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July 5, 2024
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Project No. C4138

Magnolia Tank Farm - Land Use Plan Amendment
Orange County Coastkeeper
3151 Airway Ave. Suite F-110
Costa Mesa, CA 92626

Subject: **Review of Magnolia Tank Farm Development – Sea Level Rise Hazard Analysis and Ongoing Contamination and Remediation Work**

Dear Susan and Ray,
Integral Consulting conducted a review of sea level rise (SLR) and climate change studies and existing and ongoing contamination, and remediation work documented by third parties for the proposed rezoning of the Magnolia Tank Farm (MTF or site) within southeast Huntington Beach, CA. The project proposes the rezoning of the parcel to facilitate the redevelopment of the former MTF with 250 new private residences, a new hotel, and open space and park areas.

Upon reviewing available technical reports and the CCC staff report, there are still outstanding concerns about the project related to coastal hazards, SLR adaptation, and the adjacent contaminated sites. The coastal commission staff report does not fully acknowledge the existing and future climate related risks to flooding posed to the project site and those impacts to coastal resources exacerbated by this proposed change in land use. All technical reports are referenced as footnotes throughout the comment letter.

Project Concerns:

Under current conditions, the site has emergent groundwater that ponds water and floods during each rain event. Increasing climate risk (precipitation, SLR, and coastal hazards) increases the chance that this area would flood more frequently with longer duration and increases the stress on any mitigative measures on the site.

1) **Maladaptive:** The following change in land use at this location is maladaptive. It encourages more development in a hazardous area putting more life and property at risk over time. This site is in a low-lying area that was once an historic wetland.

2) **Increasing Flooding in Surrounding Areas:** If developed as proposed, the area would be hardscaped and "domed," elevating it above the adjacent areas and transferring stormwater to surrounding areas. These nearby areas would suffer increased flood depths, as shown in Figure 1, provided by Anchor QEA[1].

3) **Island Effect:** Higher flood depths in the surrounding areas will limit roadway and utility access to the site, putting both first responders and residents at risk (Figure 2).

4) **Short-sighted Adaptation Strategies:** Increasing SLR and higher frequency of intense precipitation events will stress the site in terms of groundwater shoaling, hydraulic pressure due to coastal water elevations, and higher compound flood volumes. These stressors are projected to increase in the future, thereby putting more demand on the drainage system including maintaining the sheet pile walls, pump stations, building infrastructure and channel outlet.

5) **Increasing Cost to Local Agencies:** The increasing demand on the surrounding drainage system will cause additional maintenance and financial responsibilities as an undue burden to the local agencies. For example, the OCFCD maintains the vertical sheet pile walls of the Huntington Beach Flood Control Channel along with the City of Huntington Beach and the US Army Corps of Engineers. Increasing flooding due to climate change and increased flood depths would require more regular maintenance of the vertical sheet pile walls.

6) **Talbert Channel Flooding:** Historically, the mouth of the Talbert Channel was a bar-built estuary, meaning the sand berm fronting the estuary would open and close seasonally. If the channel mouth is closed, the estuary water levels could fill to the height of the beach berm. Elevation data[2] indicates an average of 13 feet NAVD88 beach berm crest elevation (12–15-foot range) between Brookhurst and Beach Blvd. Closed beach barrier flooding could cause flooding to elevations of ~12 to 15 feet NAVD88 under existing conditions. This could translate into 5 feet of additional water elevation in the flood control channel. This flooding could rise with sea level to an elevation of 16.5 to 19.5 feet with 4.5 feet of SLR[3]. The mouth of the Talbert Channel regularly requires sand removal and is maintained open by the

[1] Anchor QEA, 2021. *Sea Level Rise Vulnerability Assessment and Adaptation Plan.* Prepared for SLF-HB Magnolia, LLC. July 2021.
[2] Orange County Public Works Topographic Lidar Survey.
[3] Ocean Protection Council, 2024. Sea Level Rise policy guidance. June 2024.

Orange County Public Works (OCPW), but when it does close, results can be catastrophic. Regulatory permits do not allow maintenance of the outlet from March 1 to September 30 unless emergency conditions are met[4] to protect endangered species. A closure in 2022 resulted in fish die-off and poor water quality that poses hazards to coastal recreational users.

7) **Compound Flood Risk:** The study performed by Q3[5] assumed that the Talbert Channel mouth was open and ocean water levels reached a maximum of 5.2 feet NAVD88. They found that compound flooding impacted the site with 6.7 feet of SLR (assuming a total ocean water level 11.9 feet). The study performed by Anchor QEA assumed that the ocean water level would reach a maximum of 6.44 feet and found that compound flooding impacted the site with 6.0 feet of SLR (assuming a total ocean water level 12.44 feet). These findings are not reflective of the worst-case scenario when the channel mouth is closed. As described above, if stormwater drainage encountered closed barrier beach water levels (12 to 15 feet[6]), then compound flooding could impact the site today.

8) **Shoaling Groundwater:** The site lies over the Talbert Aquifer, which is tidally influenced. Anchor QEA's study, which references LGC Valley[7], estimates groundwater depths ranging from -0.20 to 1.67 feet above mean sea level (MSL)[8], as shown in Figure 3. Note that these values (a negative number) imply that groundwater is already emerging at the northwest corner of the site at W-2 (Figure 3). This was corroborated with estimates made by the United States Geological Survey (USGS) (CoSMoS, Figure 4), which estimated current groundwater depth to be either emergent or very shallow. Increasing SLR will cause groundwater to increase in elevation, daylighting at the site, causing inundation.

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[4] Merkel & Associates, Inc., 2022. Talbert Marsh 2022 Inlet Closure Impact Evaluation. January 5, 2022.

