6.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

6.10.1 INTRODUCTION

This section addresses potential hydrology and water quality impacts that would result with implementation of the proposed project. Issues related to the availability of water supply and potential environmental impacts related to the use of existing and planned supplies are addressed in Section 6.5, "Utilities."

6.10.2 ENVIRONMENTAL SETTING

HYDROLOGY AND DRAINAGE

Regional Setting

Sacramento Area

The City of Sacramento is located at the confluence of the Sacramento River and American River in the Sacramento River Basin. The Sacramento River Basin encompasses approximately 26,500 square miles and is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Sacramento–San Joaquin Delta (Delta)/Central Sierra Nevada area to the south. Six small tributaries of the Sacramento River (Dry Creek, Magpie Creek, and Arcade Creek in the northern area of the city, and Morrison Creek, Elder Creek, and Laguna Creek to the south) pass through and provide drainage for the Sacramento area. Forty miles to the south, the Sacramento River joins the San Joaquin River, which drains into the Delta and San Francisco Bay.

Average annual rainfall in the Sacramento area is 17.22 inches; most of this rain occurs during the months of November through March. 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 a maximum flow in the river), drainage pumping plants, and flood control bypass channels. Such facilities control flood flows by regulating the amount of water passing through a particular reach of the river. Specifically, the City of Sacramento's (City's) stormwater drainage system consists of a network of natural channels, canals, levees, subsurface drains, and pumping stations that ultimately drain into the Sacramento and American Rivers. Urban runoff is disposed of via one of two methods: (1) conveyance to the Sacramento and American Rivers through sumps, pipelines, and treatment facilities organized, primarily, by drainage basin; or (2) conveyance by the City's Combined Sewer Service System, along with sewage, to the Sacramento Regional Wastewater Treatment Plant (SRWTP).

The volume of water flowing past the levee system that protects Sacramento from flooding is controlled by Folsom Dam on the American River, approximately 25 miles east of the project area, and the reserve overflow area of the Yolo Bypass on the Sacramento River. The majority of the City's corporate limits and the project area could be subject to flooding from failure along the Sacramento and American River levee systems. Folsom Dam was completed in 1956 and was designed to reduce flood flows in the American River to a flow rate that could be safely carried by the downstream levees. A dam is designed to contain a flood that has a certain probability of occurring in any given year. If a larger flood occurs, then that structure will either release water through its spillway or be overtopped. There have been no dam failures in Sacramento County since 1950 (County of Sacramento 2004, cited in City of Sacramento 2005).

Folsom Dam was designed to provide flood control for Sacramento up to a 500-year level storm (i.e., a storm with 0.2% chance of occurring in a given year). However, after the dam became operational, a series of record storms and flood flows resulted in downgrading the dam's projected design flood. In 1986 Folsom's performance was downgraded to about a 60-year storm (SAFCA 2005a). 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 (County of Sacramento 1993). Nonetheless, Folsom Dam has stopped three potentially catastrophic floods from occurring. In February 1986, the levee system passed a volume of water generated by the 80- to 100-year flood event. The 1986 storm exceeded Folsom's design for flooding by almost 20% (County of Sacramento 1993). Although the storm caused some flooding in certain areas, the major levee systems that protect the city from disaster withstood record water flows.

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, the County of Sacramento, the County of Sutter, the American River Flood Control District, and Reclamation District 1000 (RD 1000), was formed with the goal of providing at least 100-year flood protection for the area, and ultimately 200-year flood protection (SAFCA 2005b). 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 the funding of American River levee improvements in 1996. In 1999, Congress again approved significant flood control projects, including the enlargement of the outlets in Folsom Dam (City of Sacramento 2005). More recently, Congress authorized funding for additional improvements, including raising the height of Folsom Dam by 7 feet, in the Energy and Water Development Appropriations Act of 2004 (Public Law 108-357) to provide 200-year flood protection for Sacramento (SAFCA 2005c). Construction of this "mini-raise" has not yet begun, and at this time it is not known when construction would begin.

The Yolo Bypass is part of the Sacramento River Flood Control Project which includes six weirs, three flood control relief structures, and an emergency overflow roadway. Weirs located along the Sacramento River are lowered sections of levees that allow flood waters to flow in excess of the downstream channel capacity to escape into a bypass basin or channel (e.g., Yolo Bypass). The Yolo Bypass is a flood bypass area that primarily protects the City of Sacramento and surrounding communities from flooding along the Sacramento River. The Yolo Bypass conveys 80 percent of the Sacramento River's floodwaters through Yolo and Solano Counties until rejoining the Sacramento River a few miles upstream of Rio Vista. The Fremont Weir, located approximately 9 miles northwest of the project site and approximately 2 miles in length, marks the northern extent of the Yolo Bypass. The Fremont Weir is the main water input to the Yolo Bypass by allowing floodwaters to flow by gravity after water levels in the Sacramento River reach an overflow water surface elevation. The Sacramento Weir, located approximately 5 miles south of the project site, has a primary purpose to protect the City of Sacramento from excessive flood stages in the Sacramento River channel downstream of the American River. The Sacramento Weir is 1,920 feet long and consists of 48 gates that divert Sacramento and American River floodwaters to the Yolo Bypass. The Sacramento Weir uses gates located on top of the overflow section to hold back floodwaters until opened manually (DWR 2003a).

Natomas Basin

The Natomas Basin is a low-lying area east of the Sacramento River, north (upstream) of its confluence with the American River. The basin is served by a series of canals and pump stations. In the undeveloped areas of Natomas, canals and drains serve the dual purpose of providing flood control and irrigation water. Irrigation water is provided in the area by Natomas Central Mutual Water Company (Natomas Mutual), a private water company whose service area includes the entire Natomas Basin. Natomas Mutual diverts water from the Sacramento River and the Natomas Cross Canal to provide irrigation water for agricultural uses and habitat preservation. Drainage and flood control for the Natomas Basin is provided by RD 1000, a public agency that has a coinciding service area and several joint-use facilities with Natomas Mutual. RD 1000 operates the primary drainage canals within the Natomas Basin and is responsible for conveying and pumping urban and non-urban stormwater runoff from the basin. Runoff from developed and existing agricultural lands within the Natomas Basin flows into numerous local drainage ditches that ultimately drain into the primary RD 1000 canals. RD 1000's primary system of interior drains includes the following:

- The *East Drainage Canal* conveys drainage water from the northern and eastern Natomas Basin to its confluence with the Main Drainage Canal northwest of the Interstate 80 (I-80)/Interstate 5 (I-5) interchange. At its closest point the East Drainage Canal is approximately 1.8 miles east of the project site.

- The *West Drainage Canal* conveys drainage water from the western Natomas Basin northwest of Sacramento International Airport to its confluence with the Main Drainage Canal. Fisherman's Lake, a natural slough, is a portion of the West Drainage Canal. The West Drainage Canal is approximately 3,000 feet (0.6 mile) south of the project site at its closest point across I-5, just before the drainage canal turns south toward Fisherman's Lake.

- The *Main Drainage Canal* conveys the combined flows of the East and West Drainage Canals from their confluence northwest of the I-80/I-5 interchange through South Natomas west of I-80. Drainage water from the Main Drainage Canal is pumped into the Sacramento River approximately 5 land miles to the south (downstream) of the project site.

