3.8 HYDROLOGY, WATER QUALITY AND DRAINAGE

3.8.1 Introduction

This section describes potential hydrologic effects related to drainage and water quality associated with development of the Yosemite Avenue - Gardner Avenue to Hatch Road Annexation project (proposed project). As discussed in the Initial Study for the proposed project (Appendix B), potential impacts related to 100-year flood zones, impediment or redirection of flood flows, and other flood hazards (e.g., dam/levee failure and inundation by seiche, tsunami or mudflow) were determined to be less than significant. Additionally, the Initial Study identified that the project site is not within a 100-year flood hazard area and would not risk release of pollutants due to inundation of the project site. Accordingly, these issues are not further evaluated in this EIR.

As discussed in Chapter 1, Introduction, a Notice of Preparation (NOP) for this Environmental Impact Report (EIR) was initially published in December 2016 based on the original project applications. In 2019, the project applicant submitted revised applications and site plans, increasing the number of residential units from 330 to 540 and increasing the amount of onsite parking. The City issued a revised NOP in May 2020. The City received a total of seven comment letters in response to the NOP issued in 2017, and six comment letters in response to the NOP issued in 2020. One specific comment was raised pertaining to drainage, stating that storm drainage in the Black Rascal and Cottonwood Creek watershed areas through downstream connections with Bear Creek have contributed to downstream flooding in previous storm incidents. Both NOPs and letters received in response to them are provided in Appendix A.

Information to prepare this section is derived primarily from the Storm Drainage Report (Appendix H), Flood Study (Appendix G), and Water Supply Assessment (Appendix L) prepared by QK, Inc. for the proposed project. The information in these technical documents is supplemented by information from the Merced Vision 2030 General Plan (City of Merced 2012a), the Merced Vision 2030 General Plan EIR (City of Merced 2012b), and the Merced Groundwater Subbasin Groundwater Sustainability Plan (GSP). This plan was developed and adopted by three agencies – the Merced Subbasin Groundwater Sustainability Agency (GSA), Merced Irrigation-Urban GSA, and Turner Island Water District GSA, and is herein referred to as the Merced Groundwater Subbasin GSP and cited as “Merced GSA 2019.”

3.8.2 Environmental Setting

Merced Region Watersheds and Drainage Basins

The Merced region is situated over a large underground aquifer with groundwater depths ranging from within 5 feet of the surface to over 1,200 feet deep. The City contains a varied surface water

system which includes a natural creek and drainage systems, the Merced Irrigation District's (MID) irrigation canal system and Lake Yosemite in the northeastern portion of the City's planning area (City of Merced 2012a). The City of Merced and areas within the Sphere of Influence/ Specific Urban Development Plan/ (SOI/SUDP) are located within the San Joaquin/Merced River watershed. A watershed is defined as the area of land that drains water, sediment, and dissolved materials to a common outlet at some point along the stream channel. The San Joaquin Valley drainage basin stretches approximately 110 miles from north to south between near the City of Stockton to near the City of Fresno, and approximately 95 miles from east to west between the Sierra Nevada mountain range and the coastal mountain ranges. The basin encompasses approximately 11,000 square miles. The San Joaquin River originates in the Sierra Nevada mountains and flows southwesterly to the vicinity of Mendota. It then flows northwesterly to its mouth in the Suisun Bay, and is the principal river within the drainage basin. Other rivers and surface waters within the basin and SOI/SUDP, as well as the proposed project area, include the following, as shown in Figure 3.8-1, Regional Hydrology:

- **The Merced River** is located approximately eight miles north of the SUDP study area, flowing through the northeastern part of Merced County. Originating in Yosemite National Park, it drains an area of approximately 1,040 square miles along the western flank of the Sierra Nevada range. With an average flow of 969,400 acre-feet, the Merced River provides a source of water for a number of water systems including the Merced Irrigation District.

- **Black Rascal Creek** located north of Santa Fe Drive and Olive Avenue, flows southwesterly through the SUDP plan area. Black Rascal Creek originates in the foothills northeast of the SUDP plan area near the boundary of Merced and Mariposa Counties. Black Rascal Creek is listed by the State of California as an Impaired Waterway (303(d) list) due to bacteria, dissolved oxygen, and toxicity and is subject to Total Maximum Daily Load (TMDL) requirements, with attainment of those standards currently expected by 2027 (SWRCB 2021a and 2021b).

- **Bear Creek** located south of Santa Fe Drive/Olive Avenue, flows in an east-west direction, south of Black Rascal Creek. Its headwaters are impounded by a reservoir approximately four miles east of the SUDP plan area. Bear Creek ultimately flows directly into the San Joaquin River. Bear Creek is listed by the State of California as an Impaired Waterway (303(d) list) due to bacteria and toxicity and is subject to TMDL requirements. According to the 2014 and 2016 Integrated Report, attainment of those standards was expected by 2021 (SWRCB 2021c).

- **Fahrens Creek** originates at approximately the 700-foot elevation northeast of the SUDP plan area and flows southwesterly to its confluence with Black Rascal Creek at a location east of Highway 59 and north of Olive Avenue.

In addition to the natural drainages and rivers, the City and SOI/SUDP is transected by numerous man-made channels which are part of MID's extensive system of irrigation canals, levees, and ditches (City of Merced 2012b). This includes the Yosemite Lateral Irrigation Canal north of the project site and an extension of the Yosemite Lateral Irrigation Canal adjacent to the northern project site boundary.

Groundwater Resources and Quality

The City of Merced is located within the 2,665 square-mile Middle San Joaquin-Lower Chowchilla watershed (USGS Hydrologic Unit 18040001), which in turn is part of the San Joaquin River Groundwater Basin. The basin covers approximately 15,200 square miles. Groundwater, which is generally supplied by runoff from the foothills and mountains, is the sole source of domestic water support for the City of Merced and is found within the San Joaquin Valley Groundwater Basin and Merced subbasin. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin (Merced GSA 2019).

The Merced Groundwater Subbasin is one of 21 basins in the State of California identified by the California Department of Water Resources as critically overdrafted and one of 48 basins considered high priority. The boundaries of this basin and nearby major waterways are shown in Figure 3.8-2, Merced Groundwater Subbasin. Consistent with the requirements of the California Sustainable Groundwater Management Act (SGMA), water management and land management agencies in Merced Subbasin have formed three GSAs: the Merced Irrigation-Urban Groundwater Sustainability Agency, the Merced Subbasin Groundwater Sustainability Agency, and the Turner Island Water District Groundwater Sustainability Agency. The three GSAs collaborated on developing a GSP for the entire Merced Groundwater Subbasin, which was adopted by each of the three GSAs in November and December 2019 (Merced GSA 2019).

In addition, the City of Merced prepared an Urban Water Management Plan (UWMP), last updated in 2017, that identifies the amount of groundwater available to the City and the existing and projected amounts of water demand in the City. The UWMP recognizes that the Merced Subbasin experiences overdraft conditions. It also found that the rate of groundwater extraction was reduced between 2013 and 2017 in response to drought conditions and is expected not to rebound to pre-drought levels because water metering had been implemented throughout the city

and water conservation measures would remain in effect regardless of any increases in precipitation over time (City of Merced 2017).

Further, the City participated in development of the Merced Integrated Regional Water Management Plan (MIRWMP) which was adopted in 2013 and last updated in 2019 (Merced Irrigation District 2019). The MIRWMP has identified the correction of overdraft conditions as one of the highest priorities for the region. The Groundwater Management Plan and MIRWMP identify several actions that have been implemented by local agencies to improve groundwater conditions, including:

- **Groundwater Recharge:** Merced Irrigation District (MID) has implemented in-lieu recharge programs to reduce groundwater pumping.
- **Water Conservation and Education:** The City implemented watering restrictions, provided rebates for water efficient fixtures, and distributed educational information.
- **Conjunctive Use of Water Resources:** Surface water from MID canals is used to irrigate landscape within the City and UC Merced.
- **Wastewater Reclamation and Recycling:** The City's Wastewater Treatment Plant (WWTP) is capable of producing approximately 12 million gallons per day (mgd) of highly treated recycled water which can be used in-lieu of ground water for irrigation. In 2015, the City used 4,886 acre-feet of recycled water for sewer and storm drain flushing, agricultural, and environmental purposes and discharged 2,653 acre-feet into Hartley Slough (City of Merced 2017).

As shown in Figure 3.8-2, the Merced Groundwater Subbasin includes lands south of the Merced River between the San Joaquin River on the west and the crystalline basement rock of the Sierra Nevada foothills on the east. Geologic units in the Merced Subbasin consist of consolidated rocks and unconsolidated deposits. The consolidated rocks include the Ione Formation, the Valley Springs Formation, and the Mehrten Formation. In the eastern part of the area, the consolidated rocks generally yield small quantities of water to wells except for the Mehrten Formation, which is an important aquifer. There are three ground water bodies in the area: an unconfined water body, a confined water body, and the water body in consolidated rocks (City of Merced 2012b).