[5] Q3 Consulting, 2024. *Technical Study: Assessment of Climate Change-Induced Impacts to Flooding in Southeast Huntington Beach and Adaptation Measures for Future Conditions*. Prepare for the City of Huntington Beach. February 22, 2024.

[6] Orange County Public Works Topographic Lidar Survey.

[7] LGC Valley, Inc., 2018a. *Groundwater Investigation at 2185 Magnolia Street within the City of Huntington Beach, California*. Prepared for SLF-HB Magnolia, LLC. Project No. 164011-01. January 17, 2018.

[8] The Anchor QEA and LGC report reference different vertical datums, confusing the interpretation of the impacts of groundwater changes.

9) **Contamination Potential:** The site is adjacent to several contaminated properties currently under regulatory oversight, including a State Superfund site, the former Ascon Landfill, which is overseen by the Department of Toxic Substances Control (DTSC). The following cases were reviewed on DTSC's EnviroStor website:

    a. Ascon Landfill (EnviroStor 30490018) – Ascon is a former landfill located adjacent to the north of the site that received industrial, construction (asphalt, concrete), and oil field waste including drilling muds, wastewater brines, and other drilling wastes in the form of liquid and semi-liquid wastes deposited onsite into open lagoons and pits from approximately 1938 to 1984.[9] Ascon was designated as a State Superfund site and is regulated by DSTC under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is also known as Superfund. Two remedial excavations were completed between 2003 and present. A Remedial Action Plan (RAP), prepared by Geosyntec Consultants (Geosyntec), was approved by DTSC in 2015. The RAP includes limited waste removal, onsite waste reconsolidation under an engineered cap with a vegetated cover. A landfill gas collection and treatment system and stormwater collection system are included with the cap.

    Reconsolidated waste material will be placed above a clay/silt layer that extends across the central portion of the Ascon property. Geosyntec identified the clay/silt layer as confined (i.e., an aquitard) or semi-confined, [10] which can be defined as a saturated, low permeability (low hydraulic conductivity) geologic material that prevents (does not allow) transmission of significant quantities of water into water bearing units below the confining layer. However, confining layers or aquitards may transmit substantial water to or from adjacent aquifers. In addition, where there are breaks in a confining layer or variations in grain size (i.e., silty clay), water can readily transmit to units below these confining layers. A well draw down test for wells screened above and below the clay/silt layer has not been performed or are not available for review. Such tests would help to evaluate the assertion that the clay/silt layer is confining. In the absence of pump tests, it is difficult to assess whether Ascon Landfill COCs would leak from

[9] Geosyntec Consultants, 2015. Final Remedial Action Plan (RAP), Ascon Landfill Site, Huntington Beach, California. Dated June 9, 2015.
[10] Geosyntec Consultants, 2007. Groundwater Remedial Investigation Report (Revision 1.0), Ascon Landfill Site, Huntington Beach, California. Dated June 14, 2007.

the containment units and either into the water bearing units below or adjacent. The degree to which the clay/silt layer is confining has not been assessed. Based upon geologic cross-sections and well logs prepared by Geosyntec, the clay/silt layer is not continuous, and pinches to zero or near zero thickness (See boring logs AW-5 through AW-7, GP-6 through GP-11, and P-9) along the southern portion of the Ascon property, which is adjacent to the site.

In the context of oil field waste contained within the Ascon Landfill, oil and gas exploration and production drilling utilize fluid products to help prevent drilling fluid loss, reduce friction while drilling, and increase extraction efficiency. The United States Environmental Protection Agency (USEPA) found that the oil and gas industry may have handled per- and polyfluoroalkyl (PFAS) products at a higher rate than other industries.[11] Fluorinated surfactants are commonly found in drilling fluids, including those used for stimulating oil wells during water flooding and in foam-reducing hydrocarbon liquids, such as perfluorooctanesulfonamide (one of more than 10,000 PFAS compounds). Minnesota Pollution Control Agency (MPCA) found that North American Industry Classification System (NAICS) codes for the oil and gas industry (e.g., NAICS 211130, 324, and 424710) have a higher risk for PFAS sources than other industries.[12]

In April 2024, USEPA finalized a critical rule to designate two widely used PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), as hazardous substances under CERCLA.

Oil field wastes may contain significant quantities of PFAS compounds with potential to impact soil and groundwater, especially beneath land disposal sites such as Ascon. The Ascon property is topographically higher than the surrounding area and groundwater beneath this property is near MSL. Recent groundwater monitoring reports indicate that known chemicals of

[11] Palmerton, D. L., 2024. Navigating PFAS Compliance in the Oil and Gas Industry. The PIOGA Press. Dated February 2024.

[12] Minnesota Pollution Control Agency, 2024. PFAS Desktop screening tool and review guide. Accessed July 2, 2024. Available at: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.pca.state.mn.us/sites/default/files/gp3-08.pdf&ved=2ahUKEwi119jnv5GHAxWAmo4IHeuWCKAQFnoECBkQAQ&usg=AOvVaw2wqZum2CkCOnXDmvX954LL

concern (COCs), such as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and 1,4-dioxane, are generally not present in groundwater beneath Ascon.[13] However, the presence of PFAS compounds in soil and groundwater has not been evaluated at either Ascon or the MTF site.

As SLR progresses, groundwater emergence could remobilize known residual impacts and unknown COCs (like PFAS) from beneath the planned landfill cap at Ascon and into the underlying aquifers. In addition, the historical groundwater flow direction from the Ascon property, prior to municipal supply well pumping, may have been to the south (towards the ocean), and towards the MTF site.