- The *North Drainage Canal* is an interior canal that conveys drainage water from the Sutter County portion of the Natomas Basin northward, where it is pumped into the Natomas Cross Canal.

- The *Cross Canal* conveys drainage water from central portions of Sutter County westward to the Sacramento River. The Cross Canal connects with the Sacramento River approximately 7.1 miles north of the project site.

- The *Natomas East Main Drainage Canal* conveys drainage water from Dry Creek, Arcade Creek, and a large portion of the Natomas area north of the confluence with Dry Creek. The Natomas East Main Drainage Canal is also referred to as Steelhead Creek. The Natomas East Main Drainage Canal outfalls to the Sacramento River at the northern edge of Discovery Park and near the confluence of the Sacramento River and American River approximately 5.2 miles south of the project site.

Exhibit 6.10-1 graphically depicts this primary drainage system.

The City is responsible for maintenance of internal conveyance, detention basins, and pump stations that discharge into the system; RD 1000 is responsible for maintenance of the canal system. The North Natomas Comprehensive Drainage Plan (CDP) (see the discussion of local regulations in Section 6.10.3, "Regulatory Setting") identifies various basin areas including detention basins and pumping facilities to convey discharge to the existing RD 1000 system within the North Natomas Community Plan area. Developed flow discharges to the RD 1000 system are limited to approximately 0.1 cubic foot per second (cfs) per acre, which is generally the standard for development in North Natomas.

Historically, the flood control system within the Natomas Basin was adequate for agricultural use, but the urbanization of the basin has resulted in the need for an increased level of flood protection. The North Natomas CDP is among the flood control efforts which created or modified storm water detention basins, detention basin pump stations, and trunk lines. As part of the North Natomas CDP, the North Area Local Project, a flood control project begun in 1993 under the direction of the Sacramento Area Flood Control Agency (SAFCA), was completed in 1998. As a result, North and South Natomas (including the project site) were deemed to have a "100-year" level of flood protection by the Federal Emergency Management Agency (FEMA). (The "100-year" flood is defined as having a one in 100 chance (1%) of occurring in any given year). The levees were found to meet FEMA criteria for 100-year flood protection under a previous system of levee evaluation. However, the levees have recently been found to require additional improvements under the current evaluation criteria which includes an underseepage analysis. As part of its Natomas Levee Evaluation Program, in March 2006 SAFCA completed a draft report of erosion, underseepage, and levee failure issues along the Natomas levee system during a 200-year storm event. In addition, the study also evaluated the potential for levee failure from seepage during a 100-year storm event. The study concluded that several flood control facilities in the Natomas area do not provide sufficient freeboard (i.e., distance between the water surface and the top of the levee) during a 200-year storm event and some facilities are susceptible to underseepage and erosion during 100-year flood events (SAFCA 2006). SAFCA staff presented the results of the Natomas Levee Evaluation Program to the SAFCA Board of

Directors (Board). The Board directed that staff commence with preparation of the necessary studies, analysis, and environmental documents to implement levee improvements to ensure that 200-year storm protection is provided within the Natomas area. In April 2006, the SAFCA Board approved the consultant contracts that would evaluate and ultimately implement the necessary levee improvements. The consultants will evaluate the needed levee improvements, make recommendations based on cost, design, associated with the recommended alternative, establish a funding program to implement the improvements, and will ultimately construct the improvements. SAFCA anticipates that improvements would be constructed within the next 2 to 5 years.

Project Site

Surface Water Hydrology

The project site is located in the southwestern portion of the Natomas Basin, within the Sacramento River Hydrologic Basin as defined by the California Department of Water Resources (DWR). The site occupies 577 acres of low-lying land approximately 2 miles northeast of the Sacramento River and 5 miles northwest (upstream) of the American River at their closest points. The project site is currently vacant undeveloped land supporting agricultural uses. The existing topography of the project site slopes from east to west in a southwesterly direction with elevations ranging from 5 to 25 feet. Because the site is generally flat, soils on the site may be susceptible to ponding. Soils on the project site are described further in Section 6.10, "Geology and Soils."

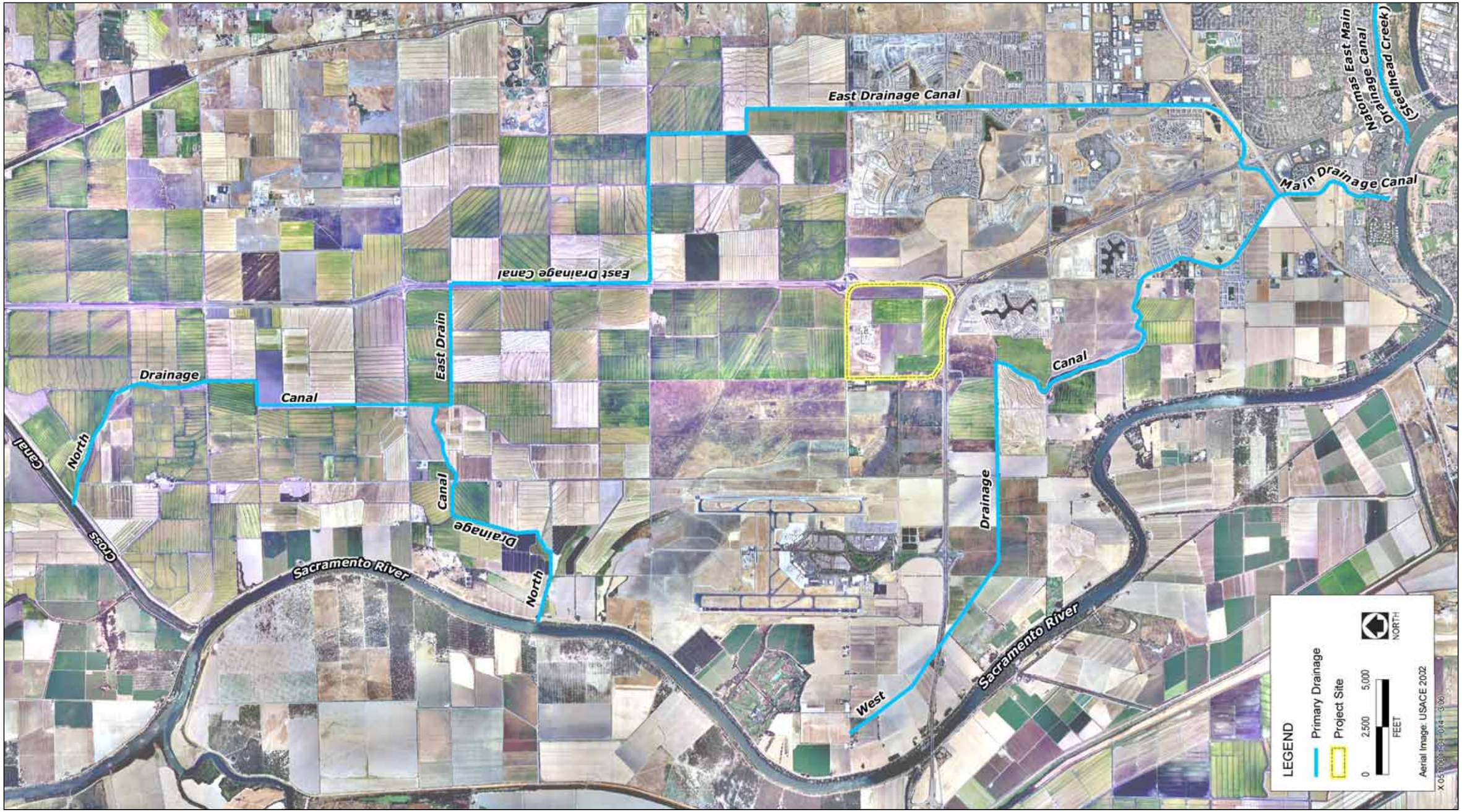
As discussed above, the North Natomas area was granted 100-year flood protection in 1998 as a result of local flood protection projects. Consequently, the project area was redesignated in Flood Zone X on the FEMA Flood Insurance Rate Map (FIRM) for the City of Sacramento dated July 6, 1998 (060262-0045E) (FEMA 1998). Based on this redesignation, the project area is considered to be protected from flooding from a 100-year storm event, including flooding from backwater effects. (The "backwater effect" refers to the rise in surface elevation of flowing water upstream of and resulting from an obstruction to flow, such as a narrow bridge opening, buildings, or fill material, that limits the area through which the water must flow.) As a result, there are currently no restrictions on development caused by flooding concerns. However, as described above, SAFCA has conducted a study that determined that some flood control facilities (i.e., levees) could be subject to flooding as a result of erosion and underseepage during a 100-year storm event. SAFCA has initiated a program of studies and activities that would provide improvements to flood control facilities within the Natomas area to provide protection from a 200-year storm event. At this time, it is unknown whether SAFCA will request that FEMA's flood designation be changed; however, at this time the project site and surrounding area currently is considered to be protected from a 100-year storm event.