Groundwater recharge and discharge is driven by both natural and anthropogenic (human-influenced) factors. Anthropogenic recharge, particularly deep percolation from agricultural irrigation and earthen-lined canals, is a key source of recharge in the Merced subbasin. Groundwater discharge is primarily through groundwater production wells. However, groundwater also discharges to rivers and streams where groundwater elevations are higher than river stage (Merced GSA 2019).

The Merced Groundwater Subbasin Groundwater Sustainability Plan: Annual Water Report Water Years 2016 - 2019, includes an estimate of historic change in the storage of the Merced Subbasin between 1996 and 2019. The report found that between 2006 and 2015, the subbasin storage was reduced by 1.92 million acre-feet (MAF) in total (192 thousand acre-feet (TAF) per year), resulting in total storage in 2015 of 45.3 MAF. By 2019, the total storage had increased slightly to 46.0 MAF, thus between 2016 and 2019 storage increased by an average of 16 TAF per year. The Annual Water Report concluded that "significant and unreasonable reduction of groundwater storage is not present and not likely to occur in the Subbasin. The 2006-2019 cumulative change in storage described above, which includes both representative dry and wet years, reflects a rate of overdraft of approximately 0.3 percent per year. It is not reasonable to expect that the available groundwater in storage would be exhausted" (Merced GSA 2020).

Groundwater in the Merced subbasin contains both anthropogenic and naturally occurring constituents. While groundwater quality is often sufficient to meet beneficial uses, some of these constituents either currently impact groundwater use within the subbasin or have the potential to impact it in the future. Depending on the water quality constituent, the issue may be widespread or more of a localized concern. The primary naturally occurring water quality constituents of concern are arsenic and uranium. There are also aesthetic issues related to iron and manganese. The primary water quality constituents of concern related to human activity include salinity, nitrate, hexavalent chromium, petroleum hydrocarbons, pesticides, solvents, and emerging contaminants. Salinity is also an issue due to the widespread nature of the problem and difficulty of management given increases in salinity as a result of both urban and agricultural use (Merced GSA 2019).

Flooding

A 100-year flood plain is defined as an area subject to inundation from a flood event that has a statistical probability of occurring once every 100 years (City of Merced 2012b). The proposed project site is not within a 100-year flood zone; the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Mate (FIRM) map number 06047C0429G indicates that the project site is within Flood Zone X (not shaded) and is therefore not in a special Flood Hazard Area and is an area outside the 0.2 percent annual chance Floodplain. No designated flood elevation applies to this project in regard to FEMA criteria for the 100-year Floodplain (Appendix G).

The City also requires consideration of potential localized flooding effects. Portions of the project site would be subject to shallow (less than 3 feet deep) flooding from Black Rascal Creek (which is located south of the project site) and Cottonwood Creek (which is located north of the project site) in the event of a 200-year storm event. Specifically, flooding of the Black Rascal Creek channel could create flooding of between 0 feet at the northeast corner of the Crossings component of the project site to 1.4 feet at the southwest corner of the Crossings component.

Flooding of the Cottonwood Creek channel could add approximately 0.3 feet of flooding depth to the Crossings component of the project site. Additionally, the southeastern portion of the Remainder Area would be subject to shallow (less than one foot) flooding from flooding of the Black Rascal Creek channel (Appendix G).

The Merced Streams Group is implementing flood control improvements on Black Rascal Creek approximately 5 miles east of the proposed project site. The flood control project "consists of a new perimeter levee, internal levee, and training levees to create a flood control detention basin and wetland area on Black Rascal Creek, which is a tributary to Bear Creek" and would reduce peak flows in Bear Creek by limiting flow in the diversion channel to 3,000 cubic feet per second (cfs). The perimeter levee would create a 300-acre detention basin to accommodate up to 2,800 acre-feet of water during a 200-year storm event while the internal levee would accommodate flood flows up to a 50-year storm event (to protect agricultural land within the 300-acre detention basin) (County of Merced 2017).

Surface Water Quality

Due to increased amounts of impervious surfaces within the City and SOI/SUDP, higher rates of stormwater runoff have occurred during rainy periods. This runoff can be a source of surface water pollution. Pollutants found in urban runoff vary from storm event to storm event at a given site and from site to site within a given area. Variances can be the result of differences in rainfall intensity and occurrence, geographic features and the land use of the site, as well as vehicle traffic and percent of impervious surface. The construction of roadways and vehicle parking areas, in combination with the use of chemical pesticides and fertilizers, cleaning solvents, etc., may have resulted in inadvertent contamination of surface waters throughout the City of Merced urban area. Storm runoff can carry these polluting agents into natural drainage courses causing adverse effects on surface water quality.

As noted above, both Black Rascal Creek and Bear Creek are identified by the State of California as impaired waterways, with Black Rascal Creek having elevated levels of bacteria, dissolved oxygen, and toxicity and Bear Creek having elevated levels of bacteria and toxicity. In general, agricultural operations contribute to bacteria levels in surface water bodies, while toxicity and changes in dissolved oxygen levels can result from both agricultural operations and land development.

In the Central Valley, there is a natural weather pattern of long dry periods from May to October. During this seasonal dry period, pollutants created by agricultural operations as well as urban and suburban sources such as vehicle exhaust, vehicle and tire wear, crank case drippings, spills and atmospheric fallout accumulate on the ground, building roofs, roadways, parking areas, and other areas of hardscape and compacted soil (where groundwater infiltration is limited). Precipitation

during the early portion of the wet season, typically beginning in November, displaces these pollutants into the storm water runoff, resulting in high pollution concentrations in the initial wet weather runoff. This early runoff with peak pollutant levels is commonly referred to as the "first flush" of a storm.

Under conditions where surface storm water discharge is not regulated, stormwater runoff from paved roadways and parking areas may contain substances such as oil, battery acid, and engine coolant. All of these can be hazardous to local flora and fauna. Pesticides and fertilizers applied to landscaping could be washed into the stream channel which could affect native plants and animals (City of Merced 2012b).

Project Site Conditions

Topography and Soils

The project site slopes from the northeast to the southwest. Based on soil data from the Natural Resource Conservation Service maps (USDA 2019), the following three soil types are mapped within the project site, as shown in Figure 3.8-2: Ryer clay loam, 0-2 percent slopes; Wyman clay loam (deep over hardpan), 0-1 percent slopes; and Yokohl clay loam, 0-3 percent slopes. Ryer clay loam and Wyman clay loam are well-drained alluvium soils derived from igneous rock. These soils fall within Hydrologic Soil Group D, which has the highest runoff potential, and are generally characterized as well drained with slow permeability rates and slow to medium runoff rates. They have very low infiltration rates and high runoff potential when thoroughly wetted and consist of clay soils with a high shrink-swell potential, soils with a permanent high-water table, soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission (USDA 2009).

Existing Drainage and Stormwater Runoff

Approximately 26 acres of the project site are currently farmed with irrigation water supplied by MID. As described in the project's Storm Drainage Report (Appendix H), drainage from the project site and adjacent road ditches flow to the southwest corner of the project site. In previous years, this drainage continued south in a ditch along Parsons Avenue and discharged into Black Rascal Creek. As properties on the south side of Yosemite Avenue were developed as residential housing projects, their respective storm drainage systems were required to maintain and accommodate the historical drainage pattern from the north side of Yosemite Avenue. One of these residential developments, the Silverado project, installed a 24-inch storm drain pipe that collects drainage from the project site, crosses under Yosemite Avenue, and flows into the Silverado storm detention basin. Flows leaving the detention basin are conveyed to a storm pump station that discharges into Black Rascal Creek. This station was constructed as a shared system

between the Oakmont Village, Silverado, and Camelot residential subdivisions located south and southwest of the project site. The pump station is located at the southern terminus of Cascade Creek Avenue, adjacent to a portion of the Rascal Bike Path. Drainage from adjacent parcels to the north, east or west do not enter into or cross the project site.

The City of Merced does not provide storm drainage and detention facilities; the City's standards require each development to provide its own system that includes on-site detention of the runoff that would occur due to the project improvements (increased impervious surfaces) under a 50-year, 24-hour storm event. The Silverado project design accounted for the drainage and the 2-year, 24-hour discharge rate that the subject 30-acre property was "entitled" to; this detention capacity is still available.

3.8.3 Regulatory Setting

Federal Regulations

Clean Water Act

The Clean Water Act (CWA, 33 U.S.C. 1251 et seq.), as amended by the Water Quality Act of 1987, is the major legislation governing water quality. The main objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Sections of the act relevant to consideration of the project's effects on hydrology and water quality include:

- CWA Section 303 requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are defined as consisting of two elements: (1) designated beneficial uses of the water body and (2) criteria that protect the designated uses. States are also required to develop a list of impaired water bodies that do not meet water quality standards and objectives and establish a TMDL for each pollutant/stressor. A TMDL defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. In California, the EPA has designated the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) with the authority to identify beneficial uses and adopt applicable water quality objectives.
- CWA Section 304(a) requires that the U.S. Environmental Protection Agency (U.S. EPA) publish advisory water quality criteria based on the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from pollutants in water. If multiple beneficial uses exist for a water body, water quality standards must protect the most sensitive use.
- CWA Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity which may result in discharge to waters of the United States,

obtain certification from the state that the discharge will comply with all provisions of the act.

