

4.6 DRAINAGE AND HYDROLOGY

Hunsaker & Associates Irvine, Inc., (Hunsaker) prepared a hydrology analysis for the proposed project to document the existing hydrologic conditions of the site and to determine the post-development 100-year peak storm runoff discharges, which will be utilized as the basis of storm drain design for the proposed project. In addition, Hunsaker also prepared a Conceptual Storm Water Pollution Prevention Plan (SWPPP) and Conceptual Water Quality Management Plan (WQMP). The findings and recommendations presented in these documents are summarized below and are available for review at the City of Newport Beach.

4.6.1 Existing Conditions

Local Drainage/Hydrology

No stream or river exists on site. A portion of the existing surface runoff generated on the subject property occurs as sheet flow and drains in a northerly and westerly direction before discharging into Newport Bay, which has been identified as containing “environmentally sensitive areas” as defined by the 2003 Orange County Drainage Area Management Plan (DAMP) and the Water Quality Control Plans for the Santa Ana Basin. In addition, an existing drain pipe system also collects runoff, which is also discharged into Newport Bay. The site is currently developed. As such, the site is divided into three drainage areas as summarized in Table 4.6-1 and illustrated on Exhibit 4.6-1.

**Table 4.6-1
Existing Hydrology**

Drainage Area	Area (in acres)	Flow Rate (cubic feet/second)
A	0.125	0.76
B	0.181	1.04
C	0.081	0.51
Total	0.387	2.31

SOURCE: Hunsaker & Associates Irvine, Inc. (February 2, 2009)

As indicated in Table 4.6-1, a total of 2.31 cubic feet per second (cfs) is discharged in the existing condition during a 100-year storm event. A portion of the runoff associated with the existing development (i.e., Area C) is discharged to Carnation Avenue where it flows into a public catch basin and then onto the bluff face and into the harbor from an existing 24-inch diameter pipe located below the existing multiple-family residence at approximately 31 feet above mean sea level. Additional runoff is discharged into the bay near the base of the stairs at the northwestern corner of the site from a second private drain pipe. The remaining runoff occurs as surface runoff from the roof, which is discharged onto the bluff and ultimately into the cove and harbor below. The existing surface water flows are neither detained on-site nor treated prior to their discharge into the harbor.