Drainage on the project site consists of several drainage/irrigation ditches that ultimately convey flows south. As shown in Exhibit 6.10-2, the project site consists of three major watersheds:

- The north/northwestern part of the site drains into the Lone Tree Canal, which parallels the western boundary of the site. The canal drains from north to south and joins runoff from the south/southeastern part of the site before flowing under I-5 through three existing 5-foot by 8-foot box culverts into an RD 1000 canal outside the project area. This canal, in turn, flows toward the RD 1000 West Drainage Canal. The 100-year peak flow through the three culverts, considered together, is 904 cfs (Wood Rodgers 2005).

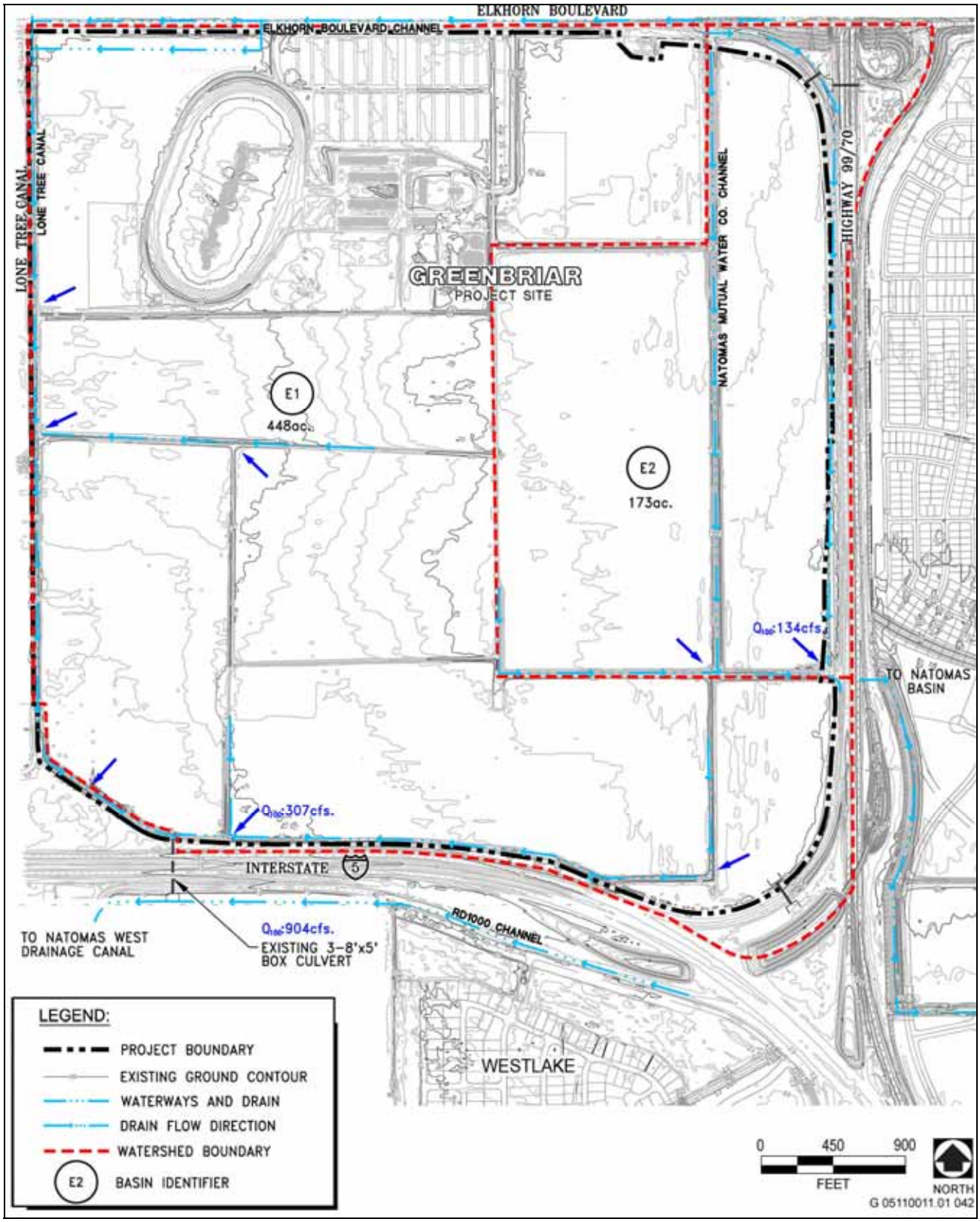
- The eastern shed drains into the existing Natomas Mutual channel in the eastern portion of the site, then under SR 70/99, then southward toward the West Drainage Canal. The West Drainage Canal drains south and, as mentioned above, terminates in the Main Drainage Canal, which is pumped into the Sacramento River.

Runoff from the 540-acre-foot off-site watershed north of the project site discharges into the Lone Tree Canal during storms. The Lone Tree Canal measures approximately 12 feet wide at bottom and is 6 feet deep. The capacity of the Lone Tree Canal for a 100-year peak flow is 355 cfs (Wood Rodgers 2005). Sheet flow from the off-site watershed will cross Elkhorn Boulevard and enter the project site. This flow re-enters the Lone Tree Canal on-site.



