effluent discharge standards;
- Interfere substantially with groundwater recharge or substantially deplete groundwater supplies such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level; or
- Substantially increase runoff such that the geomorphology of creeks is altered.

3.10.4.2 Analysis Methodology

Analysis of effects of the Proposed Action related to surface hydrology, flooding, and water quality is based on the Preliminary Drainage and Stormwater Master Plan prepared for the Sierra Vista Specific Plan (Civil Engineering Solutions 2009, dated October 23, 2009). Provisions related to hydrology and water quality in Sierra Vista Specific Plan and the main features of the Proposed Action's Drainage and Stormwater Master Plan are briefly summarized below as these are relevant to the evaluation of the Proposed Action's hydrology and water quality impacts.

Among its provisions relevant to hydrology and water quality, the Sierra Vista Specific Plan designates open space corridors with created wetlands along both Curry Creek and Federico Creek, to control peak 100-year

storm flows. Additional flood control would be provided in an 8-acre (3.2-hectare) detention basin within the WAPA corridor. The Sierra Vista Specific Plan requires all storm drainage facilities to be developed in accordance with the City's Improvement Standards, the City's Stormwater Quality Design Manual, the PCFCD Stormwater Management Manual, and the terms of federal permitting under the Clean Water Act. It includes requirements to direct drainage away from vernal pool habitat. The plan also provides for a wide range of low-impact development (LID) options, including the following.

- Reduction of impervious surfaces; disconnected and separated pavement, permeable pavement, and porous pavement
- Disconnected roof drains
- Bioretention facilities, rain gardens, and bioswales
- Tree planting
- Grass swales and channels
- Curb cuts and vegetated filter strips
- Stream buffers
- Soil amendments

The Drainage and Stormwater Master Plan (Civil Engineering Solutions 2009) includes the hydraulic analyses required by the City's Design Standards and the PCFCD SWMM, as well as design specifications for drainage infrastructure and for the larger flood management improvements that would serve the community as a whole. These include the following.

- Preservation of the Curry Creek and Federico Creek floodplains (including floodway and floodway fringe areas) as open space.
- Creation of increased floodplain storage in wetland areas within the Curry and Federico Creek corridors.
- Construction of two permanent stormwater detention basins within the WAPA easement in the north-central portion of the project area. The basins would be constructed in series and would be designed to provide a total of approximately 20 acre-feet (2.5 hectare-meters) of short-term flood storage.

Impacts on groundwater reserves are evaluated based on water demand analyses in the City's Sierra Vista SP EIR (City of Roseville 2010a).

To evaluate the effects of the Proposed Action and alternatives on surface water hydrology, this EIS uses the increase in impervious surfaces (as reflected by the development footprint) under the Proposed Action and each alternative. **Table 3.10-2** presents the development footprint under each alternative.

Table 3.10-2
Development Footprint

Alternative	Development Footprint (in acres)	Percent greater or less than Proposed Action
Proposed Action	1,370	--
No Action	1,135	- 17%
Alternative 1 (Reduced Footprint, Increased Density)	1,027	-25%
Alternative 2 (Reduced Footprint, Same Density)	1,027	-25%
Alternative 3 (Focused Avoidance)	1,150	-16%
Alternative 4 (Southwest)	1,434	+5%

3.10.5 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Impact HYDRO-1 Effect related to On- or Off-Site Flood Hazards

Proposed Action

The Proposed Action would avoid significant effects related to on-site flood risks. These effects are considered **less than significant**. Mitigation is not required. The Proposed Action could contribute to off-site flooding in the sump area upstream from the Natomas Cross Canal–Pleasant Grove Canal confluence. This would be a **significant** effect. Mitigation will be implemented that would reduce this effect to a **less than significant** level.

The project site is currently undeveloped. Development under the Proposed Action would modify existing topography and drainage on the project site by grading to create pads for construction of residences and commercial development and to construct roadways. In addition, assuming the use of conventional hardscape, buildout under the Proposed Action would add approximately 1,370 acres (554 hectares) of impervious surface to the site, with approximately 257 acres (104 hectares) preserved as open space. This increase in impervious surface would potentially increase peak storm flows, as **Table 3.10-3** summarizes.

Table 3.10-3
Pre- and Post-Project (Buildout) Peak Storm Flows, With and Without Stormwater Measures

Stream Station	Location	10-Year Peak Flow (cfs)				100-Year Peak Flow (cfs)			
		Pre-Project	Buildout (No Mitigation)	Buildout with Mitigation	Net Change	Pre-Project	Buildout (No Mitigation)	Buildout with Mitigation	Net Change
Curry Creek Main Channel									
1.44	Fiddyment Road at upstream end of study area	146	146	145	-1	285	285	285	0
1.385	Upland Drive crossing	170	153[1]	153	-17	331	272[1]	255	-76
1.333	Pedestrian crossing #1	253	184[1]	186	-67	477	326[1]	334	-143
1.265	Market Street Crossing	202	226[1]	219	17	406	364[1]	349	-57
1.215	Baseline Road eastern upstream crossing	226	237[1]	230	4	458	380[1]	366	-92
1.025	Baseline Road western downstream crossing	210	263[1]	272	62	455	397[1]	414	-41
0.87	Watt Avenue crossing	214	274[1]	280	66	431	414[1]	434	3
0.552	Pedestrian crossing #2	215	279[1]	282	67	428	424[1]	454	26
0.33	Pedestrian crossing #3 at existing driveway bridge	216	277[1]	277	61	424	425[1]	455	31
0.03	Downstream end of Curry Creek at Federico Creek confluence	220	278	273	53	432	429	461	29
Federico Creek									
1.15	Pedestrian crossing #4	61	99	64	3	116	182	121	5
0.9954	East-West Road	95	105[1]	76	-19	185	168[1]	130	-55
0.975	Market Street	100	105[1]	76	-24	194	165[1]	128	-66
0.931	Pedestrian crossing #5	121	105	59	-62	228	172	214	-14
0.865	Westside Drive	176	142[1]	71	-105	319	223[1]	157	-162
0.805	North-South Road	202	213[1]	132	-70	366	312[1]	240	-126
0.775	Watt Avenue	207	230[1]	150	-57	376	320[1]	252	-124
6.9	Downstream project boundary	466	488	426	-40	804	799	740	-64

