

4.5 HYDROLOGY, WATER QUALITY AND DRAINAGE

4.5.1 Introduction

This section describes the existing hydrology, water quality, and drainage of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed McKinley Village Project (proposed project). The potential for both localized and regional flooding to occur and emergency evaluation in the event of a regional flood event are also evaluated.

In response to the Notice of Preparation (NOP), comments were received regarding the potential exposure of the project site to flood hazards, and the potential effects of the project on off-site flood hazards. Specific areas of concern included effects of a catastrophic flood event or levee failure, and the ability to safely evacuate the site, the potential effects of creating underpasses beneath the Union Pacific Railroad (UPRR) right-of-way (ROW), which provides secondary flood protection, and the manner in which proposed flood gates would be operated, and the project's impacts to the sewer and storm drain system. All of these concerns are addressed in this section.

A copy of the NOP and letters received in response to it are included in Appendix A. A copy of the project's Storm Drainage Master Plan is included in Appendix J.

Information to prepare this section was obtained from the Sacramento 2030 General Plan (City of Sacramento 2009a), the Sacramento 2030 General Plan Master EIR (MEIR) (City of Sacramento 2009b), and the drainage and sewer system technical memos that were prepared for the project by Wood Rogers (2013a, 2013b). In addition, public agency information sources were consulted to gather site-specific information; these include Federal Emergency Management Agency (FEMA) flood hazard zones, U.S. Department of Agriculture (USDA) soil surveys, and Central Valley Regional Water Quality Control Board (CVRWQCB) data on water quality, water quality objectives, and impaired water bodies.

4.5.2 Environmental Setting

Regional Hydrologic Context

The City of Sacramento (City) is located within the Sacramento River Basin at the confluence of two major rivers: the Sacramento River and the American River. The Sacramento River Basin (which includes the drainage area of the American River) is composed of approximately 27,000 square miles, and is bound by the Sierra Nevada mountain range to the east, the Coast range to the west, the Cascade range and Trinity Mountains to the north, and the Sacramento–San Joaquin Delta (Delta)/Central Sierra Nevada area to the south.

The project site is within the American River watershed, which encompasses approximately 1,900 square miles and is a tributary to the Sacramento River. The American River watershed is situated on the western slope of the Sierra Nevada mountain range, extending from the spine of the Sierra Nevada westward to the City of Sacramento. The American River watershed climate is temperate and is characterized by wet winters and dry summers; 95% of the annual precipitation occurs between November and April as both rain and snow at higher elevations. The river is regulated by dams, canals, and pipelines for power generation, flood control, water supply, recreation, fisheries, and wildlife management. Folsom Dam, located on the American River, is owned and operated by the U.S. Bureau of Reclamation. Folsom Lake and its afterbay, Lake Natoma, release water to the lower American River and to the Folsom South Canal. The operation of Folsom Dam directly affects most of the water utilities on the American River system (City of Sacramento 2009b).

Major storm events can produce high flows throughout the Sacramento and American River systems. Flood control facilities along these rivers consist of a comprehensive system of dams, levees, overflow weirs (diversion structures intended to ensure that flows in the river do not exceed an identified maximum level), drainage pumping plants, and flood control bypass channels. The flood control network seeks to control water flows by regulating the amount of water passing through a particular reach of the river. Urban runoff flows are directed into this system by the City via two systems: (1) conveyance to the Sacramento River and American River through sumps, pipelines, and treatment facilities; or (2) conveyance by the City's Combined Sewer Service System (CSS), along with sewage to the Sacramento Regional Wastewater Treatment Plant (SRWTP) located near Elk Grove.

Surface Water Hydrology

Hydrologic Features

The closest permanent surface water feature to the project site is the American River. The project site is located approximately 0.25 mile to the southwest of the American River, and about 3 miles southeast of its confluence point with the Sacramento River. The site historically was underlain by a slough of the American River along the southern edge and northeastern portion of the parcel, within the former floodplain of the American River. However, since the construction of the levee system in the 1950s, the site no longer receives overland flows from the river.

Drainage and Stormwater Runoff

The approximately 48.75-acre property ranges in elevation from approximately 14 feet above mean sea level (AMSL) on the west side of the property to approximately 27 feet AMSL on the east side of the property (Wood Rodgers 2013a). Slopes on site are generally flat, with a slope

gradient of less than 1%.¹ However, slopes can be as high as 50% percent in small localized areas due to constructed slopes such as the sides of the railroad embankment and the fills supporting the eastern approach to the A Street Bridge. As shown in Figure 4.5-1, Flood Hazard Zones and Topography, the topography of the site is fairly unusual in that it is surrounded on all sides by raised earth; either due to the UPRR embankment to the south or the former 28th Street Landfill (Sutter's Landing Regional Park) to the north.

The project site is essentially an internally drained closed basin. Under existing conditions, stormwater runoff within the project site flows to the west and collects in the lowest portion of the basin where it either evaporates or infiltrates into the ground. There is little to no stormwater run-on from off site since adjacent areas drain to other locations. When the volume of stormwater runoff accumulating in the basin exceeds the rates of infiltration and evaporation, water begins to pond on the site. The soil on the western part of the site is mapped by the USDA as the Columbia sandy loam and characterized as occasionally flooded and somewhat poorly drained (USDA NRCS 2013). Accordingly, during the rainy season, the lowest portion of the site (the western part) can temporarily pond following high rates of rainfall.

Surface Water Quality

The Sacramento and American rivers have been classified by the CVRWQCB as having numerous beneficial uses, including providing municipal, agricultural, and recreational water supply. Other beneficial uses include freshwater habitat, spawning grounds, wildlife habitat, navigation on the Sacramento River, and industrial uses on the American River (CVRWQCB 2010). Ambient water quality in the Sacramento and American rivers is influenced by numerous natural and artificial sources, including soil erosion, discharges from industrial and residential wastewater plants, stormwater runoff, agriculture, recreation activities, mining, timber harvesting, and flora and fauna (City of Sacramento 2009b). The reaches of the Sacramento and American rivers that flow through the Sacramento urban area are considered impaired for certain fish consumption and aquatic habitat and are listed on the U.S. Environmental Protection Agency (U.S. EPA)-approved Section 303(d) list of water quality limited segments. The Sacramento River is listed as impaired under the 303(d) list for chlordane, DDT, dieldrin, mercury, polychlorinated biphenyl (PCBs), unknown toxicity, and diazinon, and the American River is listed for mercury, PCBs and unknown toxicity (SWRCB 2010).

The CVRWQCB has primary responsibility for protecting the quality of surface and groundwater within the City. The CVRWQCB's efforts are generally focused on preventing either the introduction of new pollutants or an increase in the discharge of existing pollutants into bodies of water that fall under the CVRWQCB's jurisdiction. The CVRWQCB is concerned with all

¹ The slope in percent is expressed as the ratio of the elevation gain over a specific distance, multiplied by 100.

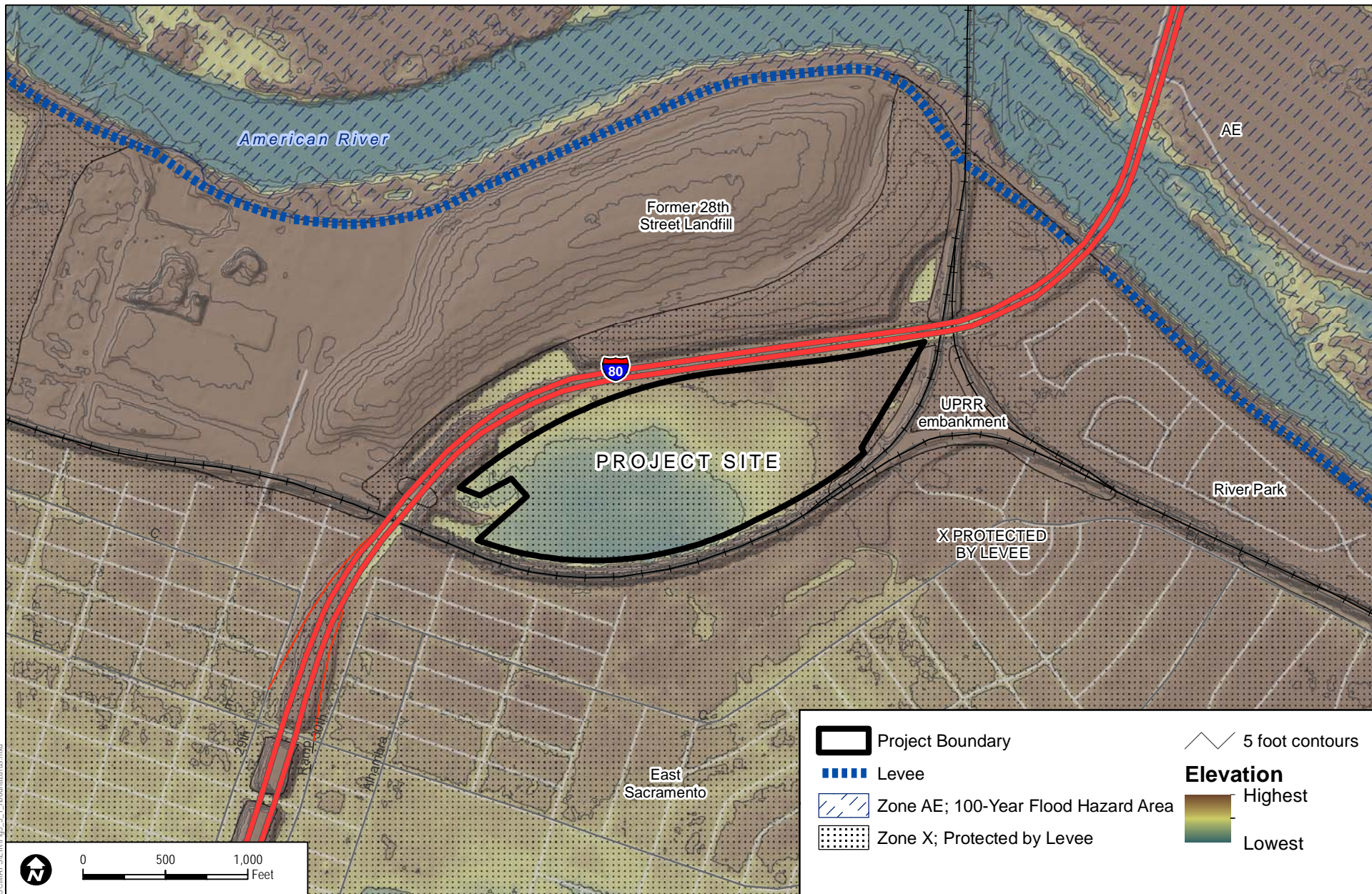
potential sources of contamination that may reach both these subsurface water supplies and rivers through direct surface runoff or infiltration. The City of Sacramento has received a municipal National Pollutant Discharge Elimination System (NPDES) permit from the CVRWQCB. Under this permit, the permittees are required to develop, administer, implement, and enforce a comprehensive Stormwater Quality Improvement Plan (SQIP) in order to reduce pollutants in urban runoff to the maximum extent practicable. The SQIP emphasizes all aspects of pollution control, including, but not limited to, public awareness and participation, source control, regulatory restrictions, water quality monitoring, and treatment control. The permitting framework is further discussed in the Regulatory Setting.

American River and other Receiving Waters

Based on current water quality reports, the American and Sacramento rivers are both excellent supplies for drinking water. These rivers can be treated to meet all 22 CFR Chapter 15 drinking water standards using conventional and direct filtration processes, as well as newer membrane technologies. There are no persistent constituents in the raw waters that require additional treatment processes (City of Sacramento 2009b). In addition, the Sacramento River water is considered to be of good quality, although higher sediment loads and extensive irrigated agriculture upstream of Sacramento tends to degrade the water quality. During the spring and fall, irrigation tailwaters are discharged into drainage canals that flow to the Sacramento River. In the winter, runoff flows over these same agricultural areas. In both instances, flows are highly turbid and introduce large amounts of herbicides and pesticides into the drainage canals, particularly rice field herbicides in May and June. The turbidity (i.e., clarity) of the river is changed from relatively clear to turbid from sediment laden discharges.

Urban Stormwater Runoff

Constituents found in urban runoff vary as a result of differences in rainfall intensity and occurrence, geographic features, the land use of a site, as well as vehicle traffic and percent of impervious surface. In the Sacramento area, there is a natural weather pattern of a long dry period from May to October. During this seasonal dry period, pollutants contributed by vehicle exhaust, vehicle and tire wear, crankcase drippings, spills, and atmospheric fallout accumulate within the urban watershed. Precipitation during the early portion of the wet season (November to April) washes these pollutants into the stormwater runoff, which can result in elevated pollutant concentrations in the initial wet weather runoff. Stormwater runoff on the project site would not resemble typical urban stormwater runoff because the site is currently vacant and undeveloped.