- CWA Section 404 establishes a permit program for the discharge of dredge and fill material into waters of the United States, which is jointly administered by the U.S. Army Corps of Engineers and the EPA. Refer to Section 4.2, Biological Resources, Impact 4.2-3 for a discussion of jurisdictional waters.

Numerous agencies have responsibilities for administration and enforcement of the CWA. At the federal level this includes the EPA, the U.S. Army Corps of Engineers, the Bureau of Reclamation, and the major federal land management agencies such as the U.S. Forest Service and the Bureau of Land Management. At the state level, with the exception of tribal lands, the California EPA and its sub-agencies, including the SWRCB, have been delegated primary responsibility for administering and enforcing the CWA in California.

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.

National Pollution Discharge Elimination System

CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), which is a permitting system for the discharge of pollutants into waters of the United States. The permit program is administered by the SWRCB and the RWQCBs, who have programs that implement individual and general permits related to construction activities, stormwater quality runoff, and various types of non-stormwater discharges. Large communities with the potential to cause larger impacts to receiving waters are issued permits with requirements specific to that community. The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for Small Municipal Separate Storm Sewer System (MS4) operators in small communities. Cities permitted under the general MS4 permit are required to develop and implement a Stormwater Management Plan (SWMP) outlining measures to reduce the discharge of pollutants to the maximum extent practicable. MS4 permits are described in more detail under State Regulations and the City's adopted SWMP is described further under Local Regulations.

National Flood Insurance Program

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

State Regulations

Porter-Cologne Water Quality Control Act

The Porter–Cologne Act (codified in the California Water Code, Section 13000 et seq.) is the primary water quality control law for California. Whereas the CWA applies to all waters of the United States, the Porter–Cologne Act applies to waters of the state, which includes isolated wetlands and groundwater in addition to federal waters. Under the Act, that State must adopt water quality policies, plans, and objectives that project the State's waters for the use and enjoyment of the people. The act is implemented by the SWRCB and the RWQCBs, who are required to adopt and periodically update water quality control plans (Basin Plans). Basin Plans are the regional water quality control plan that detail beneficial uses, water quality objectives, and implementation programs as required under the CWA and the Porter-Cologne Act. 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. Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. WDRs typically require many of the same best management practices (BMPs) and pollution control technologies as required by NPDES-derived permits.

Basin Planning

As noted above, the primary enforcement authority for the Porter-Cologne Act and portions of the CWA has been given to the SWRCB and its nine RWQCBs. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for implementation of state and federal regulations. Each of the nine RWQCBs are responsible for adopting and implementing Basin Plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality

problems. The Central Valley RWQCB (CVRWQCB) is responsible for the protection of the beneficial uses of waters draining to the Central Valley Region.

The *Central Valley Region Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley: Sacramento River Basin and San Joaquin River Basin* designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan (California Water Code Sections 13240–13247) (CVRWQCB 2018). Beneficial uses of the surface waters of the Sacramento–San Joaquin Delta include municipal, agricultural, industrial, and recreational uses, freshwater habitat, migration, spawning, wildlife habitat, and navigation. Beneficial uses for all groundwater resources in the Central Valley region include or potentially include municipal, agricultural, and industrial uses (City of Merced 2012b).

The Basin Plan identifies the Bear Creek Minor Subarea consisting of 620 square miles of the Bear Creek watershed contained within Merced County. This area is within the Lower San Joaquin River watershed, upstream of the Salt Slough Subarea. The Basin Plan finds that "water quality in the San Joaquin River has degraded significantly since the late 1940s, with increasing concentrations of salt, boron, selenium, molybdenum and other trace elements resulting from "reservoir development on the east side tributaries and upper basin for agricultural development, the use of poorer quality, higher salinity, Delta water in lieu of San Joaquin River water on west side agricultural lands and drainage from upslope saline soils on the west side of the San Joaquin Valley" (CVRWQCB 2018). To address this degradation of water quality, the CVRWQCB adopted a control program for salt and boron with specific implementation actions to address subsurface agricultural drainage.

Sustainable Groundwater Management Act

The California Sustainable Groundwater Management Act (SGMA), which was adopted in 2014, established a framework for sustainable groundwater management by requiring governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, local agencies may form GSAs which are required to adopt Groundwater Sustainability Plans (GSPs) that define a sustainable management plan for crucial groundwater basins and requires that annual reports be submitted to DWR to provide updates on basin conditions and GSP implementation.

The Merced Groundwater Subbasin is one of 21 basins in the State of California identified by the California Department of Water Resources as critically overdrafted and one of 48 basins considered high priority. The Merced Groundwater Subbasin GSP was adopted in late 2019 by three GSAs that were formed in accordance with the SGMA, as noted above and discussed further in the Local Regulations section below.

State Nondegradation Policy

In 1968, as required under the federal antidegradation policy described previously, the SWRCB adopted a nondegradation policy aimed at maintaining high water quality 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 includes a provision stating that when existing water quality is better than required under the water quality control plan, such quality would be maintained until it can be demonstrated that a change would be consistent with maximum public benefit. Additionally, the policy requires any waste producing activities which would discharge into high-quality waters be required to meet discharge requirements ensuring that pollution or nuisance would not occur and that the highest water quality for maximum public benefit would be maintained.

Regional Water Quality Control Board (Central Valley Region)

NPDES Construction General Permit (Order No. 2009-0009 DWQ, as amended)

For stormwater discharges associated with construction activity in the State of California, the SWRCB has adopted the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) to avoid and minimize water quality impacts attributable to such activities. Construction General Permits regulate stormwater flows from construction activities that disturb one acre or more of land and construction on smaller sites that are part of a larger project. The permit requires preparation of and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which includes Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality through construction and operation of the project. The Construction General Permit requires routine inspection of all BMPs to monitor effectiveness of the SWPPP. The project applicant must submit a Notice of Intent (NOI) to the SWRCB to be covered by a NPDES permit and prepare the SWPPP prior to the beginning of construction. Since development of the proposed project would disturb more than one acre of land, the project would require coverage under the Construction General Permit.

The City's standard conditions of approval requires development project applicants to prepare and submit a SWPPP for review by the City Engineer in conjunction with the submittal of the Improvement Plans, Grading Plans, and Final Map.

Municipal Stormwater Permit (CVRWQCB Order 2013-0001-DWQ, as amended)

For discharges from municipal storm sewer systems, the State Water Resources Control Board issued a Phase II Small MS4 General Permit (Permit Number CA000004, Water Quality Order

No. 2013-0001 DWQ) which became effective on July 1, 2013. The Phase II Small MS4 General Permit requires regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for their stormwater discharges. Each regulated MS4 is required to develop and implement a stormwater management program/approach to reduce and/or eliminate discharge of pollutants from the MS4 to the maximum extent practicable and effectively prohibit discharges of non-stormwater into its MS4, unless such discharges are authorized.

The Storm Water Management Program (SWMP) was implemented to limit discharge of pollutants from the storm sewer systems of the Merced Storm Water Group (which is a coalition of municipalities consisting of the City of Atwater, City of Merced, and Merced County) to fulfill requirements of storm water discharges from Small MS4 operators in accordance with Section 402(p) of the Federal Clean Water Act (CWA). The SWMP was developed to also comply with the Phase II Small MS4 General Permit. The Small MS4 Permit regulates stormwater runoff by requiring implementation of BMPs to reduce pollutants in runoff to the maximum extent practicable to protect water quality. The provisions of the Phase II Small MS4 General Permit are implemented in the City through Municipal Code Chapter 15.50.120, Reductions of Pollutants in Storm Water, which is described in more detail under Local Regulations. The City's standard conditions of approval require development project applicants to demonstrate that the proposed development meets the requirements of the Phase II Small MS4 General Permit and corresponding design standards.

Local Regulations

Merced Subbasin Groundwater Sustainability Plan

As discussed above, the Merced Groundwater Subbasin GSP was adopted in late 2019 by three GSAs that were formed in accordance with the SGMA (Merced GSA 2019). The Merced Groundwater Subbasin GSP was submitted to the California Department of Water Resources (DWR) in January 2020, ahead of the January 31, 2020 regulatory deadline for submission of GSPs for critically overdrafted subbasins. The first annual report for water years 2016 to 2019 was submitted in April 2020 and the second annual report for water year 2020 was submitted in April 2021.

Stormwater Management Program

The City has developed a Stormwater Management Program (SWMP) to limit the discharge of pollutants from the Merced Storm Water Group's storm sewer systems (City of Merced 2015). The development and implementation of the SWMP is to fulfill requirements of storm water

discharges from Small Municipal Separate Storm Water Sewer System (MS4) operators in accordance with Section 402(p) of the Federal Clean Water Act (CWA). The SWMP was developed to also comply with the Phase II Small MS4 General Permit.