Flooding

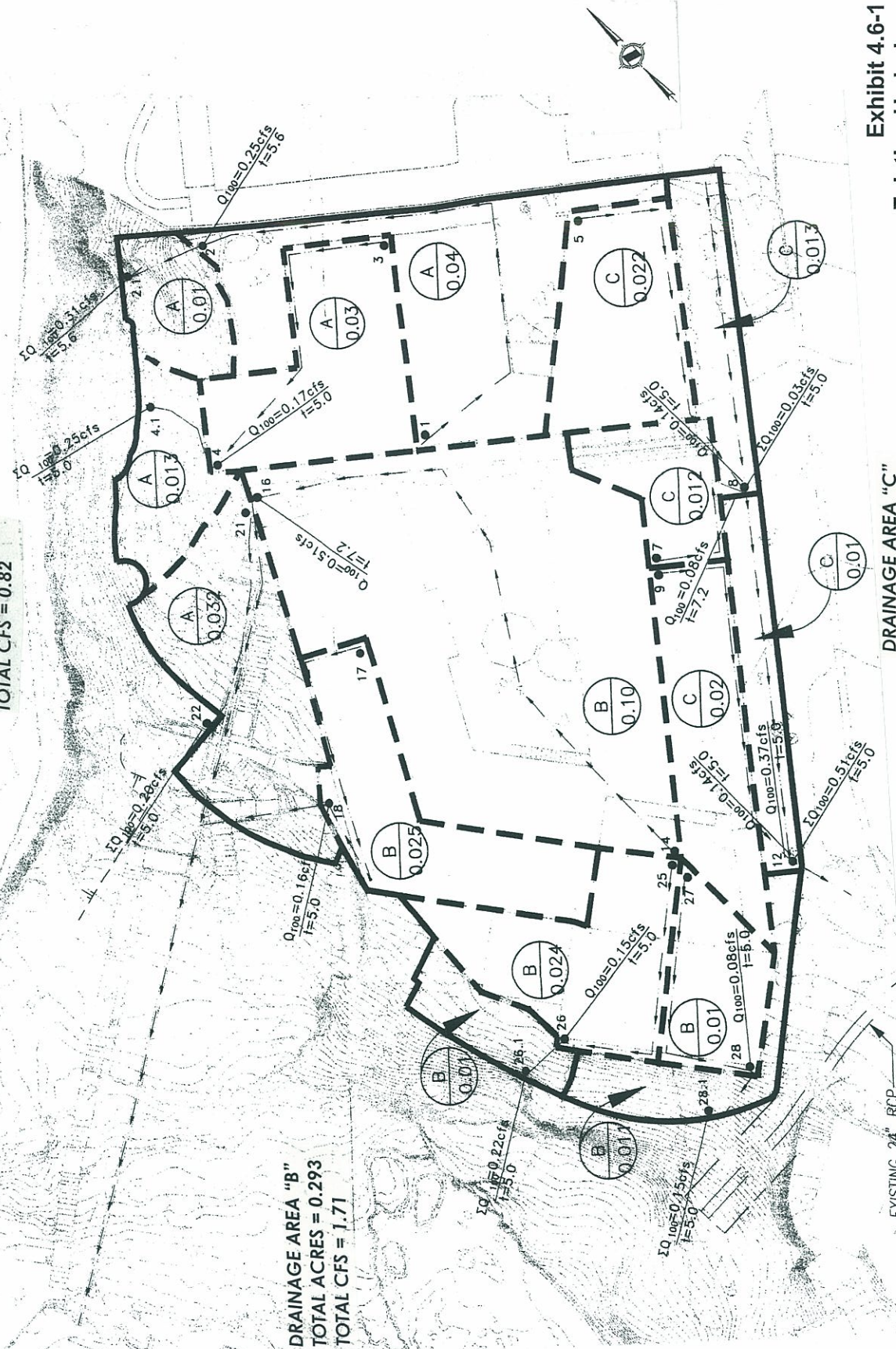
The subject property is not located within the 100-year flood plain as delineated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA) for the City of Newport Beach. The subject property is located in an area designated by FEMA as “Area C” on the FIRM (i.e., areas outside the 500-year flood plain). The site is not subject to the effects of flooding associated with a 100-year storm.

DRAINAGE AREA "A"
TOTAL ACRES = 0.132
TOTAL CFS = 0.82

DRAINAGE AREA "B"
TOTAL ACRES = 0.293
TOTAL CFS = 1.71

DRAINAGE AREA "C"
TOTAL ACRES = 0.081
TOTAL CFS = 0.51

Exhibit 4.6-1
Existing Hydrology



SOURCE: Hunsaker & Associates Irvine, Inc.

Water Quality

The project site is located within the jurisdiction of the Santa Ana Region of the California Regional Water Quality Control Board (CRWQCB) and within the East Costa Mesa-Newport Beach Watershed (i.e., County of Orange Watershed G). The subject property is tributary to and discharges directly into Lower Newport Bay, which is currently identified as a 303d-listed impaired water body for Chlordane, Copper, DDT, PCBs (Polychlorinated biphenyls), and Sediment Toxicity. Additionally, Total Maximum Daily Loads (TMDL) have been proposed to be established for copper in 2007 and Chlordane, DDT, PCBs and Sediment Toxicity in 2019. Due to the proximity of the site to Lower Newport Bay, the site contains “environmentally sensitive areas” as defined by the 2003 Orange County Drainage Area Management Plan (DAMP) and the Water Quality Control Plan for the Santa Ana Basin (Basin Plan).

Surface water quality is subject to federal, state and local water quality requirements. General requirements are reflected in Table 4.6-2 and described below.

