
3.9 - Hydrology and Water Quality

3.9.1 - Introduction

This section describes the existing hydrology and water quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on the Sacramento County General Plan, the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, the Local Floodplain Management Plan for the County of Sacramento (2001), the Elk Grove General Plan Environmental Impact Report (2003), the Sacramento County General Plan Update Environmental Impact Report (2009), the Sacramento River Basinwide Management Plan (2003), and the Zone 40 2010 Draft Urban Water Management Plan (2011).

3.9.2 - Environmental Setting

Regional Hydrology

The proposed Sphere of Influence Amendment (SOIA) Area is primarily located in the Sacramento River Basin. The region covers approximately 27,000 square miles, which includes 400 miles of river spanning from Lake Shasta to the Sacramento-San Joaquin Delta convergence. The Sacramento River serves as the central spine of the Sacramento River hydrologic region, draining the area from Modoc County in Northern California, the west side of the Sacramento Valley, the west slope of the Sierra Nevada Mountains, to the Delta. Within the Sacramento River Basin are sub-basins or smaller watersheds that drain into the tributaries of the Sacramento River. The American River watershed is a sub-basin of the Sacramento River watershed. The American River originates in the Tahoe and El Dorado national forests and flows into the Folsom Lake Reservoir, which holds approximately 1 million acre-feet of water. The majority of Sacramento County is within the Sacramento River basin; however, southwestern Sacramento County contains Delta waterways, which interconnect the Sacramento, San Joaquin, and Mokelumne rivers.

The portion of the SOIA Area east of State Route 99 (SR-99) and south of Grant Line Road lies within the San Joaquin River Basin. The San Joaquin River Basin drains a region that extends across the Central Valley to the Coast Ranges, between the Cosumnes River to the north and the San Joaquin River to the South. The Cosumnes River watershed is a sub-basin of the San Joaquin River watershed. The two main tributaries to the Cosumnes River are Deer Creek and Laguna Creek.

Both the Sacramento River and Laguna Creek have been altered with the addition of levees to accommodate development and reduce flooding potential. The Cosumnes River, which forms the southeastern border of the SOIA Area, is the last free-flowing, undammed river on the western slope of the Sierra Nevada. Exhibit 3.9-1 shows the regional hydrology of Sacramento County.

Localized Drainage

The SOI Amendment area currently requires minimal storm drainage services, as the area remains primarily agricultural. The main surface hydrological features in the SOIA Area are the Sacramento River, the Cosumnes River, and Deer Creek. Based on aerial and topographic evaluations, all surface flows on portion of SOIA Area west of SR-99 move generally from east to west and ultimately drain into Beach Stone Lakes.

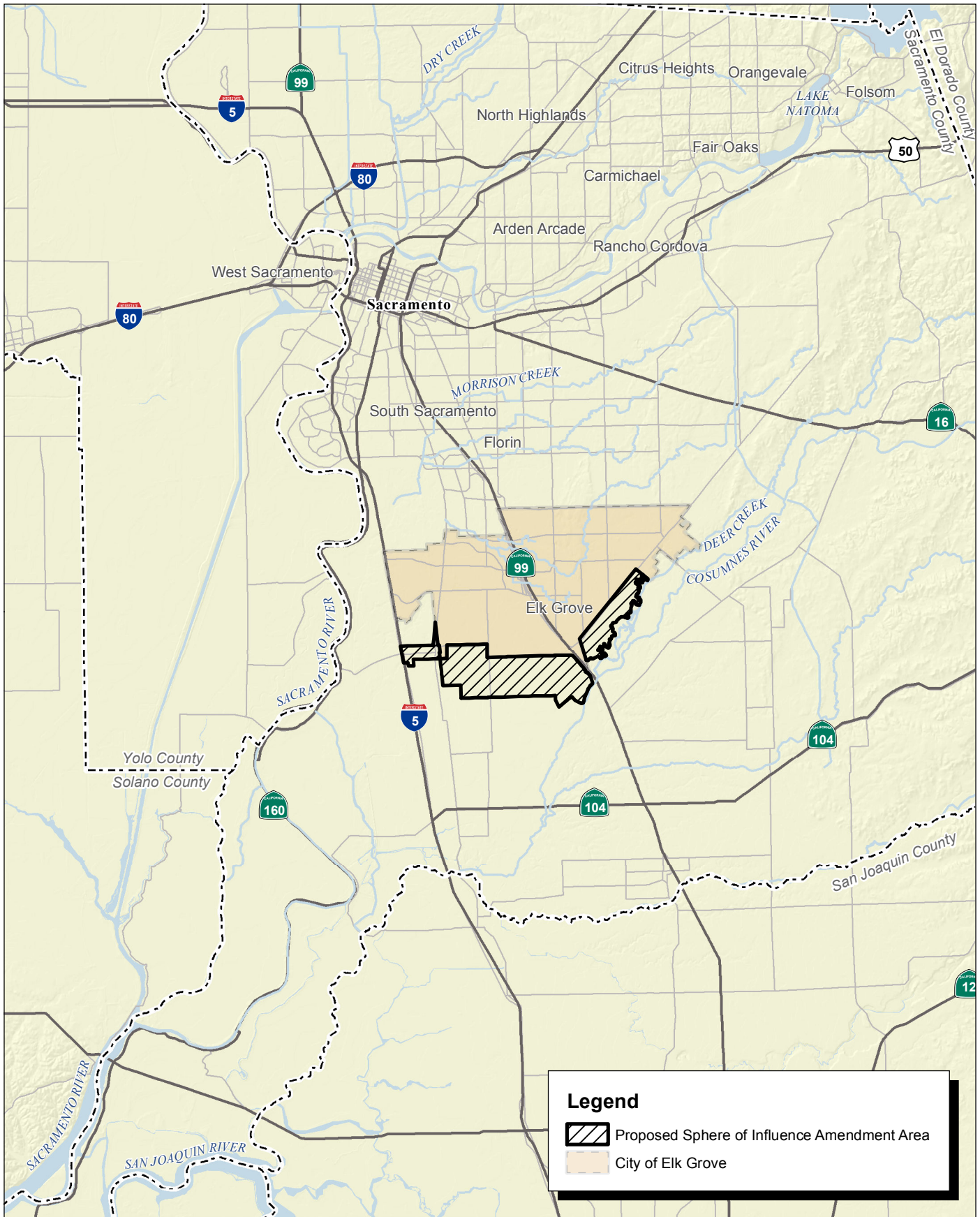
The Beach-Stone Lakes Basin is the area is bounded by the Southern Pacific Railroad on the west, Lambert Road on the south, the Western Pacific Railroad on the east, and Morrison Creek on the north. Point Pleasant is a subarea located within the Beach-Stone Lakes Basin. Flooding typically occurs in the Beach-Stone Lakes basin every year, with severe floods occurring about once every 3 years. Flooding and drainage problems in the Beach-Stone Lakes basin are primarily a result of inadequate channel capacities during periods of heavy rainfall, of backwater flooding from the Mokelumne River, and of the restricted outlet structure at Lambert Road (SRCSD, 2000). As stated by the County of Sacramento Municipal Services Agency, the CALFED project designed to reduce flooding of the area, the North Delta project, will not significantly abate the flood threat in this area.

The Beach-Stone Lakes basin receives runoff from approximately 49 square miles of local urban and rural tributary areas and ultimately discharges through the Lambert Road structure into Snodgrass Slough, a tributary of the Sacramento-San Joaquin Delta. Historically the Beach-Stone Lakes basin was an overflow area of the Sacramento River.

