4.10 Hydrology and Water Quality

This section describes the existing hydrology and water quality conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, identifies mitigation measures related to implementation of the proposed project, and evaluates cumulative impacts. In addition to the documents listed in Section 4.10.8, References, information contained in this section is based on the following:

- **Appendix F-1:** Water Supply Assessment; prepared by Irvine Ranch Water District; dated April 14, 2025
- **Appendix F-2:** Water Supply Verification; prepared by Irvine Ranch Water District; dated April 14, 2025
- **Appendix F-3:** Preliminary Hydrology Report, Gateway Village, City of Irvine, California; prepared by Fuscoe Engineering Inc.; dated December 2024
- **Appendix F-4:** Preliminary Water Quality Management Plan, Gateway Village, City of Irvine, California (Preliminary WQMP); prepared by Fuscoe Engineering Inc.; dated December 2024
- **Appendix E-1:** Preliminary Geotechnical Subsurface Evaluation, Residential Development, Gateway Village, Irvine, California (Geotechnical Report); prepared by LGC Geotechnical Inc.; dated November 22, 2024

4.10.1 Existing Conditions

Project Site Hydrology

The project site has been farmed for decades and at present consists of unpaved, highly pervious open space. The topography on the upper third of the site generally drains southwest toward Jeffrey Road by two surface ditches, at a gradient of 3.5%. This upper-third site tributary is part of the larger East Hicks Canyon Watershed, which originates off site and upstream of the project site. Stormwater from the upper third of the project site is collected by existing 42-inch, 66-inch, and 96-inch storm drain laterals that feed into Hicks Canyon Facility F27, which is a 102-inch reinforced concrete pipe (RCP) in Jeffrey Road (Figure 4.10-1, Existing On-Site Hydrology). Additionally, off-site run-on conditions (when stormwater flows onto the project site from an adjacent property) occur along the northern project boundary in the form of surface/channel conveyance and along the eastern project boundary in the form of surface and pipe flow conveyance, which in turn feed into the existing 96-inch storm drain lateral (Appendix F-3, Preliminary Hydrology Report).

The topography on the lower two-thirds of the site generally drains in a southerly direction toward Portola Parkway, with a moderate gradient of 2.5% to 3.0%. At Portola Parkway, the flow from the lower two-thirds is collected by two existing storm drain pipes, one on Portola Parkway midway between Jeffrey Road and Bee Canyon Access Road, and one at the intersection of Portola Parkway and Bee Canyon Access Road (Figure 4.10-1). One of the existing storm drain facilities heads northwest along Portola Parkway and turns south at Jeffrey Road, while the second existing storm drain facility heads southeast along Portola Parkway, eventually turning southwest along Paragon. Lastly, run-on conditions from areas east of Bee Canyon Access Road are not present in the lower two-thirds of the site, as existing flows are intercepted and surface-conveyed south before entering a 36-inch RCP and conveyed underground to a connection point with the southern Portola Parkway storm drain (Appendix F-3).

Regional Hydrology

The project site is located within the San Diego Creek Watershed, which is located within the encompassing Central Orange County Watershed Management Area (Figure 4.10-2, Regional Hydrology). The San Diego Creek Watershed covers 112.2 square miles in central Orange County (County) and includes portions of the Cities of Costa Mesa,

Irvine, Laguna Woods, Lake Forest, Newport Beach, Orange, Santa Ana, and Tustin. Smaller tributaries include Serrano Creek, Borrego Canyon Wash, Agua Chinon Wash, Bee Canyon Wash, Peters Canyon Wash, Sand Canyon Wash, Bonita Canyon Creek, and the Santa Ana Delhi Channel. The main tributary to San Diego Creek is Peters Canyon Wash (County of Orange 2007, 2024).

San Diego Creek is the principal watercourse within the larger Newport Bay Watershed, also known as the Central Orange County Watershed Management Area, which encompasses an area of approximately 154 square miles, with overland flows draining toward the Pacific Coast into Newport Bay. The watershed is bounded on the northeast by the Santiago Hills (Loma Ridge), which are part of the Santa Ana Mountains, and on the southeast by the Santiago Hills. The Tustin Plain, a broad alluvial valley, occupies the major portion of the watershed. Major cities within the watershed include Newport Beach, Irvine, Tustin, and portions of Orange, Lake Forest, Laguna Hills, Costa Mesa, and Santa Ana. The watershed has been rapidly urbanizing over the past four decades, with large tracts of agricultural land being transformed into commercial and residential uses. Other land uses include light industrial, county and state open spaces, and federal properties (County of Orange 2007).

Surface Water Quality

The project site is located within the watershed of Reach 1 of San Diego Creek and the downstream Upper Newport Bay. The State Water Resources Control Board (SWRCB) establishes statewide water quality control policy and regulation. SWRCB also coordinates Regional Water Quality Control Boards (RWQCBs), which are responsible for designating beneficial uses, establishing water quality objectives to protect those uses, and identifying programs of implementation to meet objectives through the preparation of a basin plan. The Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) (Santa Ana RWQCB 2019) sets forth policies that address regionwide water quality concerns. Beneficial uses of these water bodies are listed in Table 4.10-1.

Table 4.10-1. Beneficial Use Designations for Water Bodies in the Project Area

Beneficial Use	Water Body	
	San Diego Creek Reach 1	Upper Newport Bay
Municipal and Domestic Supply (MUN)	N/A	N/A
Agriculture Supply (AGR)	N/A	N/A
Industrial Service Supply (IND)	N/A	N/A
Industrial Process Supply (PROC)	N/A	N/A
Groundwater Recharge (GWR)	I	N/A
Navigation (NAV)	N/A	N/A
Hydropower Generation (POW)	N/A	N/A
Water Contact Recreation (REC-1)	X	X
Non-contact Water Recreation (REC-2)	X	X
Commercial and Sport Fishing (COMM)	N/A	X
Warm Freshwater Habitat (WARM)	X	N/A
Limited Warm Freshwater Habitat (LWRM)	N/A	N/A
Cold Freshwater Habitat (COLD)	N/A	N/A
Preservation of Biological Habitats of Special Significance (BIOL)	N/A	X
Wildlife Habitat (WILD)	X	X

Table 4.10-1. Beneficial Use Designations for Water Bodies in the Project Area

Beneficial Use	Water Body	
	San Diego Creek Reach 1	Upper Newport Bay
Preservation of Rare and Endangered Species (RARE)	X	X
Spawning, Reproduction, and/or Early Development (SPWN)	N/A	X
Marine Habitat (MAR)	N/A	X
Shellfish Harvesting (SHEL)	N/A	X
Estuarine Habitat (EST)	X	X

Source: Santa Ana RWQCB 2019.
Note: X = existing or potential beneficial use; I = intermittent beneficial use; N/A = not applicable.

The Peters Canyon Wash and Reach 1 of San Diego Creek are impaired water bodies, as established by SWRCB. These water bodies are impaired with benthic community effects, dichlorodiphenyltrichloroethane (DDT), indicator bacteria, malathion, nutrients, sedimentation/siltation, selenium, toxaphene, pH, and toxicity. In addition, Upper Newport Bay is impaired with chlordane, copper, DDT, and indicator bacteria (SWRCB 2024).

Total maximum daily loads (TMDLs) are defined in federal regulations as "the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background such that the capacity of the water body to assimilate pollutants (the loading capacity) is not exceeded." TMDLs set limits for the total amount of a particular pollutant that can be discharged to a water body. This limit ensures that pollutant loads from all sources will not impair the designated beneficial uses of the water body. The time frame for compliance with TMDL targets varies but may take many years. TMDLs will often include a compliance schedule, identifying interim and final targets (Orange County Public Works 2024).

A TMDL is developed when a water body has been identified as impaired. Section 303(d) of the federal Clean Water Act (CWA) requires states to establish a listing of all impaired water bodies and to rank those water bodies according to priority for TMDL development. This list, called the 303(d) List, is updated every 2 years and is developed by the Regional and State Water Quality Control Boards and approved by the U.S. Environmental Protection Agency (EPA). TMDLs that have been established or are being developed for all of the pollutants listed above for Peters Canyon Wash, Reach 1 of San Diego Creek, and Upper Newport Bay (SWRCB 2024).

Orange County Groundwater Basin

The project site is underlain by the Irvine Sub-basin of the Orange County Groundwater Basin (Basin). The 350-square mile Basin is bounded on the north by consolidated rocks exposed in the Puente and Chino Hills, on the east by the Santa Ana Mountains, and on the south by the San Joaquin Hills (Figure 4.10-3, Orange County Groundwater Basin). The Basin is bounded on the southwest by the Pacific Ocean and on the northwest by a low topographic divide approximated by the Orange County–Los Angeles County line. The Basin is a three-aquifer system, consisting of shallow, principal, and deep aquifers. The total groundwater storage capacity of the Basin is 38 million acre-feet. The upper aquifer system consists of Holocene alluvium, older alluvium, stream terraces, and the upper Pleistocene deposits represented by the La Habra Formation. The average thickness of the upper aquifer system is 800 feet. The upper aquifer system contains a lower percentage of water-bearing strata in the northwest and coastal areas because clays and clayey silts dominate. Recharge occurs primarily in the northeastern portions of the Basin. The upper aquifer system provides most of the irrigation water for the overlying areas (County of Orange 2007).

The middle aquifer system of the Basin consists of the lower Pleistocene Coyote Hills and San Pedro Formations. The average thickness of the middle aquifer is 1,600 feet, and it is composed of sand, gravel, and minor amounts of clay. The primary recharge of the middle aquifer occurs through a series of recharge basins receiving flows from the Santa Ana River in the northeast portion of the Basin. The middle aquifer system provides 90% to 95% of the groundwater produced from the Basin. The lower aquifer system consists of the Upper Fernando Group of upper Pliocene age and is composed of sand and conglomerate, 350 to 500 feet thick. The lower aquifer system is not widely used because it has colored water issues. Recharge to the Basin originates from percolation of Santa Ana River flow, infiltration of precipitation, and injection into wells. The Santa Ana River flow contains natural flow, reclaimed water, and imported water that is spread in the Basin forebay (County of Orange 2007).

Groundwater Supply

IRWD operates groundwater production facilities in the Basin under the Orange County Water District Act, which empowers the Orange County Water District (OCWD) to impose replenishment assessments and basin equity assessments on production and to require registration of water-producing facilities and the filing of certain reports. However, OCWD is prohibited from limiting extraction unless a producer agrees to such limitation and from impairing vested rights to the use of water. As a result, producers may install and operate production facilities without OCWD approval. However, OCWD is required to annually investigate the condition of the Basin, assess overdraft and accumulated overdraft, and determine the amount of water necessary for replenishment. OCWD has studied the Basin replenishment needs and potential projects to address growth in demand through 2035 in its Final Draft Long-Term Facilities Plan, which was last updated in November 2014 (Appendix F-1, Water Supply Assessment).