SOURCE: ESRI 2013; County of Sacramento 2013

FIGURE 4.5-1

Flood Hazard Zones and Topography

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In general, stormwater runoff within the City of Sacramento flows into either the City's CSS or into individual drainage pump stations located throughout the City which discharge to creeks and rivers. The CSS is considered at or near capacity and requires all additional inflow into the system to be mitigated. During dry weather, approximately 32 million gallons per day (mgd) are transported to the Sacramento Regional County Sanitation District's (SRCSD) SRWTP. For smaller storms, the City sends up to 60 mgd of wastewater to the SRWTP, which treats stormwater and sanitary sewage prior to discharge into the Sacramento River. When the flows in the CSS exceed 60 mgd, flows are routed to Pioneer Reservoir, a 22-million-gallon storage and primary treatment facility adjacent to the Sacramento River just north of the Pioneer Bridge (U.S. Highway 50). Once capacity of Pioneer Reservoir has been met, additional volume of up to 250 mgd receives primary treatment with disinfection and is discharged into the Sacramento River (City of Sacramento 2009b).

The City also operates its Combined Wastewater Treatment Plant (CWTP), where an additional 130 mgd of combined wastewater receives primary treatment with disinfection prior to discharging to the Sacramento River. The system may also store water in the CWTP basins. Under extreme high flow conditions, discharge of untreated combined wastewater from the CSS may occur. The City's NPDES permit regulates waste discharge requirements from the CSS (NPDES No. CA0079111), as well as operation of the CSS. All piping, drains, basins, and pumps connected to the CSS are maintained and operated by the City of Sacramento Department of Utilities (DOU).

As indicated above, stormwater runoff on the project site accumulates in a closed basin and therefore does not discharge to either stormwater collection system. However, once the project is constructed, stormwater would be pumped to Sump 99 and eventually discharged into the American River.

Flood Hazards

High water levels along the Sacramento and American rivers are a common occurrence in the winter and early spring. The low-lying landscape of the Sacramento area, with the convergence of two large river systems, has historically made the area susceptible to flooding. An extensive system of dams, levees, overflow weirs, drainage pumping plants, and flood control bypass channels are located on the Sacramento and American rivers to protect the area from flooding. Additionally, flows on the American River can be controlled at the Folsom and Nimbus dams. In the City of Sacramento's past, floods have been the most frequent and considerable natural hazard affecting the local environment and economy. Three different types of flood events occur in the Sacramento area: flash, riverine, and urban stormwater. All of the flood types typically result from severe weather and heavy rainfall, either in the City or in areas upstream of the City (i.e., the Sacramento River watershed in the northern portion of the valley and to the east in the Sierra Nevada).

Flood conditions may be due to high amounts of localized rainfall, but are usually due to high water volumes being released from the Sierra and Cascade Mountain watersheds. The water released is typically in the form of springtime snowmelt, and/or combined with heavy rain falls. California, and specifically the Sacramento area, has also experienced high river flows due to the effects of a “pineapple express.” These are conditions that bring warmer Pacific tropical rain into the mountains that combine copious warm rainfall with the excess snowmelt runoff from the warmer rains. While recent storms in 1986 and 1997 resulted in significant flood events in the Sacramento area, scientists predict that current global warming trends may be changing the pattern of precipitation to more rain instead of snow. This trend brings the threat of significant river runoff events and flood conditions (City of Sacramento 2008).

Regulatory Flood Zones

Floodplains are illustrated on inundation maps produced by FEMA, which show areas of potential flooding and water depths. The floodplain is most often referred to as the area that is inundated by a 100-year flood event. A 100-year flood event has a 1% chance of being equaled or exceeded in any given year. An area within a designated 100-year floodplain may have substantially less protection and be susceptible to flooding on a regular basis; however, the 100-year flood protection is a requirement for most construction within floodplains. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

As shown in Figure 4.5-1, the project site is outside of the 100-year flood hazard zone (Zone AE), but within Zone X, which is defined as areas that are protected from the 100-year flows by levees (FEMA 2012). The project site has the same level of flood protection as existing Sacramento neighborhoods such as McKinley Park, East Sacramento, River Park, Midtown, and Downtown, which are all protected by the certified flood control levee on the south bank of the American River, shown in Figure 4.5-1. Because the project site is within a FEMA designated Zone X, no flood insurance is required. However, because there remains residual risk of flooding from catastrophically large floods (such as a 500-year flood), levee breaks, or dam failures, the City actively encourages residents in flood-prone areas, even if outside of a regulatory flood zone, to purchase optional flood insurance (i.e., preferred risk policy).

Folsom Dam and American River Levee Status

The volume of water flowing through the Sacramento levee system is primarily controlled by Folsom Dam on the American River, approximately 20 miles east of the project site, and the reserve overflow area of the Yolo Bypass on the Sacramento River.

Folsom Dam was completed in 1956 and was designed to provide flood control for Sacramento up to a 500-year storm (a storm with a 0.2% chance of occurring in any given year). However,

after the dam became operational, a series of record storms and flood flows resulted in a reevaluation of the dam's design flood capacity. In 1986, Folsom Dam's performance was downgraded to an approximately 60-year storm (1.67% chance of occurring in any given year). An initial reconnaissance report, "American River Investigation," January 1988, concluded that Folsom Dam and the American River levees were only capable of handling a 70-year flood event. Nevertheless, during the February 1986 event, the levees contained a volume of water generated by an 80-year to 100-year storm event with only localized flooding (City of Sacramento 2009b).

In the wake of the 1986 storm, efforts were undertaken to reduce the Sacramento area's vulnerability to catastrophic flooding. In 1989, the Sacramento Area Flood Control Agency (SAFCA), a joint powers agency established by the City of Sacramento, Sacramento County, Sutter County, the American River Flood Control District (ARFCD), and Reclamation District 1000 (RD-1000), was formed with the goal of ensuring that at least 100-year flood protection was achieved for the area. Ultimately, SAFCA's plan is to reach 200-year flood protection, pursuant to the provisions of Senate Bill 5 (City of Sacramento 2009b).

In 1994, SAFCA and the U.S. Bureau of Reclamation agreed to adjust and coordinate operations at Folsom Dam so that upstream reservoirs could assist in flood control measures. Congress approved funding for American River levee improvements in 1996 and also approved additional funding for flood control projects, including the enlargement of the outlets on Folsom Dam, in 1996. Congress authorized funding to raise the height of Folsom Dam in the Energy and Water Development Appropriations Act of 2004. Due to the rapidly rising cost of construction, the project design, now called the Folsom Dam Joint Federal Project, has been revised to raise the height of the dam and include a spillway for flows greater than the dam outlets can currently handle. Construction on the revised spillway design began in December 2007 and is expected to be completed in 2015.

In August 2012, the U.S. Army Corps of Engineers (ACOE) declared the City of Sacramento and 15 other areas to have failed federal maintenance criteria (Weiser 2012). The primary issue, according to the ACOE, involved encroachments onto the levees that hinder the ability to access and maintain them. This includes many locations where homes, swimming pools, fences, and other structures are built too close to the levee, or in some cases, on the levee itself. The Central Valley Flood Protection Plan released by the Department of Water Resources, according to the ACOE, did not go into sufficient detail on how encroachments on the American and Sacramento rivers would be addressed. The implication of this is that the Sacramento area may not have access to emergency funds from the ACOE to repair damaged or breached levees in the event of a major flood event. However, other sources of recovery money are available, including state and local levee agencies and congressional appropriation. So the loss of funding from the ACOE does not mean damaged levees won't be repaired in the event of a break. In August 2013, Reclamation District 1000 (which operates and manages the

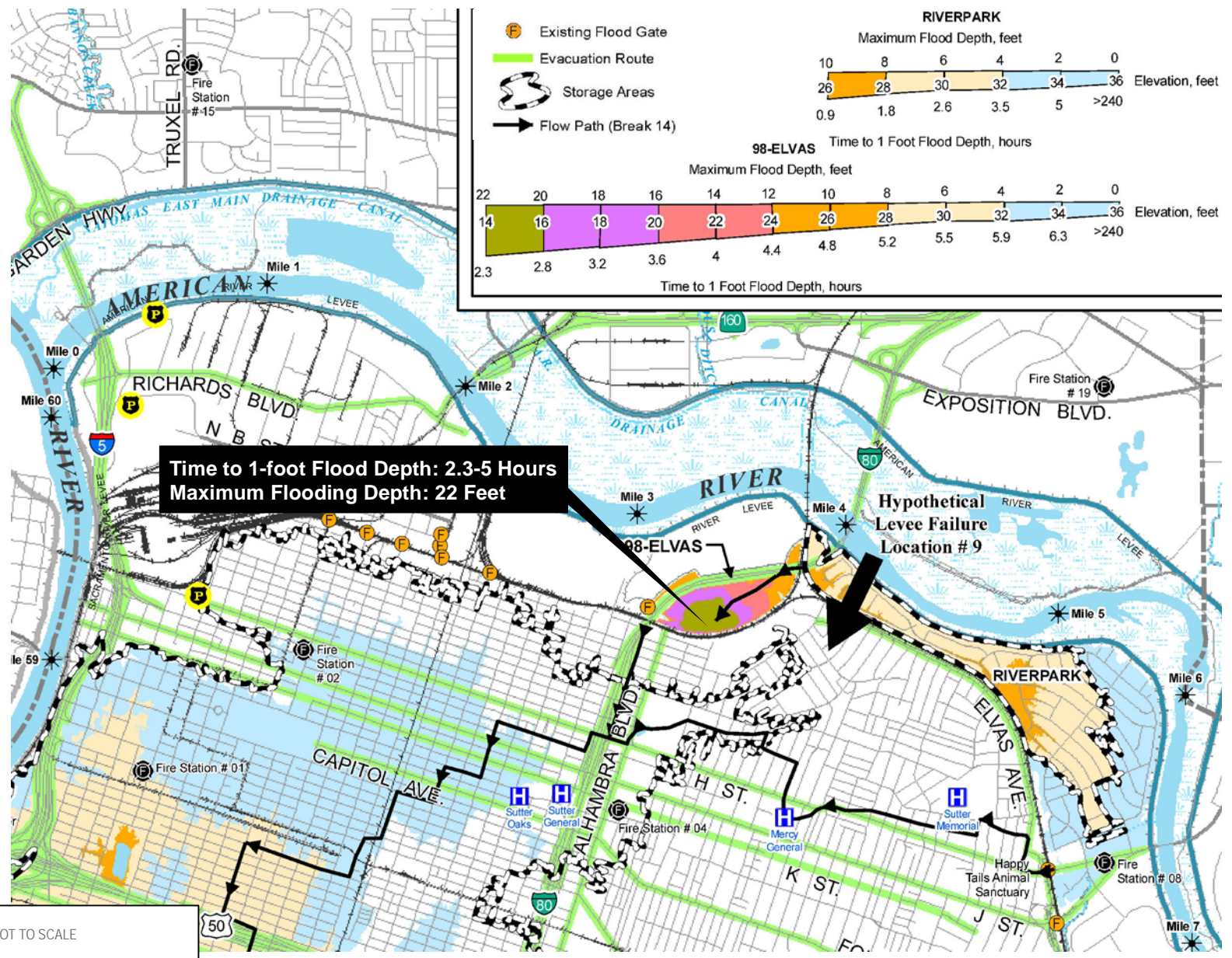
levees protecting the Natomas Basin) had its levee certification restored by sending the ACOE a letter of intent to rectify encroachment issues; the ARFCD will soon be sending the ACOE its own letter of intent (Weiser 2013).

These actions by the ACOE are separate from the 100-year flood certification issued under FEMA, and as discussed above, the project site is in FEMA Zone X where no flood insurance is required. However, FEMA uses ACOE data to decide whether a community should be stripped of its 100-year flood certification. It is expected that FEMA will undertake a remapping effort in 2014. The primary points of contention—levee encroachments—are not as great an issue for the portion of the American River levee in the area that protects the project site (i.e., along and west of River Park); the main problem areas are in Natomas and Knights Landing. Furthermore, levee improvement projects are ongoing and have recently received increased funding, including additional funds for the Folsom Dam Joint Federal Project, as well as levee improvements in Sacramento (Matsui 2013). These are projects, such as filling gaps in the cut off walls within the levees along the American River that will help SAFCA reach its goal of 200-year flood protection.

Union Pacific Railroad Embankment and Flood Gates

The UPRR embankment, which is to the south and east of the project site, is not a certified levee. While the embankment functioned as a levee prior to the construction of the American River levees in the early 1950s, it does not meet current ACOE levee design criteria. Nevertheless, the City of Sacramento identifies the UPRR embankment (from approximately 7th Street in downtown Sacramento to approximately 14th Avenue in the Power Inn area) as a secondary flood control facility. This is because the embankment would slow the flow of floodwaters in the event of an American River levee failure, providing additional time for evacuation of at-risk areas.

