4.12 HYDROLOGY AND WATER QUALITY

This section analyzes water quality conditions of ground and surface waters in the project vicinity and the project's potential impacts to these water resources. It describes the existing hydrologic conditions in the Plan area, presents a summary of the national, state, and local regulatory context, analyzes the hydrology and water quality impacts of the proposed project facilities, and provides mitigation measures needed to reduce significant and potentially significant project impacts. This analysis uses existing information from previously completed documents that address hydrology and water resources in the project vicinity including the following:

- Downtown Specific Plan Hydraulic Study (RFB Consulting 2008),
- Dry Creek Coordinated Resource Management Plan. (ECORP Consulting, Inc. 2003),
- Dry Creek Bank Erosion Management Plan (Swanson Hydrology & Geomorphology 2003),
- Dry Creek Greenway Regional Vision (Foothill 2004), and
- Royer / Saugstad Park Master Plan Update (Carducci & Associates, Inc. 2007).

4.12.1 EXISTING CONDITIONS

REGIONAL HYDROLOGY

The Plan area is located in the south-central portion of the Sacramento River Hydrologic Region as defined by the California Department of Water Resources (DWR). The core of this region is formed by the Sacramento Valley which encompasses major drainage basins including the McCloud River, Pit River, and Goose Lake in the north; the Delta in the south; the Sierra Nevada and Cascade Ranges in the east; and the Coastal Range and Klamath Mountains in the west. Major drainage ways in the Sacramento region include the Sacramento River, Feather River, and American River along with major and minor streams that drain the east and west sides of the region (e.g., Antelope Creek, Dry Creek).

The Plan area is located in the Dry Creek watershed. The Dry Creek watershed drains a 101-square-mile basin originating in the foothills just south of the City of Auburn and generally flows in a north-northeast to south-southwest direction. Upper portions of the Dry Creek watershed are dominated by basalt and granitic bedrock and large cobble stones. At lower elevations, soils are generally underlain by a claypan or hardpan with low permeability, fine texture (e.g., silts, clays), low soil strength, and high shrink-swell potential. These soils often require artificial drainage for urban development or agricultural operations.

In the upper portion of the Dry Creek watershed, numerous creeks provide drainage including Secret Ravine Miners Ravine, Boardman Canal, and Clover Creek along with several intermittent tributaries. Dry Creek, which flows through the Plan area, begins approximately two miles upstream of the Plan area at a point located west of I-80 and south of Atlantic Avenue at the confluence of Miner's Ravine and Antelope Creek.

Dry Creek is located within U.S. Geological Survey Hydrologic Unit Code (USGS HUC) 18020111 (Lower American River) and flows through a relatively wide alluvial valley bounded by high banks and through numerous privately owned lands (e.g., residential, commercial, vacant parcels, parklands) including the City of Roseville's Royer and Saugstad Parks. Land adjacent to Dry Creek has changed in land use over time from primarily agricultural to a currently urban community.

Past and present land uses include grazing, agricultural use, urban development, and placer mining in the upper watershed. As with most creeks, Dry Creek has eroding banks in some areas, and sediment deposition in other areas. Dry Creek also has opportunities for increased pools, riffles, and riparian vegetation in some areas.

LOCAL HYDROLOGY

Within the approximate 3,700 linear-foot section of Dry Creek located in the Plan area, the active channel of Dry Creek generally extends between 40 and 80 feet in width and stream banks are generally very steep (some places are nearly vertical) and range from 10 to 30 feet in height. In addition, numerous bank sections are stabilized with riprap, concrete chunks, gabions, jute netting, and other bank stabilization features. Culverts located along Dry Creek discharge storm water from storm drains directly into Dry Creek. Dry Creek flows generally north to south through the Plan area, then diverts in a westerly direction after the confluence with Cirby Creek and continues west for several miles.

Roseville experiences a Mediterranean climate with warm-dry conditions occurring between April and October and wet-mild weather occurring between November and March. Average rainfall in Roseville is 25 inches per year with the wettest month being January. The driest and warmest period in Roseville occurs during late July-early August. During most of the year, the water level in Dry Creek is at an elevation between 125 and 129 feet above mean sea level (msl) which is approximately 10 to 15 feet below the floodplain. The average gradient for Dry Creek through the Plan area is approximately 0.2%. Stream banks along Dry Creek are composed primarily of unconsolidated, highly erodible sands up to 20 feet thick from hydraulic mining occurring historically upstream in Miners Ravine and Secret Ravine.

The USGS has maintained a gage station along Dry Creek since 1996 at the Vernon Street Bridge in Roseville (gage #11447293). The City of Roseville also maintains a stage gage located at Vernon Street as part of the City's ALERT system network. As recorded by the Roseville stage gage, the minimum annual peak flow for Dry Creek was 131 cubic feet per second (cfs) in 1977. Flood stage for Dry Creek at this location is 127 feet above msl and the highest recorded peak flow was at 132.2 feet above msl on January 10, 1995 (ECORP 2003). The maximum flow for Dry Creek, as measured at the USGS gage, was 7,950 cfs (24.39 feet gage height) in 1996 (Swanson 2003).

The 100-year flood boundary along Dry Creek is located at approximately 144 feet msl through Royer Park. The last significant flood along Dry Creek occurred on January 10, 1995 and caused approximately 4 feet of overbank flow. Several existing retaining walls and buildings that border the Dry Creek channel are located within the floodplain and, therefore, are subject to flooding.

WATER QUALITY

A water quality monitoring program was implemented by Dry Creek Conservancy to assess watershed health with regard to a variety of parameters over time. Preliminary data indicate potential for water quality impairment throughout the Dry Creek watershed. Water quality concerns include summer temperature impairment and pesticides along with heavy metal toxicity, nutrients, turbidity, and fecal coliforms at specific locations. However, dissolved oxygen, conductivity (salinity), pH, ammonia, most metals, and most pesticides are within the limits for sustaining aquatic life (ECORP 2003).

