

4.9 HYDROLOGY AND WATER QUALITY

This section identifies the hydrological resources, the existing drainage conditions, surface water resources, groundwater resources, surface water quality, groundwater quality, and potential for flooding in Rocklin and the surrounding area. Key issues include impacts to water quality, groundwater quality, groundwater supply, drainage, flooding, risk of seiche, tsunami, or mudflow. General Plan policies and mitigation measures that would serve to reduce impacts are also identified. This section is based on review of maps, plans, and documents related to water and water quality within the Planning Area. Relevant federal and state laws as well as local programs and codes are identified which regulate drainage, flooding and water quality. Abbreviated citations for each information source are provided in the text, with full references provided at the end of this section.

4.9.1 EXISTING SETTING

REGIONAL SETTING

The City of Rocklin is located in south Placer County in what is known as the Loomis Basin. The Loomis Basin is situated at the easternmost edge of the Sacramento Valley in a transitional zone between the Sacramento Valley and the western foothills of the Sierra Nevada range. Placer County is made up of fourteen different major watersheds (**Figure 4.9-1**). Each watershed drains to the stream or river that gives the watershed its name: Auburn Ravine, Coon Creek, Dry Creek, American River, Bear River, Truckee River, Pleasant Grove, Curry Creek, and others.

According to the 2005 California Department of Water Resources California Water Plan Update, the state has been subdivided into ten hydrologic regions. The City of Rocklin is located in the south-central portion of the Sacramento River Hydrologic Region, which covers approximately 17.4 million acres (27,200 square miles) (DWR 2005b, pg. 6-1) and includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Geographically, the Sacramento River Hydrologic Region extends south from the Modoc Plateau near the Oregon border to the Sacramento-San Joaquin River Delta. The northernmost area, mainly high desert plateau, is characterized by cold, snowy winters with only moderate rainfall, and hot, dry summers. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. Another significant feature is the Sacramento River, which is the longest river system in the State of California with major tributaries the Pit, Feather, Yuba, Bear, and American rivers. Overall, annual precipitation in the Sacramento River Hydrologic Region generally increases as one moves from south to north and west to east. The heavy snow and rain that falls in this region contributes to the overall water supply for the entire state.

The Sacramento River Hydrologic Region is the main water supply for much of California's urban and agricultural areas. Annual runoff in the Sacramento River Hydrologic Region averages about 22.4 million acre-feet, which is nearly one-third of the state's total natural runoff. Major water supplies in the region are provided through surface storage reservoirs. Shasta Lake is one of the two largest surface water projects in the region. In total, the region has 43 reservoirs with a combined capacity of almost 16 million acre-feet (DWR 2005b, pg. 6-3). Major reservoirs in the region not only provide water supply but also are the source of recreation, power generation, and other environmental and flood control benefits. In addition, the region has a network of creeks and rivers that convey water for use throughout the region and also provide nesting and rearing ground for major fish and wildlife species. Approximately 8 million acre-feet of water go to municipal, industrial, and agricultural uses, while approximately 2.5 million acre-feet are stored as groundwater. Much of the remainder of the runoff goes to dedicated natural flows, which

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support various environmental requirements, including in-stream fishery flows and flushing flows in the Sacramento River Delta.

SURFACE WATER RESOURCES

Hydrological features in the Planning Area include the perennial waterways of Antelope Creek, Secret Ravine Creek, and Sucker Creek. Other streams in the city include Pleasant Grove Creek and Clover Valley Creek. These five stream systems provide drainage to the Planning Area. A drainage basin is an extent of land where water from rain or snowmelt drains downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea, or ocean. The drainage basin includes the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels. Drainage basins are separated from adjacent basins by a drainage divide. Secret Ravine Creek and Sucker Creek drain the eastern side of the Loomis Basin, while Antelope Creek and Clover Valley Creek drain the central area and Pleasant Grove Creek drains the western side of the basin. Several ephemeral streams exist within the City of Rocklin during the rainy season, and seasonal wetlands occur within grassland habitats.

The City of Rocklin is made up of the Dry Creek watershed and the Pleasant Grove/Curry Creek watershed.

Dry Creek Watershed

The majority of the city is encompassed by the Dry Creek watershed. The Dry Creek watershed covers approximately 101 square miles in southwestern Placer County and northern Sacramento County. Headwaters of the Dry Creek watershed originate in the Sierra Nevada foothills near Newcastle, flow southwesterly into the Sacramento Valley, and empty into the Natomas East Main Drainage Canal. The Natomas East Main Drainage Canal drains into the Sacramento River downstream of Sutter County. The Dry Creek watershed bridges the Sierra Nevada and Central Valley geologic provinces and has year-round flows in its major watercourses. According to the Dry Creek Watershed Coordinated Resource Management Plan, the Dry Creek watershed is composed of mixed urban, suburban, rural, and open space land. Drainages are composed of numerous intermittent streams and perennial tributaries to the Dry Creek mainstream. The seven main tributaries in the Dry Creek watershed are Antelope Creek, Secret Ravine, Miners Ravine, Strap Ravine, Linda Creek, Cirby Creek, and mainstem Lower Dry Creek. In addition, there are two lesser tributaries, Clover Valley Creek and Sierra Creek (Placer and Sacramento Counties 2003, pg. 61).

Pleasant Grove/Curry Creek Watershed

The Pleasant Grove/Curry Creek watershed is located in western Placer County and includes the western portion of Rocklin. Pleasant Grove Creek and Curry Creek empty into the Pleasant Grove Creek Canal, which drains to the Sacramento River via the Cross Canal. The combined watershed covers approximately 40,800 acres with elevations ranging from a high of around 590 feet on the eastern boundary to a low of approximately 35 feet where Pleasant Grove Creek meets the Pleasant Grove Creek Canal. The watershed is composed of five major drainages: Curry Creek, Lower Pleasant Grove Creek, Kaseberg Creek, South Branch Pleasant Grove Creek, and upper Pleasant Grove Creek. The watershed was historically dominated by agriculture; however, current development trends in the watershed are resulting in conversion of agricultural and grasslands to suburban land uses, predominantly low- to medium-density residential communities with associated neighborhood or community commercial.

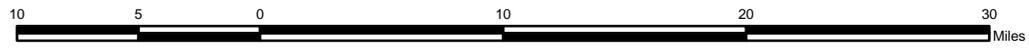
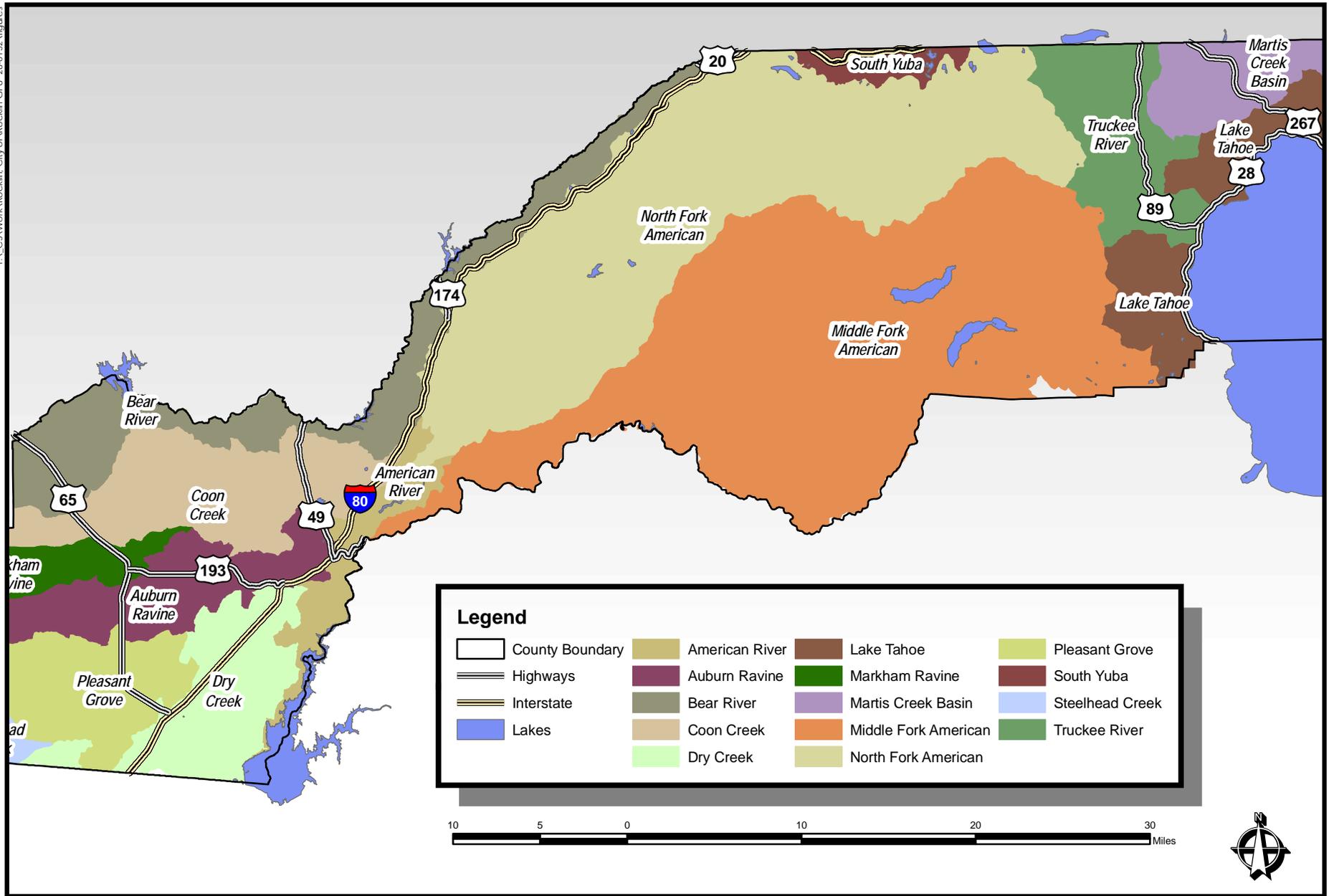