Currently, groundwater flow from the Ascon property is towards the north, away from the site, reportedly due to municipal supply well pumping. Historically, prior to municipal pumping and construction of the Huntington Beach Flood Control Channel in the 1950s, the likely groundwater flow direction would have been towards the ocean to the south. Under this historical scenario, groundwater would have flowed from the Ascon property towards the site, potentially mobilizing COCs beneath the site. Further subsurface investigation would be needed to assess whether PFAS compounds from the Ascon property have impacted soil, soil vapor, and/or groundwater beneath the MTF site.

b. EPTC - Huntington Beach (EnviroStor CAD000631085) – In 1995, Southern California Edison (SCE) was issued a court order to close 11 facilities for violating hazardous waste laws, including for their Huntington Beach electricity generating facility at 21730 Newland Street. In response to the court order, SCE conducted investigations to close two wastewater retention basins (Wastewater Retention Basin and Boiler Chemical Cleaning Basin) that operated at the power station without permit or authorization from DTSC (Chapter 15 of Title 22, California Code of Regulations) from 1958 until about 1989.[14] The EPTC facility engaged in the use of ponds or lagoons (concrete lined in 1958 and retrofitted synthetic lined in 1984), nonstationary containers, and hazardous waste treatment. In 1981, EPTC reportedly

[13] Geosyntec Consultants, 2023. Interim Groundwater Monitoring Report – September 2023, Ascon Landfill Site, Huntington Beach, California. Dated October 25, 2023, Revised December 19, 2023.
[14] Department of Health Services, *Interim Status Document*, Huntington Beach Generating Station. April 6, 1981.

handled toxic waste, extremely hazardous waste, flammable waste, water reactive wastes, volatile wastes, bulk liquid wastes, containerized liquid wastes, asbestos, alkalis, acids, pesticides, and polychlorinated biphenyls (PCBs). These wastes included K-listed hazardous (Resource Conservation and Recovery Act or RCRA) wastes (e.g., K-054), which, according to USEPA, included sludges, residues, and byproducts from activities like metal plating, wood preservation, and pesticide manufacturing. EPTC wastes also included D-listed hazardous wastes (e.g., D-001 [ignitable] and D-002 [corrosive]).

EPTC is still undergoing closure and continually reports their water quality results as part of their closure plan. In 2019, the most recent Summary of Observations issued by DTSC available on EnviroStor indicated that they are reviewing compliance information. While no violations were noted as part of DTSC inspections in 2002, 2014, 2015, 2016, and 2019, minimal water quality monitoring data are available for review on EnviroStor. EPTC has a groundwater monitoring network that includes 14 monitoring wells. Groundwater flows towards the north-northwest (away from the site). Groundwater test results include VOCs, metals, pH, total dissolved solids (TDS), 1,4-dioxane, and chloride. Exceedances have been observed in cobalt, nickel, and arsenic in groundwater. Further research would be needed to evaluate this case. The regulatory status for EPTC is Corrective Action/Post Closure. Evaluation of this regulatory case is further discussed below in subsections c and d.

c. Huntington Beach Generating Station (HBGS) (EnviroStor 30490057) – The HBGS is under a Corrective Action Plan (CAP). However, the CAP was not available for review on EnviroStor. Additional research would be needed to evaluate this case.

d. AES SCE - Huntington Beach Generating Station (EnviroStor 600001194) – A risk analysis and a health risk evaluation were completed for potential vapor intrusion for the wastewater basins/pipelines area. Results of these analyses were not available for review on EnviroStor. Additional research would be needed to evaluate this case.

e. OCSD – OCSD Plant 2, which is a Publicly Owned Treatment Works (POTW) located approximately 0.7 miles to the southeast of the site along the coast, consistently found PFAS in influent, effluent, and biosolids samples analyzed during four quarterly sampling events conducted in 2021.

The presence of PFAS at this and many other POTW facilities in California suggests that PFAS compounds are prevalent in wastewater and should be evaluated at wastewater and waste storage, treatment, and disposal facilities, such as Ascon and MTF.[15]

10) Additional Hazards:

a. Tsunami – The Anchor QEA study found that although the area is not within a tsunami hazard zone, according to a 2021 report,[16] it would be reasonable to assume that the site could be in a tsunami hazard zone as SLR progresses. The site is currently mapped adjacent to a tsunami hazard area (Figure 5). In 1964, following an 8.2 magnitude earthquake in Alaska, an approximately 4-to-5-foot tidal surge hit the Huntington Harbor area causing substantial damage. On March 11, 2011, a 9.0 magnitude earthquake occurred near Tohoku, Japan causing a two-foot run up (above MSL) in Huntington Beach.

b. Faults – A northwest-oriented Quaternary fault trace mapped by USGS and California Geological Survey (CGS) (2018) and an inferred fault trace mapped by Morton (2004) bisect the central portion of the site (Figure 6).[17] This fault trace, which is associated with the South Branch fault, cuts through Late Holocene eolian/dune deposits that underly the site. Shallow groundwater depths in the site vicinity have prevented fault trenching, which is the most definitive method for fault characterization and for evaluating whether Holocene rupture occurred along a fault. Past desktop fault studies have concluded that "…although there is no information that directly implicates the "South Branch" as being active, there are no data that demonstrably preclude Holocene activity." If a fault study involving trenching were undertaken, the fault traces inferred through the site may