Storm drain outfalls are located along the banks of Dry Creek which discharge storm water runoff from Downtown Roseville, including the UPRR railyard. The existing outfalls appear to be unfiltered. (Carducci & Associates, Inc., 2007).

Saugstad Park, which is located completely within the Dry Creek floodplain, was previously the site of a sanitary landfill. Saugstad Park is predominantly flat except for berms located at the perimeter of the park's lighted playing fields and its eastern edge that borders a forested hill.

GROUNDWATER

The Plan area is located in the North American sub-basin of the Sacramento Valley groundwater basin (Department of Water Resources 2006). Depth to groundwater in the upper Dry Creek watershed varies from approximately 161 ft below ground surface (bgs) to 13 ft bgs (USGS 2001).

Aquifer recharge occurs primarily at the valley margins due to interaction with streams fed by rainfall and snowmelt in the Sierra Nevada. Groundwater levels in southwestern Placer County and northern Sacramento County have decreased during the past 40 years and many groundwater wells experience declines at a rate of between 1 and 1.5 feet per year. Depths to domestic and municipal/irrigation wells in the region range between approximately 50 to 1,750 feet bgs.

Overall, groundwater quality is good with localized marginal water quality due to natural variability in the aquifer and/or potential contamination from spills (USGS 2001). There are three major groundwater types in the region including magnesium calcium bicarbonate or calcium magnesium bicarbonate; magnesium sodium bicarbonate or sodium magnesium bicarbonate; and sodium calcium bicarbonate or calcium sodium bicarbonate (Department of Water Resources 2006). A comparison of groundwater quality data with applicable water quality standards and guidelines for drinking and irrigation uses indicate elevated levels of total dissolved solids/specific conductance, chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron manganese, and arsenic may be of concern at specific locations in the North American sub-basin (DWR 1997).

4.1.2 REGULATORY BACKGROUND

FEDERAL PLANS, POLICIES, AND REGULATIONS

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (AEP) event (i.e., the 100-year flood event). Portions of the Plan area near Dry Creek are located within a FEMA 100-year flood zone.

Federal Clean Water Act of 1972

Section 404 of the federal Clean Water Act (CWA) establishes a requirement for a project applicant to obtain a permit before engaging in any activity that involves any discharge of dredged or fill material into waters of the United States, including wetlands. Fill is defined in the CWA as material placed in waters of the United States where the material has the effect of replacing any portion of a water of the United States with dry land; or changing the bottom elevation of any portion of a water of the United States. Examples of fill material include, but are not limited to: rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and material used to create any structure or infrastructure in waters of the United States.

Under Section 404 of the CWA, the USACE regulates and issues permits for activities that involve the discharge of dredged or fill materials into waters of the United States. Fill of less than one-half acre and/or less than 300 linear feet of nontidal waters of the United States for residential, commercial, or institutional development projects can generally be authorized under USACE's nationwide permit program provided that the project satisfies the terms and conditions of the particular nationwide permit. Fills that do not qualify for a nationwide permit or regional general permit require an individual permit.

National Pollutant Discharge Elimination System Permit Program

The National Pollutant Discharge Elimination System (NPDES) permit program was established to regulate municipal and industrial discharges to surface waters of the United States. The discharge of wastewater to surface waters is prohibited unless an NPDES permit issued by the applicable Regional Water Quality Control Board (RWQCB) allows that discharge. NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source storm water runoff. NPDES permits generally identify allowable concentrations of effluent in receiving waters and/or limits on pollutant emissions contained in discharges; prohibit discharges not specifically allowed under the permit; and describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring, and other activities.

In November 1990, EPA published regulations establishing NPDES permit requirements for municipal and industrial storm water discharges. Phase 1 of the permitting program applies to municipal discharges of storm water in urban areas where the population exceeds 100,000 persons. Phase 1 also applies to storm water discharges from a large variety of industrial activities, including general construction activities if the project would disturb more than 5 acres. Phase 2 of the NPDES storm water permit regulations, which became effective in March 2003, require that NPDES permits be issued for construction activities for projects that disturb between 1 and 5 acres. The RWQCBs in California are responsible for implementing the NPDES permit system (see "NPDES Permit System and Waste Discharge Requirements" below).

Section 401 Water Quality Certification or Waiver

Under Section 401 of the CWA, an applicant for a Section 404 permit (to discharge dredged or fill material into waters of the United States) must first obtain a certificate from the appropriate state agency stating that the fill is consistent with the state's water quality standards and criteria. In California, the authority to either grant water quality certification or waive the requirement is delegated by the State Water Resources Control Board (SWRCB) to the RWQCBs.

Section 303(d) Impaired Waters List

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that would not attain water quality objectives for specific pollutants after implementation of required levels of treatment by point-source dischargers (municipalities and industries). Dry Creek is not listed as a 303(d) impaired water body.

Safe Drinking Water Act

Under the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to domestic water supplies. Contaminants of concern that are relevant to domestic water supplies are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA National Primary Drinking Water Regulations and National Secondary Drinking Water Regulations. Maximum Contaminant Levels (MCLs) are set for all contaminants of concern. MCLs and the process for setting these standards are reviewed triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting drinking-water MCLs.

STATE PLANS, POLICIES, AND REGULATIONS

State Water Resources Control Board

In California, the SWRCB has broad authority over water quality control issues for the state. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the state by the federal government under the CWA. Other state agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) (for drinking-water regulations), the

California Department of Pesticide Regulation, the California Department of Fish and Game (DFG), and the Office of Environmental Health and Hazard Assessment. Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The regional boards are required to formulate and adopt water quality control plans (Basin Plans) for all areas in the region and establish water quality objectives in the plans. The Central Valley RWQCB is responsible for regulating water bodies located in the Plan area.

State Non-Degradation Policy

In 1968, as required under the federal anti-degradation policy, the SWRCB adopted a non-degradation policy aimed at maintaining high quality for waters in California. The non-degradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows.

- Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.

- Any activity that produces waste or increases the volume or concentration of waste and that discharges to existing high-quality waters would be required to meet waste discharge requirements that would ensure that (1) pollution or nuisance would not occur and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Toxics Rule

In May 2000, the SWRCB adopted and EPA approved the California Toxics Rule (CTR) which establishes numeric water quality criteria for approximately 130 priority pollutant trace metals and organic compounds. The SWRCB subsequently adopted its State Implementation Policy (SIP) of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries. The SIP outlines procedures for NPDES permitting for toxic pollutant objectives that have been adopted in Basin Plans and in the CTR.

NPDES Permit System and Waste Discharge Requirements

The SWRCB and Central Valley RWQCB have adopted specific NPDES permits and/or waste discharge requirements (WDRs) for a variety of activities that have the potential to discharge wastes to waters of the state or to land. Dischargers are required to eliminate or reduce non-storm water discharges to storm sewer systems and other waters. The SWRCB's statewide storm water permit for general construction activity (Order 99-08-DWQ, as amended) is applicable to all land-disturbing construction activities that would disturb more than 1 acre. Construction activities such as clearing, grading, stockpiling, and excavation are subject to the statewide general construction activity NPDES permit. Although specific actions associated with the Specific Plan would not expose greater than 1 acre of disturbed construction area to storm water runoff, individual redevelopment projects occurring in the Plan area could expose greater than 1 acre of disturbed construction area to storm water runoff. These individual redevelopment projects could thus require an NPDES storm water permit for general construction activity.

The NPDES permit requires filing of a notice of intent (NOI) with the RWQCB to discharge storm water and preparation and implementation of a storm water pollution prevention plan (SWPPP) to control contaminated runoff from temporary construction activities. The SWPPP provides the plans and specifications for erosion and sediment best management practices (BMPs), means of waste disposal, methods for implementation of approved local plans, postconstruction sediment and erosion control BMPs and maintenance responsibilities, non-storm water management BMPs, and BMP performance inspection requirements.

NPDES permits require that design and operational BMPs be implemented to reduce the level of contaminant runoff during construction. The permit also requires dischargers to consider the use of permanent post-construction BMPs that will remain in service to protect water quality throughout the life of the project. Types of BMPs include source controls, treatment controls, and site planning measures. The NPDES regulations also require implementation of appropriate hazardous materials management practices to reduce the possibility of chemical spills or release of contaminants, including any non-storm water discharge to drainage channels.

Construction dewatering activities that discharge to surface waters require NPDES authorization under the RWQCB's General Order for Dewatering and Other Low-Threat Discharges to Surface Waters (Order No. 5-00-175). This permit requires the applicant to submit a NOI before the activity verifying that the dewatering will occur in compliance with applicable water quality objectives. It contains terms and conditions for discharge prohibitions, specific effluent and receiving water quality limits, solids disposal activities, and water quality monitoring protocols. The permit authorizes direct discharges to surface waters up to 250,000 gallons per day for no more than a 4-month period each year.

The Central Valley RWQCB may also issue site-specific WDRs, or waivers to WDRs, for certain waste discharges to land or waters of the state. In particular, RWQCB Resolution R5-2003-0008 identifies activities subject to waivers of reports of waste discharge and/or WDRs for a variety of activities, including minor dredging activities and construction dewatering activities that discharge to land.

All NPDES permits have inspection, monitoring, and reporting requirements. In Resolution 2001-046, the Central Valley RWQCB responded to a court decision by implementing mandatory water quality sampling requirements for visible and nonvisible contaminants in discharges from construction activities. Water quality sampling is now required if the activity could result in the discharge of turbidity or sediment to a water body that is listed as impaired under Section 303(d) because of sediment or siltation, or if a release of a nonvisible contaminant occurs. Where such pollutants are known or should be known to be present and have the potential to contact runoff, sampling and analysis are required.

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. Under the act, the state must adopt water quality policies, plans, and objectives that protect the state's waters for the use and enjoyment of the people. The act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update Basin Plans. Basin Plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The act also requires waste dischargers to notify the RWQCBs of their activities through the filing of Reports of Waste Discharge (RWDs) and authorizes the SWRCB and RWQCBs to issue and enforce WDRs, NPDES permits, Section 401 water quality certifications, or other approvals. The RWQCBs also have authority to issue waivers to RWDs/WDRs for broad categories of "low threat" discharge activities that have minimal potential for adverse water quality effects when implemented according to prescribed terms and conditions.

Safe Drinking Water Program

As part of the federal Safe Drinking Water Act, the EPA has delegated to DHS the responsibility for administering California's drinking-water program. DHS is accountable to EPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by EPA.

Title 22 of the California Code of Regulations (Article 16, Section 64449) defines secondary drinking-water standards that are established primarily for reasons of consumer acceptance (i.e., taste) rather than because of health issues. For mineralization (i.e., total dissolved solids and chloride), the secondary standards are expressed in the form of recommended, upper, and short-term MCLs. The recommended, upper, and short-term MCLs for total dissolved solids are 500, 1,000, and 1,500 milligrams per liter, respectively.

LOCAL PLANS, POLICIES, AND REGULATIONS

The *City of Roseville General Plan 2020* contains the following hydrology and water quality-related goals and policies applicable to the proposed project:

Community Form Goal 7: Roseville will promote and encourage the availability of a variety of goods and services, and will take measures to retain a positive business climate in the City.

- **Community Form Policy 1:** Ensure high quality development in new and existing development areas as defined through specific plans, the development review process and community design guidelines.

- **Community Form Policy 4:** Promote a diversity of residential living options (e.g., density ranges, housing types, affordability ranges) while ensuring community compatibility and well-designed residential development.

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

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

- **Flood Protection Policy 1:** Continue to regulate, through land use, zoning, and other restrictions, all uses and development in areas subject to potential flooding.

- **Flood Protection Policy 2:** Monitor and regularly update City flood studies, modeling and associated land use, zoning and other development regulations.

