4.13 HYDROLOGY AND WATER QUALITY

4.13.1 INTRODUCTION

This section addresses potential hydrologic effects related to drainage and water quality in the Project area. Site characteristics such as regional and local drainage and flooding conditions and water quality are described based on site-specific information and published technical information, as indicated in footnoted references. The primary sources of information for this section regarding drainage, flooding and groundwater conditions are listed below:

- *Sierra Vista Specific Plan Drainage and Stormwater Master Plan*, October 2009.
- *West Roseville Specific Plan Final EIR*, February 2004.

The documents listed above are available for review during normal business hours at:

City of Roseville Permit Center

311 Vernon Street

Roseville, CA 95678

During circulation of the Notice of Preparation (NOP), comments regarding stormwater runoff were received from Sutter County, which asked that the EIR address the effects of post-project run-off on south Sutter County. Copies of comments submitted on the NOP can be viewed in Appendix B of this EIR.

4.13.2 ENVIRONMENTAL SETTING

Regional Surface Water Hydrology

The Project area is located within the Curry Creek watershed. The Curry Creek watershed totals approximately 16.5 square miles and slopes from east to west. The elevation in the upper watershed is approximately 120 feet, decreasing to approximately 45 feet in Sutter County[1]

Curry Creek drains to the Natomas Cross Canal via the Pleasant Grove Canal, which includes drainage from both Placer and Sutter Counties. Curry Creek drains into the Sacramento River just

[1] West Roseville Specific Plan EIR, February 2004, based on information from Wood Rodgers Inc. Fiddyment-Westpark Master Plan Drainage Analysis.

south of its confluence with the Feather River, approximately 14 miles west of Roseville. Other watersheds that drain into the Natomas Cross Canal include Pleasant Grove Creek, Coon Creek, Auburn Ravine and Markham Ravine.

The Natomas Cross Canal watershed is within the Sacramento River Basin. The Sacramento River Basin covers approximately 26,500 square miles and is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Delta-Central Sierra area to the south. The Sacramento River is the principal river in the basin. The principal tributaries to the Sacramento River are the Pit and McCloud Rivers, which join the Sacramento River from the north, and the Feather and American Rivers, which are tributaries from the east. The average runoff from the Basin is estimated to be 21.3 million acre-feet per year.[2]

Sierra Vista Specific Plan Drainage

Curry Creek enters the Project area from the east at Fiddyment Road as a small seasonal stream. At Fiddyment Road, the creek receives flows from several shallow storm drain pipes discharging on the west side of the roadway. The tributary areas upstream of Fiddyment Road are completely urbanized. Curry Creek traverses the southeastern corner of the Project area in a southwestern direction toward Baseline Road. It leaves the site near the proposed intersection of Market Avenue and Baseline Road (see Figure 4.13-1). South of Baseline Road, Curry Creek goes through the County's Placer Vineyard Specific Plan Area, eventually re-entering the SVSP project area near Watt Avenue. Curry Creek then traverses the Project area in a northwesterly direction, exiting the Project area boundary approximately 3,000 feet north of Baseline Road.

Within the central area of the Project area, a small seasonal swale flows in a westerly direction, joining Curry Creek near Watt Avenue. The swale is proposed to be named Federico Creek after a property owner in the area. Federico Creek collects runoff from areas within the SVSP and offsite urbanized areas to the north in the West Roseville Specific Plan area.

In the north portion of the Project area, within the Richland property in the Urban Reserve area, a northern tributary of Curry Creek passes through the boundary. The northern tributary of Curry Creek conveys runoff from the West Roseville Specific Plan area, west to the future extension of Watt Avenue at the western boundary of the SVSP area. West of the proposed Watt Avenue

[2] EIP Associates, Stoneridge Specific Plan EIR, 1997.

extension, Curry Creek discharges flows into Placer County's Regional University Specific Plan project area.

Stormwater Volume

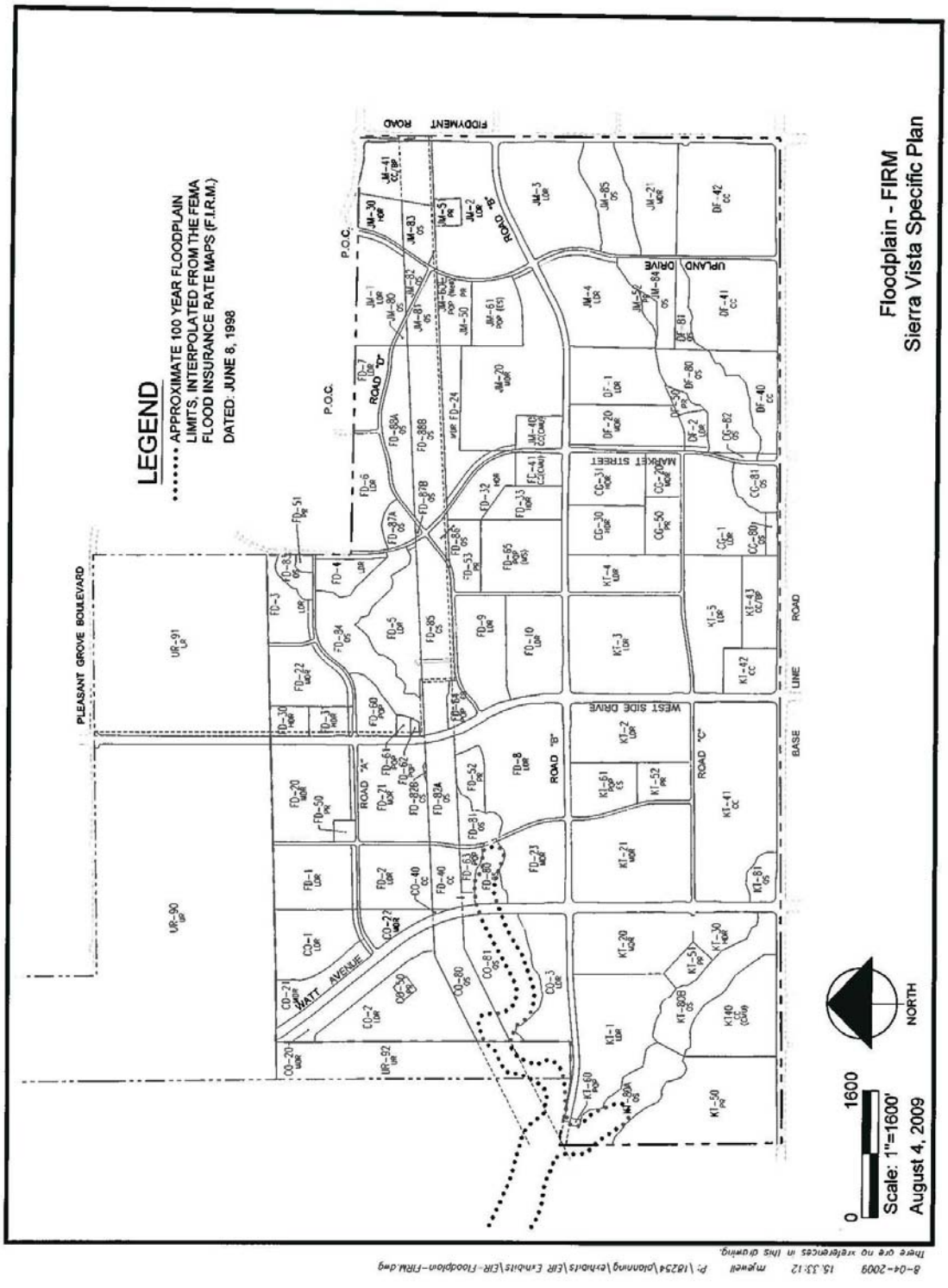
Sutter County and Reclamation District 1001 have expressed concern with flooding as a result of increased stormwater volume generated by development in Placer County. In response to these concerns, Placer County and the Cities of Roseville, Rocklin, Lincoln and Auburn participated in the *Auburn Ravine, Coon, and Pleasant Grove Creek Watershed Study* prepared in 1993. The study found that the unmitigated peak flow increases would have the potential to increase flows in the Cross Canal by less than 3.6 inches along tributary streams and volumetric runoff and would have the potential to increase flooding 1.2 inches in the ponding area upstream of the Cross Canal. While shallow, these increases would inundate several hundred additional acres in Sutter County during a major flood. The study recommended a combination of regional and local detention and retention basins, adoption of a regional floodplain management plan, and grading ordinances and policies. Since that time, the City of Roseville established a fee program to construct a regional retention basin at Reason Farms, northwest of the project site. In early 2003, the City certified a final EIR for the City of Roseville Retention Basin Project (SCH#2002072084, hereby incorporated by reference), purchased the Reason Farms property and approved the site and conceptual plans for a retention basin flood control project. The City is collecting drainage impact fees to fund construction of the retention basin project. Given the recent slowdown in development this project will likely not be constructed until at least 2015.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) published Flood Insurance Rate Maps (FIRM) for the project area. A conceptual floodplain map is illustrated in Figure 4.13-1. The mapping delineates the boundary of the 100-year floodplain.