Because of its ancillary benefit for the purposes of flood control, the City of Sacramento has required flood gates on streets that penetrate the UPRR embankment. Flood gates are defined here as flood control structures that can be used to seal off openings in the embankment in the event of a levee break. These can consist of hinged metal gates, A-frame, or stop log structures, which are beams inserted in grooves cast in a channel wall. The City of Sacramento DOU maintains and operates all flood gate structures on the UPRR embankment. There are a number of streets that penetrate the UPRR embankment including H Street, J Street, Interstate 80 (Capital City Freeway), and Folsom Boulevard, each of which has flood gates or stop logs. All flood gates (except the 7th Street roadway underpass and the bike–pedestrian underpass at Sacramento State University) are shown in Figures 4.5-2 and 4.5-3 (Levee Breach Scenarios). A recent example of a flood gate is the 7th Street extension between Downtown and the Richards Boulevard area, where a flood gate structure was constructed in conjunction with that underpass.



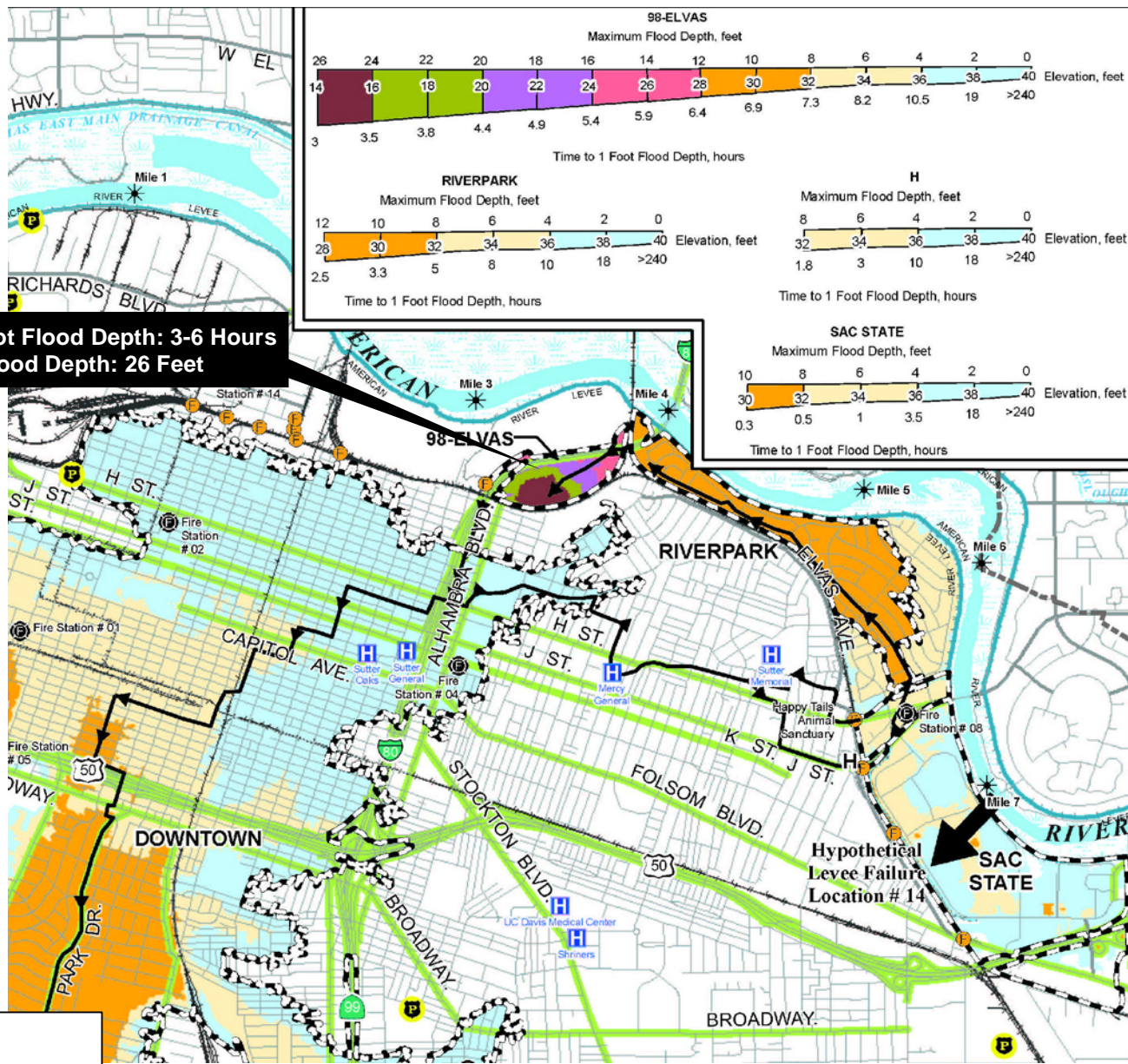
NOT TO SCALE

SOURCE: Wood Rodgers 2013

FIGURE 4.5-2
Levee Breach Scenarios

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**Time to 1-foot Flood Depth: 3-6 Hours
Maximum Flood Depth: 26 Feet**



NOT TO SCALE

SOURCE: Wood Rodgers 2013

7828-01

MCKINLEY VILLAGE PROJECT EIR

**FIGURE 4.5-3
Levee Breach Scenarios**

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The closest flood gate to the project site is adjacent to its northeastern border and crosses the Capital City Freeway.

The existing gates are manually operated; most take about a half an hour to 2 hours to shut and require city workers to either close large steel doors or place heavy boards into steel slots or against metal frames; some of the gates are longer and require more time (e.g., up to 4 hours) to erect (City of Sacramento 2006). The gates are then sealed with sandbags and/or plastic sheeting. These materials are stored with some gates in adjacent vaults, but in other cases must be transported from storage yards. City transportation crews hold drills each fall to stay skilled at operating the gates as swiftly as possible. The flood gate adjacent to the site crossing the Capital City Freeway several hundred feet northeast of the A Street Bridge is an A-frame type floodgate that would take City crews approximately 4 hours to install (City of Sacramento 2006). The gates would be closed by both the Public Works, and the field services division of the DOU, according to standard operating procedures.

Levee Breach

The City and County of Sacramento have prepared detailed maps showing hypothetical levee breaks, inundation levels, and the time it would take for waters to rise in affected neighborhoods, and rescue and evacuation zones (Wood Rodgers 2009). Each sample levee break location represents a hypothetical failure along that general stretch of levee. They do not depict known weak points or other issues that suggest a break would occur there versus anywhere else along the levee.

The levee breaks that were modeled and are closest to the proposed project are Scenario No. 9, which models a levee break immediately to the east of the freeway crossing (see Figure 4.5-2), and Scenario No. 14, which models a levee break about 4 miles upstream within the Sacramento State University campus (see Figure 4.5-3). With respect to the project site, these scenarios are the worst-case scenarios due to their proximity to the project site and the speed with which floodwaters would arrive. Under Scenario No. 9, floodwaters would first inundate the River Park neighborhood. Starting about 2.3 hours after the levee breach, floodwaters would begin to inundate the project site with 1 foot of water at the lowest elevation. Thereafter, floodwaters would slowly fill the project site to as deep as 22 feet before project grading (18 feet after project grading) after about 12 hours. Under Scenario No. 14, floodwaters would first inundate the Sacramento State campus and the River Park neighborhood. Starting about 3 hours after the levee breach, floodwaters would begin to inundate the project site with 1 foot of water at the lowest elevation. Thereafter, floodwaters would slowly fill the project site to as deep as 26 feet before project grading (22 feet after project grading) after about 14 hours.

Dam Failure

There is a continuum of threat conditions that face Sacramento. On the one extreme lies the threat of a worst-case catastrophic flood event. This scenario involves a catastrophic failure of the Folsom Dam that would allow for hundreds of thousands of cubic feet of water to cascade down the American River toward Sacramento. Such large amounts of water would easily overflow the levees and inundate contiguous areas along the levee. In such a case, rapid notification and activation of evacuation strategies would be critical for the safety of Sacramento's citizens. In this worst-case scenario, the attempt would be to evacuate as many persons as possible to safety, while simultaneously calling upon local, state, and federal mutual aid resources to begin mobilizations for rescue operations support (City of Sacramento 2008).

While not as severe in consequences, a catastrophic release of the Oroville Dam on the Feather River and the Shasta Dam on the Sacramento River would also allow for rapidly rising water levels along Sacramento's two rivers. Note that the Feather River and Yuba River have their confluence with the Sacramento River north and upriver of the City of Sacramento. In all cases, however, there is some time to react to the situation before the City must switch from evacuation procedures and into a rescue mode (City of Sacramento 2008).

Dam failure could occur under three conditions: earthquake, structural instability, or rainfall in excess of the dam's holding capacity. Table 4.5-1 indicates that should the Folsom Dam fail, floodwater would arrive in the City of Sacramento within 8 hours (City of Sacramento 2008). These estimates and arrival times assume full catastrophic failure of the dam, which is extremely unlikely considering dam safety regulations and existing projects to improve the holding capacity and reliability of the dam. State law requires local jurisdictions to adopt emergency procedures to address emergencies including dam failure and flooding.

**Table 4.5-1
Catastrophic Dam Failure — Time for Inundation Flood Waters to Reach Sacramento**

Dam	River	Time to reach Sacramento
Folsom	American	8 Hours
Oroville	Feather	40 Hours
Shasta	Sacramento	60 Hours

Source: City of Sacramento 2008.

Groundwater

The project site is located within South American Groundwater Sub-basin of the larger Sacramento Valley Groundwater Basin, as delineated in the California Department of Water Resources (DWR) Bulletin 118 (DWR 2004).

Groundwater Levels and Subsurface Flow

The project site is located in the Sacramento River Hydrologic Basin. The groundwater basin's beneficial uses are designated as domestic, municipal, and irrigation supply. Groundwater within the City of Sacramento is currently utilized for irrigation purposes (DWR 2004). According to the City of Sacramento Design and Procedures Manual, certain areas of the City including, but not limited to, Natomas and the Pocket Area are subject to high groundwater elevations which are dependent on the river stages, canal elevations, seasonal rainfall, irrigation activities, releases from upstream reservoirs, etc. The groundwater elevations can have large annual variations and be near the surface during wet winters when the river stage remains high (City of Sacramento 2008).

Consistent with the general information above, groundwater on the project site appears to be relatively shallow, under semi-confined conditions, and responsive to seasonal changes in flow on the American River, suggesting at least partial subsurface hydrological connectivity to the American River (EKI 2013; WKA 2006; and Geosyntec 2013, included as Appendix M). As part of corrective actions and ongoing monitoring associated with deactivation of the former 28th Street Landfill north of the project site, the City of Sacramento was required to install two side-by-side groundwater monitoring wells on the project site (see Section 4.4, Hazards and Public Safety). Recent data from the on-site groundwater monitoring wells indicate that first groundwater is present at an elevation of 5.60 feet AMSL, or approximately 20 feet below ground surface (bgs). Drill logs for these wells show that groundwater was first encountered at a depth of approximately 27 feet bgs, indicating confined groundwater conditions may exist at the site. Groundwater monitoring performed at the former 28th Street Landfill indicates that groundwater beneath the site flows primarily in a southerly direction (Geosyntec 2013, included as Appendix K). In addition, geotechnical work on the project site also found shallow groundwater levels between 6 and 18 feet bgs in 24 of the 40 borings drilled (WKA 2006). The authors of the geotechnical report suggested that, under pre-project grading conditions, groundwater may seasonally approach site surface elevations and could account for at least some of the water that temporarily ponds on the western part of the site during the rainy season.

Groundwater Quality

Groundwater quality in the Sacramento area is generally within the secondary drinking water standards for municipal use, including levels of iron, manganese, arsenic, chromium, and nitrates. The groundwater in the vicinity is described as a calcium magnesium bicarbonate, with minor fractions of sodium magnesium bicarbonate (DWR 2004). The water quality in the upper aquifer system is regarded as superior to that of the lower aquifer system. The upper aquifer is preferred over the lower aquifer principally because the lower aquifer system (specifically the Mehrten formation) contains higher concentrations of iron and manganese (City of Sacramento 2009b). Water from the upper aquifer generally does not require treatment other than disinfection.

Locally, the groundwater in the project vicinity does not appear to be experiencing significant effects from the presence of the former 28th Street Landfill, which is subject to post-closure monitoring and semi-annual reporting. Volatile organic compounds (VOCs) have been detected at concentrations below their respective maximum contaminant level (MCL) in groundwater samples since 2007 (EKI 2013). Vinyl chloride was detected in C11S groundwater samples greater than its MCL of 0.5 micrograms per liter ($\mu\text{g/L}$) between 1997 and 2005. Since 2006, vinyl chloride has not been detected in groundwater samples collected from the on-site wells (EKI 2013). Inorganic compounds detected in on-site wells have remained relatively stable since 2007 (EKI 2013). Since the inorganic compound concentrations (i.e., total suspended solids, sulfate, chloride, etc.) have remained stable during each sampling event, it does not appear that leachate from the 28th Street Landfill has significantly impacted groundwater at the project site.

While groundwater concentration levels are below MCLs, discharge permitting requirements take into consideration basin-wide discharge standards, which may be lower than MCLs, and they also take volume and duration of discharges into consideration.

