D. HYDROLOGY AND WATER QUALITY

This section describes existing hydrological conditions in the Lower Arsenal site, including runoff, drainage, and water quality, based on available information about the project, consultation with City staff, review of mapping conducted by local and regional governmental agencies and other published materials, and a site reconnaissance. Based on existing hydrologic information, this section identifies impacts that could result from development of the Specific Plan, and recommends mitigation measures to reduce these impacts. Impacts associated with storm drainage infrastructure are discussed in Section IV.M, Utilities and Infrastructure.

1. Setting

A description of the existing conditions at and near the site related to hydrology is provided below.

a. Climate. The climate of the Benicia area is characterized as dry-summer subtropical (often referred to as Mediterranean), with cool wet winters and warmer dry summers. Summer temperatures are often moderated by cool sea breezes from the west. July and August are the warmest months, with an average high temperature of 87 degrees Fahrenheit (°F); December and January are the coolest months, with an average low temperature of 39°F. Precipitation averages approximately 20 inches per year, and falls mostly between December and April.[1] Analysis of long-term precipitation records indicates that wetter and drier cycles, lasting several years, are common in the region. Severe, damaging rainstorms occur at a frequency of about once every three years.[2]

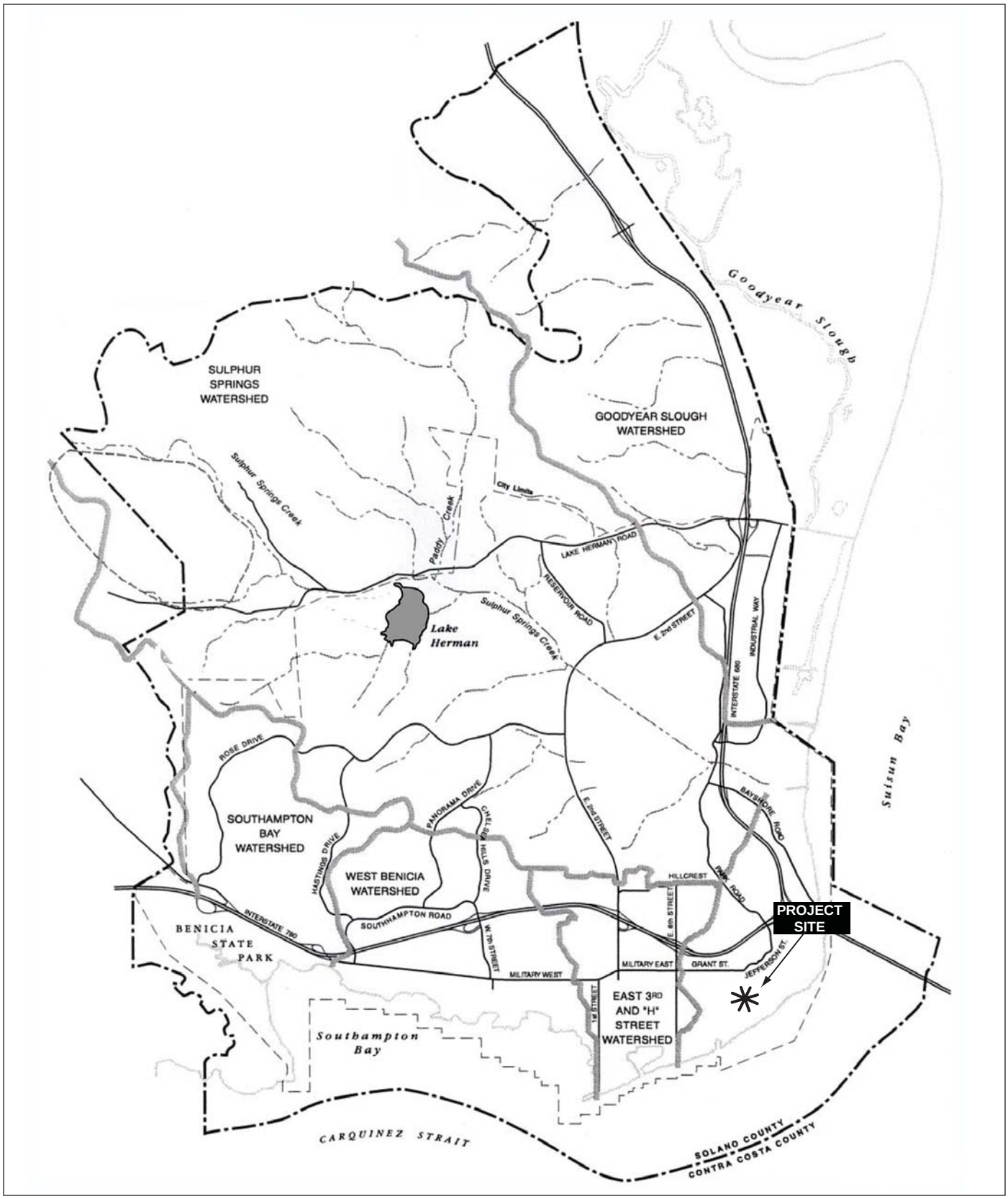
Climate change – specifically a global warming trend – is also likely to affect the climate of Benicia in the future. The California Environmental Protection Agency notes that the "evidence for climate change is overwhelming," although it is impossible to predict exactly how climate change will affect California in the future. Anticipated changes include more frequent and intense droughts and flash floods, worsening air quality, and a rise in sea level (sea levels in California have already risen by 3 to 8 inches in the last 100 years). In addition, many scientists anticipate that, with warmer winters, more precipitation in California will fall as rain, decreasing the size of the Sierra Nevada snowpack. Related effects include increased flooding, and shortages of drinking water and water for irrigation of agricultural crops.[3] Water volume, velocity, and temperature of creeks and streams in California will also likely change in response to shifting global climate patterns.