Portions of SOIA Area east of SR-99 drains into Deer Creek. Since essentially all of the natural drainage courses in the area have been altered by agricultural activities, surface water flows are channeled into agricultural and roadside ditches. Based on the National Wetland Inventory (NWI), the SOIA Area may contain approximately 162 acres of freshwater emergent wetlands and approximately 45 acres of freshwater ponds.

Water Consumption

The project site primarily contains agricultural uses consisting of fallow/row crops/nursery, orchards, vineyard, dairy, and livestock operations. Few structures exist within the project site, and these are limited to barns, rural housing, storage sheds, and related structures. The average water consumption of common crops in the SOIA Area is provided in Table 3.9-1. The average water consumption for urban land uses are provided in Table 3.9-2.



Source: Census 2000 Data, The CaSIL, Sacramento County GIS 2009 & MBA GIS 2011.

Table 3.9-1: Annual Average Water Consumption by Crop

Crop	Annual Consumption per Acre	
	Acre-Feet	Gallons
Table Grapes	2.26	734,795
Corn ¹	2.14	698,397
Stone Fruit	2.81	914,013
Note: ¹ April planting. Source: University of California, Davis, 2005.		

Table 3.9-2: Annual Average Water Consumption by Land Use

Sector Water Use	Consumption Rate (gallons) ¹	
	Per Capita per Day	Per Capita per Year
Residential (Single- and Multi-family)	174	63,510
Commercial and Institutional	25	9,125
Industrial	21	7,665
Note: ¹ Water consumption rates for the Sacramento River Hydrologic Region, 2005. Source: California Department of Water Resources et al., 2010.		

Surface Water Resources and Quality

Surface Water Resources

Surface water resources in the proposed SOIA Area include the Morrison Creek Stream Group and the Deer Creek-Cosumnes Corridor. The Morrison Creek Stream Group includes Elder, Elk Grove, Laguna (including its tributaries), Morrison, Strawberry, and Whitehouse creeks. The main sources of surface water supply in the area are runoff from precipitation and snowmelt from the Sierra Nevada Mountains (Elk Grove 2003).

Surface Water Quality

As described in Section 2, Project Description, the proposed SOIA Area is a primarily used for agriculture, with few structures limited to barns, rural housing, and storage sheds. A small portion of the area is developed with relatively suburban uses, and Sunset Sky ranch Airport (Elk Grove Airport), a private airport (closed effective July 1, 2010), lies in the eastern portion of the project area. Both non-storm (nuisance) and stormwater discharge influence surface water quality. Nuisance runoff includes surface drainage from residential and commercial land uses, including landscape irrigation, surface cleaning, and other similar activities.

Stormwater flow in an agricultural area often includes contaminants collected from the use of pesticides and fertilizers. The portion of the Sacramento River that lies west of the SOIA Area (running from Red Bluff to the Delta), Elder Creek, Elk Grove Creek, and Morrison Creek are listed as impaired water bodies on the California Clean Water Act Section 303(d) list. In addition, the Cosumnes River and Deer Creek are listed as impaired water bodies on the California Clean Water Act Section 303(d) list. The SOIA Area lies in both the lower American River watershed and the Mokelumne River Watershed. Water quality conditions are affected to a large degree by a combination of urban, industrial, and agricultural land uses. The known agricultural contaminants and conditions that affect water quality in the watershed are chlorpyrifos, Diazinon, PCBs, and toxicity from unknown sources (RWQCB 2008). The South Fork of the American River is listed on the 2006 Section 303(d) list for mercury from an unknown source in the reach of the river just below Slab Creek Reservoir to Folsom Lake. The reach of the Lower American River from Nimbus Dam to the confluence of the Sacramento River also is listed for mercury (State Water Board 2006). This same reach of the lower American River is listed for unknown toxicity from an unknown source (State Water Board 2006). The Cosumnes River is listed on the 2006 303(d) list for exotic species from an unknown source. Deer Creek is listed for iron from an unknown source.

There are relatively few water quality concerns in the Cosumnes River. The only known concern in the lower reaches of the river pertains to bioaccumulation of methyl mercury. Methyl mercury may be mobilized and transported by irrigation return flows; however, it is not directly connected to irrigated agricultural operations. The Cosumnes River is not on the 2006 Section 303(d) list for any stressors and is not significantly affected by irrigated agriculture. Because of its excellent water quality, the Cosumnes River has been used in studies as a reference for unaffected water quality.

Non-Point Pollution Sources

Non-point source (NPS) pollution is defined as pollution that cannot be traced back to a single origin or source such as a discharge pipe or smokestack. Agricultural activities that can cause NPS pollution include grazing, plowing, irrigation, and the application of pesticides and fertilizers. As water moves across the surface of the ground, it collects both human and naturally occurring pollutants, eventually carrying the pollutants into the watershed.

Agricultural non-point source pollution is the leading cause of impairment to surveyed rivers and lakes and the third-largest source of impairment to surveyed estuaries (EPA 2005).

Groundwater Resources and Quality

Groundwater Resources

The City of Elk Grove and surrounding areas, which include the SOIA Area, overlie the Sacramento Valley aquifer system. The groundwater resources in the SOIA Area are contained in a two-aquifer system—an unconfined upper (shallow) aquifer and a semi-confined lower (deep) aquifer. The two aquifers are separated by a semi-confining clay barrier, which allows for the potential vertical

movement of groundwater between the two aquifers. The vertical movement of groundwater between the two aquifers could occur if heavy pumping from one aquifer reduced the pressure within the system, allowing water flow into the other aquifer, thereby recharging the groundwater system. While vertical movement between the two aquifers is possible, the main sources of aquifer recharge are from stream recharge from the Cosumnes and Sacramento rivers, subsurface inflows, and rainfall and applied water percolation. Although high to moderate recharge capabilities are found in a large area on both sides of the Cosumnes River and a small portion around the Sacramento River, the majority of the SOIA Area has poor groundwater recharging capabilities.

Regionally, water has been overdrafted in parts of the County of Sacramento since the 1940s. Significant groundwater overdraft problems have been identified in three areas of Sacramento County, including Elk Grove. Groundwater levels in Elk Grove were calculated in the spring of 1992 and were found to be 70 feet below the original level (SCGP 2003). Land subsidence can occur in areas where groundwater overdraft is present as a result of structural changes to soils from dewatering. Although the groundwater of Sacramento County has been historically overdrafted, there has been no reported land subsidence associated with groundwater withdrawal in the proposed SOIA Area or in any other geologically similar areas in California.

Groundwater Quality.

Fresh water is defined as water with less than 1,000 milligrams per liter dissolved solids concentrations and groundwater quality varies depending on the depth and permeability of rocks that underlie the aquifer. Fresh water is available throughout the Sacramento Valley and is generally lower in dissolved solid concentrations than in other areas in the Central Valley.

The majority of the land within the proposed SOIA Area is used for agricultural purposes and, therefore, contributes to the groundwater quality and recharge potential in the area. Generally, groundwater quality is affected by both naturally occurring and human-made constituents. The largest source of pollution near the proposed SOIA Area is from agricultural operations. Groundwater in agricultural areas can become excessively saline from dissolved salts left behind after the evaporation of sprayed irrigation water. Excessive concentrations of nitrates from the leaching of nitrogen fertilizer can also be of concern in agricultural areas. According to the United States Environmental Protection Agency (EPA), the maximum allowable level of nitrates in drinking water is 10 milligrams per liter; nitrate levels as low as 5 milligrams per liter can damage certain crops. Nitrate concentrations exceeding 5 milligrams per liter are found sporadically in portions of the SOIA Area, an area mainly limited to shallow areas of the aquifer (Elk Grove 2003).