4.5.3 Regulatory Background

Federal Regulations

The Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. 1251–1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Important sections of the Act are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity, which may result in a discharge to waters of the United States, to obtain certification from the state that the discharge will comply with other provisions of the Act.
- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the State Water Resources Control Board (SWRCB).
- Section 404 establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by the ACOE and the U.S. EPA.

Federal Antidegradation Policy

The federal antidegradation policy is designed to protect water quality and water resources. The policy directs states to adopt a statewide policy that includes the following primary provisions: (1) existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; (2) where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and (3) where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) (Public Law 93-523), passed in 1974, the U.S. EPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by the U.S. EPA primary and secondary MCLs. MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting drinking water MCLs.

Federal Emergency Management Agency

Sacramento County and the City are participants in the NFIP, a federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 adopted a desired level of protection that would protect developments from floodwater damage associated with an Intermediate Regional Flood, a flood which is defined as a flood having an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year.

State Regulations***Porter–Cologne Water Quality Control Act***

The Porter–Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. The CVRWQCB implements waste discharge requirements relevant to the proposed project.

State Water Resources Control Board and Regional Water Quality Control Board

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities. The proposed project area lies within the jurisdiction of the CVRWQCB.

The CVRWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the fourth edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (CVRWQCB 2010) to implement plans, policies, and provisions for water quality management. The Basin Plan was prepared in compliance with the federal CWA and the state Porter–Cologne Water Quality Control Act. The Basin Plan establishes beneficial uses for major surface waters and their tributaries, water quality objectives that are intended to protect the beneficial uses, and implementation programs to meet stated objectives.

State and federal laws mandate the protection of designated beneficial uses of water bodies. State law defines beneficial uses as “domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves” (Water Code Section 13050[f]). The Basin Plan contains specific numeric and narrative water-quality objectives applicable to ambient surface and groundwater resources and for a number of physical parameters, chemical inorganic and organic constituents, biological factors, and toxic priority trace metal and organic compounds. Water quality objectives for toxic pollutants in the Basin Plan complement the federal water quality standards adopted in the California Toxics Rule in May 2000.

NPDES Program – Construction Activity

The NPDES program regulates municipal and industrial stormwater discharges under the requirements of the CWA. California is authorized to implement a state industrial stormwater discharge permitting program, with the SWRCB and CVRWQCB as the permitting agencies.

The City must comply with the requirements of the NPDES permit for Discharges of Storm Water Runoff associated with Construction Activity (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ). This permit (i.e., the Construction General Permit) regulates discharges from construction sites that disturb 1 acre or more of total land area. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance must comply with the provisions of this NPDES permit. The permitting process requires the development and implementation of an effective Storm Water Pollution Prevention Plan (SWPPP). The project applicant must submit a Notice of Intent (NOI) to the CVRWQCB to be covered by a NPDES permit and prepare the SWPPP prior to the beginning of construction.

The SWPPP must include best management practices (BMPs) to reduce pollutants and any more stringent controls necessary to meet water quality standards. A SWPPP describes the site, erosion and sediment controls, means of waste disposal, implementation of local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management control. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary. Dischargers must also comply with water quality objectives as defined in the Central Valley Basin Plan. If Basin Plan objectives are exceeded, corrective measures would be required.

Implementation of the SWPPP starts with the commencement of construction and continues through completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination to the CVRWQCB to indicate that construction is completed.

Statewide General Waste Discharge Requirements (WDR) for Discharges to Land with a Low Threat to Water Quality, Water Quality Order No. 2003-0003-DWQ

Among other types of discharges, this general order applies to small/temporary construction-related dewatering discharges to land (i.e., discharges that would evaporate or infiltrate into the ground and would not flow into a surface water body). General WDRs require dischargers to comply with all applicable Basin Plan provisions, including any prohibitions and water quality objectives governing the discharge. As part of the standard provisions in the order, the discharger is required to develop a discharge management plan incorporating contingency measures, should sampling results show violation of water quality standards. In no case shall the discharge continue to impair beneficial uses or violate water quality standards or cause a possible nuisance condition. A Negative Declaration in compliance with the California Environmental Quality Act (CEQA) has been adopted for these General WDRs. The environmental impacts from new discharges authorized by these General WDRs have been found to be less than significant.

Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003

To provide a consistent, statewide regulatory approach to address sanitary sewer overflows (SSOs), the SWRCB adopted Statewide General WDRs for Sanitary Sewer Systems, Water Quality Order No. 2006-0003, on May 2, 2006. An SSO is any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. The Sanitary Sewer Systems WDR requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans and report all SSOs to the SWRCB's online SSO database.

State Nondegradation Policy

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

- a) Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.
- b) Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements which would ensure (1) pollution or nuisance would not occur and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Toxics Rule

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

Local Regulations***The Sacramento Area Flood Control Agency***

SAFCA was formed in 1989 by local agencies anxious to address the deficiencies in Sacramento's flood control system identified by the ACOE following the flood of 1986. Through a joint exercise of powers agreement, the City of Sacramento, County of Sacramento, the Sacramento County Water Agency, Sutter County, the Sutter County Water Agency, the ARFCD, and Reclamation District 1000 (RD 1000) pooled their common flood-control authorities, established a management structure, and identified a program for improving Sacramento's flood control system. This program has three elements:

1. Ensure the structural integrity of the existing levee system;

2. Provide at least a 100-year level of flood protection as quickly as possible to the areas within the FEMA 100-year floodplain by, among other actions, increasing the space available for flood control at Folsom Dam and Reservoir (Folsom); and
3. Work toward achieving at least a 200-year level of flood protection for the Sacramento area.

SAFCA finances the local share of the cost to improve Sacramento's flood control system by creating assessment districts and levying annual assessments on properties which benefit from the improvements. These assessments are billed on Sacramento County's and Sutter County's annual real property tax bill.

SAFCA has carried out its flood risk management program on a step-by-step basis. It has succeeded in moving flood zone properties in Natomas and North Sacramento from a high-risk status (less than 100-year protection) to a moderate-risk status (greater than 100-year but less than 200-year protection) by raising and strengthening levees around the Natomas basin and along lower Dry and Arcade creeks. When this work is completed, these properties will have greater than a 200-year level of protection and a relatively low risk of flooding. Outside the North Area, steps have been taken to ensure the integrity of the levee system along the Sacramento and American rivers and to secure additional flood storage space at Folsom Reservoir on an interim basis.

The American River Flood Control District

The ARFCD is the member of SAFCA that provides flood protection for the project site and surrounding neighborhoods. Formed by an act of the State Legislature in 1927, its mission is to protect the citizenry by maintaining the 40 miles of levees along the American River and portions of Steelhead, Arcade, Dry, and Magpie creeks. The ARFCD's year-round maintenance activities are designed to prevent degradation of the levees' structural stability and to keep the surface of the levees accessible and clearly visible so problems can be detected and flood emergency equipment can be moved in when needed. In addition to routine operation and maintenance activities, the ARFCD implements projects along the levee to improve accessibility. For example, in 2008, the ARFCD began working with numerous landowners to remove abandoned encroachments in River Park (such as deteriorating retaining walls, debris, and mounds of dirt), which resulted in a clean levee slope free of obstructions that will no longer compromise levee safety.

City of Sacramento 2030 General Plan

The following City of Sacramento 2030 General Plan goals and policies are applicable to hydrology and water quality.

Environmental Constraints: Flooding Hazards

Goal EC 2.1 Flood Protection. Protect life and property from flooding.

Policy EC 2.1.6 New Development. The City shall require evaluation of potential flood hazards prior to approval of development projects.

Environmental Resources: Water Resources

Goal ER 1.1 Water Quality Protection. Protect local watersheds, water bodies and groundwater resources, including creeks, reservoirs, the Sacramento and American rivers, and their shorelines.

Policy ER 1.1.4 New Development. The City shall require new development to protect the quality of water bodies and natural drainage systems through site design, source controls, stormwater treatment, runoff reduction measures, best management practices (BMPs) and Low Impact Development (LID), and hydromodification strategies consistent with the city's NPDES Permit.

Policy ER 1.1.5 No Net Increase. The City shall require all new development to contribute no net increase in stormwater runoff peak flows over existing conditions associated with a 100-year storm event.

Policy ER 1.1.6 Post-Development Runoff. The City shall impose requirements to control the volume, frequency, duration, and peak flow rates and velocities of runoff from development projects to prevent or reduce downstream erosion and protect stream habitat.

Policy ER 1.1.7 Construction Site Impacts. The City shall minimize disturbances of natural water bodies and natural drainage systems caused by development, implement measures to protect areas from erosion and sediment loss, and continue to require construction contractors to comply with the City's erosion and sediment control ordinance and stormwater management and discharge control ordinance.

Utilities: Stormwater Drainage

Goal U4.1 Adequate Stormwater Drainage. Provide adequate stormwater drainage facilities and services that are environmentally-sensitive, accommodate growth, and protect residents and property.

Policy U4.1.1 Adequate Drainage Facilities. The City shall ensure that all new drainage facilities are adequately sized and constructed to accommodate stormwater runoff in urbanized areas.

Policy U4.1.2 Master Planning. The City shall implement master planning programs to: Identify facilities needed to prevent 10-year event street flooding and 100-year event structure flooding Ensure that public facilities and infrastructure are designed pursuant to approved basin master plans Ensure that adequate land area and any other elements are provided for facilities subject to incremental sizing (e.g., detention basins and pump stations).

Policy U4.1.3 Regional Stormwater Facilities. The City shall coordinate efforts with Sacramento County and other agencies in the development of regional stormwater facilities.

Policy U4.1.4 Watershed Drainage Plans. The City shall require developers to prepare watershed drainage plans for proposed developments that define needed drainage improvements per City standards, estimate construction costs for these improvements and comply with the City's (National Pollutant Discharge Elimination System) NPDES permit.

Policy U4.1.5 New Development. The City shall require proponents of new development to submit drainage studies that adhere to City stormwater design requirements and incorporate measures to prevent on- or off-site flooding.

City of Sacramento Stormwater Management and Control Code

The City Stormwater Management and Control Code (Chapter 13.16 of the City Code) is intended to control non-stormwater discharges to the stormwater conveyance system; eliminate discharges to the stormwater conveyance system from spills, dumping, or disposal of materials other than stormwater; and reduce pollutants in urban stormwater discharges to the maximum extent practicable. Non-stormwater discharges are prohibited except where the discharge is regulated under a NPDES permit. (See the descriptions of the NPDES in the discussions of federal and state water quality regulations above.) Discharges from specified activities that do not cause or contribute to the violation of any plan standard, such as landscape irrigation and lawn watering and flows from fire suppression activities, are also exempt from this prohibition. Discharges to the stormwater conveyance system of pumped groundwater not subject to a NPDES permit may be permitted upon written approval from the City and in compliance with the City's conditions of approval.

City of Sacramento Grading, Erosion, and Sediment Control Ordinance

The City Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code) sets forth rules and regulations to control land disturbances, landfill, soil storage, pollution, and erosion and sedimentation resulting from construction activities. With limited exceptions, grading approval must be received from the City DOU before construction. All project applicants, regardless of project location, are required to prepare and submit separate erosion and sediment control plans applicable to the construction and post- construction

periods. The ordinance also specifies other requirements, such as written approval from the City for grading work within the ROW of a public road or street, or within a public easement.

City of Sacramento SQIP

The City of Sacramento SQIP provides a comprehensive plan to direct the Sacramento City Stormwater Management Program (Sacramento City Stormwater Program) and its priorities and activities through the 2008–2013 permit term. Included in the City of Sacramento SQIP is information on the Sacramento City Stormwater Program’s history and accomplishments as well as a description of specific activities for the 2008–2013 permit term. The City of Sacramento Stormwater Management Program is designed to reduce stormwater pollution to the maximum extent practicable and eliminate prohibited non-stormwater discharges in accordance with federal and state laws and regulations.

The Construction Element was designed to reduce the discharge of stormwater pollutants to the maximum extent practicable by requiring construction sites to reduce sediment in site runoff and reduce other pollutants such as litter and concrete wastes through good housekeeping procedures and proper waste management. The Construction Element strategy includes the following components:

- Ensure that plan review and approval procedures, standards, and field requirements are clear and effective.
- Ensure that the development and construction communities:
 - Comply with local grading, erosion, and sediment control requirements
 - Properly implement the required BMPs associated with construction activities
 - Maintain good housekeeping practices associated with construction activities
 - Obtain coverage under the State Construction General Permit for projects that disturbed 1 or more acres of land.
- Ensure that City project managers:
 - Obtain coverage under the State Construction General Permit for all municipal improvement projects that disturbed 1 or more acres of land
 - Comply with local erosion and sediment control requirements. Provide plan review, inspections, and enforcement.
- Evaluate and incorporate new technologies and alternative control measures.
- Provide training and technical support to Sacramento City staff on local and state stormwater quality requirements and procedures.

