5.7 - Hydrology and Water Quality

5.7.1 - Introduction

This section describes the existing hydrology and water quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information contained in the Preliminary Water Quality Management Plan prepared by Fuscoe Engineering in October 2008, the Marina Park Coastal Engineering Study prepared by Everest International Consultants, Inc. in October 2008, and the Marina Resort & Community Plan Final EIR prepared by Michael Brandman Associates in 2004. The Preliminary Water Quality Management Plan and the Marina Park Coastal Engineering Study are included in this EIR in Appendix H, Hydrology and Water Quality Data. The Marina Resort & Community Plan Final EIR is available for review at the City of Newport Beach Planning Department.

5.7.2 - Existing Conditions

Hydrology/Drainage

The project site is located within the Newport Bay watershed that covers 13.2 square miles along the coast of central Orange County. The watershed includes portions of Costa Mesa and Newport Beach. The East Costa Mesa, Santa Isabel, and other smaller channels drain into Newport Bay.

Specifically, the project site is located on the Balboa peninsula between Balboa Boulevard and the Lower Newport Bay and contains approximately 10.45 acres. The peninsula is crossed by a system of streets with flat grades that do not exceed a few tenths of one percent. No substantial longitudinal slopes occur along Balboa Boulevard other than minor slopes created at storm drain inlets. The site is currently fully developed and approximately 83 percent of the site contains impervious surfaces.

The existing topography was reviewed to assess 100-year storm potential impact to existing buildings. The City of Newport Beach requires that one traffic lane remains passable during a 10-year event. Streets provide conveyance capacity for the 100-year storm. However, currently during a 100-year storm event, the existing storm drain system can be surcharged and most likely becomes inefficient. A large portion of the storm runoff drains to Balboa Boulevard and pond until reaching a relief elevation that allows the stormwater to outlet to Lower Newport Bay.

Runoff from the eastern portion of the site is conveyed via existing onsite storm drain lines to the storm drain line along Balboa Boulevard that ultimately discharges into Lower Newport Bay at 15th Street. Runoff from the western portion of the site (i.e., east of 18th Street) is conveyed via existing onsite storm drain lines to the storm drain line at Balboa Boulevard that ultimately discharges to the Lower Newport Bay at 18th Street. The storm water in the portion of the project site adjacent to 19th Street currently is conveyed to the existing storm drain along 19th Street prior to discharging to the Lower Newport Bay.

Groundwater

Groundwater levels at the site vary in response to tidal fluxuations. Based on two borings conducted by Terra Costa, groundwater levels were encountered at 6.5 feet and 10 feet below the ground surface elevation.

Water Quality

Surface water quality and the water quality of Lower Newport Bay were evaluated.

Surface Water Quality

Under existing conditions, there are no substantial water quality issues identified for the project site. There has been no indication of past soil contamination since development of the project site to cause surface water quality issues. Typical urban runoff contaminants associated with the existing mobile home park, parking areas, and beach as well as the public facilities on the project site include bacteria, heavy metals, nutrients, pesticides, organic compounds, sediments, trash and debris, oxygen demanding substances, oil and greases.

Lower Newport Bay Water Quality

Based on the 2006 Section 303(d) list of Water Quality Limited Segments published by the Santa Ana Regional Water Quality Control Board, the Lower Newport Bay is listed as impaired for chlordane, copper, DDT, PCBs, and sediment toxicity.

Once a water body has been listed as impaired, a Total Maximum Daily Load (TDML) for the constituent of concern (pollutant) must be developed for the water body. A TDML is an estimate of the daily load of pollutants that a water body may receive from point sources, non-point sources, and natural background conditions (including an appropriate margin of safety), without exceeding its water quality standard. Those facilities and activities that are discharging into the water body, collectively, must not exceed the TDML.

Several TDMLs have been developed jointly for the San Diego Creek Watershed and the Newport Bay, including nutrients, pathogens and pesticides. In addition, TDMLs for organochlorine compounds and metals are currently in development by the Regional Water Quality Control Board.