Figure 4.9-1
Placer County Watersheds

GROUNDWATER RESOURCES

The City of Rocklin lies above the Sacramento Valley Groundwater Basin, North American subbasin (DWR 2006). The aquifer system underlying Rocklin is part of a regional aquifer system that extends beyond Placer County into the Central Valley. This basin is composed primarily of Continental rocks and Pliocene to Holocene deposits, with some deposits of Continental rocks and Eocene and Holocene river deposits. The water-bearing materials of the North American subbasin are dominated by unconsolidated continental deposits of Late Tertiary and Quaternary age (DWR 2006). Deposits include Miocene/Pliocene volcanics, older alluvium, and younger alluvium. The alluvium can be characterized as comprising the upper aquifer system, occupying the upper 200 to 300 feet below ground surface; the Mehrten and older geologic units can be characterized as comprising the lower aquifer system, occurring generally deeper than 300 feet toward the west side of the subbasin (DWR 2006). The cumulative thickness of these deposits increases from a few hundred feet near the Sierra Nevada foothills on the east to over 2,000 feet along the western margin of the subbasin (DWR 2006).

The depth to groundwater in the North American subbasin is approximately 161 feet (upper watershed) to 13 feet (lower watershed) below ground surface (Placer and Sacramento Counties 2003, pg. 63). The aquifer thickness saturated with freshwater is approximately 500 to 1,500 feet (Placer and Sacramento Counties 2003, pg. 63). Most of the groundwater is produced in the northern portion of the subbasin. The aquifer zones in the upper 200 to 300 feet of this portion of the subbasin appear to be unconfined and behave similarly to stresses imposed on them. Conversely, deeper zones show a delayed response to stresses in the upper zone, indicating possibly limited interconnection with the shallower zones (DWR 2006).

As surface water supplies have been so abundant in the Sacramento Valley, groundwater supply primarily supplements the surface water supply. Yet with changing environmental laws and requirements, this balance is shifting to a greater reliance on groundwater, and conjunctive use of both supplies is occurring to a greater extent throughout the Sacramento Valley, particularly in drought years. From the 1860s to the 1960s, the groundwater hydraulic head dropped 40 to 80 feet within the lower confined aquifer in the Rocklin area. By 1975, however, levels were back to near predevelopment conditions due to increased use of surface water resources (Placer and Sacramento Counties 2003, pg. 64).

The City of Rocklin receives its water from the Placer County Water Agency (PCWA), which primarily uses surface water as its source of supply. A relatively small amount of groundwater is currently used by the PCWA for emergency purposes from one existing well (PCWA 2005, pg. 4-1). The current largest source of water is from the Yuba and Bear rivers for consumptive uses. This supply comes from Lake Spaulding and is purchased from Pacific Gas and Electric (PG&E). The American River provides a second source from appropriated water rights developed through construction of the Middle Fork Project. A third source is the United States Bureau of Reclamation's Central Valley Project (CVP) (PCWA 2005, pg. 4-1). Please refer to Section 4.14, Water Resources, for a complete discussion of Rocklin's water supply.

WATER QUALITY

The Sacramento River Hydrologic Region is part of the California Regional Water Quality Control Board's Central Valley Region (CVRWQCB) (**Figure 4.9-2**). Water quality standards for all waters in the region are discussed in the CVRWQCB Water Quality Control Plan (Basin Plan). This Basin Plan covers the entire area included in the Sacramento and San Joaquin river drainage basins. As stated above, the Sacramento River drainage basin covers 27,200 square miles and includes the entire area drained by the Sacramento River including the City of Rocklin.

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Surface Water Quality

Section 303(d) of the federal Clean Water Act (CWA) requires states to identify the waters of the state that do not meet the CWA's national goal of "fishable, swimmable" and to develop total maximum daily loads (TMDLs) for such waters, with oversight of the United States Environmental Protection Agency (EPA). These waters are commonly referred to as "impaired." A TMDL is a quantifiable assessment of potential water quality issues, contributing sources, and load reductions or control actions needed to restore or protect bodies of water.

Currently no surface water features in the Planning Area are listed as impaired under Section 303(d) of the CWA. However, the Central Valley Regional Water Quality Board has proposed the following water features for listing as impaired (CVRWQCB 2009):

- Dry Creek – Dissolved oxygen (unknown source). TMDL development planned for year 2021.
- Pleasant Grove Creek (20-mile segment upstream of Fiddymont Road) – Dissolved oxygen (unknown source) and the pesticide pyrethroids (urban runoff). TMDL development planned for year 2021.
- Curry Creek – Pesticide pyrethroids (urban runoff). TMDL development planned for year 2021.

Of the three creeks, only Pleasant Grove Creek is located within the Planning Area.

Groundwater Quality

Groundwater quality in the North American subbasin underlying the City of Rocklin is generally excellent. However, localized portions may have marginal water quality due to natural variability in the aquifer and/or potential contamination from spills (Placer and Sacramento Counties 2003, pg. 64). There are three major groundwater types within this region: magnesium calcium bicarbonate or calcium magnesium bicarbonate; magnesium sodium bicarbonate or sodium magnesium bicarbonate; and sodium calcium bicarbonate or calcium sodium bicarbonate (Placer and Sacramento Counties 2003, pg. 64). These groundwater types may have elevated levels of total dissolved solids (TDS), chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron, manganese, and arsenic in some locations.

CLIMATE AND PRECIPITATION

The climate in this region is considered Mediterranean with a warm, dry season during May through October and a wet, mild season from November through April. The average monthly temperatures range from approximately 33 degrees Fahrenheit (January minimum) to 97 degrees Fahrenheit (July maximum) (Placer and Sacramento Counties 2003, pg. 63). Annual precipitation is approximately 20 to 25 inches per year, with peak rainfalls occurring December through February. Summer stream flows are generally composed of flow from springs and urban runoff, such as irrigation drainage and effluent from wastewater treatment systems.

Changing climate conditions resulting from the potential increase in carbon dioxide (CO₂) could significantly change the regional hydrology in the Rocklin area. Some studies have indicated that the doubling of atmospheric CO₂ is likely to occur in the next 50 to 100 years if current trends in CO₂ production continue, and temperature change will affect different portions of the state in different ways. Climate models estimate that the higher temperatures resulting from the

doubling of atmospheric CO₂ may warm the Sierra mountain ranges, resulting in reduced snowpack and higher winter surface water flow (more flooding potential), lower spring/summer flow (less snowpack storage), and higher overall precipitation. These effects would greatly impact water storage and conveyance systems, water needs and use, and regional biological resources that have adapted to a different hydrology. Please refer to the discussion of global climate change in Section 4.15, Climate Change and Greenhouse Gases, of this Draft EIR.

FLOODING

Flooding is the accumulation of water where none usually occurs or the overflow of excess water from a stream, river, lake, reservoir, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to waterbodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. In the City of Rocklin, the main type of flooding to occur is riverine. Riverine or overbank flooding occurs due to excessive rainfall and water runoff volumes within the watershed of the stream or river. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. The City of Rocklin drainage volumes are characterized by a variety of watersheds that flow westward from the Sierra Nevada foothills and ultimately discharge into the Sacramento River southwest of the city. The city's urban drainage system discharges into the creeks that transect the community. These include Antelope Creek, Pleasant Grove Creek, Secret Ravine Creek, Clover Valley Creek, Sucker Creek, the Aguilar Tributary area, and the Second Street Tributary area. All of these ultimately discharge into the Sacramento River.

Major floods affecting the Rocklin region have typically resulted from extended periods of winter rainfall produced by winter storms. Generally, these storms affect the region from early November until the end of April. In general, the waterways most susceptible to flooding in the City of Rocklin are Antelope Creek, Secret Ravine Creek, Clover Valley Creek, and Sucker Creek. These perennial streams can overflow during storm events, but flooding is typically of a local nature. As the City of Rocklin participates in the federally sponsored Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA), FEMA has mapped known floodplains in Rocklin and surrounding areas. The identified floodplains appear on Flood Insurance Rate Maps (FIRMs) numbered 06061C0411F, 06061C0414F, 06061C0413F, 06061C0412F, 06061C0418F, 06061C0477G, and 06061C0481G. The maps show 100-year and 500-year floodplains and floodways located along the channels of the creeks listed above, as well as Pleasant Grove Creek and tributaries, Rocklin City Tributary, Loomis Tributary, and Aguilar Road Tributary. (A 100-year floodplain is an area that experiences a 1-in-100 chance of flooding each year; a 500-year floodplain experiences a 1-in-500 chance of flooding each year.) According to the Placer County Multi-Hazard Mitigation Plan, Rocklin contains 2,415 parcels located in areas designated as 100-year floodplains (Placer County 2005). Refer to **Figure 4.9-3** for 100-year floodplain areas within the City of Rocklin.