A portion of IRWD is outside the jurisdictional boundary of OCWD. IRWD is eligible to annex the Santa Ana River Watershed portion of this territory to OCWD, under OCWD's current annexation policy (OCWD Resolution No. 86-2-15). A September 29, 1998 Superior Court ruling indicates that IRWD is entitled to deliver groundwater from the Basin to the IRWD service area irrespective of whether such area is also within OCWD (Appendix F-1).

The Basin is considered medium priority, with respect to the Sustainable Groundwater Management Act (SGMA) (DWR 2020, 2025). SGMA requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. In July 2019, the California Department of Water Resources (DWR) approved an alternative to a Groundwater Sustainability Plan (GSP) for the Basin. Alternative plans can be submitted in lieu of GSPs and must demonstrate how water managers have already achieved or will achieve sustainable groundwater management (DWR 2019; OCWD et al. 2017; OCWD 2019).

In April 2023, OCWD and the Orange County Sanitation District completed the final phase of construction of the world's largest indirect potable reuse facility. Located in Fountain Valley, the groundwater replenishment system takes highly treated wastewater that would have been discharged into the Pacific Ocean and purifies it further through a three-step advanced treatment process. The purified water is then injected and percolated into the Basin, where it ultimately becomes part of the County's drinking water supply. The groundwater replenishment system has expanded twice since opening in 2008, completing its final phase in 2023 with a production capacity of 130 million gallons per day of high-quality drinking water (SWRCB 2023).

Groundwater Quality

Groundwater in the Basin is characterized as sodium-calcium bicarbonate, with localized areas of high total dissolved solids due to seawater intrusion along the Pacific Ocean coast, as well as nitrate and volatile organic compounds. Groundwater is recharged naturally from precipitation and injection wells (as discussed above) to

reduce seawater intrusion. OCWD also injects water into the Talbert Barrier and the portion of the Alamitos Barrier Project within the County to prevent seawater intrusion. Water supplies for the seawater barriers include water from the groundwater replenishment system and State Water Project water (DWR 2025).

Project Site Groundwater

Groundwater was not encountered in borings drilled in September 2024, to the maximum explored depth of 30 feet below existing grade. During a previous evaluation in 2023, groundwater was encountered at depths ranging from approximately 64 to 99 feet below existing grade. Regional mapping indicates the historical high groundwater table at a depth ranging from 20 to 40 feet below existing grade. Based on the recently drilled borings and eventual removal of the crops and irrigation from the area, groundwater is not anticipated to occur in the upper 30 feet of sediments. However, groundwater seepage may occur in the bedrock areas on the southern edge of the project site (Appendix E-1, Geotechnical Report).

In general, groundwater levels fluctuate with the seasons, and local zones of perched groundwater may be present within the near-surface deposits due to local seepage or during rainy seasons. Groundwater conditions below the site may be variable, depending on numerous factors including seasonal rainfall, local irrigation, and groundwater pumping, among others

Flooding

The project site is not located in a 100-year floodplain, as designated by the Federal Emergency Management Agency (FEMA). The majority of the site is located within FEMA Zone X, which is an area determined to be outside the 0.2% annual chance floodplain (i.e., 500-year floodplain). However, Hicks Canyon Wash, located along the northern perimeter of the site, is susceptible to a 1% annual chance flood discharge (FEMA 2009, Map Number 06059C03505J, revised December 3, 2009). In addition, the project site is not located in a dam inundation area, as indicated in the 2045 Irvine General Plan Safety Element (City of Irvine 2024).

4.10.2 Relevant Plans, Policies, and Ordinances

Federal

Clean Water Act

The CWA was first introduced in 1948 as the Water Pollution Control Act. The CWA authorizes federal, state, and local entities to cooperatively create comprehensive programs for eliminating or reducing the pollution of state waters and tributaries. The primary goals of the CWA are to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to make all surface waters fishable and swimmable. As such, the CWA forms the basic national framework for the management of water quality and the control of pollutant discharges. The CWA also sets forth a number of objectives to achieve the above-mentioned goals. These objectives include regulating pollutant and toxic pollutant discharges; providing for water quality that protects and fosters the propagation of fish, shellfish, and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of nonpoint sources of pollution.

Since its introduction, major amendments to the CWA have been enacted (e.g., 1961, 1966, 1970, 1972, 1977, and 1987). Amendments enacted in 1970 created EPA, while amendments enacted in 1972 deemed the discharge of pollutants into waters of the United States from any point source unlawful unless authorized by an EPA National

Pollutant Discharge Elimination System (NPDES) permit. Amendments enacted in 1977 mandated development of a "Best Management Practices" Program at the state level and provided the Water Pollution Control Act with the common name of "Clean Water Act," which is universally used today. Amendments enacted in 1987 required EPA to create specific requirements for discharges.

In response to the 1987 amendments to the CWA and as part of Phase I of its NPDES permit program, EPA began requiring NPDES permits for (1) Municipal Separate Storm Sewer Systems (MS4s) generally serving, or located in, incorporated cities with 100,000 or more people (referred to as municipal permits); (2) 11 specific categories of industrial activity (including landfills); and (3) construction activity that disturbs 5 acres or more of land. Phase II of EPA's NPDES permit program, which went into effect in early 2003, extended the requirements for NPDES permits to (1) numerous small MS4s; (2) construction sites of 1 to 5 acres; and (3) industrial facilities owned or operated by small MS4s. The NPDES permit program is typically administered by individual authorized states.

In 2008, EPA published draft Effluent Limitation Guidelines for the construction and development industry. On June 27, 2016, EPA finalized its 2016 Effluent Guidelines Program Plan.

In California, the NPDES stormwater permitting program is administered by SWRCB, which was created by the Legislature in 1967. The joint authority of water distribution and water quality protection allows SWRCB to provide protection for the state's waters, through its nine RWQCBs. The RWQCBs develop and enforce water quality objectives and implement plans that will best protect California's waters, acknowledging areas of different climate, topography, geology, and hydrology. The RWQCBs develop "basin plans" for their hydrologic areas, issue waste discharge requirements, enforce action against stormwater discharge violators, and monitor water quality.

Section 303 of the Clean Water Act (Beneficial Use and Water Quality Objectives)

The Santa Ana RWQCB is responsible for the protection of the beneficial uses of waters within the project area. The Santa Ana RWQCB uses its planning, permitting, and enforcement authority to meet its responsibilities as adopted in the Basin Plan (Santa Ana RWQCB 2019) to implement plans, policies, and provisions for water quality management.

In accordance with state policy for water quality control, the Santa Ana RWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The Basin Plan has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction (Santa Ana RWQCB 2019). Under CWA Section 303(d), the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. A TMDL defines how much of a specific pollutant/ stressor a given water body can tolerate and still meet relevant water quality standards. SWRCB has developed TMDLs for select reaches of water bodies.

Section 401 of the Clean Water Act (Water Quality Certification)

Section 401 of the CWA requires that an applicant for any federal permit (e.g., a U.S. Army Corps of Engineers Section 404 permit) obtain certification from the state requiring that discharge to waters of the United States would comply with provisions of the CWA and with state water quality standards. For example, an applicant for a permit under Section 404 of the CWA must also obtain water quality certification per Section 401 of the CWA. Section 404 of the CWA requires a permit from the U.S. Army Corps of Engineers prior to discharging dredged or fill material into waters of the United States, unless such a discharge is exempt from CWA Section 404. For the project area, the Santa Ana RWQCB must provide the water quality certification required under Section 401 of the CWA. Water quality certification under Section 401 of the CWA, as well as the associated requirements and terms, is required to minimize or eliminate the potential water quality impacts associated with the action(s) requiring a federal permit.

Section 402 of the Clean Water Act (National Pollutant Discharge Elimination System)

The NPDES permit program, as authorized by Section 402 of the CWA, was established to control water pollution by regulating point sources that discharge pollutants into waters of the United States (33 USC 1342). In the state of California, EPA has authorized the SWRCB permitting authority to implement the NPDES program. Regulations (Phase II Rule) that became final on December 8, 1999, expanded the existing NPDES Program to address stormwater discharges from construction sites that disturb land equal to or greater than 1.0 acre and less than 5.0 acres (small construction activity). The regulations also require that stormwater discharges from small MS4s be regulated by NPDES General Permit for Storm Water Discharges Associated with Construction Activity, Order No. 99-08-DWQ, also known as the Construction General Permit. See local regulations below for additional information on the Construction General Permit.

Section 404 of the Clean Water Act

Section 404 of the CWA established a permitting program to regulate the discharge of dredged or filled material into waters of the United States, which include wetlands adjacent to national waters (33 USC 1344). This permitting program is administered by the U.S. Army Corps of Engineers and enforced by EPA.

Safe Drinking Water Act

Congress passed the Safe Drinking Water Act in 1974 to protect public health by regulating the nation's public drinking water supply. The act authorizes EPA to set national health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in drinking water.

Per Section 1424(e) of the Safe Drinking Water Act, EPA established the Sole Source Aquifer Program in 1977 to help prevent contamination of groundwater from federally funded projects. The Sole Source Aquifer Program allows for EPA environmental review of any project that is financially assisted by federal grants or federal loan guarantees to determine whether such projects would have the potential to contaminate a sole source aquifer. The Wellhead Protection Program was developed as a part of the Ground Water Protection Strategy for States and Tribes under the 1986 Amendments to the Safe Drinking Water Act. The Wellhead Protection Program includes delineation of Wellhead Protection Program areas, detection of possible contamination, remediation and monitoring of contamination, contamination prevention, and public education and participation. In March 2021, EPA made a determination to issue drinking water regulations for perfluorooctanoic acid and perfluorooctanesulfonic acid (PFAS), and as part of that process issued a PFAS Strategic Roadmap in October 2021. This roadmap states that EPA will issue drinking water regulations for PFAS under an accelerated time frame.

National Flood Insurance Act

The National Flood Insurance Act of 1968 established the National Flood Insurance Program to provide flood insurance within communities that were willing to adopt floodplain management programs to mitigate future flood losses. The act also required the identification of all floodplain areas within the United States and the establishment of flood risk zones within those areas. FEMA is the primary agency responsible for administering programs and coordinating with communities to establish effective floodplain management standards. FEMA is responsible for preparing Flood Insurance Rate Maps that delineate the areas of known special flood hazards and their risk applicable to the community. The program encourages the adoption and enforcement by local communities of floodplain management ordinances that reduce flood risks. In support of the program, FEMA identifies flood hazard areas throughout the United States on FEMA flood hazard boundary maps.