- Conduct outreach and provide guidance to the development and construction community on stormwater quality requirements related to construction activities.
- Conduct periodic meetings with Sacramento City Stormwater Program Inspectors to evaluate current and proposed ESC requirements and good housekeeping practices.

The New Development Element was designed to protect local creeks and rivers by reducing the discharge of stormwater pollutants that could result from new developments to the maximum extent practicable and by mitigating increased flows that could cause erosion and degrade habitat. The New Development Element strategy for reducing stormwater pollutants from new development includes the following:

- Incorporate water quality and watershed protection principles into Sacramento City procedures and policies.
- Improve the development review process to ensure effective implementation of the development standards for new development and redevelopment projects.
- Implement stormwater quality development standards for all regulated new development and redevelopment projects.
- Ensure that standards and maintenance requirements are clear and effective.
- Require maintenance provisions for all privately maintained treatment control measures. Develop the hydromodification management plan and update the Stormwater Design Manual with new design criteria for hydromodification measures.
- Evaluate new technology and alternative control measures.
- Provide training and technical assistance to Sacramento City staff (planners, engineers, CIP project managers, building and construction inspectors, etc.) on stormwater quality requirements and procedures to ensure effective implementation of stormwater quality development standards for municipal projects and private development projects.
- Provide training and outreach to the development community on the stormwater quality development standards.

City of Sacramento Floodplain Management Ordinance

This Floodplain Management Ordinance is designed to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas. The Ordinance regulates development which is or might be dangerous to health, safety, and property by requiring at the time of initial development, or substantial improvement, methods of protection against flood damage in areas vulnerable to flooding in order to minimize flood damage. The Ordinance regulates the following developmental impacts: filling, grading, or erosion, alteration

of natural flood plains, stream channels or water courses, the imposition of barriers which increase flood hazards, or any other impacts that aggravate or cause flood hazards.

Resolution 93-164

Resolution 93-164, with regard to storm drainage, is intended to prevent street flooding during 10-year return storms and to prevent flooding of structures during 100-year return storms at complete buildout in each drainage basin.

State Water Resources Control Board Order No. 2006-0003, Waste Discharge Requirements

Stormwater discharges from the project site are proposed to be detained on site, pumped to Sump 99, and eventually discharged to the American River. This discharge would be regulated under the area-wide WDR for stormwater discharges from separate storm sewer systems (also known as an MS4 permit).

The permit is intended to implement the Water Quality Control Plan, established by the CVRWQCB (CVRWQCB 2010). The City of Sacramento NPDES permit requires implementation of programs that establish priorities based on addressing urban pollutants of concern, to reduce the level of pollutants in stormwater discharges from municipal separate storm sewer systems and requires that any change in water quality will not unreasonably affect the present and anticipated beneficial use of receiving waters and will not result in water quality less than that prescribed in SWRCB policies. The SQIP, described earlier, provides a comprehensive plan to direct the City's Stormwater Management Program priorities and activities, including program management, target pollutant reduction strategy, monitoring program, program element implementation (i.e., industrial, municipal, construction, and public education and outreach elements), and program evaluation.

Additionally, the Stormwater Quality Design Manual for the Sacramento and South Placer Regions (Sacramento Stormwater Quality Partnership 2007), requires development and redevelopment projects within urban areas of Sacramento County to implement stormwater treatment measures and source control measures to comply with state and federal regulatory standards. The manual also encourages projects to implement runoff reduction measures. Compliance with the manual constitutes compliance with the Sacramento NPDES permit.

General Order for Dewatering and Other Low-Threat Discharges to Surface Waters

The CVRWQCB has adopted a general NPDES permit for short-term discharges of small volumes of wastewater from certain construction-related activities. Permit conditions for the discharge of these types of wastewaters to surface water are specified in "General Order for Dewatering and Other Low-Threat Discharges to Surface Waters" (Order No. R5-2013-

0074/NPDES Permit No. CAG995001). Discharges may be covered by the permit provided they are either (1) 4 months or less in duration or (2) the average dry weather discharge does not exceed 0.25 mgd. Construction dewatering, well development water, pump/well testing, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the permit. The general permit also specifies standards for testing, monitoring, and reporting, receiving water limitations, and discharge prohibitions.

Combined Sewer System Development Fee

The City of Sacramento adopted a sewer ordinance for the CSS in 2005, which requires payment of a development fee for projects that add sewer flows within the CSS service boundary. Key aspects of the CSS development fee include: a fee per equivalent single-family dwelling unit that will be subject to periodic adjustments; CSS development fees may be fully or partially offset by constructing or cost sharing in the construction of a mitigation project approved by the DOU; the fee approximates the cost to construct local storage to mitigate downstream impacts; and fees will be collected and deposited in a fund for the City to construct larger projects to mitigate multiple developments.

4.5.4 Impacts and Mitigation Measures

Methods of Analysis

A site-specific study was prepared for the project site by Wood Rodgers (2013a) to estimate existing runoff and proposed project runoff, and to identify drainage facilities that would be needed to meet the current City of Sacramento Improvement Standards, the City of Sacramento Storm Drainage Design Standards, and the Stormwater Quality Design Manual for the Sacramento and South Placer Regions. This impact analysis incorporates the results of that study to identify potential proposed project impacts associated with drainage and post-construction water quality.

The southwestern edge of the project site is one of several possible locations that are being considered by the City for a separate Combined Sewer Detention Project, which could be constructed to mitigate combined sewer surcharging in the CSS within East Sacramento by providing extra storage during peak wet weather flows. This sewer detention project would be adjacent to the proposed project site, but within City-owned property, and would undergo a separate environmental review process. The sewer detention project is not considered a part of the proposed project. The sewer and drainage facilities proposed as part of the project would be designed to have the capacity to serve the project irrespective of whether or not the City's Combined Sewer Detention Project would eventually be constructed.

Each impact statement that follows is focused on issues raised by the public in response to the NOP, particularly with respect to flood hazards. The significance thresholds are all addressed

below, except for issues relating to placing structures within a 100-year flood hazard area. Because the project is not located within a 100-year flood zone and is protected from the 100-year flood by a system of levees, the criteria does not apply and is not discussed further. However, catastrophic flooding due to levee failure or dam failure, as well as local flooding due to excessive stormwater runoff is addressed under Impacts 4.5-4 and 4.5-5.

Impacts of the environment on a project or plan (as opposed to impacts of a project or plan on the environment) are beyond the scope of required CEQA review. “[T]he purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project.” (*Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473.) The impacts discussed in this section related to flooding are effects on users of the project and structures in the project of preexisting environmental hazards, as explicitly found by the court in the *Ballona* decision, and therefore “do not relate to environmental impacts under CEQA and cannot support an argument that the effects of the environment on the project must be analyzed in an EIR.” (*Id.* at p. 475.) Nonetheless, an analysis of these impacts is provided for informational purposes.

Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, thresholds of significance adopted by the City in applicable general plans and previous environmental documents, and professional judgment, a significant impact would occur if the proposed project would:

- substantially degrade water quality;
- violate any water quality objectives or waste discharge objectives set by the State Water Resources Control Board, due to increases in sediments and other contaminants generated by construction and/or development of the project;
- substantially increase the exposure of people and/or property to the risk of loss, injury, damage, or death in the event of a 100-year flood or as a result of the failure of a levee or dam;
- 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;
- place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- substantially deplete groundwater supplies or interfere with groundwater recharge resulting in a net deficit in the aquifer volume or a lowering of the groundwater table; or
- substantially alter the existing site drainage or substantially increase the rate or amount of surface runoff which would result in flooding on or off site.

Project-Specific Impacts and Mitigation Measures

4.5-1: Construction activities associated with the project could generate increases in sediment and/or other contaminants which could violate water quality objectives and/or waste discharge requirements set by the State Water Resources Control Board. Based on the analysis below the impact is *less than significant*.

Development of the proposed project would involve the construction of a 328-unit residential neighborhood, with roadways, parks, and infrastructure, which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. Of the project's approximately 48.75-acre watershed, approximately 30 acres are proposed for residential uses, approximately 7.0 acres are proposed for parks, the recreation center, and landscaped areas, and approximately 11.7 acres for streets and alleys. Construction would have the potential to affect water quality by contributing to localized violations of water quality standards if stormwater runoff from construction activities enters receiving waters in an uncontrolled manner.

The first phase of construction would consist of the backbone infrastructure, which would include the site's stormwater drainage system. The drainage system would include two detention basins with a total volume of approximately 8 acre-feet and a pump station with a 10 cubic feet per second (cfs) pump capacity which would convey water to the City's existing Sump 99 through a newly constructed force main (Figure 4.5-4). Prior to installation of the drainage system, groundwater would be the primary receiving water body, since the site is an internally closed basin. As the phases of construction proceed, stormwater runoff would eventually be collected and discharged into the American River from Sump 99. Thus, stormwater runoff and non-stormwater discharges (i.e., construction site dewatering) from construction activities have the potential to affect both groundwater quality and—when water is pumped to Sump 99—the American River.

Stormwater Discharges

Construction activities such as grading, excavation, and trenching for site improvements would result in disturbance of soils at the project site. Construction site runoff can contain soil particles and sediments from these activities. Dust from construction sites can also be transported to other nearby locations, where the dust can enter runoff or water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites can also enter runoff. Typical pollutants could include petroleum products and heavy metals from equipment, and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the

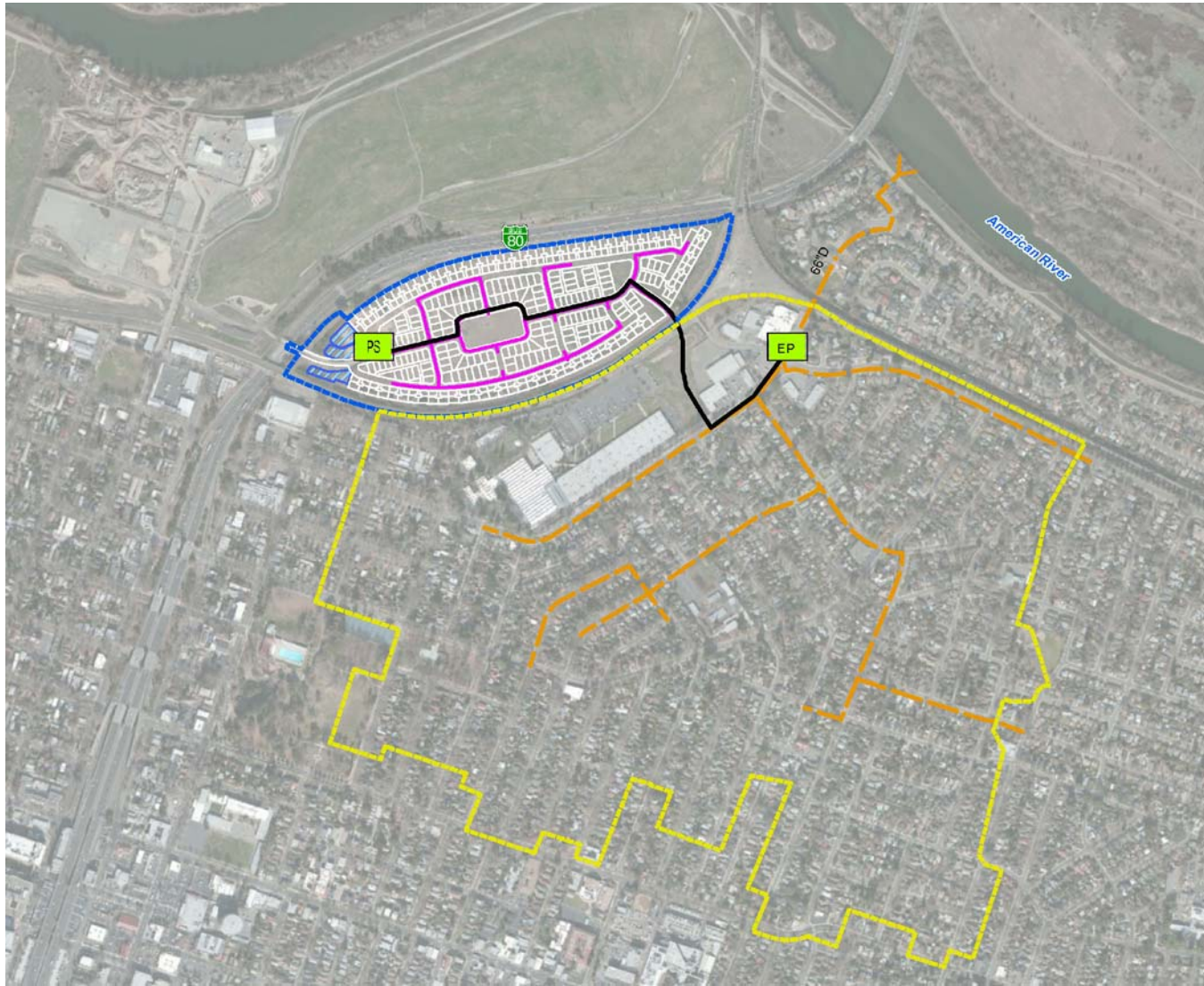
sediment entered receiving waters in sufficient quantities to exceed water quality objectives. Impacts from construction-related activities would generally be short-term and of limited duration.