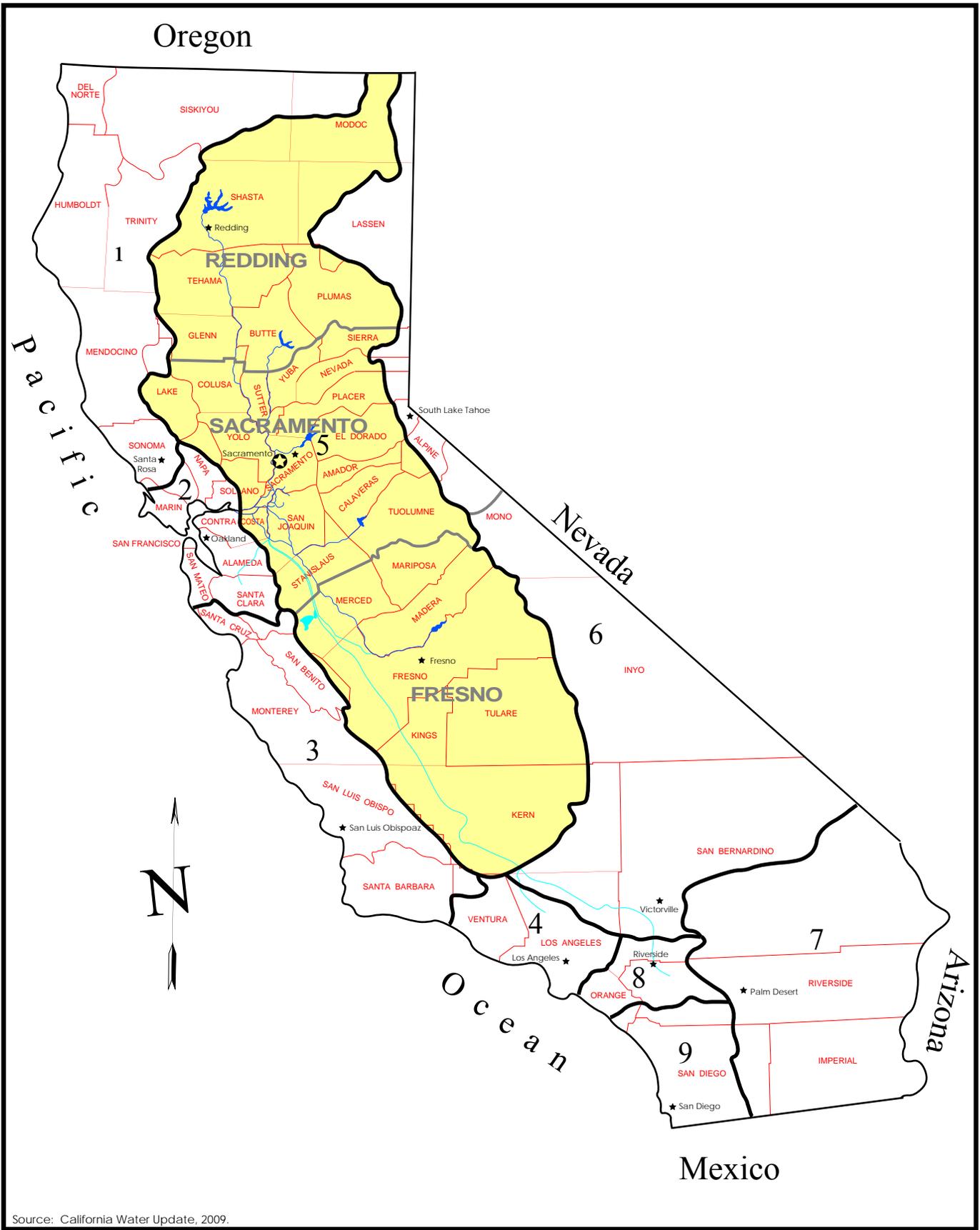
In addition, localized flooding can occur outside of recognized drainage channels or delineated floodplains due to a combination of locally heavy precipitation, increased surface runoff, and inadequate facilities for drainage and stormwater conveyance. Such events frequently occur in flat areas and in urbanized areas with large impermeable surfaces. Local drainage may result in "nuisance flooding," in which streets or parking lots are temporarily closed and minor property damage occurs.

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DAM FAILURE

Dams are man-made structures built for a variety of uses including flood protection, power, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year (Placer County 2005, pg. 58). If a larger flood occurs, then that structure will be overtopped. Overtopping is the primary cause of earthen dam failure. Failed dams can create floods that are catastrophic to life and property as a result of the tremendous energy of the released water. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives.

According to the Placer County Multi-Hazard Mitigation Plan (2005), dam inundation zones generally follow the existing streams and drainage areas, and areas subject to flooding from a dam failure would likely be those areas located along these streams and drainages. Rocklin itself does not have any navigable waters or regulated dams. All of the creeks and drainages are influenced by seasonal runoff and have specific control mechanisms (Placer County 2005, pg. 170). Furthermore, it should be noted that the city is not within the inundation area of Folsom Reservoir.

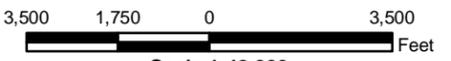
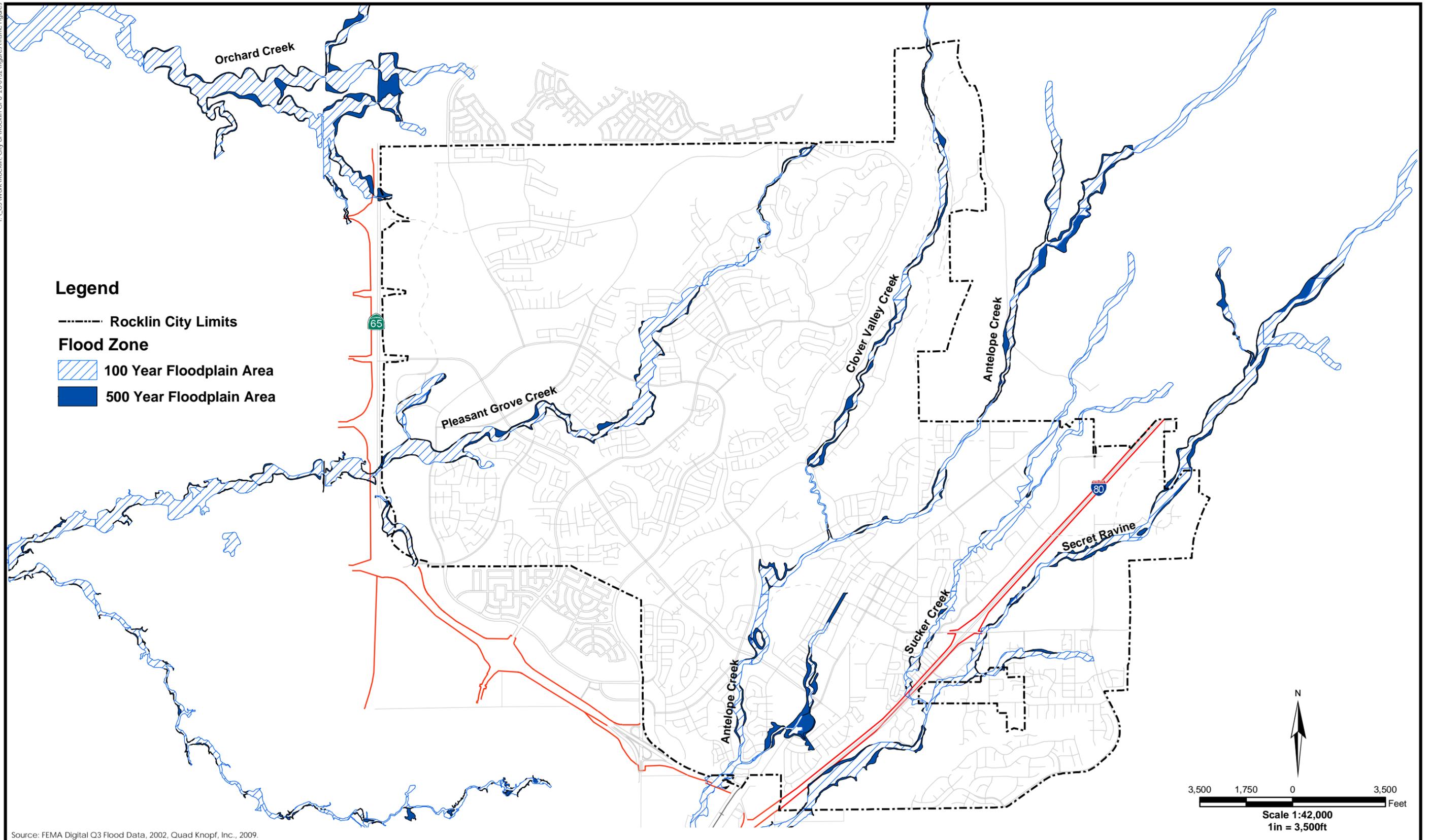


Source: California Water Update, 2009.