FIGURE 4.13-1

FLOODPLAIN MAP



Civil Engineering Solutions determined "Base Flood Elevations"(BFEs) for the 100-year floodplain along Curry Creek.

Surface Water Quality

Surface water quality in the project area can generally be characterized by surrounding land use. Most of the project area has been agricultural, primarily for grazing and pasture. Typical constituents in runoff from pasture lands would include nitrogen, phosphorus, and coliform bacteria. Runoff upstream of the project site, would include urban pollutants such as oil, grease, metals, nitrogen, and phosphorus from fertilizers, pesticides and herbicides, bacteria, and sediment.

Comprehensive stormwater runoff water quality testing has not been performed by the City to characterize existing water quality as a result of urban runoff, but the City has a stormwater program that complies with adopted stormwater quality regulations.

Although not located within the project area, Pleasant Grove Creek will receive additional flow as a result of the proposed Project. Wastewater flows generated from the Project area will be conveyed to the Pleasant Grove Wastewater Treatment Plant (PGWWTP) for processing. Treated tertiary effluent from the PGWWTP discharges directly to a segment of Pleasant Grove Creek within the West Roseville Specific Plan Area. The PGWWTP outfall to Pleasant Grove Creek is located northeast of the treatment plant in an area designated as open space in the West Roseville Specific Plan as shown on Figure 4.13-2.

In accordance with state requirements, surface water quality samples are collected both upstream and downstream of the PGWWTP outfall. Sampling locations are located 200 feet upstream and 200 feet downstream of the PGWWTP effluent outfall. Water samples are collected on a weekly basis and analyzed for the parameters shown in Table 4.13-1. Table 4.13-1 shows the minimum and maximum results from sampling since the PGWWTP began operations in 2004.

TABLE 4.13-1
PLEASANT GROVE CREEK WATER QUALITY DATA

Location		Constituent			
		pH (SU	Dissolved Oxygen (mg/L)	Turbidity (ntu)	Temperature (Deg F)
Upstream (1)					
	Minimum	6.6	3	1	32
	Maximum	9.0	15	35	91
	Average	7.5	8	8	61
Downstream (2)					
	Minimum	6.5	4	1	32
	Maximum	8.5	14	32	83
	Average	7.5	9	5	67

(1) 200 feet upstream of PGWWTP discharge outfall

(2) 200 feet downstream of PGWWTP discharge outfall

(3) Source: Civil Engineering Solutions

4.13.3 REGULATORY SETTING

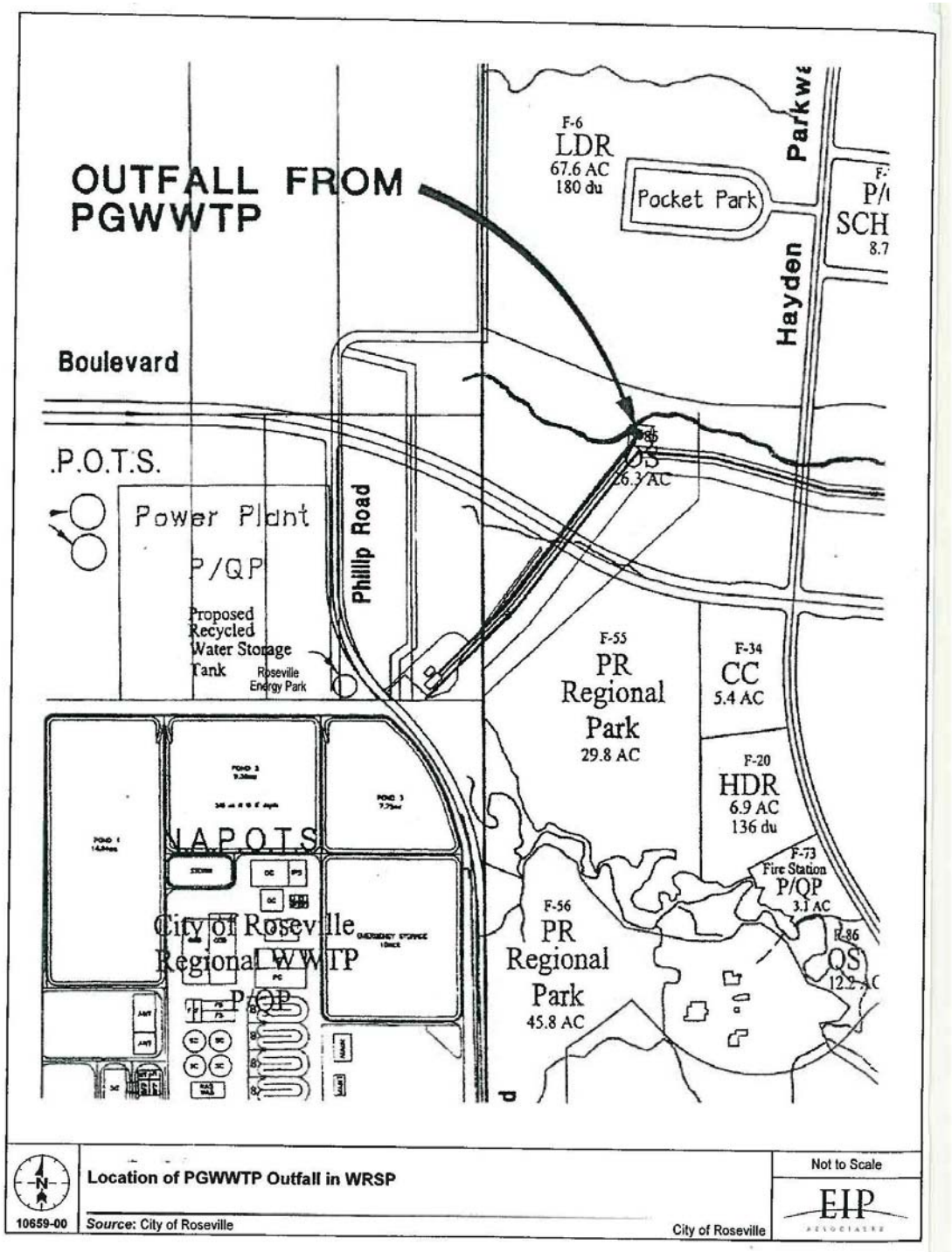
Federal

Floodplain Development

FEMA determines floodplain boundaries for the purposes of flood insurance requirements, and distributes Flood Insurance Rate Maps (FIRM) that are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas, within the 100-year floodplain, and in some cases also identify a regulatory floodway; however, no floodway has been identified in this project.