b. Watershed. The project site is located where the foothills of California's Coast Range meet Carquinez Strait. Elevations range from approximately 100 feet above mean sea level (msl) to 40 feet above msl. The Plan Area is located in one of Benicia's small urban watersheds (see Figure IV.D-1, Watershed Map). A watershed is a region draining into a body of water. The watershed in which the site is located consists of the southeastern portion of Benicia. Runoff in this watershed drains to Suisun Bay and Carquinez Strait. The eastern half of Downtown Benicia (to the west of the project

[1] CDM, 2005. City of Benicia, Urban Water Management Plan. December.

[2] Brown, William M. III, 1988. Historical Setting of the Storm: Perspectives on Population, Development, and Damaging Rainstorms in the San Francisco Bay Region, in Landslides, Floods, and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, Stephen D. Ellen and Gerald F. Wieczorek, Eds., U.S. Geological Survey Professional Paper 1434

[3] California Environmental Protection Agency, Air Resources Board, 2007. The Greenhouse Effect and California.



LSA

FIGURE IV.D-1

LEGEND

- PLANNING AREA BOUNDARY
- CITY LIMITS
- WATERSHED BOUNDARY
- INTERMITTENT CREEK CHANNEL

N

0 1600 3200
FEET

Lower Arsenal Mixed Use Specific Plan EIR
Watershed Map

SOURCE: CITY OF BENICIA, 1999.

I:\CIB0701 lower arsenal\figures\Fig_IVD1.ai (5/10/07)

site) is located in the East 3rd and "H" Street Watershed; the western half of Downtown is located in the West Benicia Watershed. These two watersheds comprise small, local drainages that run into the Carquinez Strait.[4]

The project site itself comprises a patchwork of pervious and impervious surfaces. In general, impervious surface coverage increases in the southern portion of the site, as development intensity increases. The Plan Area contains no identified streams or creeks. However, small seasonal wetlands are located along the northern boundary of the site (on the north side of Jefferson Ridge) and along Adams Street. These small wetlands, which are described in more detail in Section IV.F, Biological Resources, comprise approximately 0.18 acres. They consist of low-lying depressions that are believed to have been created by historic grading and filling activities (due to evidence of significant grading in surrounding areas). These depressions appear to receive runoff from developed upland areas and/or groundwater.

c. Flooding. The project site is not located within the 100-year flood hazard zone, as mapped by the Federal Emergency Management Agency (FEMA) (see Figure IV.D-2). A 100-year flood is a theoretical flood that would be expected to occur once every 100 years and is used to determine the extent of flood hazards in an area. A 100-year flood zone is located south of the project site, extending from the shoreline of the Carquinez Strait north approximately to Bayshore Road.[5] The base flood elevation in this 100-year flood zone is 6 feet msl. Therefore, the project would not be susceptible to storm-related flooding.