**Table 4.6-2
 Water Quality Regulatory Agencies**

Water Quality Requirement	Enforcement Agency
Clean Water Act (CWA)	U.S. Environmental Protection Agency (USEPA)
National Pollutant Discharge Elimination System (NPDES) Permit ¹	State Water Resources Control Board (SWRCB)
Municipal Separate Storm Sewer System (MS4)	Regional Water Quality Control Board (RWQCB)
Drainage Area Management Plan (DAMP)	County of Orange
Local Water Quality Ordinance	City of Newport Beach
Coastal Zone Management Act (CZMA)	Coastal Programs Division (CPD) within the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management (OCRM)
California Coastal Act	California Coastal Commission (CCC)
Local Coastal Program (LCP)	City of Newport Beach
¹ California Regional Water Quality Control Board, Santa Ana Region, Order No. 2002-0010, NPDES No. CAS618030, 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. SOURCE: Hunsaker & Associates Irvine, Inc., (January 28, 2009)	

4.6.2 Significance Criteria

Implementation of the proposed project would result in a significant adverse environmental impact if any of the following occurs as a result of project implementation.

- Substantial and adverse increased inundation, sedimentation and/or damage from water forces to the subject project and/or other properties are caused by improvements such as grading, construction of barriers or structures.
- Development within the 100-year flood plain as delineated by FEMA that would expose people and/or property to potential serious injury and/or damage.

- Impervious surfaces increase and/or divert storm water runoff that result in the inability of the existing collection and conveyance facilities to accommodate the increased flows.
- Project implementation will cause a violation of water quality objectives and impede the existing beneficial uses of on-site surface waters or off-site coastal waters.
- A usable groundwater aquifer for municipal, private, or agricultural purposes is substantially and adversely affected by depletion or recharge.
- Storm water and/or induced runoff mixes with a tidal habitat or pond causing instability to the existing water quality (e.g., reduction of salinity, increase of dissolved solids, introduction of sediments, etc.) that, in turn, substantially and adversely affects the habitat.
- Sediments are increased and/or diverted by proposed improvements and cause sediment deposition in sensitive habitat areas (e.g., riparian, etc.) to the detriment of the habitat and/or sensitive species.

4.6.3 Standard Conditions

- SC 4.6-1 Prior to issuance of a grading permit, the project applicant shall be required to submit a notice of intent (NOI) with the appropriate fees to the Regional Water Quality Control Board for coverage of such future projects under the General Construction Activity Storm Water Runoff Permit prior to initiation of construction activity. As required by the NPDES permit, a Storm Water Pollution and Prevention Plan (SWPPP) will be prepared and will establish BMPs in order to reduce sedimentation and erosion.
- SC 4.6-2 Prior to issuance of a grading permit, the project applicant shall prepare a Water Quality Management Plan (WQMP) for the project and submit the WQMP to the Regional Water Quality Control Board for approval. The WQMP shall specifically identify Best Management Practices (BMPs) that will be used to control predictable pollutant runoff, including flow/volume-based measures to treat the “first flush.” The WQMP shall identify at a minimum the routine structural and non-structural measures specified in the Countywide NPDES Drainage Area Master Plan (DAMP), which details implementation of the BMPs whenever they are applicable to a project, the assignment of long-term maintenance responsibilities, and shall reference the locations of structural BMPs
- SC 4.6-3 Prior to issuance of a grading permit, the project applicant shall prepare a Storm Water Pollution and Prevention Plan (SWPPP) and submit that plan to the City of Newport Beach for approval. The SWPPP will establish BMPs in order to reduce sedimentation and erosion.
- SC 4.6-4 Future site grading and construction shall comply with the drainage controls imposed by the applicable Municipal Code requirements prescribed by the City of Newport Beach.

4.6.4 Potential Impacts

4.6.4.1 Short-Term Construction Impacts

Water Quality

The site is under the jurisdiction of the California Regional Water Quality Control Board (RWQCB) for issues related to water quality. As previously indicated, each of the nine California RWQCBs is responsible for adopting and implementing water quality control plans for each basin's water bodies, regulating waste discharges from both point and nonpoint sources, and monitoring permit compliance within its designated basin. Development of the subject property as proposed will result in alteration of the site and a change in the existing drainage conditions on the site. Exposure of the site during grading could result in an increase in erosion that could adversely affect water quality. In addition, the construction of parking lots and other circulation features that accommodate automobiles could also contribute to an increase in hydrocarbon and other pollutant discharges into the surface and ground water features.