FIGURE 4.13-2

PGWWTP OUTFALL LOCATION



FIURE 4.13.2

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within the flood hazard areas depending on the potential for flooding within each area.

Executive Order 119888 contains direction to federal agencies to avoid development within a floodplain. Specifically, if an agency has determined, or proposes, to conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative, consistent with the law and with the policy set forth in the Executive Order, requires siting in a floodplain, prior to taking action the agency shall (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of the Executive Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain

The SVSP would meet the floodway encroachment "No Adverse Impact" (NAI) requirements with the proposed project and City's Construction Standards. NAI is a concept developed by the Association of State Floodplain Managers that includes principles to ensure that floodplain management is consistent. The objective is to incorporate activities to minimize flooding.

Water Quality

Section 303 of the Federal Clean Water Act (CWA) requires states to adopt water quality standards for all surface water of the United States. Where multiple uses exist, water quality standards must protect the most sensitive use.

Title 40 of the Code of Federal Regulations (40 CFR) includes U.S. Environmental Protection Agency (EPA) regulations to implement the National Pollutant Discharge Elimination System (NPDES) permit system, which was established by the Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that EPA must consider in setting effluent limits for priority pollutants.

State

Urban Water Quality

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) are responsible for ensuring implementation and compliance with the provisions of the CWA, Porter-Cologne Water Quality Control Act, and NPDES programs. Along with the SWRCB and RWQCB, water quality protection is the responsibility of numerous water supply and wastewater management agencies as well as city and county governments.

The Project area is located within the jurisdiction of the Central Valley Region of the RWQCB (Region 5). The Central Valley RWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. Water quality objectives for the Sacramento River and its tributaries (e.g., Pleasant Grove Creek and Curry Creek) are specified in the Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin (Basin Plan) prepared by the RWQCB in compliance with the federal CWA and the State Porter Cologne Act. The Basin Plan establishes water quality objectives and implementation programs to meet stated objectives and to protect the beneficial uses of water in the Sacramento-San Joaquin River Basin. Because the City of Roseville is located within the Central Valley RWQCB's jurisdiction, all discharges to surface water or groundwater are subject to the Basin Plan requirements.

On January 20, 2005, the State Water Resources Control Board adopted sustainability as a core value for all RWQCB activities and programs, and directed RWQCB staff to consider sustainability in all future policies, guidelines, and regulatory actions.

Low Impact Development (LID) is a sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional urban stormwater management, which collects untreated stormwater through drain inlets and conveys runoff directly and quickly through storm drain pipes, or other conveyances to streams and creeks, LID uses site design and stormwater management concepts that maintain the site's pre-development runoff rates and volumes. The goal of LID is to infiltrate, filter, store, evaporate, and detain runoff close to its source, which contributes to the effect of mimicking a site's predevelopment hydrology and helps maintain the predevelopment hydraulics of the receiving waters. LID has been a proven approach in other parts

of the country and is seen in California as an advancement to conventional stormwater management. The RWQCBs are promoting the use of LID principles throughout California in various ways.

Beneficial uses for the Sacramento River include municipal and domestic supply, agricultural supply, recreation, and aquatic and wildlife habitat. These beneficial uses also apply to Pleasant Grove Creek and its tributaries and Curry Creek because these streams ultimately discharge to the Sacramento River.

Construction Site Runoff Management

On September 2, 2009, the State Water Resources Control Board adopted Order 2009 0009-DWQ, State Water Resources Control Board NPDES General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities ("General Permit"), superseding Order 99-08-DWQ and establishing new requirements for storm water discharges from construction activities. The new General Permit takes effect on July 1, 2010, and applies to site disturbance as small as one acre, as described below.

Under the General Permit, any construction activity affecting one or more acres of land, or any activity that is part of a common plan of development or sale that disturbs one acre or more, as well as construction activities for linear overhead/underground utility projects that result in disturbance of one acre or more, must obtain a General Construction Activity Stormwater Permit Waste Discharge Identification Number.

The September 2009 General Permit implements substantial changes from the prior permitting system, including risk-based assessments and numeric effluent limitations for projects covered under the General Permit. The Permit also imposes effluent monitoring and reporting requirements.

Urban Runoff Management

The 1987 amendments to the Clean Water Act (CWA) added Section 402(p), which requires the U.S. Environmental Protection Agency (EPA) to develop a comprehensive phased program to regulate storm water quality discharges under the National Pollutant Discharge Elimination System (NPDES) program. In November of 1990, Phase I of the NPDES program was issued

addressing storm water discharges from municipal separate storm sewer systems (MS4s) serving populations over 100,000 and industrial activities including discharges from construction activities disturbing five acres or more. On December 8, 1999, the EPA published the NPDES Phase II regulations in the Federal Register as required by Section 402(p) of the CWA. NPDES Phase II regulations require small MS4s, those serving a population of less than 100,000 (at the time the amendments were finalized) and located in an urbanized area, to obtain a municipal storm water permit.

As a Phase II community, the City of Roseville is currently required to operate under a NPDES Municipal Stormwater Permit administered by the State of California. The City of Roseville's Stormwater Management Plan was adopted and approved by the RWQCB in March 2003, at which time the City received a Phase II Stormwater Permit. The State Water Resources Control Board is currently updating the General Phase II permit requirements, which are expected to be more in line with the current Phase I requirements. Upon the adoption of the updated General Phase II Permit by the State, the City will update its Stormwater Permit to comply with the new requirements.

Local

City of Roseville Stormwater Management Plan

The City's SWMP dated March 2003 contains a comprehensive set of priorities, activities, and strategies that comprise the City's minimum control measures and best management practices (BMPs) intended to address Phase II requirements, described in the prior subsection. The goal is to reduce pollutants in stormwater to the maximum extent practicable. The SWMP was prepared with input by a Citizen's Advisory Committee.

The SWMP identifies activities to implement the following six minimum control measures required under the General Permit: public outreach, public involvement, illicit discharge detection and elimination, construction site runoff, new development and redevelopment, and municipal operations.

The SWMP includes minimum required control measures for new development, such as structural and non-structural control strategies, and long-term operation and maintenance of controls. It

includes specific guidance for volume and flow control design parameters for structural controls such as detention ponds, vegetative areas, and runoff pretreatment.

The City adopted the "Urban Stormwater Quality Management and Discharge Control Ordinance" (Stormwater Ordinance)(Ord. 4395 § 2 (part), 2006.) in order to establish a regulatory frame work to implement construction and post-construction stormwater controls. In March 2007, the City adopted the Stormwater BMP Guidance Manual for Construction, and in May 2007, the City adopted the Stormwater Quality Design manual. The City has the authority during plan checks, as well as site inspections, to enforce the Storwmater Management Plan. Prior to final approval, the owner of any stormwater control structure will be required to submit an operations and maintenance manual and a proposed maintenance schedule. Additional detail on post-construction controls is provided in the SWMP which is available on the City's website (www.roseville.ca.us).

City of Roseville General Plan

The General Plan includes several policies relating to hydrology and water quality.

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

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

Policy 1: Continue to regulate, through land use, zoning and other restrictions, all uses and development n areas subject to potential flooding.

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

Policy 3: Continue to pursue a regional approach to flood issues.

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

Policy 6: Require new developments to provide mitigation to insure that the cumulative rate of peak run-off is maintained at pre-development levels.

Policy 7: Continue to implement the Storm Maintenance Program to keep creeks and storm drain systems free of debris.

Policy 8: Establish flood control assessment districts or consider other funding mechanisms to mitigate flooding impacts.