Executive Order 11988

Under Executive Order 11988 – Floodplain Management, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a 1% or greater chance of flooding in any given year (the 100-year floodplain). FEMA requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. Executive Order 11988 addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding a project in a floodplain to avoid incompatible floodplain development, be consistent with the standards and criteria of the National Flood Insurance Program, and restore and preserve natural and beneficial floodplain values.

State

Porter–Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act of 1967 (Porter–Cologne Act)(California Water Code Section 13000 et seq.) is the basic water quality control law for California. The Porter–Cologne Act established the legal and regulatory framework for California's water quality control. The California Water Code authorizes SWRCB to implement the provisions of the CWA, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

As discussed above, the State of California is divided into nine RWQCBs, governing the implementation and enforcement of the California Water Code and CWA. The project site is located within Region 8, also known as the Santa Ana Region (i.e., the Santa Ana RWQCB). Each RWQCB is required to formulate and adopt a basin plan for its region. The Basin Plan is a comprehensive document that reports beneficial uses for surface and groundwaters, defines narrative and numeric parameters to protect water quality, and describes implementation programs to protect waters throughout the region. This plan must adhere to the policies set forth in the California Water Code and established by SWRCB. The RWQCB is also given authority to include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste. The criteria for the project area are contained in the Basin Plan, adopted by the Santa Ana RWQCB on January 24, 1995, and updated June 2019 (Santa Ana RWQCB 2019).

California Water Code

The California Water Code includes 22 kinds of districts or local agencies with specific statutory provisions to manage surface water. Many of these agencies have statutory authority to exercise some forms of groundwater management. For example, a Water Replenishment District (California Water Code Section 60000 et seq.) is authorized to establish groundwater replenishment programs and collect fees for that service, while a Water Conservation District (California Water Code Section 75500 et seq.) can levy groundwater extraction fees. Through special acts of the legislature, 13 local agencies have been granted greater authority to manage groundwater. Most of these agencies, formed since 1980, have the authority to limit export and even control some in-basin extraction upon evidence of overdraft or the threat of an overdraft condition. These agencies can also generally levy fees for groundwater management activities and for water supply replenishment.

California Toxics Rule

In 2000, EPA promulgated the California Toxics Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. In 1994, a California state court revoked the state's water quality control plans, which contained numeric criteria for water quality. This was in direct violation of the CWA and required EPA action. EPA then implemented the California Toxics Rule. EPA promulgated this rule based on Section 303(c)(2)(B) of the CWA, which dictates that states must adopt numeric criteria to protect human health and the environment. The California Toxics Rule establishes acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water, such as inland surface waters and enclosed bays and estuaries, that are designated by the Santa Ana RWQCB as having beneficial uses protective of aquatic life or human health.

Groundwater Management Act

In 1992, Assembly Bill 3030 was passed, which greatly increased the number of local agencies authorized to develop a groundwater management plan and set forth a common framework for management by local agencies throughout California. These agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (California Water Code Section 10754), provided they receive a majority of votes in favor of the proposal in a local election (California Water Code Section 10754.3).

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package—Assembly Bill 1739, Senate Bill 1168, and Senate Bill 1319—collectively known as SGMA. SGMA requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically overdrafted basins, sustainability should be achieved by 2040. For the remaining high- and medium-priority basins, 2042 is the deadline. Through SGMA, DWR provides ongoing support to local agencies through guidance, financial assistance, and technical assistance. SGMA empowers local agencies to form Groundwater Sustainability Agencies to manage basins sustainably and requires those Groundwater Sustainability Agencies to adopt GSPs for crucial (i.e., medium- to high-priority) groundwater basins in California. The Basin is considered a medium-priority basin with respect to SGMA (DWR 2025).

Local

Water Quality Control Plan for the Santa Ana River Basin

As mentioned above, the Basin Plan was written and implemented by the Santa Ana RWQCB to preserve and enhance water quality throughout northwestern Orange County, parts of San Bernardino County, and western Riverside County. The Basin Plan outlines water quality parameters for both inland surface waters and for groundwaters for a wide variety of water quality constituents. Specifically, the Basin Plan (1) identifies beneficial uses for surface and ground waters; (2) includes the narrative and numerical water quality objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy; and (3) describes implementation programs and other actions necessary to achieve the water quality objectives established in the Basin Plan.

National Pollutant Discharge Elimination System Permit Program

The NPDES permit program was first established in 1972 under authority of the federal government through the CWA to control the discharge of pollutants from any point source into the waters of the United States. As indicated above, in California, the NPDES stormwater permitting program is administered by SWRCB through the nine RWQCBs. For all water-quality-related objectives for CWA purposes, including the NPDES, the state must achieve water quality standards in effect at the state level and the regional level. At the regional level, the effective plan is the Basin Plan.

National Pollutant Discharge Elimination System Construction General Permit

Construction projects that disturb more than 1 acre of land surface are subject to the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (i.e., the Construction General Permit). The most recent Construction General Permit (Order 2022-0057-DWQ, NPDES No. CAS000002) was adopted by SWRCB on September 8, 2022. The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the United States from construction sites that disturb 1 acre or more of land surface or that are part of a common plan of development or sale that disturbs more than 1 acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires that construction sites be assigned a risk level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. Depending on the risk level, the construction projects could be subject to the following requirements:

- Effluent standards
- Good site management "housekeeping"
- Non-stormwater management
- Erosion and sediment controls
- Run-on and runoff controls
- Inspection, maintenance, and repair
- Monitoring and reporting requirements

The Construction General Permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater from moving off site into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management, and good housekeeping, and are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Each category contains specific BMPs to achieve the goals of the overarching category. Specific BMPs may include the following:

- **Soil stabilizing BMPs:** Use of straw mulch, erosion control blankets or geotextiles, and/or wood mulching
- **Sedimentation control BMPs:** Use of storm drain inlet protection, sediment traps, gravel bag berms, and fiber rolls

- **Waste management BMPs:** Stockpile management, solid waste management, and concrete waste management
- **Good housekeeping BMPs:** Vehicle and equipment cleaning, implementation of water conservation practices and rules for fueling construction vehicles and equipment

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Additionally, 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 site discharges directly to a water body listed on the 303(d) list for sediment. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations and vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the Santa Ana RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a Notice of Intent and permit registration documents to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the Santa Ana RWQCB of violations or incidents of non-compliance and for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a State Qualified SWPPP Developer, and implementation of the SWPPP must be overseen by a State Qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify permit registration documents, is responsible for obtaining coverage under the permit.

National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System

The Municipal Stormwater Permitting Program regulates stormwater discharges from MS4s. Stormwater runoff and authorized non-storm flows (conditionally exempt discharges) are regulated under NPDES stormwater permits. Phase I NPDES permits require medium and large cities, or certain counties with populations of 100,000 or more, to obtain NPDES permit coverage for their stormwater discharges. Phase II permits require regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges. The MS4 permits require the discharger to develop and implement a stormwater management plan/program with the goal of reducing the discharge of pollutants to the maximum extent practicable (the performance standard specified in CWA Section 402[p]), typically through the application of BMPs. The management programs specify what BMPs will be used to address certain program areas. The program areas include public education and outreach, illicit discharge detection and elimination, construction and post-construction, and good housekeeping for municipal operations.

The current County MS4 Permit (Order No. R8-2009-0030, as amended by R8-2010-0062) regulates stormwater runoff and authorized non-storm flows (conditionally exempt discharges) in the Orange County Flood Control District and the incorporated cities of the County within the Santa Ana RWQCB jurisdiction. The MS4 permit contains minimum standards that the Permittees must enforce when construction activities disturb an area greater than 1

acre, such as for the project (see also requirements for the statewide construction permit discussed above, which is a permit that the construction contractor must apply for and adhere to). Compliance with MS4 construction requirements includes implementation of worksite BMPs similar to those described for the Construction General Permit for erosion, sediment, non-stormwater management, and waste management.

During operation of the project, non-stormwater discharges from the project site would be prohibited (with some conditional exceptions). Stormwater discharges must meet water-quality-based effluent limitations or water quality standards for discharges leaving the project site and must not cause or contribute to the exceedance of receiving water limitations (water quality standards for receiving waters). The MS4 permit requires implementation of a water quality management plan (WQMP) for all new development and significant redevelopment projects. In addition, the Permittees shall ensure that the following potential impacts are considered during CEQA reviews:

A. Potential impact of project construction on storm water runoff
B. Potential impact of project's post-construction activity on storm water runoff
C. Potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks, or other outdoor work areas
D. Potential for discharge of storm water to affect the beneficial uses of the receiving waters
E. Potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm
F. Potential for significant increases in erosion of the project site or surrounding areas
G. Potential decreases in quality and quantity of recharge to groundwater
H. Potential impact of pollutants in storm water runoff from the project site on any 303(d) listed water bodies

The MS4 permit also requires that volume- or flow-based BMPs be installed as part of the project WQMP. Volume-based BMPs shall be designed to infiltrate, filter, or treat one of the following:

1. The volume of runoff produced from a 24-hour, 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Isopluvial Map 53
2. The volume of annual runoff produced by the 85th percentile, 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998)
3. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial
4. The volume of runoff, as determined from the local historical rainfall record that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event
5. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inches of rainfall per hour, for each hour of a storm event
6. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two
7. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two

In addition, structural infiltration BMPs shall be constructed such that they are protective of underlying groundwater quality.

Central Orange County Integrated Regional and Coastal Watershed Management Plan

The Central Orange County Integrated Regional and Coastal Watershed Management Plan (IRCWM Plan) (County of Orange 2007) incorporates integrated regional water management planning to address issues related to water quality, habitat protection and enhancement, flood control, water supply, and stormwater management. The IRCWM Plan is a programmatic planning document for the region prepared in accordance with the state's Integrated Regional Water Management Plan Standards, as required per California Water Code Section 79560 et seq. The purpose of the IRCWM Plan is to provide a bridge between existing and developing watershed planning efforts, allowing for more effective collaboration and greater opportunity to leverage agency resources across jurisdictions. Regional planning efforts include the Orange County Stormwater Program; the Nitrogen and Selenium Management Program; an agreement to fund nutrient, fecal coliform, and toxics TMDL studies for the Newport Bay Watershed; the Newport Bay Watershed Sediment Control Monitoring and In-Channel Maintenance Program; and other programs and specific water-resource-related projects.

