

4.10 HYDROLOGY AND WATER QUALITY

This section evaluates the potential impacts to hydrology and water quality conditions from implementation of the Nakase Nursery/Toll Brothers Project (proposed Project). The analysis in this section is based in part on the *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b) (Appendix I), the *Preliminary Hydrology Analysis* (Hunsaker & Associates 2019a) (Appendix I), the *Geotechnical Evaluation of Proposed Residential and School Site Development* (NMG Geotechnical, Inc. 2017) (Appendix F), and the *Preliminary Geotechnical Exploration* (NMG Geotechnical, Inc. 2018) (Appendix F) that were prepared for the proposed Project and are included in this Environmental Impact Report (EIR).

4.10.1 Scoping Process

The City of Lake Forest (City) received 28 comment letters during the public review period of the Initial Study/Notice of Preparation (IS/NOP). For copies of the IS/NOP comment letters, refer to Appendix A of this EIR. Five comment letters included comments related to hydrology and water quality.

The letter from Orange County Public Works (OCPW) (August 13, 2018) expressed concern about whether the project would result in increased development runoff and requested that the EIR identify and recommend mitigation for these impacts. OCPW also noted that all hydrological and hydraulic studies should comply with current guidelines and criteria specified in the *Orange County Hydrology Manual* and the *Orange County Flood Control Design Manual*. They commented that the City should approve the hydrology and hydraulic analyses to confirm that the proposed Project is protected from erosion and flooding in a 100-year storm event. Additionally, OCPW noted that an encroachment permit would be required for any project work within the Orange County Flood Control District (OCFCD) right-of-way.¹ They also suggested that the City ensure that floodplains are identified and structures conform to Federal Emergency Management Agency (FEMA) regulations.

The letter from the Santa Ana Regional Water Quality Control Board (RWQCB) (August 15, 2018) expressed concern related to the National Pollutant Discharge Elimination System (NPDES) permitting and control of residual nitrogen leaving the Project site and suggested Best Management Practices (BMPs) and mitigation to address impacts from stormwater runoff into waters of the United States (i.e., Serrano Creek). They also expressed concern with the adequacy of the proposed underground detention basin and increased peak flows downstream of the Project site. They asked if the basin could destabilize Serrano Creek. The Santa Ana RWQCB also requested clarification of whether the on-site drainage channel would be filled in or replaced with a concrete channel. They suggested maintaining the flow gaging stations at locations where Serrano Creek and the unnamed interior drainage channel exit the Project site, and noted a Water Quality Standards Certification would be required for any impacts to Serrano Creek or the unnamed interior drainage channel.

¹ Please note that although OCPW expressed concern about encroachment into OCFCD right-of-way, the proposed Project would not include improvements within OCFCD right-of-way and no encroachment permit would be required.

The letter from the California Department of Transportation (Caltrans) (August 13, 2018) expressed concern regarding the mitigation of hydrology and water quality impacts, particularly those related to discharges entering Caltrans right-of-way.¹ Additionally, Caltrans recommended coordination with the OCFCD during the encroachment permit process, which would be required if the proposed Project would require any work within State Highway System lands.

The letter from Judy Esposito (August 6, 2018) expressed concern about water quality in waterways receiving runoff from the Project site. The letter from the Autumnwood Homeowners Association (HOA) (August 8, 2018) requested a full analysis of Serrano Creek flooding impacts, including slope stability and erosion. They also noted that CEQA requires a discussion of the Project's consistency with regional flood control and erosion control plans in the EIR.

4.10.2 Existing Environmental Setting

4.10.2.1 Surface Waters

The Project site is located within the San Diego Creek Watershed, which is a subwatershed of the larger 154-square-mile (sq mi) Newport Bay Watershed. The Newport Bay Watershed is defined by the foothills of the Santa Ana Mountains to the east (Loma Ridge), and the San Joaquin Hills to the west and southwest.² The San Diego Creek Watershed is approximately 112 sq mi in area and located in parts of Irvine, Aliso Viejo, Laguna Hills, Laguna Woods, Lake Forest, Orange, Santa Ana, and Tustin.

For regulatory purposes, the Santa Ana RWQCB designates watershed areas in Hydrologic Units (HUs), which are further divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). As designated by the Santa Ana RWQCB, the Project site is located within the Santa Ana River HU, Lower Santa Ana River HA, and East Coast Plain HSA (Santa Ana RWQCB 1995).

The Project site is bound on the southeast by Serrano Creek. Serrano Creek is an approximately 7.5-mile (mi) long tributary of San Diego Creek. Serrano Creek originates in the Santa Ana Mountains in a canyon in Whiting Ranch Wilderness Park, near the boundary of the Cleveland National Forest. From the Santa Ana Mountains, Serrano Creek then flows southwest into the City of Lake Forest, then into San Diego Creek, Newport Bay, and the Pacific Ocean. Serrano Creek carries intermittent flows.

4.10.2.2 On-Site Drainage

In the existing condition, on-site drainage is divided into two drainage areas. Drainage Area "A" consists of the western/northwestern portion of the site (approximately 76.6 acres [ac]). Stormwater runoff within Drainage Area "A" drains southwesterly via sheet flow. Flow then channelizes in an on-site natural and partly paved drainage system that connects to an existing

¹ Please note that although Caltrans expressed concern about stormwater discharge to Caltrans right-of-way, stormwater from the Project site would not drain to Caltrans right-of-way.

² United States Environmental Protection Agency (EPA). Newport Bay Watershed. Website: <https://19january2017snapshot.epa.gov/www3/region9/water/watershed/measurw/newport-bay/index.html> (accessed June 22, 2019).

10.5 x 10.5-foot (ft) reinforced concrete box and the existing storm drain system (OCFCD Facility No. F19-P07), located along the southwest Project site boundary. This existing storm drain system discharges into Serrano Creek approximately 0.6 mi to the southwest of the Project site. Run-on to Drainage "A" consists of runoff from off-site areas to the north of the Project site (approximately 227.9 ac) that discharge into the Project site via an existing 84-inch reinforced concrete pipe (RCP) at Rancho Parkway and Corridor Center. Total tributary area (on site and off site) to the OCFCD Facility No. F19-P07 connection is 304.45 ac.

Drainage Area "B" consists of the eastern/southeastern portion of the Project site (approximately 43.4 ac). Stormwater runoff within Drainage Area "B" drains southeasterly via sheet flow. Flow then channelizes in an on-site natural and partly paved drainage prior to discharging to Serrano Creek via OCFCD Facility No. F19, which is located along the southern corner of the Project site. There is no off-site run-on to Drainage Area "B".

The Project site discharges directly to an Environmentally Sensitive Area (ESA). Serrano Creek is considered an ESA because it is listed as impaired on the 2014/2016 California 303(d) List of Water Quality Limited Segments (303[d] list), as discussed further below.

4.10.2.3 Surface Water Quality

As discussed in greater detail in Section 4.10.4, Methodology, the receiving waters for stormwater runoff from the Project site are impaired on the 303(d) list for several constituents. Serrano Creek is listed as impaired for ammonia, indicator bacteria, pH, benthic community effects, and toxicity. San Diego Creek (Reach 2 – above Jeffrey Road to the headwaters) is listed as impaired for indicator bacteria, nutrients, sedimentation/siltation, and unknown toxicity. San Diego Creek (Reach 1 – below Jeffrey Road) is listed as impaired for fecal coliform, selenium, toxaphene, nutrients, pesticides, sedimentation/siltation, benthic community effects, dichlorodiphenyltrichloroethane (DDT), malathion, and toxicity. Upper Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, metals, nutrients, polychlorinated biphenyls (PCBs), pesticides, sediment toxicity, sedimentation/siltation, and malathion. Lower Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, nutrients, PCBs, pesticides, and sediment toxicity.

4.10.2.4 Groundwater

According to the California Department of Water Resources (DWR), the Project site is within the Coastal Plain of the Orange County Groundwater Basin. The Coastal Plain of the Orange County Groundwater Basin is bounded on the north by the Puente Hills and Chino Hills, on the east by the Santa Ana Mountains, on the south by the San Joaquin Hills, on the southwest by the Pacific Ocean, and on the northwest by a low topographic divide at approximately the Orange County-Los Angeles County line (DWR 2004).

For regulatory purposes, the Santa Ana RWQCB divides the Coastal Plain of Orange County Groundwater Basin into three Groundwater Management Zones. The Project site is within the Irvine Groundwater Management Zone (Santa Ana RWQCB 1995). The Irvine Groundwater Management Zone is bounded to the north by the Chino Hills, to the northeast by the Santa Ana Mountains, to

the south by the San Joaquin Hills, to the southwest by the Pacific Ocean, and to the northwest by State Route 55 (SR-55).

Recharge to the Coastal Plain of the Orange County Groundwater Basin occurs from percolation of the Santa Ana River flow, infiltration of precipitation, and injection into wells (DWR 2004). A portion of the flow from the Santa Ana River directly below Prado Dam is diverted to recharge groundwater (Santa Ana RWQCB 2004).

According to the *Geotechnical Evaluation of Proposed Residential and School Site Development* (NMG Geotechnical, Inc. 2017) and the *Preliminary Geotechnical Exploration* (NMG Geotechnical, Inc. 2018) that were prepared for the proposed Project, groundwater is present within the alluvium beneath the Project site. The groundwater encountered during the geotechnical evaluation ranged from 20 to 45 ft below ground surface (bgs). Based on maps published by the State of California, the historic high groundwater levels at the site ranged from 15 to 20 ft bgs. Currently, there is a water well located in the southwest corner of the Project site that provides irrigation water for the nursery operation.

4.10.2.5 Groundwater Quality

Water in the Coastal Plain of the Orange County Groundwater Basin is primarily sodium-calcium bicarbonate based. Total dissolved solids range from 232 to 661 milligrams per liter (mg/L) and average 475 mg/L. Near the coast, groundwater is impaired from seawater intrusion. Groundwater is impaired by salinity, nitrate, and methyl tertiary-butyl ether (MTBE) (DWR 2004).

4.10.2.6 Floodplains

According to FEMA Flood Insurance Rate Map (FIRM) Map No. 06059C0316J (December 3, 2009), a portion of the Project site along the southeast boundary is located within Zone AO of the Serrano Creek 100-year floodplain. Zone AO is defined by FEMA as a Special Flood Hazard Area subject to inundation by the 1 percent annual chance flood (100-year flood) with flood depths between 1 ft and 3 ft. However, a Letter of Map Revision (LOMR) became effective on July 16, 2018, after a 90-day appeal period, and affects the floodplains mapped on the Project site. The proposed LOMR was noticed to the public in the Saddleback Valley News on March 9 and 16, 2018. The LOMR changed the portion of the Serrano Creek adjacent to the Project site to Zone AE (i.e., areas subject to inundation by the 1 percent annual chance flood event determined by detailed methods with base flood elevations shown). The LOMR revised the FIRM to remove a majority of the southeastern boundary of the Project site from the 100-year floodplain. Only the southern corner of the Project site remains mapped within a 100-year floodplain.

4.10.3 Regulatory Setting

4.10.3.1 Federal Regulations

Clean Water Act. In 1972, the Federal Water Pollution Control Act (now referred to as the Clean Water Act [CWA]) was amended to require that the discharge of pollutants into waters of the United States from any point source be effectively prohibited unless the discharge is in compliance with an NPDES permit. In 1987, the CWA was again amended to require that the United States

Environmental Protection Agency (EPA) establish regulations for the permitting of storm water discharges (as a point source) by municipal and industrial facilities and construction activities under the NPDES permit program. The regulations require that Municipal Separate Storm Sewer System (MS4) discharges to surface waters be regulated by an NPDES permit.

