4.8 HYDROLOGY AND WATER QUALITY

This section of the Environmental Impact Report (EIR) describes the existing setting of the proposed project site as it relates to hydrology and water quality; identifies associated regulatory conditions and requirements; presents the criteria used to evaluate potential impacts on hydrology and water quality, and identifies mitigation measures to reduce or avoid each significant impact. This following analysis of the potential impacts to hydrology and water quality is derived primarily from the listed sources. The reports are summarized in the following discussion and the stormwater studies are included as Appendix H to this EIR.

- Propel Vallejo 2040 General Plan.
- City of Vallejo Code of Ordinances.
- Stormwater Control Plan for Fairview at Northgate Commercial Project.
- Stormwater Control Plan for Fairview at Northgate Residential Project.

The project includes a 0.25-acre water quality treatment basin, approximately 16 other C3 compliant water quality features within the residential area, and approximately 20 water quality features in the parking medians and landscaped areas of the commercial area to comply with the California Regional Water Quality Control Board (RWQCB) Municipal Regional Permit (MRP) and associated C3 requirements. The project would include appropriate source controls, to manage trash, sediment, and metal capture, and to reduce total maximum daily loads (TMDL), unwanted discharges, and to prevent increases in runoff flows. The water quality basin would be located on the northern portion of the project site between the open space and residential area just south of Turner Parkway. The water quality basin would be designed to manage storm flows from both the commercial and residential components of the proposed project and treat run-off before being released downstream. The final location and design of the C3 source control storm water treatment measures would be determined based on the final project design and detailed in a storm water drainage design. Similar to the open space, the water quality basin would be managed by a homeowner's association (HOA). The bioretention facilities on the commercial and residential sites would be managed and maintained by the HOA and commercial property owners.

4.8.1 ENVIRONMENTAL SETTING

The 51.3-acre project site is vacant, undeveloped property with low-lying vegetation and minimal tree canopy cover. It is southeast of the intersection of Turner Parkway and Admiral Callaghan Lane. Elevations for the existing site range from approximately 89 ft to 124 feet above mean sea level, and surface water generally flows to the northwest towards a natural drainage swale which conveys flows towards Turner Parkway. The majority of the site (over 44 acres) is covered in non-native annual grassland with some elements of mixed woodland and coyote brush scrub intermixed. A seasonal wetland traverses the site flowing from south to north and ultimately drains to two existing culverts that convey water off the property underneath Turner Parkway. The culverts are approximately 315 feet east of the intersection

of Turner Parkway at Admiral Callaghan Lane. A perennial stream traverses the southwestern corner of the property and surface water flows on and off the property through existing underground culverts.

The City of Vallejo is bordered by the City of American Canyon and unincorporated Napa County to the north, the City of Benicia and unincorporated Solano County to the east, the Carquinez Strait to the south, and the Napa River and San Pablo Bay to the west. Adjacent to the City and to the west is the San Pablo Bay National Wildlife Refuge. The Solano County Land Trust's Lynch Canyon Open Space is approximately one mile north of the City. Vallejo is along the east margin of San Pablo Bay, a northeastern lobe of San Francisco Bay. The environment along Mare Island and parts of the east margin of the Napa River includes gently sloping terrain in the central part of the City (especially the area adjacent to I-80 north of Curtola Parkway); hillier terrain that dominates the east-central and northeast parts of the City and include the East Bay Hills and Briones Hills to the southwest; the Vaca Mountains and Napa Valley to the north; and, the Diablo Ranges to the southeast. Elevations range from near sea level on the shores of the Carquinez Strait to nearly 1,000 feet above mean sea level along the crest of Sulphur Springs Mountain in the northeast part of the City.

WATERSHEDS

The City of Vallejo lies within two watersheds: San Pablo Bay Watershed and Suisun Bay Watershed. The majority of Vallejo is within San Pablo Bay Watershed. A small portion of the City east of Rollingwood Drive (in the southeast portion of the City) and east of Columbus Parkway (in the northeast portion of the City) is within the Suisun Bay Watershed.

The San Pablo Bay Watershed is approximately 900 square miles and is the drainage area of the major creeks and streams that flow into San Pablo Bay. The watershed is part of the San Francisco Bay-Delta Estuary, which drains more than 40 percent of California's surface area. The San Pablo Bay Watershed is among the richest ecosystems in the West and has the largest untouched expanse of tidal wetlands in California. It is one of three critical stopover sites for migratory shorebirds navigating the Pacific Flyway and is an essential nursery for salmon, sturgeon, and lampreys. The watershed is under increased development pressure from urban and agricultural uses, which has led to the development of a watershed restoration and management plan headed by the U.S. Army Corps of Engineers (Corps).

The Suisun Bay Watershed is approximately 660 square miles. Suisun Bay is a shallow tidal estuary that lies at the confluence of the Sacramento and San Joaquin Rivers, forming the entrance to the Sacramento-San Joaquin River Delta. Suisun Marsh is the largest contiguous brackish water marsh remaining on the west coast of North America and includes 52,000 acres of managed wetlands, 27,700 acres of upland grasses, 6,300 acres of tidal wetlands, and 30,000 acres of bays and sloughs. It encompasses more than ten percent of California's remaining natural wetlands and also serves as the resting grounds and feeding grounds for waterfowl migrating on the Pacific Flyway. Suisun Marsh also supports 80 percent of the State's commercial salmon fishery by providing important tidal rearing areas for juvenile fish.

In 2014, the Suisun Marsh Management Plan was completed, which was a joint effort between the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), U.S. Bureau of

Reclamation, California Department of Fish and Wildlife (CDFW), California Department of Water Resources, Delta Stewardship Council, and the Suisun Resource Conservation District. The Suisun Marsh Management Plan Project will be completed over a 30-year period and is intended to restore 5,000 to 7,000 acres of tidal marsh; enhance more than 40,000 acres of managed wetlands; maintain the heritage of waterfowl hunting; improve water quality for fish and wildlife habitat; and, provide other recreational opportunities.

DRAINAGE AND FLOOD CONTROL

There are several water features within or adjacent to Vallejo, including the Napa River, Austin Creek, Blue Rock Springs Creek, Chabot Creek, Rindler Creek, and Sulphur Springs Creek. There also are several lakes and reservoirs within the City limits. Lake Chabot is owned and operated by the City of Vallejo and was built in 1870 to supply water to Vallejo residents. It is a 47-foot-high earthen dam with a capacity of 504 acre-feet and a reservoir area of 61 acres. Other City-owned and operated lakes and reservoirs in the City are Summit Reservoir, Swanzy Reservoir, and Fleming Hill No. 2 Reservoir. Lake Dalwigk is owned and operated by the Vallejo Sanitation and Flood Control District (VSFCD) as a flood control basin to help alleviate flooding in the surrounding neighborhoods. Collected water is drained as needed into the Mare Island Strait through a pump station. The VSFCD recently completed a project to remove tule grass, create a low flow channel, regrade and deepen the basin, and create a low-level outlet to enhance its capacity as a flood control basin. Lake Dalwigk also serves as a valuable marsh habitat for birds, amphibians, and other wildlife.

