5.9 HYDROLOGY AND WATER QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential impacts of the Laguna Niguel City Center Mixed Use Project (proposed project) to hydrology and water quality conditions in the City of Laguna Niguel (City). Hydrology deals with the distribution and circulation of water, both on land and underground. Water quality deals with the quality of surface and groundwater. Surface water includes lakes, rivers, streams, and creeks; groundwater is under the earth's surface.

The analysis in this section is based in part on the following technical report(s):

- *Conceptual Hydrology Study,* Fuscoe Engineering Inc., September 2, 2021.
- *Water Quality Management Plan*, Fuscoe Engineering Inc., February 1, 2022.
- *Response to Comments on the Geotechnical Evaluation Report for CEQA,* Geotechnical Professionals Inc., November 2019.
- *Updated Geotechnical Evaluation Report for CEQA, Proposed Laguna Niguel Town Center,* Geotechnical Professionals Inc., August 13, 2021.

Complete copies of these studies are in the technical appendices to this Draft EIR (Appendix I1, I2, I3, and G1, respectively).

5.9.1 Environmental Setting

5.9.1.1 REGULATORY BACKGROUND

Federal

Clean Water Act and National Pollution Elimination Discharge System

The Clean Water Act establishes regulations to control the discharge of pollutants into the waters of the United States and regulates water quality standards for surface waters (US Code, Title 33, §§ 1251 et seq.). Under the act, the US Environment Protection Agency (EPA) is authorized to set wastewater standards and runs the National Pollutant Discharge Elimination System (NPDES) permit program. Under the NPDES program, permits are required for all new developments that discharge directly into Waters of the United States. The federal Clean Water Act requires wastewater treatment of all effluent before it is discharged into surface waters. NPDES permits for such discharges in the project region are issued by the Santa Ana Regional Water Quality Control Board (RWQCB).

Safe Drinking Water Act

The Safe Drinking Water Act, the principal federal law intended to ensure safe drinking water to the public, was enacted in 1974 and has been amended several times since it came into law. The act authorizes the EPA to set national standards for drinking water, called the National Primary Drinking Water Regulations, to protect

against both naturally occurring and man-made contaminants. These standards set enforceable maximum contaminant levels in drinking water and require all water providers in the United States to treat water to remove contaminants, except for private wells serving fewer than 25 people. In California, the State Water Resources Control Board (SWRCB) conducts most enforcement activities. If a water system does not meet standards, it is the water supplier's responsibility to notify its customers.

State

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (Water Code §§ 13000 et seq.), which was passed in California in 1969 and amended in 2013, the SWRCB has authority over State water rights and water quality policy. This act divided the state into nine regional basins, each under the jurisdiction of a Regional Water Quality Control Board to oversee water quality on a day-to-day basis at the local and regional level. RWQCBs engage in a number of water quality functions in their respective regions. RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. The project site and the City are within the jurisdiction of the San Diego RWQCB.

State Water Resources Control Board General Construction Permit

The SWRCB has adopted a statewide Construction General Permit (Order No. 2012-0006-DWQ) for stormwater discharges associated with construction activity. These regulations prohibit the discharge of stormwater from construction projects that include one acre or more of soil disturbance. Construction activities subject to this permit include clearing, grading, and other disturbance to the ground, such as stockpiling or excavation, that results in soil disturbance of at least one acre of total land area. Individual developers are required to submit permit registration documents (PRD) to the SWRCB for coverage under the NPDES permit prior to the start of construction. The PRDs include a notice of intent, risk assessment, site map, Stormwater Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. The PRDs are submitted electronically to the SWRCB via the Stormwater Multiple Application and Report Tracking System website.

The NPDES Construction General Permit requires all dischargers to (1) develop and implement a SWPPP that specifies best management practices (BMP) to be used during construction of the project; (2) eliminate or reduce non-storm water discharge to stormwater conveyance systems; and (3) develop and implement a monitoring program of all specified BMPs. The two major objectives of the SWPPP are to (1) help identify the sources of sediment and other pollutants that affect the water quality of stormwater discharges and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-storm water discharges.

State Water Resources Control Board Trash Amendments

On April 7, 2015, the SWRCB adopted "Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to Control Trash," and "Part 1, Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California." They are collectively referred to as "the

Trash Amendments." The purpose of the trash amendments is to reduce trash entering waterways statewide, provide consistency in the SWRCB's regulatory approach to protect aquatic life and public health beneficial uses, and reduce environmental issues associated with trash in state waters. There are two compliance tracks:

- **Track 1.** Permittees install, operate, and maintain a network of certified full-capture systems to capture trash in storm drains—in priority land use areas for municipal systems and the entire facility for industrial and commercial permit holders.
- **Track 2.** Permittees install, operate, and maintain any combination of controls (structural and/or institutional) anywhere in their jurisdiction as long as they demonstrate that their system performs as well as Track 1.

The Trash Amendments provide a framework for permittees to implement its provisions. Full compliance must occur within 10 years of the permit, and permittees must meet interim milestones, such as average load reductions of 10 percent per year.

Regional

Water Quality Control Plan for the San Diego Basin

The San Diego Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

- Designates beneficial uses for surface and ground waters.
- Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy.
- Describes implementation programs to protect the beneficial uses of all waters in the region.
- Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan. (San Diego RWQCB 2016)

San Diego RWQCB MS4 Permit

MS4 permits are issued by the local RWQCB to address stormwater quality issues specific to the local watershed or region. MS4 permits require permittees to develop and implement a stormwater management program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). The stormwater management program—or drainage area management plan as it is referred to in the Orange County MS4 Permit (Order No. R9-2015-0001 NPDES Permit No. CAS0102966)—must specify BMPs approved by the San Diego RWQCB.

The proposed project and its facilities would discharge into the MS4 within the jurisdiction of Laguna Niguel. Pursuant to the Orange County MS4 Permit, the City is responsible for controlling or limiting urban pollutants generated by postconstruction activities from reaching their MS4s. The proposed project is therefore subject

to the requirements of the Orange County MS4 Permit (San Diego Region) as it is applied by the permittee and its co-permittees.

South Orange County Watershed Management Area Integrated Regional Water Management Plan

The South Orange County Watershed Management Area Integrated Regional Water Management Plan comprises goals, objectives, and methodologies for prioritizing projects for Integrated Regional Water Management grant funding. The plan also provides an overview of watershed management governance; a description of the water challenges facing the region; stakeholder involvement opportunities; climate change modeling for how the region will be impacted by sea level rise and other factors; and coordination with existing efforts, plans, and regulatory compliance efforts (OCWD 2018).

The plan was prepared to identify and implement water management solutions on a regional scale. Agencies, organizations, and stakeholders collaborated to identify water resource needs, develop goals to improve water resource management, and evaluate projects for increased regional self-reliance.

South Orange County Watershed Management Area Water Quality Improvement Plan

The MS4 permit regulates stormwater runoff from urbanized areas in the San Diego Region by requiring development and implementation of a water quality improvement plan for "watershed management areas." The improvement plan identifies high-priority water-quality conditions and sets goals, strategies, and schedules to address them. Monitoring the progress and effectiveness of the strategies informs an "adaptive management" approach to updating and amending the plan over time (OCPW 2021a).