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

Sierra Vista Specific Plan

The SVSP designates creek corridors and their associated floodplains as wetland creation areas and open space. Peak flow stormwater impacts for the 100-year, 24-hour storm events will be mitigated within the created wetlands proposed within the Curry Creek and Federico Creek open space corridors, as well as in an 8 acre, 20 acre-foot detention basin within a portion of the WAPA corridor. All drainage facilities will be designed and constructed in conformance with the City's Improvement Standards, the City's Stormwater Quality Design Manual, the Placer County Flood Control and Water Conservation District (PCFCWCD) Stormwater Management Manual and the Open Space Operations and Maintenance Plan (required under the Clean Water Act 404 Permit) which include requirements to direct drainage away from vernal pool habitat.

The SVSP indicates that various LID options may include, but are not limited to, the following:

- Disconnected roof drains;
- Disconnected and separated pavement;
- Bioretention facilities, rain gardens, and bioswales;
- Tree Planting;
- Grass swales and channels;
- Curb cuts and vegetated filter strips;
- Impervious surface reduction – permeable pavements and porous pavements;
- Stream Buffers;
- Soil Amendments; or
- Pollution prevention and good housekeeping practices.

City of Roseville Development Standards

The City maintains policies and guidelines regarding grading, erosion control, inspection, and permitting. Section 16.20.040 of the Roseville Municipal Code regulates stockpiling and grading, and addresses conditions under which permits and grading plans are required. Section 16.20.070 identifies grading plan performance standards.

A grading plan shall comply with the following criteria:

A. Fill or cut slopes with a height exceeding five feet shall not exceed a slope of 4:1.

B. When grading around native oak trees:

   1. Cut or fill slopes exceeding two feet in height shall not be permitted within a distance of 1.5 times the radius of the tree's protected zone.

   2. The grade shall not be raised or lowered around more than 50 percent of the protected zone; and

   3. The grading shall not change the drainage pattern within a distance of 1.5 times the radius of the tree's protected zone.

Section 16.20.020 requires that all grading be performed in accordance with either City of Roseville Improvement Standards or Chapter 16 of the Zoning Ordinance, whichever is more restrictive. The Public Works Department requires that a grading permit be obtained prior to grading activities. At that time, the Applicant must submit, for review and approval, Improvement and/or Grading Plans along with a site-specific Stormwater Pollution Prevention Plan (SWPPP). Slopes or banks along creek channels must be designed with proper slope protection to prevent soil erosion and channel-bank undercutting. The City has also adopted standards that would apply to projects within public right-of-way or easements.

Section 10 of the City Improvement Standards identifies hydrologic and hydraulic methods to determine peak flow rates and criteria for identifying appropriate design and capacity for storm drainage infrastructure. Design criteria include requirements for channels and outfall design, cross culverts, inlet and outlet structures, and piping materials.

City of Roseville Floodplain Development

To prevent flooding conditions and to limit exposure of residents and structures to potential harm and/or damage, the City of Roseville General Plan (Safety Element/Flood Protection) contains policies that restrict land uses and development within the 100-year floodplain. For specific plans:

> *No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in any off-site increase in the water surface elevation.*

Chapter 9.80 of the Roseville Municipal Code identifies floodplain development criteria and restrictions that implement FEMA requirements. Section 10, of the City's Improvement Standards, also identifies criteria for development within the 100-year floodplain.

Placer County Flood Control and Water Conservation District (PCFCWCD)

The PCFCWCD was formed by Senate Bill 1312, effective August 23, 1984. The PCFCWCD formulates regional strategies for flood control management. In 1990, the PCFCWCD developed a Stormwater Management Manual (SWMM) that presents policy, guidelines, and specific criteria for evaluating hydrologic and hydraulic conditions associated with new development within the context of regional stormwater issues. The City references the SWMM criteria in Section 10 (Drainage) of the City's Improvement Standards.

The SWMM contains specific principles and policies for the design of storm drain facilities:

A. Storm drainage planning, design and construction will avoid increasing the storm drainage problems in any area, or transferring drainage problems from one location to another. Watershed boundaries shall not be altered, and flows shall not be diverted from one watershed to another without compelling reasons.

B. Storm drains should use the natural drainage channel alignments whenever possible.

C. Development plans shall provide a secondary surface flow escape paths for flows in excess of the capacity of the primary piped or channelized drainage system without damage to structures.

D. Storm drainage planning and design shall be consistent with the flood boundaries and floodways delineated and regulated by the National Flood Insurance Program or other studies, such as watershed master plans.

E. Public Storm drainage facilities shall normally be located within public road right-of-way, unless specifically approved by the local jurisdiction and shall be designed as permanent facilities with minimal maintenance costs..

F. The points at which drainage enter and exit a project shall be at the same vertical and horizontal location as exists before the project except by written and recorded agreement between adjacent landowners in the form of an easement.

G. Fill or structures shall not be permitted to block drainage paths even if these paths function only in storms of rare occurrence.

H. Storm drainage systems shall incorporate best management practices for the protection of water quality when required by the local jurisdiction.

4.13.4 IMPACTS

Methods of Analysis

Drainage and Flooding

Technical data to support the analysis of potential drainage and flooding impacts of the proposed project were developed by Civil Solutions and presented in the Sierra Vista Specific Plan Drainage and Stormwater Master Plan (2009) found in Appendix O.

Stormwater Peak Flows

Master watershed modeling for Curry Creek was adapted from the original "Cross Canal Watershed Study" models of 1992 by several other projects including: Regional University Specific Plan, Placer Vineyards Specific Plan, and the West Roseville Specific Plan. The Regional University Specific Plan comprehensive model, which covers the SVSP Plan area is used as the base analysis model for this plan. Civil Solutions prepared a detailed hydraulic analysis of the pre-project and post-project conditions for Curry Creek and the tributaries that will remain in their existing state

after the proposed Project is built. A HEC-1 analysis along with unsteady state hydraulic modeling was prepared to determine the 100-year and 10-year storm events.

Stormwater Runoff Water Quality

The analysis of potential water quality effects was based on a qualitative comparison of pre-development and post-development land uses.

Surface Water Quality

The analysis of potential surface water quality effects on Pleasant Grove Creek as a result of increase tertiary treated effluent discharges from the PGWWTP are analyzed in Section 4.12.3, Wastewater, Impact 4.12-8. This analysis concludes that the impact is less-than-significant.

Thresholds of Significance

For purposes of this EIR, a significant impact would occur if development proposed in the project would do any of the following:

- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Expose people, housing or other structures to flood hazards by placing them in an area subject to inundation within the 100-year floodplain as defined by FEMA or the City's regulatory floodplain as defined by site-specific floodplain maps.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a dam or levee.
- Substantially degrade surface water quality due to increases in sediments, erosion and urban contaminants generated by construction and/or operational activities or violate any water quality standards or waste discharge requirements.
- Violate any water quality standards or waste discharge requirements.

- 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 that would result in flooding on or siltation on-or off-site.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.

Groundwater impacts are analyzed in Chapter 4.11-1 Water. Impacts from tsunamis and seiches were screened out of the analysis given the fact that the Project area is not located near a water body or other feature that would pose a risk.

IMPACT 4.13-1	**CHANGES IN THE RATE OF STORMWATER RUNOFF (PEAK FLOWS) THROUGH THE DEVELOPMENT OF NEW IMPERVIOUS SURFACES**	
Applicable Policies and Regulations	City of Roseville Improvement Standards Placer County Stormwater Management Manual	
	SVSP	**Urban Reserve**
Significance with Policies and Regulations	Less Than Significant	Significant
Mitigation Measures:	None Required	WMM 4.12-1 Prepare Site Specific Drainage Study
Significance after Mitigation:	Less Than Significant	Less Than Significant

SIERRA VISTA SPECIFIC PLAN

The SVSP area is undeveloped at present. Development of residential, commercial, schools, parks and associated uses pursuant to the proposed SVSP would increase the amount of impervious surfaces compared to the present condition on approximately 1,371 acres[3]. This increase in impervious surfaces would increase the rate of surface runoff entering Curry Creek. In addition,

[3] The 1,627 acre specific plan minus 256 acres that would remain as open space as part of the project.

development and grading would alter the existing runoff patterns and conveyance capacities on the properties.