The City and the VSFCD are jointly responsible for flood control planning, and the VSFCD provides storm water and flood control protection services for Vallejo. The VSFCD operates and maintains over 250 miles of storm drains, more than 10,000 catch basins, and 9 storm water pump stations in the City. The VSFCD also protects land and residents from flooding damage through its storm drain system. Several of the storm drain systems and basins drain into Lake Dalwigk. VSFCD's Storm Drain Master Plan (1987; updated in 1992 and 2002) included computer modeling of 11 drainage areas within VSFCD's jurisdiction, GPS field surveys and mapping of over 6,000 storm drain facilities, evaluation of existing flooding problems, and estimating the construction and cost of alternative solutions. Given the nearly built-out nature of the City, the 2002 Storm Drain Master Plan did not identify any new flooding problems and VSFCD has completed the majority of the storm drain improvement projects identified in the 2002 Master Plan. In addition, the City of Vallejo has restrictions on building within the 100-year floodplain, as cited in the Municipal Code Chapter 7.98, Flood Management Regulations.

GROUNDWATER

Portions of western and central Vallejo are within the Napa-Sonoma Valley Groundwater Basin and more specifically within the Napa-Sonoma Lowlands Subbasin. The subbasin occupies a lowland area immediately north of San Pablo Bay and is bordered by the Mayacamas Mountains to the north, Sonoma and Napa Valleys to the northeast and northwest, and tidal marshlands at or below sea level to the south.

The San Francisco RWQCB Basin Plan lists beneficial uses for this groundwater basin as municipal/domestic water supply and agricultural water supply and potential uses as industrial process water supply and industrial service water supply. However, local groundwater is not used for water supply by the City of Vallejo, and the City has no intention to seek or investigate groundwater supply.

Shallow groundwater in Vallejo varies in depth depending on location and typically ranges from 5 to 28 feet below ground surface (bgs). Groundwater dewatering operations associated with excavation activities may be required in some areas of the City.

4.8.2 REGULATORY SETTING FEDERAL

Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the Waters of the U.S. The CWA establishes the basic structure for regulating discharges of pollutants into the "Waters of the U.S." and has given the U.S. Environmental Protection Agency (U.S. EPA) the authority to implement pollution control programs. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402), which is addressed later in this section.

Clean Water Act Section 404

Section 404 of the CWA (33 U.S.C. 1251 et seq.) requires a permit from the Corps for the discharge of dredged or fill material into "Waters of the U.S.," which include rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The limits of non-tidal waters extend to the Ordinary High Water Mark (OHWM) or to the limit of adjacent wetlands. The U.S. EPA also has authority over wetlands and may veto a Corps permit under CWA Section 404(c).

Clean Water Act Section 303(d)

Section 303(d) of the CWA (CWA, 33 USC 1250, et seq., at 1313(d)) requires states to identify "impaired" water bodies as those which do not meet water quality standards. States are required to compile this information in a list and submit the list to U.S. EPA for review and approval. An affected waterbody, and associated pollutant or stressor, is then prioritized in a list of impaired waterbodies known as the 303(d) List. The CWA further requires the development of a TMDL for each listing.

National Pollutant Discharge Elimination System

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface "Waters of the U.S.," including discharges from municipal separate storm sewer systems (MS4s). Federal NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source storm water runoff. NPDES permits generally identify effluent and receiving water limits on allowable concentrations and/or mass emissions of pollutants contained in the discharge; prohibitions on discharges not specifically allowed under the permit; and provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring, and other activities.

Under the NPDES program, all facilities that discharge pollutants into "Waters of the U.S." are required to obtain an NPDES permit. Requirements for storm water discharges are also regulated under this program. In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs. Vallejo lies within the jurisdiction of the San Francisco RWQCB (Region 2) and is subject to the waste discharge requirements of the Municipal Regional Stormwater Permit (MRP; Order No. R2-2015-0049) and NPDES Permit No. CAS612008, which was issued on November 19, 2015 and effective January 1, 2016 (RWQCB, 2018). The City of Vallejo and the VSFCD are permittees under the MRP, as well as the cities of Fairfield and Suisun City and other cities and towns in Alameda, Contra Costa, Santa Clara, and San Mateo counties.

Under Provision C3 of the MRP, the co-permittees use their planning authorities to include appropriate source control, site design, and storm water treatment measures in new development and redevelopment projects to address both soluble and insoluble storm water runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID)¹ techniques.

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency's (FEMA) primary mission is to reduce the loss of life and property and protect the nation from all hazards, including flooding. FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding in relation to a Special Flood Hazard Area (SFHA). These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year. FEMA also maps the 500-year flood zones, which means that in any given year, the risk of flooding in the designated area is 0.2 percent. However, mandatory flood insurance is not required for buildings or homes within the 500-year floodplain. **Figure 4.8-1: FEMA Map**, shows these areas.

¹ LIDs are systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat (EPA, 2019).



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Additionally, FEMA has developed requirements and procedures for evaluating earthen levee systems and mapping the areas affected by those systems. Levee systems are evaluated for their ability to provide protection from 100-year flood events and the results of this evaluation are documented in the FEMA Levee Inventory System. Levee systems must meet minimum freeboard standards and must be maintained according to an officially adopted maintenance plan. Other FEMA levee system evaluation criteria include structural design and interior drainage.

FEMA FIRM panels for the City were updated on June 9, 2014 on FIRM map 06095C0440F. This depicts the vast majority of the project site, approximately 50.8 acres, in a Zone X, which is defined as an outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood. Approximately 0.5 acres at the southwest corner of the project site is shown on the FEMA FIRM map as being in zone AE or other areas of flood hazard. These zones are defined as an areas subject to inundation by the 1-percent-annual-chance flood, or an area with 0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (FEMA, 2014).

Levee Inventory System. Levee systems must meet minimum freeboard standards and must be maintained according to an officially adopted maintenance plan. Other FEMA levee system evaluation criteria include structural design and interior drainage.

FEMA FIRM panels for the City were updated on June 9, 2014 on FIRM map 06095C0440F. This depicts the vast majority of the project site, approximately 50.8 acres, in a Zone X, which is defined as an outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood. Approximately 0.5 acres at the southwest corner of the project site is shown on the FEMA FIRM map as being in zone AE or other areas of flood hazard. These zones are defined as an areas subject to inundation by the 1-percent-annual-chance flood, or an area with 0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (FEMA, 2014).

STATE

Sustainable Groundwater Management Act

Section 10720.1 of the Sustainable Groundwater Management Act (SGMA), effective January 1, 2015, established a framework of priorities and requirements to facilitate sustainable groundwater management throughout California. The legislative intent of the SGMA is for groundwater to be managed in California's groundwater basins by local public agencies and newly-formed Groundwater Sustainability Agencies (GSAs).

