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MALLARD LAKES SUSTAINABILITY ISSUES

Mallard Lakes (ML) Flood Risk:

- Rising water (tidal inundation) breaches the tidal lake banks frequently in the most vulnerable areas (Source: Stacey Selby)
- Buildings on pilings are particularly vulnerable since they are on wooden foundations (vice concrete slabs that are under the remaining buildings), allowing flood water to rise through their floors. These units are: #1 All Island buildings; #2, 37898 Eagle Lane; #3, 38420 Cardinal Lane; #4, 37816 Eagle Lane, #5, 38256 Hummingbird Lane; #6, 37862 Eagle Lane. (Source: Stacey Selby)
- Houses on slabs are also vulnerable. There is no separation between the first floor of the house and the outside grade, so any flood waters would directly impact the house. Second, poor drainage can lead to the slab being undermined by water saturating the soil underneath the slab, causing the slab to crack and settle because of the instability of the underlying soil. (Source Sharon Cruz)
- As sea levels have risen, the tidal water has migrated into the man-made lakes, causing them to become brackish lakes. (Source Stacey Selby). Heavy storm surge could result in freshwater lakes flooding residents due to this backwash effect.
- New building development within the inland bay systems around MLs will cause additional water rise within ML's tidal lake, due to having fewer wetlands to absorb tidal water. (Source: Wetlands: Protecting Life and Property from Flooding)
- Effects of sea level rise and construction will exacerbate areas within ML that are experiencing subsidence (sinking land). (Source: Todd Fritchman).
- A Federal Interest Determination conducted by the US Army Corps of Engineers (USACE) concluded that "Flooding and damage to structures in the Delaware Little Assawoman Bay area occurred during Hurricane Sandy, and the risk of similar damaging storm events is expected to increase in the future."

Flood Risk Statistics:

- First Street Foundation, a nonprofit research and technology organization that creates models to calculate climate risk, rates every unit in ML at "severe" or "extreme" risk of flooding. Their model shows **every ML building is at risk**, not solely those on the tidal lake:
- The buildings on the Hummingbird Lane "island" have a 99% chance of at least one foot of interior flooding in the next 30 years, with a 60-80% chance in the next 10 years.

- Buildings on the north side of the tidal lake have an 80-95% chance of at least one foot of interior flooding over the next 30 years and 30-50% over the next ten years.
- Most buildings on the other lakes have a 50-75% chance of at least one foot of interior flooding over the next 30 years and a 15-20% chance over the next 10 years.
- The buildings furthest from the tidal lake have up to a 40% chance of 6 inches of flooding in the next 10 years.

Health and Safety:

- Constant exposure to moisture can lead to health and safety issues in the affected units, which will only increase as the lakes expand. According to climatecentral.org, water-damaged homes provide ideal growing conditions for molds (types of fungi) and other microbes that can harm respiratory health and contribute to other illnesses. (Source: Climate Central Org).

Financial and Property Value Impact:

- Although property values in ML have rebounded since Hurricane Sandy, ML property values are lower compared to similar condos in the area (e.g., and could worsen as water levels rise and storms become more frequent.

Challenge:

- Future major storms and rising water levels are unavoidable. ***While the properties around the tidal lake are at the greatest risk, degradation of affected properties around the tidal lake will affect the overall community.***

Key Reference Documents:

- Climate risk financial modeling (firststreefoundation.com)
- Coastal Sea Rise statics for Sussex County Sussex_County_DE.pdf
- Hazard Mitigation Assistance Technical Review for Elevations, Elevation Technical Review Supplement T1.3
- National Risk Index, Sussex County, Community Report - Sussex County, Delaware | National Risk Index
- National Risk Index by Census Track, Community Report - Census tract 10005051309, Sussex County, Delaware | National Risk Index
- Firstmap Historic Imagery, Mallard Lakes Historic Maps
- Environmental Protection Agency, flooding effects of filling wetlands, Wetlands: Protecting Life and Property from Flooding
- USACE Federal Interest Determination (FID), CAP #205, Flood Risk Management Study, Delaware Bayshores, DE, dated April 2016

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Experts:

- Stacey Selby, Mallard Lakes Maintenance Manager
- Todd Fritchman, President and CEO of Envirotech Environmental Consulting, Inc.
- Sharon Cruz, Senior Municipal Engineer, Davis Bowen and Friedel
- Scott Sanderson, US Army Corps of Engineers, Chief Project Development Branch, Environmental Scientist
- Jason Miller, US Army Corps of Engineers, Silver Jackets and Flood Plain Management