NO SCALE



Figure 4.9-2
Central Valley Regional Water Quality Control Board Boundaries



Scale 1:42,000
1in = 3,500ft

Figure 4.9-3
Floodplain Map

4.9.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA) regulates the water quality of all discharges into waters of the United States including wetlands and perennial and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water quality certification requirements for “any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters.” Section 404, Title 33, Section 1344 of the CWA in part authorizes the U.S. Army Corps of Engineers to:

- Set requirements and standards pertaining to such discharges: subparagraph (e);
- Issue permits “for the discharge of dredged or fill material into the navigable waters at specified disposal sites”: subparagraph (a);
- Specify the disposal sites for such permits: subparagraph (b);
- Deny or restrict the use of specified disposal sites if “the discharge of such materials into such area will have an unacceptable adverse effect on municipal water supplies and fishery areas”: subparagraph (c);
- Specify type of and conditions for non-prohibited discharges: subparagraph (f);
- Provide for individual state or interstate compact administration of general permit programs: subparagraphs (g), (h), and (j);
- Withdraw approval of such state or interstate permit programs: subparagraph (i);
- Ensure public availability of permits and permit applications: subparagraph (o);
- Exempt certain federal or state projects from regulation under this Section: subparagraph (r); and
- Determine conditions and penalties for violation of permit conditions or limitations: subparagraph (s).

Section 401 certification is required prior to final issuance of Section 404 permits from the U.S. Army Corps of Engineers.

Section 303(d) of the federal Clean Water Act requires that all states in the U.S. identify waterbodies that do not meet specified water quality standards and that do not support intended beneficial uses. Identified waters are placed on the Section 303(d) List of Impaired Waterbodies. Once placed on this list, states are required to develop a water quality control plan — called a total maximum daily load (TMDL) — for each waterbody and each associated pollutant/stressor. TMDLs are discussed in more detail below.

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National Pollutant Discharge Elimination System

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating non-point sources that discharge pollutants into waters of the United States. It is the responsibility of the water boards, such as the Central Valley RWQCB, to preserve and enhance the quality of the state's waters through the development of water quality control plans and the issuance of waste discharge requirements (WDRs). WDRs for discharges to surface waters also serve as NPDES permits.

Under Phase I, which started in 1990, the Regional Water Quality Control Boards have adopted NPDES stormwater permits for medium (serving between 100,000 and 250,000 people) and large (serving more than 250,000 people) municipalities. As part of Phase II, the State Water Resources Control Board (SWRCB) adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including nontraditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what best management practices (BMPs) will be used to address certain program areas. The program areas include public education and outreach, illicit discharge detection and elimination, construction and post-construction, and good housekeeping for municipal operations.

Under Phase II requirements, dischargers in any location whose projects disturb 1 or more acres of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres are required to obtain coverage under the statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP). The SWPPP should contain a site map(s) that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list best management practices the discharger will use to protect stormwater runoff and the placement of those BMPs.

On September 2, 2009, the SWRCB adopted a new Construction General Permit (CGP) (Order No. 2009-0009-DWQ) that supersedes the existing CGP as of July 1, 2010. This General Permit differs from the prior General Permit in the following significant ways (SWRCB 2009):

Rainfall Erosivity Waiver: Allows the option for a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for the site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: Includes numeric action levels (NALs) for pH and turbidity.

Technology-Based Numeric Effluent Limitations: Contains daily average numeric effluent limitations (NELs) for pH during any construction phase where there is a

high risk of pH discharge and daily average NELs turbidity for all discharges in Risk Level 3. The daily average NEL for turbidity is set at 500 NTU [turbidity] to represent the minimum technology that sites need to employ (to meet the traditional Best Available Technology Economically Achievable (BAT)/Best Conventional Pollutant Control Technology (BCT) standard) and the traditional, numeric receiving water limitations for turbidity.

Risk-Based Permitting Approach: Establishes three levels of risk possible for a construction site. Risk is calculated in two parts: (1) Project Sediment Risk, and (2) Receiving Water Risk.

Minimum Requirements Specified: Imposes more minimum BMPs and requirements that were previously required only as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: Provides the option for dischargers to monitor and report the soil characteristics at their project location to provide better risk determination and eventually better program evaluation.

Effluent Monitoring and Reporting: Requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to determine compliance with the NELs and evaluate whether NALs included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: Requires some Risk Level 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Storm Water Performance Standards: Specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize, and/or mitigate post-construction storm water runoff impacts.

Rain Event Action Plan: Requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: Requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and public information.

Certification/Training Requirements for Key Project Personnel: Requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: Includes requirements for all Linear Underground/Overhead Projects (LUPs).

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Total Maximum Daily Loads

Under CWA Section 303(d) and California's Porter-Cologne Water Quality Control Act of 1969, the State of California is required to establish beneficial uses of state waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes the total maximum daily load process to assist in guiding the application of state water quality standards, requiring the states to identify waters whose water quality is impaired (affected by the presence of pollutants or contaminants) and to establish a TMDL or the maximum quantity of a particular contaminant that a waterbody can assimilate without experiencing adverse effects on the beneficial use identified. TMDLs serve as a regulatory mechanism to identify and implement additional controls on both point and nonpoint source discharges in waterbodies that are impaired from one or more pollutants and are not expected to be restored through normal point source controls. Within California, the Regional Water Quality Control Boards generally prepare TMDLs for the impaired waterbodies under their jurisdiction. Implementation of the TMDL is accomplished through amendments to the RWQCB basin plans, which are reviewed and if necessary, modified or amended triennially. Water quality objectives for all of the waterbodies in the City of Rocklin were established by the Central Valley Regional Water Quality Control Board and are listed in the Water Quality Control Plan for the Central Valley region (Basin Plan).

Federal Emergency Management Agency

National Flood Insurance Program

The City of Rocklin is a participant in the National Flood Insurance Program (NFIP), a federal program administered by the Federal Emergency Management Agency (FEMA). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted, as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. The City of Rocklin is occasionally audited by the Department of Water Resources and FEMA to ensure the proper implementation of FEMA floodplain management regulations.

Executive Order 11988

Executive Order 11988 (Floodplain Management) is an order given by President Carter in 1977 to avoid the adverse impacts associated with the occupancy and modification of floodplains. The order addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding a project in a floodplain to:

- Avoid incompatible floodplain development;
- Be consistent with the standards and criteria of the NFIP; and
- Restore and preserve natural and beneficial floodplain values.

STATE

Porter-Cologne Water Quality Act

The Porter-Cologne Act is the primary law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The act applies to surface waters, wetlands, and groundwater and to both point and non-point

sources of pollution. In addition, the act established nine RWQCBs and the SWRCB. These agencies have primary responsibility for protecting water quality in California and are charged with implementing the act's provisions. The Porter-Cologne Act also implements many provisions of the federal CWA, such as the NPDES permitting program. The Porter-Cologne Act also requires adoption of water quality control plans (WQCPs) which contain the guiding policies of water pollution management in California. The SWRCB has adopted a number of statewide water quality control plans. Likewise, each RWQCB has adopted regional water quality control plans, commonly referred to as basin plans (SWRCB and CCC 2000).

Senate Bill 5

Senate Bill (SB) 5 was signed into law in October 2007 and requires the State to develop a plan for flood protection by 2012. Once this state plan takes effect, the bill will prohibit counties and cities located in the Sacramento-San Joaquin Valley watershed from entering into development agreements or approving permits, entitlements, or subdivision maps in a flood zone unless there is an appropriate level of flood protection or the local flood management agency has determined that adequate progress toward that flood protection has been made. Also once the plan takes effect, the bill will require 200-year flood protection for proposed projects in urban and urbanizing areas (defined as 10,000 residents or more). The bill also authorizes cities and counties to develop and adopt local plans of flood protection that include a strategy to meet the 200-year level of flood protection, an emergency response plan, and a long-term funding strategy for improvement, maintenance, and operation of flood protection facilities.

To implement this bill, the Department of Water Resources (DWR) was required to provide cities and counties within the Central Valley watershed with preliminary 100- and 200-year floodplain maps by July 1, 2008. DWR has prepared preliminary 100- and 200-year flood maps for 32 counties and 91 cities within the watershed, including the City of Rocklin. These maps are based on the best information currently available. DWR has initiated several projects that will provide updated information about flood hazards in the watershed over the next two to four years (DWR 2008).

Assembly Bill 162

Assembly Bill (AB) 162 was signed into law in October 2007 and requires cities and counties in California to incorporate flood hazards in their general plans in order to minimize risk in flood-prone areas. The bill further requires that each city and county submit their draft safety element, or draft amendment to the safety element of its general plan, to the Central Valley Flood Protection Board (formerly the State Reclamation Board) for review and comment at least 90 days prior to adoption.

