

5. Environmental Analysis

5.8 HYDROLOGY AND WATER QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential impacts of the Proposed Project to hydrology and water quality conditions in the City of San Juan Capistrano. Hydrology deals with the distribution and circulation of water, both on land and underground. Water quality deals with the quality of surface and groundwater. Surface water includes lakes, rivers, streams, and creeks; groundwater is under the earth's surface. The analysis in this section is based in part on the following technical report:

- *Preliminary Drainage Study: Creekside San Juan Capistrano, California*, KHR Associates, January 10, 2020.
- *Conceptual Water Quality Management Plan (WQMP)*, KHR Associates, April 8, 2020.

Complete copies of these studies are included in Appendix G and H of this DEIR, respectively.

5.8.1 Environmental Setting

5.8.1.1 REGULATORY BACKGROUND

Local laws, regulations, plans, or guidelines that are potentially applicable to the Proposed Project are summarized in this section. They are designed to achieve regional water quality objectives and thereby protect the beneficial uses of the region's surface and groundwater.

Federal

Clean Water Act

The Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972. The CWA is the principal statute governing water quality. It establishes the basic structure for regulating discharges of pollutants into the waters of the United States (U.S.)¹ and gives the federal Environmental Protection Agency (EPA) the authority to implement pollution-control programs, such as setting wastewater standards for industry. The statute's goal is to end all discharges entirely and to restore, maintain, and preserve the integrity of the nation's waters. The CWA regulates both the direct and indirect discharge of pollutants into the nation's waters. The CWA sets water quality standards for all contaminants in surface waters and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit is obtained under its provisions. The CWA mandates permits for wastewater and stormwater discharges, requires states to establish site-specific water quality standards for navigable bodies of water, and regulates other activities that affect water quality, such as dredging and the filling of wetlands. The CWA also funded the construction of sewage treatment plants and recognized the need for planning to address nonpoint sources of pollution. The following CWA Sections assist in ensuring water quality in surrounding water bodies.

¹ Waters of the U.S., generally include surface waters—lakes, rivers streams, bays, the ocean, dry streambeds, wetlands, and storm sewers that are tributary to any surface water body.

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- **Section 208** of the CWA requires the use of best management practices (BMPs) to control discharge of pollutants in stormwater during construction.
- **Section 303(d)** requires creation of a list of impaired water bodies by states, territories, and authorized tribes; evaluation of lawful activities that may impact impaired water bodies;² and preparation of plans to improve the quality of these water bodies. Water bodies on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution-control technology.
- **Section 402(p)** establishes a framework to control water pollution by regulating point-source discharges under the National Pollutant Discharge Elimination System (NPDES) permit program. Point-source discharges are readily identifiable, discrete inputs where waste is discharged to the receiving waters from a pipe or drain. Nonpoint discharges occur over a wide area and are associated with particular land uses (such as urban runoff from streets and stormwater from construction sites).

National Pollution Discharge Elimination System

Under the NPDES program (under Section 402 of the CWA), all facilities that discharge pollutants from any point source into waters of the U.S. must have a NPDES permit. The term “pollutant” broadly applies to any type of industrial, municipal, and agricultural waste discharged into water. Point sources can be publicly owned treatment works (POTWs), industrial facilities, and urban runoff. (The NPDES program addresses certain agricultural activities, but the majority are considered nonpoint sources and are exempt from NPDES regulation.) Direct sources discharge directly to receiving waters, and indirect sources discharge to POTWs, which in turn discharge to receiving waters. Under the national program, NPDES permits are issued only for direct, point-source discharges. The NPDES has a variety of measures designed to minimize and reduce pollutant discharges. All counties with storm drain systems that serve a population of 50,000 or more, as well as construction sites one acre or more in size, must file for and obtain an NPDES permit.

State

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act (Water Code sections 13000 et seq.) is the basic water quality control law for California. Under this Act, the State Water Resources Control Board (SWRCB) has ultimate control over state water rights and water quality policy. In California, the EPA has delegated authority to issue NPDES permits to the SWRCB. The state is divided into nine regions related to water quality and quantity characteristics. The SWRCB, through its nine Regional Water Quality Control Boards (RWQCBs) carries out the regulation, protection, and administration of water quality in each region. Each regional board is required to adopt a Water Quality Control Plan or Basin Plan that recognizes and reflects the regional differences in existing water quality, the beneficial uses of the region’s ground and surface water, and local water quality conditions and problems.

² Impaired water bodies, and water bodies that do not meet, or are not expected to meet, water quality standards.

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Regional

Orange County Flood Control Act

The Orange County Flood Control Act gave the authority to the Orange County Flood Control District (OCFCD) to control flood and storm water from streams that may flow into and within Orange County. The OCFCD provides flood control by designing and constructing improvements and operating and maintaining OCFCD's flood control channels, retarding basins, dams, and pump stations to handle the discharge of a 100-year storm event.