There are two mapped dam failure inundation zones in Benicia. The first is the inundation zone for Lake Herman, which generally follows the course of Sulphur Springs Creek. The second is the inundation zone for the former Pine Lake, which runs through the eastern section of Downtown Benicia.[6] Pine Lake has been drained. Therefore, the project site would not be susceptible to flooding as a result of dam failure.

Over 80 tsunamis have occurred in California over the past 150 years; nine tsunamis caused minor damage in port areas; two caused major damage. However, the Carquinez Strait is protected from significant tsunami damage due to its distance from the Pacific Ocean shoreline and intervening landmasses (e.g., San Francisco Peninsula). Based on tsunami mapping prepared by the State of California Seismic Safety Commission, the Carquinez Strait has historically been subject to tsunami run-ups of less than 0.5 meters (approximately 19.7 inches).[7] Therefore, the project site would not be exposed to significant hazards associated with tsunamis.

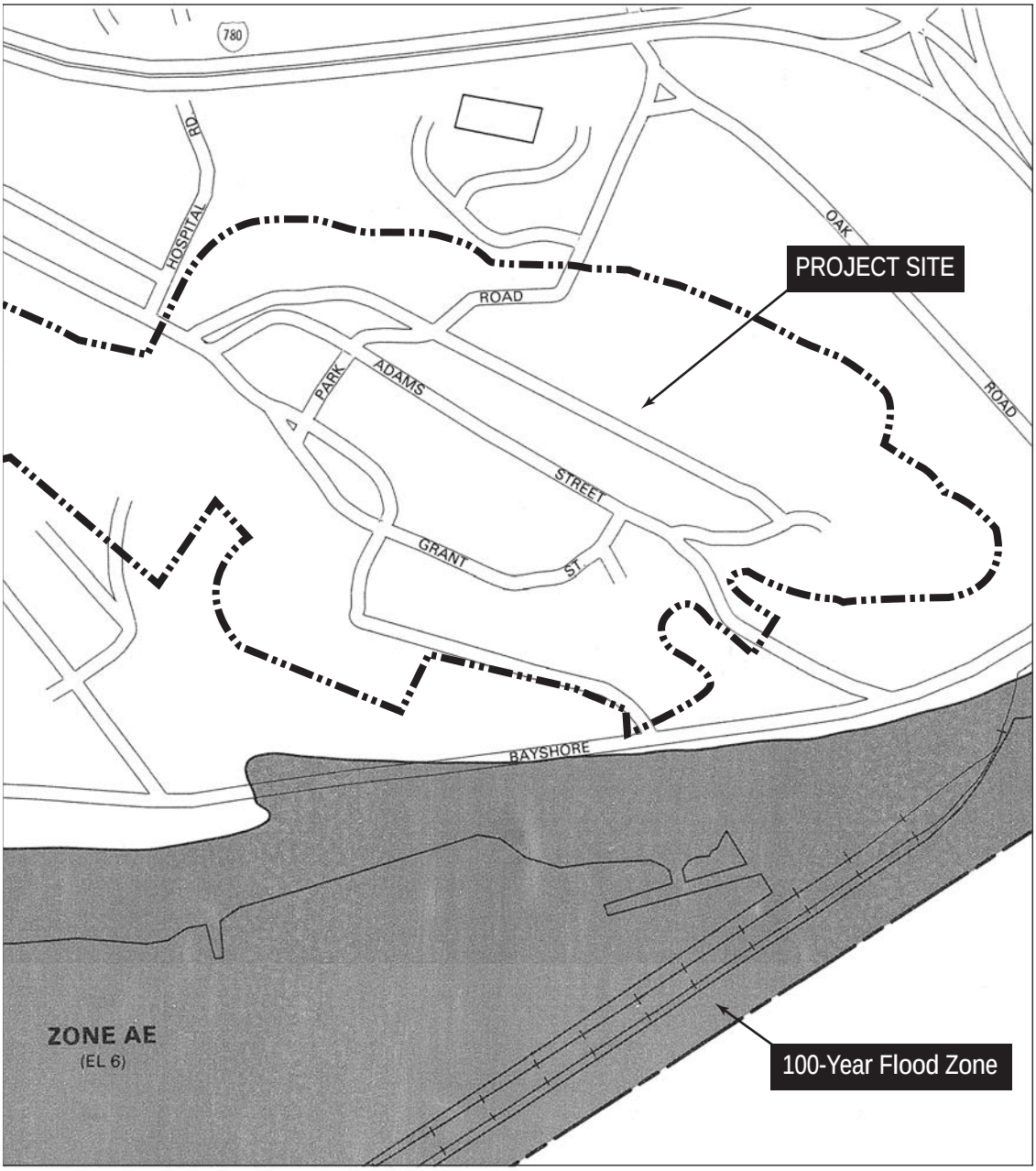
Sea level rise due to global warming and ice cap melting is expected to result in sea level rise in California and other coastal areas. Plausible projections for sea level rise due to climate change range