[15] CDM Smith, 2021. PFAS Sampling Results for Treatment Plan No. 2, Final. Orange County Sanitation District, Contract No. CS-2020-11178BD, December 2021.
[16] State of California, 2021. Tsunami Hazard Area Map County of Orange. Produced by the California Geological Survey, the California Governor's Office of Emergency Services, and AECOM. Dated July 8, 2021. Accessed July 14, 2021. Available at: https://www.conservation.ca.gov/cgs/Documents/SHP/Tsunami/HazardArea/Maps/Tsunami_Hazard_Area_Map_Orange_County_a11y.pdf
[17] Lettis Consultants International, Inc. *Assessment of the Newport-Inglewood Fault Zone.* Prepared for Orange County Coastkeeper. May 13, 2020, Revision 1.

demonstrate active (Holocene) faulting, which would preclude the proposed development project in its current form.

c. Liquefaction – The entire project area is located within a mapped liquefaction hazard zone, whereby earthquake-induced ground shaking causes soils to change from a solid to a liquid state (Figure 7 and 8).[18,19] Liquefaction would likely be exacerbated onsite by an increase in groundwater levels due to SLR.

d. Storms – Storm surge fueled by global warming increases the frequency and intensity of storms, increasing the probability of flooding in low lying areas. In 1983, El Niño spawned a record-breaking storm that inundated the low-lying areas of Huntington Beach, causing severe damage with floodwaters 3 to 5 feet deep. Project adaptation measures are unlikely to overcome long term flood potential without continual flood protection improvements. CoSMoS results indicate coastal wave storm flooding would occur at the site under the SLR projections of 5.0 to 7.0 feet under existing conditions (Figure 9).[20] The 100-year flood maximum water levels under future sea levels for existing condition places the site under water with 6.0 to 7.0 feet of SLR and no flooding for proposed adaptation measures. However, under such scenarios, the Ascon property and the site and would become an island.

In general, wetlands and marshes absorb and store flows, reducing flood velocities and erosion. An alternative to the site project would be to extend and elaborate local wetlands/marshes (e.g., Magnolia Marsh) with constructed wetlands/marshes to help absorb runoff from storm events, and slow flood velocities caused by storm/tidal surge or tsunami and exacerbated by SLR. This would increase coastal community resilience in the early stages of SLR, particularly for existing residential neighborhoods adjoining the site to the east.

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[18] Orange County Liquefaction Zones map. Dated August 19, 2015. Accessed July 3, 2024. Available at: https://gis.data.ca.gov/datasets/cadoc::cgs-seismic-hazards-program-liquefaction-zones/explore?location=35.673513%2C-119.759465%2C7.01

[19] City of Huntington Beach, 2008. Liquefaction Potential map, City of Huntington Beach, Information Services Department. Dated October 2008. Accessed July 3, 2024. Available at: https://www.huntingtonbeachca.gov/Documents/Departments/City%20Maps/Liquefaction.pdf

[20] Lettis Consultants International, Inc. *Assessment of the Newport-Inglewood Fault Zone.* Prepared for Orange County Coastkeeper. May 13, 2020, Revision 1.