South Orange County MS4 Permit

Whereas the General Construction Permit are issued statewide, MS4 permits are issued by local RWQCBs in order to provide the permits with the means to address stormwater quality issues specific to the local watershed or region. As a result, MS4 permits are a more prescriptive level of regulation, requiring permittees to develop and implement a stormwater-management program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). The MEP standard is a more stringent performance standard than BCT/ BAT established for the General Construction Permit. The stormwater management program or Drainage Area Management Plan (DAMP), as it is referred to in the MS4 Permit, must specify SARWQCB-approved BMPs.

The Proposed Project and its facilities would discharge into the MS4 within the jurisdiction of the City of San Juan Capistrano. Pursuant to the South Orange County MS4 Permit (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100), the City is responsible for controlling or limiting urban pollutants generated by construction and post-construction activities from reaching their MS4s. The Proposed Project is, therefore, subject to the requirements of the South Orange County MS4 Permit as it is applied by the permittee and its co-permittees.

Orange County Drainage Area Management Plan

The Orange County Drainage Area Management Plan (DAMP) is primary policy, planning and implementation document for municipal NPDES Stormwater Permit compliance. The DAMP describes the agreements, structures and programs that:

- Provide the framework for the program management activities and plan development
- Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment
- Improve existing municipal pollution prevention and removal best management practices (BMPs) to further reduce the amount of pollutants entering the storm drain system
- Educate the public about the issue of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs

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- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues
- Ensure that construction sites implement control practices that address control of construction related pollutants discharges including erosion and sediment control and on-site hazardous materials and waste management
- Ensure that existing development will address discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations (Note: The San Diego permit explicitly outlines a residential component, but the Santa Ana permit is more general about residential requirements)
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system
- Identify impacted receiving waters and produce environmental quality information to direct management activities, including prioritization of pollutants to support the development of specific controls to address these problems
- Assess watersheds and manage urban runoff on a watershed basis (OC Public Works 2020).

Orange County Hydrology Manual

The Orange County Hydrology Manual (OCHM) provides the computational techniques and criteria for the estimation of runoff, discharges, and volumes to provide protection to all habitable structures and other non-floodproof structures from a 100-year storm event. The OCHM also provides specific design criteria for more frequent flood events such as a 10 and 25-year storm event (OCEMA 1986).

Orange County Local Drainage Manual

The Orange County Local Drainage Manual provides design criteria policies and procedures to be used as guidelines in the design of drainage facilities in Orange County. The manual provides the guidelines necessary to apply the OCHM for design of local drainage systems in Orange County and is intended to be consistent with the Orange County DAMP (OCEMA 1996).

Local

City of San Juan Capistrano Jurisdictional Runoff Management Plan

The City of San Juan Capistrano Jurisdictional Runoff Management Plan (JRMP) was prepared to comply with the permit provision in R9-2013-0001, as amended by R9-2015-0001 and R9-2015-0100. Additionally, the JRMP serves to protect and improve water quality for identified beneficial uses of local surface waters within the City limits. The JRMP includes a wide range of continuing and enhanced Best Management Practices (BMPs) and control techniques to help prevent or eliminate the discharge of pollutants into and from the City's storm drainage system to the local surface waters. The City's JRMP is intended to serve as the planning and

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implementation document that the City will follow during the life of the Regional Permit, and may be further updated and modified as the City determines necessary, or as directed by the Regional Board (San Juan 2019).

5.8.2 Existing Conditions

Regional Drainage

The City of San Juan Capistrano is in the San Juan Creek Watershed that encompasses about 616 square miles. The City lies in a valley surrounded to the north, west and east by coastal foothills that reach an elevation of about 880 feet above sea level. The City is traversed by three major creeks—San Juan, Oso and Trabuco Creeks. Oso Creek passes approximately half a mile west of the Proposed Project and Trabuco Creek passes approximately 0.6 miles southwest of the proposed site. San Juan Creek passes 2 miles east of the Proposed Project.

Generally, the City of San Juan Capistrano provides storm drain service to the entire City. The existing storm drain system, owned and operated by the City, consists of catch basins, inlets, detention basins, desilting basins, and other drainage infrastructure.

Many of the stream reaches in the San Juan Hydrologic Unit suffer from “urban stream syndrome” to varying degrees as a result of past modifications to stream form (i.e., channelization), increases in hydrologic loading, primarily from increases in imperviousness, dry weather nuisance water discharges, and/or increases in pollutant loads from urbanization. Except in certain reaches that are upstream of the limits of urbanization, most reaches are experiencing impacts associated with at least two of these stressors (South Orange County 2016).