Results of hydrologic and hydraulic modeling were used to identify appropriate drainage facilities in the SVSP to manage stormwater peak flows in accordance with City Improvement Standards and Placer County Stormwater Management Manual requirements.

Increased stormwater flows and altered drainage patterns as a result of development of the SVSP could increase the potential for localized and regional flooding downstream of the SVSP area. Curry Creek flows to the Pleasant Grove Canal then to the Natomas Cross Canal and then drains to the Sacramento River. At present, during large storm events, water in Curry Creek downstream from the SVSP project site overflows its banks, flooding homes and ranches. The flood waters also run through the "Sankey Gap" into the Sutter County portion of the Natomas Basin in the vicinity of the Sutter Pointe Specific Plan area.

Consistent with General Plan Policy SB-6 and PCFCD SWMM standards, peak flow runoff rates were determined for the SVSP to identify drainage features that would be necessary to mitigate post development flows. Pre-project and post-development peak hydraulic grades for Curry Creek are presented in Table 4.13-2.

TABLE 4.13-2

100-YEAR (& 10-YEAR) PEAK FLOW COMPARISON

Stream Station	Description	Pre-Project Peak Flow (cfs)	Post-Project Future, Fully Developed, Unmitigated Peak Flow (cfs)	Post-Project Mitigated Peak Flow (cfs)	Post – Project Mitigated Net Peak Flow Reduction (cfs)
Curry Creek – Main Channel					
1.44	Fiddyment Road at Upstream end of Analysis	285 (146)	285 (146)	285 (145)	0 (1)
1.385	Upland Drive Crossing	272 (153)	255 (153) (note 2)	267 (149)	76(17)
1.333	Pedestrian Crossing #1	477 (253)	326 (184) (note 2)	334 (186)	143 (67)
1.265	Market Street Crossing	406 (202)	364 (226) (note 2)	349 (219)	57 (-17) (onsite)
1.215	Baseline Road Eastern Upstream Crossing	458 (226)	380 (237) (note 2)	366 (230)	88 (-4) (see note 1)
1.025	Baseline Road Western Downstream Crossing	455 (210)	397 (263) (note 2)	414 (272)	39 (-62) (onsite)
0.87	Watt Avenue Crossing	431 (214)	314 (274) (note 2)	434 (280)	-3 (-5) (onsite)
0.552	Pedestrian Crossing #2	428 (215)	424 (279) (note 2)	454 (282)	26 (-67) (onsite)
0.33	Pedestrian Crossing #3 At Existing Driveway Br.	424 (216)	425 (277) (note 2)	455 (277)	-31 (-61) (onsite)
0.03	Downstream end of Curry Creek at Confl. with Federico Creek	432 (220)	429 (278) (note 2)	461 (273)	-29 (-53) (onsite)
Federico Creek					
1.15	Pedestrian Crossing #4	116 (61)	182 (99)	121 (64)	-5 (-3)
0.9954	East-West Road	185 (95)	168 (105) (note 2)	130 (76)	55 (19)
0.975	Market Street	194 (100)	165 (105) (note 2)	128 (76)	66 (24)
0.931	Pedestrian Crossing #5	228 (121)	262 (156)	214 (126)	14 (-5) (onsite)
0.865	Westside Drive	319 (176)	223 (142) (note 2)	157 (71)	162 (105)
0.805	North-South Road	366 (202)	312 (213) (note 2)	240 (132)	126 (70)
0.775	Watt Avenue	376 (207)	320 (230) (note 2)	252 (150)	124 57)

Stream Station	Description	Pre-Project Peak Flow (cfs)	Post-Project Future, Fully Developed, Unmitigated Peak Flow (cfs)	Post-Project Mitigated Peak Flow (cfs)	Post –Project Mitigated Net Peak Flow Reduction (cfs)
CURRY CREEK DOWNSTREAM OF CONFLUENCE					
6.9	Downstream Project Boundary	804 (466)	799 (488)	740 (426)	64 40) (1 cfs reduction required by SWMM in 100-year)

Note 1: Peak flow increases occur in the 10-year thru the reach south of Baseline Road. 100-year generates substantial flow reductions through this reach.

Note 2: An apparent flow reduction in the post-project un-mitigated results from the need for the Future Fully Developed Unmitigated alternative to include all bridges and worst case 'n' values for the purpose of determining the maximum floodplain elevations for design. Inherently this increases the amount of attenuation represented in this model.

As shown in Figure 2-14, Project Description, stormwater detention improvements are proposed that would provide in-stream detention storage for the 100-year event.

As a condition of project approval, the City would require the preliminary infrastructure to convey stormwater flows in the SVSP Area and the construction of the in-stream stormwater detention improvements as identified in the *Sierra Vista Specific Plan Drainage and Stormwater Master Plan.* All applicants would need to secure appropriate permits from the regulatory agencies such as the USACE 404 permit or the California Fish and Game Code Section 1602 stream alteration permit, as required. These permits are described in Section 4.8, Vegetation and Wildlife. Prior to issuance of building permits, the final design for the storm drainage infrastructure and the in-stream detention improvements would be reviewed by the City's Engineering Department to ensure it complies with the City Improvement Standards and the *Sierra Vista Specific Plan Drainage and Stormwater Master Plan*.

In summary, the peak flow comparisons indicate that the proposed in-stream detention described above for Curry Creek would provide the required peak flow mitigation beyond the SWMM requirements. As SVSP land uses are developed, specific data for detention requirements would be further refined, consistent with SWMM, the City of Roseville standards, and the *Sierra Vista Specific Plan Drainage and Stormwater Master Plan*. Therefore, impacts for the SVSP Area would be **less than significant.**

URBAN RESERVE

Stormwater from future development of the Urban Reserve area would be conveyed to Curry Creek. This could have a **significant** impact by increasing flows in Curry Creek.

Previously adopted WMM 4.12-1 *Prepare Site Specific Drainage Study* , identified in the WRSP EIR, require that when future uses within the Urban Reserve area have been more clearly defined, site specific hydrologic and hydraulic analyses would be preformed as required under City of Roseville General Plan Policy SB-6. Prior to issuance of building permits, the final design for infrastructure would be reviewed by the City's Public Works Department, Engineering Division to ensure that the development does not significantly increase stormwater runoff. With mitigation, this would be a **less than significant** impact.

IMPACT 4.13-2	**INCREASE IN THE AMOUNT OF SURFACE RUNOFF VOLUME, WHICH WOULD EXCEED THE CAPACITY OF EXISTING STORM DRAINAGE SYSTEMS AND INCREASE THE POTENTIAL FOR DOWNSTREAM FLOODING**	
Applicable Policies and Regulations	City's Regional Flood Control Program	
	SVSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant
Mitigation Measures:	WMM 4.12-2 Pay fair share of Roseville Regional Stormwater Retention Facility improvements.	WMM 4.12-3 Retention Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

SIERRA VISTA SPECIFIC PLAN

As discussed in Impact 4.13.-1, development of the SVSP would increase the impervious surfaces on approximately 1, 371 acres, which would cause additional stormwater runoff into Curry Creek watershed compared to existing conditions. In addition, development and grading would alter the existing runoff patterns and conveyance capacities on the properties in the SVSP Area. This volume increase, when combined with the larger water sheds contributing to the Natomas Cross Canal watershed, has the potential to peak with the flood waters of the Sacramento River and have the potential to cause flooding in Sutter County. Development of the SVSP is estimated to generate an additional runoff volume of 196.6 acre feet over the 8-day 100-year storm model.