Specifically, the SGMA establishes a definition of "sustainable groundwater management," requires that a Groundwater Sustainability Plan be adopted for the most important groundwater basins in California, establishes a timetable for adoption of Groundwater Sustainability Plans, empowers local agencies to manage basins sustainably, establishes basic requirements for Groundwater Sustainability Plans, and provides for a limited State role.

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board (SWRCB) regulates water quality through the Porter-Cologne Water Quality Act of 1969, which contains a complete framework for the regulation of waste discharges to both surface waters and groundwater of the State. On the regional level, the proposed project falls under the jurisdiction of the Central Valley RWQCB, which is responsible for the implementation of State and federal water quality protection statutes, regulations, and guidelines.

California Water Code Sections 13050-13260

California Water Code Section 13050(e) defines "Waters of the State" as "any surface water or groundwater, including saline waters, within the boundaries of the state." California Water Code Section 13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the "Waters of the State," other than into a community sewer system, must submit a report of waste discharge to the applicable RWQCB.

State Water Resources Control Board General Construction Permit

In California, the SWRCB has broad authority over water quality control issues for the State. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the CWA. Section 402 of the CWA authorizes the California State Water Resources Control Board (SWRCB) to issue NPDES General Construction Storm Water Permit referred to as the "General Construction Permit."

Construction activities that disturb one or more acres of land that could impact hydrologic resources must comply with the requirements of the SWRCB General Construction Permit (Order 2009-0009-DWQ), as amended by Order 2010-0014-DWQ and Order 2012-006-DWQ. Under the terms of the permit, applicants must file Permit Registration Documents (PRDs) with the SWRCB prior to the start of construction. The PRDs include a Notice of Intent (NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. The PRDs are submitted electronically to the SWRCB via the Storm Water Multiple Application and Report Tracking System (SMARTS) website.

Construction activities can comply with and be covered under the General Construction Permit provided they:

- Develop and implement an SWPPP which specifies best management practices (BMPs)² that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off-site into receiving waters;
- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the nation; and

² A BMP is a practice, or combination of practices, that is determined to be an effective and practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (NCForestservice.gov, 2019).

• Perform inspections of all BMPs.

The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the construction site discharges directly to a water body listed on the 303(d) list for sediment. Increased compliance tasks under the adopted Construction General Permit include project risk evaluation, effluent monitoring, receiving water monitoring, electronic data submission of the SWPPP and all other permit registration documents, and a Rain Event Action Plan, which must be designed to protect all exposed portions of a project site within 48 hours prior to any likely precipitation event. The General Construction Permit also requires applicants to comply with post-construction runoff reduction requirements.

REGIONAL AND LOCAL

San Francisco Bay Regional Water Quality Control Board

Regional authority for planning, permitting, and enforcement in California is delegated to the nine RWQCBs. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. As previously stated, the City of Vallejo is within the jurisdiction of the San Francisco Bay RWQCB (Region 2).

The San Francisco Bay RWQCB addresses region-wide water quality issues through the creation of the Water Quality Control Plan for San Francisco Bay Basin (Basin Plan). The Basin Plan was updated in March 2015. This Basin Plan designates beneficial uses of the State waters within Region 2; describes the water quality that must be maintained to support such uses; and, provides programs, projects, and other actions necessary to achieve the standards established in the Basin Plan. The Water Quality Control Policy for the Enclosed Bays and Estuaries of California, as adopted by the SWRCB in 1995, also provides water quality principles and guidelines to prevent water quality degradation and protect the beneficial uses of waters of enclosed bays and estuaries.

Municipal storm water discharges in the City of Vallejo are regulated under the San Francisco Bay RWQCB's recently revised MRP, NPDES Permit Order No. R2-2015-0049, adopted November 19, 2015.

Provision C3 of the MRP addresses post-construction storm water requirements for new development and redevelopment projects that create and/or replace 10,000 sf or more of impervious area or special land use categories (i.e., auto service facilities, gasoline stations, restaurants, and uncovered parking lots) that create and/or replace 5,000 sf of impervious surfaces. Provision C3 of the MRP also mandates that new development projects implement the following measures:

- Incorporate site design, source control, and storm water treatment measures into the project design.
- Minimize the discharge of pollutants in storm water runoff and non-storm water discharge.
- Prevent increases in runoff flows as compared to pre-development conditions.

• LID methods are the primary mechanisms for implementing such controls. Additionally, projects within the City that drain to a natural water body must also construct and maintain hydrograph modification measures to ensure that estimated post-project runoff peaks and durations do not exceed estimated pre-project peaks and duration.

The 2015 MRP requires any regulated project to treat 100 percent of the calculated runoff (based on the sizing criteria described in the C3 provisions of the MRP) with LID treatment measures that include harvesting and reuse, infiltration, evapotranspiration, or biotreatment/bioretention. Projects that create or replace 2,500 sf or more but less than 10,000 sf, of impervious surface must implement site design measures to reduce storm water runoff. Project applicants must also prepare an Operation and Maintenance Plan to maintain the storm water treatment measures and execute agreements that these treatment measures will be maintained in perpetuity.

Bay Protection and Toxic Cleanup Program

In 1989, the California legislature established the Bay Protection and Toxic Cleanup Program with the goal of protecting present and future beneficial uses of the Bay and estuarine waters of California. In addition, the program was tasked with identifying toxic hot spots (i.e., localized areas with elevated concentrations of pollutants) and developing prevention and control strategies to remediate the toxic hot spots. As part of this program, in 1993, the San Francisco Bay RWQCB initiated the Regional Monitoring Program (RMP) that includes water quality and sediment monitoring near Vallejo. The RMP is a collaborative effort between the San Francisco Estuary Institute, RWQCB, and the regulated discharger communities. The purpose of the program is to assess regional water quality conditions, characterize patterns and trends of contaminant concentrations and distribution in the water column, and identify general sources of contamination in San Francisco Bay. The program has established a database of water quality and sediment quality in the Bay, particularly with respect to trace elements and organic contaminants.

Vallejo Sanitation and Flood Control District (VSFCD)

The VSFCD is an independent special district that was formed in 1952 to collect and treat wastewater and provide storm water and flood control services to the Vallejo community. To meet the demands on the wastewater treatment plant and storm drain system associated with City growth, the VSFCD imposes sewer and storm drain user fees. The District Code includes provisions for the storm drainage system under Title 6, which includes storm drain system collection fees (Chapter 6.04), storm drain system user fees (Chapter 6.08), and storm water management and discharge control (Chapter 6.12).

The VSFCD also has storm drain design standards and policies that apply to new development and redevelopment projects that connect to the existing storm drain system. Hydrologic design must be in accordance with the Solano County Water Agency Hydrology Manual, with a 15-year level of protection for drainage areas less than 640 acres and a 100-year level of protection for areas greater than 640 acres. A higher level of protection may be required at the VSFCD's discretion. A connection permit issued by the VSFCD with hydraulic calculations to verify the capacity of the receiving storm drain system is also required.

Propel Vallejo 2040 General Plan (VGP)

Project relevant General Plan policies for hydrology and water quality are addressed in this section.