Groundwater

San Juan Capistrano lies in the San Juan Valley Groundwater Basin (see Figure 5.8-1, *San Juan Valley Groundwater Basin*). The San Juan Valley Groundwater Basin (San Juan Basin) is located in the San Juan Creek Watershed and is comprised of four principal groundwater sub-basins: Lower Basin, Middle Basin, Upper Basin, and Arroyo Trabuco. San Juan Basin is managed by the San Juan Basin Authority (SJBA), and members of the SJBA are the City of San Juan Capistrano, Santa Margarita Water District, Moulton Niguel Water District, and South Coast Water District. The San Juan Basin is recharged through a variety of sources such as: 1) streambed infiltration in San Juan Creek, Horno Creek, Oso Creek, and Arroyo Trabuco; 2) subsurface inflows along boundaries at the head of the tributaries upstream and other minor subsurface inflows from other boundaries; 3) precipitation and applied water; and 4) flow from fractures and springs.

The San Juan Basin is considered a subterranean flowing stream and is therefore subjected to the State Water Resources Control Board’s water rights purview. It is not an adjudicated groundwater basin and has not been identified by Department of Water Resources as overdrafted.

The City receives approximately 62 percent of its water supply from groundwater from the San Juan Valley Groundwater Basin (56 percent from the City’s Groundwater Recovery Plant and 6 percent from domestic wells), 22 percent from imported water, and 16 percent from recycled water. Under Permit 21074 (Permit for

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Diversion and Use of Water) issued by the California State Water Resources Control Board (SWRCB) in October 2000 and amended in October 2011, the SJBA may extract up to 8,026 acre-feet per year (afy) of groundwater from the San Juan Basin (WEI 2016). Pursuant to the City's 2002 Implementation Agreement with the SJBA, the City has the right to produce 5,800 afy (Arcadis 2016).

A groundwater table was not encountered up to a depth of 93 feet below ground surface (bgs) during the subsurface field evaluation conducted at the Project Site. However, some seepages were observed at depths ranging from 11 feet bgs and 41 feet. (LGG 2019)

Surface Water

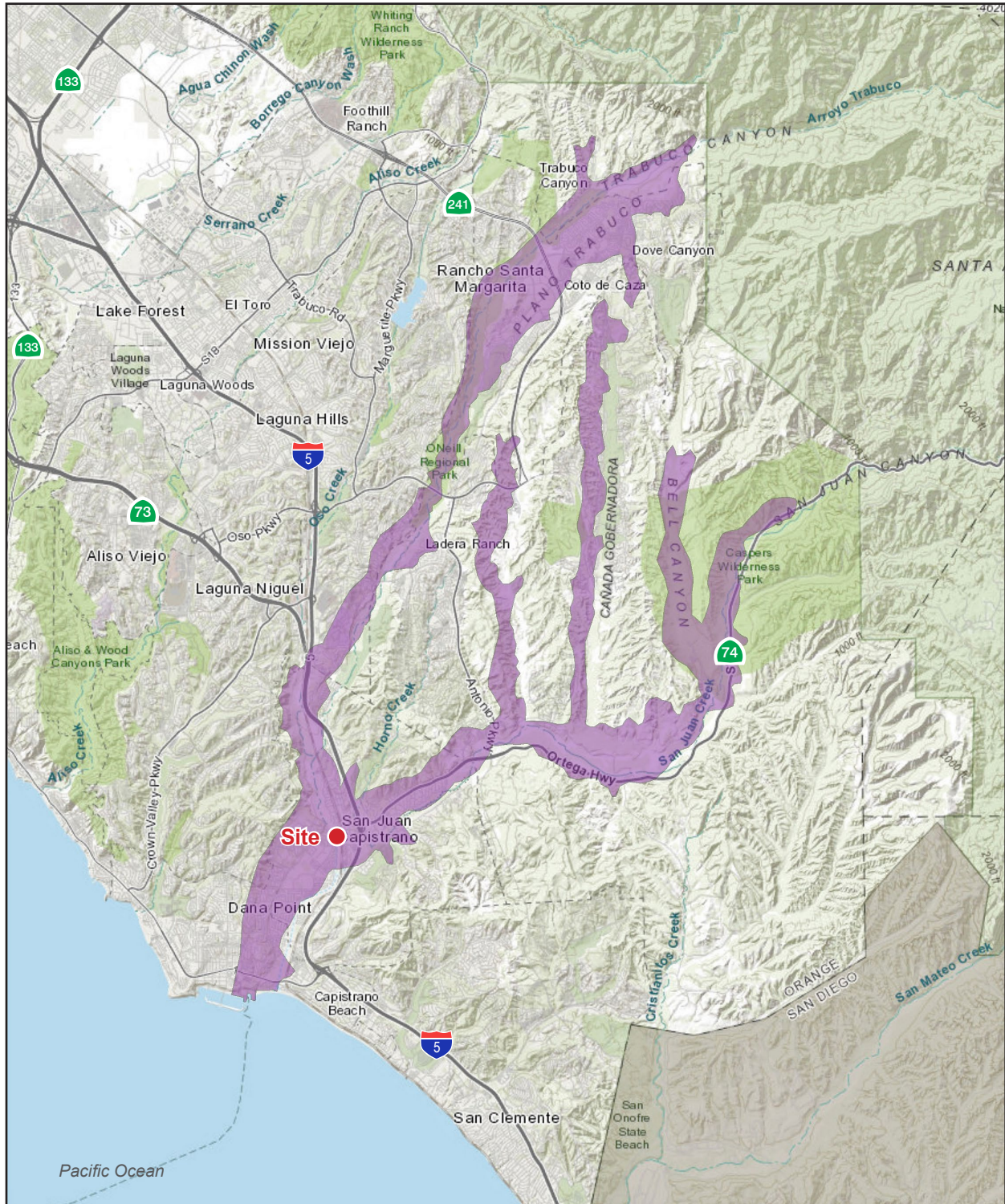
Three creeks located in the City of San Juan Capistrano are the San Juan, Trabuco, and Oso Creeks. These creeks carry water runoff from the hills northeast of the City toward the Pacific Ocean in the south. Oso Creek is a tributary of Trabuco Creek, which in turn is a tributary of San Juan Creek. San Juan Creek empties into the ocean at Doheny State Park south of the City. Floods can be expected along any of these creeks (San Juan Capistrano, 1999b). The topography in the area is characterized by valley floors, which are associated with the creeks, and the foothills and ridgelines that surround the valley floor. A significant portion of the flood plain associated with these creeks contains poorly consolidated sediments and high groundwater levels (San Juan Capistrano, 1999a).