Site grading and construction activities that occur as a result of project implementation may result in short-term increases in silt and sediment to downstream locations. However, implementation of the BMPs prescribed in the SWPPP and WQMP that must be prepared for the proposed multiple-family residential project will ensure that the construction-related impacts resulting from site grading will minimize the amount of silt and sediment that is transported to downstream locations. These potential impacts will be avoided or reduced through the implementation of appropriate BMPs as prescribed in the Orange County DAMP and in the standard conditions previously identified. These measures will be implemented during grading and construction activities. In addition, other standard conditions (e.g., compliance with applicable building code requirements) will further minimize construction-related impacts. Therefore, implementation of the proposed Aerie residential project will not have a significant effect on water quality as a result of silt and sediment transport from construction activities.

Although it is anticipated that the concentration of urban pollutants in storm runoff from the grading and construction activities associated with project implementation could increase during the construction phase, the runoff would be controlled through applicable BMPs to minimize discharges of pollutants, including siltation associated with erosion resulting from grading activities. Further, once construction activities are completed, these potential impacts will cease.

Potentially adverse water quality impacts during the construction phases would be avoided through compliance with existing regulatory programs administered by the City of Newport Beach and the Santa Ana Regional Water Quality Control Board (RWQCB). A variety of Best Management Practices (BMPS) have been identified in a preliminary Stormwater Pollution Prevention Plan (SWPPP) to ensure that there is no contact between storm water and construction site wastes and materials and to prevent any accidental spills, leaks or wastes from draining off-site and into Newport Bay or the nearby storm drain system. The BMP program incorporated in the SWPPP is structured to maintain compliance with the Best Available Technology (BAT) and Best Conventional Pollutant Control Technology (BCT) standards and provide multiple safeguards against potential harm to the environment.

While it is impossible to anticipate all potential environmental issues that could arise on a daily basis during the course of the project, the BMPs have been tailored to provide effective options to those who are responsible for overseeing workplace safety and environmental compliance. BMPs included in the SWPPP address sediment and erosion control for both temporary (i.e., construction) and long-term (i.e., operational) activities occurring on the subject property. In addition, BMPs have also been prescribed for pollutants other than sediment, including those intended to control spills for hazardous materials, solid waste management, hazardous waste management, contaminated soil management, etc. A final SWPPP will be subject to approval, prior to issuance of a grading permit by the City or issuance of a

General Construction Permit by the RWQCB. The permits will include requirements for ongoing monitoring and reporting to ensure that all water pollution control measures are properly implemented.

As indicated in Chapter 3.0, project implementation also includes the replacement of the existing four-slip dock facility with an eight-boat dock and one guest side tie to accommodate future residents of the proposed dwelling units. Construction of the replacement dock would result in potential water quality impacts. During the pile removal and subsequent drilling required for the emplacement process, water turbidity will increase. Turbidity may also increase if vessel propellers impact the bay floor or prop wash stirs up bottom sediments. In order to prevent the spread of any turbidity plume out of the area, Best Management Practices (BMPs), which eliminate any disposal of trash and debris at the project site as well as the removal of construction debris, will be implemented during construction. Appropriate mitigation measures will be required to ensure that turbidity impacts and related water quality impacts associated with the off-shore activities are avoided or reduced to an acceptable level (refer to Section 4.7-5).

4.6.4.2 Long-Term Operational Impacts

Hydrology

Due to the extensive site grading and excavation requirements and expanded building coverage, the existing drainage areas that encompass the site will be modified. Impervious surfaces comprising the existing development encompass approximately 22 percent of the total area of the project site. When redeveloped as proposed, impermeable surfaces will cover approximately 28 percent of the project site. The remaining 72 percent will remain permeable.