Orange County Model Water Quality Management Plan and Technical Guidance Document

The Orange County Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) have been developed to aid the County of Orange, the Orange County Flood Control District, and cities of Orange County and development project proponents with addressing post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects that qualify as priority projects.

The Model WQMP and TGD describe the process that permittees will employ for developing a project WQMP for individual new development and significant redevelopment projects. A project WQMP is a plan for minimizing the adverse effects of urbanization on site hydrology, runoff flow rates, and pollutant loads. Development of a Model WQMP and TGD to provide guidance for preparation of a project WQMP is required by the NPDES permit. The permit also requires development of conceptual or preliminary WQMPs prior to submission of a project WQMP (OCPW 2021b).

Local

Laguna Niguel Local Implementation Plan

Under the City's Local Implementation Plan (LIP), land development policies pertaining to hydromodification and Low-Impact Development (LID) are regulated for new developments and significant redevelopment

projects. The term "hydromodification" refers to the changes in runoff characteristics from a watershed caused by changes in land use and condition. The use of LID BMPs in project planning and design is to preserve a site's predevelopment hydrology by minimizing the loss of natural hydrologic processes such as infiltration, evapotranspiration, and runoff detention. LID BMPs try to offset these losses by introducing structural and nonstructural design components into the project's land plan that restore these water quality functions. These land development requirements are detailed in the countywide model WQMP and TGD, which cities have incorporated into their discretionary approval processes for new development and redevelopment projects.

Laguna Niguel Municipal Code

The purpose of Title 6, Article 5, Prohibition of Non-Stormwater Discharges into Storm Sewer, is to implement the MS4 NPDES permit requirements, which include:

- Developing and implementing runoff management programs and implementation plans.
- Enacting legislation and ordinances as necessary to ensure compliance with the runoff management programs and implementation plans.
- Pursuing enforcement actions as necessary to ensure compliance with runoff management programs and implementation plans.
- Prohibiting illicit and illegal discharges from entering the stormwater conveyance systems, subject only to specific exceptions.
- Ensure adequate response to emergency situations, including spills, leaks, and illicit or illegal discharges.
- Developing and requiring implementation of BMPs to ensure that pollution is reduced to the maximum extent practicable.

Title 8, Article 8, Grading and Excavation Code, regulates grading, drainage, and hillside construction. Section 8-1-805 requires grading permits for all project sites requiring excavation, fills, and paving. Each application for a grading permit requires plans and specifications and applicable soils engineering and engineering geology reports. Section 8-1-836 requires that erosion control plans prepared in accordance with the City's Grading Manual be submitted to the Building Official for approval for projects under grading permits.

Title 8, Article 2, 2019 California Building Code and Related Codes, adopts the 2019 California Building Code by reference.

Water Quality Management Plans

The City's LIP includes a provision to prepare a project-specific WQMP for specified categories of development aimed at reducing pollutants in post-development runoff. Specifically, a project-specific WQMP includes BMPs approved by the San Diego RWQCB, where applicable, that address postconstruction management of stormwater runoff water quality. This includes operation and maintenance requirements for all structural or treatment control BMPs required for specific categories of developments (termed "priority

development projects") to reduce pollutants in post-development runoff to the maximum extent practicable (MEP). The categories of development that require preparation of a project-specific WQMP include:

- All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site.
- New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site), including commercial, industrial, residential housing subdivisions, mixed-use, and public projects.
- Automotive repair shops.
- Restaurants where the land area of development is 5,000 square feet or more including parking area.
- All hillside developments on 5,000 square feet or more that are in areas with known erosive soil conditions or where the natural slope is 25 percent or more.
- Developments of 2,500 square feet or more of impervious surface adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas, such as areas designated in the Ocean Plan as Areas of Special Biological Significance or water bodies listed on the CWA Section 303(d) list of impaired waters.
- Parking lots with 5,000 square feet or more of impervious surface exposed to stormwater runoff.
- Streets, roads, highways, and freeways with 5,000 square feet or more of paved surface shall incorporate EPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" in a manner consistent with the MEP standard.
- Retail gasoline outlets of 5,000 or more square feet with a projected average daily traffic of 100 or more vehicles per day.

As required by the Laguna Niguel LIP and municipal ordinances on stormwater quality management, projects that result in 5,000 square feet or more of impervious surfaces must submit a priority-project-specific WQMP to the City for approval prior to the City issuing any building or grading permits. Thus, a project-specific Preliminary WQMP has been prepared for the proposed project by Fuscoe Engineering, Inc. (see Appendix I1).

5.9.1.2 EXISTING CONDITIONS

Regional Drainage

The project site is in the Aliso Creek Watershed, which spans 35 square miles within the South Orange County Water Management Area. The Aliso Creek Watershed is a long, narrow coastal canyon with headwaters in the Cleveland National Forest. The Aliso Creek Watershed encompasses portions of the cities of Aliso Viejo, Dana

Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, and Mission Viejo. The creek ultimately discharges into the Pacific Ocean at Aliso Beach.

Local Surface Waters and Drainage

The existing topography of the project site is steep, dropping approximately 48 feet from the most northwest corner to the entry at Crown Valley Parkway. This results in an existing average slope of approximately 4.8 percent. The west side of the site is bounded by existing 2:1 manufactured slopes, and there are manufactured 2:1 slopes on the easterly side dropping to Alicia Parkway.

The majority of existing runoff is caught in above-grade drainage inlets throughout the project site and is diverted into the City's storm drain system southeast of the site in Crown Valley Parkway. Under existing conditions, runoff is discharged from the site at three places (see Figure 5.9-1, *Existing Conditions Hydrology Map*):

- Runoff from the bulk of the project site drains to the south. There are several drainage devices and catch basins on the southern portion of the project site that convey collected runoff to an existing 60-inch storm drain running through the property from Pacific Island Drive in the north to Crown Valley Parkway in the southwest. This storm drain is Orange County Flood Control District Facility No. J03P07 and connects off-site to a 96-inch storm drainpipe, which conveys runoff to Sulphur Creek Channel and Sulphur Creek Reservoir.

- Runoff drains via surface flow into Crown Valley Parkway at the drive entrance that serves both the Laguna Niguel Library and Laguna Niguel City Hall. Collected runoff then flows east along Crown Valley Parkway before entering the storm drain system discharging to Sulphur Creek Channel.

- Surface runoff from the north end of the site flows north toward Pacific Island Drive. Runoff on Pacific Island Drive flows east toward the intersection with Alicia Parkway, then south along Alicia Parkway toward Crown Valley Parkway.

Groundwater

Historical groundwater depths at the project site range from 5 to 20 feet. During the geotechnical evaluation, groundwater was encountered at depths of approximately 14 to 24.5 feet below the existing site.

5.9.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines and the City's CEQA Manual, a project would normally have a significant effect on the environment if the project would:

HYD-1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

HYD-2 Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

HYD-3 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 a 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.

iv) Impede or redirect flood flows.