Because the proposed project would require construction activities resulting in a land disturbance of more than 1 acre, the project applicant is required by the state to obtain the General Permit for Discharges of Stormwater Associated with Construction Activity (Construction General Permit), which pertains to pollution from grading and project construction. Compliance with the permit requires the project applicant to file a NOI with the SWRCB and prepare a SWPPP prior to construction. The SWPPP would incorporate BMPs in order to prevent, or reduce to the greatest feasible extent, adverse impacts to water quality from erosion and sedimentation. BMPs may include: scheduling or limiting activities to certain times of year, prohibitions of practices, maintenance procedures, and other management practices.

In addition, the project applicant must comply with the City of Sacramento's Grading, Erosion, and Sediment Control Ordinance which requires that the applicant prepare an erosion and sediment control plan (ESC) for both during and after construction of the proposed project to be included in the improvement plans for the review and approval of the City of Sacramento. The City of Sacramento also requires that post-construction stormwater quality control measures be incorporated into development plans to minimize the increase of urban runoff pollution caused by development of the area (these are discussed below under Impact 4.5-2). Preparation of a SWPPP, as required under the Construction General Permit, and preparation of an ESC and integration of post-construction stormwater quality control measures, as required under City ordinance codes, would be consistent with General Plan Policy ER 1.1.7, Construction Site Impacts.

Non-Stormwater Discharges

Due to shallow groundwater levels in the vicinity of the project site, trenching and excavation activities associated with construction of the proposed project could reach a depth that would expose the water table, which would require dewatering of excavation sites. This could create a direct path for contaminants, if present, to enter the groundwater system. Potential contaminants that could be introduced during construction include particulate matter, sediment, oils and greases, and construction supplies such as concrete, paints and adhesives. Preparation and implementation of a SWPPP as required under the Construction General Permit and described earlier would minimize the potential for release of construction-related contaminants into groundwater.



- Existing Off-Site Drain Pipes
- Proposed Drain Pipes
- Proposed Force Main
- Off-Site Shed Boundary
- On-Site Shed Boundary
- ▨ Proposed On-Site Basin
- PS Proposed On-Site Pump Station
- EP Existing Sump 99 Pump Station

NOT TO SCALE

SOURCE: Wood Rodgers 2013, City of Sacramento 2013

**FIGURE 4.5-4
Drainage Evaluation: Drainage Shed 99 Developed Conditions System**

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However, groundwater discharged during construction-related trenching and excavation, if discharged to the City's storm drainage system, has the potential to adversely affect water quality. The deepest excavations associated with the proposed project would be in connection with the sewer and drainage infrastructure (Wood Rodgers. 2013a). The two proposed stormwater detention basins would vary somewhat in depth. The north basin would vary in elevation from 10.5 to 13.5 feet AMSL at the bottom of the basin, and adjacent grades would vary from elevation 16.8 to 25 feet AMSL. The south basin would vary in elevation from 13.7 to 15.0 feet AMSL at the bottom of the basin, with adjacent pads ranging from 22.2 to 22.5 feet AMSL. The underground pump station would be between 10 and 15 feet deep, and the sewage detention tank would be 12 feet deep (Wood Rodgers. 2013a, 2013b). Ultimate excavation depths would be slightly greater since installation of such facilities would require some degree of over excavation to prepare sub-grade soils. The manner in which dewatering discharges would be made would depend on a number of factors, such as the season/weather, the location of the excavation, and whether space is available to infiltrate the dewatering discharges back into the shallow groundwater table (i.e., make discharges to land). Given that the excavations most likely to encounter groundwater would occur within the lowest (westernmost) portion of the site, it is likely that the construction contractor would need to dewater the site by actively pumping seepage out of the construction site into either the City's separate storm drainage system or into its CSS.

According to the Phase I Environmental Site Assessment, groundwater beneath the project site has been impacted by some VOCs, bicarbonate (which can indicate hardness), and vinyl chloride associated with the former 28th Street Landfill (Geosyntec 2013, included as Appendix K). However, VOC data from the last 5 years are below applicable regulatory guidelines, e.g., MCLs, notification levels, or vapor intrusion screening levels (ESLs) indicating that there is no significant risk for residential development (i.e., less than one in a million lifetime incremental cancer risk). Vinyl chloride has not been detected on the site since 2005 (EKI 2013). In addition, inorganic groundwater monitoring parameters (e.g., bicarbonate) measured in these monitoring wells have been stable and not increasing. These inorganic constituents are typically monitored as indicators associated with landfill impacts to groundwater. Thus, the stability of inorganic parameters indicate that landfill leachate impacts to local groundwater have been stable for the recent 5-year period reviewed and not indicative of increasing impacts to groundwater quality on the project site (EKI 2013).

Normally, construction site dewatering discharges are an allowable type of non-stormwater discharge under the Construction General Permit, if short-term and uncontaminated. This is the currently anticipated regulatory pathway for the project. However, if the City determines that groundwater volumes and conditions warrant, the construction contractor could be required to obtain permit coverage under either statewide or region-specific general WDRs, depending on whether dewatering discharges would be made to land or to the City's stormwater conveyance system. The General Order for Dewatering and Other Low-Threat Discharges to Surface Waters

(Order No. R5-2013-0074) applies to short-term discharges of small volumes of wastewater from certain construction-related activities. The Statewide General WDRs for discharges to land with a low threat to water quality (Order No. 2003-0003-DWQ) applies to small/temporary construction-related dewatering discharges to land (i.e., discharges that would evaporate or infiltrate into the ground, and would not flow into a surface water body). Either one of the general orders may be applicable, provided that groundwater samples are analyzed and shown to be below screening levels for priority pollutants. If groundwater quality testing shows exceedance of one or more priority pollutants, the construction contractor may need to obtain coverage under General WDRs/NPDES permit for limited threat discharges of treated/untreated groundwater to surface waters (Order No. R5-2013-0073/NPDES Permit No. CAG995002), or an individual NPDES permit, in lieu of the general orders/WDRs for low-threat discharges.

Regardless of the specific NPDES permit coverage being sought by the project applicant and/or its construction contractor—prior to undertaking any dewatering activities—the project applicant would be required to submit to the CVRWQCB a NOI to comply with the terms and conditions of the General WDRs and/or a Report of Waste Discharge pursuant to California Water Code Section 13260, a fee, a project map, evidence of CEQA compliance, and a monitoring plan. Analysis results for priority pollutants within the groundwater beneath the site would need to be submitted along with the NOI, and the CVRWQCB would have 30 to 60 days to process the application. The CVRWQCB staff would then determine whether or not coverage under the General WDRs is appropriate and, if so, would notify the project applicant and/or its construction contractor by letter of coverage (i.e., Notice of Applicability). In the event of any conflict between the provisions of the General WDRs and the Basin Plan, the more stringent provision would prevail. The WDR would require treatment of groundwater, if contaminated, prior to discharge into the stormwater conveyance system, and a monitoring program thus ensuring compliance with basin plan provisions and Section 303 of the Clean Water Act.

In the event the CVRWQCB determines the dewatering discharges are not subject to a separate NPDES permit, discharges of pumped groundwater to the City's stormwater conveyance system could be permitted upon written approval by the City and in compliance with conditions of approval set forth by the City (Ord. 2004-042 Section 1; Ord 98-007 Section 1; prior code Section 87.01.107), as the City's stormwater conveyance system is, itself, covered by an NPDES permit.

Should the construction contractor seek to direct groundwater dewatering discharges into the City's CSS, the discharge would be regulated and monitored by the City pursuant to DOU Engineering Services Policy No. 0001, adopted as Resolution No. 92-439 by the Sacramento City Council, and in accordance with Section 16 of the City's Standard Specifications. Groundwater discharges to the City's sewer system are defined as construction dewatering discharges, treated or untreated contaminated groundwater cleanup discharges, and uncontaminated groundwater discharges. Unless approved in writing by the City's DOU,

groundwater and/or water from trench dewatering shall be free of sediment and other construction materials before entering the City sewer or storm drain system. A dewatering plan, including a water de-sedimentation plan, shall be submitted to the City's DOU for approval prior to any pumping or discharging of water to the CSS.

The City also requires that any short-term discharge be permitted, or an approved Memorandum of Understanding (MOU) for long-term discharges be established, between the discharger and the City. Short-term limited discharges of 7 days duration or less must be approved through the City DOU by acceptance letter. Long-term discharges of greater duration than 7 days must be approved through the City DOU and the Director of the DOU through an MOU process. The MOU must specify the type of groundwater discharge, flow rates, discharge system design, a City-approved contaminant assessment of the proposed groundwater discharge indicating tested levels of constituents, and a City-approved effluent monitoring plan to ensure contaminant levels remain in compliance with state standards or SRCSD and CVRWQCB-approved levels. All groundwater discharges to the sewer must be granted a SRCSD discharge permit. If the discharge is part of a groundwater cleanup or contains excessive contaminants, CVRWQCB approval is also required.

Conclusion

The preparation and implementation of the SWPPP, ESC, NPDES permit requirements, and/or DOU/SRCSD discharge permits would ensure that neither stormwater runoff from the construction site, nor construction site groundwater dewatering discharges would violate water quality objectives and/or waste discharge requirement. Therefore, the proposed project would have a **less-than-significant impact** to surface water quality due to construction activities.

Mitigation Measures

None required.

4.5-2: The design of the project, including increases in impervious surface area and residential uses on site could result in substantial long-term effects on water quality. Based on the analysis below the impact is *less than significant*.

The increased impervious area created by the development of the proposed project could alter the types and levels of pollutants that could be present in project site runoff. Runoff from streets, driveways, parking lots, and landscaped areas typically contains nonpoint source pollutants such as oil, grease, heavy metals, pesticides, herbicides, fertilizers, and sediment. Concentrations of pollutants carried in urban runoff are extremely variable, depending on factors such as the following:

- Volume of runoff reaching the storm drains

- Time since the last rainfall
- Relative mix of land uses and densities
- Degree to which street cleaning occurs.

Under existing conditions, stormwater that is not infiltrated moves as sheet flow towards the western end of the site, and if rainfall is sufficiently intense and/or long-lasting, begins to pond. Under proposed conditions, stormwater runoff would generally be directed through streets, gutters, swales, and drain pipes in the same general direction (to the west), and into two detention basins located on the western edge of the site. The detention basins would have the ability to retain approximately 8 acre-feet of stormwater runoff, which is sufficient to capture runoff from the site for the 100-year peak flow event. When peak flows in the larger drainage-shed subside, the on-site pump station would convey stored stormwater to Sump 99 via a new force main for eventual discharge into the American River (see Figure 4.5-4). Because the detention basins would capture the peak flows generated by the development, the project would be in compliance with General Plan Policy ER 1.1.5, which requires all new development to contribute no net increase in stormwater peak flows associated with a 100-year storm event.

The development of the project site would generally maintain the size and topography of the existing watershed and would not include substantial re-grading sufficient to alter general drainage patterns. The pre- and post-project watershed area would be the same, and stormwater would flow in the same general direction (to the west). However, the project would increase the amount of impervious surfaces by approximately 42 acres due to rooftops, driveways, sidewalks, and streets. This increase in imperviousness would accelerate the velocity of stormwater runoff and increase the amount of stormwater that is conveyed as runoff rather than retained and/or infiltrated into the ground. The primary pollutants of concern in a residential development are associated with private vehicle maintenance (e.g., car washing and grease/oils associated with maintenance/repairs), yard work (e.g., improper/excessive use of pesticides, herbicides, and/or fertilizers), and/or trash (e.g., due to improper waste disposal). The release of such pollutants would be localized and periodic in nature, minor in magnitude (especially in comparison to the total volume of stormwater discharges entering the American River), and would not contribute to the existing impairments under Section 303(d) of the CWA. Nevertheless, because the cumulative effects of past projects have resulted in substantial water quality problems in the region's major waterways, and because water quality problems are generally cumulative in nature, all efforts must be made to reduce pollutant concentrations within stormwater discharges to the maximum extent practicable, even if the impact of an individual project appears inconsequential.

The project applicant is in the process of developing detailed on-site drainage designs and is including Low Impact Development (LID) applications to implement runoff reduction measures

based on the Stormwater Quality Design Manual for the Sacramento and South Placer Regions (Wood Rodgers 2013a; Sacramento Stormwater Quality Partnership 2007). The preliminary plans call for LID runoff reduction features in the “T-Court” driveways, seven open space parcels to include stormwater planters, and three park sites which would be designed to collect local stormwater and drain to depressed on-site locations. The stormwater planters placed in front of each lot would collect runoff, directing it to design infiltration locations. The local street design would be directed to the stormwater planters. Overall, besides the main detention basins in the western portion of the site, the project contains approximately 14 bio-retention and hydromodification basins scattered throughout the proposed project which would provide both water quality benefits and reduce the arrival time and magnitude of peak flows into the detention basins. It is estimated that these LID measures could reduce stormwater runoff volume by 20% to 30% compared to the proposed project without LID measures (Wood Rodgers 2013a). Incorporation of LID measures into the project design is consistent with General Plan Policy ER 1.1.4, requiring new development to protect the quality of water bodies and natural drainage systems through site design, source controls, stormwater treatment, runoff reduction measures, BMPs and LID measures.