Sections of San Juan Creek upstream of the I-5 Freeway have received rip-rap or soil cement improvements to protect adjacent development from flooding. Lower San Juan creek (downstream of the Interstate 5 bridge) has been modified for flood control with the sides protected by concrete or rip-rap, and with a soft earthen bottom. The channel is concrete lined from Camino Capistrano Bridge downstream to the ocean. Trabuco Creek is concrete lined from the intersection with San Juan Creek upstream to approximately 1,800 feet north of the Del Obispo Street Bridge (San Juan Capistrano, 1999a).

Drainage Facilities

The site elevation rises by 76 feet from the east boundary to the northwest portion. Rancho Viejo Road slopes from south to north and Malaspina Road slopes from east to west. Figure 5.8-2, *Existing Drainage Plan*, illustrates the existing drainage condition of the Project Site. Runoff on the property flows westerly toward Rancho Viejo Road and along the curb and gutter until it is collected by one of the six catch basins near the western property line. All catch basins connect to the City's storm drain line, which varies in size from 15 inches, 18 inches, 21 inches, 36 inches, 42 inches, and 48 inches. The City's storm drain line conveys runoff into Casitas Capistrano Storm Drain (owned by OCFCD) which drains into Trabuco Creek Channel and ultimately discharges into San Juan Creek Channel. These channels contain deficient reaches that are not capable of conveying runoff from the 100-year storm event.

Figure 5.8-1 - San Juan Valley Groundwater Basin
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 San Juan Valley Groundwater Basin

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Scale (Miles)



Source: DWR, 2016

PlaceWorks

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Furthermore, the Project Site receives run-on from the hillside to the east. The northerly portion of the hillside run-on is collected within a storm drain system that discharges to the curb face on Malaspina Road via a parkway culvert. The southerly portion of the hillside run-on is collected in a storm drain system that discharges to the curb face on Rancho Viejo Road via a parkway culvert.

Other constituents of concern within the San Juan Basin include nitrate, manganese, and iron. Manganese is a naturally-occurring inorganic constituent dissolved in water. Manganese is an essential micronutrient at low concentrations, but at higher concentrations in drinking water, manganese may lead to objectionable aesthetic qualities such as bitter taste and staining of clothes. The California secondary MCL for manganese is 0.5 mg/L. Most wells monitored for manganese exceeded the secondary MCL for manganese by as much as 40 times. Iron is a naturally-occurring inorganic constituent dissolved in water. Similar to manganese, iron in low concentrations is an essential micronutrient, but iron in higher concentrations in drinking water leads to the same objectionable aesthetic qualities as those of manganese. The California secondary drinking water MCL for iron is 0.3 mg/L. With the exception of one groundwater well in the Oso area, all wells tested with the groundwater basin exceeded the secondary MCL for iron by as much as 60 times (Arcadis 2016).

Flood Hazards

The City's Safety Element shows that the Project Site is not located in an area of potential flooding from a 100-year flood or from a dam failure. Furthermore, the Project Site is approximately 4.5 miles from the ocean. For this reason, tsunamis are not a concern at the Project Site.

5.8.3 Thresholds of Significance

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

- HYD-1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
- HYD-2 Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- HYD-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - i) Result in a substantial erosion or siltation on- or off-site.
 - ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.

