Environmental Impact Statement for New Construction and Development along Lake Drive, Singer Island, Lake Worth Lagoon

The Lake Worth Lagoon, from the Palm Beach Inlet north to Little Lake Worth, houses some of the most potentially-endangered marine organisms known from the southeastern coast of Florida. These include at least 7 species and subspecies of endemic mollusks, federally-protected animals such as the Queen Conch and West Indian Sea Star, and an endangered sea grass species (see Appendix 1 of this report). All of these organisms are restricted to the oceanographic parameters of the lagoon and inhabit environments such as open sand sea floors, Turtle Grass beds, and peripheral mangrove forests. The highly-endemic fauna of the Lagoon has been the subject of numerous recent publications, including books on Lake Worth marine ecosystems and numerous scientific papers containing the descriptions of several newly-discovered resident species.

The four greatest potential environmental dangers to the various ecosystems in the Lake Worth Lagoon include: **shading** of sea grass beds and marine vegetation by piers, bridges, tall buildings, or floating docks (fatal to marine vegetation because of loss of sunlight intensity); **suspended sediments** in the water column caused by disruption of the sea floor (which will choke-out sensitive organisms and reduce the light intensity for benthic organisms); an **input of organic material** into the lagoon (the decomposition will lower the dissolved oxygen level in the water column and will encourage toxic algal blooms); and the **physical alteration of the sea floor**, by the removal of sediments, changing sediment type and grain size, or removing hard substrate areas (this would damage the habitats for many benthic organisms).

The proposed construction parcel, encompassing the area extending from 2429 to 2525 Lake Drive and immediately south of the Blue Heron Boulevard Bridge, is situated next to an area with the **lowest benthic biodiversity in the Lagoon**. Construction along this parcel of land will have no impact on the ecological well-being of the adjacent sea floor, for the following reasons:

1. Suspended Sediments and Water Quality. The repair and enlargement of the property's sea wall will not involve dredging or filling with sediments in the lagoon, so no suspended sediments will be discharged into Lake Worth and there will be no subsequent detrimental effects to the sea grass beds in nearby areas, such as Peanut Island and Pine Point.

2. Rainwater Runoff and Water Quality. Having a sizeable set-back from the edge of the sea wall, the ongoing construction will have no effect on the water quality of the lagoon and any sediment-filled rainwater runoff will enter the islands storm drain system and will not spill into Lake Worth. Organisms that are sensitive to suspended particulates will be unaffected by the construction.

3. Shading of the Sea Floor. Diminishment of sunlight produced by the 300 foot-tall completed building will only be taking place during the morning hours of each day and will have little or no effect on the marine plant growth in that area. A cursory biotic survey has shown that the sea floor adjacent to the parcel supports only a sparse growth of phaeophytes, such as small patches of

Dictyota and *Padina*, and is mostly open sand areas with very low productivity. The area currently is in sporadic shade due to all the docks and piers that have been constructed over the past decades and this has prevented extensive plant growth from developing. The addition of floating docks will not affect the low-productivity sea floor that presently exists there.

4. Introduction of Organic-Rich Materials and Nutrients. Since an enlarged and elevated sea wall is being constructed along the periphery of the parcel, the property is effectively sealed-off from the adjacent marine environment. This will prevent any large-scale introduction of organic debris or mass discharges of nutrient-rich surficial rain water. The very strong tidal flushing in the adjacent boat channel will also prevent the build-up of organic material or fine-particulate sediments. The pattern of the currents will also not be affected by any aspect of the completed project. These will continue to flood the area with fresh sea water during every tidal cycle, as it has since the original expansion of Lake Worth, and will maintain open oceanic sea water conditions.

5. Physical Alterations of the Sea Floor. Since the construction project will be isolated from the lagoon by the sea wall, no physical alteration will take place on the adjacent shallow sea floor. No marine communities or ecosystems will be affected and the area will remain as it is now. The tidal currents and water flow patterns will also be unaffected, so no submarine barriers will prevent the movement or dispersal of marine organisms.

6. Endangered Marine Organisms. The areas of highest biodiversity in the Lake Worth Lagoon are present in 3 localities:

--the **northern end of the lagoon**, between Pine Point Road and MacArthur State Park and containing immense beds of Turtle Grass that house unique mollusks such as the gastropods *Stramonita buchecki* and *Melongena corona winnerae*, and bivalves such as *Semele donovani* and *Mercenaria hartae*). These sea grass beds also shelter the protected Queen Conch (*Aliger gigas*), the West Indian Sea Star (*Oreaster reticulatus*), as well as Green Sea Turtles and Manatees.

--the deep channel under the **Blue Heron Boulevard Bridge**, and adjacent to Phil Foster Park, supports one of the richest coastal ecosystems known from southeastern Florida, and housing dense growths of corals, sponges, and gorgonians, along with Sea Horses and numerous tropical fish species. The strong tidal currents within the channel prevent the accumulation of fine sediments and the proximity to the Gulf Stream (directly off the Palm Beach Inlet) allows for the recruitment of larvae from many seldom-seen Caribbean species. Because of this amazingly-high biodiversity, the Blue Heron Bridge area is a world-renowned dive site and attracts divers from all over the planet.

--**Peanut Island**, at the mouth of the Palm Beach Inlet, is constantly bathed in Gulf Stream water and supports a high-diversity marine fauna containing special endemic gastropod mollusks such as *Modulus pacei*, *Cerithium lutosum lindae*, and *Nerita lindae*. Like the Blue Heron Bridge, Peanut Island contains a remarkable fauna and flora of marine organisms and is a popular dive locality for marine biologists and amateur naturalists.

After conducting several decades of biotic surveys in the Peanut Island-Blue Heron Bridge area,

I have observed that the area immediately adjacent to the proposed development consistently has had a lower biodiversity than what is encountered elsewhere in the Palm Beach Inlet region. I attribute this lack of species-richness to the strong tidal scouring that occurs in this locality four times a day, making it nearly impossible for most pelagic larvae to settle out on the constantly-shifting substrate. This is readily apparent when comparing the impoverished sea floor biota of the 2429-2525 Lake Drive area with those found around the more stable and quiet environments near Peanut Island and under the Blue Heron Bridge. The biotic impoverishment was also exacerbated by decades of boat wakes and propeller thrust near, and around, the docks and piers in that area.

Prospectus. Because of the natural and manmade degradation of the sea floor environment south of the Blue Heron Bridge, along Lake Drive, a high-biodiversity environment never became established there, as it has in other localities around the Lake Worth Lagoon. The area has already been shaded by numerous marine structures for decades and the sea floor only supports a very few minor organisms. The addition of shade from floating docks and semi-diurnal shade from tall buildings will have no impact whatsoever on the composition of the already-impoverished, low biodiversity ecosystem. It has already adapted to, and responded to, decades of low-light or partial-light conditions. No additional reduction in biodiversity is predicted in this situation. The almost-continuous flushing of the area by clean, open-oceanic sea water will also ensure that the impoverished biota of the area will not diminish or degrade subsequent to the finished construction project.

As a marine biologist and oceanographer, who has studied the Lake Worth Lagoon for 45 years, I can state with confidence that the 2429-2525 Lake Drive development will have no impact on the health of the adjacent marine environment; neither during the initial construction phases nor after the building is completed. I have a vested interest in the ecological health of Lake Worth, as I have discovered and named many new species of endemic mollusks from there; if I felt that they would be endangered by this project, I would be the first person to speak out against it. But the entire concept of this construction project is benign and will have no negative impacts on our local marine ecosystems.

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