[4] CDM, 2005. City of Benicia, Urban Water Management Plan. December.

[5] Federal Emergency Management Agency (FEMA), 2007. City of Benicia, Solano County, Flood Insurance Rate Map (FIRM) #0603680004C. Website: msc.fema.gov. May 6.

[6] Association of Bay Area Governments, 2006. Dam Failure Inundation Map for Benicia. Website: abag.ca.gov/cgi-bin/pickdamx.pl. May 6.

[7] State of California Seismic Safety Commission, 2005. *The Tsunami Threat to California: Findings and Recommendations of Tsunami Hazards and Risks*.



LSA

FIGURE IV.D-2

Lower Arsenal Mixed Use Specific Plan EIR

100-Year Flood Zone

N

0 250 500

FEET

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY, 1989

I:\CIB0701 lower arsenal\figures\Fig_IVD2.ai (5/10/07)

from 0.5 meters to 3 meters by 2100. A study of potential sea level rise in San Francisco Bay conducted in 1990 and updated in 2005 indicated that, based on a 1-meter rise in sea levels, the 100-year tide level (including storm surge effects) in Benicia would increase from 6.5 feet National Geodetic Vertical Datum (NGVD) to 9.8 feet NGVD.[8] Therefore, the project site, which ranges in elevation from approximately 40 msl to 100 msl (msl and feet NGVD are roughly equivalent units), would not be directly affected by possible sea level rise over the next 100 years.

d. Water Quality. The quality of surface and groundwater at the project site is affected by historic and current land uses in and around the site and the composition of subsurface geologic materials. Water quality in surface and groundwater bodies is regulated by the State Water Resources Control Board and Regional Water Quality Control Boards. The project site is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), which is responsible for implementation of State and federal water quality protection guidelines in the Bay Area. The RWQCB implements the Water Quality Control Plan (Basin Plan),[9] a master policy document for managing water quality issues in the region. The Basin Plan establishes beneficial water uses for waterways and water bodies within the region.

(1) Groundwater. Groundwater is defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Where groundwater occurs in a saturated geologic unit that contains sufficient permeable thickness to yield significant quantities of water to wells and springs, it can be defined as an aquifer. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers.[10] Designated groundwater basins rarely align precisely with drainage basins due to variations in geology, water-bearing capacity, and groundwater flow characteristics. In addition, not all areas are included within a designated groundwater basin due to a lack of suitability as a ground-water source.

The project site is not located within a designated groundwater basin (as specified by the San Francisco Bay Regional Water Quality Control Board Basin Plan), although it is located immediately to the west of the Suisun-Fairfield Valley Groundwater Basin, one of 28 identified groundwater basins under the jurisdiction of the RWQCB. The Suisun-Fairfield basin covers 133,600 acres and is the second largest groundwater basin in Solano County. It occurs to the west of the English Hills and is not used in a significant capacity due to low yields and poor water quality.

The California Department of Water Resources has no groundwater level monitoring locations in the vicinity of the project site,[11] indicating that important regional groundwater supplies are not reasonably exploitable. While groundwater does occur in the geologic units underlying the site, it does not occur in quantities and/or yields that would allow for economically feasible extraction.[12] Use of groundwater underlying the project site is not proposed as part of the proposed project. Based on

[8] Gleick, Peter H. and Edwin P. Maurer, 2004. Assessing the Costs of Adapting to Sea Level Rise: A Case Study of San Francisco Bay. February 17.