The CWA requires states to adopt water quality standards for water bodies and have those standards approved by the EPA. Water quality standards consist of designated beneficial uses for a particular water body (e.g., wildlife habitat, agricultural supply, fishing), along with water quality criteria necessary to support those uses. Water quality criteria are set concentrations or levels of constituents (e.g., lead, suspended sediment, and fecal coliform bacteria) or narrative statements that represent the quality of water that support a particular use. Because California had not established a complete list of acceptable water quality criteria for toxic pollutants, the EPA Region IX established numeric water quality criteria for toxic constituents in the form of the California Toxics Rule (CTR).

When designated beneficial uses of a particular water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as impaired. Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for each impairing water quality constituent. A TMDL is an estimate of the total load of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (often with a “factor of safety” included, which limits the total load of pollutants to a level well below that which could cause the standard to be exceeded). Once established, the TMDL is allocated among current and future dischargers into the water body.

Direct discharges of pollutants into waters of the United States are not allowed except in accordance with the NPDES program established in Section 402 of the CWA.

Clean Water Act, Section 303, List of Impaired Water Bodies. The State Water Resources board (SWRCB), in compliance with Section 303(d) of the CWA, prepared a 2014/2016 list of impaired water bodies in California. The SWRCB approved the 2014/2016 California Integrated Report (CWA Section 303(d) List/305(b) Report) on October 3, 2017. On April 6, 2018, the EPA approved the 2014/2016 California 303(d) List of Water Quality Limited Segments (303[d] list) The 303(d) list includes a priority schedule for the development of TMDL implementation for each contaminant impacting the water body.

Serrano Creek is listed on the 303(d) list as impaired for ammonia, indicator bacteria, pH, benthic community effects, and toxicity. San Diego Creek (Reach 2) is listed as impaired for indicator bacteria, nutrients, sedimentation/siltation, and unknown toxicity. San Diego Creek (Reach 1) is listed as impaired for fecal coliform, selenium, toxaphene, nutrients, pesticides, sedimentation/siltation, benthic community effects, DDT, malathion, and toxicity. Upper Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, metals, nutrients, PCBs, pesticides, sediment toxicity, sedimentation/siltation, and malathion. Lower Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, nutrients, PCBs, pesticides, and sediment toxicity.

National Flood Insurance Act. Congress acted to reduce the costs of disaster relief by passing the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded flood control structures and disaster relief efforts by restricting development in floodplains. FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in a floodplain. FEMA issues FIRMs of communities participating in the NFIP. These maps delineate flood hazard zones in the community. The City of Lake Forest manages local storm drain facilities, and the OCFCD is responsible for regional flood control planning within Orange County.

4.10.3.2 State Regulations

Porter-Cologne Water Quality Control Act of 1970. The federal CWA places the primary responsibility for the control of water pollution and planning the development and use of water resources with the states, although it does establish certain guidelines for the states to follow in developing their programs.

California's primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and the nine RWQCBs broad powers to protect water quality and is the primary vehicle for the implementation of California's responsibility under the federal CWA. The Porter-Cologne Act grants the SWRCB and RWQCBs the authority and responsibility to adopt plans and policies, to regulate discharges to surface water and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil, or petroleum product.

Each RWQCB must formulate and adopt a water quality plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that an RWQCB may include in its region a regional plan with water discharge prohibitions applicable to particular conditions, areas, or types of waste. The City, including the Project site, is within the jurisdictional boundaries of the Santa Ana RWQCB (Region 8).

California Toxics Rule. As stated previously, because California had not established a complete list of acceptable water quality criteria for toxic pollutants, EPA Region IX established numeric water quality criteria for toxic constituents in the form of the CTR. The CTR provides water quality criteria for certain potentially toxic compounds for inland surface waters, enclosed bays, estuaries, and waters designated for human health or aquatic life uses. The CTR is often used by the RWQCBs when establishing water quality objectives and TMDLs. Although the CTR criteria do not apply directly to discharges of storm water runoff, they are utilized as benchmarks for toxics in urban runoff. The CTR is used as a benchmark to evaluate the potential ecological impacts of storm water runoff to receiving waters. The CTR establishes acute and chronic surface water quality standards for certain water bodies. Acute criteria provide benchmarks for the highest permissible concentration below which aquatic life can be exposed for short periods of time without deleterious effects. Chronic criteria provide benchmarks for an extended period of time (i.e., 4 days or more) without

deleterious effects. The acute CTR criteria have a shorter relevant averaging period (less than 4 days) and provide a more appropriate benchmark for comparison for storm water flows.

CTR criteria apply to the receiving water body and are calculated based on the probable hardness values of the receiving waters. At higher hardness values for receiving waters, certain constituents (including copper, lead, and zinc) are more likely to be complexed (bound with) components in the water column. This in turn reduces the bioavailability and resulting potential toxicity of these metals.

Total Maximum Daily Load Requirements. The following TMDLs apply to San Diego Creek, and Upper and Lower Newport Bay, which are downstream receiving waters for the Project site. There are no approved TMDLs for Serrano Creek.

- **Pesticides:** The EPA issued mass-based TMDLs for legacy pesticides (e.g., chlordane, dieldrin, and DDT), PCBs, and organophosphate pesticides (diazinon and chlorpyrifos) for all water bodies in the Newport Bay Watershed, including San Diego Creek. Legacy pesticides are pesticides that are banned or restricted by the EPA. Because their rate of decomposition is slow, these pesticides frequently remain at elevated levels in the environment for years after their widespread use has ended. The EPA TMDLs did not specify implementation plans and left that responsibility up to the RWQCB. The Santa Ana RWQCB adopted a Water Quality Control Plan (Basin Plan) amendment in April 2003 to incorporate a diazinon and chlorpyrifos TMDL and implementation plan into the Basin Plan. The RWQCB adopted a Basin Plan amendment on September 7, 2007, to incorporate an organochlorine compound TMDL and implementation plan for San Diego Creek and Newport Bay into the Basin Plan (Resolution No. 2012-0051). In 2003, the Santa Ana RWQCB adopted an amendment to the Basin Plan to incorporate a TMDL for diazinon and chlorpyrifos for the San Diego Creek and Upper Newport Bay (Resolution No. R8-2003-0039).
- **Metals:** The EPA established TMDLs for dissolved cadmium, copper, lead, and zinc in Newport Bay on June 14, 2002. The TMDL targets are expressed as concentration limits, based on the CTR criteria at various hardness values associated with different flow regimes. The concentration-based TMDLs apply to all freshwater discharges into Lower Newport Bay, including discharges from agricultural, urban, and residential lands (including flows from stormwater systems).

The Santa Ana RWQCB is in the process of adopting an amendment to the Basin Plan (Resolution No. R8-2018-0071) to incorporate a TMDL for copper and non-TMDL action plans for zinc, mercury, arsenic, and chromium. The draft amendment was circulated for public review in the Fall of 2018. Public workshops for the TMDL and action plans were held in May 2019.

- **Nutrients:** The Santa Ana RWQCB adopted an amendment to the Basin Plan in 1998 establishing a TMDL for nutrients in the Newport Bay/San Diego Creek Watershed (Resolution No. 98-9, as amended by Resolution No. 98-100).

- The nutrient TMDLs for the Newport Bay/San Diego Creek Watershed establish targets for reducing the annual loading of nitrogen and phosphorus to Newport Bay by 50 percent and meeting the narrative and numeric water quality objectives by 2012.
- For nitrogen, the overall annual target is divided into a summer season allocation and a winter season allocation. Attainment is to be achieved in two stages: a 30 percent and 50 percent reduction in summer loads by 2002 and 2007, respectively, and a 50 percent reduction in winter loads by 2012.
- For phosphorus, the attainment targets require either a 30 percent and 50 percent reduction by 2002 and 2007, respectively, or a reduction of total annual loads of 86,912 pounds (lbs) by 2002 and 62,080 lbs by 2007.
- **Selenium:** The EPA TMDL (2002) load targets for the metal selenium in Lower Newport Bay are established in pounds per year and are based on a water quality criteria of 71 micrograms per liter ($\mu\text{g/L}$) dissolved selenium. The TMDL load targets include flows from storm drain systems, open space, nurseries, agricultural uses, dewatering, and groundwater pumping operations. In 2017, the Santa Ana RWQCB adopted an amendment to the Basin Plan to incorporate a TMDL for selenium in the Newport Bay Watershed (Resolution No. 218-0041).
- **Sediment:** In 1998, the Santa Ana RWQCB adopted phased sediment TMDL targets for the Newport Bay Watershed (Resolution No. 98-69, as amended by Resolution No. 98-101). An initial TMDL target was to reduce the annual average sediment load from 250,000 to 125,000 tons per year (tpy) and to capture half the remaining sediments in sedimentation basins, limiting the total load to Newport Bay to 62,500 tpy. The base existing load of 250,000 tpy was derived from the local sediment control plan (the 2008 plan). Recognizing the episodic nature of sediment loads, the TMDLs are defined in terms of 10-year running annual averages. As part of the TMDL, monitoring data and information are collected by the Newport Bay Watershed Executive Committee. The Santa Ana RWQCB will use the data collected by this monitoring program to reevaluate the sediment TMDL as part of its planning process.
- **Fecal Coliform:** In 1999, the Santa Ana RWQCB amended the Basin Plan by adopting TMDLs for fecal coliform in Newport Bay (Resolution No. 99-10, amended by Order No. R8-2010-0062). The Santa Ana RWQCB has adopted phased TMDL criteria for fecal coliform bacteria in Newport Bay, with the initial focus on additional monitoring and assessment to address areas of uncertainty. The TMDL load targets include flows from storm drain systems, agricultural uses, natural sources, and vessel waste. The waste load allocation for fecal coliform in Newport Bay in urban runoff, including stormwater, and in agricultural runoff that must be met by December 30, 2013, are as follows: the geometric mean must be less than 200 organisms/100 milliliters (mL), and not more than 10 percent of the samples can exceed 400 organisms/100 mL for any 30-day period. This waste load allocation is already in effect for fecal coliform from natural sources and from vessel waste. The waste load allocation for fecal coliform in Newport Bay in urban runoff (including stormwater), agricultural runoff, and from natural sources that must be met by December 30, 2019, are as follows: the monthly median must be less than 14 most probable number (MPN)/100 mL, and not more than 10 percent of the samples can exceed 43 MPN/

100 mL. This waste load allocation is already in effect for vessel waste. Order R8-2019-0050 set a time schedule for the permittees to comply with the TMDL requirements.

General Construction Activity Storm Water Permit. The *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*, Order No. 2009-0009-DWQ, NPDES No. CAS000002, as amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ (Construction General Permit), adopted by the SWRCB, regulates construction activity that includes clearing, grading, and excavation resulting in soil disturbance of at least 1 ac of total land area. The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities.

The Construction General Permit requires that all developers of land where construction activities will occur over more than 1 ac do the following:

- Complete a Risk Assessment to determine pollution prevention requirements pursuant to the three risk levels established in the General Permit;
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States;
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) that specifies BMPs that will reduce pollution in stormwater discharges to the Best Available Technology/Economically Achievable/Best Conventional Pollutant Control Technology standards;
- Perform inspections and maintenance of all BMPs; and
- Conduct stormwater sampling, if required based on risk level.

To obtain coverage under the Construction General Permit, a project applicant must electronically file all permit registration documents with the SWRCB prior to the start of construction. Permit registration documents must include a:

- Notice of Intent (NOI),
- Risk Assessment,
- Site map,
- SWPPP,
- Annual fee, and
- Signed certification statement.

Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, and control pollutants from construction materials. The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

Sustainable Groundwater Management Act. The Sustainable Groundwater Management Act (SGMA) of 2014 is a comprehensive three-bill package that Governor Jerry Brown signed into California state law in September 2014. The SGMA provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for State intervention if necessary to protect the resource. The plan is intended to ensure a reliable groundwater supply for California for years to come.

The SGMA requires governments and water agencies of high- and medium-priority basins to halt overdrafts of groundwater basins. The SGMA requires the formation of local groundwater sustainability agencies (GSAs) that are required to adopt Groundwater Sustainability Plans to manage the sustainability of the groundwater basins.