Source: Civil Engineering Solutions, Inc. 2009

[1] *An apparent flow reduction in the post-project un-mitigated results from the need for the Future Fully Developed Unmitigated alternative to include all bridges and worst-case 'n' values for the purpose of determining the maximum floodplain elevations for design. Inherently this increases the amount of attenuation represented in this model.*

As shown in **Table 3.10-3**, the Proposed Action would have the potential to increase peak flood flows over much of the on-site length of Curry and Federico Creeks. However, consistent with the requirements of the City's Design Guidelines, the Sierra Vista Specific Plan, and the PCFCD SWMM, the Proposed Action would incorporate a number of features to provide safe conveyance of increased peak flows within the project site. The Proposed Action would include LID measures, preservation of the Curry Creek and Federico Creek floodplains as open space, and the two storm water detention basins in the WAPA corridor, which would ensure that it would not increase flood hazards to downstream areas. **Table 3.10-3** also compares pre-project peak flows with (1) unmitigated post-project flows at buildout and (2) post-project flows at buildout with the proposed stormwater detention and floodplain storage in place.

Table 3.10-4 below compares pre-project water surface elevations at selected locations along Curry and Federico Creeks during the 100-year flood with post-project 100-year water surface elevations at the same sites. Since post-project flows would increase, the reduction in water surface elevation in most locations reflects the effect of the increased flood storage provided by the Proposed Action.

Table 3.10-4
Pre- and Post-Project Water Surface Elevations

Location	Pre-Project 100-Year Water Surface (feet msl)	Post-Project 100-Year Water Surface (feet msl)	Change in Water Surface (feet)
Curry Creek Main Channel			
Downstream side of Fiddyment Road	114.55	114.55	0.00
Upstream side of Baseline Road	104.71	102.97	–1.74
Downstream side of Baseline Road (off site)	100.37	100.18	–0.19
Upstream side of Baseline Road (off site)	92.09	90.72	–1.37
Downstream side of Baseline Road	89.40	88.96	–0.44
Confluence with Federico Creek	80.49	80.37	–0.12
Federico Creek			
Flow entering the northern site boundary at northern tributary	107.74	108.04	0.30[1]
Flow entering eastern site boundary at northern tributary	99.46	99.47	0.01[1]

Source: Civil Engineering Solutions, Inc. 2009

[1] *Increases result from required 'n' value modification in channel for nuisance flow contribution to vegetation propagation.*

With these detention features and added floodplain storage features in place, peak 2-year, 10-year, and 100-year storm flows on the project site, and peak flows delivered off site in these events, would decrease by comparison with existing conditions. The water surface

elevation would also be lowered under 100-year flood conditions for most on-site locations. Consequently, although at buildout, the Proposed Action would modify site topography and add impervious surface, it would not result in significant effects related to on-site flood risks. These effects would be **less than significant**. Mitigation is not required.

The Sierra Vista Specific Plan envisions that the development on the project site would take place in a phased manner, and provides for backbone infrastructure, including storm water management, to be phased along with residential and commercial development. The Drainage and Stormwater Master Plan prepared for the project identifies the specific storm water management features needed in association with each of the four major development phases to ensure that flow attenuation meets SWMM requirements and avoids increases in flood risks on a phase-by-phase basis. As development proceeds, residential or commercial improvements on individual parcels within each of the four major development phases would be identified in more detail as Small Lot Tentative Maps or subsequent entitlements are approved. The approvals process at the parcel level will require further evaluation of peak flow discharges and storm water management requirements in light of the parcel-specific proposals, and if additional mitigation is identified as necessary, it will be implemented through the City approvals process. Additional mitigation at the parcel-specific or phase level cannot feasibly be designed at this time, and may not be needed, but if needed, will be enforced by the City under its existing permit review process.

On the more regional scale, with the peak flow management features described above in place, the Proposed Action would satisfy the PCFCD SWMM requirement to avoid increasing the water surface elevation off site, as shown in **Table 3.10-4** above. However, the increase in impervious surface associated with development of the currently undeveloped project site would increase the total volume of runoff that would be contributed to the Natomas Cross Canal in any given flood event. Flooding presently occurs in the sump area upstream from the Natomas Cross Canal–Pleasant Grove Canal confluence when the Sacramento River rises above a stage of 37.0 feet at the Verona Gauge, and additional runoff could increase the depth of flooding during this type of event (Civil Engineering Solutions 2009). This represents a **significant** effect.

Mitigation Measure HYDRO-1 will be implemented to address this effect, requiring the payment of the City's Pleasant Grove Watershed Mitigation Fee, which would provide a fair-share contribution toward the cost of the Reason Farms flood control project (City of Roseville 2010a). This measure is the same as Mitigation Measure WMM 4.12-2 in the Sierra Vista Specific Plan EIR and was adopted by the City of Roseville at the time of project approval and will be enforced by the City. By contributing funds toward the construction of the Reason Farms flood storage project, the Sierra Vista Specific Plan EIR concluded that this mitigation measure would reduce the effect to a less than significant level (City of Roseville 2010a). The USACE agrees with the conclusion in the Sierra Vista Specific Plan EIR and finds that this effect would be reduced to a **less than significant** level.