Sincerely,

David Revell, Ph.D.
Principal Coastal Climate Risk and Resilience

Enclosure

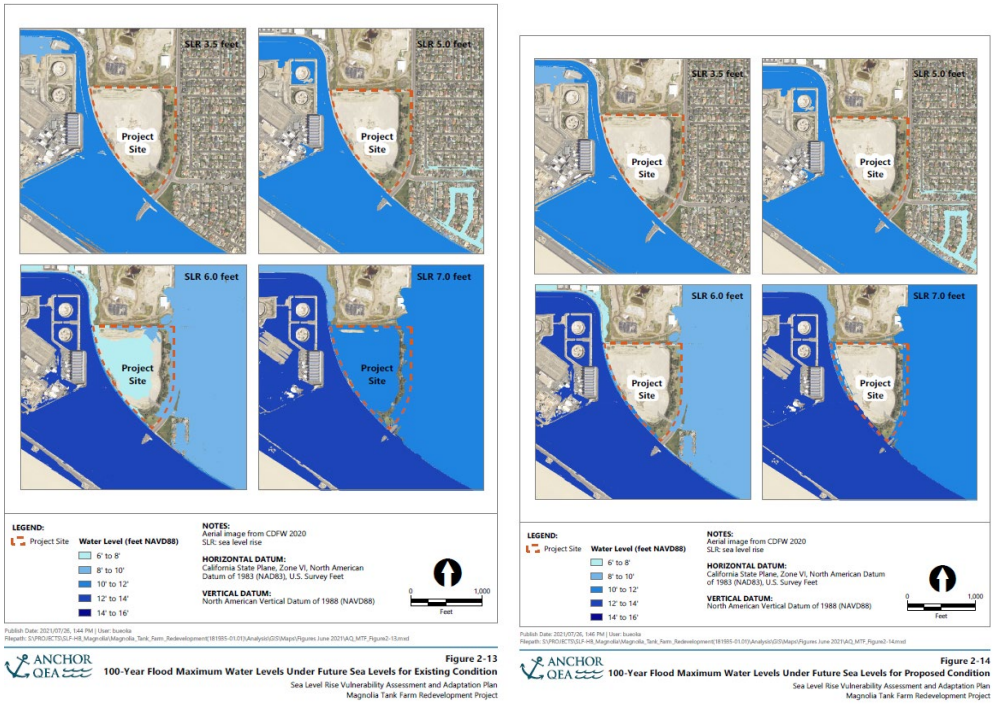
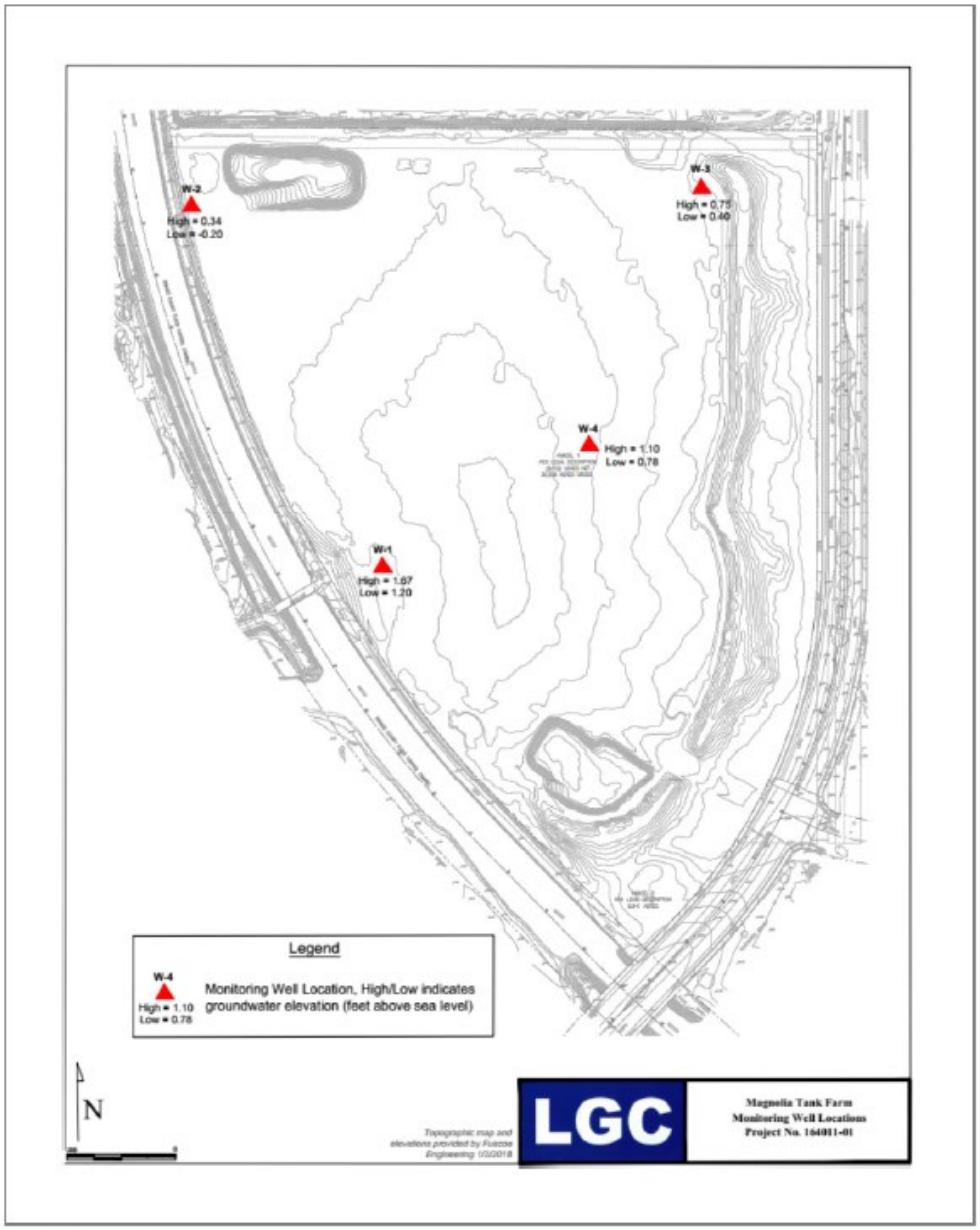


Figure 1. Flood levels from the Anchor QEA Hec-RAS 2D study. The undeveloped project is on the left panel, and the developed project is on the right panel. The study shows the island effect of the project site, with where water that typically would flow into the project site (left panel, undeveloped) would flow into the surrounding areas.

Figure 2. Closed mouth of the Talbert Channel on April 24, 2022. Source: Google Earth.



Source: LGC Valley, Inc. 2018a

ANCHOR QEA

Figure 2-20
Magnolia Tank Farm Groundwater Well Monitoring Locations
Sea Level Rise Vulnerability Assessment and Adaptation Plan
Magnolia Tank Farm Redevelopment Project

integral consulting inc.

Figure 3. Groundwater well monitoring locations provided in the Anchor QEA referencing the LGC memo showing the minimum and maximum groundwater elevations in feet above sea level. Note that negative values indicate lower than sea level.