Action CP-1.15A	Require new development to incorporate site design, source control, and treatment measures to keep pollutants out of stormwater during construction and operational phases, consistent with City of Vallejo Municipal Ordinance.
Action CP-1.15B	Encourage new development to incorporate low impact development (LID) strategies, such as rain gardens, filter strips, swales, and other natural drainage strategies, to the greatest extent feasible, in order to reduce stormwater runoff levels, improve infiltration to replenish groundwater sources, reduce localized flooding, and reduce pollutants close to their source.
Action CP-1.15D	Require new development to connect to the Vallejo Sanitation and Flood Control District sewer system for treatment of wastewater rather than septic systems, which are not allowed.

City of Vallejo Municipal Code

The City of Vallejo Municipal Code contains the following directives pertaining to hydrology and water quality issues:

- **Chapter 7.98 Flood Management Regulations.** This floodplain management ordinance is designed to protect human life and health, minimize expenditures for costly flood control projects, minimize the need for rescue and relief efforts, business interruptions, and damage to public facilities and utilities. The ordinance also requires property owners that construct new or substantially improved buildings within the 100-year floodplain to obtain a development permit and elevate or flood-proof the lowest floor of the structure so that it is above the base flood elevation. This ordinance complies with the National Flood Insurance Program's goals to protect life and property.
- **Chapter 11.52 Water Wells.** This regulation requires a permit to be obtained from the Board of Health prior to using a groundwater well for drinking purposes.
- **Chapter 11.53 Well Regulation and Monitoring.** This regulation authorizes the Solano County Department of Environmental Management, Division of Environmental Health to regulate the construction, destruction, or inactivation of water, cathodic protection, and monitoring wells.
- Chapter 12.40 Excavation, Grading, and Filling. This regulation requires permit applications to include erosion control measures and submit erosion control plans, if the project comprises 50 acres or 200 lots, whichever is less. Drainage areas must be identified and estimated; runoff amounts must be estimated, and sediment basins are required for large developments. Erosion control measures must be implemented during the rainy season (October 15 through April 15).

- **Chapter 15.06.250 Grading and Erosion Control.** This regulation requires subdividers to provide on-site grading and other improvements necessary to properly control erosion and prevent sedimentation or damage to off-site properties, as specified in the final grading plan.
- **Chapter 12.41 Stormwater Management and Discharge Control.** This regulation is intended to protect and enhance the water quality within the City of Vallejo's watercourses, water bodies, and wetlands and carry out the conditions specified in the MRP that requires appropriate source control measures, site design measures, and storm water treatment measures for new development and redevelopment projects within the City.
- **Chapter 16.71 Water Efficient Landscaping Requirements**. This regulation meets the requirements of the State's Model Water Efficient Landscape Ordinance (MWELO) and requires submittal of a landscape documentation package for new or rehabilitated landscapes ranging in size from 1,500 to 5,000 sf (depending on the project). The landscape documentation package must include a water-efficient landscape worksheet, soil management report, landscape design plan, irrigation design plan, and a grading design plan with the goal of minimizing water irrigation rates and maximizing water irrigation efficiency.

4.8.3 STANDARDS OF SIGNIFICANCE

The following significance criteria for hydrology and water quality were derived from the Environmental Checklist in the State CEQA Guidelines, Appendix G. An impact of the project would be considered significant and would require mitigation if it would meet one of the following criteria.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - i. Result in substantial erosion or siltation on- or off-site.
 - ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.
 - iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Impede or redirect flood flows.
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.8.4 **PROJECT IMPACTS AND MITIGATION**

WOULD THE PROJECT VIOLATE ANY WATER QUALITY STANDARDS ORIMPACTWASTE DISCHARGE REQUIREMENTS OR OTHERWISE SUBSTANTIALLYHYD-1DEGRADE SURFACE OR GROUND WATER QUALITY?

(LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED)

SHORT-TERM CONSTRUCTION IMPACTS

Demolition and construction activities associated with the project would include grading, excavation, and other earthmoving activities that have the potential to cause substantial erosion on the project site. If erosion is not prevented or contained during construction, sediments and particulates, along with other contaminants found on the project site, could be conveyed off-site and into downstream waters, resulting in water quality degradation and the subsequent violation of water quality standards.

Because the proposed project would disturb more than one acre of land, the project would be required to comply with the requirements of the NPDES General Permit, which helps control water pollution by regulating point source and non-point sources that discharge pollutants into receiving waters³. As discussed previously, Vallejo lies within the jurisdiction of the San Francisco RWQCB (Region 2) and is subject to the waste discharge requirements of the Municipal Regional Stormwater Permit and NPDES Permit.

The proposed project would also be required to obtain a General Construction Permit. The General Construction Permit requires implementation of an SWPPP, which would include BMPs designed to protect the quality of storm water runoff. Construction BMPs may include, but are not limited to, stabilization of construction entrances, straw wattles on embankments, and sediment filters on existing inlets. The SWPPP would also contain a site map(s) showing the construction perimeter, existing and proposed buildings, storm water collection and discharge points, general pre- and post-construction topography, drainage patterns across the site, and adjacent roadways; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants, should the BMPs fail; and a sediment monitoring plan, should the site discharge directly into a water body listed on the 303(d) list for sediment.

The SWPPP would also contain a summary of the structural and nonstructural BMPs to be implemented during the post-construction period, pursuant to the nonpoint source practices and procedures as required by the City's Public Works Department. Once grading begins, the SWPPP must be kept on-site and updated as needed while construction progresses.

³ Surface water quality is affected by point source and non-point source pollutants. Point source pollutants are those emitted at a specific point, such as a pipe, while non-point source pollutants are typically generated by surface runoff from diffuse sources, such as streets, paved areas, and landscaped areas.

Preparation, implementation, and participation with both the NPDES General Permit and the General Construction Permit, including the SWPPP and BMPs, would reduce project demolition and construction effects on water quality to acceptable levels. As a result, short-term construction impacts associated with water quality standards and wastewater discharge requirements would be less than significant.

LONG-TERM OPERATIONAL IMPACTS

The proposed residential development on the east side of the project site would use a drainage system to collect rainwater and the existing intermittent flows from the east and convey flows to a bioretention basin within the linear park site in the northwestern part of the neighborhood. The bioretention basin would treat the surface water through infiltration in compliance with C3 requirements. During peak storm events the basin would retain the surface water to allow sediments and other pollutants to settle before the water is released into an outfall (with an energy dissipater) prior to ultimately reaching the central drainage channel. For aesthetic purposes, suitable deciduous trees and ground plantings would be placed within each basin facility area. The park site basin facility is proposed to have gentle side-slopes and a shallow depth as a safety feature for park visitors.