The overall goals of the SWMP are to do the following: (a) reduce the potential impact(s) of pollution from urban areas on waters of the State and waters of the United States (U.S.) and protect their beneficial uses; and (b) develop and implement an effective stormwater program that is well-understood and broadly supported by stakeholders. As part of complying with the City's obligations under the Phase II Small MS4 General Permit, the City has prepared a Program Effectiveness Assessment and Improvement Plan (PEAIP) (City of Merced 2015). The PEAIP includes the City's strategy for tracking the short- and long-term effectiveness of the stormwater program, measures used to assess the effectiveness of BMPs and/or the stormwater program as a whole, and the City's approach to using the information obtained through the PEAIP to improve the stormwater program (City of Merced 2015).

Post Construction Standards Plan

The City of Merced Post Construction Standards Plan provides guidance on the design and use of stormwater management measures for new construction projects. These standards require that a proposed development project identify the Drainage Management Area(s) within the project site, identify potential sources of pollutants within the project, incorporate appropriate Best Management Practices / Source Controls into the project design, demonstrate how the City's identified Low Impact Design standards will be achieved, and demonstrate that stormwater runoff will be managed for flow rates, flow volumes, and water quality treatment. The City's standards require that each project detain the equivalent of a 50-year, 24-hour storm due to the increased runoff from the project improvements (City of Merced n.d.). Further, the City's storm design standards allow detained stormwater to be discharged over a 48-hour period at a metered discharge rate equivalent to the runoff that the undeveloped property would generate from a 2-year, 24-hour storm. The Post Construction Standards Plan recognizes that reducing storm water discharge to zero would be ideal but that the heavy clay soils throughout most of the City of Merced make this infeasible because they do not allow for sufficient water infiltration rates.

Merced Vision 2030 General Plan

The Merced Vision 2030 General Plan, Public Services and Facilities Chapter includes several goals and policies relating to hydrology and water quality (City of Merced 2012a). The following policies and implementing actions are applicable to the proposed project:

Policy P-1.1 Provide adequate public infrastructure and municipal services to meet the needs of future development

Policy P-1.3 Require new development to provide or pay for its fair share of public facility and infrastructure improvements.

Implementing Actions

1.3.c All new development shall contribute its fair share of the cost of on-site and off-site public infrastructure and municipal services as appropriate. This could include installation of public facilities, payment of impact fees, and annexation to the City Communities Facilities District for annual operating costs of City services. New development shall provide adequate financing, as necessary, to meet all identified costs associated with new development, including, but not limited to, public facilities and municipal services where nexus can be shown. It is understood, however, that facilities and infrastructure not provided by the City is the planning and funding responsibility of other governmental, quasi-public, or private entities.

1.3.d The City may require developments to install off-site facilities which also benefit other properties. The City may establish funding mechanisms to reimburse developers for infrastructure capacity in excess of the fair share costs resulting from a specific development's impacts if these excess facilities are deemed necessary to efficient and orderly development. 1.3.e Master Plans, Community Plans, General Plan amendments, pre-zoning, and annexation proposals, through the Development Agreement process, shall ensure that infrastructure development and public facilities and municipal services are consistent with overall local public agency plans, and that the local public agencies can reasonably provide and/or extend services within the proposed development time frame of implementation. Master Plans, Community Plans, General Plan amendments, pre-zoning, and annexation proposals prepared for areas subject to annexation to the City shall include an evaluation (prepared by the applicants with input from the City, School Districts, and other service providers) of all infrastructure, public facilities, and services under the jurisdiction of all local public agencies. These Plans for Service should include an evaluation of existing infrastructure and services, future public facilities and services required to serve the development, and the timing and funding of such public facilities and municipal services. The determination of the ability to reasonably provide or extend services for purposes of this implementing action rests with the City Council when considering the master plan, community plan, or annexation as a whole.

Policy P-5.1: Provide effective storm drainage facilities for future development.

Implementing Actions

5.1.c Continue to require all development to comply with the Storm Water Master Plan and any subsequent updates. All new development proposals will be reviewed for consistency with the plan and shall be responsible for construction of storm water retention basins, collection, treatment and disposal facilities necessary to adequately support the project. Where development is proposed in an area which lacks basic drainage infrastructure at present, the development project may be required to construct the necessary improvements with non-project related costs to be reimbursed as other development occurs in the area.

5.1.d Installation or design of facilities necessary to provide services to development projects will be based on the full build-out scenario. Short-term or intermediate flood control and storm drainage facility improvements can result in higher long-term costs for ultimate system development and result in short-term flooding on adjacent areas. At the same time, if it can be demonstrated that an immediate development project's storm water can be contained completely on-site without off-site impacts to the regional drainage system, such proposals can be approved provided that the project contribute its fair share towards the regional flood control and drainage system.

Policy P-5.2: Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.

Implementing Actions

5.2.b Storm water facilities shall be designed and constructed in accordance with the standards in the Parks and Open Space Master Plan and the Storm Water Master Plan. The City's Parks and Open Space Master Plan and Storm Water Master Plan include design criteria and standards for joint use facilities. Design criteria include the use of rounded or sculpted edges, natural materials, and abundant landscaping.

Merced Municipal Code

The City of Merced Municipal Code Chapter 15.50 Storm Water Management and Discharge Control establishes the City's requirements for "controlling non-storm water discharges to the storm water conveyance system from spills, dumping, or disposal of materials other than storm water, and by reducing pollutants in urban storm water discharges to the maximum extent practicable" (City of Merced 2020). Section 15.50.120, Reduction of Pollutants in Storm Water, details the requirements for any person performing construction activities in the city. This section

requires prevention of pollutants from entering the storm water conveyance system and compliance with all applicable federal, state and local laws, ordinances, or regulations, including, the California NPDES General Permit for storm water discharges associated with construction activity (Construction General Permit) and the city storm water management and discharge control chapter. All construction projects, regardless of size, having soil disturbance or activities exposed to storm water are required to implement BMPs for erosion and sediment controls, soil stabilization, dewatering, source controls, pollution prevention measures, and prohibited discharges. Prior to issuance of a construction permit or approval of the proposed improvement plans, for projects subject to the state's current Construction General Permit, the waste discharger identification (WDID) number and the SWPPP must be submitted to the City for approval.

3.8.4 Impacts

Methods of Analysis

Hydrology and water quality impacts were evaluated in the Storm Drainage Report prepared by QK, Inc. (Appendix H). This study provides comparisons of runoff rates for the pre- and post-project runoff and stormwater retention conditions.

The impact analysis below considers compliance with regulations pertaining to water quality and implementation of the City's standard conditions of approval for new development as part of the proposed project. Impact determinations are made based on both the magnitude of project-related change from existing conditions, as well as the effectiveness of compliance with existing regulations and standards.

Issues Addressed in the Initial Study

As discussed in the Initial Study for the proposed project (Appendix B), the project site is outside of flood hazard zones and not within the Federal Emergency Management Act (FEMA) Flood Insurance Rate Maps (FIRM) for a 100-year, 500-year or dam failure inundation zone, as shown on Figure 3.8-1 of the City's General Plan EIR (City of Merced 2012b), and would be subject only to shallow (less than 3 feet deep) flooding from Black Rascal Creek and Cottonwood Creek in a 200-year storm event. Thus, the Initial Study concludes that potential impacts related to 100-year flood zones, impediment or redirection of flood flows, and other flood hazards (e.g., dam/levee failure and inundation by seiche, tsunami or mudflow) would be less than significant and there would be no risk to people or property on the project site from dam or levee failure. Additionally, the project site is not within a 100-year flood hazard area and would not risk release of pollutants due to inundation of the project site. These issues are not further addressed in this EIR.

Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a significant impact would occur if development of the proposed project would:

- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: result in a substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; or 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
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impacts and Mitigation Measures

Impact 3.8-1: Through compliance with federal, state, and local regulations, implementation of the proposed project would not violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality. This would be a less than significant impact.

The Crossings

Construction

Construction of the proposed project would result in earth disturbing activities such as site clearing and grading for construction of onsite driveways, parking areas, and building pads. Before disturbed areas are paved, if they are exposed to rainfall they could lead to an increase in erosion and the discharge of sediment to receiving waters resulting in a degradation of water quality. Additional pollutants can be introduced during construction from vehicular use, construction materials, and construction waste products. Pollutants typically present on construction sites include petroleum products and heavy metals from equipment, and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Construction activities could result in water quality degradation if runoff entering receiving waters contains

pollutants in sufficient quantities to exceed water quality objectives defined in the Basin Plan or TMDLs established under CWA Section 303(d). Impacts from construction-related activities would generally be short term and of limited duration.