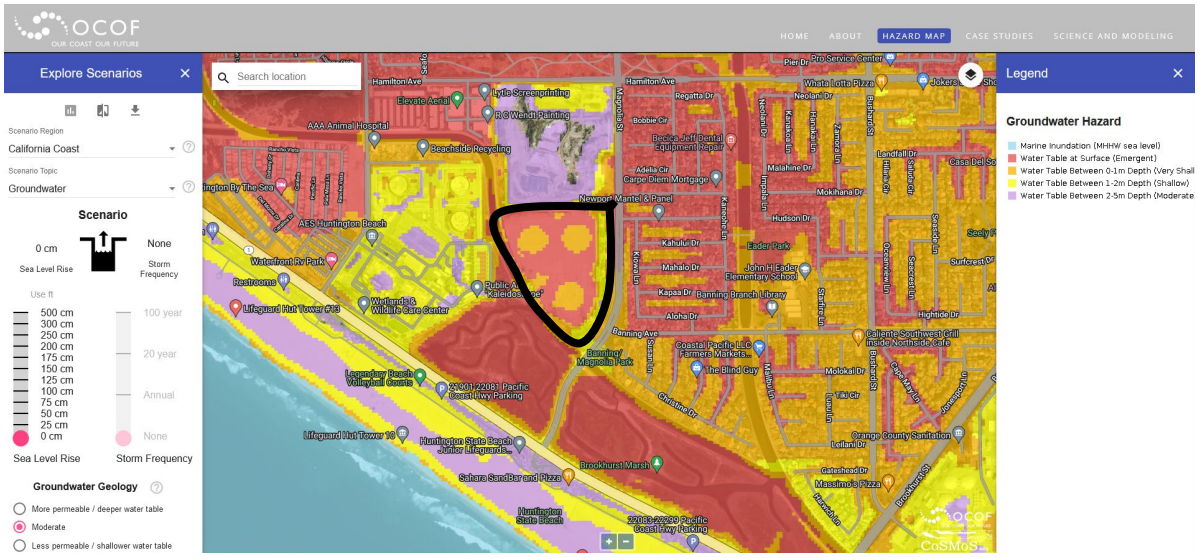


Figure 4. CoSMoS groundwater viewer showing groundwater levels as emergent at the site under moderate permeability geology. The site outlined in black.

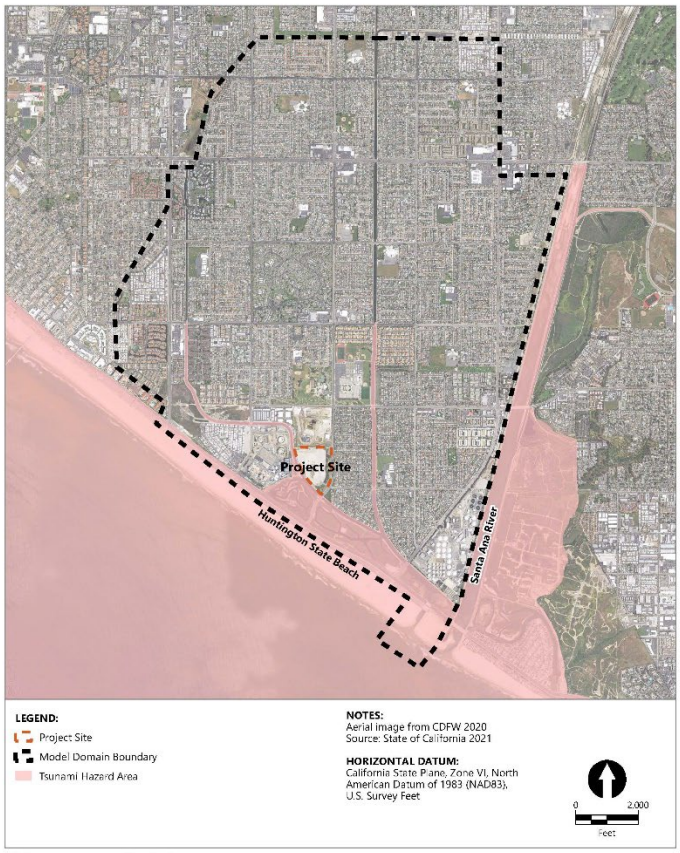


Figure 5. Tsunami Hazard Area Map. Site outlined in orange.

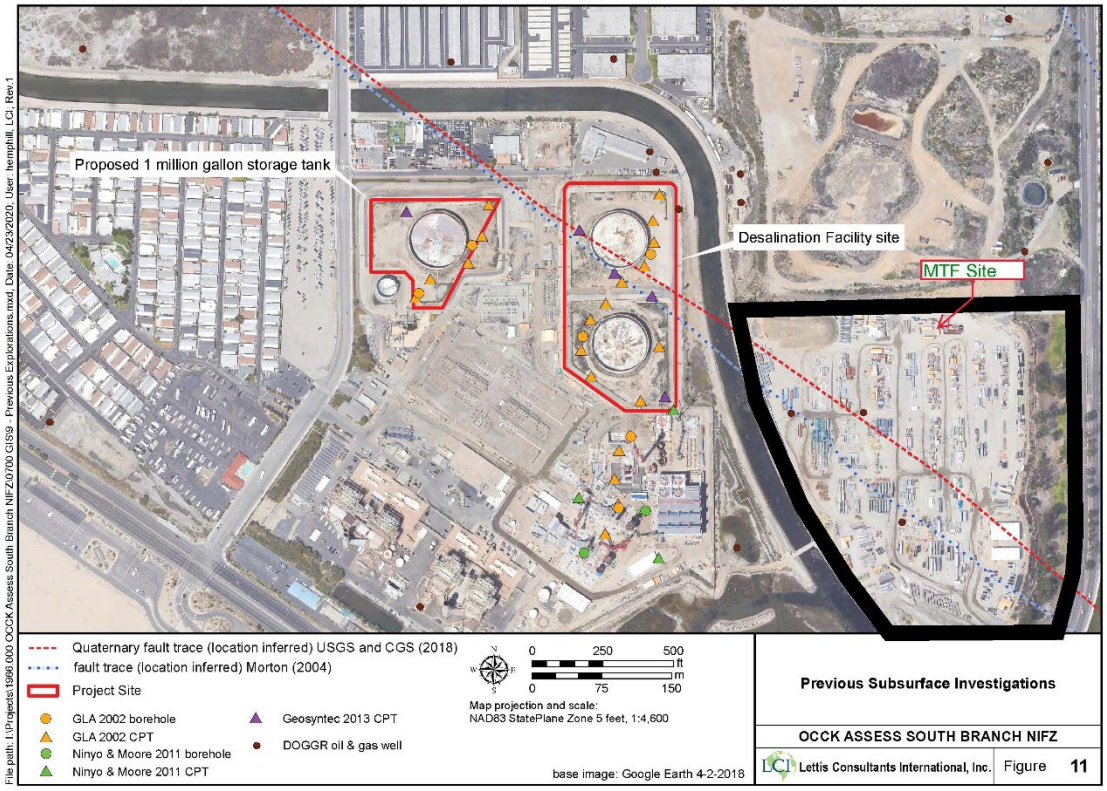


Figure 6. Quaternary fault traces (LCI, 2020). Site outlined in black.