[9] San Francisco Bay Regional Water Quality Control Board (RWQCB), 2004. *Water Quality Control Plan (Basin Plan).* November 17.

[10] RWQCB, 2004. op. cit.

[11] California Department of Water Resources (DWR), 2007. *Ground Water Level Data*. Website: wdl.water.ca.gov/gw. May 8.

[12] RWQCB, 2004. op. cit.

existing monitoring wells around the project site, groundwater flows in a southwest or southeast direction, and shallow water depth ranges from 2.1 feet below the surface in areas adjacent to Carquinez Strait to 23.0 feet in more inland areas.[13]

A geotechnical investigation conducted north and south of Jefferson Street within the Plan Area in 2000 encountered water in one location at 6 feet below the ground surface. This water likely represents "perched" water (i.e., water that is not in contact with the main body of groundwater), and is a localized occurrence. Perched water on the site is not expected to pose a significant flooding concern.[14]

The project site has been subject to over 100 years of development and military and industrial uses, and groundwater on the site may contain pollutants typical of urban uses, including petroleum hydrocarbons, heavy metals, and pesticides. For further discussion of potential groundwater contamination in the site, refer to Section IV.E, Hazards and Hazardous Materials.

(2) Storm Water Quality. Runoff water quality is regulated by the National Pollutant Discharge Elimination System (NPDES) Nonpoint Source Program (established through the Clean Water Act); the NPDES program objective is to control and reduce pollutants to water bodies from nonpoint discharges. Nonpoint source pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. Regionally, the NPDES program is administered by the RWQCB. On December 8, 1999, U.S. EPA promulgated regulations, known as Phase II, requiring permits for storm water discharges from Small Municipal Storm Sewer Systems (MS4s). General Permit CAS000004 regulates storm water discharges from MS4s. Compliance with the NPDES Permit is mandated by State and federal statutes and regulations. Regulated MS4s subject to this requirement must adopt an ordinance or other document to ensure implementation of the Design Standards included therein or a functionally equivalent program that is acceptable to the RWQCB.[15] The ordinance or other document must be adopted and effective prior to the expiration of this General Permit or, for Small MS4s designated subsequent to the Permit adoption, within 5 years of designation as a regulated Small MS4.

Participating agencies (including the City of Benicia) must comply with the provisions of the permit by ensuring that new development and redevelopment projects mitigate water quality impacts to storm water runoff both during construction and operation periods. The City of Benicia, as required by the EPA under the provisions of the NPDES Phase II regulations and the RWQCB Phase II General Permit requirements, developed and implemented a Storm Water Management Plan (SWMP) in 2003.[16]

All discretionary development and redevelopment projects that fall into one of the following categories are subject to the Design Standards. These categories are:

- Single-Family Hillside Residences;

[13] EDR, 2007. Government Records Search. April 12.

[14] ENGEO, Inc., 2000. *Geotechnical Exploration, Bortolazzo Property, Benicia, California.* May 15.

[15] State Water Resources Control Board (SWRCB), 2003. Water Quality Order No. 2003 – 0005 – DWQ.

[16] City of Benicia, 2003. *Stormwater Management Plan.* Adopted Aug 5.

- 100,000 Square Foot Commercial Developments;[17]
- Automotive Repair Shops;
- Retail Gasoline Outlets;
- Restaurants;
- Home Subdivisions with 10 or more housing units; and
- Parking lots of 5,000 square feet or more or with 25 or more parking spaces that are potentially exposed to storm water runoff.

Individual projects that would be built as part of the Draft Specific Plan could fall under these aforementioned guidelines, and would be required to meet the terms of the permit, including but not limited to:

> *Numeric Sizing Criteria for Pollutant Removal Treatment Systems.* The Permittees shall require that post-construction treatment control BMPs incorporate, at a minimum, either a volumetric or flow based treatment control design standard, or both, so as to mitigate (infiltrate, filter or treat) approximately 85 percent of storm water runoff (in the Bay Area this is equivalent to about the 1-inch storm).
>
> *Operation and Maintenance of Treatment Measures.* Improper maintenance is one of the most common reasons why water quality controls will not function as designed or cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent Best Management Practice (BMP), and what equipment is required to perform the maintenance properly. As part of project review, if a project sponsor has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that the sponsor provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements, and/or Conditional Use Permits.
>
> *Limitation on Increase of Peak Storm Water Runoff Discharge Rates.* Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

In addition, projects disturbing more than 1 acre of land[18] during construction are required to file a Notice of Intent (NOI) with the RWQCB to be covered under the State General Construction Permit

[17] 100,000 Square Foot Commercial Development is defined as any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas.