- **Flood Protection Policy 5:** Minimize the potential for flood damage to public and emergency facilities, utilities, roadways, and other infrastructure.

- **Flood Protection Policy 9:** Where feasible, maintain natural stream courses and adjacent habitat and combine flood control, recreation, water quality and open space functions.

The *City of Roseville Municipal Code* contains the following hydrology and water quality-related ordinances applicable to the proposed project:

Urban Stormwater Quality Management and Discharge Control (Section 14.20): The purpose of the ordinance is to provide for the health, safety, and general welfare, and protect and enhance the water quality in the City pursuant to the Federal Clean Water Act by reducing pollutants in stormwater discharges to the stormwater conveyance system.

Zoning regulations for Floodway and Floodway Fringe Zones (Section 19.18.040): The purpose of the ordinance is to provide for the health, safety, and general welfare, and to minimize losses due to flooding.

Flood Damage Prevention (Section 9.80): The purpose of this chapter is to protect human life and health, minimize the expenditure of public funds for flood control projects, and to minimize impacts to residents, businesses and public facilities due to flooding.

The following additional City of Roseville documents contain hydrology and water quality-related information and guidance applicable to the proposed project:

City of Roseville Grading Ordinance and Construction Standards provide instruction for stormwater compliance on construction sites including requirements for SWPPP components and best management practices for erosion and sediment control, and good housekeeping practices.

City of Roseville Storm Water Quality BMP Guidance Manual for Construction (March 2007) contains information aimed at providing the development community with clear instruction for stormwater quality compliance on construction sites and at helping construction site managers meet and comply with SWPPP requirements.

Stormwater Quality Design Manual for Sacramento and the South Placer Regions (May 2007) (including the City of Roseville) provides guidance and for design and selection of stormwater quality control measures, including source-control runoff reduction and treatment control.

4.12.3 ENVIRONMENTAL IMPACTS

ANALYSIS METHODOLOGY

The environmental analysis for hydrology and water quality was based on background information provided in the Downtown Specific Plan Hydraulic Study, the Royer / Saugstad Park Master Plan Update, the Dry Creek Bank Erosion Management Plan, the Dry Creek Coordinated Resource Management Plan, and California's Groundwater Bulletin 118 (DWR 2006). The effects of the proposed project were compared to environmental baseline conditions (i.e., existing conditions) to determine impacts.

THRESHOLDS OF SIGNIFICANCE

Based on the State CEQA Guidelines and CEQA checklist (Appendix G), the proposed project would result in a potentially significant impact on hydrology or water quality if it would:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;
- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- expose people or structures to a significant risk of loss, injury or death involving flooding;
- place within a 100-year flood hazard area structures which would impede or redirect flood flows; or
- cause inundation by seiche, tsunami, or mudflow.

IMPACT ANALYSIS

IMPACT 4.12-1 **Hydrology and Water Quality – Short-Term Degradation of Water Quality from Project-Related Construction Activities.** *Construction disturbances associated with the proposed project would create the potential for soil erosion and sedimentation of storm water drainage systems and runoff to Dry Creek. Construction activities may also involve the potential for releases of other pollutants to surface waters and/or the future storm drain system including oil and gas, chemical substances used in the construction process, accidental discharges, waste concrete, and wash water. Implementation of standard erosion control measures and implementation of minimum control measures required by the SWMP would be required by individual development projects in the Plan area. This impact is considered* ***less than significant****.*

Construction activities associated with future redevelopment projects in the Plan area would include demolition, grading, restoration, and new pedestrian crossings across Dry Creek which could expose disturbed surfaces and could potentially cause unstable soil conditions, resulting in soils that are easily disturbed by equipment and eroded by rain and wind. For individual project sites in the Plan area, excavations would be necessary to construct foundations for buildings and other facilities, parking facilities, and pipelines and other utilities associated with project site development. Development activities would also include the installation of pipeline improvements throughout the Plan area (see Section 4.2, "Public Utilities").

The City of Roseville currently operates under a NPDES Municipal Storm water Permit and is required to develop, implement, and enforce a NPDES Phase 2 Storm Water Management Program (SWMP). The City's SWMP (dated March 2003) outlines a comprehensive set of priorities, activities, and strategies that comprise the City's minimum control measures (MCMs) and best management practices (BMPs) to reduce pollutants in storm water to the maximum extent practicable. In addition, Section 16.20.040 of the Roseville Zoning Ordinance regulates stockpiling and grading and addresses conditions under which permits and grading plans are required. Section 16.20.070 identifies grading plan performance standards. Section 16.20.020 requires that all grading be performed in accordance with either City of Roseville Improvement Standards or Chapter 16 of the Zoning Ordinance, whichever is more restrictive. The City of Roseville Department of Public Works Improvements Standards require that a grading permit be obtained prior to grading activities. At the time an applicant applies for a grading permit, they must submit a site-specific erosion and sedimentation control plan to demonstrate how the plan would reduce the potential for contaminants to enter receiving waters. All of these City regulations impose specific standards for project construction and erosion control measures including revegetation of disturbed areas, avoidance of grading activities near drainages during wet weather, and avoidance of drainage disturbances. BMPs to be followed can include storm water inlet protection measures, such as the use of straw bales, sandbags, gravel traps, and filters; erosion control measures such as vegetation and physical stabilization; and sediment control measures such as fences, dams, barriers, berms, traps, and basins.

For individual projects in the Plan area, project applicants would need to obtain and comply with the NPDES storm water general permit for construction activity, including the City itself for activities associated with improving Dry Creek wildlife habitat and drainage flows. This would include filing an NOI and preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP). Before the start of any construction work, site grading, or excavation associated with construction of a development project, a SWPPP would be prepared detailing measures to control soil erosion and waste discharges from a construction site and an NOI would be submitted to the Central Valley RWQCB for storm water discharges associated with general construction activity. All contractors conducting construction-related work would be required to implement the SWPPP to control soil erosion and waste discharges of other construction-related contaminants. The general contractor(s) and subcontractor(s) conducting the work would be responsible for constructing or implementing, regularly inspecting, and maintaining the measures in good working order.