4.10.3.3 Regional Regulations

Water Quality Control Plans (Basin Plans). The Santa Ana RWQCB has adopted a Basin Plan for their region of responsibility that delineates water resource area boundaries based on hydrological features. For the purposes of achieving and maintaining water quality protection, specific beneficial uses have been identified for each of the surface waters and groundwater management zones described in the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established, and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses.

Beneficial uses of surface receiving waters for the Project site are shown in Table 4.10.A. As shown in Table 4.10.A, beneficial uses of surface receiving waters for the Project site include: groundwater recharge (GWR); navigation (NAV); water contact recreation (REC1); non-contact water recreation (REC2); commercial and sport fishing (COMM); warm freshwater habitat (WARM); preservation of biological habitats of special significance (BIOL); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); spawning, reproduction and development (SPWN); marine habitat (MAR); shellfish harvesting (SHEL); and estuarine habitat (EST). The surface receiving waters are excepted from the municipal and domestic supply (MUN).

Beneficial uses of the Irvine Groundwater Management Zone include municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), industrial process supply (PROC).

Basin Plans also establish implementation programs to achieve water quality objectives to protect beneficial uses and require monitoring to evaluate the effectiveness of the programs. These objectives must comply with the State antidegradation policy (State Board Resolution No. 68-16), which is designed to maintain high-quality waters while allowing some flexibility if beneficial uses are not unreasonably affected.

Table 4.10.A: Beneficial Uses of Surface Receiving Waters

Receiving Water	Beneficial Use													
	MUN	GWR	NAV	REC1	REC2	COMM	WARM	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST
Surface Waters														
Serrano Creek	❖	□		□	□		□		□					
San Diego Creek Reach 2 (above Jeffrey Road to headwaters)	❖	□		□	□		□		□					
San Diego Creek Reach 1 (below Jeffrey Road)	❖			● ¹	●		●		●					
Upper Newport Bay	❖			●	●	●		●	●	●	●	●	●	●
Lower Newport Bay	❖		●	●	●	●			●	●	●	●	●	

Source: *Water Quality Control Plan, Santa Ana River Basin* (Santa Ana RWQCB 1995, updated 2008 and 2011).

Note: ● = Existing or Potential Beneficial Use
□ = Intermittent Beneficial Use
❖ = Exempted from MUN

¹ Access prohibited in all or part per agency with jurisdiction.

BIOL = preservation of biological habitats of special significance

COMM = commercial and sport fishing

EST = estuarine habitat

GWR = groundwater recharge

MAR = marine habitat

MUN = municipal and domestic supply

NAV = navigation

RARE = rare, threatened, or endangered species

REC1 = water contact recreation

REC2 = non-contact water recreation

RWQCB = Regional Water Quality Control Board

SHEL = shellfish harvesting

SPWN = spawning, reproduction and development

WARM = warm freshwater habitat

WILD = wildlife habitat

Basin Plans have established narrative and numeric water quality objectives for inland surface streams and groundwater. If water quality objectives are exceeded, the RWQCBs can use their regulatory authority to require municipalities to reduce pollutant loads to the affected receiving waters. Relevant surface water quality objectives for all inland surface waters, bays and estuaries, and groundwater under the jurisdiction of the Santa Ana RWQCB that are applicable to the receiving waters for the Project site are shown in Tables 4.10.B, 4.10.C, and 4.10.D, respectively.

In addition to the water quality objectives applicable to all surface waters, bays and estuaries, and groundwater, the Santa Ana RWQCB has designated site-specific water quality objectives for waters. The site-specific water quality objectives for San Diego Creek Reach 2 (above Jeffrey Road to the headwaters) are:

- **Total Dissolved Solids:** 720 mg/L
- **Total Inorganic Nitrogen:** 5 mg/L

The site-specific water quality objectives for San Diego Creek Reach 1 (below Jeffrey Road) are:

- **Total Dissolved Solids:** 1,500 mg/L
- **Total Inorganic Nitrogen:** 13 mg/L
- **Chemical Oxygen Demand:** 90 mg/L

Table 4.10.B: Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.
Ammonia, Un-ionized	Waters with WARM Beneficial Use Designation: Varies based on pH and temperature.
Boron	Shall not exceed 0.75 mg/L in inland surface waters of the region as a result of controllable water quality factors.
Chlorine (residual)	Chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish or other surface water resources used for human consumption shall not be impaired.
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, that cause a nuisance or adversely affect beneficial uses.
Metals	Varies based on hardness.
Oil and Grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that result in a visible film or in coating objects in the water or which cause a nuisance or adversely affect beneficial uses.
Oxygen (dissolved)	Waters with WARM Beneficial Use Designation: Shall not be depressed below 5 mg/L as a result of controllable water quality factors. Waste discharges shall not cause the median dissolved oxygen concentration to fall below 85% of saturation or the 95 th percentile concentration or fall below 75% of saturation within a 30-day period.
Pathogen Indicator Bacteria	Waters with REC1 and REC2 beneficial use designations: waste discharges shall not cause or contribute to excessive risk of illness from microorganisms pathogenic to human beings. Pathogen indicator concentrations shall not exceed a geometric mean of at least 5 samples in a 30-day period of 126 E. coli organism per 100 mL as a result of controllable water quality factors unless it is demonstrated to the Regional Board's satisfaction that the elevated indicator concentrations do not result in excessive risk of illness among people recreating in or near the water.
pH	Shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.
Solids (suspended and settleable)	Shall not cause nuisance or adversely affect beneficial uses as a result of water quality factors.
Sulfides	Shall not increase as a result of controllable water quality factors.
Surfactants	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water or that adversely affect aquatic life.
Taste and Odor	Shall not contain taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish or other regional inland surface water resources used for human consumption shall not be impaired.
Temperature	Waters with WARM beneficial use designation: shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors.
Toxic Substances	Shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. Concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.
Turbidity	Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. Where natural turbidity is between 50 NTU and 100 NTU, increases shall not exceed 10 NTU. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10%.

Source: *Water Quality Control Plan, Santa Ana River Basin* (Santa Ana RWQCB 1995, updated February 2016).

°F = degrees Fahrenheit

mg/L = milligrams per liter

mL = milliliter

NTU = nephelometric turbidity units

pH = percentage of hydrogen

REC1 = water contact recreation

REC2 = non-contact water recreation

RWQCB = Regional Water Quality Control Board

WARM = warm freshwater habitat

Table 4.10.C: Surface Water Quality Objectives for Bays and Estuaries

Constituent	Concentration
Algae	Waste discharges shall not contribute to excessive algal growth.
Ammonia, Un-ionized	Waters with WARM beneficial use designation: varies based on pH and temperature.
Chlorine (residual)	Chlorine residual in wastewater discharged to enclosed bays and estuaries shall not exceed 0.1 mg/L.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish or other bay and estuarine water resources used for human consumption shall not be impaired.
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, that cause a nuisance or adversely affect beneficial uses.
Oil and Grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that result in a visible film or in coating objects in the water or which cause a nuisance or adversely affect beneficial uses.
Oxygen (dissolved)	Shall not be depressed to levels that adversely affect beneficial uses as a result of controllable water quality factors.
Pathogen Indicator Bacteria	Waters with REC1 Beneficial Use: Fecal coliform log mean less than 200 organisms/100 mL based on five or more samples/30-day period, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period. Water with SHEL Beneficial Use: Fecal coliform median concentration not more than 14 MPN/100 mL and not more than 10% of samples exceed 43 MPN/100 mL.
pH	Shall not be raised above 8.6 or depressed below 7.0 as a result of controllable water quality factors; ambient pH levels shall not be changed more than 0.2 units.
Radioactivity	Shall not be present in concentrations which are deleterious to human, plant, or animal life.
Solids (suspended and settleable)	Shall not cause nuisance or adversely affect beneficial uses as a result of water quality factors.
Sulfides	Shall not increase as a result of controllable water quality factors.
Surfactants	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water or that adversely affect aquatic life.
Taste and Odor	Shall not contain taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish, or other enclosed bay and estuarine resources used for human consumption shall not be impaired.
Temperature	Shall meet the objective specified in the SWRCB's Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan).
Toxic Substances	Shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. Concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.
Turbidity	Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10%.

Source: *Water Quality Control Plan, Santa Ana River Basin* (Santa Ana RWQCB 1995; updated February 2016).

mg/L = milligrams per liter

mL = milliliter

MPN = most probable number

NTU = nephelometric turbidity units

pH = percentage of hydrogen

REC1 = water contact recreation

RWQCB = Regional Water Quality Control Board

SHEL = shellfish harvesting

WARM = Warm Freshwater Habitat

Table 4.10.D: Groundwater Quality Objectives for Groundwater Basins

Constituent	Concentration
Arsenic	Waters with MUN Beneficial Use Designation: Shall not exceed 0.05 mg/L as a result of controllable water quality factors.
Bacteria, Coliform	Waters with MUN Beneficial Use Designation: Total coliform numbers shall not exceed 2.2 organisms/100 mL median over any 7-day period as a result of controllable water quality factors.
Barium	Waters with MUN Beneficial Use Designation: Shall not exceed 1.0 mg/L as a result of controllable water quality factors.
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.
Chloride	Waters with MUN Beneficial Use Designation: Shall not exceed 500 mg/L as a result of controllable factors.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.
Cyanide	Waters with MUN Beneficial Use Designation: Shall not exceed 0.2 mg/L as a result of controllable water quality factors.
Fluoride	Waters with MUN Beneficial Use Designation: Shall not exceed 1.0 mg/L as a result of controllable water quality factors.
Hardness	Waters with MUN Beneficial Use Designation: Shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.
Metals	Waters with MUN Beneficial Use Designation: Shall not exceed the following: Cadmium 0.01 mg/L; Chromium 0.05 mg/L; Cobalt 0.2 mg/L; Copper 1.0 mg/L; Iron 0.3 mg/L; Lead 0.05 mg/L; Manganese 0.05 mg/L; Mercury 0.002 mg/L; Selenium 0.01 mg/L; and Silver 0.05 mg/L, as a result of controllable water quality factors.
Methylene Blue-Activated Substances	Waters with MUN Beneficial Use Designation: Shall not exceed 0.05 mg/L as a result of controllable water quality factors.
Oil and Grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.
pH	Shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.
Radioactivity	Waters with MUN Beneficial Use Designation: Shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha particle activity, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta particle activity, and 20 pCi/L for uranium.
Sodium	Waters with AGR Beneficial Use Designation: Shall not exceed a sodium absorption rate of 9. Waters with MUN Beneficial Use Designation: Shall not exceed 180 mg/L as a result of controllable water quality factors.
Sulfate	Waters with MUN Beneficial Use Designation: Shall not exceed 500 mg/L as a result of controllable water quality factors.
Taste and Odor	Shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.
Toxic Substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: *Water Quality Control Plan, Santa Ana River Basin* (Santa Ana RWQCB 1995, last updated February 2016).

AGR = agricultural supply
MUN = municipal supply
mg/L = milligrams per liter
mL = milliliter
pCi/L = picocuries per liter
pH = percentage of hydrogen

There are no site-specific water quality objectives for Serrano Creek, Upper Newport Bay, or Lower Newport Bay.

The site-specific water quality objectives for the Irvine Groundwater Management Zone are:

- **Total Dissolved Solids:** 910 mg/L
- **Nitrate as Nitrogen:** 3.4 mg/L

Orange County National Pollutant Discharge Elimination System Permit. The City is a Permittee of the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030, as amended by Order No. R8-2010-0062. The North Orange County MS4 Permit regulates discharges into the MS4 system in the cities and county areas within Orange County that are in the Santa Ana Region. As discussed further below, the North Orange County MS4 Permit requires preparation of a Water Quality Management Plan (WQMP) and implementation of post-construction BMPs for new development and significant redevelopment projects that qualify as Priority Projects.