Flooding and Flood Control

Flooding

Flooding is defined as an overflowing of normally dry land, often after heavy rain. When the capacities of streams and storm drainage facilities are exceeded, flooding often occurs. The

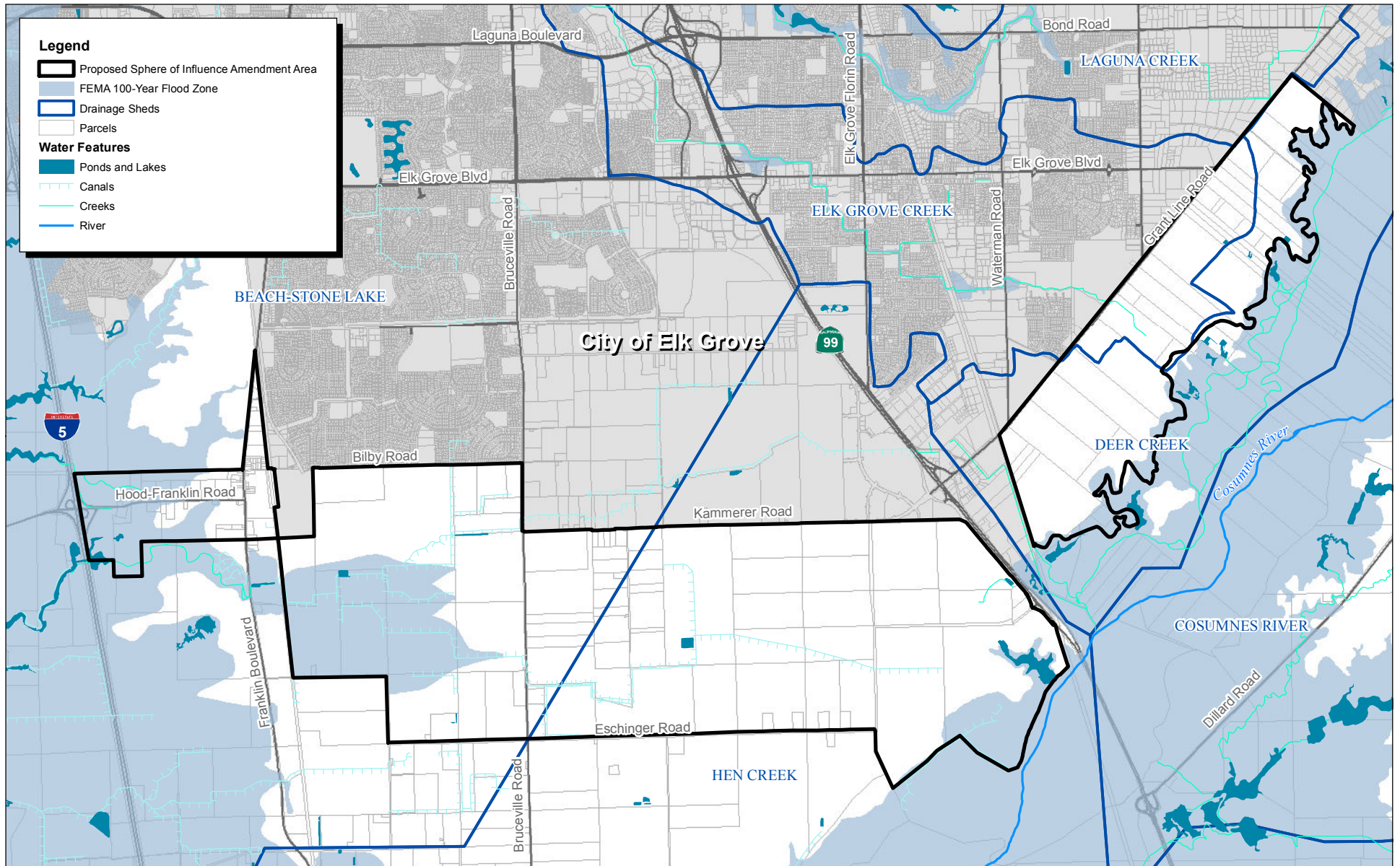
Sacramento area has historically been challenged with flooding. Before the 1900s, flooding due to winter storms occurred regularly in the Sacramento Valley. In addition, mining activity increased the severity of flooding, which was due to decreased soil water capacity, channel sedimentation, and construction of levees derived from excess mine tailings.

In more recent times, the Sacramento River has been reinforced with an extensive system of dams, levees, pumping stations, overflow weirs, and other flood control structures. Development of the flood control system has greatly diminished the extent of flood hazard areas. However, there are areas surrounding the Sacramento River and Laguna Creek that are inside of the Federal Emergency Management Agency's (FEMA's) 500-year and 100-year floodplains. In October 2007, Governor Arnold Schwarzenegger signed into law Senate Bill 5 (SB 5), which requires the Department of Water Resources (DWR) to develop preliminary maps by July 1, 2008 for the 100- and 200-year floodplains located within the Sacramento-San Joaquin Valley. Pursuant to the SB 5, DWR prepared the preliminary 100- and 200-year maps for 32 counties and 91 cities located within the Sacramento-San Joaquin Valley. Portions of the western SOIA Area lie within the 100-year floodplain. Exhibit 3.9-2 shows the flood hazard areas. By default, those portions within the 100-year flood plain are also located within the 200-year and 500-year floodplains. However, there is currently insufficient mapping to delineate additional lands within the SOIA Area that may be within the 200-year and 500-year floodplains.

Flood Control

Flood issues in the SOIA Area are mainly associated with Laguna Creek (and its tributaries) and the Cosumnes River. Flooding is particularly prevalent in the eastern portion of the SOIA Area where major drainage systems have not been built and stormwater flows in natural channels or small ditches that are frequently exceeded. As stated above, flooding typically occurs in the Beach-Stone Lakes basin every year, with severe floods occurring about once every 3 years. The Cosumnes River is a free-flowing, undammed river and presents a major flood hazard along the eastern and southern portions of the planning area (Sacramento County 2004).

The Sacramento River Flood Control System provides flood protection to the proposed SOIA Area and consists of the Fremont and Sacramento weirs, the Yolo Bypass Channel, and levees along the Sacramento and Lower American rivers, Natomas East Main Drain, Arcade Creek, Natomas Cross Channel and the Sacramento Bypass channels. The amount of water flowing through levee systems on the Sacramento River is controlled by the reserve overflow area of the Yolo Bypass.



Source: County of Sacramento and City of Elk Grove GIS Data, 2009. FEMA Q3 Data.

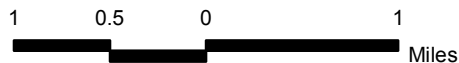


Exhibit 3.9-2 FEMA Designated Flood Hazard Zones

3.9.3 - Regulatory Framework

Federal

Clean Water Act

Section 303 of the 1972 Federal Clean Water Act (CWA) requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards. (See a description of State Porter-Cologne Water Quality Control Act, below.) Standards are based on the designated beneficial use(s) of the water body. Where multiple uses exist, water quality standards must protect the most sensitive use.

Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than 1 acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the SWRCB, implemented, and enforced by the nine RWQCBs. Effective February 14, 2011, all dischargers whose project includes clearing, grading, or stockpiling activities expected to disturb 1 or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ and 2010-0014-DWQ, which amends Order Number 2009-0009-DWQ.

