

APPENDIX C | REGIONAL SUMMARIES

CONNECTING TO THE ONE WATER PLAN

This appendix provides additional detailed information that correlates to the following sections and figures.

CORRELATING SECTIONS AND INFORMATION

2 Collaboration Process	2.3 Foundation for Collaboration Figure 2-1	App. C.1 through C.8 contain further details by region (Regional Summaries) used to inform key themes from stakeholder input in past efforts.
4 Regional Planning District Profiles	4.1 What is a Planning District Profile?	App. C.1 through C.8 constitute the Regional Summaries that were used to develop the shorter Regional Planning District Profiles.

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REGIONAL SUMMARY OVERVIEW

For each regional summary, a wide range of information was gathered from reviewing and summarizing plans, such as:

- Key regional themes relating to water as identified through reviewed plans.
- Places of historical, cultural, development, ecological, or environmental importance within the region.
- Locations of concern or that may be specifically prone to climate hazards and other impacts.
- Concerns related to water and infrastructure.
- A synthesized list of recommendations based on previous planning efforts and recommendations identified for the future from previous plans.

Regional summaries were developed based on the plans reviewed and cited at the end of each summary, workshops that focused on the known areas of concern, and meetings and discussions with the One Water Honolulu Panel and Leadership Group through June 2026. They are a documented record of previous planning efforts identified for each region, rather than new analysis prepared for this plan. A summary of climate hazards, water infrastructure, and climate impacts across O‘ahu is summarized in Plan Section 3.

In addition to the plans cited in each regional summary, a literature review was conducted in 2024 which evaluated a wide range of major plans related to the focus of the One Water Honolulu Plan. The documents evaluated as part of the literature review provided information on existing and future hazards, vulnerabilities, and adaptation efforts, and supported building upon prior work by the City and other regional and local entities. The review also helped characterize community-relevant climate hazards and related risks, vulnerabilities, and potential adaptation strategies.

This record served two purposes. First, the recommendations compiled here informed the refined list of recommendations included in Plan Section 4, which incorporates information from updated plans and other resources, including input gathered through workshops, meetings, and discussions with the One Water Honolulu Panel and Leadership Group through August 2026. Second, the regional information documented here supported the identification of Known Areas of Concern within the Climate Change Adaptation Framework, which in turn informed hotspot identification and the development of the projects carried forward in the Plan. The analysis that translated this regional record into prioritized locations and projects is presented in Plan Sections 5, 6, and 7 and in Appendices D, F, and H.

The intent of Appendix C is to document the information gathered through previous planning efforts which are cited in the references for Plan Section 4.

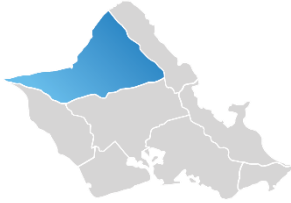
A map of O‘ahu’s eight regions is included as Figure C-1.



Figure C-1. O'ahu's Eight Regional Planning Districts (Source: Department of Planning and Permitting [DPP], 2026).

SECTION C.1: NORTH SHORE AREA SUMMARY

C.1.1 COMMUNITY PROFILE



The North Shore remains predominantly rural, with daytime tourism heavily centered on ocean activities, leading to frequent, year-round traffic congestion. The community prioritizes mālama ‘āina (long-term stewardship of the land), sustainable development, and placing limits on future growth. Agriculture on the North Shore depends on irrigation sources from both local and Central O‘ahu systems, supporting cultural practices such as lo‘i kalo (taro patches) and loko i‘a (fishponds). Wastewater management is limited, with most properties relying on cesspools or septic systems. Growing concerns include the vulnerability of residential areas and low-lying infrastructure to the impacts of sea level rise.

C.1.2 THREATS/OPPORTUNITIES

- About 40 percent of cesspools in Waialua-Hale‘iwa are failing, and they can impact the stream and nearshore water quality.
- Existing wastewater treatment plants are limited in service area and potential sources for recycled water.
 - Pa‘ala‘a Kai, municipal
 - Hale‘iwa, privately owned
 - Pūpūkea-Sunset Beach, privately owned
- Agricultural opportunities are limited by the R-2 water from Wahiawā Reservoir (Lake Wilson) that supplies irrigation water to the North Shore via the Wahiawā Irrigation System; R-2 water can only be used for crops where water does not touch edible portions of plants.
- Sea level rise could submerge pipeline infrastructure in seawater, leading to corrosion, breaks, and replacement costs.
- Pollution and runoff from nonpoint sources runoff from impervious surfaces, and excessive sedimentation pose threats concerning water quality and ecosystem health.
 - Waialua Mill site
 - Erosion-prone areas along waterbodies
 - Agricultural lands

- Polluted streams and waterbodies
- Traditional cultural sites such as lo‘i kalo and loko i‘a require protection to maintain cultural practices and respect traditional water use.
- Coastal zones are vulnerable to sea level rise and storm intensity and face risks like saltwater intrusion into freshwater sources and ecosystem disruption, requiring protective measures.
- Kaiwiko‘ele Stream (Waimea River) poses significant concerns for natural resources and flooding impacts.
- Portions of Kamehameha Highway can sometimes be closed during periods of high surf or flooding.

C.1.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Support conversion of the cesspools and other onsite sewage disposal systems to ones that provide a higher level of treatment.
- Look at opportunities to reuse WWTP effluent for beneficial reuse.
- Support projects that will upgrade treatment of wastewater to R-1 quality for non-potable irrigation (although, due to the limited wastewater treatment plants in the area, opportunities for R-1 are constrained).
- Promote the utilization of nature-based solutions, or practice sustainable land use management to mitigate the consequences of soil and coastline erosion to threatened infrastructure.
- Encourage BMPs in agriculture, urban development, and land use to minimize impacts on water quality and quantity.
- Uphold Native Hawaiian rights and support traditional water use and management practices by integrating cultural values into modern strategies.
- Support biodiversity and ecosystem services for water filtration and flood mitigation. Preserving these areas is vital for environmental protection.
- Administer and enforce zoning controls to restrict future development within identified floodway, flood fringe, coastal high hazard, tsunami inundation areas, and general flood plain districts.
- Retain natural gulches as flood plains and open space resources. Limit uses within gulches and limit modifications to natural gulches and drainageways to the extent possible.

C.1.4 CURRENT CITY EFFORTS TO DATE

- Reuse Feasibility Study being conducted under the Kahuku, Pa‘ala‘a Kai, Waimānalo Wastewater Facilities Plan (ENV)
- Coastal mitigation with dune restoration at Sunset Beach (DPR/Sea Grant)

C.1.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES
RELATING TO WATER

- **Cultural Significance:** Water is deeply intertwined with cultural practices and traditions, essential for activities such as fishing, gathering, and ceremonies that preserve cultural identity and heritage.
- **Public Health and Safety:** Clean and safe drinking water is vital for protecting public health, preventing waterborne diseases, and ensuring community well-being.
- **Environmental Stewardship:** The community prioritizes protecting and preserving natural water resources, valuing sustainable practices that maintain the health of ecosystems, including streams, wetlands, and coastal areas.
- **Recreational Opportunities:** Access to clean water for activities like swimming, fishing, and kayaking is highly valued, enhancing quality of life and community connection.
- **Sustainable Development:** Development practices that balance growth with the preservation of water quality and natural habitats are widely supported.
- **Responsible Water Management:** Effective water management is essential for ensuring sustainability, future availability, and protection of vital resources.
- **Water Conservation:** Conservation efforts, including efficient use and recycling, are emphasized to protect this critical resource.
- **Agricultural Economy:** Water availability is crucial for supporting a healthy agricultural economy and sustaining local farming practices.
- **Pollutant Protection:** Safeguarding water sources from pollutants is a priority to maintain environmental health and community safety.
- **Infrastructure:** Adequate public and private wastewater treatment facilities are essential for protecting water resources and ensuring community health.
- **Water Quality and Availability:** Clean and safe water is highly valued for both agricultural and recreational uses, with concerns about contamination affecting crop production and ecosystem health.
- **Irrigation Practices:** Contaminated water sources are used for irrigation of certain crops, highlighting the need for sustainable agricultural practices.
- **Preservation of Natural Resources:** Preserving natural water resources is central to maintaining the rural character of the area and supporting sustainability goals.
- **Community Engagement:** The community’s active involvement underscores a collective commitment to water resource management that aligns with shared values and needs.

PLACES OF INTEREST

- **Waimea Valley:** Famous for its agricultural abundance, fresh water, marine resources, and ideal surfing and canoe sites, it was a favored residence for ali’i (chiefs) and kāhuna (priests). The maka‘āinana (people of the land) cultivated kalo (taro) and ‘uala (sweet potato) and fished in Waimea Bay. The valley is home to two prominent heiau: Pu‘u O Mahuka, O‘ahu’s largest, perched on a bluff overlooking the ocean; and Kūpopolo Heiau , located at the valley’s mouth. Within the valley lies Hale O Lono, where makahiki, the annual celebration beginning in October, honors Lono, the god of resource fertility.
- **Surf Spots:** Waimea Bay, ‘Ehukai Bay (Banzai Pipeline), and Paumalū (Sunset Beach) are important today as they were traditionally for surfing and other water sports (recreation and spiritual renewal).
- **Cultural and Historical Sites:** Preserving traditional irrigation systems and water-related heritage is vital for maintaining cultural practices and educating future generations about sustainable water use.
- **Ground Water Recharge Areas:** Essential for replenishing aquifers that supply drinking water, these zones must be protected to ensure a sustainable water supply.
- **Streams and Rivers:** Vital for ecological functions, local wildlife, and recreational activities, streams and rivers require water quality monitoring to prevent pollution and maintain their health.
- **Coastal Areas:** Critical for marine habitats, water quality, and flood management, these regions also protect infrastructure from climate change impacts such as rising sea levels.
- **Wastewater Treatment Facilities:** Crucial for managing wastewater and preventing contamination, these facilities safeguard public health and the environment through proper maintenance and operation.
- **Irrigation Systems:** Support local farming by managing water use efficiently and reducing runoff, which can pollute nearby waterbodies.
- **Parks and Natural Reserves:** Serve as natural filtration systems to maintain water quality, reduce runoff, and provide recreational opportunities for the community.
- **Water Sources and Infrastructure:** Improving water infrastructure, including wastewater management systems, is essential for protecting community health and ensuring environmental sustainability.
- **Irrigation Practices:** Highlight the importance of utilizing water sources effectively, even when dealing with contamination, to support agriculture and food production.
- **Bikeway and Access Routes:** Enhance access to recreational areas and waterbodies, promoting outdoor activities and safe connectivity within the community.
- **Public Facilities:** Essential for supporting water management and recreational activities, these facilities foster community engagement and education on water conservation.