Because implementation of the proposed project would collectively require construction activities resulting in a land disturbance of more than 1 acre, the project applicant is required to obtain coverage under the Construction General Permit (SWRCB Order 2009-0009-DWQ, as amended), which pertains to pollution from grading and project construction. Coverage under the Construction General Permit requires a qualified individual (as defined by the SWRCB) to prepare a SWPPP that addresses the potential for construction-related activities to contribute to pollutants within the project's receiving waterways. The SWPPP must describe the type, location and function of stormwater BMPs to be implemented, and must demonstrate that the combination of BMPs selected are adequate to meet the discharge prohibitions, effluent standards, and receiving water limitations contained in Construction General Permit.

The following list includes examples of construction water quality BMPs that are standard for most construction sites subject to the Construction General Permit:

- Silt fences and/or fiber rolls installed along limits of work and/or the project construction site;
- Stockpile containment and exposed soil stabilization structures (e.g., visqueen, fiber rolls, gravel bags and/or hydroseed);
- Runoff control devices (e.g., fiber rolls, gravel bag barriers/chevrons, etc.) used during construction phases conducted during the rainy season;
- Wind erosion (dust) controls;
- Tracking controls at the site entrance, including regular street sweeping and tire washes for equipment;
- Establishment of vehicle fueling and maintenance areas and material storage areas that are either covered or are designed to control runoff;
- Proper waste/trash management; and
- Regular inspections and maintenance of BMPs.

These BMPs would be refined and/or added to as necessary by a qualitied SWPPP professional to meet the water quality performance standards in the Construction General Permit.

To obtain coverage under the Construction General Permit, the project applicant must submit to the SWRCB a Notice of Intent and associated permit registration documents, including a SWPPP and site plan, and must obtain a Waste Discharge Identification Number. As a standard condition of approval, the project applicant is also required to provide the SWPPP for review by the City

Engineer in conjunction with the submittal of the Improvement Plans, Grading Plans, and Final Map. In addition, all earthwork, grading, trenching, backfilling and compaction operations must be conducted in accordance with the City's Building Code (Title 17 Chapter 17.04) and the City's Introduction to Standard Designs (City of Merced 2008).

The BMPs required for coverage under the Construction General Permit and the erosion control provisions contained in City ordinances would require measures to prevent transport of construction-related contaminants to impaired surface waters (Black Rascal Creek and Cottonwood Creek, as discussed in Section 3.8.2 Environmental Setting) and contributing to water quality impacts. For these reasons, water quality impacts resulting from construction-related activities and ground disturbances would be **less than significant.**

Operation and Maintenance

Implementation of the proposed project would convert approximately 28.4 acres of existing agricultural lands to urban uses and create new impervious surfaces (roof, pavement, and sidewalks) covering approximately 64 percent of the project site. The increase in impervious area created by the proposed project, as well as on-site activities and uses, could alter the types and levels of pollutants that could be present in project site runoff. Runoff from building rooftops, walkways, parking lots, and landscaped areas can contain 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; and
- Degree to which street cleaning occurs.

Under existing conditions, stormwater that is not infiltrated into the soil moves as sheet flow from northeast to the southwest. Drainage from the project property and adjacent road ditches flow to the southwest corner where the ditch that runs along the site's southern boundary on East Yosemite Avenue is piped and heads south, crossing under East Yosemite Avenue. The Phase I Environmental Site Assessment conducted for the project site did not report any detectable level of organochlorine pesticides in the soil (Appendix I). However, the past agricultural uses of the site mean that low levels of residual nutrients/fertilizers may remain within site soils. Given surface soils are exposed over the entire site, existing stormwater runoff may contain levels of sediment and/or nutrients characteristic of agricultural land uses.

Where roads, driveways and residences are proposed, the surface soils that are now exposed to stormwater runoff would be stripped and replaced with engineered fills that meet geotechnical specifications. Engineered fills and new pavement would introduce impervious surfaces to approximately 64 percent of the project site. The new site configuration would reduce the exposure of soils containing nutrients/fertilizers to stormwater runoff and would likely reduce the turbidity levels of runoff when compared to the current agricultural use. However, it would also introduce new uses and activities that have the potential to degrade the quality of stormwater runoff. The primary pollutants of concern for this type of residential and commercial development are associated with uncovered parking areas (e.g., leaking fuel or fluids may enter stormwater), landscaping and landscape maintenance (e.g., sediment, improper/excessive use of pesticides, and/or fertilizers/nutrients), and/or improper waste management (e.g., fugitive litter/trash).

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 regional waterways) and would only occur on an improperly designed and maintained development. Nevertheless, because the cumulative effects of past projects could result in substantial water quality problems in the region's major waterways, and because water quality problems are generally cumulative in nature, the City's standard conditions of approval, the Small MS4 General Permit, and drainage design standards require developers to design and maintain projects in a manner that reduces pollutant concentrations within stormwater discharges to the maximum extent practicable. Standard conditions of approval require the project applicant to demonstrate to the City Engineer and Director of Public Works that the proposed project meets the requirements of the City's Storm Water program, Post Construction Standards Plan, Introduction to Standard Designs, and the Small MS4 General Permit issued by the SWRCB. In addition, as discussed in the Construction section above, the project would be required to comply with the Construction General Permit by preparing and implementing a SWPPP, which must identify permanent BMPs that would be installed during construction to ensure post-construction water quality protection.

The proposed project would construct a network of storm drains to collect storm runoff from the project buildings and paved areas which would direct the storm water to a proposed detention basin. A storm pump station would be installed to empty the detention basin (in less than 48 hours) while limiting the discharge to the allowable metered rate into the existing City system, as discussed further in Impact 3.8-2. The proposed detention basin would provide both storm water storage and water quality treatment because detention times in the range of 24 to 48 hours allow sediment and pollutants to settle out before the storm water is discharged to downstream receiving waters.

To provide stormwater quality treatment prior to stormwater reaching the detention basin, various combinations of low impact design features would be developed during the design phase of the

project, as required by the City's Post Construction Standards Plan. These measures may include bio swales, modular wetlands biofiltration units, storm water planters, and nutrient separating baffle boxes. As required by Municipal Code Chapter 15.50 and the NPDES, the project applicant must show that water quality BMPs sufficient to "remove pollutants from stormwater to the maximum extent practicable" are included in the project design, and that BMPs will be "implemented and maintained in a manner that is consistent with the California Storm Water Quality Association (CASQA) Best Management Practice Handbooks or equivalent guidelines" (City of Merced 2020). In addition, under Municipal Code Section 15.50.120, the project would be conditioned to demonstrate compliance with the City's Storm Water program, Post Construction Standards Plan, Introduction to Standard Designs, and the Small MS4 Permit issued by the SWRCB. Specifically, Municipal Code Section 15.50.120 states "all site design measures, source controls, treatment controls, and hydromodification measures must be selected, sized, and situated in accordance with the guidance provided in the current MS4 permit and the city's Storm Water Design Standards Manual. Documentation of the site's post-construction storm water design measures must be submitted to the city engineer for review and approval prior to the commencement of the project" (City of Merced 2020). For these reasons, the impacts of the proposed project on water quality would be **less than significant.**

Remainder Area

The project proposes to pre-zone the Remainder Area with approximately 19.4 acres of Urban Transition (U-T) and approximately 20.8 acres of Low Density Residential (R-1-10). No new development within the Remainder Area is proposed at this time, however the portion of the Remainder Area that is proposed to be zoned R-1-10 could support single-family residential lots with a minimum size of 10,000 square feet. The portion of the Remainder Area zoned U-T would only allow new agricultural development unless further rezoning is approved, and thus the proposed project would not result in the potential for new development to occur on that portion of the site.

No development, construction, grading, or change in the impervious landscape within the Remainder Area is currently proposed. At the time that development is proposed within the Remainder Area, would be required to analyze the construction and operation hydrology and drainage conditions in order to demonstrate compliance with the Municipal Code and applicable storm water quality regulations. Future land uses are unknown and therefore analysis of potential impacts at this stage would be speculative. However, compliance with applicable regulations as discussed in The Crossings analysis above would ensure impacts would be **less than significant.**

Mitigation Measures

No mitigation measures are required.

Impact 3.8-2: Through compliance with the City of Merced stormwater management regulations, implementation of the proposed project would not alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in a substantial erosion or siltation, substantially increase the rate or amount of surface runoff in a manner which would result in flooding, or create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. This would be a less than significant impact.

The Crossings

The proposed project would convert approximately 28.4 acres of the existing agricultural lands to residential and commercial uses. The project would result in impervious coverage (roofs, pavement, and sidewalks) over 64 percent of the project site, which could cause an increase in the peak flows and volumes discharged from the site during storm events. To prevent the increase in peak flows, the project includes a proposed stormwater detention basin and a pump station to regulate the rate of discharge such that stormwater is released from the site over a 48-hour period at a rate equivalent to the runoff that the undeveloped property would generate from a 2 year, 24 hour storm. The proposed storm basin would have a relatively small footprint (approximately 1.1 acres), so it would be configured as a “deep & steep” basin rather than a “shallow & wide” basin in order to provide the necessary storage volume in the available space. The side slopes would be constructed at a 2:1 slope ratio and the water depth would be approximately 10 feet deep in a 50-year storm event, providing a detention volume of approximately 6 acre-feet.