The increase in runoff would need to be managed to minimize the risk of downstream flooding beyond the SVSP boundaries in the Natomas Cross Canal Watershed. As discussed in the Subsection 4.12.2 Environmental Setting, the City of Roseville has approved a regional retention basin at Reason Farms. After it is built, this facility will store approximately 2,530 acre feet of storage volume to mitigate the increase in the amount (volume) of stormwater runoff for existing and entitled projects in Roseville that ultimately discharge into the Cross Canal watershed. This storage volume provides capacity for projects within the City of Roseville that discharge into the Curry Creek, and Pleasant Grove Creek watersheds.

The Reason Farms Regional Stormwater Retention Facility is located northwest of the SVSP Project area. An EIR evaluated full buildout of the regional retention basin to 2,350 acre feet capacity, to which the SVSP would incrementally contribute, was certified in January 2003. Upon construction, the regional retention basin project will include capacity for the SVSP stormwater flows. The City is currently collecting drainage impact fees from new development projects to fund the construction of this project, which will be constructed as funds are made available, and is dependent upon development absorption rates. It is estimated the SVSP could begin construction as early as 2014, at which time impact fees will be collected with the issuance of building permits. As such, the SVSP contribution to the volume increase of the Cross Canal Watershed would be **less than significant** with the buildout of the Reason Farms retention basin. Upon construction, the retention basin will be capable of retaining increased stormwater flows generated by the buildout of the SVSP.

Implementation of WMM 4.12-2 would ensure a mechanism for determining the SVSP's proportionate contribution to development of the regional retention basin.

URBAN RESERVE

Future development of the Urban Reserve area would likely increase impermeable area and stormwater runoff. Without the completed Reason Farms Regional Retention facility, runoff at buildout of the Urban Reserve area could result in increased risk of flooding at downstream properties. This would be a **significant** impact.

Implementation of previously adopted WMM 4.12-3, *Retention Policies*, identified in the WSRP, would continue to apply to the Urban Reserve area and requires that development in the Urban Reserve demonstrate by means of a study submitted to the City of Roseville Public Works Department that stormwater will be adequately accommodated in the Regional Retention Facility. If development in the Urban Reserve area requires the retention facility to be expanded, WMM 4.12-3 requires payment for the expansion through fair share contributions by future project development. Therefore, this impact is considered **less than significant**.

IMPACT 4.13-3	**PLACEMENT OF FILL OR STRUCTURES IN 100-YEAR FLOODPLAIN COULD AFFECT WATER SURFACE ELEVATIONS, WHICH COULD INCREASE THE RISK OF FLOODING**	
Applicable Policies and Regulations	FEMA (44 CFR 60) City Floodplain Development Regulations (Chapter 9.80, Roseville City Code)	
	SVSP	**Urban Reserve**
Significance with Policies and Regulations	Less Than Significant	Significant
Mitigation Measures:	None Required	WMM 4.12-4 Floodplain Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

SIERRA VISTA SPECIFIC PLAN

As indicated above, Curry Creek flows through the Project area. The 100-year floodplain for Curry Creek is illustrated in Figure 4.13-1. Development of the SVSP is anticipated to require the placement of small amounts of fill at certain locations. Some of the fill could be used in small depressions in overbank areas to reduce the extent of the floodplain where uses other than open space or park would occur. Fill would also be placed as part of the construction of proposed roadway and bridge crossings, drainage culverts, and weir structures.

The placement of fill would slightly reduce the conveyance capacity of Curry Creek and would minimally increase water surface elevations in the SVSP area. These increases of several inches are not considered substantial and are only located within the SVSP area. The resulting flood plain elevations are shown on Table 4.13.3. Compliance with the City's Improvement Standards and 3-foot freeboard requirements will assure that developable sites within the plan area are above the floodplain elevation. Water surface elevations outside the plan area would not be measurably affected. The modeled estimates of water surface elevation changes include a component that accounts for these fill improvements.

TABLE 4.13-3

WATER SURFACE COMPARISON (Pre and Post Project)

Location	Pre-Project 100-Year HGL	Post-Project 100-year HGL	Change (ft)
Main Curry Creek			
Downstream Side of Fiddyment Road	114.55	114.55	.00
Upstream side of Baseline Road	104.71	102.97	1.74
Downstream side of Baseline Road (offsite)	100.37	100.18	0.19
Upstream side of Baseline Road (offsite)	92.09	90.72	1.37
Downstream side of Baseline Road	89.40	88.96	0.44
Flow at confluence with Federico Creek	80.49	80.37	0.12
Federico Creek			
Flow entering the northern boundary of the site at the Northern Tributary	107.74	108.04	-0.29
Flow entering the east boundary of the site at the Northern Tributary	99.46	99.47	-0.01

Compliance with the City's Floodplain Development Regulations would mitigate any impacts associated with fill in the 100-year floodplain. A Letter of Map Revision (LOMR) for that portion of Curry Creek regulated by FEMA will be submitted after the City of Roseville and Placer County Flood Control and Water Conservation District have reviewed the data. While the absolute boundary of the 10-year and 100-year floodplains could vary slightly from the elevations shown on detailed floodplain maps in the Master Drainage Study (Appendix O), placement of the fill would not increase water surface elevations beyond those estimated in the current HEC-RAS

model. As land uses are refined within the SVSP area, this detail will be further refined to ensure that no private development would occur in the floodplain consistent with City policy.

Because no development would occur in the 100-year floodplain, people and structures would not be exposed to 100-year flood hazard, and the SVSP would not increase flood elevations beyond those already identified. Therefore, this is considered a **less than significant impact**.

URBAN RESERVE

Because the specific land uses and potential fill areas within the Urban Reserve have not been identified at the same level of detail as the SVSP, it is assumed that placement of fill or structures within the floodplain could result in a reduction of the capacity of Curry Creek to handle flows. Floodplain encroachment could increase water surface elevations in the channel which could, in turn, increase flood risk within the Urban Reserve area or downstream. This is considered a **significant** impact.

Previously adopted WMM 4.12-4, identified in the WSRP EIR, would continue to apply to the Urban Reserve area and would reduce this impact to a **less than significant** level by ensuring that development in the Urban Reserve does not occur in the 100-year floodplain or, if small amounts of fill are placed in the floodplain, that water surface elevations would not be measurably affected.

IMPACT 4.13-4	EROSION AND RUNOFF FROM CONSTRUCTION SITES CONTAINING SOIL OR OTHER MATERIALS COULD DEGRADE WATER QUALITY IF DISCHARGED TO LOCAL STREAMS	
Applicable Policies and Regulations	SWRCB NPDES Permit (State General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities) Roseville Improvement Standards Section 2 and 11 City of Roseville Stormwater BMP Guidance Manual for Construction	
	SVSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant
Mitigation Measures:	MM 4.13-1 Implementation of Construction Activity Stormwater Protection Standards	MM 4.13-2 Stormwater Management Development Standards; MM 4.13-3 Storm Water Quality Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

SIERRA VISTA SPECIFIC PLAN

Development associated with the SVSP, including offsite infrastructure, would involve the construction of structures, roadways, parking lots, and infrastructure, which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. Sediment from erosion could have adverse effects on receiving water quality at the site and downstream, including Curry Creek and eventually the Sacramento River. Such effects could include increased turbidity, which could result in adverse impacts on fish and wildlife and their habitat, reduced pump life at Sacramento River water intakes due to abrasion, increased municipal water treatment costs for turbidity removal, and impaired recreation and aesthetic values. Another potential source of water quality degradation during construction activities is heavy machinery and other construction equipment. Construction equipment spills could result in the release of polluting constituents, such as heavy

metals, oil, grease, and other petroleum hydrocarbons, to Curry Creek and other onsite channels. This is a **significant** impact.