Sediments adjacent to the project site at the tide line (Intertidal Sand Beach Sediments) in the vicinity of the proposed marina generally consist of fine to medium and silts. Beyond the tide line and extending into Lower Newport Bay (Subtidal Bayfloor Sediments), sediments consist of sand, mud, or combinations of sand/shell hash. Concentrations of pollutants in the sediment vary depending on the composition of the sediment, depth of sediment, and location within Lower Newport Bay.

Based on sampling of sediments taken in 2004 by MetroPointe Engineers as part of the Marina Park Resort & Community Plan Final EIR, adjacent to the project site in the vicinity of the proposed marina, no detectable concentrations of semi-volatile organic compounds, organo-chloride pesticides, or polychlorinated biphenyl's were detected. Heavy metals were not detected at elevated ranges.

Petroleum hydrocarbons were detected, but at levels not deemed to represent an environmental condition. In 1994, the State Water Resources Control Board, in conjunction with other federal and State agencies, studied sediment chemistry and toxicity throughout Newport Bay. Based on the results of the sampling and their respective locations in various areas of Newport Bay, sediments contained elevated concentrations of mercury, copper, DDT, polychlorinated biphenyl's, tri-butyl tin, lead, DDE, and total Chlordane.

In addition to this study, the Southern California Coastal Water Research Project investigated sediments conditions in the Rhine Channel northwest of the project site. This study found similar concentrations in the sediments.

Water quality in Newport Bay is also based on the frequency of tidal flushing. A condition that affects water quality and contamination in the sediments is the amount of time required for water at a given location within Newport Bay to be exchanged with new water from the ocean (flushing activity) by tidal action. This exchange rate is known as residency time. The residency time of ocean water in the vicinity of the project site is approximately 7 days. By comparison, residency time of ocean water near the entrance to Lower Newport Bay is approximately one day. The less frequent the exchange of water results in a lower quality of water. Although there are no local or state standards, the federal Environmental Protection Agency has established guidelines that suggest adequate tidal flushing to maintain water quality of marina basins requires flushing reductions (the amount of conservative substance that is flushed from the basin) ranging from 70 percent to 90 percent over a 24-hour period.

5.7.3 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether hydrology and water quality impacts are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

a.) Violate any water quality standards or waste discharge requirements?

b.) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?

c.) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

d.) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

e.) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

f.) Otherwise substantially degrade water quality?

g.) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h.) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

i.) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j.) Inundation by seiche, tsunami, or mudflow?

5.7.4 - Project Impact Analysis and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

Water Quality Standards and Requirements

Impact 5.7-A:	**The project would not violate any water quality standards or waste discharge requirements.**

Project-Specific Analysis

Short-term Construction Impacts

Implementation of the proposed project would result in construction activities that could have the potential to contribute to pollutants in surface water. These pollutants could be conveyed off-site potentially affecting the water quality within the Lower Newport Bay. Generally, construction activities could generate pollutants such as increased silts, ground rubber, oils from automobiles, debris, litter, chemicals, dust, and dissolved solids related to grading, excavation, dredging, building construction, and painting.

The construction phase has the greatest potential for pollution of surface water and water within Newport Bay as large fueled vehicles, such as trucks and earth moving equipment, will be present on the project site. Since construction activities could result in increased pollutants to surface water, the proposed project could result in a short-term potential to degrade surface water quality that could be conveyed offsite and potentially to Newport Bay. This impact during construction activities is considered potentially significant.

Excavation, dredging, and marina construction activities will cause a short-term increase in turbidity from the discharging of the suspended fine sediments with the liquefied portions of the dredge material. Localized increases in turbidity can also occur as a result of vessel prop wash from tug boats. The extent and orientation of the dredge plume would depend on the prevailing tidal cycle. With ebbing tides, the plume could dissipate into the main channel, and out towards the harbor entrance channel. Incoming flood tides could cause the turbidity plum to disperse farther up towards the Rhine Channel. Although the increase in turbidity would be short-term during dredging activities, this potential increase would be considered significant.