Department of Water Resources

The Department of Water Resources' major responsibilities include preparing and updating the California Water Plan to guide development and management of the state's water resources, planning, designing, constructing, operating, and maintaining the State Water Resources Development System, protecting and restoring the Sacramento-San Joaquin Delta, regulating dams, providing flood protection, assisting in emergency management to safeguard life and property, educating the public, and serving local water needs by providing technical assistance. In addition, the DWR cooperates with local agencies on water resources investigations, supports watershed and river restoration programs, encourages water conservation, explores conjunctive use of ground and surface water, facilitates voluntary water transfers, and, when needed, operates a state drought water bank.

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State Water Resources Control Board

The State Water Resources Control Board (SWRCB) is composed of nine Regional Water Quality Control Boards that are responsible for preserving California's water quality. The Regional Water Quality Control Boards issue waste discharge permits, take enforcement action against violators, and monitor water quality. The SWRCB and the Regional Water Quality Control Boards jointly administer most of the federal clean water laws. However, the SWRCB retains oversight responsibility and, like the federal Environmental Protection Agency, may intervene if it determines the proposed project is not in compliance with SWRCB regulations.

On December 8, 1999, the EPA promulgated the Phase II Regulations covering small MS4s. The City of Rocklin is automatically included as a small MS4 because it is located within an urbanized area. The State Water Resources Control Board administers the Phase II Regulations issued by the EPA within California. The federal regulations allow two permitting options for stormwater discharge: individual permits and general permits. The SWRCB has elected to adopt a statewide General Permit for small MS4s. This option allows the small MS4 to sign onto the General Permit in lieu of developing a fully individualized program and allows the State to efficiently regulate numerous stormwater dischargers under a single permit.

The City of Rocklin has opted to comply with the NPDES Phase II Regulations through coverage under the State's General Permit and has prepared the City of Rocklin Storm Water Management Program, which is further described below.

Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (CVRWQCB) is responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters. In the Rocklin area, the CVRWQCB is responsible for protecting surface and ground waters from both point and non-point sources of pollution.

The Central Valley Regional Water Quality Control Plan (Basin Plan) covers all the drainage basin areas for the Sacramento and San Joaquin rivers. This plan describes the beneficial uses to be protected in these waterways, water quality objectives to protect those uses, and implementation measures to make sure those objectives are achieved.

LOCAL

Placer County Flood Control and Water Conservation District

The Placer County Flood Control and Water Conservation District (PCFCWCD) was established in 1984 by the California legislature as a special district, separate from county government, to address flood control issues arising from growth in the area. The PCFCWCD boundaries are the same as the Placer County boundaries. The main purpose of the PCFCWCD is to protect lives and property from the effects of flooding through comprehensive and coordinated flood prevention planning, using consistent standards to evaluate flood risk, and by implementing flood control measures, such as requiring new development to construct detention basins, and operation and management of a flood warning system.

City of Rocklin Storm Water Management Program

The Storm Water Management Program is an implementation tool for compliance with NPDES Phase II Regulations under the State's General Permit. The program includes the following

components and the associated best management practices (BMPs), measurable goals, and measurable parameters as identified in Tables 1-A through 6-B of the program:

- Public Education and Outreach
- Public Participation
- Illicit Discharges and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management
- Pollution Prevention/Good Housekeeping for Municipal Operations

BMPs are commonsense methods for controlling, preventing, reducing, or removing pollutants in urban runoff. There are basically two types of BMPs. Source control BMPs are intended to prevent or minimize the introduction of pollutants into runoff. Street sweeping and dry cleanup of gas station fueling areas are examples of effective source control BMPs. The second type of BMP, treatment BMPs, is designed to remove the pollutants from stormwater runoff. A silt fence that effectively filters sediment from water is an example of a treatment BMP. MEP generally emphasizes source control BMPs as the first line of defense against pollution, with treatment BMPs where appropriate serving as additional lines of defense. Also, the focus is on technical feasibility, but cost, effectiveness, and public acceptance are also important considerations in choosing and implementing BMPs. Considered together, the BMPs selected should form a comprehensive framework that reduces stormwater pollution to the maximum extent practicable.

The Storm Water Management Program consists of BMPs selected to fit local conditions and water quality problems. It comprises a comprehensive program for managing runoff to protect and improve water quality in compliance with the National Pollutant Discharge Elimination System Phase II.

City of Rocklin, Municipal Code

Chapter 8.30 of the City of Rocklin Municipal Code, Stormwater Runoff Pollution Control Ordinance, prohibits the discharge of any materials or pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater, into the municipal storm drain system or watercourses. Discharges from specified activities that do not cause or contribute to the violation of any plan standard, such as landscape irrigation, lawn watering, and flows from fire suppression activities, are exempt from this prohibition.

Chapter 15.04 of the Municipal Code adopts the 2007 California Building Code (CBC) and other related construction standards that apply seismic requirements and control grading activities.

Chapter 15.16 of the Rocklin Municipal Code, Flood Hazard Areas, promotes the public health, safety, and general welfare to minimize public and private losses due to flood conditions in specific areas by provisions designed to protect human life and health; minimize expenditure of public money for costly flood control projects; minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; minimize prolonged business interruptions; minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, streets and bridges located in areas of special flood hazard; help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighting impacts of flood damage; ensure that potential buyers are notified that property is in an area of special flood hazard; and ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

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Chapter 15.28, Grading and Erosion and Sedimentation Control, regulates grading on all property within the City of Rocklin to safeguard life, limb, health, property, and public welfare; to avoid pollution of watercourses with nutrients, sediments, or other earthen materials generated or caused by surface runoff on or across the permit area; to comply with the City's National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board; and to ensure that the intended use of a graded site is consistent with the City of Rocklin General Plan, provisions of the CBC as adopted by the City relating to grading activities, City of Rocklin improvement standards, and any applicable specific plan or other land use entitlements. In addition, this chapter establishes rules and regulations to control grading and erosion control activities, including fills and embankments; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading activities and erosion control plans for all graded sites.

4.9.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Pursuant to CEQA Guidelines Appendix G, a hydrologic or water quality impact of the proposed City of Rocklin General Plan Update would be considered significant if it would result in any of the following actions:

1. Violate any water quality standards or waste discharge requirements.
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
3. 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.
4. 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.
5. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
6. Otherwise substantially degrade water quality.
7. 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.
8. Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
9. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a failure of a levee or dam.

10. Inundation by seiche, tsunami, or mudflow.

METHODOLOGY

The hydrology and flood potential analysis is based on a review of published information, reports, and plans regarding regional hydrology, climate, geology, water quality, and regulations. Relevant documents include the Placer County Flood Control and Water Conservation District Final Report Dry Creek Watershed Flood Control Plan (Placer County Flood Control and Water Conservation District & Sacramento County Water Agency 1992), the Placer County Multi-Hazards Mitigation Plan (Placer County 2005), the Clean Water Act Section 303(d) List of Water Quality Limited Segments (CVRWQCB 2006), and the California Water Plan Update (DWR 2009). Numerous other technical studies and reports were reviewed to aid in the analysis of the hydrology and water quality setting and impacts as a result of the update of the City's General Plan. A list of these documents is located under the References heading of this section.

PROJECT IMPACTS AND MITIGATION MEASURES

Surface Water Quality Impacts

Impact 4.9.1 Implementation of the proposed project could result in a substantial alteration of the existing drainage pattern, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or may result in a violation of a water quality standard or waste discharge requirement. However, existing development standards in the Municipal Code and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, this impact is considered **less than significant**.

The boundaries of the General Plan Planning Area remain the same for the proposed General Plan Update as for the 1991 General Plan. The Planning Area represents all of the area within the city boundaries (approximately 19.8 square miles), plus the additional 1.2 square miles outside the city boundaries that are included within the City's Sphere of Influence. Buildout of the Planning Area would change drainage patterns and water quality. This would occur during both construction and operation of development projects within the Planning Area.

During construction, soils would be exposed and disturbed. During a storm, soils could be carried off-site and deposited in receiving waters. Soil erosion could occur which would affect drainage patterns. Likewise, soil and potential contaminants from construction (such as oil and gas for construction equipment) could be carried in runoff into surface waterbodies.

Operational impacts to drainage patterns occur from the introduction of buildings, pavement, roadways, and other impervious surfaces to previously vacant pieces of land. Converting previously unpaved land to urban uses results in greater volumes of runoff and more pollutants (such as pesticides, oil, fertilizers) carried in stormwater. Storm drainage carried off-site containing such pollutants can affect water quality in surface waterbodies.

Direct and indirect surface water quality impacts could occur as a result of the following general land use activities:

- **Construction:** Grading and vegetation removal activities would result in the exposure of raw soil materials to the natural elements (wind, rain, etc.). During precipitation events,

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soil erosion can impact the surface runoff by increasing the amount of silt and debris carried by runoff. In addition, refueling and parking of construction equipment and other vehicles on-site during construction may result in spills of oil, grease, or related pollutants that may discharge into city drainages. Improper handling, storage, or disposal of fuels and hazardous materials or improper cleaning of machinery close to area waterways could cause water quality degradation.

- **Residential:** Residential activities often involve the conventional maintenance of yards, e.g., using fertilizers, herbicides, pesticides, fungicides, and other chemicals in and around the home that can enter stormwater runoff. In addition, motor vehicle operation and maintenance introduces oil, antifreeze, and other petroleum-based products, heavy metals such as copper from brake linings, and surfactants from cleaners and waxes into residential runoff. Pet and animal waste from yards, trails, and stream corridors can enter stormwater runoff or flow directly into stream channels.
- **Recreation:** Parks and golf courses often practice conventional landscaping methods and maintain recreation areas using fertilizers, herbicides, pesticides, and algacides, which can enter stormwater runoff or flow directly into stream channels.