[18] The State Water Resources Control Board, Water Quality Order 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES), General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) states that: The regulations provide that discharges of stormwater to waters of the United States from construction projects that encompass five (5) or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 expand the existing NPDES program to address stormwater discharges from construction sites that disturb land equal to or greater than one (1) acre and less than five (5) acres (small construction activity). The regulations require that small construction activity, other than those regulated under an individual or Regional Water Quality Control Board General Permit, must be permitted no later than March 10, 2003.

for discharges of storm water associated with construction activity. A developer must propose control measures that are consistent with the General Construction Permit. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the General Construction Permit and should include BMPs designed to reduce potential impacts to surface water quality during the construction of the project.

The City of Benicia adopted a storm water management and discharge control chapter of its Municipal Code in November 2006.[19] The intent of this chapter is to protect and enhance the water quality in the City of Benicia's watercourses pursuant to, and consistent with, the Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.), the federal Clean Water Act (33 U.S.C. Section 1251 et seq.) and the goals of the City of Benicia General Plan. This chapter also codifies the provisions of the City's National Pollutant Discharge Elimination System (NPDES) permit that require, effective upon adoption of the chapter, implementation of appropriate source control and site design measures and storm water treatment measures for projects that create or replace 1 acre or more of impervious surface. On January 1, 2008, this threshold will be reduced to projects that create or replace 10,000 square feet or more of impervious surface.

Key specifications of the ordinance include:

- Eliminating non-storm water discharges to the municipal separate storm drain;
- Controlling the discharge to municipal separate storm drains from spills, dumping, or disposal of materials other than storm water;
- Reducing pollutants in storm water discharges to waters of the United States to the maximum extent practicable;
- Complying with applicable State and federal laws;
- Minimizing increases in nonpoint source pollution caused by storm water runoff from development that would otherwise degrade local water quality; and
- Reducing storm water runoff rates and volumes and nonpoint source pollution whenever possible, through storm water management controls and ensuring that these management controls are properly maintained and pose no threat to public safety.

e. City of Benicia General Plan. Applicable hydrology and water quality goals, policies, and programs from the Benicia General Plan are presented below.

Community Services

- *Water Goal 2.37:* Identify and preserve groundwater resources.
  - *Water Policy 2.37.1:* Work with the RWQCB to protect groundwater quality.
- *Water Goal 2.38:* Protect water quality.
  - *Water Policy 2.38.1:* Continue to require the use of feasible and practical Best Management Practices (BMP) to protect receiving waters from adverse effects of construction and urban runoff.

[19] City of Benicia, 2006. Storm Water Management and Discharge Control, Chapter 15.64, City of Benicia Municipal Code.

- *Water Program 2.38.A:* Continue the Storm Water Pollution Prevention Program (SWPPP) and the Industrial Pretreatment Program, and continue to implement the Erosion Control Ordinance. Such measures would include providing water conservation literature to visitors and tourists and installing a full range of water-conserving fixtures in hotels and restaurants.