About 40 percent of the residential site would have pervious landscape areas. A large portion of runoff from residences would drain via surface flow to lawns and vegetation prior to flowing to the streets and storm drains routed to the designated storm water treatment facility. The residential portion of the project would implement "Integrated Management Practices" to treat a total drainage area of 1,037,167 sf (23.8-acres) with an impervious ratio of 58.8 percent. Two bioretention treatment facilities at the northwest corner of the site would provide a combined treatment area of 42,640 sf (0.98 acre). The bioretention facilities would be designed to meet both treatment and flow-control requirements. **Figure 4.8-2: Residential Storm Water Control Plan**, shows the impervious and pervious areas, as well as the bioretention areas.

Admiral Callaghan Lane will be widened along the commercial frontage and would span a small portion of Blue Rock Springs on the southwest corner of the site. Approximately 18.5% percent of the commercial site would be pervious landscape. The proposed commercial area would implement "Integrated Management Practices" to treat a total drainage area of 946,593 sf (21.7-acre) with an impervious ratio of approximately 81.5%. A total of twenty bioretention treatment facilities, located throughout the site, provide a total treatment area of 42,245 sf. The bioretention facilities are designed to meet both treatment and flow-control requirements.

The majority of storm water runoff, specifically the commercial parking lots, would surface flow directly into storm bioretention facilities. **Figure 4.8-3: Commercial Storm Water Control Plan**, shows the impervious and pervious areas, as well as the bioretention areas. The proposed project also includes permanent and operational BMPs to control and treat stormwater after project construction is complete. *Table 4.8-1: Source Control BMPS*, summarizes these measures.

Potential	Permanent Source Control BMP	Operational Source Control BMP	
Pollutant Source			
Onsite Storm Drain Inlet	Inlets that are accessible from driveways/walkaways will be marked with "No Dumping Drains to Bay" or a similar message.	Inlet markings will be inspected annually and replaced or, repainted as needed. Stormwater pollution prevention information will be provided to new site owners, lessees, or operators.	
Interior Floor Drains	Interior floor drains will be plumbed to sanitary sewer.	Drains will be inspected and maintained annually to prevent blockages and overflow.	
Landscape/Outdoor Pesticide Use	Native trees, shrubs, and ground cover will be preserved to the maximum extent possible. Landscaping will be designed to minimize required irrigation and runoff, to promote surface infiltration, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. When feasible, pest- resistant plants will be selected, especially for locations adjacent to hardscape. Plants will be selected appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Owners, lessees, or operators will receive Integrated Pest Management (IMP) information. All open space landscaping is to be maintained by a professional landscaping contractor utilizing integrated pest management methods. Pesticides will only be applied by appropriately licensed contractors.	
Sidewalks and Parking Lots	Water runoff will be collected via storm drain pipes to bioretention areas for treatment	Regular street sweeping to control pollutants. Overflow storm drain inlets will	
Pools, Spas, Ponds, Decorative Fountains, and Other Water Features	Pools will be plumbed to the sanitary sewer per local municipality requirements.	Educate residents about the "Fountain and Pool Maintenance" guidelines of the CASQA Stormwater Quality Handbook.	
Refuse Areas	In the commercial area, trash and recycling facilities will be enclosed with roof and wall. The facilities will also be screened to limit the access from the public and will include a sign stating, "Do Not Dump Hazardous Materials Here" or a similar message.	Receptacles will be inspected annually and replaced to prevent leakage. Spills will be cleaned up immediately.	
Vehicle/Equipment Repair and Maintenance	In the commercial area, maintenance and repairs will only take place at designated areas away from storm drain conveyance facilities. Leaks of machinery fluids will be prevented thru; routinely inspections. Drip pans will be employed, and fluids will be properly disposed. EVAC equipment will be used to capture oils and retain for site removal.	No cars will be maintained, cleaned, or fueled onsite, except in designated areas where wash water is contained and treated. No vehicle fluids, hazardous materials, or rinse water from parts cleaning will be disposed down storm drains.	

Table 4.8-1: Source Control BMPS

Fuel Dispensing	In the commercial area, fuel areas will have	Fueling area will be routinely inspected and		
Areas	an impermeable ground surface and would	maintained through a dry sweep.*		
	be covered with a roof reducing water			
	runoff from near the fuel islands. Surface			
	water runoff will be directed to an oil and			
	water separator catchment basin before			
	being conveyed to the storm drain or			
	bioretention basin.			
Fire Sprinkler Test	In the commercial area, fire sprinkler test	Inform owners, lessees, or operators to		
Water	valves will be equipped with a means to	review CASQA fact sheet regarding hard		
	divert test water to the sanitary sewer.	metal accumulation and the BOD problem		
		associated with sprinkler water.		
* Costco policy is to have a Costco Gasoline Program trained employee and supervisor at the site during all hours of operation.				

* Costco policy is to have a Costco Gasoline Program trained employee and supervisor at the site during all hours of operation. Employees regularly inspect the fuel islands during operating hours and are trained to identify needed maintenance requirements. Employees check for leaking hoses, malfunctioning nozzles, fuel spills, and physical damage to the dispensers and controller enclosure. Training also includes methods to properly clean spills and emergency response procedures. During non-operating hours, the power to the dispensers is turned off and each nozzle pad is locked. Should the system require attention beyond what the trained site person could handle, the local authorized and certified service contractor would be contacted and dispatched to repair the equipment.⁴

Through planning and design, newly installed storm water drainage facilities would comply with the requirements of the MRP and all other applicable requirements and standards. As a result, the proposed project would ensure that storm water flows and associated sediments, particulates, and contaminants contained within the runoff would be collected and treated at the project site before water would be discharged to the existing municipal storm drain system.

To ensure that the new storm water drainage improvements are planned and designed to satisfy the San Francisco RWQCB's MRP requirements, and all other applicable requirements and standards, implementation of Mitigation Measure HYD-1, MM HYD-2, and MM HYD-3 would be required. With implementation of these measures, construction and operational impacts associated with water quality standards and wastewater discharge requirements would be less than significant.

⁴ Costco Wholesale, Vallejo California Fueling Facility, 2019.



FIGURE 4.8-2: Residential Stormwater Control Plan Fairview at Northgate Project

Kimley **»Horn**



FIGURE 4.8-3: Commerical Stormwater Control Plan Fairview at Northgate Project

Kimley **»Horn**

Mitigation Measures:

MM HYD-1: Construction Water Quality Plan. Prior to issuance of any grading permit, the applicant shall submit to the satisfaction of the Public Works Director, a Storm Water Pollution Prevention Plan (SWPPP) that satisfies the requirements of the National Pollutant Discharge Elimination System (NPDES) and State General Permit for construction. The SWPPP shall incorporate Best Management Practices (BMPs) to control runoff and sedimentation.

The SWPPP shall identify specific types and sources of storm water pollutants, determine the location and nature of potential impacts, and specify appropriate control measures to eliminate any potentially significant impacts on receiving water quality from storm water runoff. The SWPPP shall comply with the most current standards established by the San Francisco RWQCB. The BMPs shall be selected from a menu according to site requirements and shall be subject to approval by the Public Works Director and San Francisco RWQCB.