HYD-4 In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

HYD-5 Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

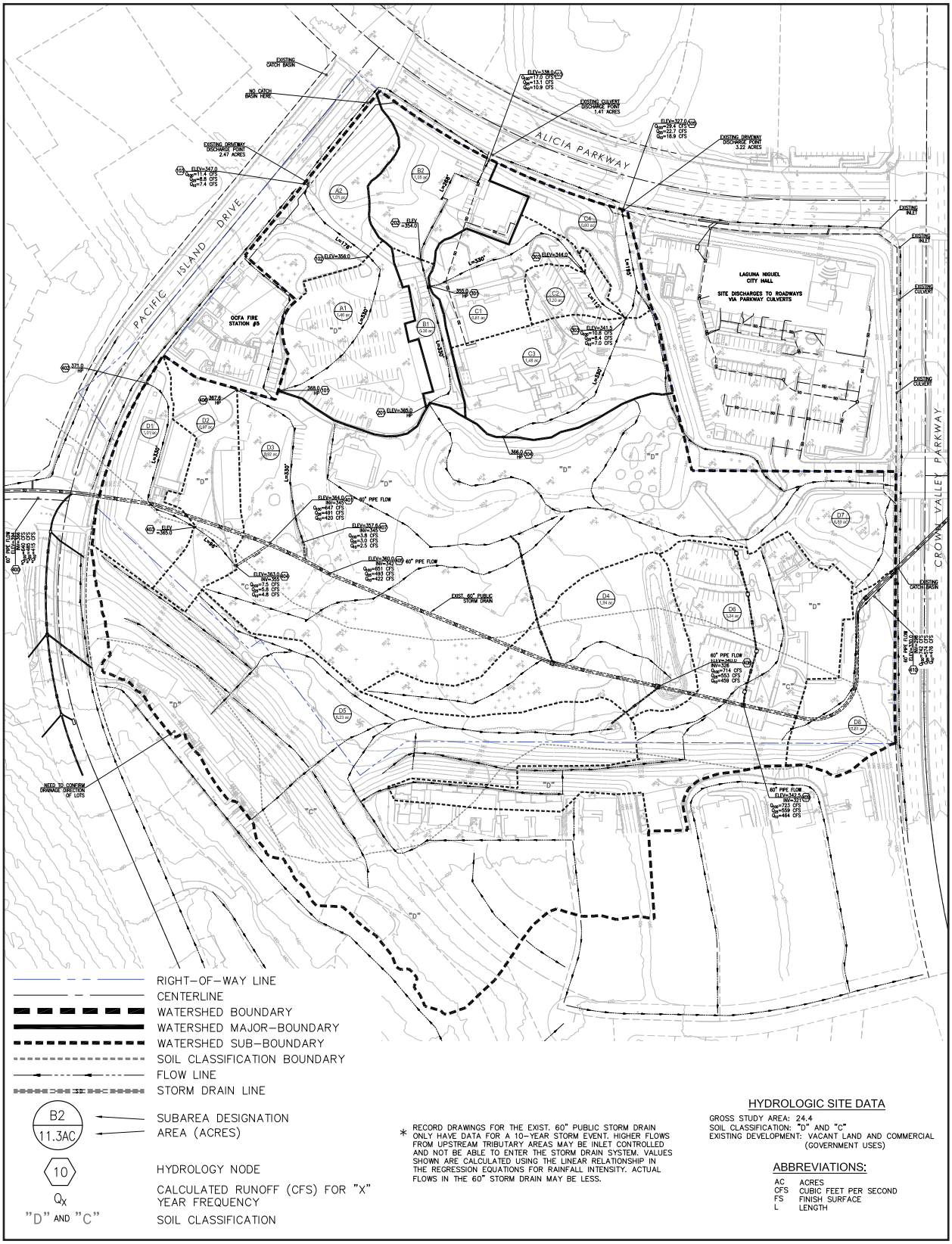
The City relies on the questions in Appendix G as the thresholds of significance for assessing impacts to hydrology and water quality, as augmented by the City's CEQA Manual:

- A project may not increase the flow ("Q") of runoff in the developed condition compared to the pre-development condition.
- A project may not increase the velocity of runoff from a project site in the developed condition compared to the pre-development condition.
- A project may not cause off-site erosion, either by storm flows or by nuisance flows.
- A project shall include a hydromodification analysis and comply with the County of Orange MS4 requirements.
- A project shall include a low impact development (LID) analysis consistent with adopted regulations. A component of the LID analysis is the ability to infiltrate flows. Infiltration in Laguna Niguel can often be infeasible either because the geologic structures do not infiltrate at acceptable rates, or infiltration could lead to geologic instability. If infiltration is not feasible, evidence must be presented documenting the infeasibility.

New development projects and site alterations to existing project sites require preparation of a hydrology and hydraulics (H&H) study and a preliminary WQMP by a qualified engineer.

Detention, retention, and/or water quality measures can take valuable space on a project site. Therefore, the sizing of such facilities must be included in the H&H and preliminary WQMP studies for review by City staff and its consultants. Additionally, long-term maintenance of such facilities must also be described, and the responsible party and funding source identified.

Figure 5.9-1 - Existing Conditions Hydrology Map
5. Environmental Analysis



Source: FUSCOE, 2021

5. Environmental Analysis
HYDROLOGY AND WATER QUALITY

This page intentionally left blank.

5.9.3 Plans, Programs, and Policies

PPP HYD-1 **Pollutant Discharge Elimination System (NPDES):** General Permit for Storm Water Discharges Associated with the Construction and Land Disturbance Activities, NPDES No. CAS000002. Compliance requires filing a Notice of Intent (NOI), a Risk Assessment, a Site Map, a Storm Water Pollution Prevention Plan (SWPPP) and associated best management practices (BMP), an annual fee, and a signed certification statement. Also, the County requires preparation of an erosion and sediment control plan for projects that disturb more than one acre of land and implementation of BMPs to control erosion, debris, and construction-related pollutants.

PPP HYD-2 **Orange County MS4 Permit (Order No. R9-2015-0001 NPDES Permit No. CAS0109266):** The MS4 Permit requires new development and redevelopment projects to:

- Control contaminants into storm drain systems.
- Educate the public about stormwater impacts.
- Detect and eliminate illicit discharges.
- Control runoff from construction sites.
- Implement BMPs and site-specific runoff controls and treatments for new development and redevelopment.

PPP HYD-3 As required by the Laguna Niguel Local Implementation Plan and municipal ordinances on stormwater quality management, the proposed project must submit a priority-project-specific final Water Quality Management Plan to the City for approval prior to the City issuing any building or grading permits.

PPP HYD-4 Per the requirements of the Orange County Department of Public Works, as detailed in the Orange County Hydrology Manual and the Orange County Local Drainage Manual, the proposed project must submit a final Hydrology Report to the City for review and approval prior to the issuance of grading permits. Catch basin, drainage pipe sizing, and final sizing for the detention basin will be calculated in the final Hydrology Report so that the proposed project does not increase the flow and velocity of runoff in the developed condition compared to the pre-development condition.