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- iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
 - iv) Impede or redirect flood flows.
- HYD-4 In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.
- HYD-5 Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The Initial Study, included as Appendix A, concluded that impacts associated with thresholds HYD-1 through HYD-5 would be less than significant. However, a comment letter was received from the Orange County Public Works (OCPW) department on May 14th, 2020 during the initial study's public review period (see Appendix B). The letter raised concerns associated with flooding offsite. In response to the OCPW's comment letter, Threshold HYD-3 (ii), (iii), and (iv) will be discussed further in this DEIR.

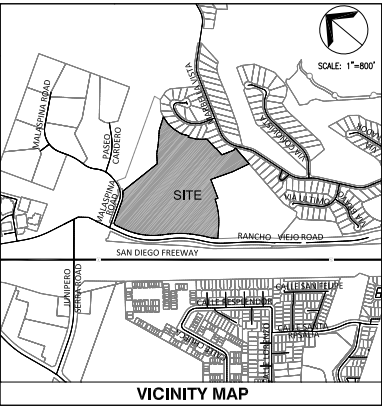
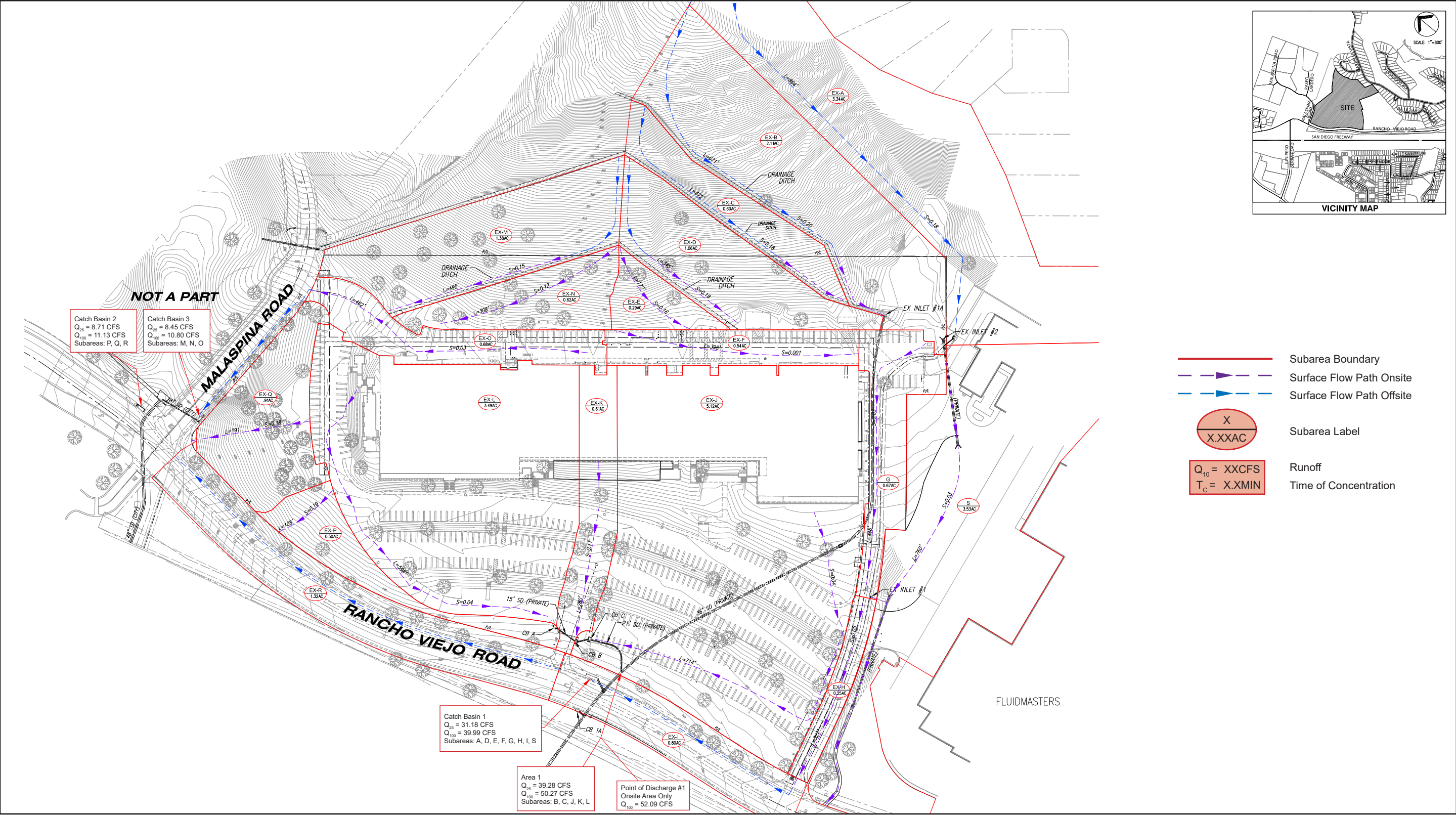
5.8.4 Plans, Programs, and Policies

- PPP HYD-1 The Proposed Project shall design drainage facilities in compliance with the Orange County Hydrology Manual and the Orange County Local Drainage Management Plan to protect all habitable structures and other non-floodproof structures from a 100-year storm event.
- PPP HYD-2 The Proposed Project will be constructed and operated in accordance with the South Orange County MS4 Permit (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100), the Orange County Drainage Area Management Plan, and the City of San Juan Capistrano Jurisdictional Runoff Management Plan.