Sources: City of Sacramento 2002, EDAW 2005

Primary Drainage System in the Natomas Basin **Exhibit 6.10-1**



Sources: Wood Rodgers 2005, EDAW 2005

Major Watersheds on the Project Site **Exhibit 6.10-2**

Groundwater Hydrology

Groundwater is defined by the Central Valley Regional Water Quality Control Board (RWQCB) *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan) as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. The Natomas area is located within the North American Groundwater Subbasin of the Sacramento Valley Groundwater Basin, as delineated in DWR Bulletin 118, *California's Groundwater* (2003 update) (DWR 2003b, cited in City of Sacramento 2005). The eastern boundary of the North American subbasin is a north-south line extending from the Bear River south to Folsom Lake and represents the approximate edge of the alluvial basin where little or no groundwater flows into or out of the groundwater basin from the Sierra Nevada. The western portion of the North American subbasin consists of nearly flat flood basin deposits from the Bear, Feather, Sacramento, and American Rivers, and several small eastside tributaries (DWR 2003b).

Groundwater occurs in unconfined to semiconfined states throughout the subbasin. Semiconfined conditions occur in localized areas; the degree of confinement typically increases with depth below the ground surface. Groundwater in the upper aquifer formations is typically unconfined. However, because of the mixed nature of the alluvial deposits, semiconfined conditions can be encountered at shallow depths in the upper aquifer (City of Sacramento 2005).

Groundwater levels in the city of Sacramento are reported to be stable at 20–40 feet above mean sea level (msl) (Sacramento Groundwater Authority 2003, cited in City of Sacramento 2005). In the Natomas Basin, groundwater levels vary seasonally with precipitation and runoff in this area and may rise closer to the ground surface during wet years. In addition, groundwater levels are influenced locally by pumping as the groundwater is withdrawn regularly during spring and summer for irrigation, and throughout the year for general use by most of the local growers; as a result, groundwater is generally higher in March and lower in October. Regional groundwater flow direction can be affected, at least temporarily, by agricultural groundwater pumping, time of year, and stage fluctuation of local creeks, drainage canals, and the nearby Sacramento River. The direction of groundwater flow is predicted to be easterly to southeasterly. (Wood Rodgers 2005.)

The current Sacramento County groundwater map (published March 2002) indicates that the groundwater in the vicinity of the project site is located at an elevation of approximately 0 feet to +5 feet relative to msl, or roughly 10–15 feet below the surface (County of Sacramento 2002). This level, measured in spring 2000, is lower than the 5–7 feet below the surface later observed by Wallace Kuhl and Associates in August 2002 and cited in its preliminary geotechnical report for the proposed project (Wallace Kuhl & Associates 2002). In its Phase I Environmental Site Assessment (ESA) for the site, conducted in January 2004, Wallace Kuhl & Associates (2004) noted that groundwater is estimated to have historically varied from approximately 6.3–19.6 feet below the ground surface. Wallace Kuhl & Associates (2002) noted that excavations at the site deeper than 5 feet could encounter groundwater seepage.

WATER QUALITY

Surface Water

"Receiving waters" is a general term typically used to describe any surface water body, such as a creek, river, lake, bay, or ocean that receives runoff. As mentioned previously, the Natomas Main Drainage Canal conveys drainage water from the East and West Drainage Canals to the Sacramento River. Therefore, the Sacramento River is receiving water for much of the drainage from the Natomas Basin (including agricultural drainage). Agricultural drainage water contributes salts, nutrients, pesticides, trace elements, sediments, and other byproducts that could affect the water quality of the Sacramento River.

Water quality in the Sacramento River is regulated primarily by the Central Valley RWQCB. The Central Valley RWQCB has established narrative and numeric standards for the Sacramento River in its Basin Plan (Central

Valley RWQCB 2004). The Basin Plan designates beneficial uses for Sacramento River water that include agricultural supply, contact water recreation, noncontact water recreation, warm freshwater habitat, cold freshwater habitat, and wildlife habitat. The Sacramento River also has the potential beneficial use of coldwater spawning, reproduction, and/or early development. Table 6.10-1 defines these beneficial uses, among others.

Table 6.10-1
Applicable Beneficial Use Designations

Beneficial Use Designation	Applicable to		Definition
	Sacramento River	Groundwater	
Municipal and Domestic Supply		X	Community, military, or individual water supply systems including, but not limited to, drinking water supply
Agricultural Supply	X	X	Farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing
Industrial Process Supply		X	Industrial activities that depend primarily on water quality
Industrial Service Supply		X	Industrial activities that do not depend primarily on water quality including, but not limited to mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization
Contact Water Recreation	X		Recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs
Noncontact Water Recreation	X		Recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities
Warm Freshwater Habitat	X		Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Cold Freshwater Habitat	X		Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat	X		Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources
Spawning, Reproduction, and/or Early Development	potential		Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish

Source: Central Valley RWQCB 2004

In accordance with the requirements of the federal Clean Water Act (see Section 6.10.3, "Regulatory Setting"), the State Water Resources Control Board has determined that beneficial uses in the Sacramento River are impaired by high concentrations of diazinon (a pesticide related to agricultural and urban runoff), mercury (related to mining in the upper watershed), and unknown toxicity. Specific beneficial uses and impairments to those uses have not been identified for the system of agricultural canals and drains internal to the Natomas Basin.

Groundwater

The Basin Plan (Central Valley RWQCB 2004) considers all groundwater in the Central Valley Region as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial process supply, and industrial service supply, unless otherwise designated by the Central Valley RWQCB. These beneficial uses are defined in Table 6.10-1.

Groundwater quality data were collected between 1991 and 1999 from groundwater wells operated by Sacramento Groundwater Authority agencies, and analyzed for levels of total dissolved solids (TDS) (the measurement of minerals in water, derived from contact from rock and soil) and other constituents of concern affecting drinking water. None of the wells with water quality data provided are in the project area; the nearest are located approximately 3.5 miles east of the site. Therefore, no data specific to the project site are available.

However, results of wells closest to the project site showed levels of the various constituents of concern in the groundwater wells sampled to be within primary and secondary drinking water standards (Sacramento Groundwater Authority 2002) (see the discussion of water quality regulations in Section 6.10.3, "Regulatory Setting").

As mentioned above under "Groundwater Hydrology," the Natomas Basin is located within the North American Groundwater Subbasin of the Sacramento Valley Groundwater Basin, as delineated in DWR Bulletin 188, *California's Groundwater* (2003 update) (DWR 2003b, cited in City of Sacramento 2005). An area along the Sacramento River (approximately 6 miles west/northwest of the project site) extending from Sacramento International Airport northward to the Bear River has been found to have high levels of TDS, chloride, sodium, bicarbonate, manganese, and arsenic. However, the groundwater in the southern part of the groundwater subbasin is otherwise generally characterized as good quality (DWR 2003b).

Other than in the area described above, groundwater in the Natomas Basin and in the vicinity of the project site is generally of good quality. None of the sites within the Sacramento area with significant groundwater contamination issues (the former McClellan and Mather Air Force Bases, an abandoned Pacific Gas and Electric Company site on Jibboom Street near Old Sacramento, the former Southern Pacific/Union Pacific Railroad rail yards along the American River, and the Aerojet Superfund site) are located in the Natomas Basin (City of Sacramento 2005). Furthermore, as described under "Results of Records Search for Hazardous Materials" in Section 6.9, "Public Health and Hazards," Wallace Kuhl & Associates (2004) found no records of on-site contamination, including contaminated groundwater wells, during its Phase I ESA for the project site; EDAW also consulted the U.S. Environmental Protection Agency's (EPA's) Envirofacts database and found no records of any regulated water dischargers, impaired water bodies or streams, or other indicators of surface or groundwater quality impairment (EPA 2005).