PPP GEO-1 The proposed project will be designed and constructed in accordance with the Laguna Niguel Building Code, which adopts the California Building Code (CBC), which is based on the International Building Code (IBC). New construction, alteration, or rehabilitation shall comply with applicable ordinances set forth by the City and/or by the most recent City building and seismic codes in effect at the time of project design. In accordance with Section 1803.2 of the 2019 CBC, a geotechnical investigation is required that must evaluate soil classification, slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on soil-bearing capacity, compressibility, liquefaction, and expansiveness, as

necessary, determined by the City building official. The geotechnical investigation must be prepared by registered professionals (i.e., California Registered Civil Engineer or Certified Engineering Geologist). Recommendations included in the report pertaining to structural design and construction recommendations for earthwork, grading, slopes, foundations, pavements, and other necessary geologic and seismic considerations must be incorporated into the design and construction of the proposed project.

5.9.4 Environmental Impacts

5.9.4.1 IMPACT ANALYSIS

The following impact analysis addresses thresholds of significance. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.9-1: The proposed project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. [Threshold HYD-1]

Redevelopment of the predominantly vacant project site would not violate water quality standards or water discharge requirements. A discussion of construction and operational phases as they relate to water quality standards and discharge requirements is provided below.

Construction

Construction activities associated with the proposed project would include demolition of existing improvements, grading, and installation of subdrains followed by installation of streets and all infrastructure and building construction, all of which could result in increased polluted stormwater runoff. During construction activities, the proposed project has the potential to produce typical pollutants such as nutrients, heavy metals, pesticides, and herbicides; toxic chemicals related to construction and cleaning; waste materials including wash water, paints, wood, paper, concrete, food containers, and sanitary wastes; and fuel and lubricants.

Since the project would disturb more than one acre of land, future development of the proposed project would require compliance with the statewide Construction General Permit, which requires the preparation and implementation of a SWPPP. A SWPPP estimates sediment risk to receiving waters from construction activities and specifies BMPs that would be used by the project to minimize pollution of stormwater.

Categories of BMPs used in SWPPPs are described in Table 5.9-1, *Construction BMPs*. Water quality impacts of project construction would be minimized to less than significant levels after implementation of the SWPPP and associated BMPs.

Table 5.9-1 Construction Best Management Practices

Category	Purpose	Examples
Erosion Controls	Protects the soil surface and prevents soil particles from being detached by rainfall, flowing water, or wind.	Scheduling, preserving existing conditions, mulch, soil binders, geotextiles, mats, hydroseeding, earth dikes, swales, velocity dissipating devices, slope drains, streambank stabilization, compost blankets, soil preparation/roughening, and non-vegetative stabilization.
Sediment Controls	Traps soil particles after they have been detached and moved by rain, flowing water, or wind.	Barriers such as silt fences, straw bales, sandbags, fiber rolls, and gravel bag berms; sediment basins; sediment traps; check dams; storm drain inlet protection; compost socks and berms; biofilter bags; manufactured linear sediment controls; and cleaning measures such as street sweeping and vacuuming
Wind Erosion Controls	Minimizes dust nuisances.	Applying water or other dust palliatives to prevent or minimize dust nuisance, reducing soil-moving activities during high winds, and installing erosion control BMPs for temporary wind control.
Tracking Controls	Prevents or reduces the tracking of soil offsite by vehicles	Stabilized construction roadways and construction entrances/exits and entrance/outlet tire wash.
Non-Storm Water Management Controls	Prevents pollution by limiting or reducing potential pollutants at their source or eliminating off-site discharge. Prohibits illicit connections or discharges.	Water conservation practices, BMPs specifying methods for: dewatering operations; temporary stream crossings; clear water diversions; pile driving operations; temporary batch plants; demolition adjacent to water; materials over water; potable water and irrigation; paving and grinding operations; cleaning, fueling, and maintenance of vehicles and equipment; concrete curing; concrete finishing.
Waste Management and Controls (i.e., good housekeeping practices)	Management of materials and wastes to avoid contamination of stormwater.	Proper material delivery and storage and material use, spill prevention and control, stockpile management, contaminated soil management, and management of solid, concrete, sanitary/septic, liquid, and hazardous wastes.

Source: CASQA 2019.

Operations

Operation and maintenance of the project would produce typical pollutants, including suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/virus), pesticides, oil and grease, toxic organic compounds, trash and debris, and household hazardous wastes. Additionally, landscaped areas throughout the project site are likely to produce suspended solids/sediment, nutrients, and pesticides.

The existing 60-inch city storm drain that runs from Pacific Island Drive/Highland Drive to Crown Valley Parkway would be removed, and a new 60-inch storm drain would be installed to follow the alignment of the

proposed internal roadways (see Figure 5.9-2, *Water Quality Management Plan*). The new alignment would connect to the existing 60-inch storm drain at the intersection of Pacific Island Drive and Highlands Avenue, follow Pacific Island Drive easterly to the west entry of the development off Pacific Island Drive, follow the roadway through the approximate center of the development and cross the parking lot of the retail center on the south side of the project, reconnecting to the existing 60-inch storm drain system west of the southbound side of Crown Valley Parkway. This primary storm drain would convey flows originating from development north of the site (draining down Highlands Avenue) through the site to the connection point at Crown Valley. These flows would bypass the development through this pipe and not contribute any tributary flow (see Figure 5.9-2).

A secondary, private storm drain system would be constructed within the proposed project roadways and convey the project flows through a detention system designed for hydromodification. It is anticipated that these local drainage facilities would have 8- to 10-inch pipe diameters. Small landscape drains would connect to the local drain with 4-inch or 6-inch drainpipes throughout the project site. The detention system would be under the proposed parking lot of the retail/market area on the south side of the project site (see Figure 5.9-2, *Water Quality Management Plan*).

