Appendix A – Sea Level Rise

I. Purpose. To ensure that sea level rise is adequately addressed in the review of coastal development permit applications and in future updates and amendments to the City's Local Coastal Program (LCP).

II. Introduction. Climate change and sea level rise have the potential to significantly threaten many resources within the City's coastal zone, including shoreline development, coastal beach access and recreation, habitats, and scenic resources. These resources are subject to specific protections and regulations in the Coastal Act and the City's LCP.

Given that the width of the City's beaches varies between fifty and six-hundred (50 and 600) feet, a sea level rise of as little as six (6) inches may have a negative impact on the low-lying areas around Newport Bay that are not protected by bulkheads and seawalls. Sea level rise may also cause increased coastal bluff retreat in the southern portion of the City where the beaches are narrow, and the surf pounds at the base of the bluffs, eroding away the soft bedrock that forms the cliffs.

The potential impacts of sea level rise include loss of recreational beaches due to accelerated erosion, loss of waterfront property through erosion and inundation of low-lying areas, the loss of coastal bluff property through increased bluff retreat, and the loss of and changes to natural habitats in the Upper Newport Bay, Semeniuk Slough, and other low-lying natural areas. In addition, there could be severe social and economic hardships associated with the loss or relocation of visitor-serving, recreational, and coastal-dependent and coastal-related businesses and facilities.

The 2012 National Research Council's Report, *Sea-Level Rise for the Coasts of California, Oregon and Washington: Past Present and Future* projects sea level rise south of Cape Mendocino at two to twelve (2-12) inches by 2030, five to twenty-four (5-24) inches by 2050, and seventeen to sixty-six (17-66) inches by 2100. Exhibit A shows areas around the harbor where there is the potential for flooding if the sea level rises 66 inches. At this level, approximately 3,000 properties and essential facilities including Coast Highway and sewer pump stations could be affected if the harbor's flood defenses, i.e. seawalls or beach berms, are breached.

III. City's Plan of Action. The City understands there is a threat of flooding in and around Newport Harbor due to sea level rise. Acknowledging the considerable uncertainty in the magnitude of the rise in sea level, the City intends to undertake a proactive program to monitor the rate of sea level rise and be prepared to implement a series of actions based on the actual rise in sea level. Those actions may include requiring public and privately–owned seawalls be properly maintained; requiring public and privately–owned seawalls caps be extended per City standards; revising City standards for new seawall, top-of-seawall elevation and finished floor elevations; studying ways to maintain access to beaches, docks and piers; and monitoring and replenishing beach sand loss in the harbor and along the ocean.

The efforts of the City are directly in accordance with the Coastal Land Use Plan policies which are listed below:

2.8.6-1. Prepare and periodically update comprehensive studies of seasonal and long-term shoreline change, episodic and chronic bluff retreat, flooding, and local changes in sea levels, and other coastal hazard conditions.

2.8.6-2. Continue to monitor beach width and elevations and analyze monitoring data to establish approximate thresholds for when beach erosion or deflation will reach a point that it could expose the backshore development to flooding or damage from storm waves.

2.8.6-3. Develop and implement a comprehensive beach replenishment program to assist in maintaining beach width and elevations. Analyze monitoring data to determine nourishment priorities, and try to use nourishment as shore protection, in lieu of more permanent hard shoreline armoring options.

2.8.6-4. Maintain existing groin fields and jetties and modify as necessary to eliminate or mitigate adverse effects on shoreline processes.

2.8.6-5. Permit revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls and other structures altering natural shoreline processes or retaining walls when required to serve coastal-dependent uses or to protect existing principal structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply, unless a waiver of future shoreline protection was required by a previous coastal development permit.

2.8.6-6. Design and site protective devices to minimize impacts to coastal resources, minimize alteration of natural shoreline processes, provide for coastal access, minimize visual impacts, and eliminate or mitigate adverse impacts on local shoreline sand supply.