Open Space and Conservation of Resources

- *Water Resources Goal 3.22:* Preserve water bodies.
  - *Water Resources Policy 3.22.1:* Avoid development that will degrade existing lakes and streams.
    - *Water Resources Program 3.22.A:* Require that all development in watersheds flowing into lakes and unchannelized streams include features to preserve run-off water quality.
- *Water Resources Goal 3.24:* Protect watersheds.
- *Water Resources Goal 4.13:* Prevent property damage caused by flooding.
  - *Water Resources Policy 4.13.1:* Continue to implement the floodplain management policy currently followed by the City.
  - *Water Resources Policy 4.13.2:* Promote non-structural solutions to flood problems, where feasible.
    - *Program 4.13.B:* Where appropriate, promote the use of stormwater retention basins rather than standard engineering *modifications* to natural channels.
    - *Program 4.13.C:* Encourage use of meandering drainage channels in all new developments and wherever channels are *replaced.*
- *Water Resources Goal 4.14:* Prevent ground and surface water contamination.
    - *Water Resources Program 4.14.A:* Inform businesses and the public of current technology and standards for preventing ground and surface water contamination, and regulations governing hazardous material use, storage, and disposal, plus agency reporting requirements.
    - *Water Resources Program 4.14.B:* Continue to communicate with State, regional, and local agencies and legislatures to relay information on Benicia's current and potential water quality contamination concerns, particularly regarding hazardous waste sites, existing and closed landfills, new and existing waste-generating industries and commercial operations, and City waste disposal and water/sewage treatment facilities.
  - *Water Resources Policy 4.14.1:* Implement non-point source pollution strategies.
    - *Water Resources Program 4.14.C:* Provide information to the public on provisions of the City's Stormwater Pollution Prevention Plan (SWPPP) program and preparation of SWPPPs for all construction projects of five acres or more. Implement Best Management Practices (BMPs) for stormwater runoff and erosion controls for all development.
    - *Water Resources Program 4.14.D:* Conduct an outreach program to industry and residents on how to reduce storm water-related pollution.

2. Impacts and Mitigation Measures

This section analyzes the impacts related to hydrology and water quality that could result from implementation of the Draft Specific Plan. This section begins with a listing of criteria of significance, which establish the thresholds for determining whether a project impact is significant. The latter part of this section presents the potential hydrology and water quality impacts associated with the proposed project. Mitigation measures are provided as appropriate.

a. Criteria of Significance. The project would have a significant effect on hydrology or water quality if it would:

- Violate any water quality standards or waste discharge requirements;

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- 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 which would result in substantial erosion or siltation on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water 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 Flood Insurance Rate Map or other flood hazard delineation map; or
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

b. Less-than-Significant Hydrology and Water Quality Impacts. The project site is not underlain by recognized groundwater aquifers; therefore the project would not result in impacts to aquifer volume or public water supplies. The project would not be expected to be susceptible to regional flood hazards since it is entirely located outside the 100-year flood hazard zone, nor would the project alter the course of flood waters. The project site is sufficiently far enough away from the Carquinez Strait shoreline that it would not be exposed to significant hazards associated with tsunamis, extreme high tides, or sea level rise. There are no creeks and streams within the project site; therefore, these water bodies would not be directly altered by implementation of the Draft Specific Plan. In addition, the project site would not be exposed to flooding in the event of dam failure because the site is not located within designated dam failure inundation areas.

The Draft Specific Plan contains the following implementation goals, policies, and actions that would reduce impacts associated with storm water runoff:

- *Infrastructure Policy 6.2.* Work to safeguard public health, safety and prosperity by providing and maintaining facilities that enable the community to live in harmony with sustainable practices and natural systems.
    - *Infrastructure Action 6.2.4.* Regulate drainage from new development so that post-development site peak flow rates are no greater than pre-development levels.
    - *Infrastructure Action 6.2.5.* Promote stormwater management strategies that maximize storage and absorption in compliance with the City's Stormwater Management Plan

(1) Downstream Flooding. Implementation of individual development and infrastructure projects as part of Specific Plan buildout could increase the coverage of impervious surfaces within the project site. This increase in impervious surfaces could reduce the infiltration of storm water into the groundwater system and increase the volume and velocity of storm water in down-slope areas. In addition, grading in the Plan Area could change drainage patterns on the site (although no streams or creeks would be directly modified).

Action 6.2.4 would require the Benicia Public Works Department to ensure that drainage plans for new development projects are designed such that peak flow rates from the site are not increased. This

action would be implemented through a requirement by the Public Works Department that project applicants prepare a final design-level hydraulic analysis that includes the following components:

- Measures to ensure that total new peak storm water flows are not in excess of existing peak storm water flows;
- Drainage features that are in compliance with City of Benicia standards; and
- Methods to ensure that drainage features are maintained in the future.

Each final design-level hydraulic analysis would be reviewed by the Public Works Department for adequacy. Therefore, the implementation of Action 6.2.4 would ensure that the Specific Plan's contribution to downstream flooding is less than significant.