SPECIFIC LOCATIONS OF CONCERN

- **Cesspools in Waialua-Hale‘iwa:** Approximately 40 percent of the cesspools in the area have failed, posing risks to groundwater and coastal water quality.
- **Pa‘ala‘a Kai WWTP:** The community’s municipal wastewater treatment plant uses injection wells for effluent disposal and serves 314 homes.
- **Hale‘iwa and Pūpūkea-Sunset Beach WWTP :** The privately-owned wastewater treatment plants have limited coverage, highlighting the need for improved systems to protect the ocean environment.
- **Kaiwiko‘ele Stream (Waimea River):** A major stream in the North Shore region, significant for watershed management and flood mitigation.
- **Lake Wilson:** Impacted by water quality issues from effluent, affecting its ecological health and limiting agricultural use for certain crops due to contamination concerns.
- **Waialua Mill Site:** Potential industrial development poses risks to water resources and the environment, requiring careful water management practices.
- **Erosion-prone Areas:** Contributing to sedimentation in waterbodies, soil erosion degrades water quality and aquatic habitats. Sustainable land management practices are critical to address these issues.
- **Agricultural Lands:** Can contribute to nutrient runoff and pesticide contamination. Implementing best management practices minimizes environmental impacts and protects water quality.
- **Polluted Streams and Waterbodies:** Certain streams in the North Shore contain elevated pollutants, including nutrients and turbidity, impacting aquatic ecosystems, recreational use, and drinking water quality.
- **Wastewater Management Facilities:** Essential for treating wastewater and preventing contamination of water sources. Proper operation and maintenance are critical for public health and environmental protection.
- **Cultural Sites:** Traditional sites such as taro patches (lo‘i kalo) require protection to maintain cultural practices and respect traditional water use.
- **Coastal Zones:** Vulnerable to sea level rise and storm intensity, these areas face risks like saltwater intrusion into freshwater sources and ecosystem disruption, requiring protective measures.
- **Kaiwiko‘ele Stream (Waimea River):** A major stream with significant watershed resource management and flooding concerns.
- **Waialua Watershed:** Develop a drainage master plan for the Waialua watershed to address erosion and flood protection concerns. Conduct public outreach and education programs that explain the potential for flooding and efforts to minimize the effects of flooding.

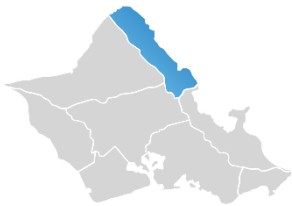
WATER & INFRASTRUCTURE CONCERNS

- **Water Quality:** Concerns about the quality of water sources, including contamination from pollutants such as nutrients, sediments, and pathogens. Monitoring and improving water quality is essential for public health and ecosystem health.
- **Water Supply and Demand:** The balance between water supply and demand is a significant concern, especially in the context of population growth and climate change. Ensuring a sustainable water supply while meeting the needs of the community is a priority.
- **Erosion and Sedimentation:** Soil erosion contributes to sedimentation in waterbodies, which can degrade water quality and aquatic habitats. Addressing erosion through land management practices is crucial for maintaining a healthy water system.
- **Flood-prone Areas:** Kaiwiko‘ele Stream, Paukauila Stream, Ki‘iki‘i Stream, Kaukonahua Stream, Anahulu River, Kaiaka Bay, Waialua Bay, and the surrounding regions of Waialua, Hale‘iwa, and Mokulē‘ia are highly vulnerable to flooding and coastal erosion due to their proximity to major waterways and low-lying topography. Modifications to natural drainage patterns and activities that increase storm runoff from the mauka areas—including stream channelization, increased erosion and sedimentation, debris buildup/blockage to restrict stream flow—further compound flood hazards in this area.
- **Climate Change Impacts:** The effects of climate change, such as rising sea levels, increased storm intensity, and changing precipitation patterns, pose risks to water resources and infrastructure. Adaptation strategies are needed to mitigate these impacts.
- **Wastewater Management:** Proper management of wastewater is essential to prevent contamination of water sources. This includes the operation of treatment facilities and the implementation of best practices to reduce runoff and pollution.
- **Community Engagement and Education:** Involving the community in water management efforts and promoting awareness about water conservation and protection practices are vital for fostering a culture of stewardship.
- **Regulatory Framework and Policies:** The effectiveness of water management is influenced by existing regulations and policies. Ensuring that these frameworks support sustainable practices and protect water resources is a key concern.
- **Biodiversity and Ecosystem Health:** Protecting aquatic and terrestrial ecosystems is essential for maintaining biodiversity and the services these ecosystems provide, including water filtration and habitat for wildlife.
- **Ocean Outfall for Treated Wastewater:** The community has rejected the option of an ocean outfall for treated wastewater effluent due to environmental and economic considerations, indicating a concern for the potential negative impacts on coastal waters.

	• General Concerns Across the North Shore: Aging wastewater systems and the prevalence of individual cesspools across various communities pose risks to water quality and public health. This is a particularly prevalent community concern. • Water Infrastructure: Reliance on aging cesspools and septic systems highlights inadequate water infrastructure and the need for a municipal wastewater system to improve water management and protect public health. • Irrigation Practices: Effective irrigation is crucial for local agriculture, and there are concerns about the sustainability of current practices. The Waialua Town Master Plan discusses the need for better management of water resources to support agricultural productivity while minimizing environmental impacts. • Environmental Protection: Protecting local ecosystems and waterbodies from pollution and degradation is a major concern. The Waialua Town Master Plan advocates for practices related to safeguarding water resources and promoting community environmental stewardship. • Cultural Significance of Water: Water is culturally important for the community, particularly traditional agricultural practices. There is a concern about preserving these cultural practices and ensuring that water management strategies respect and integrate traditional values.	
FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS	• Cesspool Conversion: Improve the treatment of wastewater by converting households using cesspools to options with a higher level of treatment. • Recycled Water Use: Maximize efficiency by utilizing recycled water for irrigation and other feasible uses, following state guidelines. • Support Agricultural Water Needs: Improve water quality entering the irrigation systems and improve water delivery to reduce losses. • Promote Water Conservation: Raise awareness about responsible water usage through educational initiatives and conservation programs. • Protect Environmental Resources: Prevent runoff and contamination from agricultural and industrial activities to safeguard ecosystems and water resources. • Promote BMPs: Encourage BMPs in agriculture, urban development, and land use to minimize impacts on water quality and quantity. • Protect Native Hawaiian Rights and Traditional Practices: Uphold Native Hawaiian rights and support traditional water use and management practices by integrating cultural values into modern strategies. • Support Biodiversity, Ecosystem Services: Natural systems can promote water filtration and flood mitigation. Preserving these areas is vital for environmental protection. • Flooding: Require elevation of existing structures above the regulatory flood elevation or relocation to sites beyond flood-prone areas. • Flooding: Use open spaces including parking lots, landscaped areas, and parks to detain and infiltrate stormwater flows to reduce transport of sediment and pollutants. • Flooding: Regularly maintain and clean drainageways and flood mitigation structures	
PLANS REVIEWED & SUMMARIZED	Area-Specific Plans: • 2005 Waialua Town Master Plan (DPP) • 2011 North Shore Sustainable Communities Plan (DPP) (currently under revision) • 2016 North Shore Watershed Management Plan (BWS)	State and Islandwide Plans: • 2019 Water Master Plan Summary Update (BWS) • 2019 Hawai'i Water Plan – Water Resources Protection Plan (CWRM) • 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division) • 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division) • 2024 Climate Ready O'ahu (CCSR)

SECTION C.2: KO‘OLAU LOA AREA SUMMARY

C.2.1 COMMUNITY PROFILE



Per the O‘ahu General Plan and expanded upon in the Ko‘olau Loa Sustainable Communities Plan, the Ko‘olau Loa region is designated as a rural area where growth and development will be managed to maintain the region’s country character and natural resources. The community’s deep connection to water and their surrounding watersheds fosters a strong concern for ecological health. Low-lying areas are vulnerable to flooding and face existing and future development challenges, while coastal erosion threatens critical infrastructure, including the primary roadway (Kamehameha Highway). The protection of local water resources and preservation of ecological and agricultural practices are priorities in the area.

C.2.2 THREATS/OPPORTUNITIES

- Changing rainfall patterns associated with climate change threaten groundwater supply and stream flow.
- Increasingly frequent and severe storms overwhelm drainage systems, heightening regional flood risks with flooding in the low-lying areas (Punalu‘u, Hau‘ula, and Kahuku) and in valleys, streams (Kahana and Kaluanui near the Sacred Falls, Mālaekahana, and Ma‘akua), and school areas (Kahuku Intermediate and High School).
- Sea level rise intensifies coastal flooding (Punalu‘u, Hau‘ula, and Kahuku) and areas of Kamehameha Highway are sometimes not passable due to inundation and/or high wave topping.
- Agricultural and stream diversions are drought-prone in areas of Ko‘olau Loa.
- Numerous cesspools require conversion.
- Coordination with existing community organizations on climate adaptation planning will bolster efforts.
- Lā‘ie WWTP produces recycled water available for reuse opportunities.
- Proposed development in Lā‘ie has raised concerns about water preservation and cultural heritage.

C.2.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Support and incentivize water conservation in areas that receive water from Ko‘olau Loa to increase water availability for local ecological and agricultural needs.

- Continue to support recycled water use from Lā‘ie WWTP and sustainable farming practices to preserve water resources.
- Upgrade Kahuku wastewater treatment facilities to allow for water reuse for irrigation purposes (pending a feasibility analysis as part of the Kahuku, Pa‘ala‘a Kai, Waimānalo Wastewater Facilities Plan).
- Transition cesspools to septic tanks with leach fields.
- Restore wetlands and coastal ecosystems to enhance natural resilience.
- Harden coastal infrastructure (e.g., roads) for flood and tsunami resilience.
- Work with Hawai‘i Reserves Inc. on One Water Planning for the Lā‘ie area.
- Continue to collaborate with Kahuku High and Intermediate School to address localized challenges like flooding.
- Enhance resilience against climate-driven hazards such as flooding and sea level rise through the implementation of nature-based solutions and establishing community engagement to incorporate local needs and knowledge.
- Emphasize cultural preservation through educational avenues that teach the importance of cultural heritage and environmental stewardship.
- Expand the existing Kahuku public golf course to support the mitigation of drainage issues, if feasible.

C.2.4 CURRENT CITY EFFORTS TO DATE

- Waialele Stream Flood Mitigation Project (DDC with U.S. Army Corps of Engineers [USACE])
- Reuse Feasibility Study being conducted under the Kahuku, Pa‘ala‘a Kai, Waimānalo Wastewater Facilities Plan (ENV)
- Hau‘ula Resiliency Hub with Hui O Hau‘ula progress (potential project with City/Hui O Hau‘ula)