Additionally, the project applicant shall provide the Public Works Director, evidence of a Waste Discharged Identification (WDID) number generated from the State Regional Water Quality Control Board's Stormwater Multiple Application & Reports Tracking System (SMARTS). This serves as the Regional Water Quality Control Board approval or permit under the National Pollutant Discharge Elimination System (NPDES) construction stormwater quality permit.

- MM HYD-2: Stormwater Quality Control Plan. Prior to issuance of a grading permit or approval of improvement plans, the project applicant shall submit to the satisfaction of the Public Works Director, a final Storm Water Quality Plan (SWQP), either within the Final Drainage Plan or as a separate document that identifies how the proposed project will meet the City's MS4 permit obligations. Site design measures, source control measures, and Low Impact Development (LID) standards, as necessary, shall be incorporated into the design and shown on the grading or improvement plans. In addition, per the MS4 permit, projects creating and/or replacing one acre or more of impervious surface (excepting projects that do not increase impervious surface area over the pre-project condition) are also required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2 year, 24-hour storm event, generally by way of infiltration, rooftop and impervious area disconnection, bioretention, and other LID measures that result in post-project flows that mimic pre-project conditions. For the commercial area, specific source control measures for trash storage areas and the gas station shall be identified in the SWCP.
- **MM HYD-3:** Final Drainage Plan. Prior to the issuance of grading and construction permits, the City of Vallejo shall review and approve a Final Drainage Plan prepared by the project applicant to demonstrate the ability of the planned on-site storm water drainage facilities to adequately collect on-site storm water flows in accordance with all applicable standards and requirements. The final drainage plan shall demonstrate that the new storm water

drainage facilities can satisfy the Regional Water Quality Control Board's Municipal Regional Permit (MRP) requirements by: Minimizing impervious surfaces, as feasible, and directing flows to Integrated Management Practices (IMPs); Integrating appropriately sized IMPs to ensure post-development flows do not exceed pre-development flows; and Incorporating bio-retention in combination with site planning, minimizing impervious areas, and dispersion of runoff to meet Low Impact Development (LID) requirements.

WOULD THE PROJECT SUBSTANTIALLY DECREASE GROUNDWATER SUPPLIES OR INTERFERE SUBSTANTIALLY WITH GROUNDWATER RECHARGE SUCH IMPACT THAT THE PROJECT MAY IMPEDE SUSTAINABLE GROUNDWATER HYD-2 MANAGEMENT OF THE BASIN?

(LESS THAN SIGNIFICANT)

As previously discussed, local groundwater is not used for the City's water supply and the City has no intention to seek or investigate groundwater supply. Therefore, the project would not result in groundwater overdraft, substantial local groundwater level drawdown, or substantially redirect storm water such that natural basin recharge would be precluded.

The proposed project would result in the creation of impermeable surfaces on the project site totaling approximately 1,381,327 sf. Pervious surfaces would include approximately 602,433 sf for an approximate 30% impervious ratio. Within the pervious area, the proposed project includes bioretention treatment facilities also known as LIDs. LIDs are systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. The needed sizing of the treatment facilities is calculated by determining the number of required sf of Integrated Management Practices (IMP). IMPs are designed to maximize stormwater infiltration and consist of layers of permeable materials including layers of gravel, soils, Class 2 permeable materials meeting Caltrans specification 68-2.02F(3), sand and compost mixes as structural features including perforated piping and drains to facilitate infiltration. In addition to the IMPs that are implemented through the installation of LIDs, approximately 5.7-acre open space in the central corridor, other basins and greenspace and 0.25-acre water quality treatment basin.

Both the residential and commercial components of the proposed project were evaluated to determine the sf of IMPs that each should contain. This was calculated based on the amount of pervious surfaces that would be needed to facilitate the infiltration of the approximate 22.5 inches of mean annual precipitation (MAP) at the project site. Based on the IMP calculation the commercial project portion of the site would require total bioretention facility area of approximately 38,845 sf and the residential component would require approximately 39,513 sf. The commercial component includes 42,640 sf (an excess of 3,795 sf) and the residential component includes 42,245 sf, (an excess of 3,900 sf). The inclusion of these design features to the proposed project would help ensure that the increase of impervious surfaces does not substantially reduce the potential for water to infiltrate and deplete ground water recharge. Impacts in this regard would be less than significant and no mitigation is required.

WOULD THE PROJECT SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF THE SITE OR AREA, INCLUDING THROUGH THE ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF HYD-3 IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD RESULT IN SUBSTANTIAL EROSION OR SILTATION ON- OR OFF-SITE?

(LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED)

The project site is not connected to a natural watercourse and the existing drainage features, including the seasonal wetland, are fed by urban run-off and stormwater flowing onto the project site from the existing developed areas to the south and southeast. Once on-site, the water flows in a northwesterly direction and feeds the approximate 5.7-acre drainage corridor (seasonal wetland) within the central project area. On-site water flows trend to the northeast then west along Turner Parkway before discharging via a culvert into Blue Rock Springs Creek west of I-80. The site-drainage from the proposed residential uses has been designed to generally mimic the existing watercourse and direction flow paths of the existing site condition.

The southwesterly side of the project site is bounded by a perennial stream, Blue Rock Springs Creek. The creek traverses the very southwestern corner of the property (a distance of approximately 90 feet) and surface water flows on and off the property through existing underground culverts. Runoff from rainfall events would flow southerly toward the creek. The proposed project; however, includes both pervious and bioretention areas within this portion of the project site. In addition, the entire southerly side of the commercial area is bounded by both bioretention and pervious areas. These areas have been designed to provide adequate drainage capacity and infiltration as well as curb and gutters along the project driveways to prevent water runoff from entering the creek and minimize potential for erosion and sedimentation.

Development of the proposed project would include site preparation activities such as grading, excavation, and other earthmoving activities. The proposed project would include a new storm water drainage system that would contain and collect storm water flows before runoff (including the soils, sediments, and particulates contained within) leave the project site. As required by the San Francisco RWQCB, the new storm water drainage facilities would be planned and designed to satisfy the MRP standards, and all other applicable standards and requirements, which include ensuring that post-development flows do not exceed pre-development flows. By maintaining storm water flows at or below pre-development levels, the new storm water drainage system would reduce the potential for both on-site and off-site erosion.

Ground disturbing activities, including grading, would occur on approximately 44.5 acres of the 51.3-acre project site. Some off-site but adjacent construction may be needed to tie into existing utilities. These improvements and other temporary disturbance areas would likely occur only in Admiral Callaghan Lane and Turner Parkway. The site preparation and grading phase of the proposed project is expected to

include construction equipment such as graders, scrapers, compactors, and water trucks. Approximately 165,000 cubic yards of earthwork would occur and are expected to balance on site.