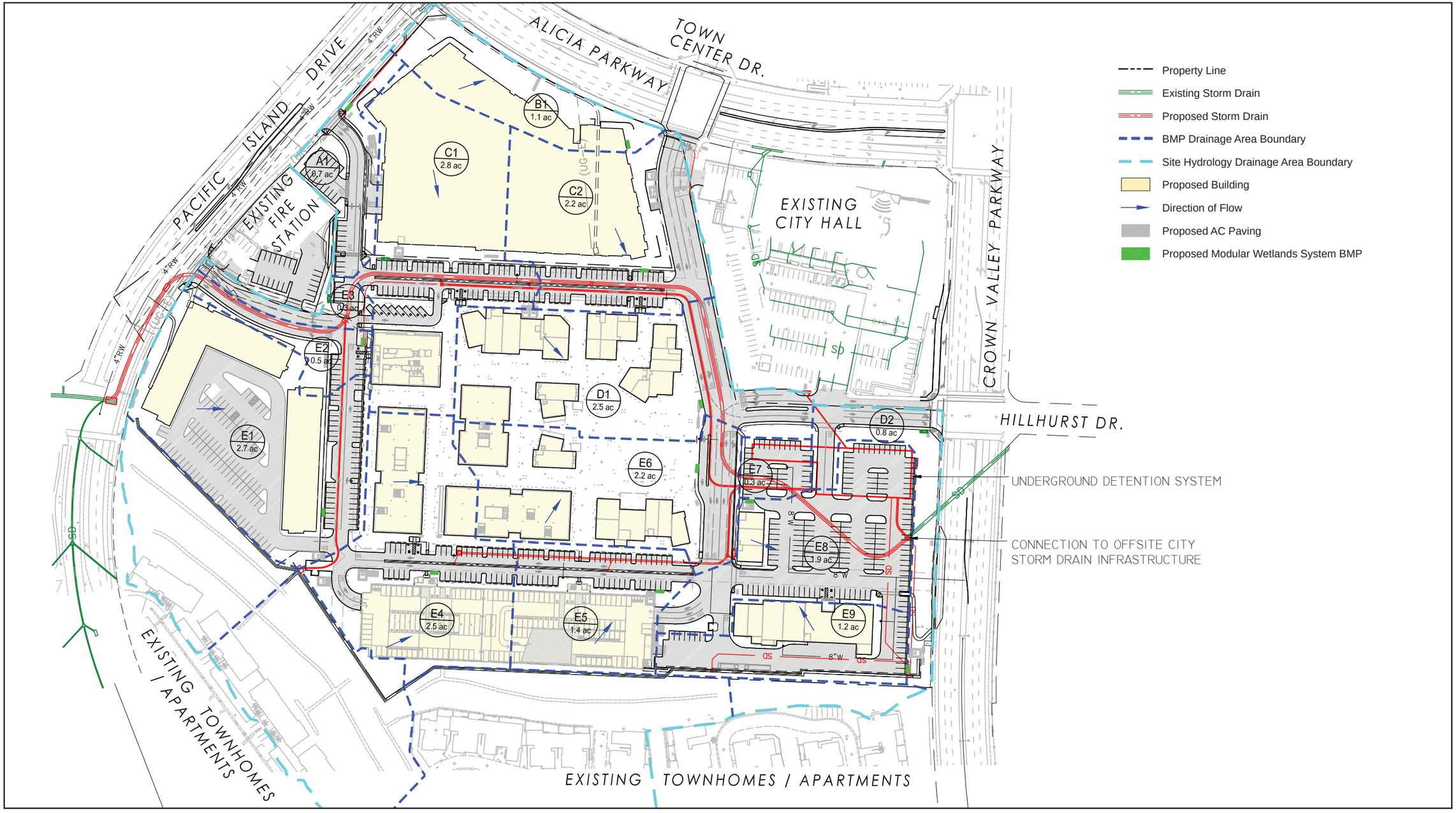
The stormwater runoff from the proposed development would discharge to the same storm sewer system on Crown Valley Parkway as the runoff under existing conditions and would continue to enter Sulfur Creek before discharging to Aliso Creek. Existing slopes to the north and west of the project site would be retained and are equipped with drainage systems to capture and divert runoff.

According to the San Diego RWQCB Order No. R9-2015-0001 NPDES Permit No. CAS0109266 (MS4 permit), a project of this type is classified as a priority development project (new development project) because the following criteria apply:

- Restaurants where the land area of development is 5,000 square feet or more including parking areas.
- Parking lots 5,000 square feet or more, or parking lots with 15 parking spaces or more, including associated drive aisle, and potentially exposed to urban stormwater runoff.
- Redevelopment project that creates, adds, or replaces at least 5,000 square feet of impervious surface on an already developed site, and the existing development or redevelopment project falls under another priority development project category.

Therefore, a WQMP is required for the project under the MS4 permit. The Preliminary WQMP prepared for the project specifies BMP categories to be implemented by the project (see Appendix I). The City requires that all qualifying development projects prepare and submit a final WQMP to the City for review and approval prior to the issuance of grading permits.

Figure 5.9-1 - Water Quality Management Plan
5. Environmental Analysis



Source: FUSCOE, 2021

5. Environmental Analysis
HYDROLOGY AND WATER QUALITY

This page intentionally left blank.

Site Design BMPs

The proposed development includes construction of buildings, parking areas, walkways, and landscape areas. The following site design BMPs are detailed in the project's Preliminary WQMP to be incorporated into the proposed project design to ensure post-development runoff flow rates and durations do not exceed existing conditions:

- **Minimize Impervious Area.** Impervious surfaces would be minimized by incorporating landscaped areas throughout the site surrounding the proposed buildings. Landscaping would be provided throughout the site within the common areas as well as around the perimeter of the buildings.

- **Preserve Existing Drainage Patterns and Time of Concentration (to the MEP).** Runoff from the site would continue to flow similar to existing conditions. Low flows and first-flush runoff would drain to landscaping and bioretention BMPs.

- **Disconnect Impervious Areas.** Runoff from the site would drain into self-treating landscaping or proprietary biotreatment BMPs prior to flowing to a detention system for storage and controlled release of flows to protect downstream receiving waters.

- **Protect Existing Vegetation and Sensitive Areas.** Under existing conditions, there are no sensitive areas to protect. The project design would create new vegetated areas throughout the property.

- **Revegetate Disturbed Areas.** All disturbed areas on the project site would be paved, covered, or revegetated.

- **Soil Stockpiling and Site-Generated Organics.** As part of the grading and stockpiling activities on the site, organic materials that are suitable for assisting with the revegetation of the site would be collected, stored, and reused during planting of the site, where feasible.

- **Fire-scaping.** The proposed project is designed to meet the Orange County Fire Authority's fuel modification standards.

- **Water Efficient Landscaping.** Xeriscape landscaping is not currently proposed for the project. However, native and/or drought-tolerant landscaping would be incorporated into the site design consistent with City guidelines.

- **Slopes and Channel Buffers.** Slopes on the project site would be protected and reinforced to reduce the risks of scouring.

Low Impact Development and Hydromodification BMPs

The primary goal of LID is to preserve the predevelopment hydrology of a project site and address post-development runoff through structural and nonstructural BMPs that store, infiltrate, evaporate, and detain runoff. BMP implementation is evaluated by site design components and performance feasibility in preventive and mitigation measures. Preventive measures are site planning, design, and construction practices that focus on minimizing the amount of land disturbed and retaining the project site's natural drainage characteristics to

the MEP. Project design features include structural BMPs that manage impacts from stormwater runoff and provide pollutant reduction for mitigating the design capture volume or design flow associated with each drainage area on the project site.

Hydromodification control is the method used to address hydrologic conditions of concern in a project's WQMP. Hydromodification control BMPs range from structural BMPs designed to control flow duration to in-stream measures such as grade control structures. In-stream measures can be desirable when stream channels are already degraded due to hydromodification caused by development. There are various alternatives for siting hydromodification control measures, including on-site, in-stream, and regional.

The project site consists of 15 drainage management areas (DMA), shown on Figure 5.9-2, *Water Quality Management Plan*. The required design flow for each DMA is shown in Table 5.9-2, *BMP Design Summary*. The table also shows the total flow capacity for the proposed BMPs. As shown in the table, all BMPs have adequate capacity to treat the design stormwater flows.