6.10.3 REGULATORY SETTING

HYDROLOGY (DRAINAGE AND FLOODING)

Federal

Federal Emergency Management Agency

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA also issues FIRMs that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA has established a minimum level of flood protection for new development as the 1-in-100 Annual Exceedance Probability (AEP) (i.e., 100-year flood event). The City and County of Sacramento are participating communities in the NFIP, and therefore all new development must comply with the minimum requirements of the NFIP.

State

There are no state policies related to hydrology that are applicable to the proposed project.

Local

City of Sacramento General Plan

The following goal and policy from the Health and Safety Element of the *City of Sacramento General Plan* are applicable to the proposed project:

Flood Hazards

- **Goal A:** Protect against flood related hazards wherever feasible.
    - **Policy 1:** Prohibit development of areas subject to unreasonable risk of flooding unless measures can be implemented to eliminate or reduce the risk of flooding.

The following goal and policies from the Public Service and Facilities Element are also applicable to the proposed project:

Drainage

- **Goal A:** Provide adequate drainage facilities and services to accommodate desired growth levels.
    - **Policy 1:** Ensure that all drainage facilities are adequately sized and constructed to accommodate the projected increase in stormwater runoff from urbanization.
    - **Policy 2:** Coordinate efforts with County Public Works Department and other agencies as appropriate to provide adequate and efficient drainage facilities and connector lines to service the Rio Linda, North Natomas and Laguna Creek areas of the City.
    - **Policy 4:** Require the private sector to form assessment districts and/or utilize other funding mechanisms to cover the cost of providing drainage facilities.

The project's consistency with the City's policies is evaluated in Chapter 5.0, "Project Consistency with Plans and Policies."

LAFCo Policies

The LAFCo Policies, Procedures, and Guidelines document does not contain any policies related to hydrology and water quality.

WATER QUALITY

Federal

EPA is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) is the primary federal law that governs and authorizes water quality control activities by EPA as well as the states. Various elements of the CWA address water quality. These are discussed below. Wetland protection elements of the CWA administered by the U.S. Army Corps of Engineers are discussed in Section 6.13, "Biological Resources."

Water Quality Criteria/Standards

Pursuant to federal law, EPA has published water quality regulations under Title 40 of the Code of Federal Regulations (CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the act, water quality standards consist of designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. As described in the discussion of state regulations below, the State Water Resources Control Board (SWRCB) and its nine RWQCBs have designated authority in California to identify beneficial uses and adopt applicable water quality objectives.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate municipal and industrial discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source municipal waste discharges and nonpoint source stormwater runoff.

Each NPDES permit identifies limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits.

"Nonpoint source" pollution originates over a wide area rather than from a definable point. Nonpoint source pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. Two types of nonpoint source discharges are controlled by the NPDES program: discharges associated with industrial activities including construction activities and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the maximum extent practicable. The RWQCBs in California are responsible for implementing the NPDES permit system (see the discussion of state regulations below).

Section 303(d) Impaired Waters List

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that would not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries). Section 303(d) requires that the state develop a total maximum daily load (TMDL) for each of the listed pollutants. The TMDL is the amount of the pollutant that the water body can receive and still be in compliance

with water quality objectives. The TMDL is also a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. EPA must either approve a TMDL prepared by the state or disapprove the state's TMDL and issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given pollutant on the Section 303(d) list would be remediated.

State

In California, the SWRCB has broad authority over water quality control issues, exercising the powers delegated to the state by the federal government under the CWA. Regional authority for planning, permitting, and enforcement is delegated by the SWRCB to the nine RWQCBs as described below. The City and County of Sacramento are located within the jurisdiction of the Central Valley RWQCB.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. The act sets forth the obligations of the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires waste dischargers to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, NPDES permits, Section 401 water quality certifications, or other approvals.

Water Quality Control Plan for the Sacramento and San Joaquin River Basins

The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins adopted by the Central Valley RWQCB (2004) identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento River and San Joaquin River basins, including the Delta. State and federal laws mandate the protection of designated "beneficial uses" of water bodies. Beneficial uses applicable to the proposed project are listed in Table 6.10-1 in Section 6.10.2, "Environmental Setting."

The Basin Plan contains specific narrative and numeric water quality objectives for a number of physical properties (e.g., temperature, turbidity, suspended solids), biological constituents (e.g., coliform bacteria), and chemical constituents of concern including inorganic parameters and trace metals and organic compounds. Water quality objectives for toxic priority pollutants (i.e., select trace metals and synthetic organic compounds) are included in the Basin Plan and the CTR.

National Pollutant Discharge Elimination System Permits

The SWRCB and Central Valley RWQCB have required specific NPDES permits for a variety of activities that have potential to discharge pollutants to waters of the state and adversely affect water quality. To receive an NPDES permit a Notice of Intent to discharge must be submitted to the Central Valley RWQCB and design and operational best management practices (BMPs) must be implemented to reduce the level of contaminated runoff. BMPs can include the development and implementation of regulatory measures (local authority of drainage facility design) and structural measures (filter strips, grass swales, and retention basins). All NPDES permits also have inspection, monitoring, and reporting requirements.

General Permit for Stormwater Discharges Associated with Construction Activity (General Construction Permit)

The SWRCB adopted the statewide NPDES General Construction Permit in August 1999. The state requires that projects disturbing 1 acre or more of land during construction file a Notice of Intent with the RWQCB to be covered under this permit. Construction activities subject to the General Construction Permit include clearing,

grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce nonstormwater discharges to storm sewer systems and other waters. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include BMPs designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving off-site into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

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

Dewatering during construction is sometimes necessary to keep trenches or excavations free of standing water when improvements or foundations/footings are installed. Clean or relatively pollutant-free wastewater that poses little or no threat to water quality may be discharged directly to surface water under certain conditions. The Central Valley RWQCB has adopted a general NPDES permit, the General Order for Dewatering, for short-term discharges of small volumes of wastewater from certain construction-related activities. Discharges may be covered by the General Order for Dewatering provided either that they are 4 months or less in duration or that the average dry-weather discharge does not exceed 0.25 million gallons per day. Construction dewatering, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the permit.

Safe Drinking Water Act

As mandated by the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to domestic water supply. Such contaminants 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 EPA primary and secondary Maximum Contaminant Levels (MCLs). MCLs and the process for setting these standards are reviewed triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting drinking water MCLs.

EPA has delegated to the California Department of Health Services (DHS) the responsibility for California's drinking water program. DHS is accountable to EPA for program implementation and for adoption of standards and regulations that are at least as stringent as those developed by EPA.

Title 22 of the California Administrative Code (Article 16, Section 64449) defines secondary drinking water standards, which are established primarily for reasons of consumer acceptance (i.e., taste) rather than for health issues.