Long-term Operational Impacts

Long-term operations of the proposed project would not increase impervious surfaces on the project site compared to existing conditions; however, the proposed project would reduce the site's percentage of impervious surfaces to 53 percent from 83 percent. Although less impervious surfaces would be constructed onsite, the proposed project may result in varying levels of long-term pollutants compared to the existing uses. These pollutants include bacteria, heavy metals, pesticides, organic compounds, sediments, trash and debris, oxygen demanding substances, oil, and grease. The proposed project includes various best management practices (BMPs) that would control predictable pollutant runoff. These BMPs are identified in the Preliminary Water Quality Management Plan (PWQMP) that has been prepared for the proposed project (see Appendix H). These BMPs include a vegetative biowale that provides filtration, landscaped biocells that capture, treat and infiltrate runoff, and porous concrete pavers proposed for the parking stalls in all three proposed parking lots. In addition, the PWQMP includes common area litter control, common area landscape management, street sweeping of parking lots, and an efficient irrigation system to avoid runoff. The proposed BMPs to remove pollutants would reduce potential long-term water quality impacts to less than significant.

In addition, the public beach between 16th and 19th Streets will continue to be a popular recreational area, and visitor use will likely increase. The volume of trash and debris generated from beach use will also likely increase. This has a low potential to degrade water quality; however, continuance of the City's regular maintenance of the beach area would reduce potential water quality impacts to less than significant.

Furthermore, implementation of the proposed marina could create a condition where there would be inadequate tidal flushing within the marina. A Coastal Engineering Study was conducted to estimate the potential impact of the proposed marina on water quality in the immediate vicinity of proposed marina basin and adjacent waterway. The impact on the proposed marina basin on water quality was evaluated based on the U.S. Environmental Protection Agency (EPA) guidelines for marina flushing management measures. These EPA guidelines were specified to minimize non-point source pollution in coastal waters. Although there is no specific guideline for marina basins in Southern California, EPA guidelines for southeastern and northwestern United states suggests adequate tidal flushing to

maintain water quality flushing reductions (the amount of conservative substance that is flushed for the basin) ranging from 70 percent to 90 percent over a 24-hour period.

A hydrodynamic and water quality model was used to evaluate the tidal flushing capability of the proposed marina basin. Based on the scenario of the Proposed Marina Basin with Existing Groin Wall, there is adequate tidal flushing at less than about one-quarter of the way into the basin while there is minimum flushing reductions father into the basin.

Poor tidal flushing conditions would exist in the majority of the basin as well as portion on the east side of the proposed groin. Overall, the flushing reductions would be an average of 43 percent over 24 hours throughout the marina basin. This average flushing reduction does not meet the EPA guideline, and therefore, is considered to cause a significant water quality impact within the marina basin.

Cumulative

Implementation of the proposed project could result in short-term water quality impacts during construction activities, and these activities could contribute to significant cumulative impacts on water quality, specifically related to turbidity within Newport Bay.

In the long-term, the proposed project includes various BMPs to reduce potential impacts on surface water quality and the quality of the water entering Newport Bay. As a result, the proposed project would contribute less than cumulatively considerable to surface water quality impacts.

Also in the long-term, the proposed project could cause poor water quality within the proposed marina due to inadequate natural flushing by the tides. Therefore, the proposed project could contribute to potential significant cumulative water quality impacts within the proposed marina basin.

Mitigation Measures

Project Specific

MM 5.7-A.1 Prior to construction activities, a stormwater pollution prevention plan (SWPPP) for construction activities that describes best management practices (BMPs) to reduce the release of potential pollutants into surface water shall be prepared and approval by the City of Newport Beach. The plan shall also identify how the BMPs will be implemented. The SWPPP shall include, but not be limited to, the following BMPs:

- **Dust Control:** Water will be sprayed periodically in newly graded areas to prevent dust from grading activities dust to be blown to adjacent areas.
- **Construction Staging:** Specific areas will be delineated for storage of material and equipment, and for equipment maintenance, to contain potential spills.