Basin 8-1 Alternative Plan

As discussed in Section 4.10.1, Existing Conditions, in July 2019, DWR approved an alternative to a GSP for the Orange County Groundwater Basin. Alternative plans can be submitted in lieu of GSPs and must demonstrate how water managers have already achieved or will achieve sustainable groundwater management. DWR designated the Coastal Plain of Orange County Groundwater Basin (Basin 8-1) as a medium-priority basin, primarily due to heavy reliance on the Basin's groundwater as a source of water supply. The agencies within Basin 8-1, including OCWD, IRWD, and the City of La Habra (collectively the Submitting Agencies), agreed to collaborate in order to submit an alternative to a GSP, known as the Basin 8-1 Alternative. In accordance with Water Code Section 10733.6(b)(3), the Basin 8-1 Alternative presents an analysis of basin conditions that demonstrates that the Basin has operated within its sustainable yield over a period of at least 10 years. In addition, the Basin 8-1 Alternative establishes objectives and criteria for management that would be addressed in a GSP and is designed to be "functionally equivalent" to a GSP.

2045 Irvine General Plan

The 2045 Irvine General Plan is composed of elements that address a broad range of issues. Each element of the plan identifies and describes goals, objectives, and implementing actions that provide specific direction for decision-making and formation of public policy through the year 2045. The General Plan contains seven elements required by the State Planning, Zoning, and Development Laws. The Conservation and Open Space Element and the Safety Element are relevant to hydrology and water-quality-related issues.

2045 Irvine General Plan Conservation and Open Space Element

The following goal, objective, and policies in the 2045 Irvine General Plan Conservation and Open Space Element are related to hydrology and water quality (City of Irvine 2024a):

Goal 3. Use and preserve geophysical resources, including, but not limited to, ridgelines, hillsides, and waterways, as part of the City's land use pattern.

Objective COS-3: Effectively utilize and safeguard geophysical resources, encompassing ridgelines, hillsides, and waterways, within the City's land use framework to maintain ecological integrity, enhance aesthetic value, and promote sustainable development practices that harmonize with the natural landscape.

Policy (c): Encourage the creation of flood control channels, preferring natural swale designs where feasible, and promote the development of small lakes for public use while preserving their natural edges.

Policy (d:) Conduct studies on existing drainage channels to determine suitable preservation measures, integrating them into surrounding development designs.

Policy (e): Minimize alterations to major creek courses and ensure no net loss in the quantity or quality of surface and subsurface water flow into the San Joaquin Marsh resulting from development activities.

Policy (h): Ensure proposed development in hillside areas minimize flood hazard and runoff impacts on both lowlands and hillsides.

Policy (i): Minimize the danger to life and property from geophysical hazards, including, but not limited to, unstable soils, liquefaction, steep slopes, and floodways.

2045 Irvine General Plan Safety Element

The following goals, objectives, and policies in the 2045 Irvine General Plan Safety Element are related to hydrology and water quality (City of Irvine 2024b):

Goal 3. Anticipate the risks and mitigate the effects that flood hazards pose to the community.

Objective S-3: Flood Hazards

Policy (a): Work with Orange County Flood Control District to ensure flood control facilities are adequately provided and maintained.

Policy (b): Collaborate with partner agencies and municipalities to align green infrastructure projects (i.e., projects that allow for the infiltration of stormwater where it falls) and develop regulations for watersheds across jurisdictions to reduce impervious hard surfaces.

Policy (c): Support efforts of other organizations and academic institutions to conduct studies of the impact combined riverine and coastal flooding, groundwater intrusion, and increased precipitation has on flood risk and vulnerability.

Policy (e): Develop and update a long-term plan to address current and future flood risk to critical facilities.

Policy (f): Continue to partner with Orange County Public Works to proactively disseminate information from the 'H2OC Stormwater Program' to educate home and small business

owners on regulations and highlight the role that engaged residents can play in assisting with community-based stormwater management.

Policy (g): Ensure resilience and long-term functionality of stormwater and sewer systems.

Policy (h): Encourage the use of climate-smart landscape surfaces (e.g., permeable pavement, stormwater parks, green streets) in new and existing developments to reduce runoff, minimize flood hazards, and maintain existing drainage ways.

Policy (i): Continue to encourage the implementation of low-impact development (e.g., rain gardens and rainwater harvesting) to reduce flood risk, filter pollutants, and replenish groundwater over time.

Policy (k): Coordinate with other agencies to increase the public awareness of flooding, stormwater management, and drought management issues and techniques for residents to mitigate those challenges on their property.

Goal 5. Protect the community from the threat of drought and extreme heat.

Objective S-5: Drought and Extreme Heat

Policy (a): Collaborate with federal, State, and local agencies and organizations to explore alternative water sources (e.g., desalination) and improve capacity in consideration of increased demand and drought.

Policy (b): Continue to support Irvine Ranch Water District's recycled water program and explore opportunities to enhance water recycling.

Policy (c): Continue to support and participate in in the development of a regional and local drought contingency plan.

Policy (d): Encourage drought-tolerant native landscaping, low-flow water fixtures beyond the state minimum code, and daytime watering restrictions on properties throughout the City to reduce water consumption.

Policy (e): Explore the feasibility of recycled water distribution for residential uses on all lot sizes.

Policy (f): Protect groundwater supply against contamination, degradation, or loss due to flooding.

Policy (g): Promote a system for rapidly detecting, reporting, and repairing water leaks in public facilities and the water conveyance system.

Policy (h): Promote nature-based methods and best management practices (BMPs) (e.g., bioswales, rain gardens, natural ground cover) through the City's stormwater program to promote groundwater infiltration and reduce the impacts of drought.

Policy (i): Support regional patterns in education and outreach efforts focused on water conservation measures (e.g., water reuse, water use, and irrigation efficiency) for City residents.

City of Irvine Water Quality Regulatory Requirements

A project WQMP must be submitted for new development and significant redevelopment projects in the City of Irvine (City). Project WQMPs describe how property owners/managers will comply with the post-construction water quality requirements described in the City's NPDES permit (issued by the Santa Ana RWQCB), and the City's Local Implementation Plan. The project WQMP template has been designed to facilitate the expeditious review and approval of project WQMPs by the City's Building and Safety Division and to reduce the number of revisions and resubmittals of project WQMPs before approval is granted. Project plans submitted for plan check must be consistent with the approved project WQMP, and the project WQMP must be approved prior to the issuance of building or grading permits.

City of Irvine Water Quality Ordinance

The Water Quality Ordinance (No. 10-06) gives the City adequate legal authority as may be necessary to carry out the requirements of the NPDES Permit and accomplish the requirements of the CWA.

City of Irvine Hydrology and Hydraulics Regulations

City of Irvine Public Works Standard Plans and Design Manuals, Section 102, Hydrology and Hydraulics, dated August 2013, indicates that drainage design requirements shall be in accordance with the latest edition of the Hydrology Manual published by the Orange County Flood Control District and the Orange County Local Drainage Manual, published by the Orange County Public Works. Design calculations and flow maps for all contributory areas shall be submitted with the plans. As noted in Section 102 (City of Irvine 2013):

> The use of underground storm drain systems shall be required:
>
> - When flooding or street overflow will cause serious damage.
> - When future upstream development will cause drainage problems.
> - When a minimum of one through lane in each direction cannot be maintained above the theoretical design storm frequency.
> - To eliminate the need for cross gutters.
> - To eliminate nuisance water in residential areas (maximum surface flow between catch basins = 750 feet).
> - When median drainage is required.
> - To insure [sic] building protection for the 100-year storm.
>
> Drainage systems shall be designed along with site grading to insure [sic] all building pads are a minimum of one-foot above the elevation of the theoretical 100-year storm flow. In addition, the 25-year design frequency shall be used for all storm drains, unless otherwise approved by the City Engineer.

4.10.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to hydrology and water quality are based on Appendix G of the CEQA Guidelines. According to Appendix G, a significant impact related to hydrology and water quality would occur if the project would:

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

2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
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:
   a. result in substantial erosion or siltation on or off site;
   b. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;
   c. 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; or
   d. impede or redirect flood flows.
4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.
5. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.10.4 Impacts Analysis

1. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less-Than-Significant Impact. The analysis below discusses construction-related water quality impacts and operations-related water quality impacts.

Construction

The project would require cut-and-fill mass grading, followed by vertical building construction, paving/ concrete, and landscape installation. Construction of the project would have the potential to result in local soil erosion during excavation, grading, trenching, and soil stockpiling. As discussed in Section 4.10.1, Existing Conditions, the project site is located within the San Diego Creek Watershed, which is the principal watercourse within the larger Newport Bay Watershed. Each of these construction-related activities would result in potential siltation of San Diego Creek and its tributaries, including Hicks Canyon Wash, which accepts stormwater runoff from the northern portion of the site. Construction equipment and materials would include fuels, oils and lubricants, solvents and cleaners, cements and adhesives, paints and thinners, degreasers, cement and concrete, and asphalt mixtures, which are all commonly used in construction. During the construction phase of the project, petroleum hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills. The accidental spill of hazardous materials could adversely affect the water quality of stormwater and/or surface water bodies.

As discussed in Section 4.9, Hazards and Hazardous Materials, of this Draft EIR, construction activities would be required to comply with numerous hazardous materials regulations designed to ensure that hazardous materials are transported, used, stored and disposed of in a safe manner to protect worker safety and to reduce the potential for a release of construction-related fuels or other hazardous materials into the environment, including stormwater and nearby surface water bodies. As discussed in Section 4.9, pursuant to California Health and Safety Code, Division 20, Chapter 6.95, the contractors would be required to prepare and implement a hazardous materials business plan that would require that hazardous materials be properly used and stored in appropriate containers, that spill prevention measures be

implemented, and that spill response procedures be in place to respond to accidental releases. The California Fire Code would also require measures for the safe storage and handling of hazardous materials.

Construction activities must be conducted in compliance with South Coast Air Quality Management District Rule 403 – Fugitive Dust, which would minimize wind and water erosion at the site. Compliance with the SWRCB regulations requires preparation and implementation of a SWPPP, in accordance with the NPDES Construction General Permit. The SWPPP must include BMPs, including erosion control measures and proper handling of petroleum products, such as proper petroleum product storage and spill response practices, to prevent pollution in stormwater discharge. The construction phase BMPs would ensure effective control of sediment discharge and also of pollutants associated with sediments, such as nutrients, heavy metals, and pesticides. The SWPPP would be subject to review and approval by the City Public Works and Sustainability Department. All project construction activities are also required to comply with the Public Works Grading Manual, which requires appropriate BMPs for wet and dry weather applications, desilting and erosion protection facilities necessary to protect adjacent property from sediment deposition, and a plan indicating how access would be provided to maintain desilting facilities during wet weather. Through compliance with these existing regulations, the project would not result in any significant water quality impacts related to soil erosion during the construction phase.