This General Permit requires all dischargers, where construction activity disturbs 1 or more acres, to take the following measures:

1. Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to include a site map(s) of existing and proposed building and roadway footprints, drainage patterns and stormwater collection and discharge points, and pre- and post-project topography.
2. Describe types and placement of Best Management Practices (BMPs) in the SWPPP that will be used to protect stormwater quality.
3. Provide a visual and chemical (if non-visible pollutants are expected) monitoring program for implementation upon BMP failure; and
4. Provide a sediment monitoring plan if the area discharges directly to a water body listed on the 303(d) list for sediment.

To obtain coverage, the landowner must file a Notice of Intent (NOI) with the SWRCB. The notice is required to include the requirements listed above. When project construction is completed, the landowner must file a notice of termination.

The law requires that a permit (Section 404) be obtained from the United States Army Corps of Engineers (USACE) for any dredge or fill materials into wetlands or waters of the United States.

Floodplain Regulations

Executive Order 11988 for Floodplain Management (May 24, 1977) directs all federal agencies to evaluate potential effects of any actions it may take in the floodplain and to avoid all adverse impacts associated with modifications to floodplains. It also directs federal agencies to avoid floodplain development whenever there is a practicable alternative and to restore and preserve the natural and beneficial values served by the floodplains.

Federal Emergency Management Agency

FEMA oversees floodplains and administers the National Flood Insurance Program adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities that participate in the program. Areas of special flood hazard (those subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The National Flood Insurance Program mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in an increase of more than 1 foot in flood elevation. In addition, development is not allowed in delineated floodways within the regulatory floodplain.

United States Army Corps of Engineers

The USACE constructs and operates regional scale flood protection systems in cooperation with state and local agencies. The USACE is responsible for the Lower San Joaquin River Flood Control Project built in the 1960s.

Special Districts

Reclamation and Levee Districts are special districts responsible for reclaiming and/or maintaining land subject to frequent flooding via levee and dike systems within urban and rural areas. The USACE was responsible for constructing much of the levee system in the early to mid-1900s, but then turned it over to the local Reclamation and Levee Districts for maintenance. Reclamation and Levee Districts are responsible for preventing flooding within their jurisdiction by maintaining levees and related facilities such as pump stations. Reclamation and Levee Districts are authorized to operate through DWR and USACE.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 authorized the SWRCB to provide comprehensive protection for California's waters through water allocation and water quality protection. The SWRCB implements the requirement of the Clean Water Act Section 303, indicating that water quality standards have to be set for certain waters by adopting water quality control plans under the Porter-Cologne Act.

The Porter-Cologne Act established the responsibilities and authorities of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements (WDRs). Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the EPA to issue NPDES permits.

The Central Valley RWQCB's Basin Plan states the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. Regional plan objectives and discharge requirements are implemented through the issuance of WDRs or NPDES permits.

Section 303(d) of the CWA requires that the SWRCB identify surface water bodies within California that do not meet established water quality standards. Once identified, the affected water body is included in the SWRCB's "303(d) Listing of Impaired Water Bodies," and a comprehensive program must then be developed to limit the amount of pollutant discharges into that water body. This program includes the establishment of "total maximum daily loads" (TMDL) for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the EPA in 2006.

Construction Site Runoff Management

The SWRCB has adopted an NPDES for stormwater discharges associated with construction activity (General Permit). The Central Valley RWQCB administers the NPDES stormwater permitting program in the proposed incorporation area. Construction activities of 1 acre or more are subject to the permitting requirements of the NPDES General Permit and are required to submit an NOI to the Central Valley RWQCB prior to the beginning of construction. The General Permit requires preparation and implementation of an SWPPP prior to the start of construction. Implementation of the SWPPP begins with the start of construction. Upon completion of construction, the project's applicant must submit a Notice of Termination to the Central Valley RWQCB to indicate that construction is completed. Note that no construction is proposed as a part of the proposed incorporation.

Municipal Stormwater

The federal CWA requires NPDES permits for municipal separate storm and sewer (MS4). The purpose of the NPDES program is to establish a comprehensive program to manage areawide urban stormwater and reduce pollution of surface waters to the maximum extent possible. Sacramento County submitted and received an MS4 permit under Phase I of the MS4 implementation (Order No. R5-2002-0206) for all unincorporated areas of the County. The MS4 Permit requires the County to develop programs to control pollutants in urban stormwater runoff and evaluate the impacts of such discharges on local receiving waters.

The City of Elk Grove became a joint participant with Sacramento County's NPDES. The permit was renewed in December 2002; it allows the City to discharge urban runoff from MS4s in its municipal jurisdictions. The permit requires that the City impose water quality and watershed protection measures for all development projects. The NPDES also requires a permit for every new construction project that implements the following measures:

- Eliminate or reduce non-stormwater discharges to stormwater systems and other waters of the nation;
- Develop and implement a stormwater pollution prevention plan (SWPPP); and
- Perform inspections of stormwater control structures and pollution prevention measures.

California Department of Water Resources

The California Department of Water Resources (DWR) is a state agency that constructs and operates regional-scale flood protection systems in partnership with USACE and local agencies. DWR provides technical, financial, and emergency response assistance related to flood hazard and safety to local agencies and evaluates maintenance of federal project levees by local reclamation and levee districts (SJC 2009).

DWR initiated various studies in support of implementing repairs and improvements to the State Plan of Flood Control in 2008. DWR is developing technical information to assist cities and counties with developing flood protection standards for new development that will be tied to the Central Valley Flood Protection Plan to become effective in 2012. Once adopted, new urban development within a flood hazard zone will be required to show that it is protected from a 1 in 200 chance of flooding. Under Assembly Bill 156, DWR prepared Levee Flood Protection Zone Maps for areas protected by the state-federal project levees in the Central Valley. DWR is also providing Best Available Maps for planning purposes to show the 100- and 200-year floodplains based on best available information. Both types of maps that include the project area are completed and available for public viewing.

Assembly Bill 5 and Senate Bill 17

Central Valley Flood Protection Board

In 2007, Assembly Bill 5 (AB 5) renamed the Reclamation Board as the Central Valley Flood Protection Board (CVFPB) and established the CVFPB as independent of DWR. CVFPB's directive is to control flooding along the Sacramento and San Joaquin rivers in cooperation with the USACE, to coordinate the establishment, operation, and maintenance of flood control infrastructure with various agencies and to maintain the integrity of the existing flood control system and floodways through authorization of encroachment permits. SB 17 similarly renamed the agency and directed the DWR to prepare and the CVFPB to adopt a State Plan of Flood Control (SJC 2009).

Other provisions to be implemented by DWR under AB 5 that may have relevance to this project include:

- Inspect all project levees, determine whether there are any deficiencies or risks of failure, make recommendations for improvements, and provide in a flood control system status report.
- Prepare maps of levee protection zones by December 31, 2008 and update the maps periodically.
- Notify all landowners whose property are fully or partially within a zone protected by a levee by September 2010 about the risks associated with flooding and provide information regarding flood insurance.
- Impose requirements on local jurisdictions to upgrade levees that protect an area where more than 1,000 people live before any funds are spent and after July 2008, the local levee maintenance agency and the city or county with jurisdiction over the affected area must sign an agreement to prepare a safety plan within 2 years. DWR is to take over maintenance of any levees it determines are not being maintained according to regulations.