The City is currently developing flood protection improvements to address flooding in the Natomas Cross Canal–Pleasant Grove Canal sump area through its Reason Farms flood storage project, which would construct a 2,530 acre-foot (312 hectare-meter) flood storage basin at Reason Farms to manage increased runoff from existing and planned (entitled) development in portions of the City that drain to the Natomas Cross Canal. This includes projects within the Curry Creek watershed. Construction of the Reason Farms basin could begin as early as 2014 and is expected to continue at the same rate of new development in the City.

No Action Alt.

The No Action Alternative would construct a smaller mixed-use development on the project site. Assuming the use of conventional hardscape, buildout under the No Action would add approximately 1,136 acres (460 hectares) of impervious surface to the site, with approximately 492 acres (199 hectares) preserved as open space. Therefore, the No Action Alternative would also have the potential to increase peak flood flows over much of the on-site length of Curry and Federico Creeks but by a slightly smaller amount. As similar detention and flood flow storage features would be included in this alternative, the No Action Alternative would also result in a **less than significant** effect related to on-site flooding. Mitigation is not required.

The No Action Alternative would contribute to flooding in the sump area upstream of the Natomas Cross Canal–Pleasant Grove Canal confluence and based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect is considered **significant**. **Mitigation Measure HYDRO-1** will be implemented to address this effect. As noted above, this measure is the same as Mitigation Measure WMM 4.12-2 in the Sierra Vista Specific Plan EIR. The USACE assumes that the City of Roseville would impose the same mitigation measure on the No Action Alternative to address this effect. The USACE finds that by contributing funds toward the construction of the Reason Farms flood storage project, this mitigation measure would reduce the effect to **less than significant**.

Alts. 1, 2, 3 (On Site)

All of the on-site alternatives would construct a project broadly similar to the Proposed Action. As the total amount of development on site and resultant impervious surfaces would be less under all three alternatives (approximately 16 to 25 percent less), the alternatives would have the potential to increase peak flows along Curry and Federico Creeks but by a smaller amount. However, similar detention and flood flow storage features would be included in each alternative and therefore Alternative 1, 2, and 3 would also result a **less than significant** effect related to on-site flooding. No mitigation is required.

The three on-site alternatives would contribute to flooding in the sump area upstream of the Natomas Cross Canal–Pleasant Grove Canal confluence and based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect is considered **significant**. **Mitigation Measure HYDRO-1** will be implemented to address this effect. As noted above, this measure is the same as Mitigation Measure WMM

4.12-2 in the Sierra Vista Specific Plan EIR. The USACE assumes that the City of Roseville would impose the same mitigation measure on the on-site alternatives to address this effect, and for the reasons presented above, the implementation of this mitigation measure would reduce the effect to **less than significant**.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines, and roadway improvements. The total increase in impervious surfaces would be slightly greater than under the Proposed Action and similar detention and flood flow storage features would be needed and provided in the Curry Creek corridor as well as the other creeks on the site. As a result, Alternative 4 would not result in significant effects related to on-site flooding and these effects would be **less than significant.** No mitigation is required.

Similar to the Proposed Action and other alternatives listed above, storm water from the Alternative 4 site would discharge into the Natomas Cross Canal and would contribute to flooding events in the sump area upstream of the Natomas Cross Canal–Pleasant Grove Canal confluence. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect would be **significant**. The USACE assumes that Placer County would impose a mitigation measure similar to **Mitigation Measure HYDRO-1** for this alternative and that the measure would reduce the effect to **less than significant** level. The USACE acknowledges that it has no authority to require **Mitigation Measure HYDRO-1** and cannot guarantee that the County will impose this measure.

Mitigation Measure HYDRO-1 **Payment of Drainage Impact Fees**
(*Applicability - Proposed Action and All Alternatives*)

The City shall collect the Pleasant Grove Drainage Fee from the applicants prior to the approval of each building permit, which would cover the cost of retention for that development's portion of the Roseville regional retention basin at Reason Farms.

Impact HYDRO-2 Effects from Construction within a Floodplain

Proposed Action The Proposed Action would not impede or redirect flood flows in a hazardous manner, and adequate conveyance capacity will be provided to convey flood flows. This effect would be **less than significant**. Mitigation is not required.

Construction within a floodplain area can be of concern because it has the potential to impede flood conveyance and/or redirect flood flows, and can exacerbate existing flood hazards or create new hazards in areas not presently subject to flooding.

As discussed in **Affected Environment** above and shown in **Figure 3.10-1**, 2 percent of the project site is within the FEMA 100-year floodplain. This comprises the immediate Federico

Creek corridor for about 1.5 miles (2.4 kilometers) upstream of the Federico Creek–Curry Creek confluence, and the Curry Creek corridor for about 0.4 mile (0.6 kilometer) upstream of the confluence. As **Figure 3.10-2** also shows, the City's Regulatory Floodplain is more extensive than the FEMA 100-year floodplain.

Both the Curry Creek and Federico Creek corridors would be protected as open space as part of the Proposed Action and City policies and ordinances independently prohibit construction within the Regulatory Floodplain. As a result, no major structures would be placed within this area, but minor, localized construction could take place within the open space corridors, potentially including areas within the FEMA and Regulatory floodplains, to accommodate improvements such as drainage culverts, weir structures, and new roadway and bridge crossings. The Proposed Action is unlikely to redirect flood flows such that flood hazards are created or exacerbated, although the Proposed Action as a whole may slightly modify the boundaries of the 10- and 100-year floodplains, and the applicant plans to submit a Letter of Map Revision for FEMA review once the City and PCFCD have reviewed and approved the hydraulic modeling conducted for the Proposed Action. Because flood flows would not be impeded or redirected in a hazardous manner, and adequate conveyance capacity will be provided, this effect would be **less than significant**. Mitigation is not required.