Project developers are required by state law to obtain coverage under the State General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit). Developers are also required under by City ordinance (RMC Chapter 14.20) to fully comply with the State construction permit and reduce pollutants to the maximum extant practicable. Compliance with the General Permit requires a number of steps. The project developer must electronically file Permit Registration Documents before construction activity begins, including a Stormwater Pollution Prevention Plan (SWPPP), Notice of Intent, Site Map, and Risk Assessment.

The Site Map must include detailed information such as site layout; the location of sensitive habitats or watercourses, drainage areas, discharge locations, soil disturbance areas, and sampling locations; and the locations of all runoff, erosion control, and sediment control Best Management Practices (BMPs). The BMPs must address source control, pollutant control, and treatment control. Examples include straw wattles, dikes, silt fences, sediment traps, or similar methods. If construction occurs during the wet season, additional winterization improvements are required to stabilize the disturbed areas of the site, prevent erosion and clean discharge waters. A discharge may be required to develop a Rain Event Action Plan before the onset of a storm event.

A discharger must develop a Risk Assessment using the forms and procedures set forth in the General Permit (Appendix 1) to assess the risk level of a construction project. Risk assessment is based on (1) sediment transport, and (2) receiving water risk. The assessed Risk Level (1, 2, or 3) will determine the specific requirements applicable to that site.

Monitoring and reporting requirements for all sites under the General Permit include visual monitoring and maintaining records of storm water and non-storm water discharges. Risk Level 2 and 3 sites are required to monitor effluent water quality, and some Risk Level 3 sites must monitor receiving water for pH and turbidity. Bioassessment sampling is required for Risk Level 3 sites larger than 30 acres with direct discharges into receiving waters. All dischargers must prepare and submit an Annual Report.

Contractors will be required to prepare, and retain onsite, an Erosion Control Plan in accordance with Sections 2 and 11 of the City of Roseville's Improvement standards, as well as the SWPPP that was developed for the General Permit. As part of the City's Stormwater Management Program, the City actively inspects construction sites to ensure compliance with the State construction permit.

All dischargers must prepare and submit an Annual Report.

Implementation of MM 4.13-1 requires the creation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), and the use of Best Management Practices (BMPs) to minimize erosion and the risk of polluted runoff from construction sites. Further, compliance with the States General Construction Permit and City Improvement Standards, combined with the City's inspection efforts under its Stormwater Management Program, would ensure that construction related sediment or other contaminants would be reduced to the maximum extent practicable as required by law. As a result, the Project will not result in the violation of any water quality standards, will not create substantial additional sources of polluted runoff, and will not otherwise substantially degrade water quality. Therefore, this impact is considered to be **less than significant**.

URBAN RESERVE

Development associated with the Urban Reserve, including offsite infrastructure connections, would involve the construction of structures, roadways, parking lots, and infrastructure, which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. Sediment from erosion could have adverse effects on receiving water quality at the site and downstream, including Curry Creek and eventually the Sacramento River. Such effects could include increased turbidity, which could result in adverse impacts on fish and wildlife, habitat, reduced pump life at Sacramento River water intakes, due to abrasion, increased municipal water treatment costs for turbidity removal, and impaired recreation and aesthetic values. Another potential source of water quality degradation during construction activities is heavy machinery and other construction equipment. Construction equipment spills could result in the release of polluting constituents, such as heavy metals, oil, grease, and other petroleum hydrocarbons, to Curry Creek and other onsite channels. This is considered a **significant** impact.

Implementation of MM 4.13-2 and MM 4.13-3 would require that future development include low impact development (LID) standards to reduce water quality impacts. Further, compliance with the State General Construction Activity Permit and City Improvement Standards combined with the City's inspection efforts under its Stormwater Management Program would ensure that construction related sediment or other contaminants would be reduced to the maximum extent practicable as required by law. As a result, future development will not result in the violation of any water quality standards, will not create substantial additional sources of polluted runoff, and will not otherwise substantially degrade water quality. As such this impact is considered to be **less than significant**.

IMPACT 4.13-5	**CHANGES IN SURFACE WATER QUALITY RESULTING FROM URBAN STORMWATER RUNOFF**	
Applicable Policies and Regulations	NPDES Phase 2 Program Regulations (City of Roseville Stormwater Management Plan)	
	SVSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant
Mitigation Measures:	MM 4.13-2 Stormwater Management Development Standards	MM 4.13-3 Water Quality Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

SIERRA VISTA SPECIFIC PLAN

Development associated with the proposed SVSP would result in the conversion of undeveloped land to urban uses including residences, schools, businesses, recreation, roadways and parking areas. As discussed above, the increase in impervious surfaces resulting from the construction of buildings and paved areas would increase the rate and amount of stormwater runoff that would carry urban pollutants into Curry Creek. It is anticipated that runoff from the SVSP area would be typical of urban runoff water quality. Activities that could increase the types or quantities of non-naturally occurring pollutants in runoff due to development include:

- Motor vehicle operations
- Residential maintenance (landscape maintenance- mowing, blowers, fertilizing, pesticide use and car washing, etc)
- Litter
- Careless material storage and handling
- Domestic animal and wildlife wastes
- Pavement wear

Pollutants typically associated with urban uses include oil and grease, coliform bacteria, petroleum hydrocarbons, nitrogen, phosphorus, heavy metals, pesticides, herbicides, and other constituents. Urban runoff studies throughout the U.S. have shown that the concentration of suspended solids usually decreases with urbanization as exposed soils are covered by impervious surfaces. Although the some sediment load of developed areas is reduced, there remains may still be present due to entrained dust on roadways and parking lots and blow over from any open space areas and/or other off-site farming and construction activities. There is the potential that urban runoff from the SVSP could contain levels of pollutants that could adversely affect water quality in the local streams or increase sediment loads. Therefore, this impact is considered **significant**.

Consistent with current and anticipated NPDES Phase II stormwater requirements, the *Sierra Vista Specific Plan Drainage and Stormwater Master Plan* identifies both source control LID strategies and treatment control water quality BMPs and LID concepts have been identified for the SVSP that can be used within the SVSP to treat the first design storm events, those storms of 0.5 inches of rain or less, sometimes referred to as "first flush" events.

Source Control and the use of Low impact development (LID) strategies are intended to mange pollution where is first generated, keeping the pollutants form entering the stormwater in the first place. The goal in the use of LID strategies is to keep pollutants from contacting runoff and leaving a site, thereby protecting water quality. LID is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings. By integrating LID concepts into the fabric of a community, stormwater management is effective on several levels. Minimizing impervious surfaces and promoting

infiltration that aids in filtration, and helps mimic the natural pre-development hydrograph. The result is a diminished amount of stormwater, both in the terms of volume and pollutant level, which otherwise would require further treatment.

The following LID measures are identified in the *Sierra Vista Specific Plan Drainage and Stormwater Master Plan* and are referenced to the site development of different land uses. These LID strategies may be implemented individually or in combinations as determined during project design. The following is a list of allowable LID measures that may be employed:

- **Disconnected roof drains**: Water runoff from roof systems would be treated by biological filtration. Provides opportunities for infiltration.
- **Pervious or partially paved driveways and porous pavement:** Pavement alternatives would allow the opportunity for infiltration of the runoff.
- **Separated sidewalks**: Runoff would be treated before entering the gutter pan and storm drain system.
- **Tree planning and canopy preservation:** Limited trees are present within the plan area. The specific plan would ensure that trees are planted and maintained, which would in turn reduce the rate and amount of total runoff which would enter the storm drain.
- **Soil amendments in landscaped areas and stormwater planters:** The addition of organic material to impervious soils can add voids which can absorb runoff preventing it from entering storm drain systems. In residential areas, this may include amending a landscape strip adjacent to the street or pavement areas where large amounts of runoff can be intercepted from lots. In commercial areas this is likely to be limited to stormwater planter areas. At roadways this will be used where roadway flows are diverted into the landscape areas.
- **Stream buffer:** As indicated in the project description, improvements are proposed to the Curry Creek channel to provide wetland mitigation, enhance the stream corridor, and provide opportunities for sheet flow to be bio-treated before flows enter the stream.
- **Vegetated swales:** Required at all storm drain outlet locations, vegetated swales offer additional treatment in the treatment train, and opportunities for additional infiltration of runoff.