5.8.4.1 METHODOLOGY

KHR associates prepared technical reports to analyze drainage and water quality impacts on the site (see Appendix G and H). The analysis was prepared in accordance with the OCHM and the Orange County DAMP. The analysis evaluated 25- and 100-year storm events consistent with City of San Juan Capistrano requirements.

Figure 5.8-2 - Existing Drainage Plan
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0 100
Scale (Feet)



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5.8.4.2 IMPACT ANALYSIS

The following impact analysis addresses thresholds HYD-3 and HYD-4. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.8-1: The Proposed Project would increase the amount of impervious surfaces but will not substantially increase the rate or amount of surface runoff in a manner which would result in potential flooding on- or offsite, create runoff water that would exceed the capacity of storm drain systems, or impede or redirect flood flows. [Thresholds HYD-3 (ii), (iii) and (iv)]

The Proposed Project would not involve the alteration of any natural drainages or watercourses but would increase impervious surfaces at the Project Site. Table 5.8-1, *Net Increase in Impervious Area*, shows the existing and post-project condition of the Project Site. As shown, the Proposed Project would increase the impervious surface area by 5.01 acres, from 8.39 acres to 13.40 acres. Therefore, the Proposed Project would result in increased runoff water. However, the Proposed Project would include on-site storm drain facilities and implement BMPs listed in the water quality management plan in Appendix H.

Table 5.8-1 Net Increase in Impervious Area

	Pervious Area (acres)	Percentage	Impervious Area (acres)	Percentage	Total Acreage
Pre-Project Conditions	7.19	46%	8.39	54%	15.58
Post-Project Conditions	2.18	14%	13.4	86%	15.58
Change	5.01	32%	-5.01	-32%	-

Source: KHR Associates, 2020a.

The proposed drainage plan for the project is shown in Figure 5.8-3, *Proposed Drainage Plan*. The water quality management plan (WQMP) divides the site into eighteen drainage management areas (DMAs) to be treated as shown in Figure 5.8-4, *Proposed Drainage Management Areas and BMPs*. Table 5.8-2, *DMA Summary*, provides a summary of each DMA.

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Table 5.8-2 DMA Summary

DMA	Total Area (ac) ¹	Impervious Area (ac)	Pervious Area (ac)	Percent Impervious
1	1.23	1.16	0.07	95%
2	1.05	0.99	0.06	95%
3	1.73	1.52	0.22	88%
4	0.20	0.11	0.09	54%
5	0.46	0.37	0.09	80%
6	0.48	0.46	0.03	95%
7	0.87	0.87	0.00	100%
8	1.38	1.35	0.03	98%
9	0.88	0.85	0.02	97%
10	0.99	0.96	0.03	97%
11	1.57	1.41	0.15	90%
12	1.96	1.76	0.20	90%
13	0.92	0.82	0.10	89%
14	1.01	0.66	0.35	65%
15	0.07	0.07	0	100%
16	0.01	0.01	0	100%
17	0.28	0	0.28	1%
18	0.49	0.03	0.46	5%
Total	15.58	13.4	2.18	86%

Source: KHR Associates, 2020a.

The runoff from DMAs 1 through 14 would be collected by catch basins within each DMA and routed through modular wetland systems (MWS) for treatment prior to being discharged off-site to the existing 36-inch reinforced concrete pipe (RCP) in Rancho Viejo Road. In DMAs 6, 7, 8, 10, and 13, the stormwater is routed from the MWS to a detention tank prior to discharging off-site in order for the proposed site to match the existing site's flow rate at the discharge point. More detailed description of the MWS is provided in Attachment C to the WQMP, included as Appendix H.

The capacity of the existing storm drain system has been established by analyzing the overall³ existing and proposed peak flows for the 25-year and 100-year storm events. The existing and proposed flow rates were calculated for Catch Basins #1, #2, and #3 in addition to Area 1 (as shown on Figures 5.8-2 and 5.8-3). Catch Basin #1 and Area 1 drain to the city main on Rancho Viejo Road while Catch Basins #2 and #3 drain into the city main on Malaspina Road before draining into the city main on Rancho Viejo Road. The overall stormwater runoff produced in the existing and proposed conditions is shown in Table 5.8-3, *Existing and Proposed 25 and 100-Year Peak Flows*.

³ Overall flow includes both offsite and onsite runoff.