No Action Alt. The No Action Alternative would construct a smaller mixed-use development on the project site. No major structures would be constructed within the FEMA and Regulatory floodplains and the No Action Alternative would also not substantially impede or redirect flood flows. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect would be **less than significant.** Mitigation is not required.

Alts. 1, 2, 3 (On Site) All of the on-site alternatives would construct a project broadly similar to the Proposed Action No major structures would be constructed within the FEMA and Regulatory floodplains and Alternatives 1, 2 and 3 would also not substantially impede or redirect flood flows. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect would be **less than significant** for all of the off-site alternatives**.** Mitigation is not required.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines, and roadway improvements. No major structures would be constructed within the FEMA floodplain and Alternative 4 would also not substantially impede or redirect flood flows. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this effect would be **less than significant** for the off-site alternative. Mitigation is not required.

Impact HYDRO-3 Exposure to Flood Hazards related to Dam or Levee Failure

Proposed Action

The Proposed Action would not expose people or structures to flood hazards related to a dam or levee failure. This effect would be **less than significant**. Mitigation is not required.

The project site, like the rest of the City, is within the area that could experience flooding in the event Folsom Lake Dikes Nos. 4, 5, and 6 fail. The National Inventory of Dams considers the Folsom Lake Dikes high hazard structures, reflecting a potential for loss of human life in the event of a failure. According to the Folsom Dam Safety and Flood Damage Reduction Joint Federal Project, Dikes 4, 5 and 6 could fail due to overtopping during a major storm event. However, the likelihood of reservoir inflows that could cause overtopping is extremely low, and would be reduced upon completion of the new Folsom Dam spillway that is currently under construction and scheduled for completion by 2015. Failure from piping could occur at any water surface elevation within the reservoir. The project site is near an area where the potential hazards from inundation of the Folsom Dam would be low. Therefore, there would be minimal damage to property and no potential for loss of human life (City of Roseville 2011).

No Action Alt.

The No Action Alternative would construct a smaller mixed-use development on the project site. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect related to dike failure would be **less than significant** under the No Action Alternative. Mitigation is not required.

Alts. 1, 2, 3 (On Site)

All of the on-site alternatives would construct a project broadly similar to Proposed Action. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect related to dike failure would be **less than significant** for all of the on-site alternatives. Mitigation is not required.

Alt. 4 (Off Site)

Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines, and roadway improvements. The Alternative 4 site and the alignments of the off-site improvements is within the area that could experience flooding in the event Folsom Lake Dikes Nos. 4, 5, and 6 fail, although flood water elevations would likely be lower at the alternative site and along the route of the off-site improvements as they would be further from the lake. Based on the significance criteria listed above and for the same reasons presented above as the Proposed Action, the effect related to dike failure would be **less than significant.** Mitigation is not required.

Impact HYDRO-4 Water Quality Effects during Construction

Proposed Action

The Proposed Action would avoid significant effects related to water quality during construction. This effect would be **less than significant.** Mitigation is not required.

The project site is generally flat (between 1 and 9 percent slopes) and soils have slight to moderate potential for soil erosion. Construction under the Proposed Action would nonetheless entail ground disturbance, with the potential to result in accelerated erosion and delivery of increased sediment loads to surface waters in the project area. Construction and site finishing would also use a variety of substances—such as vehicle fuels and lubricants, paints, paving media, adhesives, paints, fertilizers, etc.—with the potential to degrade water quality in the event they are spilled or released. However, a variety of mechanisms and policies are in place to require erosion and sediment control measures and appropriate handling of the various substances used in construction. The most important and enforceable protections are afforded through the NPDES permitting system. Because each construction phase would exceed the 1-acre (0.4 hectare) trigger threshold, development under the Proposed Action would be required to obtain coverage under the current Construction General Permit (Order 2009-0009-DWQ), which is substantially more stringent than previous requirements and requires:

- implementation of a SWPPP stipulating BMPs to prevent construction pollutants from contacting storm water and control off-site delivery of sediment and other construction related pollutants,
- elimination or reduction of reduce non-storm water discharges to storm sewer systems and other jurisdictional waters, and
- inspection and monitoring to ensure that BMPs are functioning properly.

With NPDES compliance in place, significant effects on water quality as a result of construction under the Proposed Action are not anticipated. This effect would be **less than significant**. Mitigation is not required.

No Action Alt.

The No Action Alternative would construct a smaller mixed-use development on the project site. Although the total amount of development under this alternative would be reduced compared to the Proposed Action, construction activities would still have the potential to result in short-term water quality effects. However, these effects would also be minimized by compliance with the NPDES program and the Construction General Permit. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effects related to water quality during construction would be **less than significant** under the No Action Alternative. Mitigation is not required.

Alts. 1, 2, 3 (On Site) All of the on-site alternatives would construct a project broadly similar to the Proposed Action. Construction activities under each alternative would have the potential to result in short-term water quality effects. However, these effects would also be minimized by compliance with the NPDES program and the Construction General Permit. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effects related to water quality during construction would be **less than significant** under all of the on-site alternatives. Mitigation is not required.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines, and roadway improvements. As the slopes and soils on this site and along the route of the off-site infrastructure are similar to the soils and slopes on the project site, the potential for erosion at this site and along the route of the off-site infrastructure is also slight to moderate. Construction activities would nonetheless have the potential to result in short-term water quality effects. These effects would be minimized by compliance with the NPDES program and the Construction General Permit. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effects related to water quality during construction would be **less than significant** under the off-site alternative. Mitigation is not required.