- **Sediment Control:** Sand bags or silt fences will be located along the perimeter of the site. Existing inlets and proposed area drains will be protected against intrusion of sediment.
- **Tracking:** Tracking of sand and mud on the local street will be avoided by tire washing and/or road stabilization. Street cleaning will be done if tracking occurs.
- **Waste Disposal:** Specific area and/or methods will be selected for waste disposal. Typical construction waste include concrete, concrete washout, mortar, plaster, asphalt, paint, metal, isolation material, plants, wood products and other construction material. Solid waste will be disposed of in approved trash receptacles at specific locations. Washing of concrete trucks will be done in a contained area allowing proper cleanup. Other liquid waste will not be allowed to percolate into the ground.
- **Construction dewatering:** Construction dewatering will require approved permits by the California Regional Water Quality Control Board and the City.
- **Maintenance:** Maintenance of BMPs will take place before and after rainfall events to insure proper operation.
- **Training:** The SWPPP will include directions for staff training and checklists for scheduled inspections.
- **Construction Vehicles:** Construction vehicles will be inspected daily to ensure there are no leaking fluids. If there are leaking fluids, the construction vehicles will be serviced outside of the project site area.
- **Turbidity:** Activities shall not cause turbidity increases in bay waters that exceed: a) 20 percent if background turbidity is between 0 and 5 Nephelometric Turbity Units (NTUs); b) 10 percent if background is between 50 and 100 NTUs; c) 10 percent if background turbidity is greater than 100 NTUs. Monitoring of turbidity in bay water adjacent to boat slip construction will be conducted daily during construction activities that may cause turbidity. If activities exceed the above criteria, construction activities associated with causing turbidity will be discontinued until the above criteria is met.
- **Grease:** Construction activities will not cause visible oil, grease, or foam in the work area or in the bay.
- **Silt curtains:** Silt curtains will be placed within the bay so that all effluent from dredging activities will be contained within the construction zone.
- **Hauling Trucks:** The project construction contractors will ensure that trucks hauling soil material to and from the project site will be covered and will maintain a 2-inch differential between the maximum height of any hauled material and the top pf the haul trailer. Haul truck drivers will water the load prior to leaving the site in order to prevent soil loss during transport.

- **Heavy Equipment:** Limit heavy equipment use on the beach to areas away from the high-tide line during construction.
- **Hydrogen Sulfide:** Provisions shall be made, as necessary, for the treatment of hydrogen sulfide to comply with water quality standards and to control odors from the dewatering process.
- **Dredged Material:** Project operations will require that the scow doors used to release dredged material remain closed until the scows are towed to the disposal site.

MM 5.7-A.2 Prior to construction of the marina, the City shall include mechanical devices within the marina basin design to enhance the movement and mixing of water within the basin. The use of mechanical devices shall meet the EPA guidelines of adequate tidal flushing where flushing reductions range from 70 percent to 90 percent over a 24-hour period. One option could be the use of four oloids (propeller-type devices) that have been modeled. With these devices, the average flushing reductions in 24 hours would reach 80 percent, which meets the EPA guidelines.

Cumulative

Implementation of Mitigation Measures MM 5.7-A.1 and MM 5.7-A.2 are required.

Level of Significance After Mitigation

Project Specific

Less than significant.

Cumulative

Less than significant.

Groundwater Supplies and Recharge

Impact 5.7-B:	**The project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.**

Project-Specific Analysis

Construction activities associated with the proposed project would excavate a portion of the project site to create the marina basin. The creation of this basin would extend to the groundwater; however, the basin would not substantially deplete groundwater supplies that are used by the City because the project area is not used for domestic water supply. Therefore, the construction activities associated with the project would result in less than significant impacts on groundwater supplies.

In addition, the proposed project includes a drainage design that would direct stormwater flows to bioswales and biocells on the proposed site. Since stormwater on the project site is currently conveyed to the Bay, the diversion of stormwater to biosweles and biocells would eventually convey

water to the existing groundwater table. Therefore, the proposed project would result in a beneficial impact in groundwater recharge.

Cumulative

The proposed project would not substantially deplete groundwater supplies and would beneficially impact groundwater recharge. As a result, the proposed project's contribution to cumulative impacts on groundwater supplies and recharge is considered less than cumulatively considerable.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

Less than significant.