The proposed Project is considered a Priority Project under the following categories specified in the North Orange County MS4 Permit:

- **Priority Project, Category 1:** New development projects that create 10,000 square feet (sf) or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that fall under the planning and building authority or the Permittees.
- **Priority Project, Category 5:** Impervious surface of 2,500 sf or more located within, directly adjacent to (within 200 ft), or discharging directly into receiving waters within ESAs.
- **Priority Project, Category 7:** Streets, roads, highways, and freeways. This category includes any paved surface that is 5,000 sf or greater and used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Drainage Area Management Program. The Drainage Area Management Plan (DAMP) was created by the County of Orange, the OCFCD, and incorporated cities (permittees), and includes specific water pollutant requirements of the North Orange County Stormwater Program. The DAMP is the principal guidance and compliance document for the county-wide implementation of the Stormwater Program. It is the foundation for the permittees to implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable. Section 7 of the DAMP discusses issues relating to new developments and significant redevelopments.

Local Implementation Plan. The City Local Implementation Plan (LIP) is the principal guidance and compliance document specific to the City's jurisdiction for compliance with the requirements of the

North Orange County MS4 Permit. The LIP provides the description and details of the City's water quality program implementation activities. The LIP is designed to work in conjunction with the Orange County DAMP. It should be noted that the Lake Forest LIP takes precedence over DAMP requirements.

Model Water Quality Management Plan. The *Model Water Quality Management Plan* (County of Orange 2011) was developed to aid Orange County, the OCFCD, the cities in Orange County (permittees), and developers in Orange County to address post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects that qualify as Priority Projects. The proposed Project is categorized as street, road, highway, and freeway of 5,000 sf or more of paved surface and, thus, is considered a Priority Project.

Priority Projects are required to develop a Project WQMP to minimize adverse impacts of development to on-site hydrology, volume and rate of runoff, and pollutants of concern. Project WQMPs include project-specific BMPs to minimize these effects (e.g., Low Impact Development [LID], site design measures, source control BMPs). The requirements identified in the Project WQMPs are subject to Section 7 of the DAMP.

According to the North Orange County MS4 Permit, all street and road construction of 10,000 sf or more of paved surface or street, road, highway, and freeway of 5,000 sf or more of paved surface must also comply with the EPA guidance *Managing Wet Weather with Green Infrastructure Municipal Handbook: Green Streets* (December 2008 EPA-833-F-08-009) to the maximum extent practicable.

Technical Guidance Document. The County of Orange developed the Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs) (TGD) (County of Orange 2013) in cooperation with the incorporated cities of Orange County to aid agency staff and project proponents with addressing post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects in Orange County. The TGD serves as a technical guidance to complete the Project WQMP.

Orange County Construction Runoff Guidance Manual. The *Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers* (County of Orange 2012a) presents the requirements related to construction from the DAMP. The goal of this Guidance Manual is to control pollutant discharges from construction sites. As such, it helps applicants with building and grading permits to understand the water quality requirements during the construction phase of development projects.

Groundwater Dewatering Permit. The Santa Ana RWQCB requires a permit for discharging wastes to surface waters from activities involving groundwater extraction. There are two Orders that apply to groundwater discharges to surface waters in the Newport Bay/San Diego Creek Watershed. The *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001) covers general waste discharge requirements for discharges to surface waters that pose an insignificant (de minimus) threat to water quality within the Santa Ana Region. This Order is applicable if it can be

demonstrated that the groundwater being discharged to surface waters does not contain pollutants of concern (selenium and nitrates) in the discharge. However, if groundwater is found to contain petroleum hydrocarbons, solvents, metals and/or salts, the project would be subject to the *General Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts* (Order No. R8-2007-0041, NPDES No. CAG918002, as amended by R8-2007-0041). This Order covers general discharge permits for discharges to surface waters of groundwater resulting from groundwater dewatering operations and/or groundwater cleanup activities at sites within the San Diego Creek/Newport Bay Watershed polluted by petroleum hydrocarbons, solvents, metals and/or salts, or nutrients, selenium, and other pollutants of TMDL concern. Under both Orders, permittees are required to monitor their discharges of groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.

4.10.3.4 Local Regulations

City of Lake Forest General Plan. The Recreation and Resources Element of the City of Lake Forest General Plan includes a water quality plan that specifies that all new development projects and substantial rehabilitation projects will be required to incorporate BMPs as identified in the County DAMP and City LIP.

The Safety and Noise Element of the City of Lake Forest General Plan includes mapping of flood-prone areas. This Element also specifies that the City will control development in the floodway and floodway fringe. Development in the flood-prone areas are subject to requirements specified by the City.

City of Lake Forest Municipal Code Chapter 8.30. Chapter 8.30 of the City's Municipal Code regulates grading and excavation activities.

- **Section 8.30.150** specifies that grading activities be undertaken in compliance with NPDES and City requirements. Each grading project shall implement BMPs to ensure that discharges of pollutants are effectively prohibited and will not cause or contribute to an exceedance of water quality standards. Section 8.30.150 also specifies that, prior to the issuance by the City of a grading permit, the Department of Public Works and/or Development Services Department shall review the project plans.
- **Section 8.30.152** specifies that projects with a grading permit shall submit an erosion control plan to the Director of the City of Lake Forest Public Works Department, or designee, for approval by September 15th of each year.
- **Section 8.30.154** specifies required maintenance of erosion control and sediment control BMPs after rainstorms for projects with a grading permit.

City of Lake Forest Municipal Code Chapter 15.14. Chapter 15.14 of the City's Municipal Code regulates stormwater quality and prohibits discharges of pollutants into surface waters unless the discharge is authorized by an NPDES permit.

- **Section 15.14.040** requires that all new development and redevelopment projects comply with the requirements of the North Orange County MS4 Permit. Section 15.14.040 specifies that, prior to the issuance of a grading permit or building permit, the Department of Public Works and/or Development Services Department shall review the project plans.
- **Section 15.14.050** requires preparation of an erosion and sediment control plan as a condition of approval for issuance of a construction or grading permit. Section 15.14.050 also requires implementation of construction BMPs to ensure that the discharge of pollutants from the site will be effectively prohibited and will not cause or contribute to an exceedance of water quality standards. Section 15.14.050 specified that construction and grading activities be undertaken in compliance with NPDES and City requirements.
- **Section 15.14.060** requires implementation of operational BMPs on all sites that have the potential to discharge a pollutant to the City's MS4.

4.10.4 Methodology

Project impacts to hydrology and water quality are evaluated based on the proposed Project's adherence to local, regional, State, and federal standards; the proposed land uses and project design; changes in pre- and post-project stormwater flows; and proposed BMPs for control of surface runoff and reduction of pollutants in stormwater runoff.

4.10.5 Thresholds of Significance

The thresholds for hydrology and water quality impacts used in this analysis are consistent with Appendix G of the *State CEQA Guidelines* and the *City of Lake Forest CEQA Significance Thresholds Guide* (2009). The proposed Project may be deemed to have a significant impact with respect to hydrology and water quality if it would:

- Threshold 4.10.1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.**
- Threshold 4.10.2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.**
- Threshold 4.10.3: 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:**
- Result in substantial erosion or siltation on- or off-site;**
 - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;**

iii. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or

iv. Impede or redirect flood flows.

Threshold 4.10.4: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

Threshold 4.10.5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Threshold 4.10.6: Deposit sediment and debris materials within existing channels obstructing flows.

Threshold 4.10.7: Exceed the capacity of a channel and cause overflow during design storm conditions.

Threshold 4.10.8: Adversely change the rate, direction or flow of groundwater.

Threshold 4.10.9: Cause a significant alteration of receiving water quality during or following construction.

Threshold 4.10.10: Substantially degrade water quality by discharge which affects the beneficial uses (i.e., swimming, fishing, etc.) of the receiving or downstream waters

Threshold 4.10.11: Increase in any pollutant for which the receiving water body is already impaired as listed on the Clean Water Act Section 303(d) list

The IS/NOP, included as Appendix A, substantiates that there would be no impacts associated with inundation from tsunami or seiche. In addition, the IS/NOP substantiates that impacts associated with inundation from flooding or impeding or redirecting flood flows would be less than significant. Therefore Thresholds 4.10.3(iv) and 4.10.4 will not be addressed in the following analysis.

4.10.6 Project Impacts

Threshold 4.10.1: Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

AND

Threshold 4.10.9: Would the project cause a significant alteration of receiving water quality during or following construction?

Less than Significant Impact.

Construction. The proposed Project consists of the development of the 122 ac Project site as a master planned community with single-family residential, affordable housing units for senior citizens, an elementary school, parks and open space, and an internal circulation system. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. During construction, approximately 120 ac of soil would be disturbed (Serrano Creek accounts for 2 ac of the 122 ac site and would not be disturbed). During soil-disturbing construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via stormwater runoff into receiving waters (primarily Serrano Creek, which is the closest receiving water downstream of the Project site). Sediment from increased soil erosion and chemicals from spills and leaks have the potential to be discharged to downstream receiving waters during storm events, which can affect water quality and impair beneficial uses.

Because construction of the proposed Project would disturb greater than 1 ac of soil, the proposed Project is subject to the requirements of the Construction General Permit, as specified in Regulatory Compliance Measure (RCM) WQ-1. As also specified in RCM WQ-1, a SWPPP would be prepared and construction BMPs detailed in the SWPPP would be implemented during construction, in compliance with the requirements of the Construction General Permit. In addition, as specified in RCM WQ-2, an Erosion and Sediment Control Plan would be prepared and submitted to the City's Public Works Department prior to issuance of a grading or building permit in compliance with the City Municipal Code. An Erosion and Sediment Control Plan would also be prepared annually during construction and submitted to the City's Public Works Department for approval prior to September 15 of each year. The SWPPP and Erosion and Sediment Control Plans would detail the BMPs to be implemented during construction. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site, and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Compliance with the requirements of the Construction General Permit and City Municipal Code, including incorporation of construction BMPs to target and reduce pollutants of concern in stormwater runoff, would ensure that construction impacts related to Waste Discharge Requirements (WDRs), water quality standards, degradation of water quality, and alteration of receiving water quality would be less than significant.

According to the *Geotechnical Evaluation of Proposed Residential and School Site Development* (NMG Geotechnical 2017) and the *Preliminary Geotechnical Exploration* (NMG Geotechnical, Inc. 2018) that were prepared for the proposed Project, groundwater is present within the alluvium beneath the Project site. The groundwater encountered during the geotechnical evaluation ranged from 20 to 45 ft bgs. Based on maps published by the State of California, the historic high groundwater levels at the site ranged from 15 to 20 ft bgs. Because groundwater levels fluctuate

seasonally, excavation for installation of some project features during certain times of the year (e.g., underground utilities, storm drains, and detention vaults) have a potential to encounter groundwater. In the event that excavation extends to depths where groundwater is present, groundwater dewatering would be required. Groundwater may contain high levels of total dissolved solids, nitrate, sediment, selenium, or other constituents, or high or low pH levels that could be introduced to surface waters when dewatered groundwater is discharged to surface waters. Depending on the water quality of the discharge, groundwater dewatering activities during excavation would be conducted in accordance with either the *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001) or the *General Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts* (Order No. R8-2007-0041, NPDES No. CAG918002, as amended by R8-2007-0041) as specified in RCM WQ-5. Both permits would require testing and treatment (as necessary) of groundwater encountered during groundwater dewatering prior to release to surface waters. As a result, groundwater dewatering would not introduce pollutants to receiving waters at levels that would violate water quality standards or WDRs, degrade water quality, or alter the quality of the receiving water. Impacts to surface water quality from groundwater dewatering would be less than significant.