Impact HYDRO-5 Water Quality Effects from Project Occupancy and Operation

Proposed Action Development under the Proposed Action would have the potential to generate urban runoff that could affect water quality. This effect would be **significant**. However with implementation of the proposed mitigation, the effect would be reduced to a **less than significant** level.

The Proposed Action would convert currently undeveloped lands to urban/suburban uses, including residential areas, commercial areas, roadways, parking areas, and developed recreational areas. The introduction of extensive impervious surfaces would have the potential to increase runoff from the site, and because of the introduction of developed uses, would also have the potential to decrease the quality of runoff waters. Runoff waters from the project site would be typical of developed urban areas, where a variety of activities contribute pollutants such as petroleum products, coliform bacteria, nitrogen, phosphorus, heavy metals, pesticides, herbicides, and byproducts of pavement wear. If this input were to be uncontrolled, the long-term potential for degradation of receiving waters would be **significant**.

However, as discussed above, the current NPDES Construction General Permit includes a requirement for post-construction water quality control measures. Consistent with NPDES requirements and the City's General Plan and Stormwater Management Plan, the Sierra

Vista Specific Plan incorporates implementation of LID measures to reduce impervious surface and ensure runoff quality. This approach is developed in more detail in the Drainage and Stormwater Master Plan, which includes LID impervious surface reduction measures, as well as source control strategies to limit pollutant inputs, and treatment measures to remove the pollutants already present before runoff enters surface waters.

The Sierra Vista Drainage and Stormwater Master Plan identifies the following types of LID strategies.

- **Disconnected roof drains** allow runoff from roof systems to be treated by biological filtration while providing opportunities for infiltration.
- **Various types of permeable or porous pavements** decrease the area of impervious surface and reduce runoff generation while supporting uses similar to conventional hardscape.
- **Separated sidewalks** allow runoff to be treated before it enters the storm drain system.
- **Addition of soil amendments** in landscaped areas and stormwater features can create voids that detain runoff, reducing runoff delivery to surface waters and fostering infiltration. In residential areas, this could entail amending landscape strips adjacent to roadways or other paved areas. In commercial areas, soil amendments are likely to be limited to "stormwater planter" areas. Along roadways, soil amendments can be used where roadway runoff is diverted into landscaped areas.
- **Tree planting and canopy preservation** would increase uptake of runoff and decrease the volume of runoff entering the storm drain system.
- **Stream buffers** provide opportunities for sheet flow runoff to be captured and bio-treated before it enters jurisdictional waters.
- **Stormwater retention** allows filtering and trapping of particulate before runoff enters the storm drainage system.
- **Vegetated swales**, which will be required at all storm drain outfalls, provide opportunities for infiltration, as well as additional treatment.

Measures such as oil/water grit separators, sand filter systems, end of pipe velocity attenuation and settling areas, and in-stream detention areas may also be used (City of Roseville 2010a).

The Drainage and Stormwater Master Plan identifies proposed locations for water quality treatment measures based on the current understanding of likely development patterns. These locations will be refined at the vesting tentative map and site development stage when more detailed plans are prepared, and the City will enforce the inclusion of appropriate measures and ensure long-term compliance with NPDES requirements and City stormwater quality policies through its review and approvals process. In addition, implementation of **Mitigation Measure HYDRO-5** would require the City to condition

development approval on the inclusion of source and treatment control measures consistent with City and NPDES standards current at the time of approval. This measure is the same as Mitigation Measure 4.13-2 in the Sierra Vista Specific Plan EIR and was adopted by the City of Roseville at the time of project approval and will be enforced by the City. By ensuring that all development incorporates adequate measures to prevent urban runoff from the project site from significantly degrading the quality of surface waters, the Sierra Vista Specific Plan EIR determined that this mitigation measure, in conjunction with compliance with NPDES regulations and LID measures, would reduce the effect to a less than significant level (City of Roseville 2010a). The USACE agrees with the conclusion in the Sierra Vista Specific Plan EIR and also finds that this effect would be reduced to **less than significant** with mitigation.

No Action Alt. The No Action Alternative would construct a slightly smaller mixed-use development on the project site (with approximately 17 percent less impervious surfaces than the Proposed Action). Therefore the runoff generated under this alternative would be reduced. However, compared to existing conditions, urban uses that would be established on the project site would increase net runoff from the site and would have the potential to degrade the quality of surface runoff. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this represents a **significant** effect. However, as with the Proposed Action, this effect would be minimized by compliance with the NPDES requirements and LID measures. In addition, **Mitigation Measure HYDRO-5** will be implemented to ensure that all development minimizes its effect on surface water quality. As noted above, this measure is the same as Mitigation Measure 4.13-2 in the Sierra Vista Specific Plan EIR. The USACE assumes that the City of Roseville would impose the same mitigation measure on the No Action Alternative to address this effect, and for the reasons presented above, the implementation of this mitigation measure would reduce the effect to **less than significant**.