Cumulative

Less than significant.

Drainage Pattern: Erosion or Siltation

Impact 5.7-C:	**The project would not substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.**

Project-Specific Analysis

Implementation of the proposed project includes the removal of impervious surfaces. With development of the proposed project, the site's percentage of impervious surfaces would reduce to 53 percent from 83 percent. In addition to increase the amount of stormwater captured on the project site, the project includes bioswales and biocells to allow for stormwater to percolate into the groundwater. The proposed project would not alter the course of a stream or a river because there are no streams or rivers on or immediately adjacent to the project site. Since there are no streams or rivers on or adjacent to the site, there would be no erosion or siltation occurring from an alteration of a stream or river.

Cumulative

Since the proposed project would not alter a stream or river due to the permanent change of the existing drainage pattern, the project would not contribute to a cumulative erosion or siltation impact on a stream or river.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

No impact.

Cumulative

No impact.

Drainage Pattern: Flooding

Impact 5.7-D:	**The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.**

Project-Specific Analysis

As stated above for Impact 5.7-C, implementation of the proposed project includes the reduction of impervious surfaces to 53 percent from 83 percent of the project site. This reduction of impervious surfaces would allow more stormwater to be captured on the project site. In addition to increase the amount of stormwater captured on the project site, the project includes bioswales and biocells to allow for stormwater to percolate into the groundwater. Therefore, the proposed project would be expected to reduce the amount of stormwater runoff from the project site compared to existing runoff. As a result, the project would result in a beneficial impact by reducing stormwater flows leaving the project site.

Cumulative

Since the proposed project would reduce stormwater flows leaving the project site, the project would not contribute to drainage problems or flooding adjacent to the project site. The proposed project would provide a beneficial impact on cumulative offsite flooding.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

Beneficial.

Cumulative

Beneficial.

Runoff Water and Drainage Systems

Impact 5.7-E:	**The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.**

Project-Specific Analysis

As stated above for Impact 5.7-C, implementation of the proposed project includes the reduction of impervious surfaces to 53 percent from 83 percent of the project site. This reduction of impervious surfaces would allow more stormwater to be captured on the project site. In addition to increase the amount of stormwater captured on the project site, the project includes bioswales and biocells to allow for stormwater to percolate into the groundwater. Therefore, the proposed project would be expected to reduce the amount of stormwater runoff from the project site compared to existing runoff. As a result, the project would result in a beneficial impact on the existing stormwater drainage systems that convey stormwater to the Bay.

Although less impervious surfaces would be constructed onsite, the proposed project may result in varying levels of long-term pollutants compared to the existing uses. These pollutants include bacteria, heavy metals, pesticides, organic compounds, sediments, trash and debris, oxygen demanding substances, oil, and grease. The proposed project includes various best management practices (BMPs) that would control predictable pollutant runoff. These BMPs are identified in the Preliminary Water Quality Management Plan (PWQMP) that has been prepared for the proposed project (see Appendix H). These BMPs include a vegetative biowale that provides filtration, landscaped biocells that capture, treat and infiltrate runoff, and porous concrete pavers proposed for the parking stalls in all three proposed parking lots. In addition, the PWQMP includes common area litter control, common area landscape management, street sweeping of parking lots, and an efficient irrigation system to avoid runoff. The proposed BMPs to remove pollutants would reduce potential long-term water quality impacts to less than significant.

Cumulative

The proposed project would reduce the amount of stormwater runoff from the project site compared to existing runoff. As a result, the project would result in a beneficial impact on the existing stormwater drainage systems that convey stormwater to the Bay. Thus, the project would contribute a beneficial cumulative impact on existing drainage systems.

In addition, since the proposed project includes various BMPs to reduce potential impacts on surface water quality and the quality of the water entering Newport Bay, the proposed project would contribute less than cumulatively considerable to surface water quality impacts.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

Less than significant.

Cumulative

Less than significant.

Water Quality

Impact 5.7-F: The project would not otherwise substantially degrade water quality.