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Table 5.8-3 Existing and Proposed 25 and 100-Year Peak Flows

	Q ₂₅ (cfs)	Q ₁₀₀ (cfs)	Acreage (acres)
Existing Conditions			
Catch Basin 1	31.18	39.99	10.50
Area 1	39.28	50.27	11.93
Catch Basin 2	8.71	11.13	2.74
Catch Basin 3	8.45	10.80	2.68
Total	87.62	112.19	27.85
Proposed Conditions			
Catch Basin 1	27.98	35.98	9.96
Area 1	49.09	62.85	14.72
Catch Basin 2	5.45	6.99	1.69
Catch Basin 3	5.98	7.72	1.72
Total	88.50	113.54	27.99

Source: KHR Associates, 2020b.

Notes: cfs = cubic feet per second

The Preliminary Drainage Plan also calculated the peak on-site runoff for the 100-year storm event at discharge point #1 (see Figures 5.8-2 and 5.8-3). The 100-year peak flow for existing conditions is 52.09 cubic feet per second (cfs) while the flow for the proposed conditions is 62.85 cfs. The proposed conditions have a higher flow rate compared to the existing flow rate due to an increase of imperviousness, the design of the proposed storm drain system, and lot line adjustment. In order for the stormwater in the proposed conditions to match with existing conditions, the proposed detention tanks need to hold 15,300 cubic feet of water. The tanks have the capacity to store up to 15,692 cubic feet, which detains more than the required detention volume of 15,300 cubic feet. All tanks are sufficient to hold the required volume of stormwater before the runoff is allowed to be discharged onto the existing storm drainpipe.

Furthermore, the Preliminary Drainage Plan analyzed the hydromodification effects for the off-site hillside area draining to Malaspina Road. According to the calculations, the proposed flow rates did not exceed the predevelopment flow rates and the project does not require any hydromodification mitigation controls. Additionally, according to the South Orange County Engineered Channel Exemption Areas, San Juan Capistrano Exemption Map, streams downstream from the Project Site are engineered channels/large rivers and are exempt from hydromodification concerns. Although the catch basins and associated storm drain system that collect runoff at the intersection of Malaspina Road and Rancho Viejo Road are within an area with hydrologic conditions of concern (HCOC), the Proposed Project's storm drain system would be directed to a storm drain system within Rancho Viejo Road that is exempt from hydromodification requirements; therefore, no HCOC exists for the Proposed Project.

The project would also not provide substantial additional sources of polluted runoff. In addition to the MWS, the Proposed Project would incorporate the following site design BMPs:

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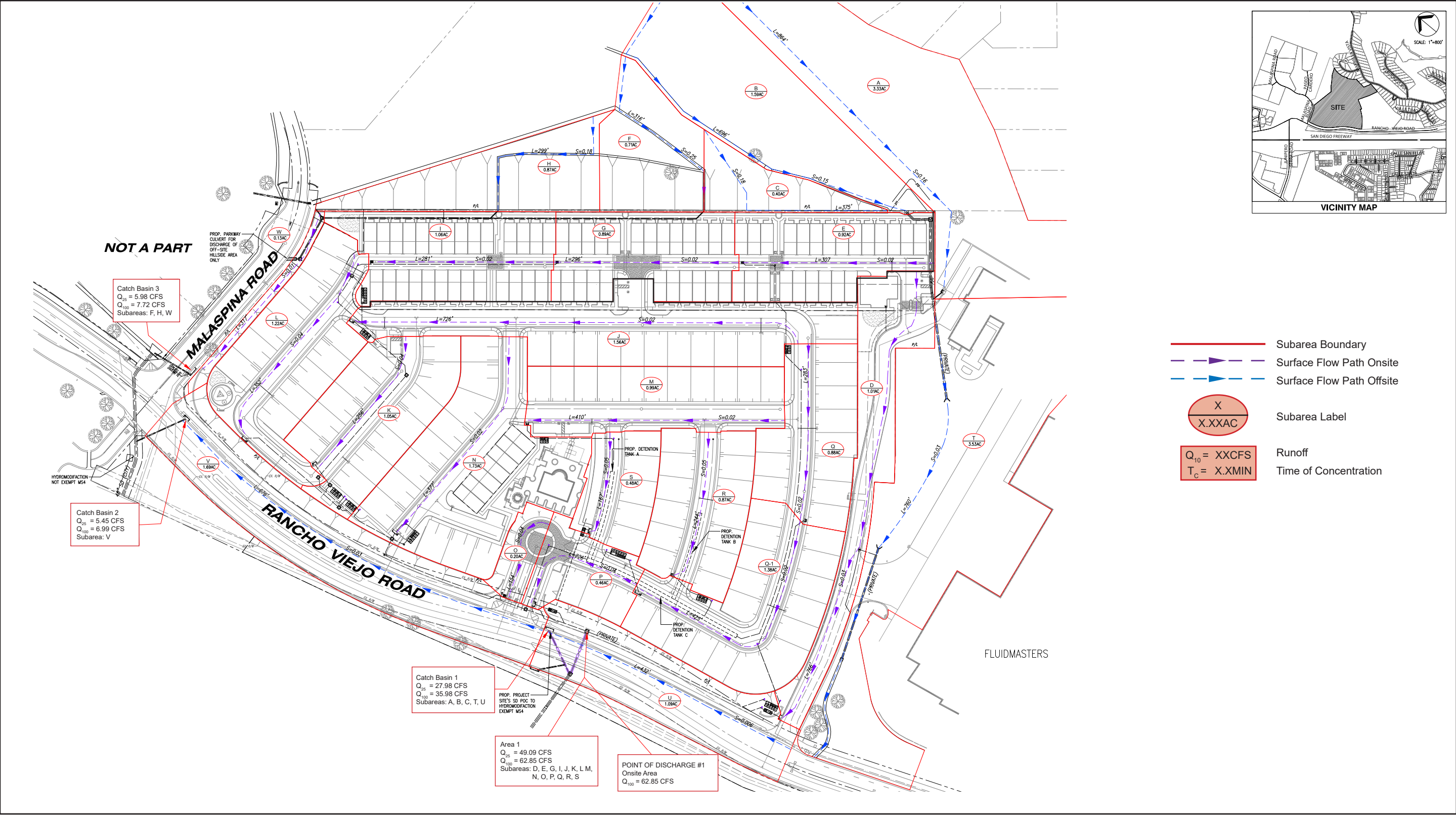
- **Minimize Impervious Area.** Landscaping will be provided throughout the site, within private lots and common area lots, and along the perimeter of the site.
- **Maximize Natural Infiltration Capacity.** Project consists of Type D soils, which are not favorable for infiltration. However, landscaping will be provided throughout the site, allowing some infiltration and evapotranspiration processes.
- **Preserve Existing Drainage Patterns and Time of Concentration.** The entire site will be developed for the Proposed Project, which will require some alterations to the existing drainage patterns and will include new storm drain systems.
- **Disconnect Impervious Areas.** Landscaping will be provided throughout the site, within private lots and common area lots, and around the perimeter of the site.