C.2.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES RELATING TO WATER	Sustaining the Rural Lifestyle of Ko‘olau Loa: This involves protecting green open spaces and agricultural areas and maintaining the rural residential character of the region. Cultural and Traditional Resources: Encourage all activities within the Ko‘olau Loa area to respect traditional and customary rights of Native Hawaiian practitioners in respective ahupua‘a. Natural Resources & Watershed Ecology: The community promotes holistic watershed management that recognizes the interconnectedness of resources and aims to protect the area's ecological health. Healthy and Plentiful Water Supply for Community (waiwai): Ensuring a reliable and sufficient water supply for community needs is a priority, highlighting the importance of water as a vital resource. Preserving Agricultural Uses and Water Supply: Supporting sustainable farming practices and maintaining water availability for agriculture is crucial for the community's livelihood and cultural heritage.
PLACES OF INTEREST	Punalu‘u Valley: Renowned for its historical and spiritual significance, with ongoing efforts to safeguard cultural sites and traditional practices. Kahana Valley: A vital area of cultural heritage that embodies the deep connection between the community and the land. Huila Fishpond: A seven-acre pond fed by ocean water and freshwater springs that was designated as a national landmark in 1962. Lo‘i Kalo (Taro Fields): Central to Hawaiian culture, these traditional agricultural systems support food security and perpetuate cultural practices. Kaluanui Valley: Notable for its rich cultural sites, which contribute to the identity and heritage of the community. Sacred Sites in Hau‘ula and Kaluanui: Recognized for their spiritual and cultural importance, these areas require protection from encroaching development. Kahuku Training Area: Has importance for both military operations and environmental management. Watersheds: Crucial for maintaining water quality and biodiversity, including key areas such as Ma‘akua Stream and Kaluanui Valley. Wetlands: Essential for biodiversity and natural water filtration, yet vulnerable to development and pollution, as seen in places like the James Campbell National Wildlife Refuge. Coastal Ecosystems: Vital habitats for marine biodiversity, increasingly threatened by erosion and climate change. Nearshore Waters: Adversely affected by sediment and nutrient runoff, leading to coral reef degradation and negative impacts on marine ecosystems.
SPECIFIC LOCATIONS OF CONCERN	Punalu‘u Valley: A key site for groundwater and surface water studies conducted by the U.S. Geological Survey. It is critical for understanding water resources and their management. Ma‘akua Stream: An important stream for its ecological health and its role in supporting agriculture and recreation. Kahana Valley: A significant environmental conservation and cultural heritage preservation area that balances ecological health and cultural practices. Kaluanui Valley: This area is focused on runoff management and pollution control, highlighting its importance in maintaining water quality. Mālaekahana Stream: Flooding from this stream affects Kamehameha Highway and downstream areas. The Hawai‘i Department of Transportation (HDOT) scheduled bridge improvements to alleviate flooding conditions on the highway. Kahuku High and Intermediate School: The school experiences flooding due to runoff during intense rainfall. Kahuku Training Area: This area is important for balancing military needs with environmental sustainability. It involves managing water resources to support military operations while mitigating runoff impacts on nearby watersheds. Lā‘ie: There are opportunities for sustainability through this site’s upgraded potable water supply and use of recycled water for irrigation, reducing reliance on groundwater. There are concerns about balancing future development with preserving water resources and honoring the area’s cultural heritage and traditional practices. Coastal Areas (including Hau‘ula and Ka‘a‘awa): These areas are susceptible to coastal erosion, threatening infrastructure and habitats. They are also important for marine ecosystems and recreational opportunities. Kamehameha Highway: In many areas of Ko‘olau Loa, the elevated grade of the Kamehameha Highway diverts or detains the overland flow of stormwater runoff towards the ocean. This condition can cause localized flooding of the highway and properties abutting the highway. Kamehameha Highway: Concern over the effects of coastal erosion and strong desire for secondary/emergency access to facilitate movement in and out of the region.

	• Drainage Issues: Drainage problems exist in Kahuku in the lowland floodplains of Ōhia, Kalaeo Kahipa, and Mālaekahana streams. As existing drainage facilities are inadequate during major storm events, the runoff from mauka areas floods the campus of Kahuku High and Intermediate School, as well as portions of commercial and residential areas.	
WATER & INFRASTRUCTURE CONCERNS	• Aging Infrastructure: Water treatment and supply facilities are aging, necessitating updates to ensure clean and safe drinking water. Maintenance backlogs could lead to potential system failures affecting water reliability. • Pollution from Cesspools: Many areas rely on aging cesspools, which contaminate groundwater and nearshore water. Transitioning to modern wastewater management systems is critical to address this issue. • Water Treatment and Supply Facilities: Ensures clean drinking water through proper management, highlighting the importance of infrastructure in maintaining public health. • Flood Control Infrastructure: There is inadequate infrastructure to manage stormwater runoff, increasing the risk of flooding in vulnerable areas. The need for environmentally friendly solutions, such as low-impact development and natural buffers, is emphasized. • Lack of Resilient Coastal Infrastructure: Coastal infrastructure, including schools, hospitals, and roads, is vulnerable to tsunamis, flooding, and coastal erosion. Designing and retrofitting structures to meet tsunami-resistant and flood-resilient standards is essential, as is planning for long-term strategies to deal with erosion such as eventual retreat. • Water Quality Management: Insufficient infrastructure to monitor and maintain water quality in critical streams and rivers. Addressing runoff and pollutants from agricultural and urban sources is necessary to protect water resources. • Groundwater Management: Two concerns are over-extraction and contamination of aquifers due to inadequate monitoring and regulation. Infrastructure is needed to assess and manage groundwater levels and recharge rates. • Accessibility and Equity: Ensuring that rural communities in Koʻolau Loa have equitable access to water resources and infrastructure improvements is a significant concern. • Adaptation to Climate Change: Existing water infrastructure is stressed by rising sea levels, extreme weather, and shifting rainfall patterns. Upgrading and maintaining infrastructure to withstand these changes is critical. • Lack of Integrated Watershed Management Facilities: Fragmented infrastructure across watersheds leads to inconsistent management and resource allocation. Investments in integrated watershed facilities can enhance ecological health and water availability. • Inadequate Emergency Preparedness: There is a need for improved resilience of critical infrastructure to withstand natural disasters and emergencies. • Kamehameha Highway: This highway is currently the singular way to and from many communities.	
FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS	• Holistic Watershed Management: Develop integrated plans that address the interconnection between water resources, ecosystems, and community needs, ensuring sustainable and equitable resource use. • Sustainable Practices: Advance sustainable agriculture by encouraging practices such as recycled water use to conserve water and maintain water quality. • Infrastructure Improvements: Modernize aging water systems to enhance reliability and capacity, meeting current and future demands. • Climate Resilience: Incorporate climate projections into planning to address flooding, sea level rise, and extreme weather. Restore and protect natural buffers, such as wetlands and coastal ecosystems, and engage communities in climate adaptation efforts to reflect local priorities and knowledge. • Cultural Preservation: Protect cultural and historical sites from development and environmental harm. Educate communities on the vital link between cultural heritage and environmental stewardship. • Emergency Preparedness: Regularly update disaster preparedness plans for events like wildfires and floods, ensuring readiness. Invest in resilient infrastructure to safeguard communities and critical resources. • Monitoring and Research: Continuously assess water quality, ecosystem health, and the success of management strategies. Collaborate with academic institutions to tackle local environmental challenges and develop innovative solutions.	
PLANS REVIEWED & SUMMARIZED	Area-Specific Plans: • 2020 Koʻolau Loa Sustainable Communities Plan • 2009 Koʻolau Loa Watershed Management Plan	State and Islandwide Plans: • 2019 Water Master Plan Summary Update (BWS) • 2019 Hawaiʻi Water Plan – Water Resources Protection Plan (CWRM)

SECTION C.3: KO‘OLAU POKO AREA SUMMARY

C.3.1 COMMUNITY PROFILE



Ko‘olau Poko is a mix of rural agricultural communities (Waikāne, Waiāhole, Waihe‘e, Kahalu‘u, and Waimānalo) and more developed residential/commercial communities (‘Āhuimanu, Kāne‘ohe, and Kailua). Ko‘olau Poko also includes Marine Corps Base Hawai‘i in Kāne‘ohe. The rainfall of this windward area varies from high at the northern end to very dry at the southern end. Popular nature-based recreational opportunities for locals and tourists include beach and ocean sports, mountain hikes, and visits to Kawainui Marsh.

C.3.2 THREATS/OPPORTUNITIES

- Implement initiatives to restore natural and cultural resources.
 - Kawainui Marsh
 - Ka‘elepulu Pond (or Enchanted Lake)
 - He‘eia Wetland (Marsh)
 - Ko‘olau Mountains and Forest Reserves
- Pollution from urban runoff and agricultural activities is affecting water quality.
 - Coastal waters (including Waimānalo Bay, Kailua Bay, Lanikai Beach, and Kāne‘ohe Bay)
 - Various streams
- Protecting and promoting cultural sites and practices
 - Waikalua Loko Fishpond
 - He‘eia Fishpond
 - Nu‘upia Fishponds
- Need to protect the limited drinking water sources in Ko‘olau Poko, such as Waihe‘e Watershed.
- Agricultural water sources are threatened by changing precipitation patterns, and increased temperatures can affect agricultural productivity, particularly for kalo.
- Wildfire risks threaten properties and ecosystems.
 - Urban Areas (e.g., Kāne‘ohe, Kailua, Lanikai)
- Urban development is encroaching on natural and agricultural lands.

- Cesspools outside of service areas should be updated and replaced with septic systems.

C.3.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Protect and restore natural and cultural resources that support water quality, manage flooding, and provide cultural and food systems support.
- Protect drinking and agricultural irrigation water sources and support water conservation measures.
- Implement measures to prevent wildfires and mitigate their impacts, including promoting fire-safe practices in land management and community planning.
- Invest in resilient infrastructure to withstand extreme weather conditions and natural disasters.
- Develop coastal management plans to address erosion and flooding, including beach restoration and relocation of roadways and related infrastructure.
- Promote the preservation of remaining undeveloped lands at the foot of the Koʻolau Mountain Range through protective regulatory measures and public acquisition.
- Defend the SCP Community Growth Boundary that will contain urban development to protect lands along the Koʻolau Mountains.
- Promote sustainable development practices that reduce environmental impacts including green infrastructure like rain gardens and bioswales to manage runoff and improve water quality.
- Develop comprehensive resilience plans, conduct public education campaigns, and engage the community in preparedness activities.

C.3.4 CURRENT CITY EFFORTS TO DATE

- Reuse Feasibility Study being conducted under the Kahuku, Paʻalaʻa Kai, Waimānalo Wastewater Facilities Plan (ENV)
- MCBH Military Installation Resilience Review (CCSR)
- Kawa Stream Trash Reduction Structures at Mokulele Drive, Namiko Street, and Kāneʻohe Senior Community Center (DFM)
- Coastal mitigation with dune restoration at Kailua Beach Park (DPR/Sea Grant/CCSR)

C.3.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES RELATING TO WATER	• Stewardship and Conservation: Emphasis on sustainable management of land and water resources, recognizing the limited fresh water. • Cultural Significance: Water supports traditional and cultural practices, vital for residential and agricultural uses. • Community Engagement and Public Participation: Engaging the community in water management decisions fosters ownership and responsibility. • Behavioral Change: Social marketing techniques can be used to motivate community members to adopt water-protective practices. • Partnerships and Collaboration: Collaborating with local organizations and agencies enhances outreach efforts and reinforces community values. • Resource Protection and Sustainability: Focus on protecting and managing groundwater supplies and watersheds through sustainable practices. • Affordability and Equity: Providing dependable, affordable water service while ensuring equitable access to water resources for marginalized groups. • Water Quality: High importance on maintaining and improving water quality. • Flood Prevention and Public Safety: Addressing flooding issues as a primary concern. • Climate Resilience and Ecological Health: Strategies that enhance climate change resilience, maintain healthy watersheds, and support biodiversity.
PLACES OF INTEREST	• Kāneʻohe Bay: Known for its coral reefs and diverse marine life, it is a popular spot for snorkeling, kayaking, and other water activities. • Koʻolau Mountains: These mountains offer numerous hiking trails and scenic views. • Heʻeia Fishpond: This site offers educational programs and volunteer opportunities to learn about traditional aquaculture. • Heʻeia Watershed: Protect resources in the makai portion of the Heʻeia watershed, including a high quality perennial stream and habitat. • Nuʻupia Fishponds: These fishponds are included in plans for improved public access and preservation.
SPECIFIC LOCATIONS OF CONCERN	• Kawainui Marsh: Significant for its ecological diversity and cultural resources, this marsh plays a crucial role in flood mitigation and water quality improvement. • Kaʻelepulu Pond (or Enchanted Lake): An estuary surrounded by development has experienced water quality impacts and invasive limu and fish. • Heʻeia Wetland (Marsh): This wetland needs continued management and restoration to improve flood management and water quality. • Coastal Waters (including Waimānalo Bay, Kailua Bay, Lanikai Beach, and Kāneʻohe Bay): These are important for recreational activities and have marine ecosystems requiring protection from pollution, increased storm intensity, and over-extraction. • Stream Protection: To maintain ecological balance and support traditional practices, streams need protection from pollution and excessive diversions. • Kualoa Regional Park: This park experiences severe, long-term erosion. • Waiheʻe Watershed: This watershed is the largest single drinking water source in Koʻolau Poko and source of surface water that is essential for agriculture like loʻi kalo. • Agricultural Lands: Changing precipitation patterns and increased temperatures can affect agricultural productivity, particularly for kalo. • Waikalua, Heʻeia, and Nuʻupia Fishponds: Affected by climate change impacts (saltwater intrusion and rainfall changes) that affect cultural practices and food security. • Waikāne: This site experiences frequent flooding. • Urban Areas (e.g., Kāneʻohe, Kailua, Lanikai): These areas are at risk from wildfires due to proximity to wildland areas and the presence of invasive species. • Maunawili Valley: Watershed related issues to address include invasive species removal and protection of springs in the valley. • Koʻolau Mountains and Forest Reserves: These areas are critical for groundwater recharge and are at risk from wildfires.