Overall, the proposed project would have a low potential to substantially degrade water quality due to the type of development being proposed, the existing drainage characteristics, and implementation the City’s SQIP. The SQIP is a comprehensive program comprised of various program elements and activities designed to reduce stormwater pollution to maximum extent practicable and eliminate prohibited non-stormwater discharges through a NPDES municipal stormwater discharge permit. The SQIP includes a construction and new development program that is implemented through City ordinances. The SQIP also includes an extensive public education effort, target pollutant reduction strategy and monitoring program.

Although detailed design of lot-level LID measures are currently in development and have not been finalized to date, the project applicant would be required to comply with the City Stormwater Management and Discharge Control Code (Ord. 2004-042 Section 1; Ord. 98-007 Section 1), Grading and Erosion and Sediment Control Ordinance No. 93-068, and must implement BMPs to the maximum extent practicable, as outlined in guidance within the Stormwater Quality Design Manual for the Sacramento and South Placer Regions. Grading plans and tentative map submittals would not be approved, and thus the project would not be constructed, without review and approval of these plans by the DOU.

In addition, the project is required to submit to the DOU for review and approval a Storm Drainage Master Plan in compliance with the City’s Design and Procedures Manual, as part of the Tentative Map submittal. The Storm Drainage Master Plan must have sufficient information to determine the ROW requirements for proposed drainage facilities as well as the hydrology, hydraulics, pumping requirement, and detention storage information (see Appendix J). Geotechnical/groundwater information must be submitted with the master plan and, in areas of

high groundwater, additional information must be provided. Prior to recording of Final Maps or Master Parcel Maps, a Drainage Design Report, including the Financing Plan, and a Geotechnical Design Report shall be completed and approved by the DOU. Stormwater utilities and infrastructure not located within a public ROW or public easement would be private facilities maintained by a homeowners association or privately-funded maintenance district.

The existing submittal and approval requirements associated with discharge control ordinances, the NPDES municipal stormwater discharge permit, and the storm drainage master plan would be sufficient to ensure that the project does not result in substantial long-term effects on water quality. Accordingly, the project's impact would be **less than significant**.

Mitigation Measures

None required.

4.5-3: Use of the combined sewer system could increase the likelihood of overflows during peak wet weather flows. Based on the analysis below the impact is *less than significant*.

Currently there are no existing sewer facilities within the project site. When the approximately 48.75-acre site is developed, it would produce approximately 328 Equivalent Single-Family Dwellings and according to the Preliminary Sewer Plan prepared for the proposed project (Wood Rodgers 2013a), the project site would have a Peak Wet Weather Flow of 0.313 mgd. These flows would need to be pumped from the site via a pump station and force main. The pump station would be located at the west side of the project site and pump flows south under the UPRR embankment south to Alhambra Boulevard at the intersection of Alhambra Boulevard and McKinley Boulevard. According to the City of Sacramento, there is adequate capacity within the existing off-site 42-inch combined sewer/storm drain pipe to accept the 0.313 mgd produced by the project (Wood Rogers 2013b). The existing 42-inch pipe flows west in McKinley Boulevard/E Street.

The sewer system would also require a sewage detention tank. According to the City of Sacramento, the tank must be designed to detain sewer flows for a 4-hour 20-minute period (Wood Rodgers 2013b). This is equivalent to 6,300 cubic feet of detention, which would require a tank that is 23 feet wide by 23 feet long and 12 feet deep (or similar dimensions yielding at least 6,300 cubic feet of storage). The sewage pump station and sewage detention tank would be collocated underground and in the same general area as the stormwater detention ponds and stormwater pump station. All sewage infrastructure would be kept separate from the stormwater drainage systems. During peak wet weather flows when the City's CSS is overwhelmed, the sewage would not be pumped via the force main to the 42-inch pipe on Alhambra Boulevard. Instead, excess flows would be detained on site in the 6,300 cubic feet (minimum) sewage

detention tank. Assuming the pipes are flowing half full, there is an additional volume of approximately 30,000 gallons of available storage within the pipes and manholes that could be utilized during large storm events. Before the ultimate facilities can be constructed, a detailed pump station, force main, and detention tank design report would be required.

Because the proposed project would direct stormwater generated on site to a separate storm sewer system (i.e., via Sump 99), and because the project applicant would install a storage tank sufficient in size to hold sewage for a 4-hour 20-minute period during peak wet weather flows, the proposed project would not result in additional stress on the CSS. During peak wet weather flows, stormwater would be directed to on-site detention basins and/or pumped to Sump 99, and sewage would be detained in a storage tank for later release into the CSS once the peak wet weather flow has subsided. Therefore, the project would not result in additional CSS overflows during peak wet weather flows, and the impact would be **less than significant**.

Mitigation Measures

None required.

4.5-4: Residential development could increase the exposure of people and/or property to the risk of loss, injury, damage, or death in the event of a levee breach along the American River or failure of Folsom Dam. Based on the analysis below the impact is *less than significant*.

As discussed in the environmental setting, the proposed project is not within a FEMA Special Flood Hazard Area, as depicted by the mapped 100-year flood hazard zone (see Figure 4.5-1). Thus, there would be no on-site or off-site impacts related to placing structures within a 100-year floodplain or otherwise modifying the boundaries of the existing 100-year floodplain, which is contained within the levees on either side of the American River. In addition, the project does not propose modification or physical alterations to these certified levees or any other SAFCA or Bureau of Reclamation lands or facilities. The potential effect of increased flood hazards due to construction of vehicular and bicycle/pedestrian (if approved by UPRR) underpasses beneath the UPRR embankment—which is not a certified levee—is addressed in Impact 4.5-5.

Although the proposed project is located outside of the 100-year flood hazard zone, it could still be subject to residual flood hazards, such as in the event of a dam failure or levee breach. As discussed in the environmental setting, the City and County of Sacramento have prepared detailed maps showing hypothetical levee breaks, inundation levels, the time it would take for waters to rise in affected neighborhoods, and rescue and evacuation zones (see Figures 4.5-2 and 4.5-3). Under Scenario No. 9, floodwaters would first inundate the River Park neighborhood. Starting approximately 2.3 hours after the levee breach, floodwaters would begin to inundate the project site with 1 foot of water at the lowest elevation. Thereafter, floodwaters

would slowly fill the project site to as deep as 22 feet before project grading (18 feet after project grading) after about 12 hours. Under Scenario No. 14, floodwaters would first inundate the Sacramento State campus and the River Park neighborhood. Starting about 3 hours after the levee breach, floodwaters would begin to inundate the project site with 1 foot of water at the lowest elevation. Thereafter, floodwaters would slowly fill the project site to as deep as 26 feet before project grading (22 feet after project grading) after about 14 hours.

Although this would be considered an unlikely worst-case flood scenario, and could only occur in the event of catastrophic flooding (e.g., from a 500-year storm or dam failure), the depth of inundation would present serious public safety risks, and the implication of placing an additional 328 housing units in a location that could experience flood depths of up to 26 feet before project grading (22 feet after project grading) was a concern expressed in comment letters received in response to the NOP. Due to the considerable depth of flooding that would be anticipated, the area is currently considered a rescue area² for the purposes of emergency operations planning. The adjacent UPRR tracks and the nearby Sutter's Landing Regional Park would be outside the hypothetical flood depths and are considered "refuge areas" during emergency operations. They would be available as a safe haven for residents to avoid drowning and loss of life until rescue operations can be carried out.

However, the need for rescue operations is considered a final measure of last resort as there are extensive emergency evacuation plans in place to provide advanced warning to citizens in the event of a major flood disaster. Besides current SAFCA and the U.S. Bureau of Reclamation efforts to provide a 200-year level of protection, the City of Sacramento has also conducted considerable emergency planning work in recognition of the significant flood hazards it faces. These procedures are outlined in detail in the City of Sacramento Evacuation Plan for Floods and Other Emergencies (City of Sacramento 2008) which enhances/supplements, but does not replace, department-specific emergency operations plans, such as the DOU's Comprehensive Flood Management Plan (City of Sacramento 1996).

Collectively, these plans and policies outline a comprehensive chain-of-command, specific roles and responsibilities for emergency management operations, cross-departmental coordination activities, and actions to be taken according to four emergency planning stages that correspond to specific river stages and their associated threat level. These emergency phases and examples of actions to be taken under each are summarized in Table 4.5-2.

² A rescue area indicates places where water has the potential to reach a depth of at least 1 foot after 2 hours from the time of a levee failure. People remaining in the area despite evacuation notices would not be able to drive out and would be stranded and require rescue.

**Table 4.5-2
Emergency Plan Phases**

Emergency Phase	River Stage / Elevation of American River at H Street Bridge	Examples of Emergency Operations Activities and Actions
Phase I Normal Preparedness	River Advisory Stage / 39 feet	Install flood gates at Del Paso. Prepare for levee patrols. Implement flood gate closure plans and begin rain patrol activities. Consider media advisory of river conditions.
Phase II Increased Readiness	River Monitor Stage / 40 feet	Utilities Operation Center begins 24-hour operation, ARFCD begins levee patrols. Advise City Manager to open City Emergency Operation Center (EOC) before river stage reaches 41.8 feet. Prepare to close flood gates. Continue media advisory on river conditions and consider advisory of self-evacuation of people with special needs.
Phase III Emergency Preparedness	Flood Alert Stage / 42.8 feet	City EOC in full operational mode. Maximum design capacity of levees is reached. Close all appropriate flood gates in coordination with the California Department of Transportation (Caltrans), the Public Works Department, and the City of Sacramento Department of Transportation. City council to approve a "State of Local Emergency" and consider volunteer evacuation of general population in affected areas.
Phase IV Emergency Phase	Flood Danger Stage / 43.8 feet	Levee freeboard encroached; consider evacuations. Consider mandatory evacuation of the areas immediately threatened and of special needs populations in immediately and potentially threatened areas. Implement evacuation routing and traffic management and request to Governor for State Emergency Proclamation.

Sources: City of Sacramento 1996, 2008.

To mitigate the potential consequences of a levee failure, the City's emergency managers would notify the potentially affected public during the high level warning stages (Phases III and IV) and implement evacuation procedures for transportation-disadvantaged people before the most dangerous stages of flood threat. In the emergency stages, mandatory evacuation would be authorized under the regulations "necessary to provide for the protection of life and property" (Cal Government Code 8634). Without the declaration of a local emergency, law enforcement may still be able to close an area when there is a threat to the public health or safety (Penal Code 409.5). Law enforcement could arrest those refusing to leave for violation of criminal statutes such as child endangerment or cruelty to animals. However, the proclamation of an emergency makes the mandatory evacuation more straightforward and typically the preferred practice.

The City would advise people who may need additional time to evacuate, owing to some transportation disadvantage, to move out of flood danger during the Increased Preparedness Phase (Phase II) of a flood threat. The City would announce this and other advisories to evacuate, as needed, through numerous notification channels such as emergency sirens, the reverse 911 system, the emergency alert system, media releases, police/fire loudspeakers, and neighborhood watch and other community support programs. They would give special attention to contacting the special-needs population service providers, so that they can contact their clients and advise them of the evacuation advisory. In the event of American River levee break on the southern levee, Cal Expo would be able to provide shelter and care support to evacuees. The only Level I adult and pediatric-designated trauma center in the area, UC Davis Medical Center, would not likely be affected either, although area hospitals report that power outages and area street flooding may still force them to discontinue services and institute their own continuity of business and evacuation plans (City of Sacramento 2008). Early evacuations would also be key in key areas of the City that lie in the American River Parkway and/or adjacent to the American River, which would include the River Park neighborhood and the California State University–Sacramento campus, since these areas would be limited in the availability of egress routes once flood gates are installed.

As a general rule, the traffic patterns for emergency evacuation from a designated area would be established so traffic leaving the area would be directed to take routes that lead directly out of the affected area and for which no turns are necessary. Based on evacuation maps provided by the City, the most likely evacuation route for the project would be via the A Street Bridge to 28th street, south to E Street, and east to access the Capital City Freeway. In the early stages of evacuation, the extension of 40th Street connecting to C Street would also be available for evacuation prior to closing the proposed flood gates to be installed within the UPRR embankment underpass. From C Street, residents would be able to access evacuation routes along Elvas Avenue or Alhambra Boulevard. In the event a train is blocking the 28th Street crossing City staff will coordinate with UPRR to address this issue and get the blockage removed. The decision on when and how to close the two proposed flood gates would be made jointly by the DOU and the City's Department of Transportation, based on the flood danger and the traffic and circulation during the evacuation effort; however, in no case would the flood gates be allowed to remain open long enough for floodwaters to penetrate the UPRR embankment (either through the 40th Street underpass or the bicycle/pedestrian underpass – if approved by UPRR) and threaten East Sacramento. Following closure of the flood gate, egress from the project site via the A Street Bridge would remain available to residents providing access to Midtown and to Sutter's Landing Regional Park. See also discussion in Section 4.4, Hazards and Public Safety.