Table 5.9-2 Best Management Practices Design Summary

DMA	Total Drainage Area (ac)	Percent Impervious[1] (%)	Design Flow (cfs)	BMP Capacity (cfs)
A1	0.7	90	0.225	0.237
B1	1.1	80	0.322	0.346
C1	2.8	80	0.819	0.924
C2	2.2	90	0.708	0.924
D1	2.5	90	0.804	0.924
D2	0.8	90	0.257	0.268
E1	2.7	90	0.869	0.924
E2	0.5	90	0.258	0.268
E3	0.3	90		
E4	2.5	90	0.804	0.924
E5	1.4	80	0.410	0.462
E6	2.2	80	0.644	0.693
E7	0.3	85	0.676	0.693
E8	1.9	85		
E9	1.2	85	0.369	0.462

Source: Fuscoe 2022.
Notes: cfs = cubic feet per second; ac = acres
[1] The square footage for the proposed buildout used in the WQMP is different than the square footage as described in Chapter 3 of this EIR. However, the WQMP relies upon industry-standard impervious surface area averages consistent with the percent coverage used in the Orange County Hydrology Manual. For urban developed areas, the design flow is relatively insensitive to minor changes in impervious ratios since that ratio almost always lies in the 0.8 to 0.9 interval. By staying on the higher side of the impervious ratio, the runoff reported will remain conservative.

The site is generally underlain by shallow fill soils that consist predominantly of expansive clay soils, except the western portion of the site, where deeper fill soils were encountered. Given the subsurface conditions, storm water infiltration at the site is not feasible because of the very low anticipated infiltration rates. In addition, because of the expansion potential of the on-site soils and presence of deep fill soils along the western side of the site, infiltration of stormwater is not recommended by the project's geotechnical engineer (refer to Appendix G of the WQMP in Appendix I1.).

Therefore, modular wetlands systems or equivalent biofiltration BMPs are proposed throughout the project site (see Figure 5.9-2, *Water Quality Management Plan*). Each DMA has a separate modular wetland system except DMAs E1 and E2 have a combined system, as do E7 and E8. Modular wetlands systems use multistage treatment processes, including screening media filtration, settling, and biofiltration. The pretreatment chamber contains the first three stages of treatment and includes a catch basin inlet filter to capture trash, debris, gross solids, and sediments; a settling chamber for separating out larger solids; and a media filter cartridge for capturing fine suspended solids, metals, nutrients, and bacteria. Runoff then flows through the wetland chamber and a variety of physical, chemical, and biological processes. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants. The discharge chamber at the end of the unit collects treated flows and discharges back into the storm drain system.

Additionally, the proposed project would implement the following BMPs:

- **Nonstructural source control BMPs.** Education for property owners, tenants, and occupants; activity restrictions; common area landscape management; BMP maintenance; common area litter control; employee training; common area catch basin inspection; and street sweeping private streets and parking lots.

- **Structural source control BMPs.** Storm-drain-system stenciling and signage; design and construction of trash and waste storage areas to reduce pollution introduction; use of efficient irrigation systems and landscape design, water conservation, smart controllers, and source control; protection of slopes and channels and provision of energy dissipation; provision of hillside landscaping; and wash water control for food preparation areas.

The project site's runoff discharges to downstream conveyances that are considered susceptible to hydromodification because they are unlined, largely earthen channels. Aliso Creek and Sulfur Creek are not concrete lined. Therefore, under the South Orange County TGD hydromodification requirements, post-development runoff flow rates and durations cannot exceed pre-development, naturally occurring, runoff-flow rates and durations by more than 10 percent of the time, from 10 percent of the 2-year runoff event up to the 10-year runoff event. To mitigate the increased flows under post-development conditions, an underground detention system would be installed to decrease post-development peak flows to less than the pre-development flows for the 2-year up to the 25-year storm frequency events. According to the Preliminary WQMP a 73,125-cubic-foot detention system is required to mitigate peak storm flows for the proposed project. An 80,000-cubic-foot underground detention system is proposed under the parking lot of the retail/market area as specified in the Preliminary WQMP. Table 5.9-3, *Pre- and Post-development Peak Flows*, shows pre-development peak flows for the 2-year storm event up to the 25-year storm events and the mitigated, post-development peak flows for the same storm events. The detention system would capture post-development flows and offset the increase in storm flow.

Table 5.9-3 Pre- and Post-development Peak Flows

Return Period	Pre-development Flow (cfs)	Post-development (Mitigated) Flow (cfs)	Percent Difference (%)
2 year	13.42	10.48	-22
5 year	16.74	14.12	-16
10 year	21.26	16.87	-21
25 year	28.38	22.33	-21

Source: Fuscoe 2022.
Note: cfs = cubic feet per second

Summary

Construction and operations of the proposed project would convert predominantly pervious areas to mostly impervious surfaces, resulting in potential impacts to stormwater quality under construction and operational phases. However, implementation of construction and operational BMPs, including the preparation of a final WQMP and a SWPPP, would reduce water quality impacts to less than significant levels. Overall, the project would meet water quality standards delineated in adopted water quality permits from the RWQCB upon implementation of the aforementioned BMPs, and construction and operational water quality impacts would be less than significant.

Level of Significance Before Mitigation: With the implementation of PPP HYD-1 through HYD-3 and PPD-GEO-1, Impact 5.9-1 would be less than significant.

Impact 5.9-2: The proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. [Thresholds HYD-2]

The Moulton Niguel Water District (MNWD) provides water to the project site. MNWD relies on imported water from the Municipal Water District of Orange County and local recycled water. Groundwater resources are not significantly utilized. Therefore, development of the proposed project would not substantially deplete groundwater supplies. Furthermore, the site is not a managed aquifer recharge site and site soils have low infiltration rates. Therefore, the proposed development would not adversely impact groundwater recharge.

Since groundwater at the project site was encountered at depths of approximately 14 to 24.5 feet, there is a potential for groundwater seepage during the construction and operational phases of the proposed project, especially since the proposed project includes a partially subterranean garage. Appropriate construction and design-based measures would be addressed in the design-level geotechnical investigation report.

During construction, the contractor would anticipate the potential for groundwater seepage when planning cuts below the existing grades. Measures to collect and discharge water seepage in a suitable manner, such as trench drains, would be required during remedial grading. Groundwater would also need to be accounted for in the installation of deep ground-improvement methods. Discharge of groundwater would be performed by the project contractor in accordance with regulatory requirements.

For the design of the proposed project, the potential for groundwater seepage would be considered for below-grade structures such as retaining walls and basement walls. Such considerations would include subdrains for below-grade walls and floor slabs, or waterproofing and designing below-grade structures to resist the hydrostatic pressures in addition to the earth pressures.

Level of Significance Before Mitigation: With the implementation of PPP GEO-1, Impact 5.9-2 would be Less Than Significant.

Impact 5.9-3: The proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in a substantial erosion or siltation on- or off-site. [Thresholds HYD-3 (i) and HYD-3(iii)]

Erosion is the movement of rock and soil from place to place and is a natural process. Common agents of erosion include wind and flowing water. Erosion can also be increased greatly by earthmoving construction activities if erosion-control measures are not used. Because the project would disturb more than one acre of land, the developer would be required to prepare and implement a SWPPP under requirements of the General Construction Permit (Order No. 2009-0009-DWQ) issued by the SWRCB. The SWPPP would specify BMPs for reducing or eliminating soil erosion from the site during project construction and operation. Erosion control measures implemented as part of BMPs may include the placement of sandbags around basins; use of proper grading techniques; appropriate sloping, shoring, and bracing of the construction site; using mulch, geotextiles, hydroseeding, swales, and earth dikes; and covering topsoil stockpiles.