As shown in Figure 3.8-3, Stormwater Management, once water is discharged from the proposed detention basin, it would flow into the existing 24-inch stormwater pipe that crosses under East Yosemite Avenue. This pipe discharges to the detention and pumping system for the Silverado residential subdivision, and then into Black Rascal Creek via the combined system pump station at the south end of Cascade Creek Avenue in the Oakmont Village subdivision (as described in Section 3.8.2, Environmental Setting). Thus, stormwater from the project site would experience two detention events – it would first be detained within the project site and then detained again once it enters the detention and pumping system for Silverado - before it is discharged to Black Rascal Creek.

The proposed project would maintain the existing drainage pattern, with stormwater runoff flowing southwest through the project site and then south through existing stormwater pipes, through the detention and pump system in the Silverado subdivision, and finally into Black Rascal Creek. Further, the project would ensure that there are no increases in the peak flows of stormwater discharge leaving the site and entering Black Rascal Creek. The project would increase the total volume of stormwater discharge from the site by increasing the extent of impervious surfaces onsite. However, given the low infiltration rates of the soils present onsite, the increase in total volume of stormwater discharge would not be substantial and would not lead to increased erosion within Black Rascal Creek or flooding.

As concluded in the Storm Drainage Report prepared by QK, Inc. (Appendix H), the project would be designed to meet all city storm drainage standards. Stormwater discharge would be equal to or less than the current discharge from the undeveloped property so there would be no adverse impact to the city's existing downstream system. As a result, the proposed detention basin would prevent the project from creating a significant impact due to an increase in erosion or siltation downstream, the proposed project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite, or 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. Impacts would be **less than significant**.

Remainder Area

No development, construction, grading, or change in the impervious landscape within the Remainder Area is currently proposed. At the time that development is proposed within the Remainder Area, the applicant for that development proposal would be required to analyze the construction and operation hydrology and drainage conditions in order to demonstrate compliance with the Municipal Code and applicable storm water management regulations. Future land uses are unknown and therefore analysis of potential impacts at this stage would be speculative. However, compliance with applicable regulations as discussed in The Crossings analysis above would ensure impacts due to potential increases in the rate or volume of stormwater runoff, including increased erosion or flooding, would be **less than significant.**

Mitigation Measures

No mitigation measures are required.

Impact 3.8-3: Implementation of the proposed project may substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. This would be a less than significant impact.

The Crossings

Agricultural uses currently at the project site obtain irrigation water from the Merced Irrigation District. The project proposes to annex the property to the City and develop residential and commercial uses in The Crossings component of the site. Water supply for the proposed uses would come from the City of Merced.

Groundwater Recharge

As noted in the Section 3.8.2 and shown in Figure 3.8-2, the project site is located in the Merced Groundwater Basin (MGWB) subbasin of the San Joaquin Hydrologic Region. The City of Merced Municipal Service Review (MSR) finds that MID canals provide a substantial source of groundwater recharge and as agricultural irrigation demands decrease, there will be less water in the MID canals and therefore less groundwater recharge from this source (Merced LAFCo 2013).

Based on the Storm Drainage Report (Appendix H) prepared for the proposed project by QK, Inc., the proposed project would result in the creation of impervious surfaces over approximately 64 percent of The Crossings component of the proposed project. The project would direct storm water runoff into a detention basin within the project site, and, as part of the project design phase, would include bio swales, modular wetlands biofiltration units, storm water planters, and nutrient separating baffle box, and/or other stormwater management measures to reduce the detention amount and allow for infiltration of stormwater runoff, to the extent that the onsite soils are capable of infiltration. Stormwater runoff collected within the detention basin would be released into the stormwater drainage system before being released into Black Rascal Creek, where it would have the opportunity to filter into the groundwater basin. Thus, the proposed project would allow for stormwater runoff to infiltrate and replenish the groundwater basin with limited recharge occurring within the project site's water quality and detention elements and greater recharge occurring once stormwater has been discharged to Black Rascal Creek. Thus, impacts relating to groundwater recharge would be **less than significant**.

Groundwater Supply

As discussed in more detail in Section 3.11, Public Services and Utilities, the Merced Subbasin is the primary source of water supply for the City of Merced. The City's system consists of 22 active groundwater wells, and 340 miles of distribution pipeline, as well as other related equipment. The City's capacity to provide water to City residents and businesses is described in

the City's UWMP, last updated in 2017 (City of Merced 2017), and the MIRWMP, which was developed by the City of Merced, County of Merced, and the Merced Irrigation District and was last updated in February 2019 (Merced Irrigation District 2019). The UWMP identifies that the City's water supply comes from two sources: 79 percent from groundwater in the Merced Subbasin and 21 percent from recycled water. Year 2035 projections of water supplies include exchanges and transfers with MID, but groundwater and recycled water remain the top two sources of water supply. Total water demands are expected to increase from 22,741 AF per year (AFY) in 2015 to 37,829 AFY in 2035. The UWMP demonstrates that the City would be able to meet water demand during normal, dry, and multiple-dry years through the year 2035 (City of Merced 2017). The project site is located within the Planning Area for the City's current UWMP and the UWMP considers the ability of the City to meet future water demands of the projected population within the City, including the SOI/SUDP, determined by the Merced County Association of Governments.

The City of Merced MSR notes that in 2009 the City supplied 7.6 billion gallons of water (equivalent to 23,306 acre feet per year) to approximately 86,000 residents, and that as population and total water demand has increased, the City has been able realize decreases in the per capita water demand, likely due to conservation efforts (Merced LAFCo 2013). As noted in Section 3.8.2, the groundwater basin has approximately 46 MAF of groundwater storage as of 2019. The Merced Groundwater Subbasin GSP recognizes that the basin has been in overdraft conditions for many years. The 2020 Annual Water Report found that "the current (2020) total fresh groundwater storage was estimated as 45.8 MAF and the cumulative change in storage from water years 2006-2020 was estimated as -1.98 MAF, or an average reduction of 132 TAF per year. During water year 2020, the change in storage was estimated as a reduction of 157 TAF" which is 25 acre-feet greater than the recent average (Merced GSA 2021). The Merced Groundwater Subbasin GSP also recognizes the historic overdraft condition, finding that the basin typically has an annual reduction in storage of 0.3% but concludes that at this rate of overdraft, it is not expected that the available groundwater in storage would be exhausted (Merced GSA 2019). The Merced GSA, City of Merced, and other agencies in the project region are continuing ongoing efforts to reduce per capita water consumption and reduce water loss in the distribution system.

Further, implementation of the Merced Groundwater Subbasin GSP is expected to eliminate the overdraft condition by 2040. The Merced Groundwater Subbasin GSP identifies the sustainable yield for the Merced Subbasin as "a net-zero change in groundwater storage over a long-term average condition" and finds that the actual sustainable yield of the basin is approximately 570,000 AFY (Merced GSA 2019). This identified sustainable yield is consistent with the SGMA definition of sustainable yield as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result"

(California Water Code §10721(w)). The Merced Groundwater Subbasin GSP finds that to achieve sustainable yield, "current agricultural and urban groundwater demand in the Merced Subbasin would need to be "reduced by approximately 10 percent, absent implementation of any new supply-side or recharge projects" (Merced GSA 2019). The Merced Groundwater Subbasin GSP identifies projects and management actions to be implemented as part of bringing the Subbasin into sustainability; these include projects that will either increase surface water supplies to augment the sustainable groundwater yield or increase groundwater recharge.

The proposed project includes 552 dwelling units, 18 extended-stay units, and 66,000 square feet of commercial space. Due to the project size, a Water Supply Assessment was prepared in accordance with the requirements of California Water Code Section 109132. The Water Supply Assessment found that the project would generate a water demand of 161 acre-feet per year. This includes residents, occupants of the extended-stay units, commercial space, and irrigation needs. The Water Supply Assessment also notes that the water demand for the project would equate to approximately 3.24 acre-feet per acre of land, which is generally consistent with the amount of water demand for the existing agricultural uses at the site (with agricultural water demand typically ranging from 2.5 to 4.0 acre-feet per acre) (Appendix L). The UWMP and other water planning documents include consideration of projected increases in City population and find that the water demand associated with the planned growth can be accommodated by the City's existing and future groundwater supply. Therefore, the proposed project would not result in a substantial decrease in groundwater supply and this impact would remain **less than significant.**

Remainder Area

No changes to the pervious/impervious surfaces within the Remainder Area would occur under the proposed project. However, portions of the Remainder Area are proposed to be zoned for single-family residential development. As discussed above, the City has been implementing water conservation requirements to reduce per capita water consumption. These requirements would apply to new residential development within the Remainder Area. Additionally, the UWMP and other water planning documents include consideration of buildout of the SOI/SUDP, which includes the Remainder Area. Thus, future development within the Remainder Area would be subject to water conservation measures and would be consistent with the City's planned water supply capacity. This impact would remain **less than significant.**

Mitigation Measures

No mitigation measures are required.