WATER & INFRASTRUCTURE CONCERNS

- **Water Quality:** Pollution from stormwater runoff and invasive species affect the water quality of streams, ponds, and coastal areas.
- **Water Quantity:** The community needs a sustainable water supply to meet the demands of agriculture and a growing population.
- **Ecosystem Health:** Protecting habitats, restoring native vegetation, and managing invasive species can help maintain biodiversity and ecological health.
- **Cultural Practices:** Protecting water resources essential for traditional Hawaiian practices is of the utmost importance, such as taro cultivation, aquaculture, and fishing.
- **Community Engagement and Education:** Involving the community in water management decisions and promoting public awareness about water conservation and pollution prevention.
- **Infrastructure and Maintenance:** Ensuring the reliability of water, wastewater and stormwater infrastructure through regular maintenance and upgrades.
- **Climate Change Adaptation:** Adapting water management strategies to address the impacts of climate change, such as altered rainfall patterns, increased flooding, and rising sea levels. Individual beach management plans should be pursued, as well as modification of setbacks and consideration of sea level rise impacts.
- **Watershed and Aquifer Protection:** Protecting watersheds and aquifer recharge areas to ensure effective groundwater replenishment.
- **Stormwater Management:** Implementing effective stormwater management practices to prevent flooding, reduce pollution, and protect water quality.
- **Equity and Access:** Ensuring equitable access to water resources and addressing disparities, particularly in underserved communities, is critical.

FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- **Protect and Restore Natural and Cultural Resources:** These resources support water quality and quantity management and provide cultural and food systems support.
- **Increase Water Supplies for Waimānalo Farmers:** Encourage the use of recycled (R-1 or R-2) water for the irrigation and other uses where this would not adversely affect potable groundwater supply or other aspects relating to public health and investigate the feasibility of small-scale rain catchment systems in agricultural areas for irrigation and other purposes.
- **Wildfire Prevention and Mitigation:** Implement measures to prevent wildfires and mitigate their impacts, including promoting fire-safe practices in land management and community planning.
- **Infrastructure Upgrades:** Invest in upgrading infrastructure to be more resilient to climate impacts. This includes reinforcing bridges, roads, and utilities to withstand extreme weather conditions especially in coastal areas.
- **Sustainability & Sustainable Development:** Promote sustainable development practices that reduce environmental impact and enhance resilience.
- **Community Resilience Planning:** Development of comprehensive community resilience plans that include emergency response strategies, public education campaigns, and community drills to prepare for natural disasters.
- **Coastal Erosion:** Designate the Alāla Point to Wailea shoreline as an erosion-prone area and prepare a beach management plan for this area, focusing beach restoration activities on the Bellows Air Force Station beach and Kaupō beach.
- **Invasive Species:** Control invasive species to keep waterways open.

PLANS REVIEWED & SUMMARIZED

Area Specific Plans:

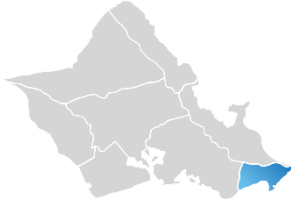
- 2012 Ko’olau Poko Watershed Management Plan (BWS)
- 2017 Ko’olau Poko Sustainable Communities Plan (DPP)

State and Islandwide Plans:

- 2019 Water Master Plan Summary Update (BWS)
- 2019 Hawai’i Water Plan – Water Resources Protection Plan (CWRM)
- 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division)
- 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division)
- 2021 Hawai’i Nonpoint Source Management Plan (Hawai’i State Department of Health)
- 2024 Climate Ready O’ahu (CCSR)

SECTION C.4: EAST HONOLULU AREA SUMMARY

C.4.1 COMMUNITY PROFILE



East Honolulu consists primarily of residential communities, including Wai‘alae Iki, Wailupe, ‘Āina Haina, Niu Valley, Kuli‘ou‘ou, Hawai‘i Kai, Portlock, and Kalama Valley, with some supporting businesses. The area experiences a generally dry climate year-round, but development has exacerbated flooding impacts along local streams. Maunalua Bay, which spans the most developed portion of the coastline, is a popular recreational hub featuring a boat harbor, fishing areas, and canoe paddling launch sites.

C.4.2 THREATS/OPPORTUNITIES

- Severe flooding is present in valleys and there is inadequate flood control in Wailupe Stream.
- There is need for enhanced drainage, debris management, and flood control systems:
 - Niu Valley
 - Kuli‘ou‘ou Valley
 - Haha‘ione Valley
 - Kamehame Ridge to Hawai‘i Kai Golf Course
- Threats exist to Kānewai Spring and to rare species from urban pressures.
- Climate adaptation strategies reflect concerns regarding wildfire, vegetation management, and water resource management.
- High salinity levels in recycled water from the East Honolulu WWTP effluent limit its use.
- Numerous cesspools pose contamination risks to groundwater and nearshore waters.
- Many emergency shelters are not hurricane-rated or climate change resilient.
- Three out of seven of O‘ahu’s Firewise certified neighborhoods, Kamilo Nui Valley/Mariner’s Cove, Wai‘alae Iki Ridge Community Association, and Wai‘alae Iki V, are in East Honolulu.

C.4.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Continue to participate in the Army Corps of Engineers Wailupe Stream Flood Risk Management Study.
- Construct improvements according to the Sand Island Wastewater Facilities Plan, serving Kāhala to Niu Valley, to increase climate change resilience.

- Support restoration efforts in the upper watershed of Niu and Wailupe Valleys to decrease soil erosion entering Maunalua Bay.
- Emphasize water recycling as a water conservation measure.
- Harden emergency shelters to effectively serve communities facing an increase in the frequency and intensity of windstorms and hurricanes.

C.4.4 CURRENT CITY EFFORTS TO DATE

- Proposed project to dredge Wailupe Stream from Kalaniana'ole Highway to West Hind Bridge (DFM)
- Add secondary treatment to the Sand Island WWTP in accordance with a 2010 Consent Decree to upgrade the treatment plant to comply with secondary treatment standards (ENV)

C.4.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES RELATING TO WATER	Water Conservation: Implement measures to ensure the sustainable use of water resources, such as low-flush toilets, drought-tolerant landscaping, and leak repairs. Protection of Water Resources: Focus on safeguarding and sustaining ground and surface water resources, as well as natural stream environments, through comprehensive studies and management strategies. Sustainable Water Supply: Develop and manage a reliable potable water supply to ensure adequate resources for residential and commercial developments. Impact of Climate Change: Address potential impacts of sea level rise on groundwater aquifers and water supply infrastructure through research and preparation. Community Engagement in Water Management: Foster community involvement in water management decisions to promote transparency and collaboration.
PLACES OF INTEREST	Kānewai Spring and Fishpond: This freshwater spring feeds into Kānewai Fishpond, Paikō Lagoon, and Maunalua Bay. It is home to rare species like freshwater limpets, brackish water mollusks, and Hawaiian Stilts. Keawāwa Wetland and Hawa Heiau: These sites are the focus of community-led restoration efforts. Maunalua Bay: This bay is the focus of many community restoration efforts coordinated by Mālama Maunalua and include invasive species removal. Paikō Lagoon Wildlife Sanctuary: A wildlife sanctuary fed by freshwater springs and Kuli’ou’ou Stream that provides critical habitat for endangered Hawaiian Stilts and migratory waterbirds. Hanauma Bay Marine Life Conservation District/ Hanauma Bay Nature Preserve: The conservation district and adjoining nature preserve are protected and actively managed conservation areas. State wildlife protections, visitor limits, and regular maintenance help preserve marine resources. Entry and parking fees fund maintenance and capital projects at Hanauma Bay.
SPECIFIC LOCATIONS OF CONCERN	Wailupe Stream: Identified as having significant drainage problems, the current flood control system is inadequate for handling debris flows and cannot accommodate flood discharges greater than a 20-year recurrence interval. Proposed improvements include channeling sections of the stream and enlarging debris basins. Niu Valley, Kuli’ou’ou Valley, and Haha’ione Valley: These valleys have a history of severe flooding, especially during intense rainstorms. The New Year’s Eve flood of 1987 highlighted issues where heavy rainfall overwhelmed concrete-lined stream channels due to debris and overgrown vegetation obstructing drainage ways. Kamehame Ridge to Hawai’i Kai Golf Course: A concrete channel in this area disrupts natural drainage patterns, raising concerns about water management effectiveness during heavy rainfall as it directs water into Ka’ili’ili Inlet. Steep Hillsides of East Honolulu: The hillsides have boulders and sediments that can have localized health and safety impacts. Maunalua Bay: Multiple issues including sedimentation, urban runoff, wastewater/cesspools are contributing to environmental impacts. Emergency Shelters: Many emergency shelters are not rated to withstand intense windstorms or hurricanes, which are expected to increase in frequency and severity due to climate change. Upgrades are necessary to ensure these facilities can serve the community effectively during emergencies.
WATER & INFRASTRUCTURE CONCERNS	Cesspools and Septic Tanks: Many homes rely on systems that can contaminate groundwater and recreational waters, especially in shallow or shoreline areas. Recycled Water Use: Recycled water from the East Honolulu WWTP is encouraged for irrigation, particularly on golf courses and landscaped areas, though high salinity currently limits its use. Wastewater Treatment: The Sand Island WWTP that serves Kāhala to Niu Valley is being improved to increase resilience to climate change impacts through the Sand Island WWTP Secondary Treatment projects. Sea Level Rise: Erosion and sea level rise can be expected to reduce lateral shoreline access, including impacts to Kalaniana’ole Highway. A number of residential neighborhoods bordering Maunalua Bay and portions of Kalaniana’ole Highway will become more vulnerable to routine flooding and coastal erosion as a result of sea level rise, particularly around Paikō Drive and makai areas of Kuli’ou’ou.
FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS	Water Quality and Groundwater Protection: Efforts focus on reducing groundwater contamination through cesspool conversion and wastewater system improvements, especially as climate change and sea level rise increase risks. Water Conservation Measures: Strategies include promoting recycled water use, low-impact development, and water-saving devices in new developments. Natural Resource Management: Restoration opportunities in the upper watershed can protect the water quality of Maunalua Bay. Climate Change Impacts: Research and planning are essential to address climate change effects on water supply and groundwater aquifers. Climate Change Impacts: Shoreline setbacks need to be routinely reviewed.