(2) Water Quality. Individual development and infrastructure projects in the Plan Area could result in construction- and operation-period impacts to storm water quality. The degradation of storm water runoff could adversely affect the quality of the Carquinez Strait and other surface water bodies.

Construction-Period Impacts. Demolition, excavation, grading and construction in the Plan area would require temporary disturbance of surface soils and removal of vegetative cover. During the construction period, excavation and grading activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. Soil stockpiles and excavated parcels on the project site would be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation in the Carquinez Strait.

The potential for chemical releases is present at most construction sites. Once released, substances such as fuels, oils, paints, and solvents could be transported to nearby surface waterways and/or groundwater in storm water runoff, wash water, and dust control water, potentially reducing the quality of the receiving waters.

Operation-Period Impacts. New construction and intensified land uses at the project site would result in increased vehicle use and potential discharge of associated pollutants. Leaks of fuel or lubricants, tire wear, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff being transported to receiving waters. Runoff from the proposed landscaped and open space areas may contain residual pesticides and nutrients. Long-term degradation of runoff water quality from the site could adversely affect water quality in the receiving waters and San Francisco Bay.

Action 6.2.5 would require the Public Works and Community Development Departments to promote storm water management strategies that retain and treat runoff on-site, consistent with the provisions of the Benicia Stormwater Management Plan. Attachment B to the 2005-2006 Storm Water Management Plan, Annual Report, outlines the storm water management conditions that would be imposed on individual infrastructure and development projects in the Plan Area.

These conditions are summarized below:

- *Preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that includes sediment and erosion control measures and is acceptable to the RWQCB.* The SWPPP would be required to prevent accelerated soil erosion through: minimizing the length of time that

soils are exposed to erosion forces; reducing the total area of exposed soil during the rainy season; protecting critical areas; and monitoring.

- *Compliance with all provisions of the State Water Resources Control Board Phase II General Permit issued on March 9, 2003 and the Clean Water Act (1972) as amended by the Water Quality Act of 1987, and implementation of post-construction Best Management Practices (BMPs) to prevent sediments and pollutants from entering waterways.* An analysis of anticipated runoff volumes and potential effects to receiving waters from storm water would be required for specific project elements. The impacts of proposed changes to the storm drain system would be required to be reduced to the maximum extent practicable (MEP). BMPs would be incorporated into the designs of individual projects such that the runoff volume from 85 percent of the average annual rainfall at a development site is pre-treated prior to its discharge from the site.
- *Incorporation of storm water treatment control features and practices from the Northbay Guidebook of Post-Construction Stormwater Best Management Practices (November 2005).*

The Public Works and Community Development Departments would verify that the conditions outlined above are incorporated into the construction plans and site plans for proposed infrastructure and development projects in the Plan Area, as required by Action 6.2.5. Action 6.2.5 and its enforcement mechanism (review of plans by the Public Works Department prior to issuance of site specific grading and building permits) would ensure that the Draft Specific Plan's contribution to water quality degradation would be less than significant.

In addition, four locations have been identified as "stormwater quality areas" that could be used to treat water from multiple development parcels within and around the project site. These storm water treatment areas would be incorporated into proposed open spaces in the Plan Area. One storm water treatment area is designated for the open area around the Commanding Officer's Quarters, north of Jefferson Street; two additional storm water treatment areas would be located immediately south of Jefferson Street; the last storm water quality area would be located in the extreme southwestern portion of the site in the South of Grant Zone.

Because individual development projects would be required to comply with the provisions of the City's Stormwater Management Plan and other applicable storm water management/treatment regulations, the storm water quality areas designated in the Draft Specific Plan would not be required to reduce significant impacts to storm water volume and quality. However, these proposed neighborhood-scale storm water treatment features would contribute to environmental quality within and around the site, and would be consistent with the RWQCB's recommendation that polluted runoff be treated via a diverse set of design features and source control. Best practices for the proposed storm water quality areas are discussed in Section IV.N, Sustainability and Energy. This section also includes a recommendation that an Integrated Pest Management Plan (IPM) be prepared and implemented in open space areas in the Plan Area. An IPM would not be required to reduce the less-than-significant effects of the Specific Plan on water quality, but would promote environmental quality and sustainability in Benicia.

c. Significant Impacts and Mitigation Measures. This Draft Specific Plan would result in no significant impacts to hydrology and water quality.