The SWPPP would be required to identify the grading and erosion-control BMPs and specifications that are necessary to avoid and minimize water-quality impacts to the extent practicable. Standard erosion control measures (e.g., management, structural, vegetative controls) would be required to be implemented for all

construction activities that expose soil. Grading operations would be required to eliminate direct routes for conveying potentially contaminated runoff to drainage channels (i.e., Dry Creek). The SWPPP would identify specific measures for stabilizing soils at individual construction sites before the onset of the winter rainfall season. These standard erosion-control measures would be designed to reduce the potential for soil erosion and sedimentation of storm drains/channels.

In addition, construction and operation pursuant to the Specific Plan could potentially violate water quality standards associated with nonpoint source (i.e., urban runoff) pollutants to the storm drain and flood control systems (i.e., Dry Creek). Urban runoff pollutants (e.g., heavy metals, nutrients, hydrocarbons, suspended solids) are those resulting from the deposition of compounds on streets, highways, and parking areas that are subsequently washed off during storms. However, the City's NPDES Phase 2 SWMP (March 2003) identifies activities to implement the following six minimum control measures required by under the General Permit: public outreach, public involvement, illicit discharge detection and elimination, construction site runoff, new development and redevelopment, and municipal operations. The goal of the SWMP is to reduce pollutants in storm water to the maximum extent practicable.

Because the project applicants for individual development projects in Plan area must follow requirements of the City along with state and federal regulations and adherence to the City's SWMP requirements, including the City itself for improvements in Dry Creek, construction activities occurring under the Specific Plan would have a less-than-significant impact related to water quality.

IMPACT 4.12-2 Hydrology and Water Quality – Temporary Effects on Groundwater Quality During Construction. *Sediments and contaminants would be prevented from entering groundwater through requirements of the NPDES storm water general permit for construction activity, including preparation of a SWPPP. The NPDES permit would be required to include provisions for dewatering, and the SWPPP would be required to include a dewatering plan, measures to prevent/minimize releases of sediment and contaminants into groundwater during excavation, and methods to clean up releases if they do occur. Because compliance with these regulations would be a required of individual development projects in the Plan area and the contamination of groundwater would be avoided and/or minimized, this impact is considered* ***less than significant****.*

Construction activities, specifically excavation, associated with individual development projects in the Plan area could intersect with shallow groundwater and require dewatering. Sediments and construction-related contaminants (e.g., fuels, lubricants, oil, grease, paint) could enter the groundwater directly from construction activities if the groundwater table is breached. Excavation and potential dewatering could cover a large area and could occur over a relatively long period (several months). Multiple small incidents of contamination, or larger single releases (e.g., fuel spill) could also result in adverse effects on groundwater.

However, the project applicants, including the City itself, would be required to obtain and comply with a NPDES general permit for construction activities including preparation of a SWPPP. The NPDES permit would be required to include provisions for dewatering and the SWPPP would be required to include a dewatering plan, measures to prevent/minimize sediment and contaminant releases into groundwater during excavation, and methods to clean up releases if they do occur. If necessary, dewatering would be done in a manner that allows discharge to an infiltration basin approved by the Central Valley RWQCB. Measures to prevent/minimize releases of sediment and contaminants into groundwater during excavation and methods of cleaning up releases may include using temporary berms or dikes to isolate construction activities, using vacuum trucks to capture contaminant releases, and maintaining absorbent pads and other containment and cleanup materials on a project site to allow an immediate response to contaminant releases if they occur. In addition, groundwater discharges to the City's storm water system from construction and/or long-term dewatering of excavated sites are regulated and monitored by the City's Environmental Utilities Department.

Because the project would be required to comply with regulations of the City's NPDES permit and require preparation of a SWPP to prevent groundwater contamination, construction activities associated with individual development projects in the Plan area would be avoided or reduced to a less-than-significant level.

IMPACT 4.12-3 **Hydrology and Water Quality – Change in the Quantity of Groundwater through Withdrawals, Interception, or Loss of Recharge Capacity**. *The Plan area is located within an existing urbanized area and is developed with impervious surfaces of various types. Implementation of the proposed project would not result in a substantial increase in impervious-surface coverage such that interference with groundwater recharge would occur. In addition, the proposed project would not result in a demand for groundwater resources. This impact is considered* ***less than significant****.*

The proposed project does not include proposals for wells or the use of groundwater. Water supplies for the Plan area would come from the City's municipal supplies, which originate primarily from surface water supplies (i.e., Folsom Lake). The City has four groundwater wells that are maintained only for use as a backup water source when emergency situations require increased quantity or pressure levels. Therefore, implementation of the Plan would not deplete groundwater supplies.

Under natural conditions, groundwater recharge results from precipitation and infiltration of excess irrigation water. However, the rate and quantity of water reaching the saturation zone depends on factors that include the amount and duration of precipitation, soil time, moisture content of the soil, and vertical permeability of the unsaturated zone. The Plan area is currently developed with urban uses and considerable impervious surfaces (e.g., buildings, roads, parking lots, driveways, sidewalks). Implementation of the proposed project would not result in a substantial increase in impervious-surface coverage such that interference with groundwater recharge would occur. This impact is considered less than significant.

