Coalition to Mitigate the Impacts of Sea Level Rise
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July 25, 2022

Susan Todani, Chairperson
Chason Ishii, Vice Chairperson
Hawaii Community Development Authority (HCDA)
547 Queen Street
Honolulu Hawaii 96813

Re: Permit # KAK 22-024; Applicant: Victoria Ward, Limited (local Howard Hughes subsidiary)

We understand that the permit application before you is "vested" and will be approved at the August 3 hearing as meeting its master plan guidelines. However, the initial public concerns as raised in our correspondence of May 23, May 30, and June 1 in opposition to the development because it omitted critical Public Health and Safety concerns, pertaining to accelerating sea level rise (SLR) and its cumulative effects, have not yet been addressed in the development application.

In light of these serious omissions, we are again requesting that HCDA and the City and County of Honolulu pause the permitting of this and similar projects within the NOAA (National Oceanic and Atmospheric Administration) four-foot SLR zone, and address the concerns about Climate Change and cumulative effects of SLR, groundwater inundation and storm drain backflow, and coordinate in developing truly effective mitigation measures that shall be funded and implemented prior to any possible development so that it will not become a liability to the next generation. Additionally, we are requesting hearings at HCDA along with sworn testimony from public officials pertaining to Climate Change and cumulative impacts of SLR on infrastructure and structural stability. Both the NOAA SLR and the PACIOOS (Pacific Island Ocean Observatory System) SLR assessments with overlays of hurricane storm surge and tsunami — evaluations of the passive flooding bathtub approach — indicate that the proposed project site is impacted by a 3-foot SLR, but do not address the cumulative effects of groundwater inundation and storm drain backflow. These will become public safety issues endangering Oahu's coastal zone and the project site with flooding years ahead of actual SLR inundation.

While concerns about the cumulative effects of Climate Change and with it unstoppable SLR is continuously being raised by scientists world-wide[i], in 2012 scientists at the University of Hawaii (UH) focused on coastal Honolulu and compiled existing groundwater data to estimate the current water table in the southern Oahu caprock aquifer and assess how potential future SLR could affect inundation potential and timing.[ii] Their research indicated that the total flooded areas by groundwater and marine inundation (aquifer inundation at mean higher high water (MHHW[iii]) under 2.1 feet (0.66 m) SLR in the Honolulu caprock aquifer) would likely include Ala Moana Blvd. in the vicinity of the present project site, thus much ahead of 3 feet SLR … *Travel, commerce, and emergency services may be impacted and groundwater inundation may change the character of the land surface in ways that work against public health and safety. Furthermore, increased soil saturation may lead to a series of geotechnical and slope-stability issues. For example, rising aquifer salinity leads to corrosion of subsurface structures, including water and sewer pipes.*

By 2020, when such concerns were not properly addressed, UH scientists, supported by the City and County of Honolulu, combined storm drain backflow with SLR and groundwater inundation research.[iv] They documented that infrastructure failure at even just the minor flood threshold of 20.5 in. (52 cm) included 200 locations where drainage inlets lose all capacity for drainage and begin acting as conduits for flooding. This included all inlets along Ala Moana Blvd at the proposed project site. Even before this threshold would be reached, the twice-a-month new and full moon high tides (even without an occasional storm-related SLR of 5-8 in.) could already heavily impact the area with occasional nuisance floods.

The facts speak for themselves. Are we not already gambling on the future of Hawaii`s next generation?

[i] [i] While it was already approaching High Noon even before 2020 for the world to take effective actions in mitigating the effects of Climate Change felt all around the world and with it ever accelerating SLR, NOAA, in the spring of 2022, issued surprisingly low SLR predictions of no more than 1 foot by 2050 based on "current" emissions. There was hope that the US would not only step up assuming its world climate leadership role but would also lead again on the Federal level under the new Biden administration. Under the previous Trump Administration, not only over 100 environmental regulations were nixed, but the US also withdrew from the 2015 Paris Climate Accord, adopted by 195 countries, that set out a global framework to avoid dangerous climate change by limiting the global average temperature to well below 3.6°F (2°C) above pre-industrial levels and pursuing efforts to limit it to 2.7°F (1.5°C). The Biden administration immediately rejoined the Climate Accord but the USA, like so many other countries, has failed in its commitment. The recent US Supreme Court ruling vetoing Federal implementation of Climate Change, the Senate's consistent inability to pass meaningful Climate Change legislation, and the effects of Russia's war in Ukraine that is forcing the EU to back down from its ambitious Climate Change mitigation goals, are also continuing to increase fossil fuel use, resulting in continued global warming much in excess of 2.7°F (1.5°C) and a seemingly unstoppable increase in SLR.
(NOAA- *Earth temperature has risen by 0.14°F (0.08°C) per decade since 1880, but the rate of warming since 1981 is more than twice that: 0.32°F (0.18°C) per decade. *2021 was the sixth-warmest year on record. *Averaged across land and ocean, the 2021 surface temperature was 1.51°F (0.84°C) warmer than the twentieth-century average of 57.0°F (13.9°C) and 1.87°F (1.04°C) warmer than the pre-industrial period (1880-1900). *The nine years from 2013 through 2021 rank among the 10 warmest years on record).