PLANS REVIEWED & SUMMARIZED	• Bay Quality: Implement low-impact development standards and other green infrastructure to restore ecological function to the area, particularly along and adjacent to stream channels, and reduce the amount of stormwater, sediment, and toxic pollutant runoff entering Maunalua Bay. • Redevelopment District: Form a community-based redevelopment district, similar to a business improvement district, that would protect, adapt, and relocate residential and commercial structures, public facilities, and natural and cultural resources vulnerable to sea level rise impacts, including coastal flooding, inundation, and erosion. • “Build Back Better and Smarter”: Map repetitive loss areas and develop and implement a “build back better and smarter” strategy to mitigate future damage costs.	
	Area-Specific Plans: • 2022 East Honolulu Sustainable Communities Plan (DPP) • 2024 East Honolulu Watershed Management Plan (BWS)	State and Islandwide Plans: • 2019 Water Master Plan Summary Update (BWS) • 2019 Hawai‘i Water Plan – Water Resources Protection Plan (CWRM) • 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division) • 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division) • 2024 Climate Ready O‘ahu (CCSR)

SECTION C.5: PRIMARY URBAN CENTER AREA SUMMARY

C.5.1 COMMUNITY PROFILE



The Primary Urban Center (PUC) is O‘ahu's most densely developed region, accounting for around 44% of the island’s population and serving as a major center of employment as well. Much of the coastline was historically modified through land reclamation to support development, particularly Waikiki, which was constructed on drained wetlands, and Māpunapuna, which was built on filled fishponds. Current development trends in the PUC focus on infill, densification, and vertical construction, particularly in areas like Kaka‘ako and Iwilei. Additionally, Transit-Oriented Development (TOD) associated with the rail system is promoting higher-density communities and increased transit usage around rail stations. The PUC faces significant climate-driven hazards, including sea level rise, coastal erosion, flooding, and stormwater runoff, particularly in low-lying areas such as those surrounding Pearl Harbor and the Ala Wai Canal. Interest in projects that integrate natural area restoration with urban design in the region has emerged. The region’s extensive development also includes aging water-related infrastructure, with many pipelines requiring repair or replacement to meet current and future demands.

C.5.2 THREATS/OPPORTUNITIES

- Heavy rains and flooding events threaten critical infrastructure, businesses, and residences along streams (including the ‘Aiea and Hālawā Streams).
- These streams also have the potential for ecological restoration.
- Pollutants from urban runoff affect recreational opportunities and public health and have restoration opportunities. Listed areas include:
 - ‘Aiea Stream
 - Ala Wai Canal
 - Waikiki Beaches
 - Kupehau Slopes (Potential bioremediation site using plants. It is an underdeveloped area in Kalihi Valley maintained by DPR. The central portion is unmaintained due to its steep terrain.)
- Some of the densely urbanized areas are at high risk for flooding and coastal inundation. These areas include:

- Māpunapuna industrial area where there is high-tide flooding and challenges from sea level rise
- Lagoon Drive where flooding impacts access for pedestrians and cyclists
- Kahauiki Station Area where there is storm-induced flooding
- Waiwai Loop area that is vulnerable to flooding
- Kapālama Canal, a focus for beautification, recreation, and flood control, with efforts to improve ecological quality while addressing flood management
- Street flooding around the Kalihi Station Area during heavy rainfall
- The area makai of Kapi‘olani Boulevard, which is within flood hazard zones
- The Waikīkī neighborhood, which is vulnerable to sea level rise impacts
- Aging infrastructure can adversely impact water, wastewater, and stormwater services, contributing to pollution.
- Sea level rise impacts certain infrastructure.
- Open spaces and waterbodies provide recreation and opportunities for improved water quality:
 - Pearl Harbor shoreline
 - Areas makai of Kalaniana‘ole Highway
 - Ke‘ehi Lagoon
 - Nu‘uanu Stream
 - Honolulu Harbor
 - Irwin Park
 - Waikīkī beaches
 - Sand Island (Mauliola)
 - Ala Wai Golf Course
 - Ala Wai Canal
 - Kapi‘olani Regional Park
- Water sources for drinking water need long-term protection (Honolulu and Pearl Harbor Aquifers).

C.5.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Implement stream management practices to mitigate flooding, including community initiatives like "Adopt a Stream" for maintenance and monitoring.
- Maintain and replace water-related infrastructure to ensure quality, support growth (especially infill), and meet environmental standards.
- Inspect and upgrade infrastructure regularly to address population growth and future needs.
- Incorporate sustainable design features (e.g., permeable surfaces, bioswales, rain gardens) to manage stormwater, recharge groundwater, and protect ocean water quality.
- Provide public education on fire safety, evacuation plans, hazard awareness, and water conservation.

C.5.4 CURRENT CITY EFFORTS TO DATE

- Adapt Waikīkī 2050 planning effort (DPP)
- Monitor wells near Red Hill and possible new source development (BWS)
- Nu‘uanu Hydro Managed Aquifer Recharge Project Feasibility Study and EA (BWS)
- Primary Urban Center Watershed Management Plan (BWS)
- Conduct an analysis of adaptation or retreat options for Māpunapuna (BWS)
- Māpunapuna/Kalihi Kai Area Drainage Assessment and Action Plan (CCSR)
- Kūwili (Iwilei) Station Resilience Planning and Mobility Hub (DPP)
- Ala Wai Canal Flood Mitigation Project (DDC)
- South Street Permeable Pavement Plan (DFM)
- Rehabilitation/Reconstruction of Storm Drains and Catch Basins in Ala Moana, Kapahulu, McCully, and Kaka‘ako (DFM)
- Kaimana Beach Outdoor Shower Improvements (DFM)
- Sand Island Secondary Treatment Project to elevate infrastructure for resilience and meet secondary treatment requirements (ENV)
- Ala Pono Bridge (DTS)
- Kalihi Transit Center (DTS)
- New Wastewater Pump Station, at Diamond Head end of Ala Moana Regional Park (ENV)
- Wa‘ahila Ridge Capture and Recharge Improvements (DFM)
- University Ave Corridor Complete Streets Project (DFM)

- Kaka‘ako Green Infrastructure (DFM)

C.5.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES
RELATING TO WATER

- **Access and Views to Water:** Enhancing access and views to water, particularly in connecting residents to waterfronts for recreational and aesthetic opportunities.
- **Preservation of Natural Waterways:** The natural beauty of streams and waterways is valued; focus on cleaning, restoring stream banks, water quality and accessibility.
- **Environmental Restoration:** Preventing water quality degradation through community-based stewardship programs, addressing factors like invasive species and erosion.
- **Health and Safety:** Maintaining clean and safe water sources to ensure the well-being of residents.
- **Preservation of Shoreline Areas:** Protecting and restoring shoreline areas reflects a commitment to maintaining ecological health and natural beauty.
- **Waterway Activities:** Opportunities for shoreline and waterway activities aim to enhance community engagement, recreation, and social and economic development.
- **Integration with Community Design:** Water features are integrated into community design to enhance character and provide recreational opportunities.
- **Environmental Stewardship:** Proper management and preservation of water resources, including natural habitats and wetlands, reflect sustainability and biodiversity.
- **Cultural Significance:** Water has deep cultural and historical importance with practices (e.g., fishponds and taro farming) that contribute to the community's heritage and identity.
- **Recreational Opportunities:** Enhancing access to waterfront areas supports walking, biking, and birdwatching—and promotes health and connection to nature.
- **Economic Development:** Well-managed water resources contribute to economic revitalization through tourism and recreational activities.
- **Sustainable Water Management:** Emphasizing sustainable use of water resources helps maintain ecological balance and supports community needs.
- **Water Quality and Accessibility:** Protecting water sources from pollution and ensuring efficient infrastructure are fundamental for clean water access for all.
- **Integration of Green Infrastructure:** Incorporating green infrastructure (e.g., rain gardens, permeable pavements) manages stormwater and enhances aesthetics.
- **Community Engagement:** Engaging residents in water management decisions and conservation practices ensures alignment with community values and needs.
- **Resilience to Climate Change:** Building resilience to climate change impacts on water resources helps the community adapt to changing conditions.
- **Infrastructure Improvements:** Upgrading water systems, incorporating water-efficient fixtures, and addressing fire flow needs ensure sustainable development.
- **Sustainability and Conservation:** Protecting watersheds and conserving water resources accommodates growth without overextending supply.
- **Water Supply Management:** Conservation measures (i.e., promote water conservation programs offered by the BWS, water-wise landscaping), usage monitoring, and system repairs have improved efficiency, reducing demand despite population growth.
- **Community Health and Safety:** Linking water management to health and safety ensures sustainable infrastructure that supports environmental and resident well-being.
- **Public Spaces and Water Features:** Urban plazas and parks can provide recreation options, connect people with water, and serve as natural stormwater systems.
- **Adaptation to Demand:** Upgrading and improving capacity in water infrastructure addresses projected population increases effectively.
- **Watershed Management Partnerships:** Collaborative efforts to restore and manage watershed areas support water quality, conservation, and availability.

PLACES OF INTEREST

- **Pearl Harbor:** A historical and natural asset offering recreation and education opportunities, enhanced by the Pearl Harbor Historic Trail.
- **Pearl Harbor Shoreline:** A critical area for managing coastal flooding and erosion, requiring coordination with the U.S. Navy for development projects.
- **Pearl Harbor Waterfront Promenade:** A shared-use path providing scenic views of Pearl Harbor and promoting outdoor recreation.
- **Sumida Watercress Farm:** An agricultural site fed by Kalauao Spring, serves as an open space resource contributing to local water management and ecological health.
- **‘Aiea Stream:** A crucial stream for flood control and water quality which flows through developed areas to ‘Aiea Bay, with significant channelization and management needs.
- **Hālawa Stream:** This stream is essential for flood mitigation and water quality, traversing Hālawa Valley before flowing into Pearl Harbor.
- **Ke‘ehi Lagoon:** A recreational and ecological asset supporting community engagement and local drainage needs.
- **Lagoon Drive Station:** Requires drainage infrastructure improvements to mitigate flood risks and support transit connectivity.

- **Iwilei:** One of the few remaining large-scale opportunity areas for growth in the core of the PUC, however, extensive sea level rise impacts and infrastructure improvement needs are obstacles to realizing the area’s potential.
- **Kapālama Canal:** Waterway from H-1 Freeway to ocean, with potential for beautification, recreation, and improved flood control, per the Kalihi-Palama Action Plan.
- **Kapālama Station:** Highlighted for redevelopment with upgraded water and sewer infrastructure to support increased density.
- **Honolulu Community College:** Needs improvements to transit access and water infrastructure.
- **Nu‘uanu Stream:** Planned improvements include greenbelts, pathways, and enhanced access to create a welcoming environment for residents and visitors.
- **Kewalo Basin Park:** A recreational area connecting the community to the waterfront, supporting water-based activities.
- **Kaka‘ako Waterfront Park:** A green space integrating stormwater management and habitat preservation with public shoreline access.
- **Mother Waldron Playground:** Supports recreational needs while contributing to local water drainage and management.
- **Sand Island (Mauliola):** Balances cultural significance in fishing and recreation with modern infrastructure, including a wastewater plant and recreational amenities.
- **Sand Island WWTP:** Essential for urban Honolulu, undergoing upgrades to meet treatment requirements and increase climate resilience.
- **Ala Moana Regional Park:** A vital recreational and natural area enhancing community access to green and water spaces.
- **Ala Wai Canal Promenade:** Offers scenic views and stormwater management while serving as a community gathering space.
- **Ala Wai Canal:** Focused on reducing pollution through community-based watershed management efforts.
- **Honolulu and Pearl Harbor Aquifers:** Essential groundwater resources requiring sustainable management for municipal supply.
- **BWS Wells and Reservoirs:** Critical for maintaining water supply in Kalihi, with planned improvements to support urban growth.
- **Community Parks and Plazas:** Planned public spaces incorporating sustainable water management to enhance livability.
- **Light Metro Stations for TOD:** Key transit hubs incorporating water management strategies to enhance accessibility and community mobility.
- **Stormwater Management Facilities:** Integrated green infrastructure solutions, such as bioswales, to mitigate runoff and enhance water quality.