IMPACT 4.12-4 **Hydrology and Water Quality – Long-Term Changes in Runoff and Water Quality**. *Although individual project sites in the Plan area are in an urban environment that is largely paved, development under the Specific Plan may slightly increase the amount of impervious surfaces, and could proportionately increase runoff from individual project sites to storm drains. However, the Plan area is located an area of Roseville where an existing storm drainage system would be used to convey urban runoff conveyance in compliance with the City's SWMP requirements. Because compliance with NPDES-related regulations for storm water runoff would be a required element of individual projects in the Plan area, this impact is considered* ***less than significant****.*

The individual project sites in the Plan area are currently developed primarily with urban uses and impervious surfaces (e.g., buildings, parking lots, driveways, sidewalks). However, operation of land uses envisioned in the Specific Plan could potentially violate water quality standards associated with non-point source (i.e., urban runoff) pollutants to the storm drain system. Urban runoff pollutants, including heavy metals, nutrients, hydrocarbons, and suspended solids, result from the deposition of compounds on streets, highways, and parking areas that are subsequently washed off during storms. However, the City's NPDES Phase 2 SWMP (March 2003) identifies activities to implement the following six minimum control measures required by under the General Permit: public outreach, public involvement, illicit discharge detection and elimination, construction site runoff, new development and redevelopment, and municipal operations. The goal of the SWMP is to reduce pollutants in storm water to the maximum extent practicable.

The City's municipal NPDES storm water permit and associated SWMP would require individual development projects in the Plan area to implement post-construction storm water contaminant source control and treatment controls. Consequently, the SWPPP and approval plans for individual development projects under Specific Plan would include site-specific post-construction storm water-runoff-control plans and measures to demonstrate how a specific development project would reduce the potential for contaminants to enter receiving waters.

Although implementation of development projects in the Plan area could incrementally increase storm water flows to the storm drain system, the incremental change is anticipated to be small because the Plan area is an existing urban environment and the amount of impervious surfaces would not substantially increase with implementation of development projects under the Specific Plan. The land use changes (i.e., mixed-use) envisioned in the Specific Plan could also incrementally change the type and amount of urban storm water contaminants discharged into the storm drain system. However, the City's SWMP regulations for project compliance would be a required element of individual development projects in the Plan area and would result in the implementation of post-construction storm water-runoff source control and treatment measures that do not likely exist under the existing conditions. Because the Specific Plan would not considerably affect the amount of drainage flow contributed to the existing storm drainage system, and with adherence to the City's SWMP requirements, this impact would be less than significant.

IMPACT 4.12-5 **Hydrology and Water Quality – Expose People or Structures to a Significant Risk of Flooding.** *Implementation of the proposed project could expose people and structures to flooding due to construction of proposed commercial/residential buildings and an amphitheater adjacent to or Dry Creek. This impact is considered* ***potentially significant****.*

The *Downtown Specific Plan Hydraulic Study* (RBF 2008) (see Appendix E) was prepared as part of the proposed Specific Plan to analyze components of the Specific Plan that could affect the hydraulics or flows of Dry Creek including flood events. Current, detailed topographic data was used to update an existing City-approved model and subsequently used to develop a new model incorporating proposed improvements and natural feature enhancements to Dry Creek as part of the Specific Plan. Proposed improvements to Dry Creek could include, but are not be limited to, bank stabilization treatments, scour protection, floodwall reconstruction, bank recontouring for flood conveyance or restoration, and construction of step pools or riffles for salmonid habitat enhancement (refer to Policy 8.4.2 of the proposed *Downtown Roseville Specific Plan*). The hydraulic study analyzed the area of Dry Creek from Folsom Road to south of Douglas Boulevard near Cherry Street including Royer Park and Saugstad Park. Based on the Hydrologic Engineering Center- River Analysis System (HEC-RAS) hydraulic model developed to analyze changes in hydraulics of Dry Creek, a "regulatory future floodplain" was identified which exceeds the special flood hazard area mapped by FEMA.

The City's General Plan identifies and establishes the policy for development within the 100-year future floodplain. In addressing fill in the future floodplain for infill properties, the General Plan establishes that:

> *No development is permitted within the future floodway. Development may be permitted within the future floodway fringe. In accordance with the Nolte definition, such development shall be limited to falling within the assumed cumulative one-foot rise in the water surface elevation. (Flood Protection chapter, Section C, Floodplain Development Regulations, Infill Areas)*

Essential public facilities (e.g., roads, bridges) are allowed to fill in the floodway. Fill is also allowed within the floodway fringe as long as it does not create a one-tenth of a foot rise in the water surface elevation upstream or downstream from the project. The proposed Specific Plan anticipates the installation of public facilities (i.e., Fire Station #1 relocation), public improvements (i.e., pedestrian bridges, creek walk, and bike trails), park facilities (i.e., amphitheatre, tennis court relocation, water features) and future development within what was previously identified as the future floodway and floodway fringe. The Specific Plan also envisions development of multi-family residential and high density residential uses adjacent to Dry Creek (see Exhibit 3-3, "Project Description"). Development of these types of land uses adjacent to Dry Creek creates the potential for exposing people (i.e., residents) and habitable structures (e.g., homes, office space) to flooding.

Existing improvements and proposed future improvements have been reflected in the City's updated flood impact model prepared by RBF Consulting. The results of this hydraulic study show that the area previously considered as the future 100-year floodplain can be filled for development and be removed from the floodplain without significantly increasing the existing water surface elevation. The boundary that has been established on the west

side of Dry Creek (see Exhibit 4.12-1) reflects future development within areas previously designated as part of the 100-year floodplain. The hydraulic study concluded that new habitable structures developed in areas identified in the Specific Plan could be located within areas that had previously been designated as future 100-year floodplain. To accomplish this, filling to a level two feet above the future 100-year floodplain, or ensuring that the habitable first floor of future structures is two feet above the 100-year floodplain, would be required. Additionally, areas adjacent to the adjusted 100-year floodplain could be considered for development in the future but would require specific improvements (e.g., piers, flood proofing) and would require site specific hydraulic modeling.

Based on the hydraulic analysis provided, and the requirement that all habitable structures will have a minimum of two feet of freeboard above the 100-year future floodplain level,, this is considered a less-than-significant impact.