Although groundwater dewatering may be required, dewatered groundwater would be discharged to the storm drain system, which discharges to Serrano Creek, rather than back into groundwater and therefore would not introduce pollutants to groundwater. Infiltration of stormwater has the potential to affect groundwater quality in areas of shallow groundwater. However, according to the *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b) prepared for the proposed Project, the majority of on-site soils are not favorable for infiltration. The northern central portion of the Project site, near the proposed school site, is the only location with potentially favorable soils for infiltration. Because the majority of the soils on the Project site are not favorable for infiltration, any infiltration during construction would be minimal. Additionally, as discussed above, groundwater could occur at depths from 15 to 20 ft bgs. Pollutants in stormwater are generally removed by soil through absorption as water infiltrates. In areas of deep groundwater, there is more absorption potential and, as a result, less potential for pollutants to reach groundwater. As such, due to the depth to groundwater, it is not expected that any stormwater that may infiltrate during construction would affect groundwater quality because there is not a direct path for pollutants to reach groundwater. Therefore, project construction activities would not substantially degrade groundwater quality.

In conclusion, construction of the proposed Project would comply with existing NPDES regulations (as specified in RCM WQ-1, RCM WQ-2, and RCM WQ-5), which include preparation of a SWPPP and Erosion and Sediment Control Plans and implementation of Construction BMPs to target and reduce pollutants of concern in stormwater runoff, and testing and treatment (if required) of any groundwater prior to discharge to surface waters. Compliance with regulatory requirements would ensure that impacts related to violation of any water quality standards or

waste discharge requirements, degradation of surface or ground water quality, and alteration of receiving water quality during construction would be less than significant, and no mitigation is required.

Operation. Expected pollutants of concern from long-term operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/virus), pesticides, oil and grease, toxic organic compounds, and trash and debris. According to the *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b), potential sources of these pollutants include the following:

- **Suspended Solids/Sediment:** Disturbed or unstabilized landscaping areas and disturbed earth surfaces
- **Nutrients:** Fertilizers, sediment, and trash/debris.
- **Heavy Metals and Toxic Organic Compounds:** Automobiles and uncovered parking areas
- **Pathogens (Bacteria/Virus):** Food wastes, pet wastes, sediment and landscaping areas
- **Pesticides:** Landscaping and open space areas
- **Oil and Grease:** Streets and parked vehicles
- **Trash and Debris:** Landscaping activities, food wrappers and food wastes

The project would be required to comply with the requirements of the North Orange County MS4 Permit and associated guidance documents. The North Orange County MS4 Permit requires that a WQMP be prepared for priority new development and redevelopment projects. WQMPs specify the Site Design, Source Control, LID, and Treatment Control BMPs that would be implemented to capture, treat, and reduce pollutants of concern in stormwater runoff. Site Design BMPs are stormwater management strategies that emphasize conservation and use of existing site features to reduce the amount of runoff and pollutant loading generated from a project site. Source Control BMPs are preventative measures that are implemented to prevent the introduction of pollutants into stormwater. LID BMPs mimic a project site's natural hydrology by using design measures that capture, filter, store, evaporate, detain, and infiltrate runoff rather than allowing runoff to flow directly to piped or impervious storm drains. Treatment Control BMPs are structural BMPs designed to treat and reduce pollutants in stormwater runoff prior to releasing it to receiving waters. The proposed BMPs would improve water quality compared to the existing nursery, which is currently untreated.

A *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b) prepared for the project specifies the Source Control, Site Design, and LID BMPs proposed for the Project (no Treatment Control BMPs are proposed). The *Preliminary/Conceptual Water Quality Management Plan* will be refined during final design based on the final site plans, as specified in RCM WQ-3. The proposed Project BMPs are detailed below.

Proposed Site Design BMPs include minimize impervious area; maximize natural infiltration capacity; preserve existing drainage patterns and time of concentration; disconnect impervious

areas; protect existing vegetation and sensitive areas, and revegetate disturbed areas; and revegetate disturbed areas and xeriscape landscaping.

Proposed Non-Structural Source Control BMPs include education for property owners, tenants and occupants; activity restrictions; common area landscape management; BMP maintenance; common area litter control; employee training; housekeeping of loading docks; common area catch basin inspections; and street sweeping public streets and parking lots.

Proposed Structural Source Control BMPs include storm drain system stenciling and signage; trash and waste storage areas; use of efficient irrigation systems and landscape design, water conservation, smart controllers, and source control; energy dissipation and protection of slopes and channels; dock areas; and wash water control for food preparation areas.

Please refer to the *Preliminary/Conceptual Water Quality Management Plan* included in Appendix I for additional details of the proposed Site Design BMPs, Non-Structural Source Control BMPs, and Structural Source Control BMPs.

The proposed LID BMPs include several categories of BMPs: Hydrologic Source Controls, Infiltration BMPs, Biotreatment BMPs, and Hydromodification BMPs. The proposed Hydrologic Source Controls include impervious surface area dispersion (e.g., rooftop disconnections) and street trees (canopy interception). In addition, trees would be planted along the parkways and within common lot areas.

Proposed Infiltration BMPs and Biotreatment BMPs include bioretention without underdrains and subsurface infiltration galleries. Specifically, the proposed Project would include a subsurface detention vault below Central Park, underground detention vaults in combination with proprietary biotreatment BMPs at each of the five neighborhood parks, a bioretention facility along Serrano Creek, and a linear bioretention facility along "A" Street. Because the northern portion of the Project site is the only area with potentially favorable soils for infiltration, the detention facility at the neighborhood park near the proposed school may be changed to an infiltration BMP during final design if the soils at this location are determined to be favorable for infiltration. The detention vault below Central Park is also classified as a Hydromodification BMP, which would meet the North Orange County MS4 Permit requirements for hydromodification. Because the underground detention vaults would be sized to meet the North Orange County MS4 Permit hydromodification requirements (i.e., stormwater discharge from the Project site would not exceed pre-development runoff rates or time of concentration by more than 5 percent), hydromodification impacts in Serrano Creek (e.g., erosion, sedimentation, channel instability) would not occur. Refer to Figure 4.10.1 for the proposed locations of the BMPs.

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FIGURE 4.10.1

LSA



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FEET

SOURCE: Hunsaker & Associates

I:\CLF1801\G\Stormwater BMPs.cdr (6/26/2019)

Nakase Nursery/Toll Brothers
Proposed Stormwater Best Management Practices (BMPs)

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The proposed BMPs would target and reduce pollutants of concern from runoff from the Project site in compliance with the North Orange County MS4 Permit requirements. Compliance with the requirements of the North Orange County MS4 Permit, including incorporation of operational BMPs to target pollutants of concern, would ensure that water quality impacts, degradation of water quality, and alteration of receiving water quality during Project operation would be less than significant.

As discussed previously, infiltration of stormwater could have the potential to affect groundwater quality in areas of shallow groundwater. However, any infiltration would be minimal due to the low infiltration potential of the majority of on-site soils. The only potential location for an infiltration BMP is the neighborhood park near the proposed school (if the soils at this location are determined to be favorable for infiltration). Due to the depth to groundwater, it is not expected that any stormwater that may infiltrate during operation would affect groundwater quality because there is no direct path for pollutants to reach groundwater. In addition, the proposed Project would be required to implement LID features to treat stormwater before it could reach groundwater. Therefore, project operation would not substantially degrade groundwater quality.

In conclusion, construction of the proposed Project would comply with existing NPDES regulations (as specified in RCM WQ-3), which includes preparation of a Final WQMP and implementation of operational BMPs to target and reduce pollutants of concern in stormwater runoff from the Project site. Compliance with regulatory requirements would ensure that impacts related to violation of any water quality standards or WDRs, degradation of surface water or groundwater quality, and alteration of receiving water quality during Project operation would be less than significant, and no mitigation is required.

Threshold 4.10.2: 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.

Construction. According to the *Geotechnical Evaluation of Proposed Residential and School Site Development* (NMG Geotechnical Inc. 2017) and the *Preliminary Geotechnical Exploration* (NMG Geotechnical, Inc. 2018) that were prepared for the Project, groundwater encountered during the geotechnical evaluation ranged from 20 to 45 ft bgs, and the historic high groundwater levels at the Project site ranged from 15 to 20 ft bgs. Because groundwater levels fluctuate seasonally, excavation for installation of some project features (e.g., underground utilities, storm drains, and detention vaults) has a potential to encounter groundwater, and groundwater dewatering may be required. However, groundwater dewatering would be localized and temporary, and the volume of groundwater removed would not be substantial. In addition, any volume of water removed during groundwater dewatering would be minimal compared to the size of the Coastal Plain of the Orange County Groundwater Basin, which has a surface area of 350 sq mi and a storage capacity of 38,000,000 acre-feet (af) (California DWR 2004). Groundwater dewatering would not interfere with the sustainable management of the groundwater basin because the groundwater basin has been sustainably managed over the last

10 years and will continue to be sustainably managed (refer to response to Threshold 4.10.5 for additional discussion on sustainable groundwater management). Therefore, construction impacts related to a decrease in groundwater supplies or interference with groundwater recharge in a manner that may impede sustainable groundwater management would be less than significant, and no mitigation is required.

Operation. Development of the proposed Project would increase impervious surface area by approximately 68.2 ac, which would decrease on-site infiltration. In addition, according to the *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b) prepared for the Project, the majority of the soils on the Project site are not favorable for infiltration; therefore, existing on-site infiltration would be minimal. Therefore, the additional impervious surface areas would not substantially decrease infiltration compared to existing conditions. Additionally, any decrease in infiltration would be minimal in comparison to the size of the Orange County Groundwater Basin. Furthermore, neither groundwater extraction nor injection would occur during operation. For these reasons, impacts related to depletion of groundwater supplies or interference with groundwater recharge in a manner that may impede sustainable groundwater management would be less than significant, and no mitigation would be required.

Threshold 4.10.3: 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:

i. Result in substantial erosion or siltation on- or off-site?

Less than Significant Impact.

Construction. During Project construction activities, soil would be exposed and disturbed, drainage patterns would be temporarily altered during grading and other construction activities, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate. Project construction would not disturb Serrano Creek because the proposed Project does not include physical improvements to the creek. As discussed above in response to Thresholds 4.10.1 and 4.10.9, the Construction General Permit requires preparation of a SWPPP (RCM WQ-1) and the City of Lake Forest Municipal Code requires preparation of erosion and sediment control plans (RCM WQ-2). The SWPPP and erosion and sediment control plans would detail Erosion Control and Sediment Control BMPs to be implemented during project construction to minimize erosion and retain sediment on site. With compliance with the requirements of the Construction General Permit and City Municipal Code and with implementation of the construction BMPs, construction impacts related to on- or off-site erosion or siltation would be less than significant, and no mitigation is required.

Operation. In the proposed condition, 80.3 ac (65.8 percent) of the Project site would be impervious surface area and not prone to on-site erosion or siltation because no soil would be included in these areas. The remaining 41.7 ac (41.7 percent) of the site would consist of pervious surface area, which would contain landscaping that would minimize on-site erosion

and siltation by stabilizing the soil. Therefore, on-site erosion and siltation impacts would be minimal. However, the proposed Project would increase impervious area on the Project site by 68.2 ac, which would result in a net increase in stormwater runoff that can lead to downstream erosion in receiving waters (Serrano Creek). Serrano Creek is susceptible to hydromodification.¹ However, as specified in RCM WQ-3, the proposed Project would be required to comply with the hydromodification requirements of the North Orange County MS4 Permit and reduce stormwater runoff from the Project site so it does not exceed pre-development runoff rates or time of concentration by more than 5 percent. To achieve this, the proposed Project would include a subsurface detention vault below Central Park, underground detention vaults in combination with proprietary biotreatment BMPs at each of the five neighborhood parks, a bioretention facility along Serrano Creek, and a linear bioretention facility along "A" Street. These features will reduce flows during storm events so it does not exceed pre-development runoff rates or time of concentration by more than 5 percent. Additionally, as detailed in the *Preliminary Hydrology Analysis* (Hunsaker & Associates 2019a), the proposed detention systems would reduce peak flow from the Project site for the 2-year, 25-year, and 100-year storm events compared to existing conditions. As specified in RCM WQ-4, a Final Hydrology Study would be required to be prepared and submitted to the City for approval. The Final Hydrology Study would also be required to demonstrate that the final design of the Project meets the hydromodification requirements and that, with implementation of detention facilities, the peak flow of stormwater runoff in the proposed condition would be less than existing conditions. Because the stormwater runoff from the Project site would not exceed the North Orange County MS4 Permit hydromodification requirements (i.e., would not exceed pre-development runoff rates or time of concentration by more than 5 percent), an analysis of flooding impacts and erosion and slope stability within Serrano Creek is not required. Compliance with the hydromodification requirements of the North Orange County MS4 Permit, as specified in RCM WQ-3 and RCM WQ-4, would ensure that the proposed Project would not increase downstream erosion or siltation impacts. For these reasons, operation impacts related to substantial on- or off-site erosion or siltation would be less than significant, and no mitigation is required.