SPECIFIC LOCATIONS OF CONCERN

- **Hālawā Stream:** Traverses Hālawā Valley into Pearl Harbor, where channelization has impacted flooding and habitats. Improvements are needed to address flood risks and support ecological resilience.
- **‘Aiea Stream:** Flows through the town of ‘Aiea into ‘Aiea Bay, with urban development raising concerns about water quality and ecosystem health.
- **Ala Wai Canal:** Requires attention for stormwater management and pollution control to improve water quality and protect community health.
- **Waikīkī Beaches:** Affected by pollution from the Ala Wai Canal, raising concerns about water quality and public health. The area is also affected by erosion.
- **Waikīkī:** Already subject to shallow and emergent groundwater, requiring constant pumping and decreasing gravity-fed drainage capacity.
- **Kupehau Slopes:** Proposed as a site for bioremediation with "clean" plants to improve water quality and manage environmental impacts. (Underdeveloped area in Kalihi Valley maintained by DPR. The central portion is unmaintained due to its steep terrain)
- **Māpunapuna Industrial Area:** Subject to high-tide flooding and challenges from sea level rise, necessitating adaptive measures for sustainability.
- **Lagoon Drive:** Requires drainage improvements to reduce flooding risks and ensure safe access for pedestrians and cyclists.
- **Kahauiki Station Area:** Noted for flooding potential during heavy rainfall, requiring improved drainage systems for enhanced water management.
- **Waiwai Loop Area:** Vulnerable to flooding, requiring improved drainage systems for risk mitigation.
- **Kapālama Canal:** A focus for beautification, recreation, and flood control, with efforts to improve ecological quality while addressing flood management.
- **Kalihi Station Area:** Prone to flooding, highlighting the need for effective stormwater management to protect infrastructure and the community.
- **Iwilei Station Area:** An area particularly vulnerable to flooding exacerbated by sea level rise, among other portions of TOD areas around the rail line.
- **Areas Makai of Kalaniana‘ole Highway:** Identified for revitalization to foster community interaction with water resources and enhance ecological health.
- **Sand Island WWTP:** Projected sea level rise scenarios place this critical asset under water, which would threaten operations. Projects to increase climate resilience for Sand Island WWTP are underway.

- **Pearl Harbor Shoreline:** A critical zone for environmental protection, emphasizing the importance of reducing pollution and protecting aquatic habitats.
- **Area makai of Kapi‘olani Boulevard:** Lies within flood hazard districts, requiring mitigation measures.
- **Ke‘ehi Lagoon:** Critical for ecological and recreational purposes, with an emphasis on protecting water quality and enhancing natural features.
- **Nu‘uanu Stream:** Requires improvements, including creating greenbelts and pathways to enhance ecological health and community access.
- **Honolulu Harbor:** Revitalization efforts should respect environmental standards and enhance water quality.
- **Irwin Park:** Improvements should include sustainable landscaping practices for better stormwater management and biodiversity.
- **Honolulu and Pearl Harbor Aquifers:** Designated as critical water resources requiring sustainable management to ensure long-term availability and protection.

WATER & INFRASTRUCTURE CONCERNS

- **Water Quality:** Concerns include pollution from urban runoff, agricultural practices, and contaminants from developments, posing health risks.
- **Stream Restoration:** Efforts focus on debris removal, bank stabilization, and setbacks to protect natural streams impacted by urbanization.
- **Flood Control:** Improved drainage systems and flood mitigation measures are critical to addressing risks, especially near waterways and flood-prone areas.
- **Sea Level Rise:** Adaptive measures are necessary to mitigate impacts on infrastructure and ecosystems.
- **Community Engagement:** Initiatives like "Adopt A Stream" encourage stewardship and community involvement in water management.
- **Infrastructure Upgrades:** Sewer, drainage, and water systems require maintenance and modernization to meet environmental and growth demands.
- **Environmental Education:** Public education promotes conservation and sustainable practices.
- **Water Supply Management:** Emphasis on conservation, efficient use, and alternative water sources like recycled wastewater and stormwater.
- **Ecosystem Protection:** Safeguarding wetlands, streams, and marine environments supports biodiversity and ecological health.
- **Cultural Heritage:** Water management practices must respect Hawaiian traditions tied to fishing, agriculture, and rituals.
- **Integrated Land Use Planning:** Sustainable development requires aligning land use decisions with water resource protection.
- **Green Infrastructure:** Incorporation of permeable surfaces and sustainable stormwater practices enhances groundwater recharge and reduces runoff.
- **Historic Preservation:** Protecting cultural and historical landmarks near waterbodies is essential for heritage and environmental health.
- **Stormwater and Wastewater Management:** Upgrades to systems to ensure capacity and regulatory compliance.
- **Environmental Protection:** Regular monitoring and mitigation measures are key to preserving water quality and ecosystem health.
- **Community Health:** Clean water and effective stormwater management are vital for public health.
- **Flood Mitigation:** Targeted measures address flood risks in vulnerable areas, safeguarding developments and the environment.
- **Regulatory Compliance:** Adherence to environmental health standards, such as NPDES permit requirements, is essential.
- **Water Resource Planning:** Coordinated efforts integrate water allocation, watershed management, and conservation programs for long-term sustainability.

FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- **Enhance Water Quality:** Implement best practices for stormwater management to reduce runoff and pollution.
- **Ecosystem Protection and Restoration:** Focus on native habitat restoration and invasive species removal.
- **Cultural Preservation:** Develop educational programs on the historical and cultural importance of water management.
- **Public Access and Recreation:** Create infrastructure like trails and viewing areas for sustainable engagement with water resources.
- **Community Education:** Organize workshops and outreach to promote water conservation, ecosystem health, and community involvement in water management.
- **Climate Adaptation and Resilience:** Develop strategies to address flooding, sea-level rise, and rainfall changes to protect water quality and habitats and design infrastructure to withstand future environmental challenges.
- **Sustainable Development:** Encourage green infrastructure like bioswales, rain gardens, and permeable surfaces in new projects.

- **Waterway Restoration:** Implement cleaning and restoration of polluted waterways, removing debris and contaminants.
- **Integration with Land Use:** Ensure water management is integrated into development planning, prioritizing sustainable systems.
- **Flood Management:** Upgrade and maintain flood control infrastructure, ensure new developments in flood zones follow climate adaptation guidelines.
- **Stream Restoration:** Enforce stream setbacks, stabilize banks, and remove invasive species to protect ecosystems.
- **Community Stewardship:** Encourage programs like "Adopt A Stream" for resident involvement in waterway care.
- **Public Awareness:** Educate about pollution impacts and the importance of clean waterways.
- **Green Building Practices:** Promote energy and water efficiency in developments to reduce environmental footprints.
- **Sustainable Stormwater Management:** Use low-impact development strategies to manage runoff and recharge groundwater.
- **Infrastructure Improvements:** Replace water and sewer systems at the end of their useful life and upgrade drainage for climate resilience.
- **Watershed Management Partnerships:** Collaborate to restore and manage watershed areas and conduct conservation programs.
- **Expand Water Sources:** Explore options like recycled wastewater and stormwater to diversify supply.
- **Protect Natural Ecosystems:** Preserve wetlands and coastal habitats to support biodiversity and the water cycle.
- **Invest in Water Infrastructure:** Upgrade systems for clean water access and environmental sustainability.
- **Improve Wastewater Management:** Upgrade infrastructure to meet current and future capacity requirements, in compliance with environmental regulations.
- **Guarantee Access to Clean Water:** Ensure that all community members have equitable access to safe and clean drinking water. Address disparities in water access and quality, particularly in underserved communities.

PLANS REVIEWED & SUMMARIZED

Area-Specific Plans:

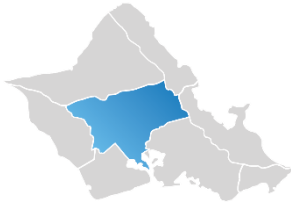
- 2001 Pearl Harbor Historic Trail Master Plan (DPP)
- 2004 Kalihi- Pālama Action Plan (completed) (DPP)
- 2004 ‘Aiea-Pearl City Livable Communities (DPP)
- 2014 ‘Aiea-Pearl City TOD Neighborhood Plan (DPP)
- 2016 Kaka‘ako Development District TOD Overlay Plan (Hawai‘i Community Development Authority [HCDA])
- 2017 Kalihi TOD Neighborhood Plan (DPP)
- 2020 Downtown TOD Neighborhood Plan (DPP)
- 2020 Hālawa TOD Neighborhood Plan (DPP)
- 2021 Ala Moana TOD Neighborhood Plan (DPP)
- 2022 Airport Area TOD Plan (DPP)
- 2023 Proposed Plan – October 2023 Primary Urban Center Development Plan (DPP)

State and Islandwide Plans:

- 2019 Water Master Plan Summary Update (BWS)
- 2019 Hawai‘i Water Plan – Water Resources Protection Plan (CWRM)
- 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division)
- 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division)
- 2024 Climate Ready O‘ahu (CCSR)

SECTION C.6: CENTRAL O‘AHU AREA SUMMARY

C.6.1 COMMUNITY PROFILE



From the turn of the last century, much of Central O‘ahu was previously in large-scale agricultural production of sugarcane and pineapple. The older and formerly rural low to mid-density suburban towns of Wahiawā, Mililani, and Waipahu have been joined by more recent developments in Royal Kunia, Village Park, Waipi‘o, and Waikele. Several military installations (Joint Base Pearl Harbor-Hickam, Schofield-Wheeler, and Joint Base Pearl Harbor-Hickam Wahiawā Annex) are located in the core of this area. The Waiāhole Ditch Irrigation system brings water from windward O‘ahu to remaining agricultural lands in Central O‘ahu, including Kunia. Groundwater from Central O‘ahu is used to supply potable demands in ‘Ewa, Wai‘anae, and, to a lesser extent, the Primary Urban Center. Low-lying areas of Pearl Harbor and parts of Waipahū are subject to coastal erosion.

C.6.2 THREATS/OPPORTUNITIES

- Climate-driven hazards, such as flooding along streams and coastal and shoreline erosion, threaten Waipahū homes and businesses and may require infrastructure improvements including stormwater retention and detention areas, improvements channels and berms, or other appropriate measures (e.g., Waikele Stream, Kapakahi Wailani Channel, Waiawa Stream).
- The transportation network is affected by flooding (e.g., Farrington Highway).
- Sedimentation and chemical and nutrient contamination from polluted streams and nonpoint sources can negatively affect potable water, the Pearl Harbor aquifer, and agriculture.
- Kaukonahua Stream (north and south forks), which drain to the North Shore, have specific regulated water quality concerns for nutrients and sediment.
- New water sources are needed to support growing demand in the Primary Urban Center, and sources may be developed in Waipahū and Waiawa.
- Effluent can enter local streams with environmental and agricultural concerns (e.g., Schofield Barracks).

C.6.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Assess flooding issues, upgrade drainage infrastructure, promote localized rainfall absorption, and restore wetlands for increased resilience and water quality improvement.
- Ensure potable and non-potable water supplies are sufficient for new developments.

- For residential and agricultural uses, promote conservation measures (low flow plumbing and efficient irrigation systems) to support water supply.
- Increase access to water-related recreational opportunities along the Pearl Harbor shoreline.