Project implementation will result in the elimination of two of the drainage areas that currently exist. However, although the subject property will encompass only one drainage area after grading and site development, implementation of the condominium project will not alter the existing off-site drainage patterns. Moreover, the total discharge from the site in the developed condition is estimated to be only 1.95 cfs or a 15 percent decrease in surface runoff when compared to the existing 2.31 cfs (refer to Table 4.6-1). The decrease in storm flow is largely attributed to the addition of a swimming pool, which would capture runoff during the storm event, thereby reducing the total storm flows on the site under existing condition because a swimming pool does not currently exist. The proposed storm drain system will capture more of the site runoff and reduce sheet flows that currently directly impact Newport Bay. The improved efficiency of the new storm drain system, together with the filtration element within the outlet structure, will ensure that the redeveloped site does not result in erosion or siltation on- or off-site. Table 4.6-3 summarizes the post-development hydrologic conditions (refer to Exhibit 4.6-2).

**Table 4.6-3
 Post-Development Hydrology**

Drainage Area	Area (in acres)	Flow Rate (cubic feet/second)
A	0.0	0.0
B	0.0	0.0
C	0.387	1.95
Total	0.387	0.50¹

¹The 1.95 cfs emanating from the site will be detained in a vault, treated, and discharged into the existing storm drain at a rate of 0.50 cfs, which is slightly less than the 0.51 cfs currently being discharged from Area C.

SOURCE: Hunsaker & Associates Irvine, Inc. (February 2, 2009)

As indicated in Table 4.6-2, virtually all of the stormwater emanating from the site in the developed condition will be generated in Drainage Area C. Although the 1.95 cfs anticipated to occur in the developed condition is less than under existing conditions, the entire building watershed has been directed to the pump vault proposed in the southern corner of the structure. The maximum pump discharge is 0.50, which approximates the flow currently entering the 24-inch RCP prior to discharging onto the bluff face and into the harbor. The pump vault is designed to store the peak flow, thereby reducing the discharge to that approximating the existing discharge. In addition, a storm filter and bacteria treatment system will also be installed along Carnation Avenue. The outflow from this facility is proposed to connect to the existing 24-inch RCP.

It must also be noted that an off-site drainage area encompassing 11.54 acres contributes storm flows to the existing catch basin in Carnation Avenue/Ocean Boulevard. Storm flows generated within this drainage area has a 100-year peak storm flow rate of 40 cubic feet per second (cfs). The proposed project would result in a decrease in the 100-year storm flow, which would be directed to an existing storm drain that has adequate capacity. However, the existing catch basin is currently deficient. Although no significant project-related impacts are anticipated as a result of the reduction in storm flow generated by the proposed project, this facility will be improved by the project applicant to accommodate the storm flows generated within the tributary area, including the project site.

- The developer shall be responsible for replacement/upsizing of the 10-foot wide catch basin located in Carnation Avenue storm drain, which is currently deficient. The new catch basin will be sized to provide sufficient capacity for the runoff generated by this project, as well as existing runoff from the rest of the 11.54-acre drainage area to this facility. It shall satisfy the appropriate storm-year design criteria established by the City Engineer. This storm drain reconstruction shall include appropriate urban runoff filtration elements, to reduce potential water pollution impacts into Newport Harbor. Reconstruction of this storm drain shall occur outside of the rainy season.

Implementation of this improvement by the applicant will ensure that adequate capacity will be provided in the deficient catch basin.

100-Year Flood Plain

Project implementation will not result in the placement of any portion of the development proposed on the subject property within the limits of the 100-year flood plain as delineated by FEMA. As a result, no significant impacts are anticipated and no mitigation measures are required.