As part of the project's conditions of approval imposed by the DOU, the project applicant would be required to prepare an evacuation route plan that establishes an exit route from the project

site to a designated elevation via a continuous paved surface and provide a project-specific evacuation route plan to the residents at time of purchase. The homeowners association for the development would be required to review the evacuation route plan at least every 3 years and include any updates or changes to residents with distribution of the annual budget. The evacuation route plan would be developed and updated in consultation with the Sacramento Office of Emergency Services and shall be consistent with the City's Emergency Operation Plan and Flood Management Plan. Original purchasers of homes in the project would be notified that their property lies within FEMA Flood Hazard Zone X, which is protected from the 100-year flood by a levee, and as such flood insurance is not mandatory. However, the project applicant shall prepare a disclosure (as approved by DOU) to the first residential purchasers as part of the builder sale documents, which describes the flood risks, and residents shall be notified of the availability of low-cost, Preferred Risk Policy flood insurance.

In the event of a levee break, the City has an established emergency operations and evacuation plan that would adequately warn residents of impending flood dangers, and either voluntary or mandatory evacuations would be ordered during flood alert and danger stages such that residents would have sufficient time to evacuate. Because the project would not substantially modify the site's topography and would include a flood gate as part of the 40th Street and bicycle/pedestrian underpass, if approved by UPPR, it would not alter the flood risks for off-site properties as currently described in the DOU maps of hypothetical levee breaks.

While economic losses and flood damages to the proposed residential units would be an unavoidable effect of a levee break, advance warning would be available; existing emergency evacuation plans are in place to protect the public; and the conditions of approval being imposed by the City of Sacramento would be sufficient to substantially reduce or avoid altogether the potential for significant impacts to public health and safety. Homeowners would be made aware of the flood risks associated with the property and would be able to, at their discretion, purchase flood insurance policies. For these reasons, and because the probability of a levee break or dam failure is very low, the effect of the proposed project on exposure of people or property to loss, injury, or damage would be **less than significant**.

Mitigation Measures

None required.

4.5-5: Plans to create vehicular and bicycle/pedestrian underpasses through the Union Pacific Railroad embankment could expose areas of East Sacramento to additional flood hazards. Based on the analysis below the impact is *less than significant*.

The extension of 40th Street through the Cannery Business Park site connecting to C Street between 40th Street and Tivoli Way would require an underpass to be constructed through the UPRR embankment. The 40th Street vehicle underpass would accommodate two lanes of traffic along with access for bikes and sidewalks on both sides of the road. In addition, the pedestrian and bicycle underpass in the western end of the site would be constructed through the existing UPRR embankment at the northerly end of Alhambra Boulevard, if approved by UPRR. If the underpass is approved by UPRR it would provide pedestrian and bicycle access between Alhambra Boulevard and the project site. Both of these underpasses would be equipped with flood gates meant to prevent the project from exposing areas of East Sacramento to increased flood risk.

As indicated in Impact 4.5-4, the decision on when and how to close the proposed flood gates would be made jointly by the DOU and the City's Department of Transportation based on the flood danger and the traffic and circulation during the evacuation effort; however, in no case would the flood gates be allowed to remain open long enough for floodwaters to penetrate the proposed 40th Street and bicycle/pedestrian underpasses and threaten East Sacramento. The design and construction of the proposed flood gates would be completed to the satisfaction of the DOU which would require the project applicant to submit plans for the flood gates as part of the tentative subdivision map, prior to approval of the final subdivision maps.

The operation and maintenance of the flood gates would occur in a similar manner as the existing flood gates that are located throughout the City through the UPRR embankment. The City of Sacramento DOU maintains and operates all flood gate structures on the UPRR embankment; and in the event of a flood emergency would close the flood gates in coordination with the City's Department of Transportation, and in accordance with the comprehensive flood management plan, as described in Impact 4.5-4. Because these would be underpasses, similar to other underpasses on the UPRR embankment, the floodgates would consist of metal doors that could be closed in a relatively short period of time (i.e., within an hour). The flood control structure at the Alhambra bicycle/pedestrian underpass (if approved by UPRR) may be a "stoplog" structure (which can also be closed in a similar timeframe). Although the specific design of the proposed flood gates is not presently available, oversight by the DOU and implementation of emergency operations plans, when necessary, would ensure the gates are properly engineered, and would prevent the vehicular and pedestrian underpasses beneath the UPRR to expose areas of East Sacramento to additional flood hazards. City transportation crews would continue to hold drills each fall to stay skilled at operating the gates as swiftly as possible, and would include the proposed gates in drills once installed.

For these reasons the impact of the underpasses on increased flood risks for East Sacramento would be **less than significant**.

Mitigation Measures

None required.

4.5-6: Stormwater runoff within the proposed development could exceed the capacity of on-site and/or off-site drainage facilities, including detention basins, storm drains, and/or pump stations, resulting in excessive ponding, nuisance flooding, or degradation of water quality on or off site. Based on the analysis below the impact is *less than significant*.

The project's proposed drainage collection infrastructure would include a drainage pump station that would be constructed adjacent to the proposed 8 acre-foot detention basins. The two detention basins would be located on the western end of the project site—one north of the A Street entrance and one south of it. As part of the project's conditions of approval and in accordance with Section 11 of the City's Design and Procedures Manual, this detention basin would be designed to hold the larger of (1) a 100-year, 24-hour storm, or (2) a 100-year, 10-day storm until the hydraulic capacity of Sump 99 becomes available. To minimize any impact to the existing off-site watershed (see Figure 4.5-4), a flap gate would be installed in the force main between the proposed on-site pump station and Sump 99. The intent of the flap gate is to halt stormwater flow from the project site to Sump 99 during times when off-site stormwater flows are high and Sump 99 is near or at its design capacity. The proposed on-site basin volume is designed to accommodate discharge from the proposed site for an extended duration.

According to the project applicant's engineer, the 8 acre-feet of detention is sufficient to accommodate a 100-year, 24-hour storm (Wood Rodgers 2013a). The City of Sacramento indicated that Sump 99 needed to be modified to include an electrical upgrade project (Wood Rodgers 2013a). The pump station is expected to have a capacity of approximately 10 cfs. Under normal conditions, drainage from the site would be pumped to the existing Sump Station 99 (storm drainage pump station) located southeast of the project site at the northeast corner of Lanatt Street and C Street/Elvas Avenue. The additional flows from the project site are not expected to require capacity upgrades to the existing Sump 99, but the project may be required to undertake an electrical upgrade project of Sump 99 (Wood Rodgers 2013a), if the City's DOU does not timely proceed with its currently planned Sump 99 electrical upgrade project.

While the project's stormwater drainage system would be designed to pass a 100-year storm without exceeding the capacity of the on-site detention basins and the off-site sump, rainfall rates in excess of this standard, or failure of the drainage system due to improper maintenance or an accident, could still result in localized flooding within the project site. However unlikely, such flooding would be localized, shallow, and represent more of a nuisance than a significant hazard to health, safety or the environment. The drainage system could be promptly repaired,

and excess water would be allowed to infiltrate into the ground, evaporate, and/or be pumped to Sump 99. For these reasons, the project would have a **less-than-significant impact** with respect to localized flooding and excessive rates of stormwater runoff.

Mitigation Measures

None required.

4.5-7: The proposed project could substantially deplete groundwater supplies or interfere with groundwater recharge. Based on the analysis below the impact is *less than significant*.

The proposed project would increase the amount of impervious surfaces; however, the effect on the amount of stormwater recharging the groundwater system would be minimal. Although it may interfere slightly with groundwater recharge due to an increase in impervious surfaces, the project site is not in a favorable groundwater recharge area due to the relatively shallow depth of groundwater and the hydrologic connection of the groundwater system with the adjacent American River. In addition, the project does not propose the use of on-site groundwater wells; therefore, it would not substantially deplete groundwater supplies. Furthermore, the project applicant has committed to implement runoff reduction LID measures, which are designed to promote groundwater infiltration. For these reasons the impact of the project on groundwater supplies and recharge would be **less than significant**.

Mitigation Measures

None required.

Cumulative Impacts

The geographic context for the analysis of cumulative hydrology and water quality impacts is the lower American River watershed areas for analysis of water quality impacts because the project site is located in this watershed. For analysis of flooding impacts, the geographic context for localized flooding impacts is the drainage shed of Sump 99 (shown in Figure 4.5-4) and for regional flooding impacts is the entire watershed area of the lower American River. This cumulative impact analyses does not rely on any list of specific pending, reasonably foreseeable development proposals in the general vicinity of the proposed project, but overall development anticipated to occur within the American River watershed.

4.5-8: The proposed project, in addition to other projects in the watershed, could result in the generation of polluted runoff that could violate water quality standards or waste discharge requirements for receiving waters. Based on the analysis below the impact is *less than significant*.

The City's 2030 General Plan MEIR determined that cumulative development in the City, in addition to other development in the watershed, could result in development of undeveloped land that could lead to potential increases in polluted runoff to local surface waters resulting in a potentially significant cumulative impact. However, future development subject to the NPDES MS4 permit would be required to comply with the SQIP; BMPs in the Stormwater Quality Design Manual for the Sacramento and South Placer Regions; LID measures to reduce pollutants; the City's Stormwater Management and Discharge Control Code and the Grading, Erosion and Sediment Control Ordinance; General Plan policies related to hydrology and water quality; and the General Construction NPDES permit. New development and redevelopment projects would require implementation of an ESC plan that identifies and implements a variety of BMPs to reduce the potential for erosion or sedimentation. For these reasons, there would be no cumulative impact; therefore, the proposed project's contribution would not be considerable, resulting in a **less-than-significant cumulative impact**.

Mitigation Measures

None required.

4.5-9: The proposed project, in addition to other projects in the watershed, could result in increased numbers of residents and structures exposed to a regional 100-year flood event. Based on the analysis below the impact is *less than significant*.

The City's 2030 General Plan MEIR found that development upstream of the Policy Area designated by the General Plan could result in increased impervious areas, increased runoff, and increased exposure of residents and structures to a localized 100-year flood event resulting in a cumulative impact. However, the drainage-shed of Sump 99 is essentially at buildout, which means that there is little opportunity for future development to increase the level and magnitude of future peak flow events that Sump 99 would need to handle. As previously indicated, Sump 99 needs to be modified with an electrical upgrade project and any development project proposed in the drainage shed would require that there be no net increase in stormwater runoff peak flows over existing conditions associated with a 100-year storm event under General Plan Policy ER 1.1.5. Therefore, localized flooding within this drainage shed would not be a cumulatively significant impact and there would be no cumulative impact associated with the project's contribution.

However, a general increase in the population in the lower American River's watershed and an increase in impervious area within its larger watershed could result in increased exposure to a

regional 100-year flood event. Most of the population growth would occur in areas designated by FEMA to be protected from 100-year flood events. Growth areas designated by the General Plan are required to construct detention basins to limit flow to the capacity of the local drainage facilities. As such, development assumed to occur under the 2030 General Plan would not produce any increase in the cumulative stormwater runoff, as noted in the MEIR. In addition, the 2030 General Plan provides policies to protect residents and property from localized flooding events. Policy U 4.1.1 requires the City to ensure all new drainage facilities are adequately sized to accommodate stormwater runoff in urbanized areas. Policy U 4.1.2 requires the City to implement master planning programs which are designed to identify facilities needed to prevent 10-year event street flooding and 100-year event structure flooding. The project will be required to submit a Storm Drainage Master Plan to the DOU as a condition of approval. Policy ER 1.1.5 requires that there be no net increase in stormwater runoff peak flows over existing conditions associated with a 100-year storm event.

Finally, the American River Common Features (ARCF) is an ongoing flood system infrastructure improvement program along the American River and Sacramento River system that ranges from levee underseepage remediation to levee height raises. The ARCF was designed to strengthen the American River levees so they can safely pass a flow of 160,000 cfs. The Common Features General Reevaluation Report will investigate the flood protection system along the American River, Natomas, the east side of the Sacramento River, and the levees in North Sacramento to identify what improvements are needed to bring the system up to a 200-year standard. Thus, levee improvement projects are ongoing and have recently received increased funding, including additional funds for the Folsom Dam Joint Federal Project, as well as levee improvements along the American River (Matsui 2013). These are projects, such as filling gaps in the off walls within the levees along the American River that will help SAFCA implement its plan for reaching 200-year flood protection.

For these reasons, the project's contribution is not cumulatively considerable and the cumulative impact would be **less than significant**.

Mitigation Measures

None required.

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