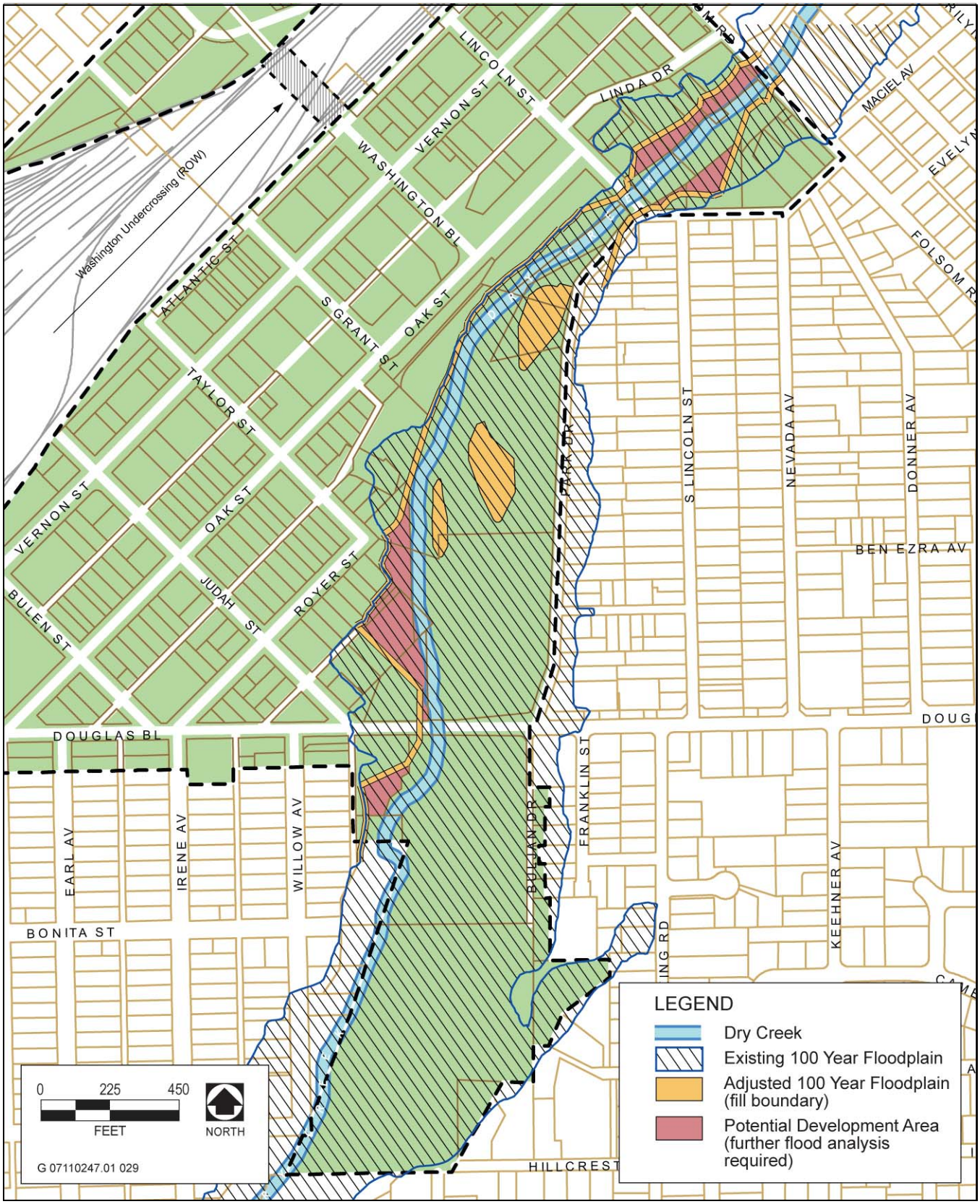
IMPACT 4.12-6 **Hydrology and Water Quality – Proposed Project Structures within the 100-year Flood Zone Could Impede or Redirect Flood Flows.** *Implementation of the proposed project could expose people and structures to flooding due to construction of proposed commercial/residential buildings, a golf course, bridges and park facilities, and an amphitheater adjacent to or across Dry Creek. This impact is considered* ***potentially significant****. Portions of the proposed project are within the 100-year floodplain. This impact is considered* ***potentially significant****.*

Several project features may require temporary construction-related or permanent placement of fill within waters of the United States (i.e., Dry Creek). These elements of the proposed project could include, but are not limited to, bank stabilization treatments that require hardscape, placement of bridge abutments and associated scour protection, construction of the library amphitheater, floodwall reconstruction, bank recontouring for flood conveyance or restoration, and construction of step pools or riffles for salmonid habitat enhancement. Although some project elements may include the introduction of hardscape to small areas along the waterside edge of the Dry Creek corridor (e.g., bridge abutments), these structures would not entirely bisect the corridor.

The *Downtown Specific Plan Hydraulic Study* (RBF 2008) (see Appendix E) was prepared as part of the proposed Specific Plan to analyze components of the Specific Plan that could affect the hydraulics or flows of Dry Creek including flood events. Current, detailed topographic data was used to update an existing City-approved model and subsequently used to develop a new model incorporating proposed improvements identified in the Specific Plan (e.g., new fire station, bike trail, park improvements, golf course) and enhancements to Dry Creek as noted above (refer to Policy 8.4.2 of the proposed *Downtown Roseville Specific Plan*). The hydraulic study analyzed the area of Dry Creek from Folsom Road to south of Douglas Boulevard near Cherry Street including Royer Park and Saugstad Park. Based on the Hydrologic Engineering Center- River Analysis System (HEC-RAS) hydraulic model developed to analyze changes in hydraulics of Dry Creek, a “regulatory floodplain” was identified of which exceeds the special flood hazard area mapped by FEMA.

Specific improvements envisioned as part of the Specific Plan that were analyzed in the hydraulic study include a new fire station headquarters and bike trail, creek walk, Royer and Saugstad Park improvements including a new 9-hole golf course at Saugstad Park. The hydraulic study made the following conclusions regarding improvements identified in the Specific Plan and their effect on hydraulic flows of Dry Creek.