Alts. 1, 2, 3 (On Site) All of the on-site alternatives would construct a project broadly similar to the Proposed Action. Impervious surfaces under all three alternatives would be reduced compared to the Proposed Action by 16 to 25 percent. However, compared to existing conditions, urban uses under all three on-site alternatives would have the potential to degrade surface water quality. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this represents a **significant** effect. However, as with the Proposed Action, these effects would be minimized by compliance with the NPDES requirements and LID measures. In addition, **Mitigation Measure HYDRO-5** will be implemented to ensure that all development minimizes its effect on surface water quality. As noted above, this measure is the same as Mitigation Measure 4.13-2 in the Sierra Vista Specific Plan EIR. The USACE assumes that the City of Roseville would impose the same mitigation measure on the on-site alternatives to address this effect, and for the reasons presented above, the implementation of this mitigation measure would reduce the effect to **less than significant**.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines and roadway improvements. Increased impervious surfaces and urban uses on that site would also have the potential to degrade surface water quality. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, this represents a **significant** effect. However, these effects would be minimized by compliance with the NPDES requirements and LID measures. In addition, **Mitigation Measure HYDRO-5** will be implemented to ensure that all development minimizes its effect on surface water quality. The USACE assumes that Placer County would impose a mitigation measure similar to **Mitigation Measure HYDRO-5** on the off-site alternative and would find that the measure would reduce the effect to **less than significant**. The USACE acknowledges that it has no authority to require **Mitigation Measure HYDRO-5** and cannot guarantee that the County will impose this measure.

Mitigation Measure HYDRO-5 **Stormwater Management Standards (*Applicability – Proposed Action and All Alternatives*)**

At the tentative map or site development stage, development shall be conditioned to include source control and treatment control measures to include LID strategies and BMP treatment as required by the City's then current design standards and the City's then current General Phase II NPDES Permit issued by the State. The measures would include, but are not limited to the measures identified above, and in Table IV.B.2 Applicable LID Measures by Development Type, found in the Sierra Vista Drainage and Stormwater Master Plan found in Appendix O of the Sierra Vista Specific Plan EIR prepared by the City of Roseville.

Impact HYDRO-6 Effect of Tertiary Treated Effluent on Pleasant Grove Creek

Proposed Action Development under the Proposed Action would not result in wastewater flows that would cause an exceedance of applicable effluent discharge standards or limits and therefore the effect on water quality would be **less than significant**. No mitigation is required.

As discussed in more detail in **Section 3.15** of this EIS, the Pleasant Grove Wastewater Treatment Plant (WWTP), which would serve the development under the Proposed Action, discharges treated effluent into Pleasant Grove Creek under NPDES Permit No. CA0084573, adopted June 12, 2008. This permit currently authorizes discharge of an average dry weather flow (ADWF) of up to 12 million gallons per day (mgd) (45 million liters per day [mld]), with the permitted limit increasing to an ADWF discharge of 15 mgd (57 mld) when planned new treatment facilities are added (City of Roseville 2010a).

Water quality effects associated with further increases in treatment capacity at the WWTP have been analyzed in two previous environmental documents: the EIR prepared for the Roseville Regional Wastewater Treatment Service Area Master Plan (City of Roseville 1996) (WWMP EIR), which analyzed an increase of up to 29.5 mgd (111.7 mld) ADWF, and the

West Roseville Specific Plan EIR (City of Roseville 2004), which analyzed an increase of up to 24.7 mgd (93.5 mld) ADWF. Additional analysis was completed in 2006 by the City to evaluate the cumulative effects associated with treatment and discharge of all foreseeable wastewater flows from future urban growth areas (UGAs), including those outside the then-current service area (Merritt Smith Consulting 2006). The Merritt Smith analysis calculated the estimated future ADWF from the treatment plant's service area as of 2005 plus flow from the UGAs located outside the 2005 service area as 23.4 mgd (88.6 mld) (City of Roseville 2010a). The Merritt Smith analysis confirmed the WWMP EIR finding of adverse effects rising to the level of a significant effect under the California Environmental Quality Act (CEQA) on several aspects of water quality (thermal loading, trace metals/organic pollutants, and dissolved oxygen levels) but concluded that mitigation identified in the WWMP EIR would be adequate to reduce effects to a less than significant level under CEQA even taking into account the contribution of development under the Proposed Action. Since the standard of significance is based on compliance with NPDES permit terms, the same conclusion applies under National Environmental Policy Act (NEPA). With mitigation adopted through the WWMP EIR in place, development under the Proposed Action would not result in wastewater flows that would cause an exceedance of applicable effluent discharge standards or limits and therefore the effect on water quality would be **less than significant**. No mitigation is required.

No Action Alt. The No Action Alternative would construct a smaller mixed-use development on the project site. As the development under this alternative would be about 17 percent less than under the Proposed Action, this alternative would have reduced effects related to discharge of wastewater to the WWTP. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect of wastewater flows on water quality would be **less than significant** under the No Action Alternative. Mitigation is not required.

Alts. 1, 2, 3 (On Site) All of the on-site alternatives would construct a project broadly similar to the Proposed Action However as the magnitude of residential and commercial development under Alternatives 2 and 3 would be smaller than the Proposed Action and equivalent to the Proposed Action under Alternative 1, the effects related to discharge of wastewater to the WWTP would be the same as the Proposed Action or reduced. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect of wastewater flows on water quality would be **less than significant** under all of the on-site alternatives. Mitigation is not required.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. The magnitude of residential and commercial development under Alternative 4 would be similar to the Proposed Action. Wastewater would be pumped from the site to the same WWTP that would serve the Proposed Action. Therefore, effects related to discharge to the WWTP would be the same as the Proposed Action. Off-site infrastructure

required to serve Alternative 4 would not generate wastewater. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect of wastewater flows on water quality would be **less than significant** under the off-site alternative. Mitigation is not required.

Impact HYDRO-7 Effect on Groundwater Recharge

Proposed Action

The effect of the Proposed Action on groundwater recharge would be **less than significant** as the project site is not important for groundwater recharge, and project site development would require implementation of LID measures with tempering effects on infiltration. Mitigation is not required.