Construction Surface Water Quality Impacts

Construction associated with subsequent development under the proposed General Plan Update would consist of grading and vegetation removal activities that could increase soil erosion rates on the areas proposed for development. Construction activities would result in the exposure of raw soil materials to the natural elements (wind, rain, etc.). In rainy periods during the summer season, grading operations may impact the surface runoff by increasing the amount of silt and debris carried by runoff. Areas with uncontrolled concentrated flow would experience loss of material within the graded areas and could potentially impact downstream water quality.

Refueling and parking of construction equipment and other vehicles on-site during construction may result in spills of oil, grease, or related pollutants that may discharge into Planning Area drainages. Improper handling, storage, or disposal of fuels and materials or improper cleaning of machinery close to area waterways could cause water quality degradation.

The State Water Resources Control Board is responsible for implementing elements of the Clean Water Act and has issued a statewide General Permit for construction activities within the state. The State General Construction Activity Storm Water Permit is implemented and enforced by Regional Water Quality Control Boards and applies to construction activities that disturb 1 acre or more. This permit also requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP) that identifies best management practices (BMPs) to minimize pollutants from discharging from construction sites to the maximum extent practicable. Standard BMPs are available in the California Stormwater Quality Association handbooks (California Stormwater Quality Association 2003).

Chapter 15.28 of the Rocklin Municipal Code, the Grading and Erosion and Sedimentation Control Ordinance, was enacted by the City for the purpose of regulating grading on all property within the city to avoid pollution of watercourses with nutrients, sediments, or other earthen materials generated or caused by surface runoff on or across the permit area. The ordinance sets forth rules and regulations to control grading and erosion control activities, including fills and embankments. This ordinance also establishes the administrative procedure for

issuance of permits and provides for approval of plans and inspection of grading construction and erosion control plans for all graded sites.

Operational Surface Water Quality Impacts

Runoff from urban land use typically contains oils, grease, fuel, antifreeze, and byproducts of combustion (such as lead, cadmium, nickel, and other metals), as well as nutrients from fertilizers and animal waste, sediment, pesticides, herbicides, and other pollutants. Also, animal waste from pets (e.g., dogs and cats) contributes bacterial pollutants into surface and source waters. Precipitation during the early portion of the wet season displaces these pollutants into stormwater runoff, resulting in high pollutant concentrations in the initial wet weather runoff. This initial runoff, containing peak pollutant levels, is referred to as the “first flush” of storm events. It is estimated that during the rainy season, the first flush of heavy metals and hydrocarbons would occur during the first inches of seasonal rainfall.

The amount and type of runoff generated by land uses within the city may be greater than that under existing conditions due to increases in impervious surfaces. There would likely be a corresponding increase in urban runoff pollutants and first flush roadway contaminants such as heavy metals, oil, grease, nutrients (i.e., nitrates and phosphates), pesticides, and herbicides from landscaped areas. These constituents may result in water quality impacts to on-site and off-site drainage flows and to downstream area waterways, including Antelope Creek, Secret Ravine Creek, Sucker Creek, Pleasant Grove Creek, and Clover Valley Creek.

As identified above, as part of the City’s coverage under the General Permit for the NPDES Phase II Regulations, the City has developed and is implementing its Storm Water Management Program to protect water quality. BMPs under this program include public participation and involvement, public education and outreach, construction site runoff control, illicit discharge detection and elimination, pollution prevention and good housekeeping, and post-construction runoff control.

Chapter 8.30 of the City of Rocklin Municipal Code, Stormwater Runoff Pollution Control Ordinance, prohibits the discharge of any materials or pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater, into the municipal storm drain system or watercourses. Discharges from specified activities that do not cause or contribute to the violation of any plan standard, such as landscape irrigation, lawn watering, and flows from fire suppression activities, are exempt from this prohibition.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing surface water quality impacts:

Policy OCR-39 Require the protection of wetlands, vernal pools, and rare, threatened and endangered species of both plants and animals through either avoidance of these resources, or implementation of appropriate mitigation measures where avoidance is not feasible, as determined by the City of Rocklin.

Policy OCR-49 Minimize the degradation of water quality through use of erosion control plans and Best Management Practices.

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Policy OCR-50 Maintain a grading ordinance that minimizes erosion and siltation of creeks and other watercourses.

Policy OCR-51 Evaluate development along stream channels to ensure that it does not create any of the following effects in a significant manner: reduced stream capacity, increased erosion or deterioration of the channel.

Policy OCR-52 Consult with other agencies to develop public education programs that will encourage residents to minimize pollutants and sediments reaching receiving waters.

Policy OCR-54 Establish and coordinate operations and maintenance procedures for all City departments to assure that water quality objectives are not threatened by City operations and to serve as an example for the community.

Compliance with the above proposed General Plan policies, as well as with State General Construction Activity Storm Water Permit requirements (where applicable), the City's Grading and Erosion and Sedimentation Control Ordinance, the City's Stormwater Runoff Pollution Control Ordinance, and the City's Storm Water Management Program, would reduce surface water quality impacts associated with implementation of the proposed General Plan Update to a **less than significant** level. This impact is minimized or altogether avoided through the use of effective construction-phase, source control, and treatment control BMPs that include site preparation, runoff control, sediment retention, and other similar features. The effectiveness of BMPs has been recognized in the California Stormwater Quality Association, Stormwater Best Management Practice Handbooks.

As part of the proposed project, the City plans to amend the Redevelopment Plan to increase tax increment limitations, increase the limit on the principal amount of bonded indebtedness secured by tax increment revenue, and extend the time limit for the commencement of eminent domain proceedings to acquire non-residential property. These amendments are intended to provide the City's Redevelopment Agency with the financial and administrative resources necessary to continue assisting projects that implement its program of blight elimination within the Redevelopment Project Area. While the extended time and financial limits authorized by the Sixth Amendment may foster and encourage new development that might not occur without the Sixth Amendment, or may occur faster than had the Sixth Amendment not been adopted, all development would be consistent with the City's General Plan and with the development assumptions analyzed throughout this DEIR. Any future development resulting from amending the Redevelopment Plan would occur in areas designated for such development by the General Plan as the land uses permitted by the Redevelopment Plan are the allowable uses under the City's General Plan. Therefore, the proposed Sixth Amendment to the Redevelopment Plan would not result in surface water quality impacts beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

In addition to the activities identified above, the project includes a Climate Action Plan (CAP) to address climate change and identify greenhouse gas (GHG) emission reduction measures. The City of Rocklin CAP augments the objectives, goals, policies, and actions of the City of Rocklin General Plan Update related to the reduction of GHG emissions; however, the CAP is intended to be updated on a more frequent basis than the General Plan, ensuring that implementation of City efforts to reduce GHG emissions is in compliance with current regulation. The CAP determines whether implementation of the proposed General Plan Update would be consistent with the state's ability to attain the goals identified in AB 32, identifies GHG emission reduction

measures, and provides monitoring of the effectiveness of GHG emission reduction measures. The CAP would not result in surface water quality impacts beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

Groundwater Quality Impacts

Impact 4.9.2 Implementation of the proposed project could result in the degradation of groundwater quality resulting from development within the Planning Area. However, existing development standards in the Municipal Code and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, this impact is considered **less than significant**.

As discussed above in Impact 4.9.1, development of the Planning Area under the proposed General Plan could generate runoff containing oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals), household pollutants, nutrients (i.e., fertilizers), and other chemicals from landscaped areas. These pollutants could potentially contaminate groundwater conditions (if not properly treated with water quality controls). However, as mentioned above under the Regulatory Framework subsection, the National Pollutant Discharge Elimination System Permit Program controls water pollution by regulating non-point sources that discharge pollutants into waters of the United States.

As part of Phase II of the NPDES, the State Water Resources Control Board has adopted a General Permit for the Discharge of Storm Water from Small MS4s to provide permit coverage for smaller municipalities, with which the City complies through implementation of its Storm Water Management Program described above that provides water quality protections for surface and groundwater. In addition, Rocklin Municipal Code Chapter 8.30.060 states that any person subject to an industrial or construction activity NPDES stormwater discharge permit must provide proof of compliance with that permit in a form acceptable to the enforcement official prior to or as a condition of a subdivision map, site plan, building permit, or development or improvement plan; upon inspection of the facility; during any enforcement proceeding or action; or for any other reasonable cause.

The California Stormwater Quality Association has prepared technical studies regarding water quality control feature impacts on groundwater in the Stormwater Best Management Practices Handbooks. These studies have identified that water quality control features (when inspected and monitored properly), such as infiltration basins, have been successful in controlling water quality and avoiding groundwater quality impacts (metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the basins).

It should also be noted that there are approved development projects in the city with adopted mitigation measures which provide mitigation for water quality impacts (preparation of a SWPPP and water quality control features).

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing groundwater quality impacts:

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Policy OCR-11 Protect the groundwater recharge value of riparian and wetland areas while recognizing that minor modifications to such areas may be a necessary outcome of the development process.