Additionally, the project's Preliminary WQMP includes BMPs that would minimize erosion or siltation on- or off-site during the operational phase of the proposed project. These BMPs include minimizing impervious areas (i.e., driveways and walkways); preserving existing drainage patterns by directing flow to the same pre-development off-site discharge locations; disconnecting impervious areas and diverting runoff into self-treating landscaping or proprietary biotreatment BMPs; implementing water-efficient landscaping; protecting slopes to reduce the risk of scouring; and revegetating disturbed areas. An underground detention system is proposed for the site because project runoff discharges to Aliso Creek and Sulfur Creek, neither of which is concrete lined. The detention system is sized per the South Orange County TGD hydromodification requirements to decrease post-development peak flows to less than the pre-development flows for the 2-year up to the 25-year storm frequency events.

Implementation of the WQMP and SWPPP BMPs would ensure the proposed project does not substantially alter the existing drainage pattern of the site in a manner that would result in a substantial erosion or siltation on- or off-site. Impacts would be less than significant.

Level of Significance Before Mitigation: With implementation of PPP HYD-1 through PPP HYD-3 and PPP GEO-1, Impact 5.9-3 would be less than significant.

Impact 5.9-4: The proposed project would not substantially increase the rate or amount of surface runoff and result in flooding on- or off-site or create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. [Thresholds HYD-3 (ii) (iii), and (iv)]

As shown on Figure 5.9-3, *Proposed Conditions Hydrology Map*, the existing 60-inch diameter City storm drain would be decommissioned, and a proposed storm drain would be constructed to align within the proposed development's roadways. The storm drain size would remain the same. The new storm drain would be constructed prior to the decommissioning of the existing storm drain, which is proposed to occur after the building demolition phase and during mass grading in the area that precludes the existing storm drain. The existing storm drain would remain operational until the proposed storm drain is constructed and connected to the existing 60-inch City storm drains to the north and south of the site. Once the proposed storm drain is completed and connected, the existing storm drain would be abandoned, demolished, or a combination thereof. The extent of removal and abandonment would be determined prior to construction and based on proximity to proposed structures. This primary proposed storm drain would convey flows originating from development north of the site (draining down Highlands Avenue) through the site to the connection point at Crown Valley Parkway. The flows through this pipe will bypass the development and not contribute any tributary flow.

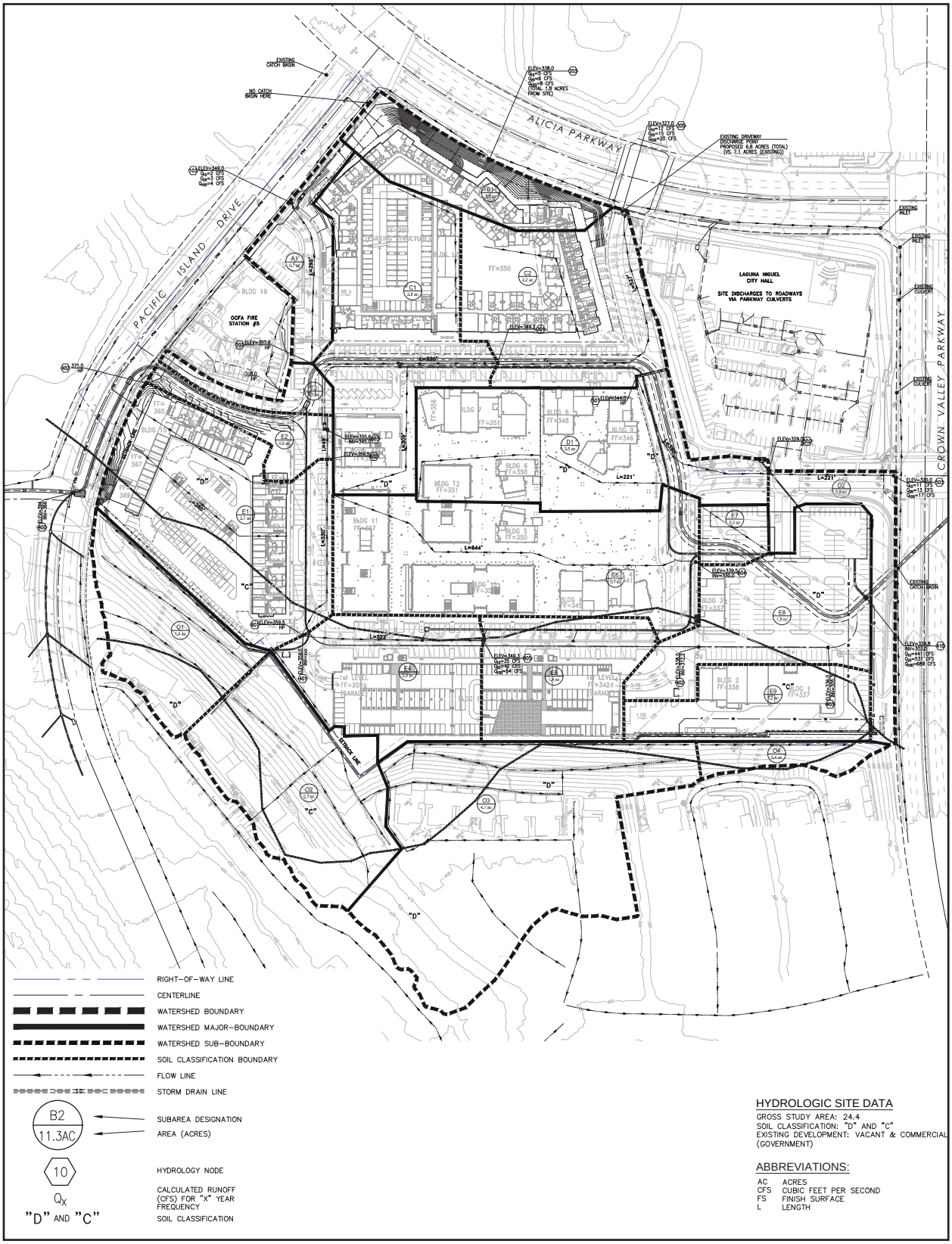
A secondary private storm drain system would be constructed along the project roadways and convey the project flows through a detention system designed for hydromodification. This detention system is proposed under the parking lot of the retail/market area on the south side of the project (where the current library is).

The easterly side of the proposed apartments on the east side of the project would discharge to the existing landscape area above the slope, and flows would then be conveyed via a drainpipe to a parkway culvert. Flows would not be allowed over the top of the slope. The volume and flow rate are anticipated to be less than the existing condition due to a much smaller drainage area. The rest of the easterly proposed apartments would convey flow to the private storm drain system in the project roadway. The proposed apartments in the northwest corner of the site would also convey flows to the private storm drain system. The apartments would have water quality BMPs to treat low flows before entering the private storm drain system.

The retail area adjacent to Crown Valley Parkway on the south side of the project would drain overland through water quality BMPs and convey flows via connection pipes to the detention system under the parking lot of that area.