Relevant provisions under SB 17 to be implemented by DWR and CVFPB include:

- Collaborate with local jurisdictions and provide them with flood information and technical assistance.
- Propose updated requirements for construction in areas protected by flood protection facilities and will include requirements for buildings in areas where flood levels during 200-year events are expected to exceed 3 feet.
- Develop preliminary 100- and 200-year floodplain maps based on best available information for lands protected by levees contained in the State Plan of Flood Control and provide those maps to local jurisdictions for planning purposes.
- Prepare the Central Valley Flood Protection Plan for approval by July 2012 and update the plan every 5 years.
- Implement flood protection improvements in urban areas before the Central Valley Flood Protection Plan is completed.

Senate Bill 5

Another key flood management bill recently enacted is SB 5, which requires Sacramento County to update its General Plan within 2 years after the CVFPB adopts the Central Valley Flood Protection Plan to contain the following:

- Location of State Plan of Flood Control facilities, other flood management facilities, and flood hazard zones

Hydrology and Water Quality

- Feasible implementation measures designed to carry out the goals for protection of lives and property
- Amend zoning ordinances to be consistent with the General Plan within 36 months of adoption of the Central Valley Flood Protection Plan

SB 5 prohibits a city or county within the Central Valley Flood Protection Plan area from approving a development agreement, a discretionary permit or entitlement, or a tentative map or parcel map for any property within a flood hazard zone unless the city or county finds, based on substantial evidence, one of the following:

- The property is protected by flood management facilities to urban levels of flood protection;
- The city or county has imposed conditions on the development that will protect the property to Central Valley Flood Protection Plan standards or;
- The local flood management agency has made adequate progress on the construction of a flood protection system that will result in flood protection equal or better than standards of the Central Valley Flood Protection Plan.

SB 5 also requires that the urban level of flood protection be achieved for urban and urbanizing areas by 2025.

Assembly Bill 70

Assembly Bill 70 (AB 70) states that local jurisdictions that approve new development in previously undeveloped areas protected by a state flood control project will share liability with the State for any flood damage that occurs to properties in new developments, unless reasonable precautions are taken to protect the development (SJC 2009).

FloodSAFE California

FloodSAFE California is a program launched in 2006 by DWR to guide the development of regional flood management plans to better identify and address flood hazards and to improve integrated flood management systems statewide with an emphasis on the Central Valley.

California Dam Safety Act

The State of California Dam Safety Act requires submittal of inundation maps to the California Office of Emergency Services (OES) for any dams for which total failure would result in loss of life or personal injury. This law also requires local jurisdictions to adopt emergency procedures for the evacuation and control of populated areas below such dams. The San Joaquin County OES has a 2003 Dam Failure Plan that includes descriptions of the dams, anticipated direction, timing and depths of floodwaters and responsibilities of the jurisdictions that would be affected (SJC 2009).

Local

Sacramento Area Flood Control Agency (SAFCA)

The Sacramento Area Flood Control Agency (SAFCA) was formed in 1989 to address the Sacramento area's vulnerability to catastrophic flooding. This vulnerability was exposed during the record flood of 1986 when Folsom Dam exceeded its normal flood control storage capacity and several area levees nearly collapsed under the strain of the storm. In response, the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District, and Reclamation District 1000 created SAFCA through a Joint Exercise of Powers Agreement to provide the Sacramento region with increased flood protection along the American and Sacramento rivers.

City of Elk Grove

The City of Elk Grove General Plan establishes goals and policies to guide both present and future development within the City's jurisdiction. Therefore, the City of Elk Grove's General Plan policies related to directly or indirectly to air quality that may apply to potential future development in the SOIA Area are provided below: The General Plan contains the following policies related directly or indirectly to hydrology and water quality that are applicable to potential future development in the SOIA Area:

- **Policy CAQ-1:** Reduce the amount of water used by residential and non-residential uses by encouraging water conservation.
- **CAQ-1-Action 1:** Implement the City's Water Conservation Ordinance.
- **CAQ-1-Action 2:** Actively encourage water conservation by both agricultural and urban water users.
- **CAQ-1-Action 3:** Work with urban and agricultural water purveyors to establish long range conservation plans which set specific conservation objectives and utilize, to the extent possible, a common planning horizon, plan framework and estimating/ forecasting procedures.
- **CAQ-1-Action 4:** Promote the use of drought-tolerant vegetation to minimize water consumption by providing information to developers and designers.
- **Policy CAQ-5:** Roads and structures shall be designed, built and landscaped so as to minimize erosion during and after construction.
- **Policy CAQ-12:** The City shall seek to ensure that the quality of groundwater and surface water is protected to the extent possible.
- **CAQ-12-Action 1:** Continue to cooperate with the County, other cities, and the Regional Water Quality Control Board regarding compliance with the NPDES permit system, and support other water quality improvement projects in order to maintain compliance with the Basin Plan.
- **CAQ-12-Action 2:** Implement the City's NPDES permit on all public and private development projects and activities.

- **CAQ-12-Action 3:** Collect information on design, construction, and operation techniques which help prevent water pollution, and provide this information to the public and the development community.
- **Policy CAQ-13:** Implement the City’s NPDES permit through the review and approval of development projects and other activities regulated by the permit.
- **Policy CAQ-14:** The city shall seek to minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and use onsite infiltration of runoff in areas with appropriate soils where the infiltration of storm water would not pose a potential threat to groundwater quality.
- **Policy CAQ-15:** The City shall encourage water supply service providers and County Sanitation District 1 to design water supply and recycled water supply facilities in a manner that avoids and/or minimizes significant environmental effects. The City shall specifically encourage the Sacramento County Water Agency to design well facilities and operation to minimize surface flow effects to the Cosumnes River.
- **Policy CAQ-16:** Future land uses that are anticipated to utilize hazardous materials or waste shall be required to provide adequate containment facilities to ensure that surface water and groundwater resources are protected from accidental releases. This shall include double containment, levees to contain spills, and monitoring wells for underground storage tanks, as required by local, state and federal standards.
- **Policy CAQ-17:** The City recognizes the value of naturally vegetated stream corridors, commensurate with flood control and public acceptance, to assist in removal of pollutants, provide native and endangered species habitat and provide community amenities.
- **Policy CAQ-18:** Post-development peak storm water runoff discharge rates and velocities shall be designed to prevent or reduce downstream erosion, and to protect stream habitat.
- **Policy CAQ-19:** Encourage the retention of natural stream corridors, and the creation of natural stream channels where improvements to drainage capacity are required.
- **CAQ-19-Action 1:** Re-vegetation using native plant species shall be encouraged; use of non-native species shall be discouraged. Use of invasive species shall be prohibited.
- **CAQ-19-Action 2:** The City shall permit stream channel realignment only:
 - When necessary to eliminate flood hazards, after alternatives to provide flood capacity while protecting the natural alignment have been shown to be infeasible; or
 - To protect and preserve natural features and vegetation which would otherwise be removed; or
 - If the existing channel has been significantly disrupted by agricultural improvements or other man-made changes.
- **CAQ-19-Action 3:** The City shall require, to the maximum extent practical, retention of topographic diversity and variation when channels are realigned or modified, including:
 - “Self-sustaining” meander characteristics,
 - Berms,