As discussed in **Groundwater Hydrology**, the project site is in the North American subbasin of the Sacramento Valley groundwater basin. The project would add extensive new impervious surfaces at a currently undeveloped site, reducing the potential for infiltration. However, the entire area in the vicinity of the project site, including the Placer County and Bear River subareas are estimated to contribute only about 5 percent of the 830,000 acre-feet per year (102,379 hectare-meter) of total recharge to the Sacramento Valley groundwater basin (California Department of Water Resources 1978). The Placer County subarea alone contributes 1.6 percent of the total recharge in the Sacramento Valley, and hardpan and claypan soils in the project area likely further limit recharge in this vicinity (City of Roseville 2004). As a result, the project site is not a significant recharge area. Moreover, under the Proposed Action, the Drainage and Stormwater Master Plan, and implementation of **Mitigation Measure HYDRO-5** (City of Roseville 2010a; see discussion in **Impact HYDRO-5** above), the project would incorporate a number of LID features that would increase infiltration by comparison with conventional hardscape, including disconnected roof drains; permeable and porous pavements; vegetated swales and other types of stormwater retention and runoff treatment features; and mandatory use of soil amendments in some settings. Therefore the effect on groundwater recharge would be **less than significant**. Mitigation is not required.

No Action Alt.

The No Action Alternative would construct a smaller mixed-use development on the project site. Due to a smaller development footprint and reduced hardscape, the No Action Alternative would have less effect on groundwater recharge than the Proposed Action, but would still increase the impervious surfaces on the site. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect on groundwater recharge would be **less than significant** under the No Action Alternative. Mitigation is not required.

Alts. 1, 2, 3 (On Site) All of the on-site alternatives would construct a project broadly similar to the Proposed Action. However as the development footprint and hardscape under all three on-site alternatives would be smaller than the Proposed Action, the effects related to groundwater recharge would be smaller. Based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect on groundwater recharge would be **less than significant** under all of the on-site alternatives. Mitigation is not required.

Alt. 4 (Off Site) Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines and roadway improvements. Although the alternative site and alignments of the off-site infrastructure also contain hardpan soils that are not amenable to infiltration, there are more areas on this site and along the off-site infrastructure routes where soils allow for better infiltration. In addition, the development footprint and hardscape at this site and along the off-site infrastructure routes would be slightly greater than under the Proposed Action. Therefore, development of the proposed project at the alternate site and along the alignment of the off-site infrastructure would have an effect on groundwater recharge that would be greater than the effect of the Proposed Action. However, based on the significance criteria listed above and for the same reasons presented above for the Proposed Action, the effect would still be **less than significant.** Mitigation is not required.

Impact HYDRO-8 Effects on Groundwater Basin

Proposed Action The effects of the Proposed Action on the groundwater basin would be **less than significant** as development proposed under the Proposed Action would not result in an exceedance of the basin's safe yield. Mitigation is not required.

Water supply for the project is analyzed comprehensively in **Section 3.15** of this EIS. This analysis focuses specifically on the potential for project-related use of groundwater to result in withdrawals in excess of the basin's safe yield.

Development under the Proposed Action would substantially increase water demand by adding population to the City of Roseville. During wet and normal water years, the City plans to continue its current practice of using a combination of surface and recycled water supply, with groundwater used only for emergency backup if recycled water supply is insufficient. During dry years, the City would continue to incorporate groundwater use as well as instituting mandatory water conservation; this is also consistent with current practices (City of Roseville 2010a). The City has used the following two approaches to estimate groundwater demand during dry years.

The Water Forum, a multi-agency regional stakeholder group focused on protection of the Lower American River and related water supply issues, in which the City is a participant, estimates that groundwater would need to be used in 7 out of every 100 years to achieve

sufficient supply, with a 20 percent conservation effort in place. Citywide groundwater need in such years—reflecting demand generated by existing and planned development, inclusive of development under the Proposed Action—was estimated to range up to 6,445 acre-feet per year (afy) (795 hectare-meter per year [hmy]) and a total of 26,363 acre-feet (3,252 hectare-meters) for the 100-year analysis period. Over the same period, a total of 293,043 acre-feet (36,146 hectare-meters) of groundwater is expected to be banked as a result of fallowing Reason Farms, assuming that banking occurs in all but dry and driest years (93 years X 3,151 afy [389 hmy] = 293,043 acre-feet [36,146 hectare-meters). Use of groundwater to supplement recycled water supply would result in an additional demand of 168 acre-feet (21 hectare-meters) over the 100-year period, assuming withdrawal of 1.37 mgd (5.19 mld) over a period of 2 days once every 5 years. Total groundwater demand under this scenario would equate to 26,363 acre-feet (3,252 hectare-meters) of groundwater demand plus 168 acre-feet (21 hectare-meters) for a total of 26,531 acre-feet (3,273 hectare-meters). This is substantially less than the total projected amount banked at Reason Farms over the 100-year period (City of Roseville 2010a).