Operation

The project includes the replacement of an existing agricultural area with new residential, recreational, and associated roadway and utility infrastructure. The primary sources of pollution in runoff from these land uses are expected to include oil, grease, petroleum products, and automobile-related pollutants; pathogens/bacteria from pets; pesticides/herbicides/insecticides, nitrogen, and phosphorous from fertilizers for landscaping; and trash, lawn clippings, and debris that can accumulate on impervious surfaces, such as parking lots, driveways, and sidewalks. Other potential pollutants that may be generated by the project include household-type cleaning products, maintenance products (e.g., paints, solvents, cleaning products), and refrigerants associated with building mechanical heating, ventilation, and air conditioning systems.

Excess fertilizers, nutrients, and pathogens/bacteria from pets can impact water quality by promoting excessive and/or rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Pesticides/herbicides/insecticides can also enter urban runoff after application on landscaped areas and can be toxic to aquatic organisms and can bioaccumulate in larger species, such as birds and fish. The potential impacts of these substances on biological resources are discussed in Section 4.4, Biological Resources, of this Draft EIR. Oil, grease and heavy metals can enter dry-weather and stormwater runoff from vehicle leaks, traffic, and vehicle maintenance activities, and metals can enter runoff as surfaces corrode, decay, or leach.

These anticipated pollutants would be addressed through project features, as described in Appendix F-4 (Preliminary WQMP) and through compliance with regulatory requirements. During operations, the project site would consist of vegetated open space, landscaped areas, buildings, and hardscapes. Low Impact Development (LID) BMPs are required in addition to site design measures and source controls to reduce pollutants in stormwater discharges. LID BMPs are engineered facilities that are designed to retain or biotreat runoff on the project site. The County MS4 Permit (Order R8-2009-0030) requires the evaluation and use of LID features, using the following hierarchy of treatment: infiltration, evapotranspiration, harvest/reuse, and biotreatment. Biotreatment BMPs are a broad class of LID BMPs that reduce stormwater volume

to the maximum extent practicable, treat stormwater using a suite of treatment mechanisms characteristic of biologically active systems, and discharge water to the downstream storm drain system or directly to receiving waters. Eleven precast Contech Modular Wetlands Systems (MWSs) and one Contech Bioscape vegetated biotreatment system are proposed to treat stormwater runoff due to poor on-site infiltration rates. The biotreatment BMPs would be sized to treat runoff from the Design Capture Storm (85th percentile, 24-hour). Because Contech MWSs and Bioscape systems are sized based on flow rate, they were sized using the methodology for flow-based BMPs (Appendix F-4).

Contech MWSs are proprietary biotreatment systems that 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 total suspended solids, metals, nutrients, and bacteria. Runoff then flows through the wetland chamber, where treatment is achieved through 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 in a manner similar to bioretention systems. The discharge chamber at the end of the unit collects treated flows and discharges back into the storm drain system (Appendix F-4).

Stormwater enters the Bioscape biotreatment system through a pipe, curb inlet, or sheet flow and ponds over the pretreatment mulch layer, capturing heavy sediment and debris. Organics and microorganisms within the mulch trap and degrade metals and hydrocarbons. The mulch also provides water retention for the system's vegetation. Stormwater flows through engineered Filterra media, which filters fine pollutants and nutrients. Organic material in the media removes dissolved metals and acts as a food source for root-zone microorganisms. Treated water exits through an underdrain pipe or infiltrates (if designed accordingly). Root-zone microorganisms digest and transform pollutants into forms easily absorbed by plants. Plant roots absorb stormwater and pollutants that were transformed by microorganisms, regenerating the media's pollutant removal capacity. The roots grow, provide a hospitable environment for the root-zone microorganisms, and penetrate the media, maintaining hydraulic conductivity. The plant trunk and foliage use nutrients such as nitrogen and phosphorus for plant health, sequester heavy metals into the biomass, and provide evapotranspiration of residual water within the system (Appendix F-4).

The project site has been divided into drainage management areas (DMAs) A-1 through A-7, B-1, and C-1 (Figure 4.10-4, Proposed On-Site Hydrology). During storm events, stormwater flows from DMAs A-1, A-2, and A-3 would be collected, treated by an MWS, and conveyed to an underground detention tank or aboveground detention basin for peak flow mitigation. Runoff from these DMAs would be conveyed to the existing 42-inch storm drain lateral, which in turn would feed into the existing 102-inch RCP Hicks Canyon Facility F27. Stormwater runoff in DMAs A-4 through A-7 would similarly be collected, treated by an MWS, and conveyed to the proposed park site, where 2-year peak flow mitigation would occur via an underground detention tank or aboveground detention basin. A pass-through storm drain would be constructed within the proposed "C" Street to intercept off-site flows along the southeast project boundary. The mitigated stormwater flow from DMAs A-4 through A-7 would flow into this proposed storm drain, which in turn would flow into the existing 66-inch storm drain lateral that feeds into the 102-inch RCP Hicks Canyon Facility F27 (Appendix F-4).

Stormwater runoff in DMA B-1 would be collected by a proposed storm drain originating from the intersection of proposed B Street and D Street (Figure 4.10-4). The low flows would be split off and sent to a Contech Bioscape system for treatment. The 2-year and high flows would be sent to a proposed

underground detention tank or aboveground detention basin, which would be provided for peak flow mitigation near the intersection of Bee Canyon Access Road and Portola Parkway. The reduced flow will be connected to an existing 36-inch RCP lateral that connects into the existing 24-inch storm drain on Portola Parkway (Appendix F-4).

Stormwater runoff in DMA C-1 would be collected in a short section of proposed storm drain in E Street and then treated by an MWS (Figure 4.10-4). Because the proposed flow rate would be marginally higher (0.1%) in this DMA than under existing conditions, peak flow mitigation would not be required. After treatment, stormwater would be conveyed to the existing 48-inch storm drain in Portola Parkway that flows northwest toward Jeffrey Road (Appendix F-3, Preliminary Hydrology Report, and Appendix F-4, Preliminary WQMP).

In addition, nonstructural source control BMPs would be employed at the site, including education for property owners, tenants, and occupants; activity restrictions to prevent water quality degradation; common area landscape management; BMP maintenance; common area litter control; employee training; common area catch basin inspections; and street sweeping of private streets and parking lots. In addition to the biotreatment system described above, other structural source control BMPs would be employed at the site, including storm drain system stenciling and signage and use of efficient irrigation systems and landscape design, water conservation, smart controllers, and source controls (Appendix F-4).

The project's LID water quality BMPs and compliance with applicable laws and regulations would ensure that operation of the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality, and impacts would be less than significant.

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

Less-Than-Significant Impact. The analysis includes a discussion of whether the project would substantially decrease groundwater supplies or interfere with groundwater recharge.

Groundwater Supplies

IRWD has been identified by the City as a public water system that will supply water service (both potable and nonpotable) to the project. As the public water system, IRWD is required by Section 10910 et seq. of the California Water Code to provide the City with an assessment of water supply availability for defined types of projects. The project has been found by the City to be a project requiring an assessment. As a result, a Water Supply Assessment (Appendix F-1) and a Water Supply Verification (Appendix F-2, which includes the Water Supply Assessment as Exhibit C), have been completed for the project.

As discussed in Section 4.10.1, in July 2019, DWR approved an alternative to a GSP for the Orange County Groundwater Basin. Alternative plans can be submitted in lieu of GSPs and must demonstrate how water managers have already achieved or will achieve sustainable groundwater management. DWR designated Basin 8-1 as a medium-priority basin, primarily due to heavy reliance on the Basin's groundwater as a source of water supply. The Submitting Agencies within Basin 8-1 agreed to collaborate to submit an alternative to a GSP, known as the Basin 8-1 Alternative (Appendix F-1).

Based on the Basin 8-1 Alternative, IRWD's water supplies remain essentially constant between normal, single-dry, and multiple-dry years, as groundwater and Metropolitan Water District (Metropolitan) imported water account for the majority of all of IRWD's potable supply, and recycled water, groundwater, and imported water comprise all of IRWD's nonpotable supply. Groundwater production from the Basin typically remains constant or may increase in cycles of dry years, even if overdraft of the basin temporarily increases, as groundwater producers reduce their demand on imported supplies to secure reliability.

Metropolitan's 2020 Urban Water Management Plan concludes that Metropolitan has supply capabilities sufficient to meet expected demands from 2025 through 2045 under a single-dry-year condition and a period of drought lasting five consecutive years, as well as in a normal water year condition. Recycled water production also remains constant and is considered "drought-proof" as a result of constant sewage flows, including years with low precipitation. This diversity of water supplies results in relatively constant groundwater production levels and minimizes adverse impacts to groundwater supplies. Based on the Water Supply Assessment and Water Supply Verification, adequate water supplies are available to meet the proposed project water demands (including peak flow demands) under normal year, single-dry-year, and multiple-dry-year conditions through the year 2045 (Appendices F-1 and F-2).

In accordance with California Water Code Section 10733.6(b)(3), the Basin 8-1 Alternative presents an analysis of basin conditions that demonstrates that the Basin has operated within its sustainable yield over a period of at least 10 years. In addition, the Basin 8-1 Alternative establishes objectives and criteria for management that would be addressed in a GSP and is designed to be "functionally equivalent" to a GSP. Basin 8-1 has been operated within its sustainable yield for more than 10 years without experiencing significant and unreasonable (1) lowering of groundwater levels; (2) reduction in storage; (3) water quality degradation; (4) seawater intrusion; (5) inelastic land subsidence; or (6) depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. Pursuant to the Basin 8-1 Alternative, the Submitting Agencies will ensure the entire Basin 8-1 continues to be sustainably managed and data reported as required by SGMA (Appendix F-1). As a result, the project would not substantially decrease groundwater supplies such that the project may impede sustainable groundwater management of the Basin. Impacts would be less than significant.

Groundwater Recharge

The project site has been farmed for decades and at present consists of unpaved open space overlying the Irvine Sub-basin of the Orange County Groundwater Basin. Following grading and construction, the project site would consist of vegetated open space, landscaped areas, buildings, and hardscapes. The buildings and hardscapes would result in a substantial increase in impervious surfaces, which in turn would impede absorption of rainfall into on-site soils. However, based on the WQMP completed for the project (Appendix F-4), on-site soils have low infiltration rates, thus precluding the use of infiltration basins as water quality LID features (see Section 4.10.4[1]). Based on these low infiltration rates, the project site is not an area of substantial groundwater recharge. As a result, the project would not interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the Basin. Impacts would be less than significant.