Policy OCR-39 Require the protection of wetlands, vernal pools, and rare, threatened and endangered species of both plants and animals through either avoidance of these resources, or implementation of appropriate mitigation measures where avoidance is not feasible, as determined by the City of Rocklin.

Policy OCR-49 Minimize the degradation of water quality through use of erosion control plans and Best Management Practices.

Policy OCR-50 Maintain a grading ordinance that minimizes erosion and siltation of creeks and other watercourses.

Policy OCR-51 Evaluate development along stream channels to ensure that it does not create any of the following effects in a significant manner: reduced stream capacity, increased erosion or deterioration of the channel.

Policy OCR-52 Consult with other agencies to develop public education programs that will encourage residents to minimize pollutants and sediments reaching receiving waters.

Policy OCR-54 Establish and coordinate operations and maintenance procedures for all City departments to assure that water quality objectives are not threatened by City operations and to serve as an example for the community.

Compliance with the above proposed General Plan Update policies, as well as compliance with Chapter 8.30.060 of the Rocklin Municipal Code and the City's Storm Water Management Program, would reduce groundwater quality impacts to a **less than significant** level.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.9.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in polluted runoff affecting groundwater quality beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

Groundwater Supply Impacts

Impact 4.9.3 Implementation of the proposed project is not expected to result in a depletion of groundwater supplies or interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level underlying the City of Rocklin Planning Area. However, the proposed Rocklin General Plan Update's mitigating policies and

their associated action steps ensure the impact will be less than significant. Therefore, this impact is considered **less than significant**.

As noted above, the PCWA provides water to the City of Rocklin. The PCWA uses both surface water and groundwater for its water supply and supplies raw and treated water to retail customers in five water service zones. Zones 1, 2, and 5 are located in western Placer County, extending from the Sacramento County line east to Auburn. The Planning Area is located in Zone 1, the largest of the five zones. Zone 1 extends from the northern boundary of the City of Roseville north to the City of Auburn, and extends to the northwest to include the City of Lincoln. Zones 2 and 4 are the only zones that pump groundwater (PCWA 2005, pg. 7-4). Since the City of Rocklin is located in Zone 1, the City does not use groundwater for water supply and no direct impacts to groundwater resources beneath the city are expected.

Although the proposed General Plan Update and its associated project components do not include land use changes that would result in a substantial change in the amount of impervious surfaces beyond what was included in the previous General Plan, development under the proposed project would result in an increased conversion of natural ground surfaces to impervious surfaces (e.g., pavement, rooftops) and could result in interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level underlying the Planning Area. However, the PCWA's 2006 Integrated Water Resource Plan notes that the California Department of Water Resources has not identified groundwater overdraft as a concern in this portion of the state. The depth to groundwater in the North American subbasin, which underlies the Planning Area, is approximately 161 feet to 13 feet below ground surface. It should also be noted that the geologic conditions present in the city (Rocklin is located over a stable granite bedrock formation and much of the area is covered by volcanic mud) are such that they greatly limit or even prohibit the ability for groundwater recharge. Specifically, water that infiltrates through the soil will not necessarily recharge groundwater because it infiltrates only so far through the soil and then moves vertically under the soil, eventually reaching a point where the underlying bedrock will not allow further infiltration. The water will then either collect and become "perched" water between the soil and the bedrock or will move horizontally toward the closest surface water source, in most cases creeks.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing impacts associated with groundwater resource issues:

Policy OCR-11 Protect the groundwater recharge value of riparian and wetland areas while recognizing that minor modifications to such areas may be a necessary outcome of the development process.

The City of Rocklin does not use groundwater for water supply, and the proposed General Plan Update includes Policy OCR-11 to protect the groundwater recharge value of riparian and wetland areas. Therefore, this impact is considered **less than significant**.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.9.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they

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would not result in polluted runoff affecting groundwater supply beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

Drainage Impacts

Impact 4.9.4 Implementation of the proposed project could result in a substantial alteration of an existing drainage pattern, including through the alteration of the course of a stream or river, which may substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site or could result in the creation or contribution of runoff water which would exceed the capacity of existing or planned stormwater drainage system. However, City and PCFCWCD development standards and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, this impact is considered **less than significant**.

When land is in a natural or undeveloped condition, soils, mulch, vegetation, and plant roots slow the movement of stormwater and increase the ability of rainwater to be absorbed, or infiltrate, thus reducing the amount of total stormwater runoff from a site. The infiltration and runoff process is altered when a site is developed with urban uses. Urban development often includes grading activities and results in the addition of impervious surfaces, including roads, parking lots, driveways, and rooftops. As a result of development, more precipitation runs off of a site as stormwater rather than infiltrating the soil as groundwater, ultimately increasing the rate or amount of stormwater, which may result in flooding.

Surface waters provide a physical conveyance of surface water flows and channels for the handling of large stormwater events. Large storms can produce extreme flows that cause bank cutting and sedimentation of ephemeral drainages and streams.

In the City of Rocklin, the main type of flooding to occur is riverine. Riverine or overbank flooding occurs due to excessive rainfall and water runoff volumes within the watershed of the stream or river. In general, the waterways that are the most susceptible to flooding in the City of Rocklin are Antelope Creek, Secret Ravine Creek, Clover Valley Creek, and Sucker Creek. These perennial streams can overflow during storm events, but flooding is typically of a local nature. Refer to **Figure 4.9-3** for 100-year floodplain areas in Rocklin.

The City participates in the Placer County Flood Control and Water Conservation District (PCFCWCD), which was formed to solve flood and water conservation problems in Placer County. The PCFCWCD has developed a Flood Control Manual that identifies areas within Placer County, including Rocklin, where the detention of flood flows needs to be provided. The City refers to this manual when evaluating projects to determine whether on-site detention is required of specific development proposals. In addition, the City has adopted a Flood Hazard Ordinance (Rocklin Municipal Code, Chapter 15.16) to restrict or prohibit unsafe land uses in flood-prone areas, control alteration of natural floodplains, control development activities that would increase flood danger, and control the diversion of floodwaters.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing drainage impacts:

- Policy S-10* Require that new development detain on-site drainage such that the rate of runoff flow is maintained at pre-development levels, except where detention is not recommended in plans and policies adopted by the Placer County Flood Control and Water Conservation District (PCFCWCD), and to require coordination with other projects' master plans to ensure no adverse cumulative effects. In lieu of detention, the City may require retention and/or off-site drainage improvements that are more beneficial to the community's overall drainage system.
- Policy S-11* Ensure that new development does not result in on-site flooding or increase flooding of off-site properties.
- Policy S-12* Require new development to annex into an existing drainage maintenance district where warranted.
- Policy OCR-48* Promote, where appropriate, the joint use of creeks for flood control, open space, conservation of natural resources, and limited recreation activities.

Implementation of the above General Plan Update policies and Chapter 15.16 of the Rocklin Municipal Code would reduce this impact to **less than significant**.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.9.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in drainage impacts beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

Flooding Impacts

Impact 4.9.5 Implementation of the proposed project may result in the placement of 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, and may impede or redirect flood flows or expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a failure of a levee or dam. However, existing development standards in the Municipal Code and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps would reduce this impact to a less than significant level. Therefore, this impact is considered **less than significant**.

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Flooding is the accumulation of water where none usually occurs or the overflow of excess water from a stream, river, lake, reservoir, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to waterbodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. In the City of Rocklin, the main type of flooding to occur is riverine. Riverine or overbank flooding occurs due to excessive rainfall and water runoff volumes within the watershed of the stream or river. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics.

Major floods affecting the Rocklin region have typically resulted from extended periods of winter rainfall produced by winter storms. Generally, these storms affect the region from early November until the end of April. In general, the waterways that are the most susceptible to flooding in the City of Rocklin are Antelope Creek, Secret Ravine Creek, Clover Valley Creek, and Sucker Creek. These perennial streams can overflow during storm events, but flooding is typically of a local nature. As the City of Rocklin participates in the federally sponsored Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA), FEMA has mapped known floodplains in Rocklin and surrounding areas. The identified floodplains appear on Flood Insurance Rate Maps (FIRMs) numbered 06061CO411F, 06061C0414F, 06061C0413F, 06061C0412F, 06061C0418F, 06061C0477G, and 06061C0481G. According to FEMA maps, most of the proposed Planning Area is located in shaded Zone X, which designates areas subject to flooding during a 500-year storm event or areas that are protected by levees from flooding during a 100-year storm event. The maps show 100-year and 500-year floodplains and floodways located along the channels of the creeks listed above, as well as Pleasant Grove Creek and tributaries, Rocklin City Tributary, Loomis Tributary, and Aguilar Road Tributary. A 100-year floodplain is an area that experiences a 1-in-100 chance of flooding each year; a 500-year floodplain experiences a 1-in-500 chance of flooding each year. According to the Placer County Multi-Hazard Mitigation Plan, Rocklin contains 2,415 parcels located in areas designated as 100-year floodplains (Placer County 2005). Refer to **Figure 4.9-3** for 100-year floodplain areas in the city.

No areas within the Planning Area have been designated as being within the 200-year floodplain; however, this may be because these maps are preliminary and are based on available information only. The Department of Water Resources, pursuant to Senate Bill 5, has initiated several projects that will provide updated information about flood hazards in the region over the next two to four years.