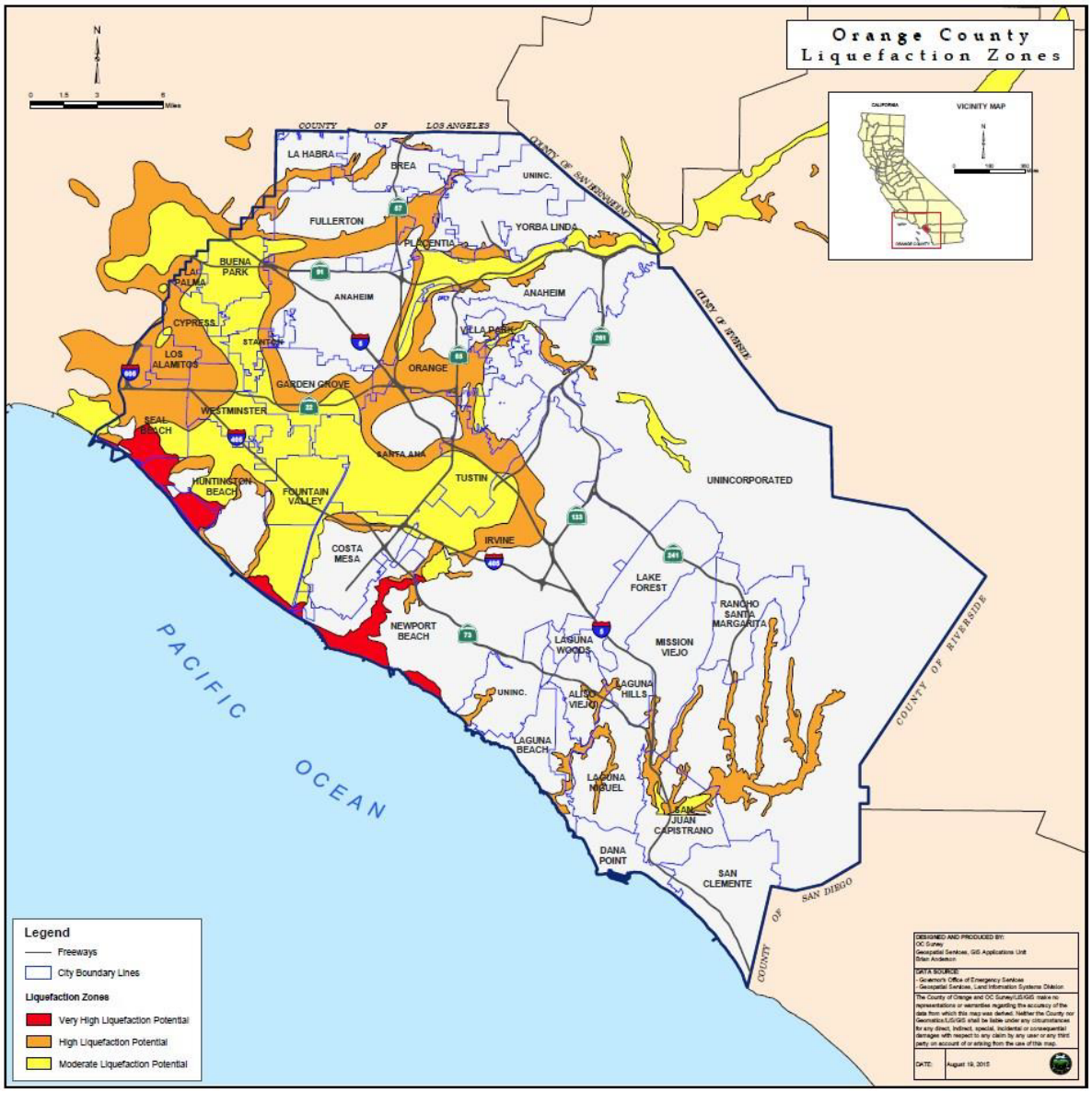


Figure 7. Orange County Liquefaction Zones map.