Threshold 4.10.3: 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:

- ii. **Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?**

Less than Significant Impact.

Construction. As discussed in response to Thresholds 4.10.1 and 4.10.9, Project construction would comply with the requirements of the Construction General Permit and would include the preparation and implementation of a SWPPP. The SWPPP would include construction BMPs to

¹ Hydromodification is the alteration of the hydrologic characteristics of water bodies. Increased stream flows and changes in sediment transport caused by increased impervious areas from urbanization or other land use changes can result in increased stream flows, erosion, and changes in sediment transport.

control and direct on-site surface runoff and would include detention facilities, if required to ensure that stormwater runoff from the construction site does not exceed the capacity of the stormwater drainage systems. With implementation of BMPs, construction impacts related to a substantial increase in the rate or amount of surface runoff that would result in flooding would be less than significant, and no mitigation is required.

Operation. In the existing condition, on-site drainage is divided into two drainages. Drainage Area “A” consists of the western/northwestern portion of the Project site (approximately 76.6 ac). Stormwater runoff in Drainage Area “A” flows through an on-site natural and partly paved drainage system that connects to an existing 10.5 x 10.5 ft reinforced concrete box and the existing storm drain system (OCFCD Facility No. F19-P07), located along the southwest Project site boundary. This existing storm drain system discharges into Serrano Creek approximately 0.6 mi to the southwest of the Project site. Run-on to Drainage Area “A” consists of runoff from off-site areas (approximately 227.9 ac) to the north of the Project site that discharge into the Project site via an existing 84-inch reinforced concrete pipe at Rancho Parkway and Corridor Center.

Drainage Area “B” consists of the eastern/southeastern portion of the Project site (approximately 43.4 ac). Stormwater runoff within Drainage Area “B” channelizes in an on-site natural and partly paved drainage prior to discharging to OCFCD Facility No. F19, which discharges to Serrano Creek and is located along the southern corner of the Project site. There is no off-site run-on to Drainage Area “B”.

The proposed Project would alter the on-site drainage patterns. In the proposed condition, Drainage Area “A” and a majority of Drainage Area “B” would be combined into one drainage area of 111.9 ac. As a result, stormwater runoff from the majority of the Project site would flow into a proposed on-site storm drain system in “B” Street and then would be diverted to the subsurface detention vault below Central Park. Flows would then be directed to the southwestern portion of the Project site to the existing 10.5 x 10.5 ft reinforced concrete box, then to the existing off-site storm drain system (i.e., OCFCD Facility No. F19-P07), and ultimately into Serrano Creek approximately 0.6 mi to the southeast of the Project site. Off-site stormwater runoff from north of Rancho Parkway would be connected to the proposed on-site storm drain system in “B” Street via the existing 84-inch storm drain system in Rancho Parkway, which would then connect to the same existing 10.5 x 10.5 ft reinforced concrete box as the on-site stormwater runoff at the southwestern portion of the Project site. Runoff from the remaining 7.3 ac of the southern portion of the Project site would continue to flow to Serrano Creek via OCFCD Facility No. F19, which is located at the southern corner of the Project site.

The proposed Project would reduce the tributary area to OCFCD Facility No. F19 from 43.4 acres to 7.3 acres. As a result, as detailed in the *Preliminary Hydrology Analysis* (Hunsaker & Associates, June 2019), flow to Serrano Creek at via OCFCD Facility No. F19 would be reduced from 82.2 cfs to 12.2 cfs during a 100-year storm event.

The proposed Project would increase the on-site tributary area to OCFCD Facility No. F19-P07, from 76.6 ac to 111.9 ac. The increased impervious surface area on the Project site would

increase stormwater runoff generated on the Project site and discharged to OCFCD Facility No. F19-P07 (and ultimately Serrano Creek) without implementation of detention measures. As mentioned previously, in the existing and proposed conditions, discharge to OCFCD Facility No. F19-P07 consists of both on-site and off-site stormwater runoff; therefore, the hydrologic analysis took into consideration the combined on-site and off-site flows to this storm drain facility. As shown in Table 4.10.E, without detention measures, the proposed Project would increase discharge to OCFCD Facility No. F19-P07 by 76.2 cubic feet per second (cfs), 174.8 cfs, and 221.4 cfs for the 2-year, 25-year, and 100-year storm events, respectively. However, the proposed detention vault below Central Park would be designed to reduce stormwater discharge to below existing conditions. With the proposed underground detention vault, stormwater flows would be reduced by 6.4 cfs, 139.7 cfs, and 217.3 cfs for the 2-year, 25-year, and 100-year storm events, respectively, compared to existing conditions. Because stormwater runoff from the Project site would be reduced to less than existing conditions at both discharge points (OCFCD Facility Nos. F19 and F19-P07), the proposed Project would not result in off-site flooding. Additionally, the proposed on-site storm drain systems, detention systems, and stormwater BMPs would be sized to collect and convey stormwater runoff on the Project site so that on-site flooding would not occur.

Table 4.10.E: Existing and Proposed Stormwater Discharge to OCFCD Facility No. F19-P07

Scenario	Area (acres)	2-Year Storm Event (cfs)	25-Year Storm Event (cfs)	100-Year Storm Event (cfs)
Existing Runoff from On- and Off-Site Areas	304.5	208.6	508.7	671.2
Proposed Runoff from On- and Off-Site Areas without Detention Measures	339.8	284.8	683.5	892.6
Proposed Runoff from On- and Off-Site Areas with Detention Measures	339.8	202.2	369.0	453.9
Change from Existing Without Detention Measures	-	+76.2	+174.8	+221.4
Change from Existing with Detention Measures	-	-6.4	-139.7	-217.3

Source: *Preliminary Hydrology Analysis* (Hunsaker & Associates 2019a).

cfs = cubic feet per second

OCFCD = Orange County Flood Control District

As specified in RCM WQ-4, a Final Hydrology Study would be required to be prepared and submitted to the City and County for approval. The Final Hydrology Study would also be required to confirm that the final design of the Project meets the hydromodification requirements, that peak flow of stormwater runoff in the proposed condition would be less than existing conditions with implementation of detention facilities, and that the on-site detention facilities are appropriately sized to accommodate stormwater runoff from the design storm. As demonstrated in the *Preliminary Hydrology Analysis* (Hunsaker & Associates 2019a) and to be subsequently confirmed in the Final Hydrology Study, impacts related to an increase in the rate or amount of surface runoff in a manner that would result in on- or off-site flooding would be less than significant, and no mitigation is required.

Threshold 4.10.3: 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:

- iii. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?**

AND

Threshold 4.10.7: Would the project exceed the capacity of a channel and cause overflow during design storm conditions?

Less than Significant Impact.

Construction. As discussed above in response to Thresholds 4.10.1 and 4.10.9, construction of the proposed Project has the potential to introduce pollutants to the storm drain system from erosion, siltation, and accidental spills. However, as specified in RCM WQ-1 and RCM WQ-2, the Construction General Permit requires preparation of a SWPPP, and the City of Lake Forest Municipal Code requires preparation of erosion and sediment control plans. Both the SWPPP and erosion and sediment control plans would identify construction BMPs to be implemented during construction to reduce impacts to water quality, including those impacts associated with soil erosion, siltation, and spills. In addition, any groundwater extracted during groundwater dewatering activities that is discharged to surface waters would be tested and treated (if necessary) to ensure that any discharges meet the water quality limits specified in the applicable NPDES permit (as specified in RCM WQ-5). RCM WQ-1, RCM WQ-2, and RCM WQ-5 are existing NPDES requirements with which the Project is required to comply. These measures would prevent substantial additional sources of polluted runoff being discharged to the storm drain system through implementation of construction BMPs that target pollutants of concern in runoff from the Project site as well as testing and treatment (if required) of groundwater prior to its discharge to surface waters.

Additionally, as discussed above in response to Threshold 4.10.3.ii, the SWPPP would include construction BMPs to control and direct surface runoff on site and would include detention measures if required to ensure that stormwater runoff from the construction site does not exceed the capacity of the stormwater drainage systems. For these reasons, construction impacts related to creation or contribution of runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff would be less than significant, and no mitigation is required.

Operation. As discussed above in response to Thresholds 4.10.1 and 4.10.9, operation of the Project has the potential to introduce pollutants to the storm drain system from the proposed on-site uses. However, as specified in RCM WQ-3, permanent operational BMPs that target and reduce pollutants of concern in stormwater runoff would be implemented and maintained throughout the life of the Project. RCM WQ-5 is an existing NPDES requirement with which the Project is required to comply. This measure would prevent substantial additional sources of

polluted runoff being discharged to the storm drain system through implementation of operational BMPs to target pollutants of concern in runoff from the Project site. Additionally, as discussed above in response to Threshold 4.10.3.ii, the proposed detention vault below Central Park would reduce stormwater runoff from the Project site to below existing conditions to both downstream storm drain systems (OCFCD Facility Nos. F19 and F19-P07). For these reasons, operational impacts related to creation or contribution of runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff would be less than significant, and no mitigation is required.

Threshold 4.10.5: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. The Project site is within the jurisdiction of the Santa Ana RWQCB. As discussed in Section 4.10.3.3, Regional Regulations, the Santa Ana RWQCB adopted a Basin Plan that designates beneficial uses for all surface and groundwater within its jurisdiction and establishes the water quality objectives and standards necessary to protect those beneficial uses. As discussed in detail above in response to Thresholds 4.10.1 and 4.10.9, the proposed Project would comply with existing NPDES requirements and would implement construction and operational BMPs to reduce pollutants of concern in stormwater runoff (RCM WQ-1, RCM WQ-2, and RCM WQ-3). Additionally, during construction, any dewatered groundwater would be tested and treated (if necessary) prior to discharge to surface waters (RCM WQ-5). Compliance with these regulatory requirements would ensure that proposed Project would not degrade or alter water quality, cause the receiving waters to exceed the water quality objectives, or impair the beneficial use of receiving waters (refer to response to Threshold 4.10.10 for further discussion of impacts to beneficial uses). As such, the proposed Project would not result in water quality impacts that would conflict with the Santa Ana RWQCB Water Quality Control Plan (Basin Plan). Construction and operational impacts related to a conflict with the Basin Plan would be less than significant, and no mitigation is required.