New Fire Station Headquarters and Bike Trail: Improvements anticipated as part of the Fire Station include widening the bridge opening under Lincoln Street, extending the Harding to Royer Park bike trail under the bridge to the icehouse plaza, and construction of a retaining wall at the edge of the parking lot for the Fire Station. The combined result of the proposed improvements located between Lincoln Street and Folsom Road would result in a reduction of water surface elevations for the 100-year flood event.



Source: City of Roseville, 2008

Future 100 Year Floodplain **Exhibit 4.12-1**

Creek Walk: In certain areas, the Creek Walk as currently proposed in the Specific Plan would increase the 100-year water surface elevations by more than the permissible amount of 0.10 feet. Specifically, the area of concern is located south of the new library bridge. To remedy this effect, the pedestrian path should be set at the existing top of bank elevation and conditioned that the Creek Walk would not be accessible during a major storm event.

Royer and Saugstad Park Improvements: The proposed pedestrian bridge and grand staircase, in combination with relocation of the Ice House Bridge and construction of a bike path, would not increase 100-year flood water surface elevations in Royer Park or upstream. However, the favorable results are based on bridge alignments different than those presented in the Specific Plan. Specifically, the HEC-RAS model was revised based on new information gathered in the field and from aerial surveys. Consideration of other alignments and configurations other than those shown as part of the RBF analysis for the two bridges will require additional hydraulic review. Proposed relocation of the Library Bridge in combination with development of the amphitheater would not affect water surface elevations.

New 9-Hole Golf Course: Minimal design information for the proposed golf course is available. There was an assumed worst case of one foot of fill modeled for the entire site area. Based on this conservative estimate of fill, the model showed an increase in water surface elevations at the golf course of up to 0.26 feet and the impact continuing upstream of Douglas Boulevard. As a result, additional information regarding conditions at the golf course site and preliminary design is required to perform a more detailed hydraulic analysis.

Based on the findings and conclusions made in the hydraulic study, implementation of the Specific Plan is considered to result in a potentially significant impact related to impeding or redirecting flood flows.

IMPACT 4.12-7 Hydrology and Water Quality – Inundation by Seiche, Tsunami, or Mudflow. *The proposed project is not located in an area susceptible to seiche or tsunamis. Steep slopes along Dry Creek could pose hazards associated with mudflows. This impact is considered* ***potentially significant****.*

The Plan area is not located near a surface water body in which a seiche or tsunami could directly or indirectly affect the area. However, the Plan area contains steep slopes along Dry Creek that could pose hazards associated with mudflows. The Specific Plan identifies development of a pedestrian path adjacent to Dry Creek which could expose pedestrians and/or bicyclists to mudflow hazards during a storm event. This is considered a potentially significant impact.

4.12.4 MITIGATION MEASURE

No mitigation measures are necessary for the following less-than-significant impacts.

4.12-1: Hydrology and Water Quality – Short-Term Degradation of Water Quality from Project-Related Construction Activities.

4.12-2: Hydrology and Water Quality – Temporary Effects on Groundwater Quality During Construction.

4.12-3: Hydrology and Water Quality – Change in the Quantity of Groundwater through Withdrawals, Interception, or Loss of Recharge Capacity.

4.12-4: Hydrology and Water Quality – Long-Term Changes in Runoff and Water Quality.

The following mitigation measures are provided for significant and potentially significant impacts.

Mitigation Measure 4.12-5: Hydrology and Water Quality – Expose People or Structures to a Significant Risk of Flooding.

All habitable structures constructed in the Plan area shall be located outside the adjusted 100-year flood plain as identified in the *Downtown Specific Plan Hydraulic Study* (RBF 2008) prepared for the Downtown Roseville Specific Plan. Additional encroachment into areas within the adjusted 100-year flood plain shall require site specific hydraulic modeling. Specific structures identified in the Downtown Roseville Specific Plan shall be prohibited from being constructed inside the adjusted 100-year flood plain unless evaluated and approved through project specific hydraulic modeling including structures associated with mixed-use development and high-density residential.

This measure would prevent development of any habitable structures in the 100-year flood hazard area and would reduce potential to expose people or structures to a flood hazard to a less-than-significant level.

Mitigation Measure 4.12-6: Hydrology and Water Quality – Proposed Project Structures within the 100-year Flood Zone Could Impede or Redirect Flood Flows.

To prevent impeding or redirecting storm water flows in Dry Creek, the following actions shall be implemented for design and construction of improvements identified in the Downtown Roseville Specific Plan adjacent to Dry Creek.

1. The Creek Walk identified in the Downtown Roseville Specific Plan shall be constructed at the existing top of bank elevation for Dry Creek and the area south of the new library bridge shall be made inaccessible during major storm events.

2. All pedestrian bridges in the Specific Plan area and the grand staircase shall be aligned to prevent increased 100-year flood water surface elevations in Dry Creek. Additional hydraulic analyses shall be conducted for the new pedestrian bridge alignments that are inconsistent with the RBF hydraulic analysis.

3. Prior to any golf course related development activities in Saugstad Park, a site-specific hydraulic analysis or other acceptable analysis shall be conducted for a more specific golf course development plan to ensure that there is no risk of impeding or redirecting flood flows. This future analysis shall be reviewed and approved by the City's Public Works Department.

These measures would ensure proposed structures and improvements identified in the Specific Plan do not impede or redirect flood flows in Dry Creek, reducing this potential impact to a less-than-significant level.

Mitigation Measure 4.12-7: Hydrology and Water Quality – Inundation by Seiche, Tsunami, or Mudflow.

Implement Mitigation Measure 4.4-3.

This measure would identify any unstable, hazardous slopes along Dry Creek that could pose a mudflow hazard to pedestrians and/or bicyclists and require implementation of recommendations to prevent landslides. This impact would be reduced to a less-than-significant level.

4.12.5 RESIDUAL SIGNIFICANT IMPACTS

All impacts associated with hydrology and water quality would be reduced to a less-than-significant level with implementation of mitigation measures. Therefore, there are no residual significant impacts.