Impact 3.8-4: Implementation of the proposed project may conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. This would be a less than significant impact.

As discussed in Section 3.8.3, the applicable water quality control plan for the region is the Basin Plan and the applicable sustainable groundwater management plan is the Merced Groundwater Subbasin GSP. The Basin Plan identifies long-term degradation of water quality within the San Joaquin basin and in response to that degradation, the CVRWQCB adopted a control program for salt and boron with specific implementation actions to address subsurface agricultural drainage. The Merced Groundwater Subbasin GSP identifies that the subbasin has been in an overdraft condition for many years and identifies projects and management programs to ensure that the subbasin will attain a sustainable yield by 2040.

The Crossings

As discussed under Impact 3.8-2, the project would comply with the City's water quality plans and requirements, and thus would not conflict with the Basin Plan. The project would provide onsite water quality treatment and detention in compliance with the City's standards. As the Basin Plan focuses on reduction of agricultural-related water pollutants, many of the Basin Plan requirements would not be applicable to the proposed development of urban uses within the site.

As discussed under Impact 3.8-3, the project would be consistent with the Merced Groundwater Subbasin GSP because the project would be subject to the City's water conservation requirements and the projected population within the City's SOI/SUDP, which includes the project site, was accounted for in the regional groundwater sustainable yield budget. The project would also be subject to water-use reduction measures under the Building Code.

The demonstrated compliance with these regulatory programs, and the use of a detention basin and release of stormwater runoff into Black Rascal Creek, would ensure construction and operation of the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Impacts would be **less than significant**.

Remainder Area

While development is not proposed to occur within the Remainder Area at this time, any development occurring in the future would be required to comply with the same NPDES stormwater permitting for construction activity through the preparation of a SWPPP, and would be required to comply with the City's Storm Water program, Post Construction Standards Plan, Introduction to Standard Designs, and the Small MS4 Permit issued by the SWRCB during operation of future uses. Additionally, the projected population within the City's SOI/SUDP, which includes the Remainder Area portion of the project site, was accounted for in the regional

groundwater sustainable yield budget. Compliance with the state and City water quality and water-use reduction requirements would ensure impacts would be **less than significant**.

Mitigation Measures

No mitigation measures are required.

3.8.5 Cumulative Impacts

Impact 3.8-5: Through compliance with federal, state, and local regulations, ongoing implementation of the City of Merced General Plan would not result in adverse cumulative effects on water quality, drainage patterns, flooding, or groundwater supply. This would be a less than significant impact.

The geographic scope of cumulative effects on hydrology, drainage, water quality, and groundwater supply is the San Joaquin/Merced River watershed within the City's SOI/SUDP. The more localized geographic scope of the cumulative hydrology and water quality analysis is the project vicinity, generally, areas within one mile of the project site for stormwater impacts due to natural drainage patterns, drainage infrastructure, and impervious surfaces, all of which contribute to limit the distance of stormwater flows. The cumulative development scenario for this area is the development anticipated in the City of Merced General Plan, particularly ongoing development within the SOI/SUDP.

Water Quality, Drainage, and Flooding

As development proceeds within the City and the SOI/SUDP, the amount of stormwater runoff would increase, which presents a potential impact to surface and groundwater quality. A greater percentage of the population would also be exposed to the risk from flooding of the 200-year floodplain, or from dam inundation. However, project level water quality and flooding impacts would be reduced to a less than significant level by proposed General Plan policies and through compliance with existing regulations. Similarly, other future development would be subject to the same requirements. Policies adopted in the General Plan address the evaluation of development to ensure adequate drainage facilities, the requirement for impact fees to fund storm drain improvements, and provision of storm drain master plans to guide development approvals include P-3.2, P-4.1, P-5.1, P-5.2, OS-1.5, and S-3.1.

On a larger scale, with the San Joaquin/Merced River watershed, development would also be required to comply with regional, State and federal regulations addressing stormwater runoff, water quality and flooding. The proposed project and other potential cumulative projects in the vicinity of the project site would be required to comply with the Construction General Permit. This permit requires projects to implement measures to prevent impacts, individual and cumulative, to

water quality during construction. In addition, projects would also be required to comply with the City's NPDES stormwater permit from the CVRWQCB and their Stormwater Management Plan which prevent impacts to water quality after construction of a project.

The General Plan EIR concludes that compliance with local, state, and federal regulations, plans, and policies designed to minimize individual and cumulative impacts related to stormwater runoff rates and flooding would ensure that the cumulative impacts would remain less than significant. Thus, there would not be a significant cumulative impact to water quality, changes in drainage patterns, or increases in flood risks to which the project could contribute, and this impact would remain **less than significant.**

Groundwater Supply and Recharge

As development proceeds within the City and the SOI/SUDP, the water demands in the City would increase. The General Plan EIR found that the impact to groundwater supply and recharge would be significant, however the General Plan EIR predates adoption of the Merced Groundwater Subbasin GSP and other recent water-planning documents discussed above. Based on the conclusions of the Merced Groundwater Subbasin GSP that a sustainable yield within this subbasin will be attained by 2040, including consideration of increased water demand due to ongoing development, the cumulative impact related to groundwater supply and recharge would be less than significant. All future development within the City would be required to meet the City's adopted water conservation measures as well as water-use reduction measures required under the Building Code, which would ensure that future development does not impede implementation of the Merced Groundwater Subbasin GSP. Thus, there would not be a significant cumulative impact to groundwater supply and recharge to which the project could contribute, and this impact would remain **less than significant.**

Mitigation Measures

No mitigation measures are required.

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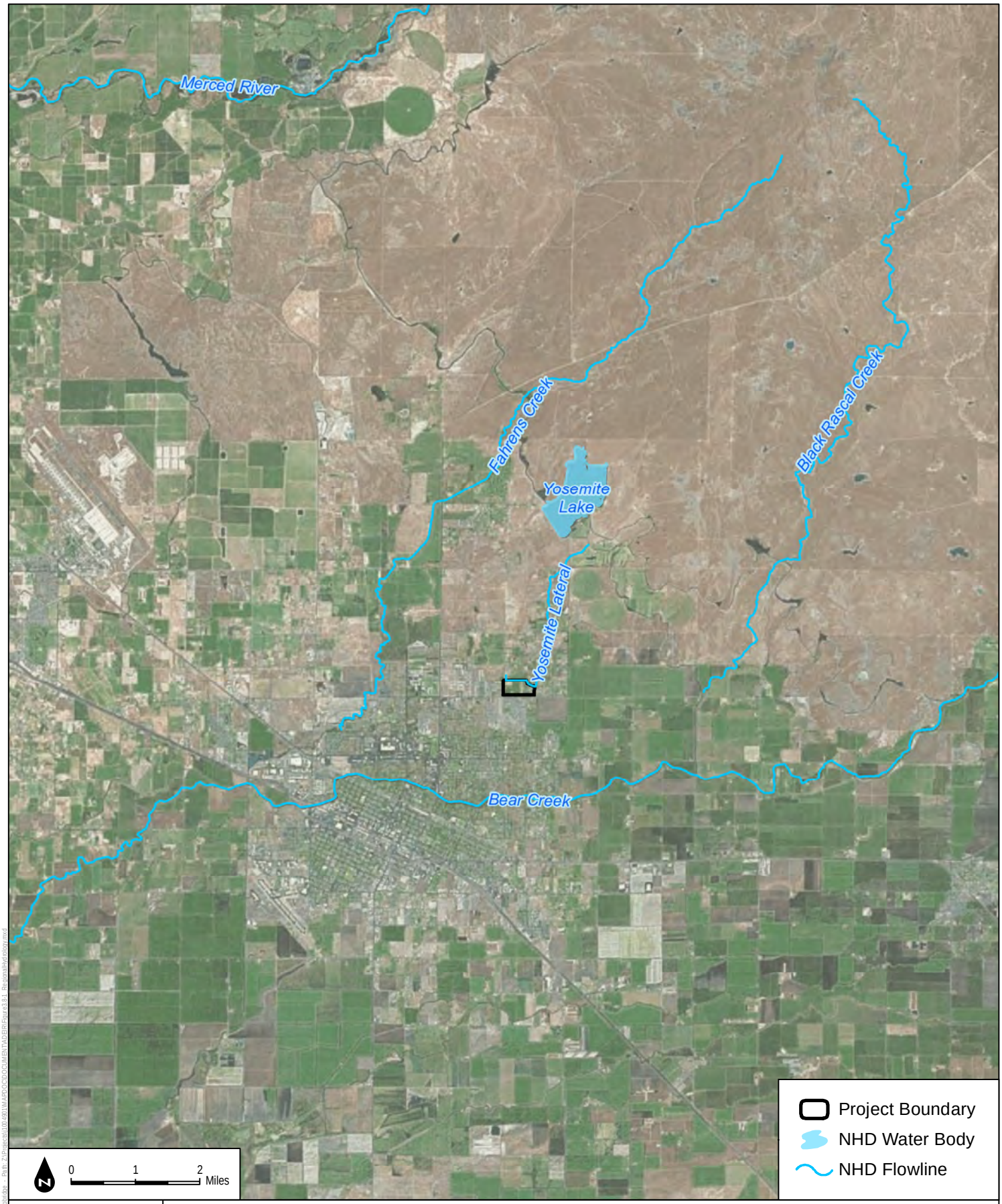