Local

City of Sacramento General Plan

The following goal and policy from the Public Services and Facilities Element of the *City of Sacramento General Plan* are applicable to the proposed project:

- **Goal A:** Provide and improve water supply facilities to meet future growth of the City and assure a continued supply of safe potable water.

    - **Policy 5:** Provide water service meeting or exceeding State and federal regulatory agency requirements.

The project's consistency with City goals and policies is evaluated in Chapter 5.0, "Project Consistency with Plans and Policies."

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 nonstormwater 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. Nonstormwater 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 of pumped groundwater not subject to a NPDES permit may be permitted to discharge to the stormwater conveyance system 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 Department of Utilities 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 postconstruction periods. The ordinance also specifies other requirements, such as written approval from the City for grading work within the right-of-way of a public road or street, or within a public easement.

City of Sacramento Stormwater Quality Improvement Plan (2004)

The City of Sacramento Stormwater Management Program is a comprehensive program comprised of various program elements and activities 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. These laws and regulations are implemented through NPDES municipal stormwater discharge permits. In 1990, the County of Sacramento and the Cities of Sacramento, Folsom, and Galt applied for and received one of the first areawide NPDES stormwater permits in the country and began development of core stormwater management program elements and activities to address local urban runoff water quality problems (City of Sacramento 2004).

An element of the program, the Construction Element (CE), 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 CE strategy includes the following components:

- Ensure each grading permit or improvement plan includes an erosion and sediment control plan detailing erosion, sediment, and pollution control measures to be used during construction of the project.

- Ensure applicable projects obtain a State General Construction Permit and prepare a SWPPP containing:

    1) a vicinity map.
    2) a site map.
    3) a site-specific listing of potential sources of stormwater pollution.
    4) the type and location of erosion and sediment control BMPs to be employed.
    5) the name and telephone number of the person responsible for implementing the SWPPP, and
    6) a certification/signature by the landowner or authorized representative.

- Inspect and enforce the project's erosion and sediment, the Grading, Erosion, and Sediment Control Ordinance, and the Stormwater Discharge Control Ordinance.

Another element of the program, the New Development Element (NDE), was designed to specifically control postconstruction urban runoff pollutants from new development or redeveloped areas. The NDE strategy for reducing stormwater pollutants from new development includes (City of Sacramento and County of Sacramento 2000):

- Employing applicable source controls on all projects.
- Employing regional water quality treatment control measures, such as water quality detention basins, for areas of large development (i.e., areas generally greater than 20 acres), where the opportunity exists,
- Employing on-site treatment control measures for commercial, industrial, and multifamily residential land uses of one acre or more in areas not served by regional water quality control measures.

LAFCo

- The LAFCo Policies, Procedures, and Guidelines documented does not contain any policies related to water quality.

6.10.4 Impacts and Mitigation

Method of Analysis

Analysis provided in this section is based on information obtained from a drainage study prepared for the proposed project (Wood Rodgers 2005) and the *Guidance Manual for On-Site Stormwater Quality Control Measures* (City of Sacramento and County of Sacramento 2000). Background information from the Sacramento Groundwater Authority's *Summary of Basin Conditions* (Sacramento Groundwater Authority 2002) is also included.

Because the project would not rely on groundwater to serve the proposed development and modeling indicates that the Lake would require little, if any, support by on-site wells (see Section 6.5, Utilities) impacts to the underlying groundwater basin are not analyzed further in this EIR. The project site is not located near the ocean and as a result would not be subject to flood-related effects associated with a tsunami. Although the project would construct an on-site lake/detention basin, this body of water would be of minimal depth (i.e., 2 to 8 feet) and limited size (i.e., 39 acres) such that the potential for a seismically induced seiche would be limited and would not result in a substantial flooding on- or off-site. These impacts are not evaluated further in this EIR.

Thresholds of Significance

An impact is considered significant, as identified by the State CEQA Guidelines (Appendix G), if the proposed project or alternatives would:

- violate any water quality standards or waste discharge requirements;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, or flooding on- or off-site;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;

- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or FIRM or other flood hazard delineation map;
- place within a 100-year flood hazard area structures that would impede or redirect floodflows;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

IMPACTS AND MITIGATION MEASURES

IMPACT 6.10-1

Construction-related and Operational Water Quality and Erosion Impacts. *Operation of the project would not result in any water quality or erosion impacts because the project would implement design features that would be consistent with the City of Sacramento Stormwater Quality Standards for Development Projects. However, project construction activities (grading, excavation, etc.) could generate sediment, erosion, and other nonpoint source pollutants in on-site stormwater, which could drain to off-site areas degrading local water quality. Further, on-site earthmoving and soil stockpiling activities could result in sheet erosion during rain events. This would be a* ***potentially significant*** impact.

Grading, earthmoving, excavation and utility installation, infrastructure development, and building construction under the proposed project would disturb the existing vegetation cover, soil, and drainage systems over the entire project site and some off-site areas (e.g., Meister Way overpass, Elkhorn Road, water and wastewater infrastructure). Construction activities would occur on portions of the project site throughout the year over a period of 5 to 10 years. Therefore, the site would be subject to exposure to wind erosion, rain, and winter stormwater runoff events depending on the season.

Localized erosion hazards are regarded as relatively low because the project site is generally flat and the soil types on the site are known to have little erosion hazard (see Impact 6.10-2 in Section 6.10, "Geology and Soils"). However, intense rainfall and associated stormwater runoff could result in short periods of sheet erosion within areas of exposed or stockpiled soils. If uncontrolled, these soil materials could cause sedimentation and blockage of drainage channels. Further, the compaction of soils by heavy equipment may reduce the infiltration capacity of soils and increase the potential for runoff and erosion.

Construction activities could result in substantial stormwater discharges of suspended solids, turbidity, and other pollutants from the project construction site as contaminated runoff or direct discharges to drainage channels. Construction-related chemicals (fuels, paints, adhesives, etc.) could be washed into surface waters by stormwater runoff. The deposition of pollutants (gas, oil, carbons) onto the ground surface by construction vehicles could similarly result in the transport of pollutants to surface waters by stormwater runoff or in seepage of such pollutants into groundwater. Increased turbidity could result in adverse impacts on fish and wildlife, reduced water pump life because of abrasion, and increased municipal water treatment costs for sediment removal. Long-term effects could include increased flooding hazards caused by reduced drainage facility and channel capacity.

Nonstormwater discharges could result from activities such as construction dewatering procedures, or discharge or accidental spills of hazardous substances such as fuels, oils, concrete, paints, solvents, cleaners, or other construction materials. Because of the shallow groundwater conditions on-site, construction dewatering activities are likely to be necessary during excavation activities deeper than 5 feet (Wallace Kuhl & Associates 2002). Potential disposal options for the dewatering discharges include land application with subsequent evaporation and percolation back to the groundwater, use for dust control practices, or direct discharge to the existing or

constructed stormwater drainage channels. Dewatering discharges may contain elevated levels of suspended sediment or other construction-related contaminants.

Water quality would not deteriorate post-construction or during operation of site-specific land uses as a result of implementation of required City of Sacramento Stormwater Quality Standards for Development Projects (May 18, 2006). Specifically, stormwater quality source controls, such as storm drain signage at outdoor storage areas and within loading/unloading areas, would be implemented on-site by individual development projects to prevent the degradation of the water quality runoff. With implementation of required source controls, water quality impacts during operation of the project would be less than significant.