3. 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:

a. Result in substantial erosion or siltation on or off site?

Less-Than-Significant Impact. Project grading and construction would not substantially alter the existing drainage pattern of the site. The topography of the site would generally remain the same, and stormwater runoff would predominantly flow to the same drainage exit points as under existing conditions. However, project grading and construction would result in a substantial increase in impervious surfaces, which in turn would result in increased stormwater runoff. Based on the project-specific Preliminary Hydrology Report (Appendix F-3), hydrologic calculations were prepared for existing conditions throughout the site to establish baseline storm flow rates at project watershed exit points. These baseline storm flow rates were compared to proposed-condition design peak flow rates to determine peak flow rate mitigation requirements. Per the Orange County Hydrology Manual (Orange County Environmental Management Agency 1986, 1996) and the City of Irvine Standards (City of Irvine 2013), a 25-year-frequency storm event was selected for design peak flow rate evaluation because sump conditions are present on site.

As discussed above for water quality during operations, during storm events, stormwater flows would be collected, treated by an MWS, and conveyed to underground detention tanks and/or an aboveground detention basin for peak flow mitigation. With the exception of DMA C-1, per applicable regulations, peak flow mitigation would be designed for a 25-year-frequency storm event. Because the proposed flow rate in DMA C-1 would be marginally higher (0.1%) than under existing conditions, peak flow mitigation would not be required (Appendices F-3 and F-4). With incorporation of stormwater detention tanks and/or aboveground detention basins into the project design, the project would not result in increased runoff and associated on-site or off-site erosion and siltation of downstream drainages. Impacts would be less than significant.

b. 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. As previously discussed, with incorporation of stormwater detention tanks and/or aboveground detention basins into the project design, in compliance with County and City stormwater standards, the project would not result in a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on or off site. Impacts would be less than significant.

c. 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. As previously discussed, with incorporation of stormwater detention tanks and/or aboveground detention basins into the project design, in compliance with County and City stormwater standards, the project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. In addition, as previously discussed, the project's LID water quality BMPs and compliance with applicable water quality laws and regulations would ensure that operation of the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality. Impacts would be less than significant.

d. Impede or redirect flood flows?

No Impact. The project site is not located in a 100-year floodplain, as designated by FEMA. The majority of the site is located within FEMA Zone X, which is an area determined to be outside the 0.2% annual chance floodplain (i.e., 500-year floodplain). However, Hicks Canyon Wash, located along the northern perimeter of the site, is susceptible to a 1% annual chance flood discharge (FEMA 2009). In addition, the project site is not located in a dam inundation area, as indicated in the 2045 Irvine General Plan Safety Element (City of Irvine 2024b). Because the project site is not located within a potential flood zone, the project would not impede or redirect flood flows. No impacts would occur.

4. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

No Impact. As previously discussed, the project site is not located within a FEMA-designated flood zone. The project site is not located in proximity to the coastline and would therefore not be susceptible to tsunamis. The project site is not located in a dam inundation area (City of Irvine 2024) and is not located adjacent to an enclosed body of water that could be susceptible to seiches. The closest reservoir, the Syphon Reservoir, is located approximately 2,000 feet southeast of the project site, and a large hill is located between the reservoir and the project site. A potential seiche in this reservoir would only affect areas immediately adjacent to the reservoir (generally, within 100 feet). As a result, the project would not risk release of pollutants due to project inundation. No impacts would occur.

5. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less-Than-Significant Impact. As discussed below, the project would not conflict with or obstruct with implementation of a water quality control plan or sustainable groundwater management plan.

Construction

The project would be required to comply with the Construction General Permit requiring preparation and implementation of a SWPPP to control runoff from construction worksites. The SWPPP must include BMPs to address transport of sediment and to protect properties from erosion, flooding, or the deposition of mud, debris, or construction-related pollutants. Implementation of BMPs, including physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of infiltration swales, protection of stockpiled materials, and a variety of other measures, would substantially reduce the potential for impacts to surface water quality from occurring during construction. Therefore, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and impacts from construction would be less than significant.

Operations

The project is subject to the requirements of the Basin Plan with respect to surface water quality and the Basin 8-1 Alternative with respect to the Irvine Sub-basin of the Orange County Groundwater Basin. The Basin Plan outlines water quality objectives for all surface water resources within the Basin Plan area, including San Diego Creek and Upper Newport Bay. Compliance with the Basin Plan is ensured through waste

discharge requirements for all surface water discharges, including stormwater. The Orange County Flood Control District and the incorporated cities of the County within the Santa Ana RWQCB jurisdiction, as Permittees under the County NPDES MS4 Permit, are required to implement stormwater BMPs that comply with water quality objectives, including capturing and treating stormwater runoff.

A WQMP (Appendix F-4) has been developed for the project as required under the County NPDES MS4 Permit and in accordance with the Orange County Hydrology Manual (Orange County Environmental Management Agency 1986, 1996) and the City of Irvine Standards (City of Irvine 2013). The WQMP includes biofiltration for water quality treatment, as described previously. Compliance with the NPDES MS4 permit and LID requirements would ensure that the project is consistent with the Basin Plan's water quality objectives. The Basin 8-1 Alternative outlines sustainability criteria and management actions needed to avoid undesirable results from groundwater extraction, including (1) lowering of groundwater levels, (2) reduction in storage, (3) water quality degradation, (4) seawater intrusion, (5) inelastic land subsidence, or (6) depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. Pursuant to the Basin 8-1 Alternative, the Submitting Agencies will ensure the entire Basin 8-1 continues to be sustainably managed and data reported as required by SGMA (Appendix F-1, Water Supply Assessment). As a result, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and impacts would be less than significant.

Impact Summary

Through compliance with applicable state and local regulations, the project would not result in any significant water quality impacts related to soil erosion during the construction phase.

The project's LID water quality BMPs and compliance with applicable laws and regulations would ensure that operation of the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality, and impacts would be less than significant.

The project would not substantially decrease groundwater supplies such that the project may impede sustainable groundwater management of the Basin. Impacts would be less than significant.

The project would not interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the Basin. Impacts would be less than significant.

With incorporation of stormwater detention tanks and/or aboveground detention basins into the project design, the project would not result in increased runoff and associated on-site or off-site erosion and siltation of downstream drainages. Impacts would be less than significant.

With incorporation of stormwater detention tanks and/or aboveground detention basins into the project design, in compliance with County and City stormwater standards, the project would not result in a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on or off site. Impacts would be less than significant.

The project's LID water quality BMPs and compliance with applicable water quality laws and regulations would ensure that operation of the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality. Impacts would be less than significant.

Because the project site is not located within a potential flood zone, the project would not impede or redirect flood flows. No impacts would occur.

The project would not risk release of pollutants due to project inundation. No impacts would occur.

The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Impacts from construction and operation would be less than significant.

4.10.5 Mitigation Measures

No significant hydrology and water quality impacts were identified in the analysis in this section; therefore, no mitigation measures are required.

4.10.6 Level of Significance After Mitigation

No mitigation is required; hydrology and water quality impacts would remain less than significant.

4.10.7 Cumulative Impacts

Water Quality – Construction

The geographic area under consideration for the topic of water quality includes the boundaries of the Central Orange County Watershed Management Area (Figure 4.10-2), as stormwater throughout this area feeds into Upper Newport Bay. During construction activities, the project site, in addition to other activities within the watershed, would use hazardous materials (e.g., fuel, oil, paint), and an accidental spill of hazardous materials could result in inadvertent releases to surface waters, which could adversely affect surface water or groundwater quality. In addition, construction would have the potential to result in local soil erosion during excavation, grading, trenching, and soil stockpiling. Erosion could result in sediment and other pollutants entering surface water bodies and adversely affecting water quality. However, the project and the cumulative projects would be subject to the same regulatory requirements discussed above.

Any cumulative project that has the potential to impact hydrology and water quality would also be required to comply with the NPDES Construction General Permit and its required SWPPP, the NPDES MS4 BMP requirements, and the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program and its required hazardous materials business plan (see Section 4.9, Hazards and Hazardous Materials, of this Draft EIR), all designed to prevent impacts to water quality and have procedures in place for responding to spills. While it is possible that the cumulative projects that contribute flows to Upper Newport Bay could result in releases of sediment and/or pollutants that could adversely affect water quality, the responsible parties associated with the project and the other cumulative projects would be required to control runoff and respond to spills to the same or similar established regulatory standards from the City, as discussed both in this section and in Section 4.9. Therefore, compliance with water quality regulations would ensure that the cumulative impacts would not be considerable.

Water Quality – Operations

Once constructed, the design of the project and the cumulative projects would result in the drainage systems for each site incorporating the requirements of the regulations discussed above during operations. As a result, the cumulative projects would incorporate on-site runoff management infrastructure, water quality BMPs, and adequate

connections to the existing stormwater drainage system. Therefore, with compliance with these regulations and implementation of stormwater management measures, the project would not cause or contribute to a cumulatively significant impact to hydrology and water quality.

Groundwater Supplies – Construction

The geographic area under consideration for the topic of groundwater supplies and recharge includes boundaries of the Irvine Sub-basin of the Orange County Groundwater Basin (see Figure 4.10-3). The Irvine Sub-basin underlies the City and receives infiltration from the entire Central Orange County Watershed Management Area. Based on the Basin 8-1 Alternative, diversity of water supplies results in relatively constant groundwater production levels and minimizes adverse impacts to groundwater supplies. In general, water use during construction is not substantial, mostly due to the relatively low quantities required and the duration of water supply needs, which is for relatively short time periods. During construction, most, if not all, cumulative projects would require grading and excavation that would likely require water for dust suppression. However, the source of water for dust suppression could come from a variety of sources and, again, would only be required on a temporary basis. Therefore, considering that the Irvine Sub-basin has a sustainable yield that includes future growth impacts from construction activities, along with the relatively minimal amount of water supplies needed, the potential impacts related to groundwater supplies and sustainable management of the Irvine Sub-basin would not be cumulatively considerable.

Groundwater Supplies and Recharge – Operations

Based on the Basin 8-1 Alternative, IRWD's water supplies remain essentially constant between normal, single-dry, and multiple-dry years. Groundwater production from the Basin typically remains constant, and Metropolitan's 2020 Urban Water Management Plan concludes that Metropolitan has supply capabilities sufficient to meet expected demands from 2025 through 2045 under a single-dry-year condition and a period of drought lasting five consecutive years, as well as under a normal water year condition. Recycled water production also remains constant and is considered "drought-proof" as a result of constant sewage flows, including years with low precipitation. This diversity of water supplies results in relatively constant groundwater production levels and minimizes adverse impacts to groundwater supplies. Based on the Water Supply Assessment (Appendix F-1) and Water Supply Verification (Appendix F-2), adequate water supplies are available to meet (1) the existing and committed demand (i.e., without the project); (2) the existing and committed demand, plus the project; and (3) the full buildout associated with IRWD's Water Resources Master Plan, which includes all cumulative projects within the City.