Project-Specific Analysis

Short-term Construction Impacts

As stated in Impact 5.7-A, implementation of the proposed project would result in construction activities that could have the potential to contribute to pollutants in surface water. These pollutants could be conveyed off-site potentially affecting the water quality within the Lower Newport Bay. Generally, construction activities could generate pollutants such as increased silts, ground rubber, oils from automobiles, debris, litter, chemicals, dust, and dissolved solids related to grading, excavation, dredging, building construction, and painting.

The construction phase has the greatest potential for pollution of surface water and water within Newport Bay as large fueled vehicles, such as trucks and earth moving equipment, will be present on the project site. Since construction activities could result in increased pollutants to surface water, the proposed project could result in a short-term potential to degrade surface water quality that could be conveyed offsite and potentially to Newport Bay. This impact during construction activities is considered potentially significant.

Excavation, dredging, and marina construction activities will cause a short-term increase in turbidity from the discharging of the suspended fine sediments with the liquefied portions of the dredge material. Localized increases in turbidity can also occur as a result of vessel prop wash from tug boats. The extent and orientation of the dredge plume would depend on the prevailing tidal cycle. With ebbing tides, the plume could dissipate into the main channel, and out towards the harbor entrance channel. Incoming flood tides could cause the turbidity plum to disperse farther up towards

the Rhine Channel. Although the increase in turbidity would be short-term during dredging activities, this potential increase would be considered significant.

Long-term Operational Impacts

Long-term operations of the proposed project would not increase impervious surfaces on the project site compared to existing conditions; however, the proposed project would reduce the site's percentage of impervious surfaces to 53 percent from 83 percent. Although less impervious surfaces would be constructed onsite, the proposed project may result in varying levels of long-term pollutants compared to the existing uses. These pollutants include bacteria, heavy metals, pesticides, organic compounds, sediments, trash and debris, oxygen demanding substances, oil, and grease. The proposed project includes various best management practices (BMPs) that would control predictable pollutant runoff. These BMPs are identified in the Preliminary Water Quality Management Plan (PWQMP) that has been prepared for the proposed project (see Appendix H). These BMPs include a vegetative biowale that provides filtration, landscaped biocells that capture, treat and infiltrate runoff, and porous concrete pavers proposed for the parking stalls in all three proposed parking lots. In addition, the PWQMP includes common area litter control, common area landscape management, street sweeping of parking lots, and an efficient irrigation system to avoid runoff. The proposed BMPs to remove pollutants would reduce potential long-term water quality impacts to less than significant.

In addition, the public beach between 16th and 19th Streets will continue to be a popular recreational area, and visitor use will likely increase. The volume of trash and debris generated from beach use will also likely increase. This has a low potential to degrade water quality; however, continuance of the City's regular maintenance of the beach area would reduce potential water quality impacts to less than significant.

Furthermore, implementation of the proposed marina could create a condition where there would be inadequate tidal flushing within the marina. A Coastal Engineering Study was conducted to estimate the potential impact of the proposed marina on water quality in the immediate vicinity of proposed marina basin and adjacent waterway. The impact on the proposed marina basin on water quality was evaluated based on the U.S. Environmental Protection Agency (EPA) guidelines for marina flushing management measures. These EPA guidelines were specified to minimize non-point source pollution in coastal waters. Although there is no specific guideline for marina basins in Southern California, EPA guidelines for southeastern and northwestern United states suggests adequate tidal flushing to maintain water quality flushing reductions (the amount of conservative substance that is flushed for the basin) ranging from 70 percent to 90 percent over a 24-hour period.

A hydrodynamic and water quality model was used to evaluate the tidal flushing capability of the proposed marina basin. Based on the scenario of the Proposed Marina Basin with Existing Groin Wall, there is adequate tidal flushing at less than about one-quarter of the way into the basin while there is minimum flushing reductions father into the basin.

Poor tidal flushing conditions would exist in the majority of the basin as well as portion on the east side of the proposed groin. Overall, the flushing reductions would be an average of 43 percent over 24 hours throughout the marina basin. This average flushing reduction does not meet the EPA guideline, and therefore, is considered to cause a significant water quality impact within the marina basin.