C.6.4 CURRENT CITY EFFORTS TO DATE

- Mililani WWTP/Patsy T. Mink Central O‘ahu Regional Park R-1 Stormwater Capture and Reuse Project (DFM with ENV, BWS, DDC, DPR, and CWRM)
- Wahiawā WWTP upgrades (ENV)
- Central O‘ahu Watershed Management Plan, under development (BWS)

C.6.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES
RELATING TO WATER

- **Flood Management:** Mitigate flooding risks to protect residents, infrastructure (including highway and roads), and economic assets.
- **Climate Change Impacts:** Address rising sea levels and rainfall variability through proactive adaptation strategies.
- **Water Conservation and Sustainability:** Promote efficient water use, prevent resource depletion, and ensure sustainability by diversifying sources through recycled water and stormwater reclamation for urban and agricultural needs.
- **Watershed Management and Water Quality Protection:** Protect drinking water from contamination by effectively managing non-potable water to safeguard the Pearl Harbor Aquifer. Preserve and manage lands above the aquifer to improve groundwater recharge and promote watershed health.
- **Public Health:** Ensure access to clean water to prevent disease and support community well-being.
- **Community Engagement:** Foster collaboration among residents, government, businesses, and organizations, promoting active participation in water management and conservation through education, workshops, and public awareness initiatives.
- **Cultural Significance:** Honor water's vital role in Hawaiian culture by supporting traditional practices such as fishpond aquaculture, taro farming, fishing, and ahupua‘a management. Emphasize the integrated stewardship of resources from mauka to makai.
- **Environmental Protection and Ecosystem Management:** Preserve natural habitats, prioritize critical sites like Pouhala Marsh to support native species and biodiversity, and manage invasive species to sustain healthy ecosystems and water resources.
- **Recreation and Access:** Enhance shoreline access for activities like fishing, boating, swimming, and picnicking, highlighting water's role in community aesthetics and enjoyment.
- **Economic Importance:** Advocate for sustainable water management to drive growth in agriculture, tourism, and industry.

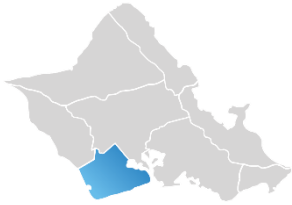
PLACES OF INTEREST

- **Waiawa Stream:** A critical natural feature requiring ecological protection, including water quality maintenance and effective stormwater management.
- **Pearl Harbor Aquifer:** A critical source of potable water for O‘ahu, essential for sustaining the island's water needs.
- **Waiāhole Ditch:** Supplies 12.6 million gallons per day of non-potable water, vital for irrigation and agricultural activities in Central O‘ahu.
- **Wahiawā Reservoir:** A potential water source for diversified agriculture in Central O‘ahu, complemented by recycled water.
- **Schofield WWTP:** Provides recycled water for urban and agricultural irrigation, conserving potable water resources.
- **Central O‘ahu Plantation Villages:** Preservation efforts focus on maintaining historic areas like Kunia and Poamoho.
- **Waipahū Transit Center:** Proposed improvements include wider sidewalks, enhanced bus shelters, new bike lanes, crosswalk upgrades, and shaded areas for a more pedestrian-friendly environment.
- **Pearl Harbor Shoreline:** An underutilized area with potential for recreational activities like fishing, boating, and picnicking, with plans to improve access.
- **Sumida Watercress Farm:** This farm, fed by Kalauao spring, is significant for both agricultural practices and community identity.
- **Waipahū Cultural Garden Park:** Features integrated water elements to enhance recreation and aesthetics, contributing to open space preservation.
- **Hans L’Orange Neighborhood Park:** A key community space with plans to connect parks and open spaces through pedestrian pathways and landscaping, improving access to recreational areas.
- **Pouhala Marsh:** A critical wildlife sanctuary and habitat for native species, vital for water quality and ecosystem stability.
- **Pearl Harbor Historic Trail:** Connects key areas of Waipahū, promoting walking, biking, and recreational access to waterfront spaces.
- **Pearl Harbor:** A historical and natural asset offering recreational and educational opportunities, with improved accessibility through the Pearl Harbor Historic Trail.
- **Waterfront Promenade:** Provides scenic views of Pearl Harbor, supporting outdoor activities and community enjoyment of the waterfront.
- **Wetlands and Natural Habitats:** Wetlands along the Pearl Harbor Historic Trail support biodiversity, environmental conservation, and educational outreach on local ecosystems.
- **OR&L Historic Railway:** The railroad right-of-way runs along Pearl Harbor’s edge, with a spur leading to Waipahū Cultural Garden Park.
- **Kunia and Poamoho Villages:** Historic plantation villages remain active housing areas in agricultural zones.

	• Kūkaniloko: North of Wahiawā is this highly significant Native Hawaiian cultural and archaeological site as for the birth of high chiefs. • Shoreline Park Preservation Area: This area focuses on expanding recreational opportunities, including nearshore fishing and boating in Pearl Harbor and West Loch.	
SPECIFIC LOCATIONS OF CONCERN	• Waipahū (Waikele, Kapakahi Wailani Channel): Flooding concerns are associated with these natural and man-made vegetated drainage system/drainageways. • Parts of Waipahū Town, Waipahū Cultural Garden Park, and Royal Kunia: This development is at risk of flooding. • Waiawa (Lower Waiawa Stream): Identified for inadequate drainage and flood risks, this stream requires infrastructure upgrades. • Farrington Highway: This major thoroughfare prone to flooding requires infrastructure resilience measures. • Ash Landfill and Former Incinerator Site: The areas surrounding the ash landfill and former incinerator are of concern due to potential environmental impacts (e.g., contaminants). • Waipi’o Peninsula: Roads to access the planned solid waste facility on Waipi’o Peninsula are highly vulnerable to sea level rise.	
WATER & INFRASTRUCTURE CONCERNS	• Flood/Stormwater Management: Effective strategies and improvements are needed to mitigate flooding risks and protect residents and infrastructure. • Water Quality and Pollution: Preventing pollution is vital for maintaining water quality in streams, marshes, and recreational areas like the Pearl Harbor shoreline. • Central O’ahu Streams: Sediment affects water quality and watershed health. Identifying sources and implementing projects to reduce sedimentation are critical. • Urban and Agricultural Areas: Chemical and nutrient contamination from land use poses risks to groundwater. • Groundwater Contamination Risks: Non-potable water with contaminants like chloride, nitrate, and pesticides for irrigation threatens groundwater and drinking water sources. Maintaining low dissolved solids in irrigation water is essential to protect drinking water quality. • Lands Above the Pearl Harbor Aquifer: Protecting these areas from development is essential to sustaining groundwater recharge and maintaining water quality.	
FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS	• Stormwater and Flood Management: Conduct studies, restore natural floodplains, and upgrade infrastructure to mitigate flooding risks and enhance stormwater absorption. • Enhance Water Quality: Prevent pollution and manage runoff effectively, particularly near parks and shorelines, to maintain water quality. • Water Supply Adequacy: Ensure potable and non-potable water supplies are sufficient for new developments to support sustainable growth. • Recycled Water Use: Encourage large-scale use of recycled water for urban and agricultural irrigation to conserve potable water and optimize resource efficiency. • Water Use Efficiency: Implement conservation measures (e.g., low-flow plumbing fixtures, efficient irrigation systems, rainwater catchments systems). • Increase Access to Water-Related Recreational Opportunities: Improve pathways and connections to water resources like the Pearl Harbor shoreline to enhance recreational activities such as fishing, boating, and picnicking. • Waipahū Shoreline Park and Preservation Area: Develop this area along the entire shoreline in Pearl Harbor's West Loch and Middle Loch with a 150-foot setback required for all new development located on the shoreline, if justified, based on historic or adopted projections of shoreline erosion or extreme flooding events. • Cultural Preservation: Promote traditional watershed management, and highlight the cultural significance of water resources via community engagement and education.	
PLANS REVIEWED & SUMMARIZED	Area-Specific Plans: • 1995 Waipahū Town Plan (DPP) • 1998 Waipahū Livable Communities Initiative (DPP) • 2001 Pearl Harbor Historic Trail Master Plan (City) • 2017 Waipahū Town Action Plan (DPP) • 2021 Central O’ahu Sustainable Communities Plan (DPP)	State and Islandwide Plans: • 2019 Water Master Plan Summary Update (BWS) • 2019 Hawai’i Water Plan – Water Resources Protection Plan (CWRM) • 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division) • 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division) • 2024 Climate Ready O’ahu (CCSR)

SECTION C.7: ‘EWA AREA SUMMARY

C.7.1 COMMUNITY PROFILE



Rapid development in ‘Ewa has increased demand on water resources and infrastructure, creating challenges in balancing growth with environmental sustainability, particularly concerning aquifers, stormwater management, and flood-prone areas. Rising sea levels and extreme weather further highlight the need for climate adaptation, prompting the community to incorporate resilience measures such as green infrastructure, sustainable stormwater practices, and wildfire mitigation into planning efforts. The community highly values its cultural heritage, including sacred Hawaiian sites and traditional practices like limu (seaweed) harvesting and anchialine pool preservation, fostering a deep sense of stewardship for natural and cultural resources. However, diverse ecosystems, ranging from coastal zones to high-elevation forests, face significant threats from urbanization, climate change, and rising sea levels.

C.7.2 THREATS/OPPORTUNITIES

- Due to urbanization, flooding and nonpoint pollution occurs, particularly where infrastructure needs upgrading.
- ‘Ewa Plain is a low-lying region susceptible to flooding, with ongoing efforts for improved stormwater systems.
- Renton, Tenney, and Varona Villages have been identified for inadequate drainage and flood risks, requiring targeted infrastructure upgrades.
- Kalo‘i Ditch needs enhanced stormwater management to reduce runoff and flooding impacts.
- Expansion of graywater and stormwater capture and reuse, including areas that can leverage green infrastructure like golf courses or parks.
- Additional water sources should be developed in this area, as it imports more than half of its water needs.
- Barbers Point desalination plant construction
- Kunia and Waikele Gulch Wells (in the ‘Ewa-Waipahū System)
- Regional water conservation and education programs will help to reduce water demands.
- Balancing wildfire risks during drought with flood risks during storms is critical.
- Erosion and sea-level rise threaten areas along the ‘Ewa Beach coastline.

C.7.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Conduct hydrologic modeling for flow and drainage management where frequent flooding occurs.
- Look for additional opportunities for the use of recycled water.
- Continue to explore and implement water source development projects to meet local demands.
- Continue to promote water conservation measures and public engagement.
- Assess wildfire risks and implement wildfire prevention measures, especially along the wildland-urban interface.
- Protect and restore cultural and natural resources in ‘Ewa, including those that help to enhance and protect water quality and water resources.

C.7.4 CURRENT CITY EFFORTS TO DATE

- Desalinization plant to expand the potable water supply (currently being constructed) (BWS)
- Honouliuli-East Kapolei R-1 reservoir and pipeline (BWS)
- Expansion of Honouliuli Water Recycled Water System (BWS with ENV & DPR)
- Upgrades to the Honouliuli WWTP with sustainability initiatives to use renewable energy and reuse bio sludge (ENV)
- NPDES MS4 Structural Best Management Practices (BMPs) for Trash Reduction – Campbell Industrial Park (DFM)
- Conduct an analysis of adaptation or retreat options for Pūpū Place (DPP)

C.7.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES
RELATING TO WATER

- **Protection of Natural Resources:** Safeguard potable water from land use impacts, including legacy agriculture.
- **Water Conservation Measures:** Promote non-potable water use (graywater and stormwater) and efficient irrigation systems, like drip irrigation.
- **Community Engagement:** Include public input to align water management policies with local priorities.
- **Climate Change Preparedness:** Address risks from rising sea levels and changing precipitation patterns. Integrate strategies for adapting to sea level rise and climate impacts in city planning.
- **Holistic Environmental Approach:** Integrate land and water management to enhance ecosystems and resources.
- **Reduce Impervious Surfaces:** Reduce impervious surfaces to recharge groundwater and decrease runoff.
- **Green Infrastructure:** Encourage the use of bioswales, rain gardens, and similar practices.