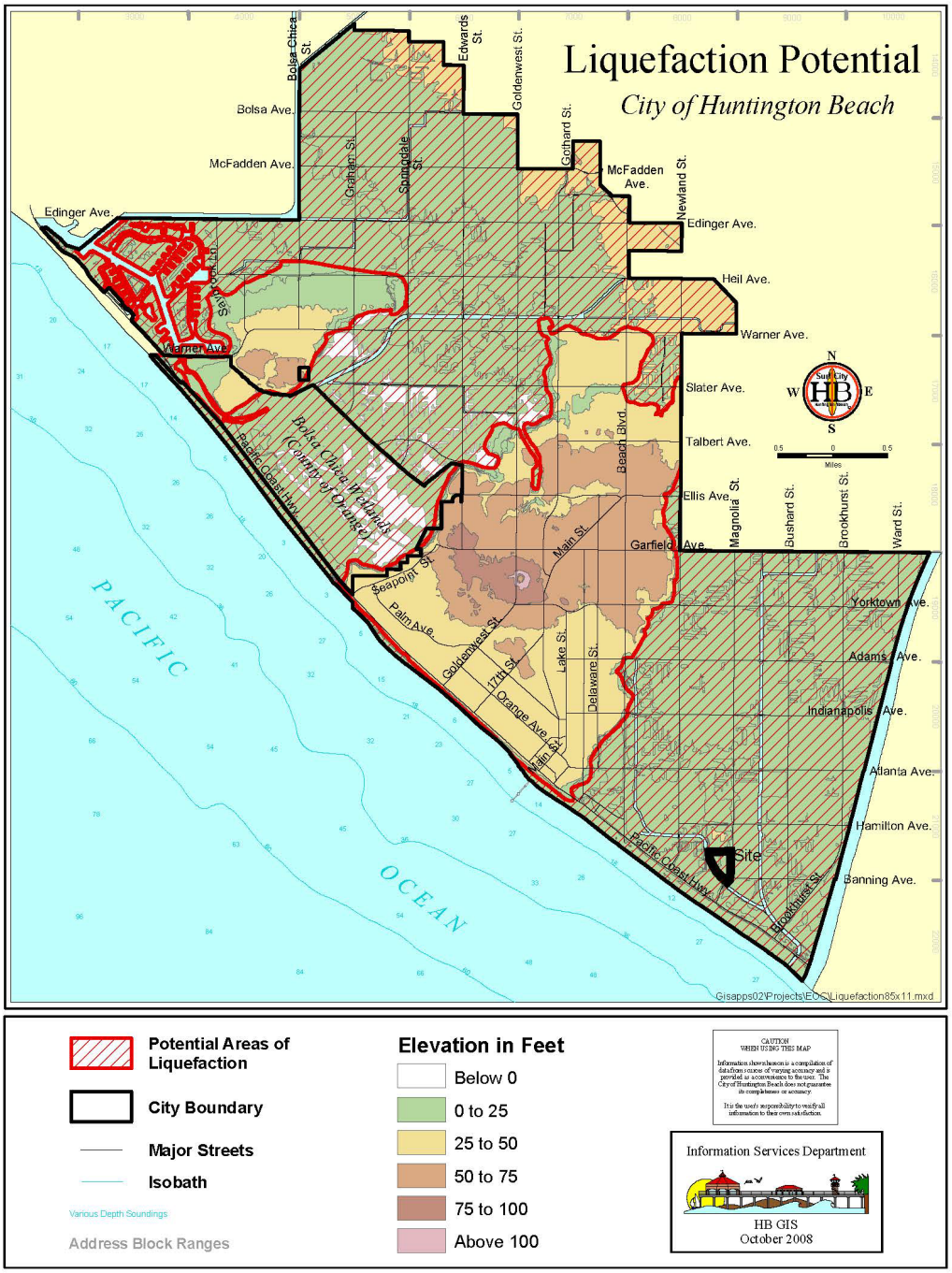


Figure 8. Liquefaction Potential map, City of Huntington Beach. Site outlined in black.

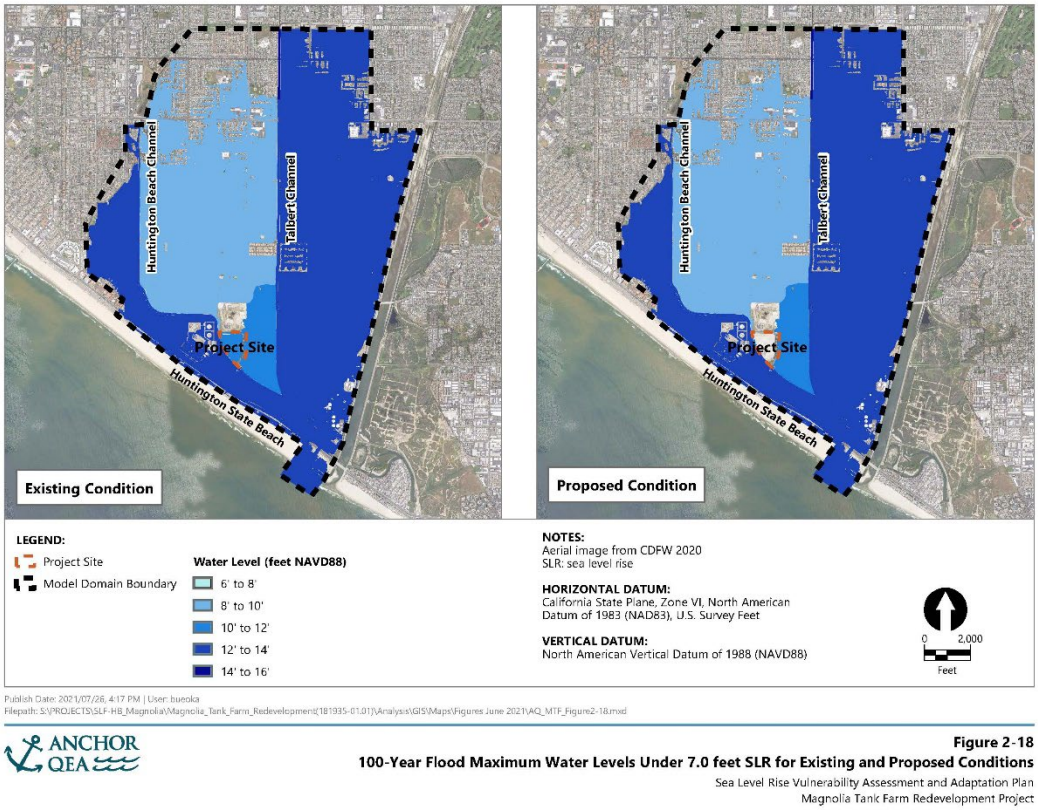


Figure 9. Flooding under Existing and Proposed Conditions from the Anchor QEA Hec-RAS 2D study. Site outlined in orange.