An alternate approach to assessing groundwater demand was based on projections in the federal Central Valley Project/State Water Project Operations Criteria and Plan (OCAP) (US Bureau of Reclamation 2004). OCAP anticipates that over the 100-year analysis period, full deliveries of surface supply will be available 58 percent of the time, with some level of conservation required 42 percent of the time, and groundwater use required 13 percent of the time. Estimates of Citywide groundwater demand, including that needed to supply the Proposed Action at buildout, range up to 6,445 afy (795 hmy) and total to 48,559 acre-feet (5,990 hectare-meters) over the 100-year analysis period (City of Roseville 2009). Over the same period, a total of 274,137 acre-feet (33,814 hectare-meters) of groundwater is expected to be banked as a result of fallowing Reason Farms, assuming that banking occurs in all but dry and driest years (87 years x 3,151 afy [389 hmy] = 274,137 acre-feet [33,815 hectare-meters). As discussed above, an additional 168 acre-feet (21 hectare-meters) would be needed over the 100-year period to supplement recycled water supply during times of shortfall. However, even with this expanded (more conservative) estimate, Citywide demand for groundwater would be well below the amount banked at Reason Farms (City of Roseville 2010a).

Therefore, under either scenario, Citywide groundwater demand, including the demand associated with the Proposed Action, would be accommodated relying only on groundwater saved by removing Reason Farms from rice production, and the development proposed under the Proposed Action would not result in an exceedance of the basin's safe yield. This effect is considered **less than significant**. Mitigation is not required.

No Action Alt.

The No Action Alternative would construct a smaller mixed-use development on the project site. Use of groundwater to supplement recycled water supply under the No Project Alternative would result in an additional demand of 97 acre-feet (12 hectare-meters) over a 100-year period, assuming withdrawal of 0.79 mgd (2.99 mld) over a period of 2 days once every 5 years. Under Water Forum conditions, total groundwater demand in the City of Roseville would equate to 26,363 acre-feet (3,252 hectare-meters) of groundwater demand plus 97 acre-feet (12 hectare-meters) for a total of 26,460 acre-feet (3,264 hectare-meters). Under OCAP conditions, total groundwater demand in the City of Roseville would equate to 48,559 acre-feet (5,990 hectare-meters) of groundwater demand plus 97 acre-feet (12 hectare-meters) for a total of 48,656 acre-feet (6,002 hectare-meters). These groundwater usage projections would be substantially less than the total projected amount banked at Reason Farms under Water Forum conditions (293,043 acre-feet [36,146 hectare-meters]) or OCAP conditions (274,137 acre-feet [33,815 hectare-meters]) over the 100-year period. Based on the significance criteria listed above, the development proposed under the No Action Alternative would not result in an exceedance of the basin's safe yield and the effect on the groundwater basin would be **less than significant** under the No Action Alternative. Mitigation is not required.

Alts. 1, 2, 3 (On Site)

All of the on-site alternatives would construct a project broadly similar to Proposed Action. Use of groundwater to supplement recycled water supply under all of the on-site alternatives would result in an additional demand of 124 acre-feet (15 hectare-meters) to 158 acre-feet (19 hectare-meters) over a 100-year period, assuming withdrawal of 1.01 mgd (3.82 mld) to 1.29 mgd (4.88 mld) over a period of 2 days once every five years. Under Water Forum conditions, total groundwater demand would equate to 26,363 acre-feet (3,252 hectare-meters) of groundwater demand plus 124 acre-feet (15 hectare-meters) to 158 acre-feet (19 hectare-meters) for a total of 26,487 acre-feet (3,267 hectare-meters) to 26,521 acre-feet (3,271 hectare-meters). Under OCAP conditions, total groundwater demand in the City of Roseville would equate to 48,559 acre-feet (5,990 hectare-meters) of groundwater demand plus 124 acre-feet (15 hectare-meters) to 158 acre-feet (19 hectare-meters) for a total of 48,683 acre-feet (6,005 hectare-meters) to 48,717 acre-feet (6,009 hectare-meters). These groundwater usage projections would be substantially less than the total projected amount banked at Reason Farms under Water Forum conditions (293,043 acre-feet [36,146 hectare-meters]) or OCAP conditions (274,137 acre-feet [33,815 hectare-meters]) over the 100-year period. Based on the significance criteria listed above, the development proposed under the on-site alternatives would not result in an exceedance of the basin's safe yield and the effect on the groundwater basin would be **less than significant**. Mitigation is not required.

Alt. 4 (Off Site)

Alternative 4 would construct a project broadly similar to the Proposed Action on the alternative site. In addition, Alternative 4 would require the installation of off-site infrastructure consisting of water, recycled water and sewer lines and roadway improvements. Water supply at the Alternative 4 site would be pumped from the City of

Roseville. Use of groundwater to supplement recycled water supply under the off-site alternative would result in an additional demand of 142 acre-feet (18 hectare-meters) over a 100-year period, assuming withdrawal of 1.16 mgd (4.39 mld) over a period of 2 days once every 5 years. Under Water Forum conditions, total groundwater would equate to 26,363 acre-feet (3,252 hectare-meters) of groundwater demand plus 142 acre-feet (18 hectare-meters) for a total of 26,505 acre-feet (3,269 hectare-meters). Under OCAP conditions, total groundwater demand in the City of Roseville would equate to 48,559 acre-feet (5,990 hectare-meters) of groundwater demand plus 142 acre-feet (18 hectare-meters) for a total of 48,701 acre-feet (6,007 hectare-meters). These groundwater usage projections would be substantially less than the total projected amount banked at Reason Farms under Water Forum conditions (293,043 acre-feet [36,146 hectare-meters]) or OCAP conditions (274,137 acre-feet [33,815 hectare-meters]) over the 100-year period. Based on the significance criteria listed above, the development proposed under the off-site alternative would not result in an exceedance of the basin's safe yield and the effect on the groundwater basin would be **less than significant**. Mitigation is not required.

3.10.6 RESIDUAL SIGNIFICANT IMPACTS

All of the effects would either be **less than significant** or would be reduced to a **less than significant** level with the proposed mitigation. There would be no residual significant effects for the Proposed Action and any of the alternatives.

3.10.7 REFERENCES

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