Water Quality

The potential stormwater or urban runoff pollutants reasonably expected to occur as a result of project implementation include: (1) sediment from driveways, parking areas, roads and roof tops; (2) organic compounds derived from automotive fluids, pesticides, and fertilizers; (3) nutrients (e.g., nitrogen, phosphorous, etc.) generated by organic litter, fertilizers, food waste, sewage and sediment; (4) metals (e.g., copper, lead, cadmium, chromium, nickel and zinc) from motor vehicles, re-roofing and hardscape/construction materials, and chemicals; (5) bacteria and viruses from animal excrement, sanitary sewer overflow, and trash container handling areas; (6) oil and grease from motor vehicles; (7) oxygen-demanding substances, including biodegradable organic materials and various household chemicals, which deplete dissolved oxygen levels in water courses; (8) pesticides, including household bug sprays, weed killers and other household sources; and (9) trash and debris, which include common litter, biodegradable organic matter such as leaves, grass cuttings, etc., from landscaped areas.

A Conceptual Water Quality Management Plan (WQMP) has been prepared for the project and is hereby incorporated by reference into this Draft EIR. The WQMP identifies a number of structural and non-structural BMPs that will be incorporated within the final designs to comply with the applicable provisions of the Orange County Drainage Area Management Plan (DAMP), the City of Newport Beach water quality regulations, and to address anticipated requirements by the Santa Ana Regional Water Quality Control Board (RWQCB), as part of a General Construction Permit (as discussed earlier). The following routine structural and non-structural BMPs will be incorporated into the project design.

Routine Non-Structural BMPs

- N1 – Education for Property Owners, Tenants and Occupants.

Facility users will be notified of the impacts of their actions on water quality. Requirements will be established for the implementation of an awareness program that informs facility users of the impacts of dumping oil, paints, solvents or other potentially harmful chemicals into the storm drain; proper use and management of fertilizers, pesticides and herbicides in home landscaping; and the impacts of littering and improper watering.

- N2 – Activity Restrictions

Language will be included in the CC&Rs of the HOA to identify source water quality protection required of all property owners and contractors.

- N3 – Common Area Landscape Management

Ongoing maintenance will be consistent with any City requirements, the county Water Conservation Resolution, and the State of California Model Water-Efficient Landscape Ordinance. In addition, fertilizer and pesticide usage will be consistent with the County Management Guidelines for use of Fertilizers and Pesticides.

- N4 – BMP Maintenance

The HOA will be responsible for implementing each applicable non-structural BMP and scheduling inspection and maintenance cleaning of all applicable structural BMP facilities. The HOA will also be responsible for inspection and maintenance activities in landscape areas and for controlling debris and other water pollutants.

- N11 – Common Area Litter Control

Weekly sweeping and trash pick-up within the project area will be required, with daily inspection of trash receptacles. In addition, litter controls will be established and violations will be noted and reported.

- N12 – Employee Training

Annual employee training/education will be established by the HOA that applies to future employees, contractors and volunteers to inform and train those engaged in maintenance activities that include the use of pesticides, fertilizers, etc.

- N15 – Street Sweeping Private Streets and Parking Lots

All parking areas exposed to rain will be vacuum swept on a weekly basis.

Routine Structural BMPs

- Provide storm drain system stenciling and signage

Although the project does not propose on-site catch basins, signs will be posted throughout the site with “No Dumping – Drains to Ocean.”

- Design and construct trash and waste storage areas to reduce pollution introduction

Trash enclosures will be provided in designated areas that are covered to prevent contact with wind and rain. Drainage from trash enclosure areas will be prohibited from entering the storm drain.

- Use efficient irrigation systems and landscape design, water conservation, smart controllers, and source control

All common areas will be landscaped with similar plant material having similar water requirements to reduce excess irrigation runoff and promote surface filtration.

The City’s “Water-Efficient Landscaping” ordinance (Municipal Code Chapter 14.17) will be implemented with common areas maintained by the HOA.

In addition, site design and treatment BMPs have also been identified in the WQMP and will be implemented to ensure that water entering the harbor has been adequately treated to avoid potential impacts to that impaired water body. Specifically, the site has been designed to minimize impervious areas and maximize permeability. The site has also been designed to minimize directly connected impervious areas. Treatment BMPs incorporated into the project intended to treat surface runoff include a proprietary StormFilter unit. The Stormwater Quality Design Flows (SQDF)¹ for the project’s cumulative drainage areas have been determined to be 0.058 cfs. The size of the units will be determined based on the final hydrology study to be prepared prior to issuance of the grading permit. Following treatment by the project StormFilter unit, site runoff will pass through an Abtech Smart Sponge Plus drain insert for additional treatment for bacteria as a pollutant of concern.