In addition, the site is not in a 100-year floodplain, in a dam inundation zone, or near any surface water bodies that could result in flood flows. Furthermore, the Project Site is approximately 4.5 miles from the ocean and is not exposed to inundation due to tsunamis.

With the implementation of the BMPs and detention features, the project would not substantially increase the rate or amount of surface runoff in a manner that would result in on- or off-site flooding or impeded or redirect flood flows. Also, the on-site detention facilities would ensure that stormwater runoff from the Proposed Project does not exceed existing conditions for the 25 and 100-year storm events and would therefore not exceed the capacity of storm drain systems. In addition, the modular wetlands system will provide biofiltration and treatment prior to discharge into the storm drain system so there will not be additional sources of polluted runoff. Therefore, this impact would be less than significant.

Level of Significance before Mitigation: With implementation of PPP HYD-1 and PPP HYD-2, Impact 5.8-1 would be less than significant.

Figure 5.8-3 - Proposed Drainage Plan
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Source: KHR Associates, Inc., 2020

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5.8.5 Cumulative Impacts

The area considered for cumulative hydrology, drainage, and flood hazard impacts is the San Juan Creek Watershed. New projects in the area, both individually and cumulatively, could increase the impervious surface areas, increase the volume of stormwater runoff, and contribute to pollutant loading in the storm drain system with discharge to Trabuco Creek, then San Juan Creek and ultimately to the Pacific Ocean. However, as with the Proposed Project, future projects within the City and Orange County would be required to comply with drainage and grading regulations and ordinances that control runoff and regulate water quality at each development site. New development and redevelopment projects would be required to demonstrate that stormwater volumes could be managed by onsite and downstream conveyance facilities and would not induce flooding. New projects also would be required to comply with the MS4 permit and all regulated projects would be required to develop a WQMP.

The projects would be subject to review and approval by the appropriate City to ensure that appropriate BMPs and treatment measures are implemented to reduce pollutants in stormwater and avoid adverse impacts to surface water quality. The county's MS4 permit also requires new development and certain redevelopment projects to retain a specified volume of stormwater runoff onsite through incorporation of BMPs so that stormwater volumes are reduced to at or below existing conditions. As described above, with the implementation of the BMPs and detention features, the Proposed Project would not substantially increase the amount of stormwater runoff and pollutants currently entering the storm drain system from this Project Site under existing baseline conditions with the implementation of required BMPs and stormwater treatment measures.

Other cumulative projects may be proposed in 100-year flood zones. Local jurisdictions regulate development in such zones both for public safety and to prevent changes to flood flows. Therefore, cumulative impacts to hydrology and water quality would not be cumulatively considerable and would be less than significant.

5.8.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, Impact 5.8-1 would be less than significant.

5.8.7 Mitigation Measures

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

5.8.8 Level of Significance After Mitigation

Impacts are less than significant.

5. Environmental Analysis

HYDROLOGY AND WATER QUALITY

5.8.9 References

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