Because the project could result in the substantial increase in stormwater discharges and could result in the discharge of pollutants to on-site stormwater from proposed construction activities, the project would result in ***potentially significant*** construction-related erosion and water quality impacts.

Mitigation Measure 6.10-1: (City of Sacramento)

a. The project applicant shall demonstrate compliance through its grading plans with all requirements of the City's Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code) including preparing erosion, sediment, and pollution control plans for each construction phase and postconstruction, if necessary. The project's grading plans shall be approved by the City of Sacramento, Department of Utilities.

b. The project applicant shall demonstrate compliance through its grading plans with all requirements of the City's Stormwater Management and Control Code (Chapter 13.16 of the City Code), which regulates stormwater and prohibits nonstormwater discharges except where regulated by an NPDES permit. The project applicant shall implement measures including the use of soil stabilizers, fiber rolls, inlet filters, and gravel bags to prevent pollutants from being carried off-site in stormwater generated on the project site. These measures shall be designed to accommodate stormwater discharges associated with proposed measures that would be implemented to control on-site dust generation (e.g., wheel washing, active watering).

c. The project applicant shall consult with the Central Valley RWQCB to acquire the appropriate regulatory approvals that may be necessary to obtain Section 401 water quality certification, SWRCB statewide NPDES stormwater permit for general construction activity, Central Valley RWQCB NPDES permit for construction dewatering activity, and any other necessary site-specific waste discharge requirements.

d. As required under the NPDES stormwater permit for general construction activity, the project applicant shall prepare and submit the appropriate Notice of Intent and prepare the SWPPP and other necessary engineering plans and specifications for pollution prevention and control. The SWPPP and other appropriate plans shall identify and specify the use of erosion sediment control BMPs, means of waste disposal, implementation of approved local plans, nonstormwater management controls, permanent post-construction BMPs, and inspection and maintenance responsibilities. The SWPPP would also specify the pollutants that are likely to be used during construction and that could be present in stormwater drainage and nonstormwater discharges. A sampling and monitoring program shall be included in the SWPPP that meets the requirements of SWRCB Order 99-08-DWQ to ensure the BMPs are effective.

e. Construction techniques shall be identified that would reduce the potential runoff, and the plan shall identify the erosion and sedimentation control measures to be implemented. The SWPPP shall also specify spill prevention and contingency measures, identify the types of materials used for equipment operation, and identify measures to prevent or clean up spills of hazardous materials used for equipment operation and hazardous waste. Emergency procedures for responding to spills shall also be identified. BMPs identified in the SWPPP shall be used in subsequent site development activities. The SWPPP shall identify personnel training requirements and procedures that would be used to ensure that workers are aware of permit requirements and proper installation

and performance inspection methods for BMPs specified in SWPPP. The SWPPP shall also identify the appropriate personnel responsible for supervisory duties related to implementation of the SWPPP. All construction contractors shall retain a copy of the approved SWPPP on the construction site.

f. The project applicant shall prepare and submit a Notice of Intent and acquire authorization for a Central Valley RWQCB NPDES permit for construction dewatering activities that may be necessary for foundation and utility installations within the project site.

Significance After Mitigation

With implementation of the above measures, the project's construction-related water quality and erosion impacts would be reduced to a ***less-than-significant*** level because sufficient measures would be in place to prevent the release of pollutants in stormwater off-site and would minimize to the maximum extent practicable erosion of on-site soils.

IMPACT 6.10-2

Potential Exceedance of Drainage System Capacity. *The proposed project includes a lake/detention basin component that has been sized to meet the stormwater drainage needs of the project. Proposed stormwater discharges would exceed the pumping capacity of RD 1000's drainage network. However, improvements to RD 1000's pumping capacity have been required by this DEIR which would increase RD 1000's pumping capacity sufficiently to serve project generated stormwater drainage. (See Mitigation Measure 6.5-5) Therefore, this impact would be* ***less than significant****.*

The proposed project would include a 39-acre lake/detention basin, outfall structure, and gravity storm drain systems. A preliminary design of the on-site storm drainage system was developed consistent with City requirements. The project site would be graded to create building pads and streets that would provide positive drainage to the lake/detention basin. The drainage system would allow drainage to flow under I-5 through three existing 5-foot by 8-foot box culverts and two proposed 78-inch reinforced concrete pipes that are to be constructed under the Metro Air Park project into an RD 1000 canal outside the project area and, from there, into the West Drainage Canal (Exhibit 6.5-2). With this drainage system, outfall runoff to the existing RD 1000 drain system would have a peak discharge value, set by RD 1000, of 0.1 cfs/acre (Wood Rodgers 2005). Pipes associated with the on-site storm drainage system would be of sufficient size to provide approximately 2 feet of freeboard (vertical distance) below the proposed grading and from the maximum 100-year elevation in the lake/detention basin (Wood Rodgers 2005).

Under the proposed project, existing culverts in the northeastern and southeastern corners of the site would remain in place. In addition, the Lone Tree Canal would remain on the western boundary of the site. With construction of the lake/detention basin, Lone Tree Canal would no longer serve as one of the primary drainage outlets for the project area; however, it would continue to carry runoff from the 540-acre off-site watershed north of the project site. Because the Lone Tree Canal would pass within 250 feet of the nearest houses on the west side of the project area, Wood Rodgers (2005) modeled the hydraulic capacity of the canal under project conditions. Following construction of the future Metro Air Park project immediately to the west of the project site, it is expected that Metro Air Park would discharge to Lone Tree Canal near the southwestern corner of the project site. Therefore, outflow from the future Metro Air Park was included in the modeling of hydraulic capacity of the Lone Tree Canal under the proposed project, using the 100-year peak pump outflow (270 cfs). The modeling showed the 100-year storm flows from the off-site watershed north of the project site and from Metro Air Park, west of the project site. Using the 100-year peak pump outflow from Metro Air Park in the modeling was a conservative approach that generated higher water surface elevation than would likely occur (Wood Rodgers 2005). Nonetheless, even under these conditions, sufficient freeboard (2.5 feet)

would be provided between the Lone Tree Canal and housing pads on the west side of the project site (Wood Rodgers 2005).

Further, as indicated above, the future Metro Air Park plans to improve storm drainage at the I-5 undercrossing by adding two 78-inch reinforced concrete pipes adjacent to the three existing 5-foot by 8-foot box culverts. Addition of these reinforced concrete pipes would result in more efficient flow of drainage from the project area. Even if these pipes are not installed, drainage would be sufficient for the project site; modeling by Wood Rodgers (2005) of the 100-year storm without the proposed pipes indicated that the water surface would be higher than under existing conditions in the area immediately upstream of the I-5 undercrossing, but that hydraulic conditions on the project site and in the Lone Tree Canal would not change (Wood Rodgers 2005).

The proposed lake/detention basin would be designed to City and RD 1000 standards in accordance with the requirements set forth in the North Natomas CDP. Further, the applicant would be required to increase the pumping capacity of RD 1000's Plant #3 (see Mitigation Measure 6.5-5). Therefore, runoff from the project site would not have an adverse effect on the capacity of the RD 1000 system. (Wood Rodgers 2005.)