- Naturalized side slope, and
- Varied channel bottom elevation, consistent with the characteristics of the watershed, public safety, and other site-specific considerations.
- **CAQ-19-Action 4:** Where existing streams support riparian vegetation, evaluate options for constructing secondary flood control channels or other facilities for flood control and water quality purposes.
- **CAQ-19-Action 5:** Channel lowering of existing natural streams shall occur only after consideration of alternatives (including surface drainage systems which do not require channel lowering) and only when it is necessary to accommodate the gravity drainage of storm runoff and/or accommodate floodflows under existing bridge structures.
- **CAQ-19-Action 6:** All storm drainage improvements on natural streams shall be designed where feasible to maintain water flows necessary to protect and enhance existing fish habitat, native riparian vegetation, water quality, and/or ground water recharge.
- **CAQ-19-Action 7:** Improvements in watercourses shall be designed for low maintenance, and to accommodate peak flows with vegetation (including mitigation plantings) in the channel. Channel modifications shall retain marsh and riparian vegetation whenever possible.
- **CO-19-Action 8:** Development design shall maximize the total floodplain frontage that is open to public view. Development adjacent to stream corridors shall be encouraged to provide a public street paralleling at least one side of the corridor with vertical curbs, gutters, foot path, street lighting, and post and cable barriers to prevent vehicular entry.
- **CAQ-19-Action 9:** Trails along stream corridors shall be located to minimize wildlife impacts and shall be restricted to non-motorized traffic.
- **CAQ-19-Action 10:** Except where approved by the City as part of the development of a public or private development project, no grading, clearing, tree cutting, debris disposal or any other similar action shall be allowed in stream corridors except for normal channel maintenance.
- **Policy CAQ-21:** Development adjacent to a natural stream(s) shall provide a “stream buffer zone” along the stream.

“Natural streams” shall be generally considered to consist of the following, subject to site-specific review by the City:

- Deer Creek
- Elk Grove Creek
- Laguna Creek and its tributaries
- Morrison Creek
- Strawberry Creek
- White House Creek

The following are examples of desired features for this transition zone; the specific design for each transition zone shall be approved on a case-by-case basis by the City.

Stream buffer zones should generally measure at least 50 (fifty) feet from the stream centerline (total width of 100) feet or more, depending on the characteristics of the stream, and shall include:

1. Sufficient width for a mowed firebreak (where necessary), access for channel maintenance and flood control, and for planned passive recreation uses.
 2. Sufficient width to provide for:
 - a. Quality and quantity of existing and created habitat,
 - b. Presence of species as well as species sensitivity to human disturbance,
 - c. Areas for regeneration of vegetation,
 - d. Vegetative filtration for water quality,
 - e. Corridor for wildlife habitat linkage,
 - f. Protection from runoff and other impacts of urban uses adjacent to the corridor
 - g. Trails and greenbelts.
 3. The stream buffer zone should not include above ground water quality treatment structures designed to meet pollutant discharge requirements.
- **Policy SA-12:** The City opposes the construction of flood control facilities that would alter or reduce flows in the Cosumnes River and supports retention of the Cosumnes River floodplain in non-urban uses consistent with location in an area subject to flooding.
 - **Policy SA-13:** The City shall require that all new projects not result in new or increased flooding impacts on adjoining parcels on upstream and downstream areas.
 - **Policy SA-14:** The City shall give priority to the designation of appropriate land uses in areas subject to flooding to reduce risks to life and property. Construction of new flood control projects shall have a lower priority, unless land use controls (such as limiting new development in flood-prone areas) is not sufficient to acceptable levels.
 - **Policy SA-15:** Development shall not be permitted on land subject to flooding during a 100-year event, based on the most recent floodplain mapping prepared by the Federal Emergency Management Agency (FEMA) or updated mapping acceptable to the City of Elk Grove. Potential development in areas subject to flooding may be clustered onto portions of a site which are not subject to flooding, consistent with other policies of this General Plan.
 - **Policy SA-16:** A buildable area outside the 100-year floodplain must be present on every residential lot sufficient to accommodate a residence and associated structures. Fill may be placed to create a buildable area only if approved by the City and in accordance with all other applicable policies and regulations. The use of fill in the 100-year floodplain to create buildable area is strongly discouraged, and shall be subject to review to determine potential impacts on wildlife, habitat, and flooding on other parcels.
 - **Policy SA-17:** Vehicular access to the buildable area of all parcels must be at or above the 10-year flood elevation.
 - **Policy SA-18:** Creation of lots whose access will be inundated by flows resulting from a 10-year or greater storm shall not be allowed. Bridges or similar structures may be used to

provide access over creeks or inundated areas, subject to applicable local, state, and federal regulations.

- **Policy SA-19:** Discourage the number of crossings of natural creeks in order to reduce potential flooding and access problems.
- **SA-19-Action 1:** Lots or parcels which will contain two or more buildable areas on both sides of a creek or floodplain shall be discouraged.
- **Policy SA-20:** Parcels should not be created on which the presence of easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.
- **Policy SA-21:** Where necessary due to clear dangers to life or property, the City will support the construction of flood control projects.
- **SA-21-Action 1:** The City will participate through the Sacramento Area Flood Control Agency in obtaining federal authorization for construction of a backbone flood control project along the Sacramento River and the immediate connection of local internal streams to this river.
- **SA-21-Action 2:** The City will continue local efforts that encourage implementation of the Federal Flood Insurance Program.
- **SA-21-Action 3:** The City will participate with the City of Sacramento, the Army Corps of Engineers and other Federal, State and local governments and agencies to develop policies to finance, construct, and plan flood improvements to eliminate flooding in Elk Grove.
- **Policy SA-22:** New and modified bridge structures shall not cause an increase in water surface elevations of the 100-year floodplain exceeding one foot, unless analysis clearly indicates that the physical and/or economic use of upstream property will not be adversely affected.
- **Policy SA-23:** The City shall require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing Comprehensive Drainage Plans.
- **SA-23-Action 1:** As part of the review of development projects, ensure that runoff control measures are planned and provided.
- **Policy SA-24:** Drainage facilities should be properly maintained to ensure their proper operation during storms.
- **Policy PF-3:** Water supply and delivery systems shall be available in time to meet the demand created by new development, or shall be assured through the use of bonds or other sureties to the City's satisfaction.
- **PF-3-Action 1:** The following shall be required for all development projects, excluding subdivisions:
 - An assured water supply and delivery system shall be available at the time of project approval. The water agency providing service to the project may provide several

- alternative methods of supply and/or delivery, provided that each is capable individually of providing water to the project.
- All required water infrastructure for the project shall be in place at the time of project approval, or shall be assured through the use of bonds or other sureties to the City's satisfaction. Water infrastructure may be phased to coincide with the phased development of large-scale projects.
 - **PF-3-Action 2:** The following shall be required for all subdivisions to the extent permitted by state law:
 - Proposed water supply and delivery systems shall be identified at the time of tentative map approval to the satisfaction of the City. The water agency providing service to the project may provide several alternative methods of supply and/or delivery, provided that each is capable individually of providing water to the project.
 - The agency providing water service to the subdivision shall demonstrate prior to the approval of the Final Map by the City that sufficient capacity shall be available to accommodate the subdivision plus existing development, and other approved projects in the same service area, and other projects that have received commitments for water service.
 - Offsite and onsite water infrastructure sufficient to provide adequate water to the subdivision shall be in place prior to the approval of the Final Map or their financing shall be assured to the satisfaction of the City, consistent with the requirements of the Subdivision Map Act.
 - Offsite and onsite water distribution systems required to serve the subdivision shall be in place and contain water at sufficient quantity and pressure prior to the issuance of any building permits. Model homes may be exempted from this policy as determined appropriate by the City, and subject to approval by the City.
 - **Policy PF-4:** The City shall require new utility infrastructure for electrical, natural gas and other infrastructure services avoid sensitive resources, be located so as to not be visually obtrusive, and, if possible, be located within roadway rights-of-ways or existing utility easements.
 - **Policy PF-5:** The City supports the use of reclaimed water for irrigation wherever feasible.
 - **Policy PF-6:** The City shall seek to protect the quality and quantity of groundwater resources, including those which serve households and businesses which rely on private wells.
 - **Policy PF-12:** To reduce the potential for health problems and groundwater contamination resulting from the use of septic systems, the City shall take the following actions:
 - **PF-12-Action 1:** The City shall prepare and implement a public information campaign aimed at homeowners in areas with septic systems on the proper design, use, and care of septic systems.