Cumulative

Implementation of the proposed project could result in short-term water quality impacts during construction activities, and these activities could contribute to significant cumulative impacts on water quality, specifically related to turbidity within Newport Bay.

In the long-term, the proposed project includes various BMPs to reduce potential impacts on surface water quality and the quality of the water entering Newport Bay. As a result, the proposed project would contribute less than cumulatively considerable to surface water quality impacts.

Also in the long-term, the proposed project could cause poor water quality within the proposed marina due to inadequate natural flushing by the tides. Therefore, the proposed project could contribute to potential significant cumulative water quality impacts within the proposed marina basin.

Mitigation Measures

Project Specific

Implementation of Mitigation Measures MM 5.7-A.1 and MM 5.7-A.2 are required.

Cumulative

Implementation of Mitigation Measures MM 5.7-A.1 and MM 5.7-A.2 are required.

Level of Significance After Mitigation

Project Specific

Less than significant.

Cumulative

Less than significant.

Housing Placement: Flood Hazard Area

Impact 5.7-G:	**The project would not place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.**

Project-Specific Analysis

Implementation of the proposed project would not involve the development of housing. As delineated by the Flood Insurance Rate Map (FIRM) designated by the Federal Emergency Management Agency (FEMA), the project site is not located within a 100-year floodplain, nor is it located within a Special Flood Hazard Area (SFHA). No impacts associated with flood and water related hazards would result with project implementation

Cumulative

Since the project site is not located within a 100-year floodplain and the project does not include housing, the proposed project will not contribute to a cumulative impact of locating housing within a 100-year floodplain.

Mitigation Measures

Project Specific

No mitigation measures required.

Cumulative

No mitigation measures required.

Level of Significance After Mitigation

Project Specific

No impact.

Cumulative

No impact.

Structures: Flood Hazard Area

Impact 5.7-H:	**The project would not place within a 100-year flood hazard area structures which would impede or redirect flood flows.**

Project-Specific Analysis

According to the Flood Insurance Rate Map prepared by FEMA, the project site is not located within a 100-year flood hazard area and would not be inundated by a 100-year flood. Therefore, the structures proposed on the project site would result in no impacts on flood flows.

Cumulative

Since the project would not impact flood flows, the project would not contribute to cumulative impacts on flood flows.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

No impact.

Cumulative

No impact.

Flooding

Impact 5.7-I:	The project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Project-Specific Analysis

The proposed project is not located in an area of flooding or in the vicinity of a levee or dam. According to city staff, the proposed project floor elevations of the structures at +10 feet above MLLW would reduce potential significant effects from storm surges and flooding. Therefore, the proposed project would not expose people or structures to a significant risk of death involving flooding, including flooding as a result of the failure of a dam or levee.

Cumulative

The proposed project is not located within the vicinity of a levee or dam. Therefore, there will be no cumulative impact resulting from the failure of a levee or dam.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

No impact.

Cumulative

No impact.

Seiche, Tsunami, or Mudflow

Impact 5.7-J:	The project could be subject to Inundation by seiche, tsunami, or mudflow.

Project-Specific Analysis

As the site lies on the coast, the risks that are associated with seiches and tsunamis are moderate to high. Studies performed by Legg, Borrero, and Synolakis (2004) suggest that this area of the coastline may be affected by both earthquake and subaqueous landslide-generated tsunamis with wave heights of 2+ meters and wave run-up of 4+ meters. As such, the site may be affected by tsunamis under certain critical conditions. As it is understood, the City of Newport Beach already has a tsunami contingency plan and evacuation routes in place which would reduce this potential impact to less than significant.

Cumulative

The proposed project has the potential to be inundated by a tsunami. However, implementation of the City's tsunami contingency plan and evacuation routes will reduce this cumulative impact to less than significant.

Mitigation Measures

Project Specific

No mitigation measures are required.

Cumulative

No mitigation measures are required.

Level of Significance After Mitigation

Project Specific

Less than significant

Cumulative

Less than significant.