In addition, Basin 8-1 has been operated within its sustainable yield for more than 10 years without experiencing significant and unreasonable (1) lowering of groundwater levels; (2) reduction in storage; (3) water quality degradation; (4) seawater intrusion; (5) inelastic land subsidence; or (6) depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. Pursuant to the Basin 8-1 Alternative, the Submitting Agencies will ensure the entire Basin 8-1 continues to be sustainably managed and data reported as required by SGMA (Appendix F-1). As a result, cumulative project development would not substantially decrease groundwater supplies such that the project may impede sustainable groundwater management of the basin. Therefore, groundwater supply impacts would not be cumulatively considerable.

On-site soils are not conducive to stormwater infiltration and, as a result, do not substantially contribute to groundwater recharge beneath the site. Regardless, increases in impervious surfaces, such as would occur with the project and likely other cumulative projects, could contribute to a cumulative reduction in natural recharge within the Basin. However, as described above for the project, cumulative projects are required to implement LID drainage control features that encourage as much on-site infiltration of stormwater runoff as feasible. As a result, blocked recharge potential associated with cumulative project development would not be cumulatively considerable.

Changes in Stormwater Runoff

The geographic area under consideration for the topic of changes in stormwater runoff that could result in substantial erosion/siltation, flooding on site or off site, exceeding stormwater drainage system capacity or generating polluted runoff, or result in possible loss or damage due to flooding, includes the watershed for the Central Orange County Watershed Management Area, or Upper Newport Bay (see Figure 4.10-2). The project and other proposed developments within the watershed would be subject to storm flow management designs imposed by the City and the County to ensure that cumulative development does not result in excessive runoff that could overwhelm regional flood control facilities. Per the Orange County Hydrology Manual and the City of Irvine Standards, a 25-year-frequency storm event was selected for design peak flow rate evaluation because sump conditions are present on site (Appendix F-2). The designs of the project and other proposed development would result in the drainage systems of each site incorporating either City, County, and/or FEMA requirements to avoid downstream flood impacts. As a result, cumulative projects would also be required to incorporate on-site runoff management measures, water quality BMPs, and adequate connections to the existing City and County stormwater drainage system. In addition, each project would be required to comply with NPDES MS4 BMP requirements and LID practices, along with City Municipal Code or County Code requirements, that would minimize pollutants in stormwater runoff. Therefore, reducing project flows to County and City standards would ensure that project effects on drainage would not be cumulatively considerable.

Flooding

The geographic area under consideration for the topic of flood hazards includes the watershed for the Central Orange County Watershed Management Area, or Upper Newport Bay (see Figure 4.10-2). Areas within the watershed, especially low-lying areas within proximity to San Diego Creek, the San Joaquin Marsh, and Mason Park, include flood hazard areas. In general, flood hazards are site-specific and do not become cumulatively considerable unless they are all within the same flood hazard area. The project site is not located within a FEMA floodplain, dam inundation area, potential seiche area, or potential tsunami area. Each cumulative project would be evaluated with respect to flooding impacts and would comply with FEMA regulations. As a result, flood-related impacts would not be cumulatively considerable.

4.10.8 References

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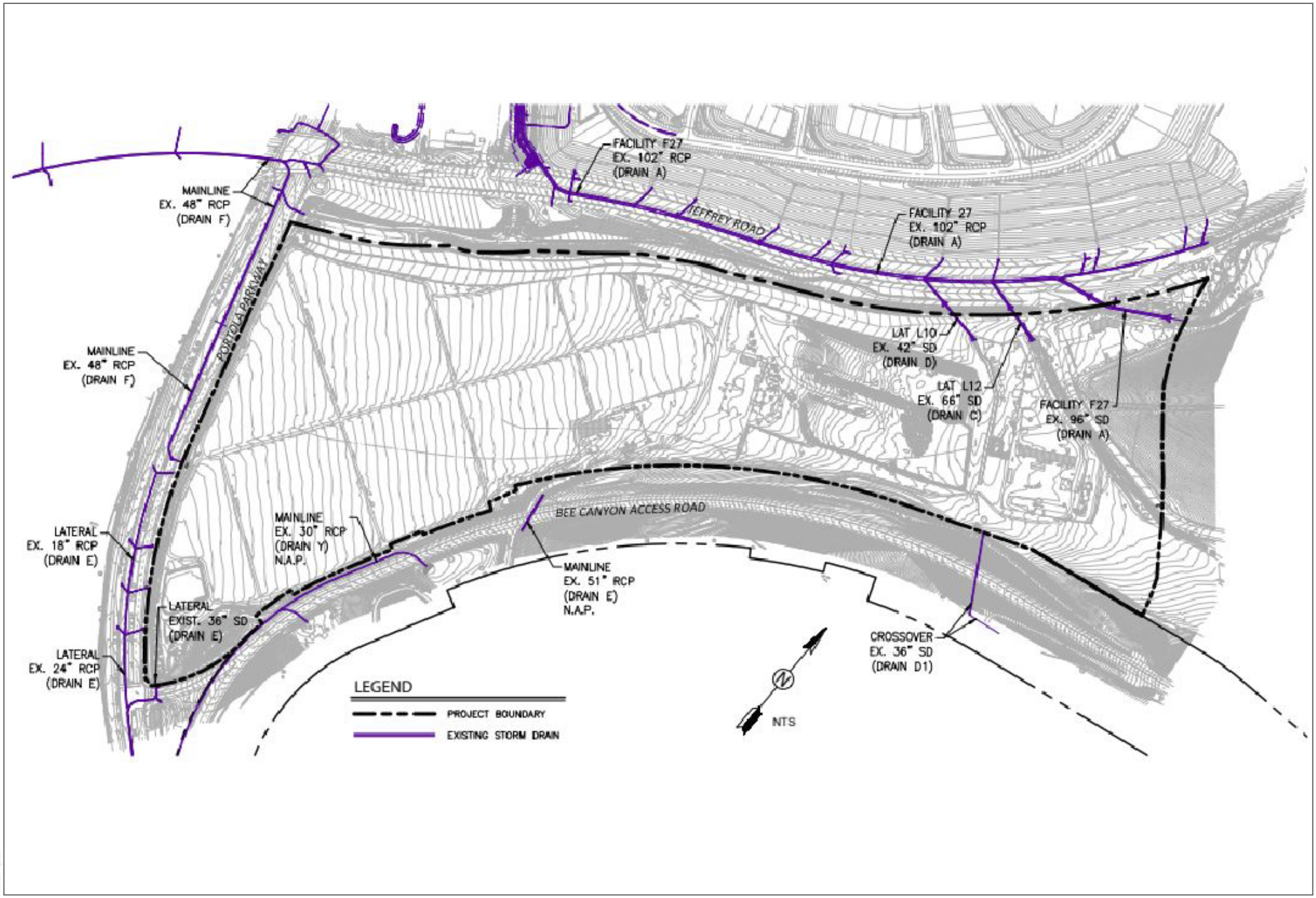

SOURCE: Fuscoe 2024a

FIGURE 4.10-1

Existing On-Site Hydrology

Irvine Gateway Village Project EIR

DUDEK

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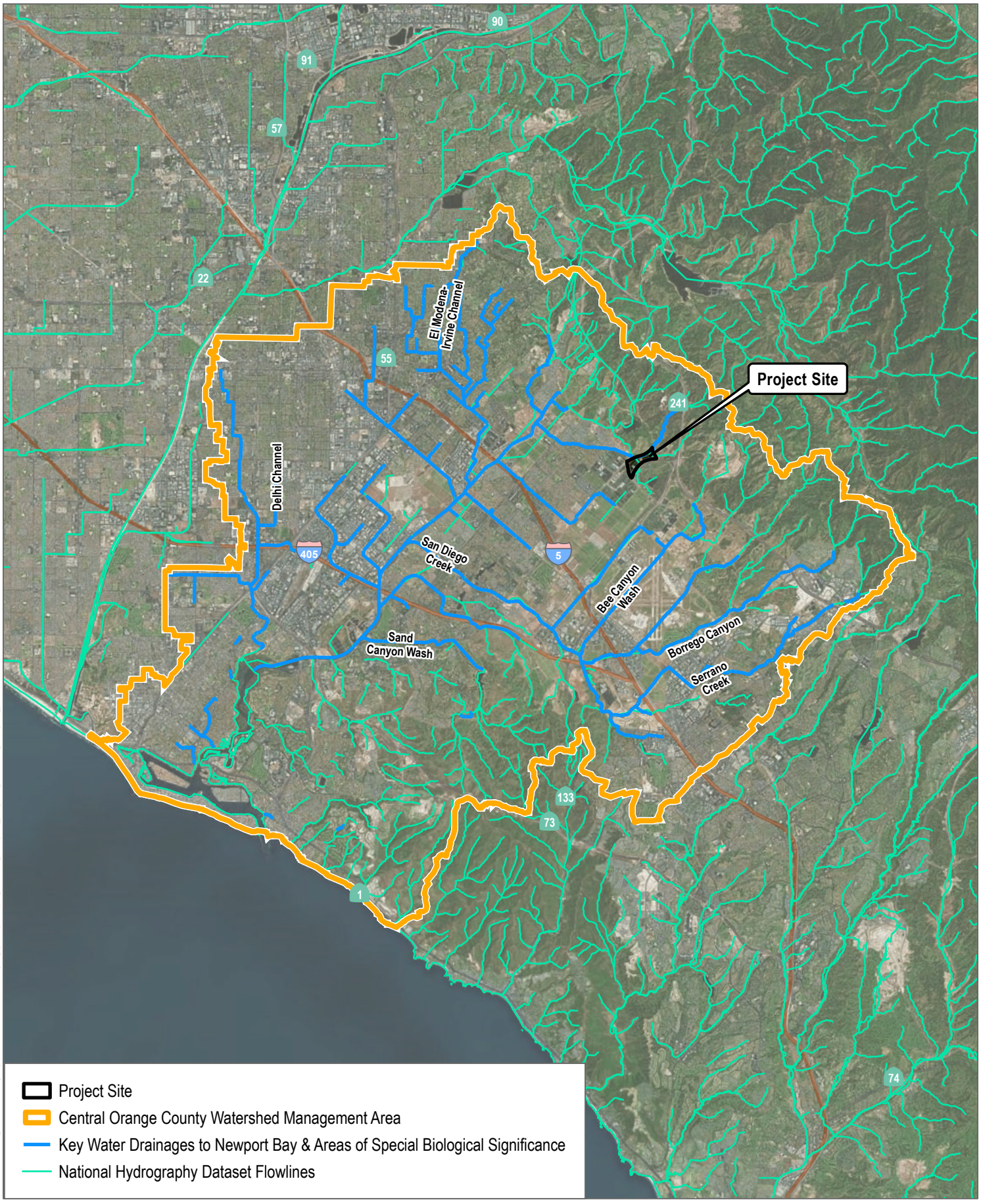