The preliminary hydrology study indicates that the 50- and 100-year storm events would involve combined street and storm drain flow. The steepness of the site results in fast but shallow flow depths. Consistent with the Orange County Hydrology Manual and the Orange County Local Drainage Manual, on-site storm drains would be sized based on a 25-year storm event for overflow conditions outside the overall building envelope and 100-year frequency for areas within the enclosed proposed apartment courtyards, which are in sump conditions. Local area drains and drainage pipes (landscape applications) will be designed for a 10-year storm event. Events exceeding the 10-year event would flow overland in landscape areas to larger catchment devices. The detention system under the proposed parking lot of the retail/market area would be designed for the 100-year storm event.

Figure 5.9-3 - Proposed Conditions Hydrology Map
5. Environmental Analysis



Source: FUSCOE, 2021

5. Environmental Analysis
HYDROLOGY AND WATER QUALITY

This page intentionally left blank

Prior to the issuance of grading permits, a final hydrology report would be submitted to the City for review and approval. Catch basin, drainage pipe sizing, and final sizing for the detention basin would be calculated in the final hydrology report so that the proposed project does not increase the flow and velocity of runoff in the developed condition compared to the pre-development condition.

In addition, the site is not in a 100-year floodplain or near any surface water bodies that could result in flood flows.

Level of Significance Before Mitigation: With implementation of PPP HYD-1 through PPP HYD-4, Impact 5.9-4 would be Less Than Significant.

Impact 5.9-5: The proposed project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. [Threshold HYD-4]

According to the Federal Emergency Management Agency, the project site is not within a 100-year flood hazard area (FEMA 2009). Furthermore, the project site is not in the inundation area of a dam or an area designated on a flood insurance rate map as being protected from 100-year floods by levees.

A seiche is a surface wave created when an inland water body is shaken, usually by an earthquake. There are no inland bodies of water near the project site that could pose a seiche hazard to the site.

A tsunami is a series of ocean waves caused by a sudden displacement of the ocean floor, most often due to earthquakes. The project site is approximately 2.3 miles inland from the Pacific Ocean and is outside of the tsunami inundation area mapped by the California Department of Conservation (CDC 2019).

Overall, no hazards would occur due to project inundation in flood hazard, tsunami, or seiche zones.

Level of Significance Before Mitigation: No Impact.

Impact 5.9-6: The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. [Threshold HYD-5]

Adherence to the Construction General Permit, implementation of the SWPPP, and adherence to the City's LIP and municipal code requirements, as described in detail in Impact 5.9-1, would ensure that surface and groundwater quality are not adversely affected during construction. In addition, implementation of the LID and BMP measures at the site, including modular wetlands systems, would ensure that water quality is not impacted during the operational phase of the project. As a result, site development will not obstruct or conflict with the implementation of the WQMP for the San Diego Basin.

Furthermore, as discussed in Impact 5.9-2, the City relies on imported water and local recycled water, and no groundwater management plan exists for the region.

Therefore, the project would not obstruct or conflict with the Basin Plan or obstruct sustainable groundwater management.

Level of Significance before Mitigation: With implementation of PPP HYD-1 through PPP HYD-3 and PPP GEO-1, Impact 5.9-6 would be Less Than Significant.

5.9.5 Cumulative Impacts

Hydrology and Drainage

The area considered for hydrology and drainage impacts is the Aliso Creek Watershed. Other projects in the Aliso Creek Watershed would increase the amount of impervious surfaces and thus could generate increased runoff. Other projects would also be required to prepare and implement WQMPs specifying BMPs—including LID BMPs—that would minimize runoff from those sites. Therefore, other projects are not expected to cause substantial increases in runoff and are not expected to require construction of substantial new or expanded municipal storm drainage systems. When considering past, present, and foreseeable future projects, the project would not create a cumulative impact, and cumulative impacts would be less than significant. Further, if significant cumulative impacts existed, the project would not make a cumulatively considerable contribution to such significant cumulative impacts because project flows would be less than existing conditions.

Water Quality

The area considered for water quality impacts is the part of Orange County in the San Diego RWQCB's jurisdiction, the area subject to the relevant MS4 Permit.

Cumulative projects would prepare and implement WQMPs specifying BMPs that would minimize runoff from those sites and reduce contamination of runoff with pollutants. Other projects disturbing one or more acres of soil would also prepare and implement SWPPPs identifying BMPs for the construction phases of those projects to minimize runoff, erosion, and stormwater pollution. Thus, other projects, when combined with the project and existing development, are not expected to cause substantial increases in stormwater pollution. Cumulative impacts would be less than significant, and project impacts would not be cumulatively considerable.

5.9.6 Level of Significance Before Mitigation

Impact 5.9-5 has no impacts.

Upon implementation of regulatory requirements and standard conditions of approval, Impacts 5.9-1 through 5.9-3 and Impact 5.9-6 would be less than significant.

Without mitigation, Impact 5.9-4 is **potentially significant**.

5.9.7 Mitigation Measures

No mitigation measures are necessary because there were no significant impacts identified under the applicable thresholds.

5.9.8 Level of Significance After Mitigation

All impacts are less than significant.

5.9.9 References

California Department of Conservation (CDC). 2019. Orange County Tsunami Inundation Maps. https://www.conservation.ca.gov/cgs/tsunami/maps/Orange.

Department of Water Resource (DWR). 1999, November. How to Fill Out a Well Completion Report. https://static1.squarespace.com/static/57573edf37013b15f0435124/t/57e2c7e103596e4c714a5fc9/1474480098590/How+to+Fill+Out+a+Well+Completion+Report.pdf.

———. 2018, May. Integrated Regional Water Management for South Orange County. https://ocgov.app.box.com/s/cnulnr2t3oa03w82xt1qullwl4y6rtis.

Federal Emergency Management Agency (FEMA). 2009, December 3. Panel 439 of 539 of "Orange County, California and Incorporated Areas." National Flood Insurance Program Flood Insurance Rate Map Number 06059C0439J.

Metropolitan Water District of Orange County (MWDOC). 2016. Water Supply Management. http://www.mwdoc.com/services/water-supply-management.

Orange County Public Works (OCPW). 2021a. South Orange County Watershed Management Area Water Quality Improvement Plan. https://ocgov.app.box.com/s/tse4dkwxt666xszgt6ath7cmvq8v4tda.

———. 2021b, May 14 (accessed). Model Water Quality Management Plan. https://cms.ocgov.com/gov/pw/watersheds/documents/wqmp/default.asp.

San Diego Regional Water Quality Control Board (SDRWQCB). 2016, May 17. "Introduction." Water Quality Control Plan for the San Diego Basin. https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/update082812/Chpt_1_2012.pdf.

State Water Resources Control Board (SWRCB). 2016, October. Glossary of Key Terms. Appendix J of South Orange County Water Quality Improvement Plan. http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/wqip/south_orange_county/Appendix_J_-_Glossary_of_Key_Terms.pdf.

US Environmental Protection Agency (USEPA). 2012, September 26. Water Permitting 101. http://www.epa.gov/npdes/pubs/101pape.pdf.

5. Environmental Analysis
HYDROLOGY AND WATER QUALITY

This page intentionally left blank.