- **PF-12-Action 2:** The City shall consider adopting Plumbing Code revisions to allow the use of updated technologies which offer an alternative to septic systems for the treatment of sewage on individual sites.

3.9.4 - Methodology

Regional and localized hydrology were reviewed for the SOIA Area, including available floodplain maps, localized drainage facilities, and groundwater data. In addition, the regional floodplain and basin management plans were reviewed.

3.9.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hydrology and water quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

- a) Violate any water quality standards or waste discharge requirements?
- b) 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)?
- c) Substantially alter the existing drainage pattern of 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 offsite?
- d) 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 offsite?
- e) 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?
- f) Otherwise substantially degrade water quality?
- g) 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?
- h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?
- i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
- j) Inundation by seiche, tsunami, or mudflow? (Refer to Section 7, Effects Found Not To Be Significant.)

3.9.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Water Quality Standards and Requirements

Impact HYD-1: **The project would not violate any water quality standards or waste discharge requirements.**

Impact Analysis

This impact evaluates water quality impacts. The proposed project proposes expansion of the City of Elk Grove's existing SOI boundary to include approximately 7,869 acres of unincorporated county land.

Approval of SOIA by LAFCo indicates that the Commission has designated the revised SOIA Area for future urbanization. The land use assumptions discussed in Section 2, Project Description, indicate that potential future growth of the SOIA Area may increase amount of waste discharge and may impact water quality. The project may indirectly result in stormwater volume increases within the SOIA Area because of the conversion of pervious surfaces to impervious surfaces.

Currently, agricultural runoff water flows from the project site. This runoff potentially contains nitrogen, phosphorus, fertilizers, pesticides, and sediment, as is evidenced by the unnaturally overgrown river channel. Hydrocarbons, grease, oil, and heavy metals from automobiles are typical runoff pollutants generated from impervious road, driveway, and parking lot surfaces. Building roofs also generate hydrocarbons from atmospheric deposition, and heavy metals from roofing materials. In addition, pesticides, and nutrients (from fertilizers and other landscape maintenance products) detergents, coliform bacteria (from pet waste), and trash are all common stormwater pollutants that can be expected from the proposed development. Although contaminants expected as a result of urban development would be partially offset by decreased agricultural runoff, indirect foreseeable water quality impacts from the proposed development would be significant.

The City of Elk Grove's Water Resources Division is responsible for drainage, flood control, stormwater quality, and long-term water and urban runoff planning within the City and would also serve any portion of the SOIA Area annexed in the future. Any construction project that will result in the disturbance of more than 1 acre is required by the SWRCB to obtain an NPDES Construction General Permit Order 2010-0014-DWQ permit prior to project initiation. As part of the NPDES permit, the project applicant must prepare and implement an SWPPP. The SWPPP must identify potential sources of pollution that are reasonably expected to affect the quality of stormwater discharges and identify, locate, and implement BMPs to ensure reduction of these pollutants during storm events. The SWPPP must include a monitoring plan for either visual or chemical monitoring depending upon the types of pollutants expected. In addition, project applicant must submit a

stormwater quality control plan for review and approval that would demonstrate adequate water quality protection during operational activities.

Mitigation Measure HYD-1 is recommended to ensure that future annexation and development activities would result in less than significant impacts.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-1 Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall demonstrate implementation of the following measures to LAFCo:

1. A Master Stormwater Pollution Prevention Plan (SWPPP) shall be prepared and submitted to the RWQCB consistent with the requirements of Construction General Permit 2009-0009-DWQ or any successor regulation that identifies specific actions and Best Management Practices (BMPs) to prevent stormwater pollution during construction activities. The SWPPP shall identify a practical sequence for BMP implementation, monitoring, and maintenance; site restoration; contingency measures; responsible parties; and agency contacts.
2. A Master Stormwater Quality Control Plan consistent with the City's Municipal Stormwater Discharge (MS4) NPDES requirements shall be submitted to the RWQCB for review and approval. The plan shall include both regional and detailed drainage plans and identify expected, site-specific pollutants and required measures to treat those pollutants before they reach the Morrison Creek stream group, Deer Creek, the Cosumnes River, or any tributaries downstream.

Level of Significance After Mitigation

Less than significant impact.

Groundwater Supplies and Recharge

Impact HYD-2: The project would not 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 that would not support existing land uses or planned uses for which permits have been granted).

Impact Analysis

This impact evaluates potential impacts on groundwater supplies and recharge. The State of California is not authorized by the California Water Code to manage groundwater. California

landowners have a correlative right to extract as much groundwater as they can put to beneficial use. In some groundwater basins, this right has been defined by the courts. Groundwater management programs have usually been developed on an ad hoc basis in response to local initiative through local agencies, adjudication, and districts formed through special legislation.

Efficient recharge from precipitation depends on a variety of conditions including large areas of permeable surfaces free from oil and grease, and relatively slow flow of water across that surface so that infiltration of water into groundwater basins can occur. The most significant groundwater recharge in Sacramento County occurs along the stream channels of the American and Cosumnes rivers. The porous soils of the Cosumnes River floodplain, the gravels of the old American River channel, and the black sands of the Mehrten formation where exposed by stream channels also provide additional important recharge. The County's Draft 2009 General Plan Conservation Element Figure-4 identifies the proposed SOIA Area as a poor area for groundwater recharge. In addition, the project site is offset from the Cosumnes River by intervening flood zones and, therefore, is anticipated to exclude any groundwater recharge areas. However, the project area currently experiences some groundwater recharge from precipitation and infiltration in the existing agricultural fields and undeveloped areas.

The proposed project proposes expansion of the City of Elk Grove's existing SOI boundary to include approximately 7,869 acres of unincorporated county land. The land use assumptions discussed in Section 2, Project Description indicate that anticipated future growth of the SOIA Area will increase amount impervious surfaces and reduce groundwater recharge. Impacts to groundwater resources would occur from extracting groundwater from the basin for use by the project and by reducing groundwater recharge with the construction of impervious development. Increased development reduces the amount of permeable surfaces suitable for recharge, increases runoff and the subsequent flow of water in streams, and increases the amount of oil and grease and other non-point source pollutants that enter streambeds and other recharge areas. The extraction of groundwater without recharge can lead to land subsidence that can necessitate the construction of levees, dikes, and flood control facilities to protect properties from flooding.

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

The SOIA Area lies within the Central Sacramento County Groundwater Basin (Central Basin). The Sacramento Central Groundwater Authority (Authority)—through a Joint Powers Agreement (JPA) signed by the cities of Elk Grove, Folsom, Rancho Cordova, and Sacramento, and the County of

Sacramento—manages the Central Basin. The Central Basin is not adjudicated and is not considered to be in overdraft according the DWR Bulletin 118 (DWR, 2011).