¹The Orange County DAMP requires that flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) based on the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour for each hour of a storm event.

Other BMPs that will be implemented include parking and storage area maintenance to ensure that the parking area is cleaned on a regular basis. Use of absorbent materials to clean up vehicle-related spills and leaks will be disposed of properly. The pool will also be cleaned regularly to control algae, pool filters will be cleaned and inspected regularly, and pool water will be disposed of properly, into the sanitary sewer. Implementation of these and other measures outlined in the WQMP will ensure that potential water quality impacts resulting from project implementation will be less than significant and will be minimized.

The BMPs have been selected to address the main pollutants of concern for this type of project, and for the impacted water body, i.e. Newport Bay. Lower Newport Bay is listed as an “impaired” water body under Section 303(d) of the Clean Water Act, with respect to metals, pesticides and priority organics. All ‘first flush’ and low flow runoff from the developed site would be captured by an underground storm drainage system that will be pumped up to Carnation Avenue and filtered by a storm filter and bacteria filter before being discharged into the existing municipal storm drain system. Notwithstanding the increase of impervious surfaces on the project site, the proposed drainage system is expected to reduce the pollutant level in site runoff, compared to existing conditions that consist of sheet flow runoff directly to the bay, and unfiltered runoff into a storm drain catch basin just south of the site, at Carnation Avenue and Ocean Boulevard. Implementation of the approved WQMP will ensure that this project does not violate any water quality standards over the long-term operating life of the developed site.

In addition, the WQMP also includes measures that are intended to avoid water quality impacts within Newport Bay during the construction of the proposed dock facility. These measures, which are also included in the CMP, are design features of the proposed project. They include:

- All debris and trash shall be disposed in suitable trash containers on land or on the work barge at the end of each construction day.
- Discharge of any hazardous materials into Newport Bay is prohibited.
- Silt curtains shall be deployed around work barges and around the pile sleeving or drilling operations where feasible to minimize the spread of turbid waters into adjacent eelgrass beds within and outside the project area.
- All construction debris shall be removed from the bay floor daily.

With the incorporation of these measures prescribed in the CMP, no significant water quality impacts to Newport Bay would occur as a result of project implementation.

4.6.5 Mitigation Measures

Hydrology

Project implementation will result in a reduction in storm flows generated on the project site. Although no significant project-related impacts will occur, the applicant will upgrade the existing deficient catch basin, which will ensure that adequate capacity exists to accommodate storm flows within the drainage area. No significant impacts are anticipated and no mitigation measures are required.

Flooding

Based on the hydraulic analysis prepared for the proposed project, project implementation will not result in a significant impact on the water surface elevations for 100-year storm flows. The subject property is located in FEMA Area C (i.e., outside of the 500-year flood plain); all of the development (i.e., structures) is proposed to be located outside of the revised floodplain. Therefore, no significant flooding impacts are anticipated and no mitigation measures are required.

Water Quality

The incorporation of BMPs prescribed in the WQMP and Construction Management Plan as well as the storm drainage/flood control facilities proposed in the vicinity of the proposed project will reduce potential pollutants that enter the surface flows as a result of project implementation to the “maximum extent practicable,” as required by the Regional Water Quality Control Board. As a result, no significant water quality impacts are anticipated and no mitigation measures are required.

4.6.6 Level of Significance After Mitigation

Implementation of the standard conditions, project features (upgraded catch basin), and, specifically, the BMPs prescribed in the Construction Management Plan, Draft WQMP and SWPPP, as well as implementation of the proposed storm drainage system described above, will ensure that the potential impacts associated with an increase in surface runoff resulting from development of the proposed Aerie residential project are reduced avoided. No significant unavoidable impacts will occur as a result of project implementation.