The SGMA, which was enacted in September 2014, requires governments and water agencies of high- and medium-priority basins to halt overdraft of groundwater basins. The SGMA requires the formation of local groundwater sustainability agencies, which are required to adopt Groundwater Sustainability Plans to manage the sustainability of the groundwater basins. The project site is located within the Coastal Plain of the Orange County Groundwater Basin, which is managed by the Orange County Water District (OCWD). The San Juan Valley Groundwater Basin is identified by the California DWR as a medium priority basin; therefore, OCWD is required to develop a Groundwater Sustainability Plan and bring the groundwater basin into balanced levels of pumping and recharge by 2042. The SGMA established a process for local agencies to develop an alternative in lieu of a Groundwater Sustainability Plan. In compliance with this requirement, OCWD prepared and submitted the *Basin 8-1 Alternative – OCWD Management Area* (OCWD 2017) to the California DWR as an alternative to a Groundwater Sustainability Plan (California DWR 2019). The *Basin 8-1 Alternative – OCWD Management Area* demonstrates that the groundwater basin has been sustainably managed over the last 10 years and will continue to be sustainably managed. As detailed in response to Threshold 4.10.2, any groundwater extracted during groundwater dewatering during construction would be minimal and would not interfere with the sustainable management of the groundwater basin. Additionally, project operation would not require groundwater extraction.

Although the project would increase water use, which may be obtained from groundwater, the Irvine Ranch Water District (IRWD), which supplies municipal water, ensures that sufficient water supplies are available so that groundwater overdraft does not occur. For these reasons, the proposed Project would not conflict with or obstruct the implementation of a sustainable groundwater management plan. Therefore, construction and operational impacts related to conflict with or obstruction of water quality control plans or sustainable groundwater management plans would be less than significant, and no mitigation is required.

Threshold 4.10.6: Would the project deposit sediment and debris materials within existing channels, obstructing flows?

Less than Significant Impact. As discussed above in response to Thresholds 4.10.1 and 4.10.9, construction of the proposed Project has the potential to introduce pollutants to the downstream receiving waters, including sediment from erosion and siltation. However, as specified in RCM WQ-1 and RCM WQ-2, the Construction General Permit requires preparation of a SWPPP, and the City of Lake Forest Municipal Code requires preparation of erosion and sediment control plans. Both the SWPPP and the erosion and sediment control plans would identify construction BMPs to be implemented during construction to reduce impacts to water quality, including those impacts associated with soil erosion and siltation, so that sediment and debris are not discharged into downstream receiving waters. In addition, any groundwater extracted during groundwater dewatering activities that is discharged to surface waters would be tested and treated (if necessary) to ensure that any discharges meet the water quality limits specified in the applicable NPDES permit (as specified in RCM WQ-5) so that sediments and debris are not discharged into downstream surface waters at concentrations that could obstruct channel flow.

As also discussed above in response to Thresholds 4.10.1 and 4.10.9, operation of the Project has the potential to introduce pollutants of concern, including suspended solids/sediment and trash and debris to the storm drain system during operation. However, as specified in RCM WQ-3, permanent operational BMPs would be implemented and maintained throughout the life of the Project. The BMPs would target and reduce pollutants of concern in stormwater runoff, including suspended solids/sediment and trash and debris, so they are not discharged to downstream surface waters at concentrations that could obstruct channel flow.

RCM WQ-1, RCM WQ-2, RCM WQ-3, and RCM WQ-5 are existing NPDES requirements with which the Project is required to comply. These measures would prevent substantial impacts to water quality through implementation of construction and operational BMPs to target pollutants of concern in runoff from the Project site and testing and treatment (if required) of groundwater prior to its discharge to surface waters. The NPDES permits are designed to ensure that Projects do not result in discharges that contain sediment and debris materials in levels that could obstruct flow in downstream receiving waters. Therefore, with compliance with the NPDES requirements, impacts related to sediment deposits and debris materials within existing channels and obstructing flows would be less than significant. No mitigation is required.

Threshold 4.10.8: Would the project adversely change the rate, direction or flow of groundwater?

Less than Significant Impact. As discussed in response to Threshold 4.10.2, groundwater dewatering may be required during excavation. However, groundwater dewatering would be localized and temporary and would not be in quantities that could adversely change the rate, direction, or flow of groundwater due to the size of the groundwater basin and limited dewatering activities. Project operation would not involve extraction or injection of groundwater and there would be no potential for Project operation to adversely change the rate, direction, or flow of groundwater. For these reasons, impacts related to change in the rate, direction, or flow of groundwater would be less than significant and no mitigation is required.

Threshold 4.10.10: Would the project substantially degrade water quality by discharge which affects the beneficial uses (i.e. swimming, fishing, etc.) of the receiving or downstream waters?

Less than Significant Impact. Beneficial uses of surface receiving waters for the Project site are discussed in Section 4.10.3.3, Regional Regulations, and listed in Table 4.10.A. As discussed above in response to Thresholds 4.10.1 and 4.10.9, construction of the proposed Project has the potential to introduce pollutants to the downstream receiving waters from erosion, siltation, and accidental spills. However, as specified in RCM WQ-1 and RCM WQ-2, the Construction General Permit requires preparation of a SWPPP, and the City of Lake Forest Municipal Code requires preparation of erosion and sediment control plans. Both the SWPPP and erosion and sediment control plans would identify construction BMPs to be implemented during construction to reduce impacts to water quality, including those impacts associated with soil erosion, siltation, and spills. In addition, any groundwater extracted during groundwater dewatering activities that is discharged to surface waters would be tested and treated (if necessary) to ensure that any discharges meet the water quality limits specified in the applicable NPDES permit (as specified in RCM WQ-5).

As also discussed above in response to Thresholds 4.10.1 and 4.10.9, operation of the Project has the potential to introduce pollutants to the storm drain system from the proposed on-site uses. However, as specified in RCM WQ-3, permanent operational BMPs that target and reduce pollutants of concern in stormwater runoff would be implemented and maintained throughout the life of the Project.

RCM WQ-1, RCM WQ-2, RCM WQ-3, and RCM WQ-5 are existing NPDES requirements with which the Project is required to comply. These measures would prevent substantial impacts to water quality through implementation of construction and operational BMPs to target pollutants of concern in runoff from the Project site, and testing and treatment (if required) of groundwater prior to its discharge to surface waters. The NPDES permits are designed to ensure that Projects do not result in discharges that contain pollutants in levels that could degrade water quality and degrade beneficial uses. Therefore, with compliance with NPDES requirements, impacts related to the degradation of water quality by discharge that affects the beneficial uses of the receiving or downstream waters would be less than significant. No mitigation is required.

Threshold 4.10.11: Increase in any pollutant for which the receiving water body is already impaired as listed on the Clean Water Act Section 303(d) list?

Less than Significant Impact. As discussed in greater detail in Section 4.10.4, Methodology, the receiving waters for runoff from the Project site are listed as impaired on the 303(d) list for several constituents. Serrano Creek is listed on the 2014/2016 303(d) list as impaired for ammonia, indicator bacteria, pH, benthic community effects, and toxicity. San Diego Creek (Reach 2) is listed as impaired for indicator bacteria, nutrients, sedimentation/siltation, and unknown toxicity. San Diego Creek (Reach 1) is listed as impaired for fecal coliform, selenium, toxaphene, nutrients, pesticides, sedimentation/siltation, benthic community effects, DDT, malathion, and toxicity. Upper Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, metals, nutrients, PCBs, pesticides, sediment toxicity, sedimentation/siltation, and malathion. Lower Newport Bay is listed as impaired for chlordane, copper, DDT, indicator bacteria, nutrients, PCBs, pesticides, and sediment toxicity.

Construction. Construction of the proposed Project would not contribute to the DDT, PCB, toxaphene, or chlordane impairments because these chemicals have been banned from use in the United States. It is unlikely that insecticides or pesticides would be used during construction, so construction of the Project would not contribute to the malathion or pesticide impairments. However, during construction activities, chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and may have the potential to contribute to the ammonia, bacteria, nutrients, toxicity, pH, benthic community effects, copper, metals, and sediment toxicity impairments. Construction activities involve the use of a variety of chemicals and materials.

As discussed above under the response to Thresholds 4.10.1 and 4.10.9, in compliance with the requirements of the Construction General Permit, a SWPPP would be prepared and construction BMPs detailed in the SWPPP would be implemented during construction, as specified in RCM WQ-1. Construction BMPs would include Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Therefore, with implementation of construction BMPs that prevent spills and construction materials from reaching receiving waters, construction of the proposed Project would not contribute to the existing nutrients, toxicity, pH, benthic community effects, copper, metals, and sediment toxicity impairments.

During construction activities, soil disturbance would increase soil erosion and sedimentation, which could contribute to the sedimentation/siltation, benthic community effects, and selenium impairments (if selenium is present on site because selenium is a naturally occurring element in soil and groundwater in the region). In compliance with the requirements of the Construction General Permit, a SWPPP would be prepared and construction BMPs detailed in the SWPPP would be implemented during construction, as specified in RCM WQ-1. In addition, as specified in RCM WQ-2, an erosion and sediment control plan would be prepared and submitted to the City's Public Works Department prior to issuance of a grading or building permit in compliance with the City of Lake Forest Municipal Code. An erosion and sediment control plan would also be prepared annually during construction and submitted to the City's Public Works Department for

approval prior to September 15th of each year during construction. The SWPPP and erosion and sediment control plans would detail the BMPs to be implemented during construction. Construction BMPs would include Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site. With implementation of Erosion Control and Sediment Control BMPs, soil disturbance activities would not have the potential to contribute to the sedimentation/siltation, benthic community effects, and selenium impairments.

As part of the good housekeeping BMPs, construction workers would be provided access to portable toilets. Waste from leaking portable toilets has the potential to contribute to ammonia, bacteria, nutrients, toxicity, pH, benthic community effects, and sediment toxicity impairments. Portable toilets would be located in the on-site staging areas and would be contained to prevent pollutants from being washed into receiving waters in the event of a leak. In addition, disposal of waste from the portable toilets would be performed by contracted waste haulers who would handle, haul away, and dispose of portable toilet waste in accordance with applicable regulations. Therefore, use of portable toilets during construction of the proposed project would not contribute to the ammonia, bacteria, nutrients, toxicity, pH, benthic community effects, and sediment toxicity impairments.

As discussed above under the response to Thresholds 4.10.1 and 4.10.9, groundwater dewatering may be required during construction. Groundwater may contain high levels of total dissolved solids, nitrate, sediment, selenium, or other constituents, or high or low pH levels that could be introduced to surface waters when dewatered groundwater is discharged to surface waters. Groundwater discharged to surface waters could contribute to the nutrients, toxicity, pH, benthic community effects, sedimentation/siltation, selenium, or sediment toxicity impairments. Depending on the water quality of the discharge, groundwater dewatering activities during excavation would be conducted in accordance with either the *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001) or the *General Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts* (Order No. R8-2007-0041, NPDES No. CAG918002, as amended by Order No. R8-2007-0041), as specified in RCM WQ-5. Both permits would require testing and treatment (as necessary) of groundwater encountered during groundwater dewatering prior to its discharge to surface waters. As a result, groundwater dewatering would not introduce pollutants to receiving waters at levels that contribute to an existing impairment.

In conclusion, construction of the proposed Project would comply with existing NPDES regulations (as specified in RCM WQ-1, RCM WQ-2, and RCM WQ-5), which includes preparation of a SWPPP and erosion and sediment control plans, implementation of construction BMPs to target and reduce pollutants of concern in stormwater runoff, and testing and treatment (if required) of any groundwater prior to its discharge to surface waters. Compliance with regulatory requirements would ensure that discharges of stormwater or groundwater during construction would not contribute to an existing impairment in downstream surface waters. Therefore, impacts related to an increase in any pollutant for which the receiving water body is

already impaired as listed on the CWA Section 303(d) list would be less than significant, and no mitigation is required.

Operation. Expected pollutants of concern from long-term operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/virus), pesticides, oil and grease, toxic organic compounds, and trash and debris. DDT, PCBs, toxaphene, or chlordane have been banned from use in the United States and are not a pollutant of concern for the project; therefore, project operation would not contribute to these existing impairments.