The project site is not connected to an off-site natural watercourse and the existing on-site drainage features, including the seasonal wetlands, are fed by urban run-off and stormwater flowing onto the project site from the existing developed areas to the south and southeast. Once on-site, the water flows in a northwesterly direction and feeds the approximate 5.7-acre drainage corridor within the project area. The site also receives some on-site flows from run-off from the residential area to the east that flow west over the project site. The existing on-site water flows trend to the northeast then west along Turner Parkway before discharging via a culvert into Blue Rock Springs Creek west of I-80. The proposed site-drainage from the proposed residential uses has been designed to generally mimic the existing watercourse and direction of flow. Much of the existing central drainage and seasonal wetland area would be preserved as part of the project design and the overall drainage pattern would remain. The residential areas would generally drain to the west and northwest and flow into the proposed bioretention basin within the linear park adjacent to Turner Parkway. Water would then maintain its northerly flow and discharge from the site at the culvert under Turner Parkway to maintain the existing flow paths.

The existing drainage from the site where the commercial site is proposed is strongly influenced by the two small hills in the northerly and southerly portions of this area. Water generally flows from the crown of the hills in a westerly direction toward Admiral Callaghan Lane or easterly toward the central drainage feature. Adjacent to the project site Admiral Callaghan Lane has a highpoint near the middle of the western project boundary. Some of the westerly flows from the project site currently flow to the unvegetated shoulder of Admiral Callaghan Lane. Existing stormwater infrastructure is lacking, and the water tends to pond creating muddy puddles, or flow southerly or northerly depending on the direction of the slope. Water flow in this area is overland and not conducted by any stormwater system.

The proposed drainage of the site would maintain the existing northerly and southerly flows along Admiral Callaghan and would be constructed with newly installed bioretention areas adjacent to the roadway. The proposed drainage system addresses the existing deficient drainage conditions along Admiral Callaghan. The new drainage system(s) include, water storage, infiltration points, and a water treatment system with permeable treatment media prior to being conducted off-site. Similar to the existing drainage patterns, flows would be dictated by the direction of the slope. As the crown of Admiral Callaghan Lane would remain, flows would be similar. Northerly flows would be directed towards Turner Parkway, and southerly flows and drainage from the southern portion of the commercial area would flow to bioretention areas along the perimeter of the site. The driveway areas around the proposed gas station include curbs and gutters to prevent surface water from flowing into Blue Rock Creek. The surface water is directed to bioretention areas for treatment.

Flows from the central portion of the commercial area would generally flow northerly with some easterly flows. Surface water would flow into bioretention areas as well as pervious landscaped areas along the margins of this area. Most flows would ultimately be conducted to the northerly project boundary with Turner Parkway, similar to the existing flow regime, and then be conducted off-site via a culvert to Blue

Rock Springs Creek. To further ensure that graded areas do not interfere with existing drainage areas, and to ensure that new storm water drainage improvements are planned and designed to satisfy the San Francisco RWQCB's MRP requirements and all other applicable standards and requirements, the project would be required to comply with MM HYD-1 (Compliance with NPDES General Construction Activities Storm Water Permit Requirements), MM HYD-2 (NOI and SWPPP Submission), and MM HYD-3 (Final Drainage Plan). With implementation of these mitigation measures, impacts associated with the altering of existing drainage patterns and erosion would be less than significant.

WOULD THE PROJECT SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF THE SITE OR AREA, INCLUDING THROUGH THE ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD SUBSTANTIALLY INCREASE THE RATE OR AMOUNT OF SURFACE RUNOFF IN A MANNER WHICH WOULD RESULT IN FLOODING ON- OR OFF-SITE? (LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED)

As discussed previously, grading and construction for both the residential and commercial sites would generally mimic the watercourse paths of the existing site condition. The rate and amount of surface runoff is determined by multiple factors, including the following: amount and intensity of precipitation; amount of other imported water that enters a watershed; and amount of precipitation and imported water that infiltrates to the groundwater. Infiltration is determined by several factors, including soil type, antecedent soil moisture, rainfall intensity, the amount of impervious surfaces within a watershed, and topography. In addition, the rate of surface runoff is largely determined by topography and the intensity of rainfall over a given period of time.

The proposed project would result in the impervious surfaces being constructed on the project site. The residential component includes an area of approximately 1,037,167 sf, of which approximately 609,854 or 58% would be impervious and 427,313 sf would be pervious. The commercial component includes a total of 946,593 sf, of which approximately 771,473 sf or 81.5% is impervious and 175,120 would be pervious. In addition to the open space and landscaped areas that increase pervious surfaces, the commercial component of the proposed project includes approximately 42,640 sf of IMP area and the residential area would have approximately 42,245 sf of IMPs. These areas are constructed with LIDs and contain soils and other materials to facilitate infiltration of surface water runoff.

The project would not alter precipitation amounts or intensities, nor would it require any additional water to be imported into the project site. However, construction would require earth-disturbing activities which may affect site-specific infiltration and permeability during construction (temporary) and operation (permanent). Based on preliminary design estimates, post-construction storm water flows for a 100-year storm event at the project site would be 36.5 cubic feet per second, compared to 39.5 cubic feet per second under existing conditions. *Table 4.8-2: Storm Water Flows for a 100-Year Storm Event*, summarizes the water flows that would result from implementation of the proposed project.

Pre-Development Peak Flow Summary							
Storm Event	Drainage Area LC 13-1	Drainage Area LC 13-2	Drainage Area LC 13-3	Total			
100-year	28.1cfs	3.0 cfs	8.4 cfs	39.5 cfs			
Post-Development Peak Flow Summary							
Storm Event	Drainage Area LC 13-1	Drainage Area LC 13-2	Drainage Area LC 13-3	Total			
100-year	28.1 cfs	0	8.4 cfs	36.5 cfs			

Table 4.8-2: Storm Water Flows for a 100-Year Storm Event

Source: MacKay & Somps, 2018.

The proposed project's new storm water system would contain and collect storm water flows in the project site, before runoff is allowed to drain off-site. As mandated by the San Francisco RWQCB, new storm water facilities would be planned and designed to satisfy its MRP requirements, which includes ensuring that post-development flows do not exceed pre-development flows. To ensure that the new storm water drainage improvements are planned and designed to satisfy the San Francisco RWQCB's MRP requirements, incorporation of MM HYD-3 would be required. With implementation of HYD-3 and maintaining storm water flows at or below pre-development levels, impacts would be less than significant.

WOULD THE PROJECT SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF THE SITE OR AREA, INCLUDING THROUGH THE ALTERATION OF THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD CREATE OR CONTRIBUTE RUNOFF WATER WHICH WOULD EXCEED THE CAPACITY OF EXISTING OR PLANNED STORMWATER DRAINAGE SYSTEMS OR PROVIDE SUBSTANTIAL ADDITIONAL SOURCES OF POLLUTED RUNOFF? (LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED)

SHORT-TERM CONSTRUCTION IMPACTS

The proposed project must comply with the requirements of the NPDES General Permit, which helps control water pollution by regulating point and non-point sources that discharge pollutants into receiving waters.

The proposed project would also be required to obtain a General Construction Permit. The General Construction Permit requires implementation of an SWPPP, which would include BMPs designed to protect the quality of storm water runoff. Preparation, implementation, and participation with both the NPDES General Permit and the General Construction Permit, including the SWPPP and BMPs, would reduce the potential for storm water flows, and any potential contaminants contained within those flows, to be conveyed off-site during construction of the proposed project. As a result, short-term construction-related impacts associated with creating or contributing to runoff and additional sources of polluted runoff would be less than significant with the incorporation of MM HYD-3.