SOURCE: Bing Maps (Accessed: 2025); County of Orange 2007

DUDEK

0 5,000 10,000 Feet

FIGURE 4.10-2

Regional Hydrology

Irvine Gateway Village Project EIR

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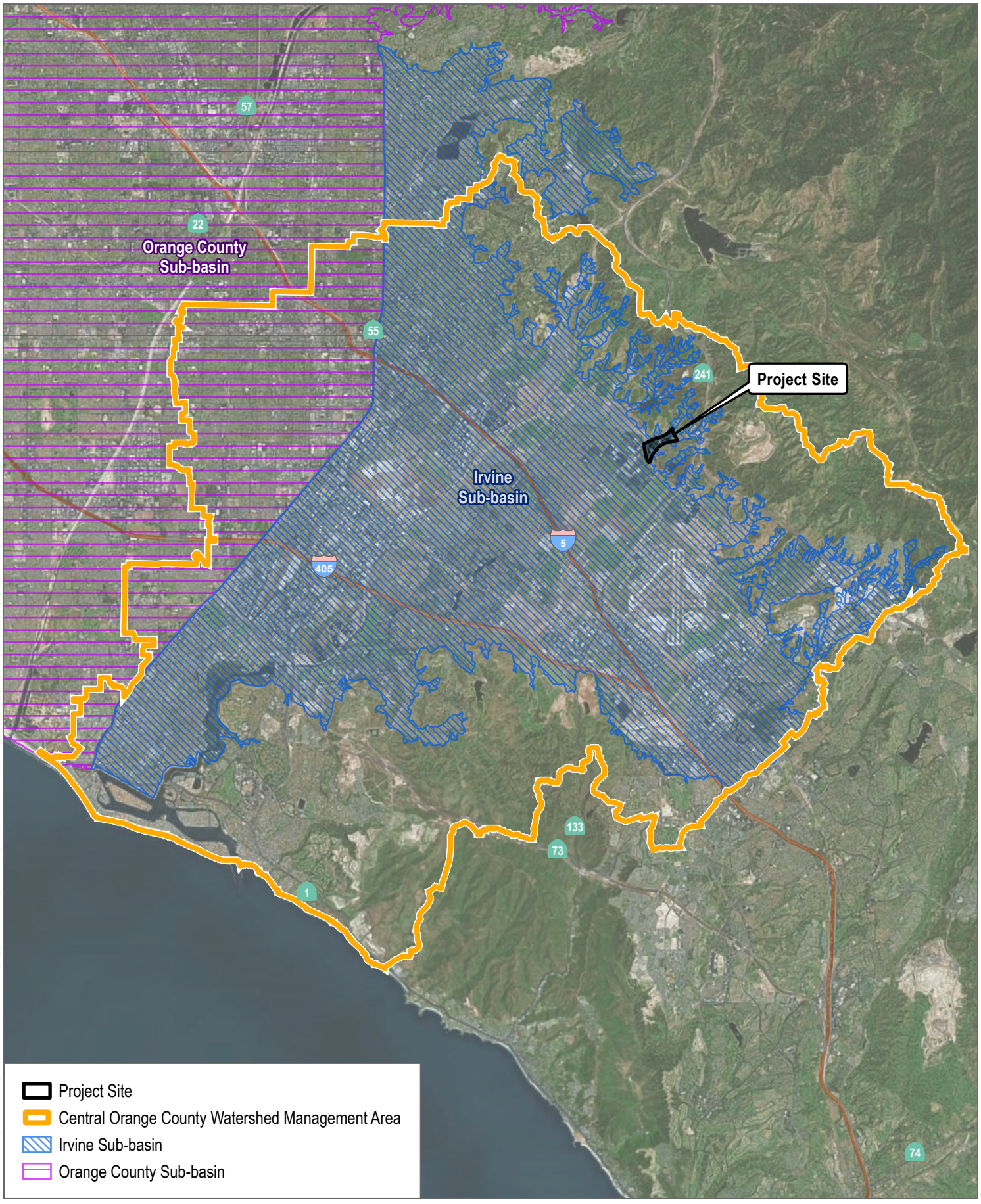

SOURCE: Bing Maps (Accessed: 2025); County of Orange 2007

DUDEK

0 5,000 10,000 Feet

FIGURE 4.10-3

Orange County Groundwater Basin

Irvine Gateway Village Project EIR

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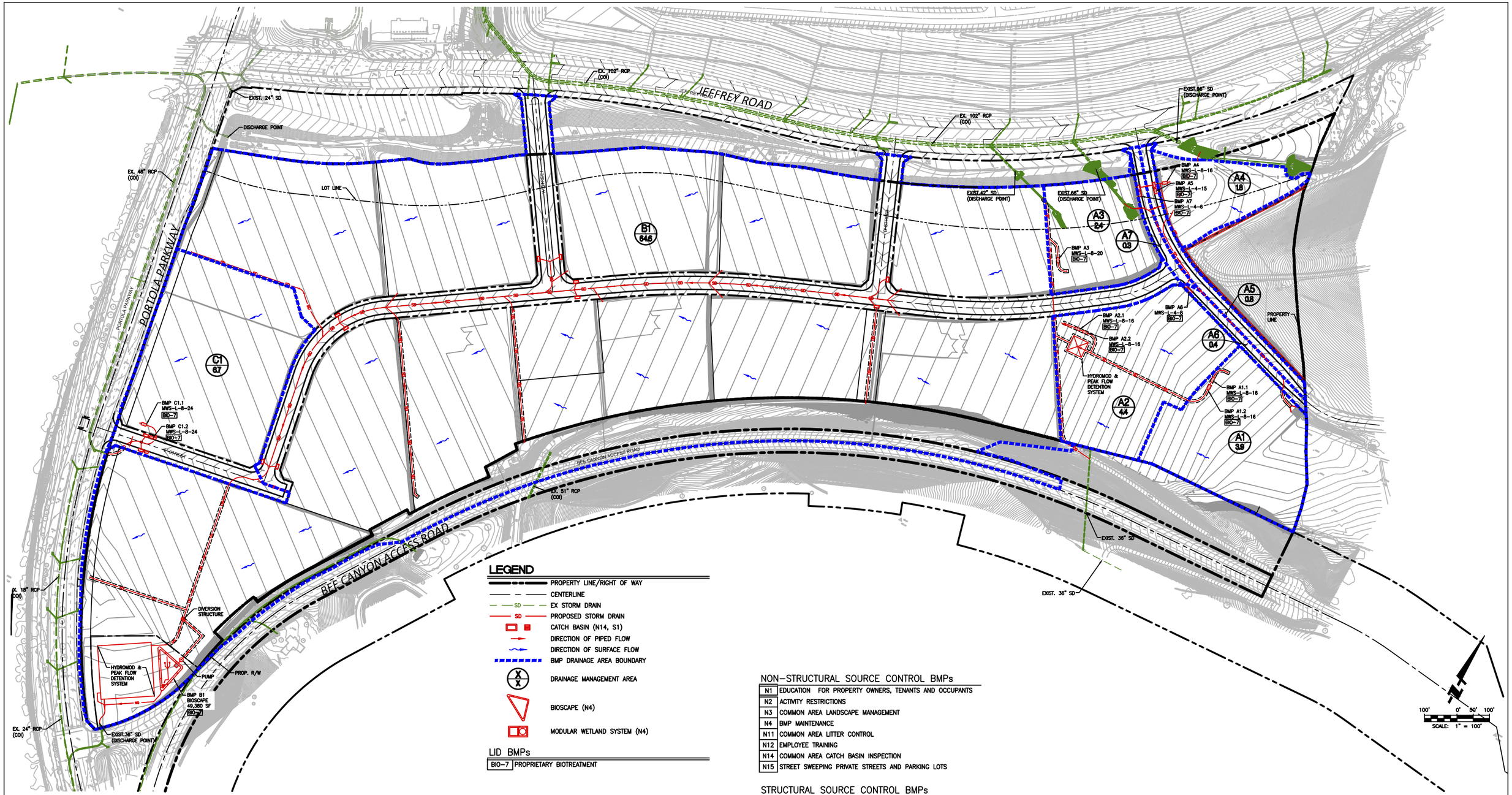

LEGEND

- PROPERTY LINE/RIGHT OF WAY
- CENTERLINE
- EX STORM DRAIN
- PROPOSED STORM DRAIN
- CATCH BASIN (N14, S1)
- DIRECTION OF PIPED FLOW
- DIRECTION OF SURFACE FLOW
- BMP DRAINAGE AREA BOUNDARY
- DRAINAGE MANAGEMENT AREA
- BIOSCAPE (N4)
- MODULAR WETLAND SYSTEM (N4)

LID BMPs

BIO-7	PROPRIETARY BIOTREATMENT

ABBREVIATIONS

COI	CITY OF IRVINE
FCS	FULL CAPTURE SYSTEM
MWS	MODULAR WETLAND SYSTEM
RCP	REINFORCED CONCRETE PIPE
SD	STORM DRAIN

NON-STRUCTURAL SOURCE CONTROL BMPs

N1	EDUCATION FOR PROPERTY OWNERS, TENANTS AND OCCUPANTS
N2	ACTIVITY RESTRICTIONS
N3	COMMON AREA LANDSCAPE MANAGEMENT
N4	BMP MAINTENANCE
N11	COMMON AREA LITTER CONTROL
N12	EMPLOYEE TRAINING
N14	COMMON AREA CATCH BASIN INSPECTION
N15	STREET SWEEPING PRIVATE STREETS AND PARKING LOTS

STRUCTURAL SOURCE CONTROL BMPs

S1	PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE
S4	USE EFFICIENT IRRIGATION SYSTEMS & LANDSCAPE DESIGN, WATER CONSERVATION, SMART CONTROLLERS, AND SOURCE CONTROL

SOURCE: Fuscoe 2024b

FIGURE 4.10-4

Proposed On-Site Hydrology

Irvine Gateway Village Project EIR

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