Suspended solids can be introduced from on-site disturbed or unstabilized landscaping or disturbed earth surfaces and contribute to the sedimentation/siltation, benthic community effects, and selenium impairments. Sources of nutrients include fertilizers, sediment, and trash/debris, which can contribute to the nutrients' impairment. Potential sources of trash and debris also include landscaping activities, food wrappers, and food waste and could contribute to the nutrients' impairment. Ammonia is used as a household cleaning agent and could contribute to the ammonia impairment if discharged to surface waters. Automobiles and stormwater runoff from streets and uncovered parking areas would contain oil and grease, metals, and toxic organic compounds, and could contribute to the existing copper, metals, benthic community effects, toxicity, and sediment toxicity impairments. Pathogens (bacteria/viruses) could be introduced from food waste, pet waste, sediment, and landscaping areas, and contribute to the existing bacteria impairment.

As discussed above under the response to Thresholds 4.10.1 and 4.10.9, and detailed in the *Preliminary/Conceptual Water Quality Management Plan* (Hunsaker & Associates 2019b), a variety of BMPs is proposed as part of the Project. The purpose of the WQMP is to identify the pollutants of concern for a project and specify the BMPs that would target and reduce the pollutants of concern in stormwater runoff on the Project site. As specified in RCM WQ-3, these BMPs would be implemented during Project operation. With implementation of BMPs during operation, the pollutants of concern described above would be removed by the BMPs to levels that would not contribute to the existing impairments. Therefore, impacts related to an increase in any pollutant for which the receiving water body is already impaired as listed on the CWA Section 303(d) list would be less than significant, and no mitigation is required.

4.10.7 Cumulative Impacts

Cumulative development in the San Diego Creek and Newport Bay Watersheds is a continuation of the existing urban pattern of development that has already resulted in extensive modifications to watercourses in the area. The area's watercourses have been channelized and drainage systems have been put into place to respond to the past urbanization that has occurred in this area. For the cumulative analysis related to hydrology and water quality, the cumulative projects being considered include the related projects discharging to the same watersheds as the proposed Project (i.e., the San Diego Creek and Newport Bay Watersheds). The related projects within the San Diego Creek and Newport Bay Watersheds include Related Projects 1, 2, 6, 7, 8, and 10. (Please refer to Table 4.A and Figure 4.0.1 in Section 4.0, Existing Setting, Environmental Analysis, Impacts, and

Mitigation Measures, for the descriptions and locations of these related projects.) Each of these related projects could potentially increase the volume of stormwater runoff and contribute to pollutant loading in stormwater runoff reaching both the City's storm drain system and the San Diego Creek and Newport Bay Watersheds, thereby resulting in cumulative impacts to hydrology and surface water quality. The remaining related projects are within the Aliso Creek Watershed and are not considered in this analysis because they do not have the potential to contribute to the hydrology- and water quality-related impacts of the proposed Project to result in cumulative impacts.

New development and redevelopment can result in increased stormwater runoff and increased urban pollutants in stormwater runoff from project sites. Each related project must include BMPs to reduce impacts to water quality and hydrology in compliance with local ordinances and plans adopted to comply with requirements of the various NPDES permits. Specifically, all projects that disturb 1 ac or more of soil must comply with the requirements of the Construction General Permit, the North Orange County MS4 Permit, and the City of Lake Forest Municipal Code. The preparation and approval of a SWPPP, erosion and sediment control plans (for construction), and a WQMP (for operation) would be required for each related project to determine appropriate BMPs to minimize water quality impacts. In addition, the preparation and approval of a hydrology study would be required to determine the hydrologic control required to minimize increases in runoff from each site so they do not exceed existing conditions or result in hydromodification impacts. In addition, the City's Public Works Department reviews all development projects on a case-by-case basis to ensure that sufficient local and regional drainage capacity is available.

Each related project must consider impaired receiving waters and TMDLs for receiving waters. The TMDL program is designed to identify all constituents that adversely affect the beneficial uses of water bodies and then identify appropriate reductions in pollutant loads or concentrations from all sources so that the receiving waters can maintain/attain the beneficial uses in the Basin Plan. Thus, by complying with TMDLs, a project's contribution to overall water quality improvement in the San Diego/Newport Bay Watershed in the context of the regulatory program is designed to account for cumulative impacts.

Regional programs and BMPs such as TMDL programs and the MS4 Permit Program have been designed under an assumption that the San Diego Creek Watershed and Newport Bay Watershed would continue their pattern of urbanization. The regional control measures contemplate the cumulative effects of proposed development. The proposed Project would be required to comply with the requirements of the Construction General Permit and the North Orange County MS4 Permit and implement construction and operational BMPs to reduce pollutants in stormwater runoff. Compliance with these regional programs and permits constitutes compliance with programs intended to address cumulative water quality impacts. As stated above, each related project would be required to develop a SWPPP, erosion and sediment control plans, a WQMP, and a hydrology study, and would be evaluated individually to determine appropriate BMPs and treatment measures to reduce impacts to surface water quality and hydrology. Because the proposed Project and other related Projects would comply with applicable NPDES requirements and would include BMPs to reduce the volume of stormwater runoff and pollutants of concern in stormwater runoff, the cumulative hydrology and water quality impacts of the proposed Project and the related projects

would be less than significant. Therefore, the proposed Project's incremental hydrology and water quality impacts would not be cumulatively considerable.

4.10.8 Level of Significance Prior to Mitigation

Construction and operational impacts related to hydrology and water quality would be less than significant with implementation of RCM WQ-1 through RCM WQ-5.

4.10.9 Regulatory Compliance Measures and Mitigation Measures

4.10.9.1 Regulatory Compliance Measures

The following RCMs are existing regulations that are applicable to the proposed Project and are considered in the analysis of potential impacts related to hydrology and water quality. The City of Lake Forest considers these requirements to be mandatory; therefore, they are not mitigation measures.

RCM WQ-1 Construction General Permit. Prior to commencement of construction activities, the Applicant shall obtain coverage under the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit)*, NPDES No. CAS000002, Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ, or any other subsequent permit. This shall include submission of Permit Registration Documents (PRDs), including permit application fees, a Notice of Intent (NOI), a risk assessment, a site plan, a Stormwater Pollution Prevention Plan (SWPPP), a signed certification statement, and any other compliance-related documents required by the permit, to the State Water Resources Control Board via the Stormwater Multiple Application and Report Tracking System (SMARTS). Construction activities shall not commence until a Waste Discharge Identification Number (WDID) is obtained for the project from the SMARTS and provided to the Director of the City of Lake Forest Public Works Department, or designee, to demonstrate that coverage under the Construction General Permit has been obtained. Project construction shall comply with all applicable requirements specified in the Construction General Permit, including but not limited to, preparation of a SWPPP and implementation of construction site Best Management Practices (BMPs) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate risk level identified for the project. The SWPPP shall identify the sources of pollutants that may affect the quality of stormwater and shall include BMPs (e.g., Sediment Control, Erosion Control, and Good Housekeeping BMPs) to control the pollutants in stormwater runoff. Construction Site BMPs shall also conform to the requirements specified in the latest edition of the Orange County Stormwater Program *Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers* to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed. Upon completion of

construction activities and stabilization of the Project site, a Notice of Termination shall be submitted via SMARTS.

RCM WQ-2 Erosion and Sediment Control Plans. In compliance with the requirements of Title 8 Buildings and Construction, Chapter 8.30, Grading and Excavation, Article XIII, Erosion Control of the City of Lake Forest Municipal Code, the Applicant shall submit a grading plan and erosion control plan to the Director of the City of Lake Forest Public Works Department, or designee, for review and approval prior to issuance of a grading permit. The Applicant shall also submit erosion and sediment control plans annually to the Director of the City of Lake Forest Public Works Department, or designee, for review and approval by September 15th of each year during construction.

RCM WQ-3 Water Quality Management Plan. Prior to issuance of building permits, the Applicant shall submit a Final Water Quality Management Plan (WQMP) to the Director of the City of Lake Forest Public Works Department, or designee, for review and approval in compliance with the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit), Order No. R8-2009-0030, NPDES No. CAS618030 (as amended by Order No. R8-2010-0062). The Final WQMP shall be prepared consistent with the requirements of the *Model Water Quality Management Plan (WQMP)* (County of Orange 2011), *Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs)* (County of Orange 2013), the *City of Lake Forest Local Implementation Plan (LIP)* (2010), and *Managing Wet Weather with Green Infrastructure Municipal Handbook Green Streets* (EPA 2008), or subsequent guidance manuals. The Final WQMP shall specify the BMPs to be incorporated into the project design to target pollutants of concern in runoff from the Project site. The Final WQMP shall also incorporate the results of the Final Hydrology and Hydraulic Analyses to demonstrate that the detention facilities meet the hydromodification requirements of the North Orange County MS4 Permit. The Director of the City of Lake Forest Public Works Department, or designee, shall ensure that the BMPs specified in the Final WQMP are incorporated into the final project design.

RCM WQ-4 Final Hydrology and Hydraulic Analyses. Prior to issuance of building permits, the Applicant shall submit Final Hydrology and Hydraulic Analyses to the Director of the City of Lake Forest Public Works Department, or designee, and the Orange County Flood Control District (OCFCD) for review and approval. The Final Hydrology and Hydraulic Analyses shall be prepared consistent with the requirements of the Orange County Hydrology Manual (Orange County Environment Agency 1986) and Orange County Hydrology Manual Addendum No. 1 (Orange County Environment Agency 1996), or subsequent guidance manuals. The Final Hydrology and Hydraulic Analyses shall confirm that the on-site storm drains, on-site detention basins, and any other drainage structures are appropriately sized to accommodate stormwater

runoff from the design storm so that the peak flow of stormwater discharge from the Project site is less than existing conditions. The Final Hydrology and Hydraulic Analyses shall also demonstrate that the detention facilities meet the hydromodification requirements of the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030 (as amended by Order No. R8-2010-0062). In compliance with the hydromodification requirements, the post-project runoff discharge volume for the 2-year storm shall not exceed that of the predevelopment condition by more than 5 percent, and the time of concentration of post-development runoff for the 2-year storm event shall not be greater than 5 percent less than that of the predevelopment condition. The Director of the City of Lake Forest Public Works Department, or designee, shall ensure that the drainage facilities specified in the Final Hydrology and Hydraulic Analyses are incorporated into the final project design.

RCM WQ-5

Groundwater Dewatering Permits. If groundwater dewatering is required during excavation activities, the Applicant shall obtain coverage under one of two orders, or any subsequent orders, that apply to groundwater discharges to surface waters within the Newport Bay/San Diego Creek Watershed depending on the nature of the groundwater. The *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001) covers discharges to surface waters that pose an insignificant (de minimus) threat to water quality within. This Order would be applicable to the project if it can be demonstrated that the groundwater being discharged to surface waters does not contain pollutants of concern (selenium and nitrates) in the discharge. However, if groundwater is found to contain petroleum hydrocarbons, solvents, metals and/or salts, the project would be subject to the *General Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts* (Order No. R8-2007-0041, NPDES No. CAG918002, as amended by R8-2007-0041), which covers general discharge permits for discharges to surface waters of groundwater resulting from groundwater dewatering operations and/or groundwater cleanup activities at sites within the San Diego Creek/Newport Bay Watershed that have been polluted by petroleum hydrocarbons, solvents, metals and/or salts, or nutrients, selenium, and other pollutants of TMDL concern. This shall include submission of a Notice of Intent (NOI) for coverage under the permit to the Santa Ana Regional Water Quality Control Board (RWQCB) at least 45 days prior to the start of dewatering. Groundwater dewatering activities shall comply with all applicable provisions in the permit, including water sampling, analysis, treatment (if required), and reporting of dewatering-related discharges. Upon completion of groundwater dewatering activities, a Notice of Termination shall be submitted to the Santa Ana RWQCB.

4.10.9.2 Mitigation Measures

The proposed Project would not result in significant impacts related to hydrology and water quality, and no mitigation is required.

4.10.10 Level of Significance after Mitigation

Construction and operational impacts related to hydrology and water quality would be less than significant.

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