2.8.6-7. Discourage shoreline protective devices on public land to protect private property/development. Site and design any such protective devices as far landward as possible. Such protective devices may be considered only after hazard avoidance, restoration of the sand supply, beach nourishment and planned retreat are exhausted as possible alternatives.

2.8.6-8. Limit the use of protective devices to the minimum required to protect existing development and prohibit their use to enlarge or expand areas for new development or for new development. “Existing development” for purposes of this policy shall consist only of a principle structure, e.g. residential dwelling, required garage, or second residential unit, and shall not include accessory or ancillary structures such as decks, patios, pools, tennis courts, cabanas, stairs, landscaping etc.

2.8.6-9. Require property owners to record a waiver of future shoreline protection for new development during the economic life of the structure (75 years) as a condition of approval of a coastal development permit for new development on a beach, shoreline, or bluff that is subject to wave action, erosion, flooding, landslides, or other hazards associated with development on a beach or bluff. Shoreline protection may be permitted to protect existing structures that were legally constructed prior to the certification of the LCP, unless a waiver of future shoreline protection was required by a previous coastal development permit.

2.8.6-10. Site and design new structures to avoid the need for shoreline and bluff protective devices during the economic life of the structure (75 years).

Future Steps

Based on the expected rate of sea level rise, the City staff will revise existing or devise new policies for consideration by City Council. Current policies that could be revised include changes to the minimum finished floor elevation, maximum roof heights, setbacks, public access requirements, existing or new seawall requirements including associated mitigation requirements, and drainage requirements.

The City will continue to analyze the potential impacts of sea level rise on the community and will consider policies and corresponding development standards for public review and discussion. This Local Coastal Program may also require appropriate amendments, which will require review and approval by the Coastal Commission.

IV. Review of Coastal Development Permits.

Upon certification of the Local Coastal Program, the City will issue coastal development permits, based on policies and standards contained therein.

The City will use the best-available science to determine a range of sea level rise projections for use in reviewing coastal development permit applications. Sea level rise science continues to evolve, and some processes that are not fully understood may potentially have large effects on future sea level rise. Therefore, the City will re-examine the best available science periodically in conjunction with the release of new information on sea level rise.

In its review of coastal development permits, the following policy shall be taken into consideration in addition to the relevant policies stated in Section III.

2.8.3-1. Require all coastal development permit applications for new development on a beach or on a coastal bluff property subject to wave action to assess the potential for flooding or damage from waves, storm surge, or seiches, through a wave uprush and impact reports prepared by a licensed civil engineer with expertise in coastal processes. The conditions that shall be considered in a wave uprush study are: a seasonally eroded beach combined with long-term (75 years) erosion; high tide conditions, combined with long-term (75 year) projections for sea level rise; storm waves from a 100-year event or a storm that compares to the 1982/83 El Niño event.

Applicability. Sea level rise should be considered in the review of a CDP when the project is on low-lying land, on eroding coastal bluffs, or are in proximity to water. These include:

- “Low-lying land” areas include the Semeniuk Slough, West Newport, Lido Peninsula, Balboa Peninsula, Bay Island, Balboa Island, Little Balboa Island, Collins Island, Balboa Coves, Mariners’ Mile, Balboa Bay Club Resort, Bay Shores, Harbor Island, and Beacon Bay.

- "Eroding coastal bluffs" include those along Ocean Boulevard in Corona del Mar and in Shorecliffs and Cameo Shores.

- "Proximity to water" includes all of the above areas and shoreline properties in Newport Shores, Newport Island, Lido Isle, Harbor Island, Bayside, Carnation Cove, China Cove, Bayside Village, Newport Dunes, and Dover Shores.

To facilitate this review, the following steps/analysis shall be considered in developing the application submittal.

Step 1 Establish the projected sea level rise range for the proposed project's planning horizon (life of project) using the best available science.

Step 2 Determine how physical impacts from sea level rise may impact the project site, including erosion, structural and geological stability, flooding and inundation.