For these reasons, the project's drainage system impacts would be ***less than significant***.

No mitigation is required.

IMPACT 6.10-3

On-Site Flooding Risk from Potential for Levee or Dam Failure. *The project site is not located within a designated 100-year floodplain as currently delineated by FEMA. Because the project site is currently certified for 100-year flood protection, the project would result in* ***less-than-significant*** *flooding impacts.*

The site is protected by a series of reservoirs including Shasta, Oroville, Black Butte, New Bullards Bar, and Folsom Dam, which were designed to reduce flood flows in the American River and Sacramento River to a rate that could be safely carried by the downstream levees. Over the years coordinated reservoir operations and Folsom Dam outlet enlargement projects have been pursued and authorization of funds for a planned "mini-raise" of the dam has been secured to ensure that Folsom Dam can continue to safely manage runoff from the Sierra Nevada during winter storms.

The levees protecting the Natomas area were found to meet FEMA criteria for 100-year flood protection under a levee evaluation conducted by USACE in 1998. SAFCA recently completed a draft report (Natomas Levee Evaluation Report) which updates previous studies and evaluates the flood protection level of the Natomas levee system. Although previous studies of these levees concluded that they provided sufficient protection against 100-year storm events, the new SAFCA draft report concludes that some portions of the levee system would be subject to underseepage and erosion hazards during a 100-year storm event while awaiting the USACE and DWR review of this draft report, SAFCA has initiated the preparation of studies and environmental documents that would accomplish two objectives: (1) address specific threats to levee integrity to preserve 100-year flood protection designations; and, (2) eventually provide protection from a 200-year storm event. These improvements include levee raising for certain segments of the levee system, construction of slurry walls, and toe rock and bank vegetation. In addition, SAFCA is evaluating whether to construct installation of a new secondary setback levee approximately 1,000 feet from the existing levee located along the upper 5 miles of the east levee of the Sacramento River.

Although the project site is located within the flooding area of concern as identified in the SAFCA Natomas Levee Evaluation Report, the project site is not currently located within a FEMA designated 100-year floodplain. For purposes of full disclosure, this DEIR has presented the latest information available regarding the status of flood protection studies within the Natomas Basin. However, these studies and the recommendations contained therein are ongoing and subject to change and further refinement. As such, this DEIR relies upon existing adopted information (e.g., FEMA certifications) As currently described in those studies, SAFCA is proceeding with implementation of necessary levee improvements to correct existing deficiencies within portions of the levee system, which are anticipated to be constructed within the next 2 to 5 years. With implementation of these improvements it is expected that superior flood protection (i.e., protection from 200-year storm events) would be provided at the site.

Because the project is currently certified for 100-year flood protection by FEMA, the project would result in ***less-than-significant*** flooding impacts.

Mitigation Measure 6.10-3 (City of Sacramento and LAFCo)

Although the project would result in less-than-significant flooding impacts, the applicant has agreed to implement the following mitigation to further ensure that adequate flood protection would be provided at the project site.

a. In the event that levees currently providing adequate flood protection to the project site are decertified and can no longer provide 100-year flood protection as determined by FEMA, the applicant shall implement one of the following mitigation measures. This mitigation measure shall terminate upon the first recertification of the levees by FEMA.

b. Raise the building pads of all buildings with the project to a level high enough to remove structures from the 100-year floodplain as identified by FEMA in any such decertification; or

c. Participate in a funding mechanism established for the purpose of implementing measures that would provide no less than 100-year flood protection for the project site, or for that portion of the Natomas Basing requiring re-certification for 100-year flood protection including the project site provided that such funding mechanism is (1) based on a nexus study; (2) is regional in nature; and (3) is proportionate, fair, and equitable; and (4) complies with all applicable laws and ordinances.

Significance After Mitigation

The project's flooding impacts would be ***less than significant*** with or without implementation of the above mitigation measure. The proposed mitigation measure would further reduce this less-than-significant impact and would ensure that adequate flood protection would be provided at the project site in the event that portions of the local levee network are decertified by FEMA.

IMPACT 6.10-4

Result in an On-site Flooding Hazard. *Project implementation would increase the amount of impervious surfaces on-site and would increase surface runoff and the need for discharge to the West Drainage Canal. However, the proposed project includes a stormwater runoff collection system sufficient to protect the project site during a 24-hour and 10-day 100-year flood event and avoid increases in off-site flooding. Therefore, development of the project site would not result in an on-site flooding hazard. This impact would be less than significant.*

Project development would increase the amount of impervious surfaces (e.g., buildings, paved roadways, parking surfaces), which would increase both the total volume and peak discharge rate of runoff generated on the project site, thus requiring the installation of a high-capacity storm drain system. Project development would increase the rate of stormwater discharges to the

Natomas West Drainage Canal. The project would also receive stormwater flows from lands to the north of the project site, which would need to be conveyed through the project's stormwater system.

The proposed project includes a stormwater runoff collection system sufficient to protect the project area during a 24-hour and 10-day 100-year flood event (Wood Rodgers 2005). This system would be built in accordance with City standards and, as described in Impact 6.10-2 above and depicted in Exhibit 6.10-3, would have adequate capacity to safely convey stormwater runoff through and off the project site without resulting in on-site or off-site flooding. Site grading would achieve a site balance while providing an overland release for storm drainage that exceeds the capacity of the underground storm drainage system. Residential lots and street drainage runoff would be directed to drain inlets while providing overland release points. Residential pads would be set above the 100-year surface elevation to prevent drainage from reaching the building pad envelope (Wood Rodgers 2005). Further, the project would not result in the construction of any large buildings that would have the potential to impede or re-direct flood flows. Lands to the north of the project site would convey stormwater flows to the project site; however, because of capacity constraints in Lone Tree Canal north of Elkhorn Boulevard, during a 100-year storm event spillage of stormwater flows on to the project site could occur resulting in localized flooding. This impact would be ***potentially significant***.

Mitigation Measure 6.10-4: (City of Sacramento and LAFCo)

a. The project applicant shall submit grading plans to the City Department of Utilities that demonstrate that Elkhorn Boulevard has been sufficiently raised to provide 1 foot of freeboard above Lone Tree Canal during a 100-year storm event. Approximately 1,800 linear feet of Elkhorn Boulevard would need to be raised to provide sufficient localized flood protection.

b. The project applicant shall submit drainage and infrastructure plans to the City Department of Utilities that provide for the installation of a 48-inch culvert in Lone Tree Canal at Elkhorn Boulevard. Construction of this improvement could result in impacts to riparian and other native habitat; impacts to biological resources including giant garter snake habitat, and construction-related air quality (NO_X, PM_{10}), noise, transportation, and stormwater quality impacts. These impacts would be mitigated to less-than-significant levels with implementation of mitigation recommended for the project and presented in this Draft EIR. As a result, no new significant environmental impacts would occur with implementation of this improvement.

Significance After Mitigation

With implementation of the above mitigation measure, the project's on-site flooding impacts would be reduced to a less-than-significant level because the project site would be graded to ensure that all stormwater flows would be conveyed to appropriate drainage facilities and these drainage facilities would be sized to accommodate on- and off-site stormwater flows.