Existing water demands from the Groundwater Sub-basin are unknown. Ultimate water demands within the entire Groundwater Sub-basin will be dependant on the type, density, intensity, and components of future projects within the SOIA Area, and forecasts the potential demand volume would vary according to the range of assumptions that may be used to forecast demand. However, as shown in the Environmental Setting, common agricultural crops consume between approximately 700,000 gallons and 915,000 gallons per acre per year. The per-acre consumption of residential land uses would depend on the total number of units and average persons-per-household. However, residential land uses within the region consume an average of 63,510 gallons per capita per year. Future development indirectly resulting from the proposed project may result in an increased consumption volume over what is currently drawn from the groundwater basin. It is logical to assume that future urban uses may include landscaping, detention ponds, and open channel swale that would maintain local recharge capabilities. Therefore, this is a potentially significant indirect impact. Mitigation Measure HYD-2 is recommended to ensure that future annexation and development activities would result in less than significant impacts.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-2 Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove demonstrate provide a Plan for Services that demonstrates that sufficient, sustainable potable water supplies adequate for projected demand needs are available and would not result in depletion of groundwater quantities greater than that under the without project baseline.

Level of Significance After Mitigation

Less than significant impact.

Drainage

Impact HYD-3: The proposed project would not increase impervious surface coverage, which may result in increased stormwater runoff volumes and peak flows.

Impact Analysis

This impact addresses the potential for development activities to increase runoff and susceptibility to downstream flooding and/or erosion that is due to increased volumes or peak flows.

No immediate, direct impacts would occur to the existing drainage conditions. The land use assumptions discussed in Section 2, Project Description, indicate that anticipated future growth of the SOIA Area would increase the amount of impervious surfaces and may alter drainage patterns

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resulting in increased stormwater runoff. Because the project may result in an indirect and reasonably foreseeable substantial increase in impervious surfaces, impacts would be potentially significant. Therefore, Mitigation Measure HYD-3 is recommended to ensure that future annexation and development activities would result in less than significant impacts. Implementation of Mitigation Measure HYD-3 would avoid and minimize the potential impact and would result in a less than significant impact.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-3 Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall prepare a Master Drainage Plan for the SOIA Area, and require site-specific drainage plans for future projects to conform to requirements of the master drainage plan. Individual projects shall prepare a detailed drainage plan that demonstrates attainment of pre-project runoff requirements prior to release at the outlet canal and describes the volume reduction measures and treatment controls used to reach attainment. The drainage plan shall identify all expected flows from the project area and the location, size, and type of facilities used to retain and treat the runoff volumes and peak flows to meet pre-project conditions. The Master Drainage Plan shall also include the geotechnical report verifying groundwater elevation for the regional basins.

Level of Significance After Mitigation

Less than significant impact.

Flood Hazards

Impact HYD-4: **The proposed project would not place structures within a 100-year flood hazard area that may have the potential to divert flood flows or to be subjected to flood hazard.**

Impact Analysis

This impact evaluates the potential for the proposed project to locate structures within a flood hazard area. Westernmost portions of the proposed SOIA Area lie within the 100-year flood zone. As such, those areas are also located with in the 200-year and 500-year floodplain.

The land use assumptions discussed in Section 2, Project Description, indicate that anticipated future growth of the SOIA Area may place structures in a 100-year flood zone.

Because the project may result in an indirect and reasonably foreseeable urbanization of the SOIA Area, impacts would be potentially significant. Mitigation Measure HYD-4a is recommended to

ensure that future annexation and development activities would result in less than significant impacts for placing structures within a 100-year floodplain.

In addition, the project may result in an increase in impervious surfaces, as discussed in Impact HYD-3. Therefore, the project may indirectly result in an exacerbation of future flooding by increasing potential flood heights downstream. Increased impervious surfaces may affect downstream areas, especially the Beach-Stone Lakes basin and the Pleasant Point sub-area. As discussed in the Environmental Setting, flooding typically occurs in the Beach-Stone Lakes basin every year, with severe floods occurring about once every 3 years. Mitigation Measure HYD-4b is recommended to ensure that future annexation and development activities would result in less than significant impacts to downstream locations in respect to diverting flood flows.

Implementation of Mitigation Measures HYD-4a and HYD-4b would reduce the potential effect to less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-4a Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall prepare a local plan of flood protection that shows the following for land within the SOIA Area: identification of all types of flood hazards (levee failure inundation, 100-year storm flooding, 200-year storm flooding and 500-year storm flooding), and locations of flood management facilities. The City will not approve any discretionary permit or entitlement, or any ministerial permit that would result in the construction of a new residence; any tentative map, or any parcel map for which a tentative map was not required; or enter into development agreement for projects located within a 200-year flood zone, unless the City makes one of the following findings based on substantial evidence (as stated in Section 65865.5 of the California Government Code):

1. The facilities of the State Plan of Flood Control or other flood management facilities protect the property to the urban level of flood protection in urban and urbanizing areas or the national Federal Emergency Management Agency standard of flood protection in nonurbanized areas.
2. The City has imposed conditions on the development agreement that will protect the property to the urban level of flood protection in urban and urbanizing areas or the Federal Emergency Management Agency standard of flood protection in nonurbanized areas.
3. The local flood management agency has made adequate progress on the construction of a flood protection system that will result in flood protection

equal to or greater than the urban level of flood protection in urban or urbanizing areas or will meet the Federal Emergency Management Agency standard of flood protection in nonurbanized areas for property located within a flood hazard zone, intended to be protected by the system.

MM HYD-4b Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall demonstrate for land within the 100-year floodplain (to be identified by hydraulic and hydrologic modeling), that development will not result in an increase in floodwater surface elevations within or downstream of the SOIA Area.

Level of Significance After Mitigation

Less than significant impact.

Levee or Dam Failure

Impact HYD-5: **The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam.**

Impact Analysis

This impact addresses flooding from levee or dam failure.

There are four major and two minor dams that, if they fail, may impact the people and resources of Sacramento County. The major dams are the Shasta Dam on the Sacramento River, the Oroville Dam on the Feather River, the Comanche Dam on the Mokelumne River, and the Folsom Dam on the American River. The minor dams include the Nimbus and Rancho Seco.

Folsom Dam (including the earth-filled dikes) would have the greatest impact on the population of Sacramento County should it fail. The floodwaters from this system would affect the cities of Sacramento and Folsom and the surrounding unincorporated area. The westernmost portion of the proposed SOIA Area, adjacent to and west of Franklin Boulevard, lies within the impacted area. The 2009 Draft County of Sacramento General Plan Safety Element Background Report states that the Flood Operations Branch, Department of Water Resources, State of California, believes that the American River Channel will not flood unless the levees fail or there is a catastrophic release. The Sacramento Municipal Utility District (SMUD) inundation map indicates that a failure of the Rancho Seco Dam would flow to the Laguna Creek Basin and stop approximately at Stockton Boulevard. Failure of Shasta Dam would affect populations south along the Sacramento River basin to about Knights Landing, where any flooding activities are projected to lessen and lose momentum. An Oroville Dam failure would impact populations southwest along the Feather River basin to about the Yolo Bypass. Sacramento County would not be affected unless all dams fail at once. A failure at Comanche Dam would affect the Delta and possibly slow the flow of other rivers through the Delta.

The General Plan further notes that the Bureau of Reclamation indicated the water would stop short of the Sacramento-San Joaquin County line at Interstate 5.

The proposed SOIA would not result in physical development that would result in new impacts due to levee or dam failure. Because of adherence to federal and state dam safety and structural requirements, the likelihood of dam failure is considered extremely low. In addition, in response to the risk, the FloodSAFE California program is guiding development of regional flood management plans to improve integrated flood management systems, particularly in the Central Valley. Therefore, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