1. **Wave Uprush and Wave Impacts (see Section 21.30.015.C.3)**. The wave uprush and wave impact the analysis should identify risks that potentially could occur over the anticipated life of the project from 1) a seasonally eroded beach combined with long term (75-year) erosion; 2) high tide conditions, combined with long-term (75 year) projections for sea level rise; and 3) storm waves from a 100-year event or a storm that compares to the 1982/83 El Niño event.

2. **Geologic Stability (see Section 21.30.015.C.4)**. Geologic stability reports should analyze site-specific stability and structural integrity without reliance upon existing or new protective devices (including cliff-retaining structures, seawalls, revetments, groins, buried retaining walls, and caisson foundations) that would substantially alter natural landforms along bluffs and cliffs. Geologic stability can include, among others, concerns such as landslides, slope failure, liquefiable soils, and seismic activity. In most situations, the analyses of these concerns will be combined with the erosion analysis to fully establish the safe developable area.

3. **Erosion**. The erosion analysis should establish the extent of erosion that could occur from current processes, as well as future erosion hazards associated with the identified sea level rise scenarios over the life of the project. If possible, these erosion conditions should be shown on a site map, and the erosion zone, combined with the geologic stability concerns, can be used to help establish locations on the parcel or parcels that can be developed without reliance upon existing or new protective devices (including cliff-retaining structures, seawalls, revetments, groins, buried retaining walls, and caissons) that would substantially alter natural landforms along bluffs and cliffs.

4. **Flooding and Inundation**. The flooding or inundation analysis should identify the current tidal datum and include analysis of the extent of flooding or inundation that potentially could occur from the identified sea level rise scenarios.

5. **Other Impacts**. Any additional sea level rise related impacts that could be expected to occur over the life of the project, such as saltwater intrusion should be evaluated. This may be especially significant for areas with a high groundwater table such as wetlands or coastal resources that might rely upon groundwater.

Step 3 Determine how the project may impact coastal resources, considering the influence of sea level rise over the life of the project. Resources to consider shall include public access and recreation, coastal habitats, water quality, archaeological/paleontological resources and scenic resources.

Step 4 Seek alternatives to avoid resource impacts and minimize risk to the project, such as increasing heights of sea walls or finished floor elevations.

Step 5 In conjunction with the approval of the CDP, appropriate conditions of approval will be placed on the project.

Projected Flooding During a Maximum (1%) Tide Assuming 66 Inch Sea-level Rise by Year 2100 and Existing Seawall Heights at Elevation 9 Feet (NAVD88)

Areas lower than Elevation 10.0 feet (NAVD88 datum). Approximate limits of flooding during a maximum tide in **Year 2055** with an approximate flood depth of 0.1-3 feet and flood duration of 0.1 to 3 hours.

Areas lower than Elevation 12.0 feet (NAVD88 datum). Approximate limits of flooding during a maximum tide in **Year 2090** with an approximate flood depth of 0.1-5 feet and flood duration of 0.1 to 7 hours.

Concept level exhibit for preliminary planning purposes.
Longer flood duration and deeper flood depths for the Balboa Islands.

Date: 12/2/2013 Document Name: FloodAreaRanges

Projected Flooding During a Maximum (1%) Tide Assuming 66 Inch Sea-level Rise by Year 2100 and Existing Seawall Heights at Elevation 9 Feet (NAVD88)

Areas lower than Elevation 10.0 feet (NAVD88 datum). Approximate limits of flooding during a maximum tide in **Year 2055** with an approximate flood depth of 0.1-3 feet and flood duration of 0.1 to 3 hours.

Areas lower than Elevation 12.0 feet (NAVD88 datum). Approximate limits of flooding during a maximum tide in **Year 2090** with an approximate flood depth of 0.1-5 feet and flood duration of 0.1 to 7 hours.

Concept level exhibit for preliminary planning purposes.
Longer flood duration and deeper flood depths for the Balboa Islands.

Date: 12/2/2013 Document Name: FloodAreaRangesUpperBay