SOURCE: Bing Maps (2016); County of Merced (2014); NHD

FIGURE 3.8-1

Regional Hydrology

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Yosemite Avenue - Gardner Avenue to Hatch Road Annexation Project

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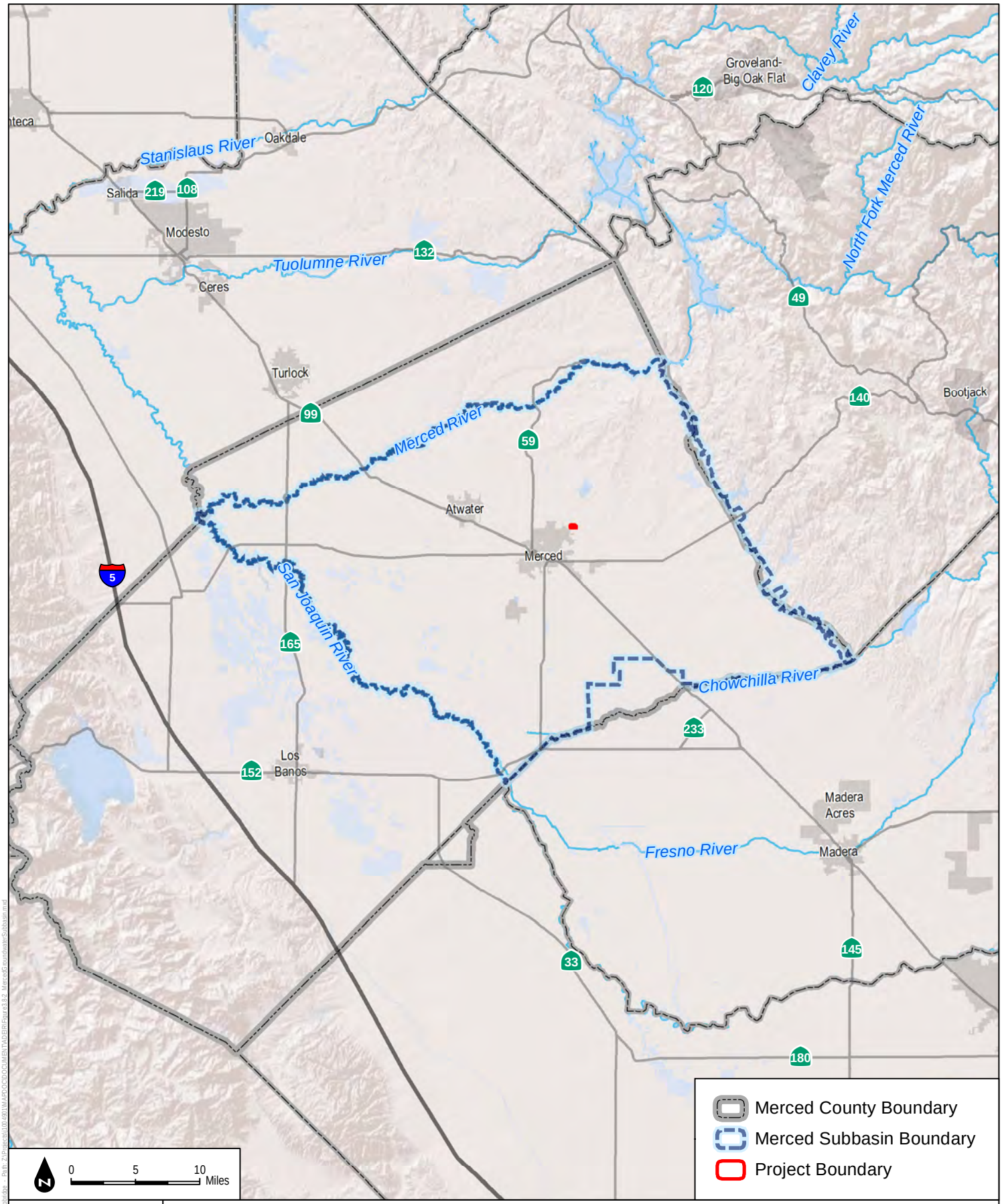

SOURCE: Bing Maps (2016); County of Merced (2014); NHD

FIGURE 3.8-2

Merced Groundwater Subbasin

Yosemite Avenue - Gardner Avenue to Hatch Road Annexation Project

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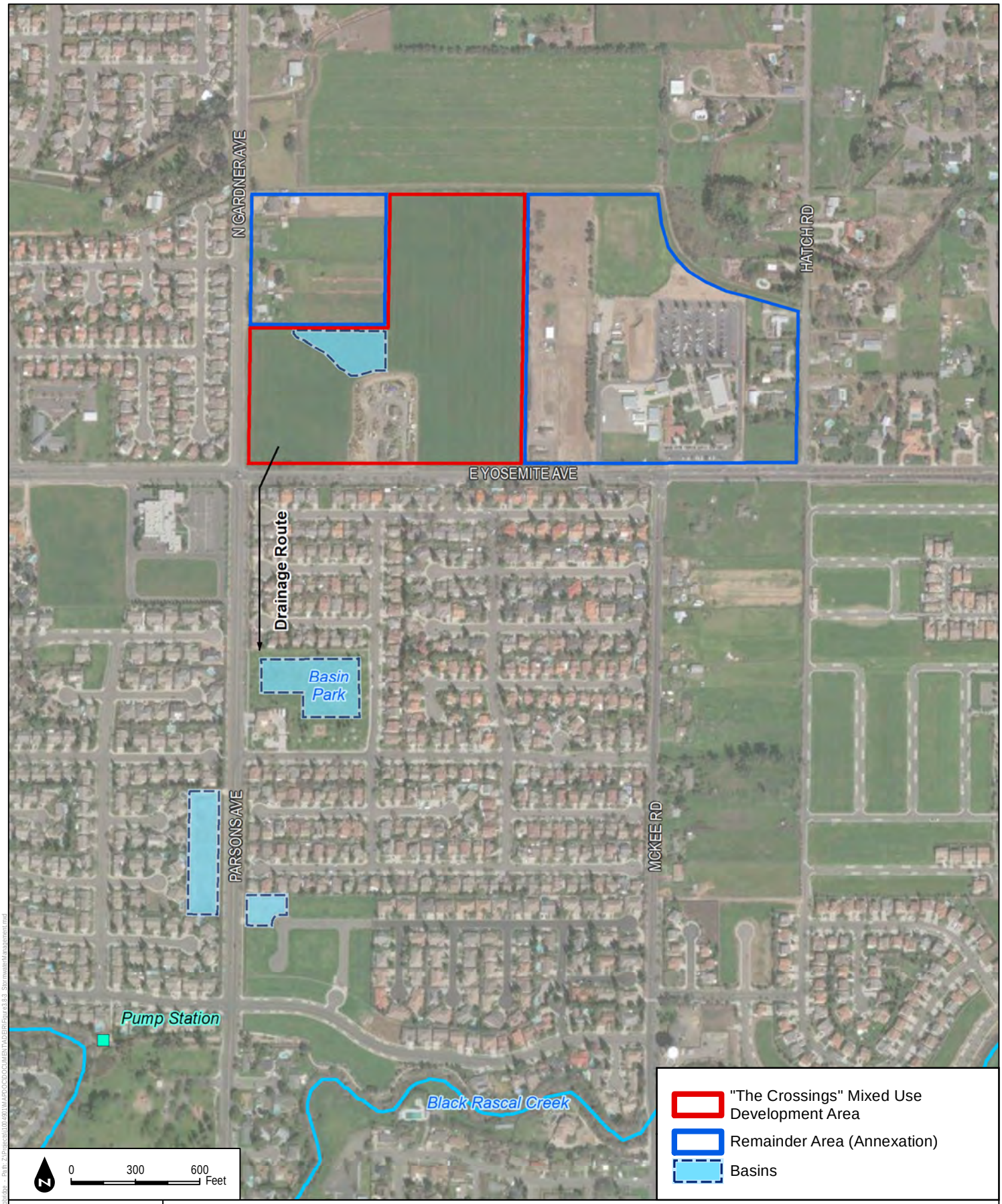

SOURCE: Bing Maps 2019, County of Merced 2014

FIGURE 3.8-3

Stormwater Management

Yosemite Avenue - Gardner Avenue to Hatch Road Annexation Project

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