Dam failure, another potential flooding risk, is the collapse or failure of an impoundment that causes significant downstream flooding. Dam inundation zones generally follow the existing streams and drainage areas associated with the location of the dam, and areas subject to flooding from a dam failure would likely be those areas located along these streams and drainages. According to the Placer County Multi-Hazard Mitigation Plan, Rocklin itself does not have any streams or drainages that are associated with an upstream dam. All of the creeks and drainages are influenced by seasonal runoff and have specific control mechanisms (Placer County 2005, pg. 170). Therefore, no impact related to dam failure is anticipated within the proposed Planning Area.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing flooding impacts:

- Policy S-7 Consult with the Placer County Flood Control and Water Conservation District and other appropriate entities regarding regional approaches for the planning, construction, operation and maintenance of drainage and flood control facilities.*
- Policy S-8 Maintain and implement the City's Ordinance regarding "Flood Hazard Areas" (Rocklin Municipal Code, Chapter 15.16).*
- Policy S-9 Ensure that the 100-year floodplain, based upon the most current information, both upstream and downstream, is not adversely affected by new development.*
- Policy S-10 Require that new development detain on-site drainage such that the rate of runoff flow is maintained at pre-development levels, except where detention is not recommended in plans and policies adopted by the Placer County Flood Control and Water Conservation District (PCFCWCD), and to require coordination with other projects' master plans to ensure no adverse cumulative effects. In lieu of detention, the City may require retention and/or off-site drainage improvements that are more beneficial to the community's overall drainage system.*
- Policy S-11 Ensure that new development does not result in on-site flooding or increase flooding of off-site properties.*
- Policy OCR-11 Protect the groundwater recharge value of riparian and wetland areas while recognizing that minor modifications to such areas may be a necessary outcome of the development process.*
- Policy OCR-46 Participate as appropriate in a regional approach to the management of drainage basins and flood plains with regional agencies such as the Placer County Flood Control and Water Conservation District.*
- Policy OCR-47 Protect designated 100-year floodplains from encroachment by development that would impede flood flows or pose a hazard to occupants.*

Implementation of the above General Plan Update policies and Chapter 15.16 of the Rocklin Municipal Code would reduce this impact, including ensuring that new development does not result in on- or off-site flooding and avoiding development in the 100-year floodplain. The proposed General Plan Update addresses the provisions of SB 5 through the policies noted above and their associated action steps, in particular action step SA-6, which directs the City to conduct particular efforts upon adoption of the Central Valley Flood Protection Plan.

Implementation of the above proposed General Plan Update policies and their associated action steps and Chapter 15.16 of the City's Municipal Code would reduce this impact to **less than significant**.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.9.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they

4.9 HYDROLOGY AND WATER QUALITY

would not place additional structures in the floodplain or expose additional people to flooding hazards beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

Risk of Seiche, Tsunami, or Mudflow

Impact 4.9.6 Implementation of the proposed project is not expected to be impacted from inundation by seiche, tsunami, or mudflow. The proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, this impact is considered to be **less than significant**.

Although the city's inland location protects it from risk of tsunami, Rocklin could be at a risk for seiches. Seiches are defined as oscillations within landlocked bodies of water such as lakes, tanks, and reservoirs due to strong ground motion from earthquakes or wind shear across the water's surface. Seiches can cause flooding of adjacent and downstream areas, much like a tsunami. However, this risk is considered very low since the only waterbodies in Rocklin that may be affected are swimming pools, water tanks, quarries, and other small impoundments. In addition, the City of Rocklin is located in an area that has a relatively low risk of seismic activity (Placer County 2005). However, the Planning Area, as with virtually all sites within California, is subject to minor ground shaking and potential secondary hazards such as liquefaction and subsidence as a result of earthquakes. The metamorphic and volcanic rocks of western Placer County that are found in the city generally exhibit good slope stability characteristics and are not expected to result in a mudflow condition.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing risks from seiches, tsunamis, or mudflows:

Policy S-1 *Require engineering analysis of new development proposals in areas with possible soil instability, flooding, earthquake faults, or other hazards, and to prohibit development that cannot mitigate the applicable hazard.*

Policy S-21 *Require site-specific geotechnical studies of development proposals in areas subject to landslide potential, erosion, and/or slope instability.*

As described above, the Planning Area does not contain conditions that would make it conducive to tsunami. The potential for seiche or mudflow are unlikely. However, implementation of the above General Plan policies would reduce potential impacts resulting from seiches and mudflows to **less than significant**.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.9.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they

would not result in additional exposure to the risk of seiche, tsunami, or mudflow beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Mitigation Measures

None required.

4.9.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting consists of the Dry Creek watershed, the Pleasant Grove Creek/Curry Creek watershed, and the Sacramento River watershed. Additionally, the cumulative setting includes anticipated development and associated assumptions described in Section 4.0 and **Table 4.0-1** that could contribute to cumulative water resource impacts.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Water Quality Impacts

Impact 4.9.7 Land uses and growth under the proposed project, in combination with current land uses in the surrounding region, could introduce substantial grading, site preparation, and an increase in urbanized development. However, existing development standards in the Rocklin Municipal Code and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, cumulative water quality impacts are considered to be **less than cumulatively considerable**.

As described under Impacts 4.9.1 and 4.9.2, development under the proposed General Plan Update and its associated project components could contribute to water quality degradation from construction, operation, and alteration of drainage patterns. This could add to other potential development activities in the region.

As part of Phase II of the NPDES, the State Water Resources Control Board has adopted a General Permit for the Discharge of Storm Water from Small MS4s to provide permit coverage for smaller municipalities, with which the City complies through implementation of its Storm Water Management Program, as described in the Regulatory Framework subsection, that provides water quality protections for surface water and groundwater.

Rocklin Municipal Code Chapter 8.30.060 states that any person subject to an industrial or construction activity NPDES stormwater discharge permit must provide proof of compliance with the permit in a form acceptable to the enforcement official prior to or as a condition of a subdivision map, site plan, building permit, or development or improvement plan; upon inspection of the facility; during any enforcement proceeding or action; or for any other reasonable cause.

Chapter 15.28 of the Rocklin Municipal Code, the Grading and Erosion and Sedimentation Control Ordinance, was enacted by the City for the purpose of regulating grading on all property within the city to avoid pollution of watercourses with nutrients, sediments, or other earthen materials generated or caused by surface runoff on or across the permit area.

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The California Stormwater Quality Association has prepared technical studies regarding water quality control feature impacts on groundwater. These studies have identified that water quality control features (when inspected and monitored properly), such as infiltration basins, have been successful in controlling water quality and avoiding groundwater quality impacts.

Proposed General Plan Update Policies That Provide Mitigation

The proposed General Plan Update policies listed under Impacts 4.9.1 and 4.9.2 would assist in avoiding or minimizing cumulative water quality impacts.

Implementation of the proposed General Plan Update policies as well as compliance with provisions of the City's Municipal Code and Storm Water Management Program would ensure that the proposed General Plan's contribution to cumulative water quality impacts would be mitigated. Thus this impact would be **less than cumulatively considerable**.

As previously discussed, neither the Sixth Amendment to the Redevelopment Plan nor the CAP would result in impacts associated with water quality beyond what is analyzed for the General Plan Update above.

Mitigation Measures

None required.

Cumulative Flood Hazards

Impact 4.9.8 Implementation of the proposed project could increase impervious surfaces and alter drainage conditions in the Planning Area, which could contribute to cumulative flood conditions downstream. However, existing City and PCFCWCD development standards and the proposed Rocklin General Plan Update's mitigating policies and their associated action steps ensure the impact will be less than significant. Therefore, this is considered a **less than cumulatively considerable** impact.

As described under Impacts 4.9.4 and 4.9.5, urban development under the proposed General Plan Update and its associated project components would result in an increase in impervious surfaces in the Planning Area that would contribute (in combination with cumulative development in the watershed) to increases in flood conditions for area waterways. Additionally, development associated with the proposed General Plan Update, in combination with future development in the region, could expose future residences and structures to flood hazards. However, the proposed General Plan Update contains policies that adequately address drainage and flooding issues at the Planning Area level.

The City also participates in the Placer County Flood Control and Water Conservation District (PCFCWCD), which was formed to solve flood and water conservation problems in Placer County. In addition, the City has adopted a Flood Hazard Ordinance to restrict or prohibit unsafe land uses in flood-prone areas, control alteration of natural floodplains, control development activities that would increase flood danger, and control the diversion of floodwaters (Rocklin Municipal Code, Chapter 15.16). As noted above, new development will be required to meet City of Rocklin Municipal Code standards for new structures.

Proposed General Plan Update Policies That Provide Mitigation

The proposed General Plan Update policies listed under Impacts 4.9.4 and 4.9.5 would assist in avoiding or minimizing cumulative flooding impacts.

The General Plan Update's contribution to the cumulative condition of drainage and flood-related impacts in the area, as well as its potential incremental contribution to cumulative impacts, would be reduced to **less than cumulatively considerable**.

As previously discussed, neither the Sixth Amendment to the Redevelopment Plan nor the CAP would result in impacts associated with flood hazards beyond what is analyzed for the General Plan Update above.

Mitigation Measures

None required.

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