LONG-TERM OPERATIONAL IMPACTS

As mandated by the San Francisco RWQCB, the proposed project's new storm water drainage system facilities have been planned and designed to satisfy the RWQCB's MRP requirements (as well as all other applicable standards and requirements) by:

- Minimizing impervious surfaces as feasible and directing flows to IMPs.
- Integrating appropriately sized IMPs to ensure post-development flows do not exceed predevelopment flows.
- Incorporating bio-retention in combination with site planning, minimizing impervious areas, and dispersion of runoff to meet LID requirements.

To ensure that the new storm water drainage improvements are planned and designed to satisfy the San Francisco RWQCB's MRP requirements, and all other applicable standards and requirements, incorporation of MM HYD-3 would be required. With implementation of HYD-3, impacts associated with the altering of drainage patterns and flooding would be less than significant.

WOULD THE PROJECT SUBSTANTIALLY ALTER THE EXISTING DRAINAGE PATTERN OF THE SITE OR AREA, INCLUDING THROUGH THE ALTERATION OF IMPACT THE COURSE OF A STREAM OR RIVER OR THROUGH THE ADDITION OF HYD-6 IMPERVIOUS SURFACES, IN A MANNER WHICH WOULD IMPEDE OR REDIRECT FLOOD FLOWS?

(NO IMPACT)

The majority of the project site is located outside of an identified Flood Hazard Area (either a 1 percent or 0.2 percent annual chance for flooding), according to the FIRM (Map Number ID: 06095C0607F) prepared by FEMA. A portion of the southwest portion of the project site is located within Zone AE, which is described by FEMA as an area subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. While the proposed project would include numerous buildings and facilities, none of the proposed improvements associated with the project would be in the 1% flood zone. As a result, no impacts would occur.

IMPACT HYD-7 IN FLOOD HAZARD, TSUNAMI, OR SEICHE ZONES, WOULD THE PROJECT RISK RELEASE OF POLLUTANTS DUE TO PROJECT INUNDATION? (LESS THAN SIGNIFICANT IMPACT)

As discussed above, the majority of the project site is located outside of an identified Flood Hazard Area (either a one percent or 0.2 percent annual chance for flooding), and there are no levees or dams on the project site.

Parts of the City are located within the inundation areas of four dams: Lake Chabot, Summit Reservoir, Swanzy Reservoir, and Fleming Hill No. 2 Reservoir. All of these dams and reservoirs are classified as a high hazard dams because their failure could result in a significant loss of life and/or property damage. However, the California Division of Safety of Dams inspects each dam on an annual basis to ensure the dam is safe, performing as intended, and not developing problems.

The project is proximate to four dam inundation areas, and is approximately one mile southeast of the Lake Chabot Dam. However, as shown in the General Plan, the project site is not located within a dam inundation area. The project site is not located adjacent to any confined water body and would not be affected by seiche. The proposed project is not located adjacent to steep hillsides and would not be susceptible to mudflow. Lastly, according to the California Emergency Management Agency (CAL EMA) Tsunami Inundation Map for Emergency Planning, the project site is not in a tsunami inundation area (CAL EMA, 2009). Therefore, impacts associated with the failure of a levee, dam, seiche, tsunami, or mudflow at the project site would be less than significant.

WOULD THE PROJECT CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OFIMPACTA WATER QUALITY CONTROL PLAN OR SUSTAINABLE GROUNDWATERHYD-8MANAGEMENT PLAN?

(LESS THAN SIGNIFICANT IMPACT)

As discussed above, the project would comply with the Water Quality Control Plan for San Francisco Bay Basin and the C3 provisions of the MRP, and therefore, would not conflict with or obstruct implementation of a water quality control plan. In addition, the City of Vallejo does not use groundwater and does not seek or intend to investigate groundwater as a source of water for the City. The proposed drainage plan would generally mimic the existing site conditions. The proposed project would Incorporate bioretention, disperse runoff to meet LID requirements, and minimize impervious areas. Surface runoff would be conducted to the bioretention treatment facilities at the northwest corner of the site. The bioretention facilities would be designed to meet both treatment and flow-control requirement and would support groundwater recharge. Impact HYD-1 and HYD-4, above provides further detail on the potential impacts and design measures that would be included to the project to protect groundwater and groundwater recharge. Therefore, the proposed project would not obstruct a water quality control plan or sustainable groundwater management plan. Impacts in this regard would be less than significant.

4.8.5 CONCLUSION

Drainage improvements planned for the project would be designed to satisfy the San Francisco RWQCB's MRP requirements, and all other applicable requirements and standards. Implementation of Mitigation Measure HYD-1 would be required to ensure that long-term operational impacts associated with water quality standards and wastewater discharge requirements would be less than significant. The City does not use groundwater; thus, the project would not result in impacts to local groundwater. To ensure that the project do not interfere with existing drainage areas, and to ensure that new storm water drainage

improvements are planned and designed to satisfy the San Francisco RWQCB's MRP requirements and all other applicable standards and requirements, MMs HYD-1, HYD-2, and HYD-3 would be required to ensure that impacts associated with the alteration of existing drainage patterns and erosion would be less than significant. Implementation of MM HYD-3 would also ensure that impacts associated with the altering of drainage patterns would be less than significant. The project site is not located within a dam inundation area, is not susceptible to seiches, and is not in a tsunami inundation area. The project site is not susceptible to mudflow and therefore would not result in impacts associated with the failure of a levee, dam, seiche, tsunami, or mudflow. Furthermore, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan would be less than significant.

4.8.6 CUMULATIVE IMPACTS

Cumulative impacts to hydrology and water quality could occur as new development, redevelopment, and existing uses are ongoing within the watershed. Because parts of the watershed are already urbanized, growth is anticipated to consist of a mix of redevelopment as well as new development and consist of a mix of uses (residential, commercials, industrial, etc.). New development and redevelopment projects would result in some increases in impervious surfaces, and thus could generate increased runoff from the affected project sites. Future developments in the watershed would be required to comply with the SWRCB and San Francisco Bay RWQCB. Depending on the size of future projects, they would be required to obtain and comply with all required water quality permits and the Water Quality Control Plan, as needed and prepare and implement SWPPPS, implement BMPs, including LID BMPs to minimize runoff, erosion, and storm water pollution, comply with the MRP and associated C3 requirements. As part of these requirements, projects would be required to implement and maintain source controls, and treatment measures to minimize polluted discharge and prevent increases in runoff flows that could substantially decrease water quality. Conformance to these measures would minimize runoff from those sites and reduce contamination of runoff with pollutants. Therefore, related projects are not expected to cause substantial increases in storm water pollution. With compliance with State and local mandates, cumulative impacts would be less than significant, and project impacts would not be cumulatively considerable.

4.8.7 REFERENCES

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