- **Stormwater retention:** Retention of stormwater allows constituents to be filtered and trapped prior to entering the stream channel.

Treatment Control features are generally engineered technologies designed to remove pollutants from site runoff. In the SVSP this could include oil/water grit separators, sand filter systems, stormwater planters, vegetated swales, end of pipe velocity attenuation, settling areas, in-stream detention areas, and end of pipe grassy swales.

Figure 4.13-5, *Proposed Water Quality Treatment Locations in the SVSP,* and Figure 2-7, in the Project Description, illustrates proposed water quality outfall locations. These grassy swales and vegetated channels will be used to remove pollutants by filtration. In-stream detention in Curry Creek, would include low-flow areas to allow pollutants to settle. Constructed wetlands, which are shallow pools with or without open water elements that create growing conditions suitable for marsh plants, provide treatment by decreasing flow velocities and increased filtration opportunities. These BMPs are typically situated near outfalls and within the open spaces. Landscaped roadside channels and or buffer strips are also effective.

Oil/water grit separators, sand filter systems, stormwater planters, vegetated swales, or other onsite structural controls could be used in commercial or other areas where higher-than-normal levels of pollutants could be generated.

The specific LID strategies and structural BMPs that could be used in the SVSP area, either individually or in combination will to be refined at the tentative map and site development stage to account for site specific plans. Drainage features will be designed to comply with the standards established as part of the City's Phase II Stormwater Management Program. As more detailed information is developed for each land use (tentative map/site development), and target pollutants are identified, the design of specific stormwater treatment devices such as those referenced above, vegetative plantings, bio-filters, or other proprietary devices will be incorporated in to the design.

Compliance with the NPDES regulations and MM 4.13-2 which requires implementation of LID measures would ensure stormwater treatment devices specific to the land uses in the SVSP are implemented to the maximum extent practicable. Stormwater treatment devices will be chosen for their effectiveness in reducing urban pollutants in the stormwater runoff to meet the Basin

Plan and water quality objectives of the City's Phase II SWMP. Taken together, all of these measures will avoid any violation of any water quality standards, will avoid the creation of substantial additional sources of polluted runoff, and will avoid any substantial degradation of water quality. As a result, potential water quality effects from urban runoff remain at **less than significant** level.

URBAN RESERVE

Development of the Urban Reserve would result in urban runoff. Although Placer County has developed and implemented a Phase 2 program, the land uses in the Urban Reserve have only been identified at a conceptual level for purposes of programmatic analysis. The types of BMPs that could be used in the Urban Reserve have not been identified and how they would be monitored has not been established. Development would increase water quality impacts. Therefore, the impacts of urban runoff could be **significant**.

Implementation of MM 4.13-3, Storm Water Quality Policies, in conjunction with compliance with the City of Roseville's permit requirements, would reduce urban runoff and pollutants so that water quality standards are not violated, substantial additional sources of polluted runoff will not be created, and substantial degradation of water quality will be avoided. As a result, impacts to water quality will be mitigated to a **less than significant** level.

4.13.5 MITIGATION MEASURES

The project area was included in the program-level analysis of the West Roseville Specific Plan Final EIR. Mitigation adopted by the City Council at time of approval in 2004 is still applicable to the project, especially to the Urban Reserve areas. This document includes the WRSP mitigation as "WMM" and provides ~~strikeout~~ to language that is being eliminated or <u>underline</u> to denote new language.

The following text denoted by ~~strike through~~ would not be included in the project because a large detention basin to accommodate the WRSP flows is not proposed as part of the SVSP. Sufficient stormwater detention facilities are planned in the WRSP. As described above, stormwaters for the SVSP would be detained by in-stream improvements.

WMM 4.12-1 ***Prepare Site Specific Drainage Study*** ~~If a larger dentention basin near the main branch of Curry Creek is used for the Remainder Area, and includes flows for the WRSP Area,~~ Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall prepare a site-specific drainage study. The study shall identify approporiate sizing and to ensure that ~~Remainder Area~~ Urban Reserve flows~~, in combination with flows generated in the WRSP Area, can be accommodated in the larger basin. The study shall also be used to identify features that~~ will limit peak flow runoff from the areas drained to Curry Creek to pre-development levels per the PCFCWCD SWMM and City standards. ~~The study shall also be used to demonstrate the larger basin will not cause or exacerbate downstream flooding conditions in the SOI Amendment Area or at downstream locations outside the SOI Amendment area.~~ The drainage study shall be submitted to the PCFCWCD and the City of Roseville for review. ~~If a basin in the Remainder Area is used to store flows generated by sheds C-WP7 and C-WP8 in the WRSP Area, in addition to Remainder Area generated flows, the drainage study shall ensure that sufficient capacity is provided to manage total flows into the basin.~~

WMM 4.12-2 ***Pay Fair Share of Roseville Regional Stormwater Retention Facility Improvements*** **(Impact 4.13-2- SVSP)**

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

WMM 4.12-3 ***Retention Policies (Impact 4.13-2- Urban Reserve)***

Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall demonstrate, through the preparation of technical engineering studies, that the increased volume of stormwater runoff from the ~~SOI Amendment~~ Urban Reserve Area, which includes the ~~WRSP~~ SVSP Area, can be accommodated in the approved regional

stormwater retention facility. The results of the study shall be submitted to the City of Roseville Public Works Department for review and concurrence. The facility shall be expanded as necessary, funded through fair share contributions by project developers.

WMM 4.12-4 ***Floodplain Policies*** **(Impact 4.13-1- Urban Reserve)**

Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall identify the 100-year floodplain for each location that could be affected by fill placement or installation of structures to ensure water surface elevations estimated in the Master Drainage Study would not be measurably increased. If measurable increases are identified, redesign or relocation of the fill or structures shall be considered. In addition, the recalculated water surface elevations shall be used to determine what improvements, if any, are necessary to provide adequate mitigation so that offsite risk of flooding is not increased as a result of ~~Remainder Area~~ Urban Reserve development, in combination with the WRSP development. Those improvements shall be required to be constructed as a condition of approval of the proposed development.

MM 4.13-1 ***Implementation of Construction Activity Stormwater Protection Standards*** **(Impact 4.13-4- SVSP)**

Prior to the issuance of a City grading permit and the commencement of construction activities, compliance with the State's General Construction permit, the City of Roseville's Construction Standards, and the City's Stromwater BMP Guidance Manual will be met. This includes the creation of a Storm Water Pollution Prevention Plan (SWPPP) that will identify the site, the location of sensitive habitats or watercourses, drainage areas, discharge locations, soil disturbance areas, and the locations of all runoff, erosion control, and sediment control Best Management Practices (BMPs). On-going monitoring and adjustments to the SWPPP will occur when needed to address changes in the field as construction activities evolve.

MM 4.13-2 ***Stormwater Management Development Standards*** **(Impact 4.13-4 and 4.13-5 – SVSP and Urban Reserve)**

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

MM 4.13-3 ***Storm Water Quality Policies (Impact 4.13-4 and Impact 4.13-5- Urban Reserve)***

Specific Plans and/or other development proposals for the Urban Reserve shall identify measures to reduce water quality impacts as a result of construction. Future development would include low impact development measures. Those improvements shall be required to be constructed as a condition of approval of the proposed development.