[ii] **Rotzoll, K. & Fletcher, C. H.** ***Assessment of groundwater inundation as a consequence of sea-level rise*****. Nat. Clim. Change. 3, 477–481 (2013; Nov. 2012 digital).** Attachment 1
The research findings were further summarized as follows: As sea level rises, groundwater inundation will prevent infiltration and drainage. It is likely that future urban settings will be characterized by standing pools of brackish water, maximized at high tide. This may affect traffic, walkways, and any movement in urbanized coastal areas. Eventually, runoff from rainstorms will encounter few drainage options. Travel, commerce, and emergency services may be impacted and groundwater inundation may change the character of the land surface in ways that work against public health and safety. Furthermore, increased soil saturation may lead to a series of geotechnical and slope-stability issues. For example, rising aquifer salinity leads to corrosion of subsurface structures, including water and sewer pipes.

[iii] MHHW=The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch.

[iv] **Habel Shellie, Charles H. Fletcher, Tiffany R. Anderson & Philip R. Thompson.** ***Sea Level Rise induced Multi-Mechanism Flooding and contribution to Urban Infrastructure Failure.*** **Nat. Clim. Change March 2, 2020.** Attachment 2
The research document stated "*In recent years, reports have been issued by local government that highlight the increasing vulnerability of urbanized areas to SLR induced flooding and such efforts are crucial towards the design of flood management strategies; however, the dismissal of main sources of SLR related flooding can potentially render (present) management strategies ineffective.*" "*Among the State of Hawai'i's municipalities, Honolulu represents the highest potential for SLR related economic losses. Much of this vulnerability stems from limited tidal ranges that have allowed a dense network of development to take place in close proximity to the shoreline and has also resulted in Honolulu having some of the lowest elevation flood thresholds in the United States similar to Baltimore, Washington D.C., and San Francisco, and others. Further, the area hosts a shallow grade such that small increments of SLR are expected to cause extensive later shifts in impacted areas.*"

Research indicated that approaching decades will likely feature large and increasing percentages of flooded area impacted simultaneously by the three flood mechanisms, in which groundwater inundation and direct marine flooding represent the most and least substantial single-mechanism flood source, respectively. These results illustrated the need to reevaluate main sources of SLR induced flooding to promote the development of effective flood management strategies.
Quantified study results further indicated that as water levels advanced from the minor flooding threshold of 20.5 in. (52 cm) to the moderate flood threshold of 32 in. (82 cm), flooded area and infrastructure impacts escalate markedly. Specifically, infrastructure failure at even just the minor flood threshold of 20.5 in. (52 cm) included 200 locations where drainage inlets lose all capacity for drainage and begin acting as conduits for flooding, which represents near doubling relative to 2017 simulation and with almost all active cesspools (nearly 90%) becoming nonfunctional. At the intermediate flooding threshold of 32 in. (82 cm) the number of failed storm-drain inlets increased to 860, a fourfold jump from the minor threshold; the length of dangerous roadway conditions increased to 9.19 km, a nearly seven-fold jump from the minor threshold; and cesspools flooded to the ground surface more than doubled.
The design of flood management strategies required therefore to mitigate these impacts necessitate site-specific consideration of each flooding mechanism to avoid the potential of being rendered ineffective. The authors therefore suggested the use of more extreme SLR projections (i.e., intermediate-high 20.5 in. [52 cm] and 77 in. [193 cm] in Honolulu by 2050 and 2100, respectively, and even high, and extreme SLR such as in excess of nine feet by 2100) when designing projects that are highly sensitive to flood impacts such as centralized critical infrastructure with no capacity to accommodate flooding.