PLACES OF INTEREST

- **Anchialine Pools:** Unique ecosystems crucial for biodiversity and cultural practices; efforts should focus on protection and restoration as ponds are important for maintaining water quality.
- **Salt Marsh (Batis) at Hoakalei Kauhale Preserve and West Loch of Pearl Harbor:** These habitats are for endangered species with initiatives to protect these sensitive ecosystems.
- **Kalo’i Gulch:** This site is targeted for ecological restoration, flood mitigation, and enhanced stormwater management.
- **Ordy Pond:** A 57.9-acre parcel with significant archaeological and ecological importance.
- **Kahe Point:** Known for its marine coastal ecosystem, including coral reefs and other sensitive habitats, this place requires protection from pollution and development pressures.
- **OR&L Railroad Alignment:** A historical transportation route that is vital for understanding the region’s economic and water transport history.
- **Pu’uwai Park Greenway Corridor:** This park is proposed as part of the Honouliuli (Ho’opili) Station Area TOD project. This open space will be critical for recreation, connectivity, and sustainable stormwater practices.
- **Ko ‘Olina:** This coastal resort area provides job growth, development, and tourism opportunities.
- **Coastal Zones:** Leeward coast is vulnerable to impacts from sea level rise, storm surges, and nearshore pollution.
- **Kalaeloa Heritage Park:** This cultural preservation site integrates environmental education and traditional resource management.
- **Honouliuli Fishpond:** The last operational fishpond in Pearl Harbor, showcasing traditional Hawaiian aquaculture and ecological significance.
- **Ancient Hawaiian Sites:** Sacred areas like Kalaeloa and Hoakalei require careful preservation and integration with modern planning.
- **Limu Beds:** These seaweed habitats are vital for ecological balance and cultural practices (e.g., food, fishing). Impacted by urbanization, the health of limu is directly linked to the quality of freshwater inputs.
- **Honouliuli WWTP:** As a key facility for wastewater management, this WWTP is crucial for supporting development in Kapolei and surrounding areas.
- **Rail Transit Station Areas:** These areas require infrastructure upgrades for climate resilience and sustainable transit-oriented growth.
- **UH West O’ahu:** Use open space areas for flood control to reduce downstream impacts in Kalo’i Gulch watershed.

SPECIFIC LOCATIONS OF
CONCERN

- **‘Ewa Plain:** A low-lying region susceptible to flooding with ongoing efforts for improved stormwater systems.
- **Renton, Tenney, and Varona Villages:** These villages were identified for inadequate drainage and flood risks, requiring targeted infrastructure upgrades.
- **Kalo’i Ditch:** This ditch needs enhanced stormwater management to reduce runoff and flooding impacts.
- **‘Ewa-Waipahū System:** The system includes plans for developing Kunia Wells and Waikele Gulch Wells to augment water sources.
- **Wildland-Urban Interface Areas:** These areas are at heightened risk for wildfires due to dry conditions and unmanaged vegetation.
- **Kalaeloa and Kapolei:** These are proposed sites for desalination plants to address long-term potable water needs. Both the regional drainage system and the onsite drainage facilities for Kalaeloa need to be addressed during the redevelopment of Kalaeloa.
- **Barbers Point Industrial Park:** This is a designated location for a BWS desalination plant.

WATER & INFRASTRUCTURE CONCERNS	• Water Supply Infrastructure: Expansion is required to meet population growth and mitigate climate-related stresses on water systems. • Caprock Aquifer Areas: Vital for groundwater recharge. • High Elevation Forests: Crucial for maintaining groundwater recharge and overall watershed health. • Urban Development Areas: Increasing pressure on limited water resources due to rapid growth in ‘Ewa. • Stormwater Management: Priority areas like Kalo’i Gulch, Kapolei, and West Loch watersheds need improvements to address flooding and pollution control.	
FUTURE RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS	• Infrastructure Resilience: Assess and adapt water systems to address climate challenges like drought and extreme rainfall. • Stormwater Utility: Develop a funding mechanism to support green infrastructure projects and incentivize low-impact development. • Community Preparedness: Engage residents with education and planning for climate change/sea level rise, especially with how sea level rise can increase the damage potential of other hazards like tsunamis (seismic hazard) and hurricanes (hazard influenced by climate change).	
PLANS REVIEWED & SUMMARIZED	Area-Specific Plans: • 1992 ‘Ewa Villages Master Plan (DPP) • 2000 Kalaeloa Redevelopment Plan (Barbers Point Naval Air Station Redevelopment Commission) • 2017 ‘Ewa Watershed Management Plan (BWS) • 2020 ‘Ewa Development Plan (DPP) (Update began in 2025) • 2020 East Kapolei TOD Neighborhood Plan (DPP)	State and Islandwide Plans: • 2019 Water Master Plan Summary Update (BWS) • 2019 Hawai’i Water Plan – Water Resources Protection Plan (CWRM) • 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division) • 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division) • 2024 Climate Ready O‘ahu (CCSR)

SECTION C.8: WAI‘ANAE AREA SUMMARY

C.8.1 COMMUNITY PROFILE



Water is central to the identity and survival of Wai‘anae, reflected in its name (wai for freshwater and ‘anae for mullet fish) and its role in sustaining agriculture, aquaculture, and daily life. Wai‘anae is a rural area with residential and commercial centers in Mā‘ili, Nānākuli, Wai‘anae, and Mākaha with the highest concentration of Native Hawaiians on O‘ahu. Agriculture includes both active contemporary and historical farms along the coast. There are thousands of acres of military lands within Mākua Military Reservation and Lualualei Naval Magazine. Low annual rainfall results in very dry conditions most of the year and high susceptibility to wildfire. When rains do occur, low-lying areas are subject to flash flooding. The Wai‘anae and Mākaha Aquifer System Areas are vital for ecosystem health and important potable water sources.

C.8.2 THREATS/OPPORTUNITIES

- Flash flooding occurs along streams and affects the roadway network.
 - Farrington Highway and bridges
 - Kili Drive and other local Mākaha roads
 - Kepue Street
 - Water Street
 - Mākaha Stream
 - Oceanfront drainage outlets
- Excessive sedimentation and pollution from nonpoint sources and impervious surfaces threaten the health of the ecosystem, streams, and nearshore waters.
 - Mākaha Stream
 - Nānākuli
 - Lualualei
 - Coastal areas and nearshore waters
 - Anchialine ponds
- Saltwater inundation is threatening potable and brackish water sources.

- Nānākuli Shaft
- Lualualei Shaft
- Existing and future development puts pressure on water and wastewater infrastructure. Stormwater and drainage infrastructure is also affected.
- Cesspools contribute to groundwater and nearshore water pollution.
- Large areas of Wai‘anae are subject to Public Safety Power Shutoff (PSPS) by the Hawaiian Electric Company (HECO) during periods of high risk for wildfire, and wildfire prevention is needed.
 - Wai‘anae
 - Nānākuli
 - Mā‘ili
 - Mākaha

C.8.3 RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS

- Conduct infrastructure improvements to address flash flooding and reduce pollution and runoff.
- Support the provision of water for ecological and cultural practices such as lo‘i kalo.
- Emphasize conservation of water and preservation of ecosystem assets through installation or improvement of the built environment.
- Support wildfire prevention efforts to protect lives and properties as well as reduce possible sediment pollutant loading.

C.8.4 CURRENT CITY EFFORTS TO DATE

- Wai‘anae WWTP improvements and upgrades (recently completed) (ENV)
- Pursuing designation of the Wai‘anae Aquifer Sector Area as a Ground Water Management Area (BWS)

C.8.5 ADDITIONAL INFORMATION

KEY REGIONAL THEMES
RELATING TO WATER

- **Respect for Native Hawaiian Rights:** Recognizing and respecting Native Hawaiian rights and traditional practices related to water use, integrating cultural values into modern water management strategies.
- **Natural Functioning of Watersheds:** Preference for allowing watersheds to function naturally with minimal interference from man-made facilities.
- **Holistic Approach:** Emphasizing a spiritual and interconnected understanding of ecosystems from mauka (mountain) to makai (ocean).
- **Education and Data-Driven Decisions:** Valid scientific data and public education are seen as essential for informed watershed management and sustainable resource use.
- **Community Engagement:** Watershed management is recognized as a shared responsibility, with education and intergenerational learning fostering a collective sense of accountability among community members.
- **Active Participation:** The community values active involvement in water management decisions, ensuring that local perspectives and needs are reflected in planning and resource allocation.
- **Environmental Health:** Advocacy for a cleaner, healthier environment includes protecting natural waterways and ensuring equitable distribution of environmental benefits and responsibilities.
- **Sustainable Water Use:** Emphasis on balancing water quality with appropriate uses, reserving high-quality water for drinking and utilizing lower-quality water for irrigation and industrial purposes.
- **Watershed Protection:** Protecting watersheds is vital to sustaining healthy forests, streams, and aquifers, contributing to drought mitigation and providing educational and vocational opportunities.
- **Water Conservation:** Strong focus on conservation practices, including leak detection, low-flow fixtures, and rain catchment systems, to reduce reliance on external water sources.
- **Diversification of Water Supply:** Advocating for diversified water sources, such as brackish water and recycled water, to maximize non-potable use while reserving potable water for essential needs.
- **Conservation and Efficiency:** Promoting water-efficient plumbing fixtures and dual water systems in new developments to encourage the use of recycled water where available.
- **Safe Yield and Sustainability:** Supporting sustainable groundwater management by determining safe yield levels for aquifers to prevent adverse effects on stream flows.
- **Recycled Water Use:** Encouraging the expansion of recycled water programs for landscaping, golf courses, and parks to utilize alternative water sources effectively.
- **Protection of Natural Resources:** Prioritizing the protection of local water sources and watershed health to maintain ecological balance and ensure reliable community water supplies.

PLACES OF INTEREST

- **Mākaha Valley:** A key area for water resources and agriculture, with approximately 4,000 acres of conservation lands owned by BWS that play a critical role in maintaining the watershed and ensuring sustainability.
- **Wai‘anae Valley:** A critical area for water supply, featuring perennial stream segments that support ecological health and biodiversity.
- **Lualualei:** Holds potential for water resource development, including the rehabilitation of brackish water wells for irrigation. Saltwater intrusion affects the feasibility and quality of the water.
- **Wetlands in Lualualei, Wai‘anae, Mākaha, ‘Ōhikilolo, and Makua:** These wetlands are vital for biodiversity, water quality management, and ecological balance.
- **Anchialine Ponds:** Coastal ponds that serve as important habitats for native species and play a critical role in maintaining the coastal ecosystem.
- **Lo‘i Kalo:** Areas in Nānākuli and Mākaha are known for their historical taro cultivation practices.
- **Wahi Pana:** Sacred cultural sites associated with water include springs, ponds, and coastal areas. These sites are associated with legends or historical events and essential to traditional practices and preserving the community’s heritage.
- **Heiau:** Various heiau (temples or places where energy was “ensnared”) are located near water sources, such as streams and coastal areas. These places usually have been dedicated to akua (deities) associated with water, agriculture, and fertility, reflecting the importance of water in traditional Hawaiian spirituality and practices.
- **Fishing Grounds:** These areas along the coast are not only important for food but for maintaining cultural practices and resources management. Specific locations include Nānākuli and Mākaha.

SPECIFIC LOCATIONS
OF CONCERN

- **Farrington Highway and Bridges:** Maintenance of drainageways near bridges and roadways is essential to prevent flooding during heavy rains and from coastal inundation.
- **Kili Drive and Other Local Mākaha Roads:** Essential for community access and connectivity, these roads require improvements to address flooding and capacity issues.
- **Kepue and Water Streets:** Frequent flooding highlights weaknesses in local drainage infrastructure needing attention.
- **Mākaha Stream:** Facing challenges such as sedimentation and soil deposits, which increase flooding risks and require proactive maintenance.
- **Oceanfront Drainage Outlets:** High surf clogs outlets with sand, exacerbating flooding, prompting exploration of alternative designs.

	• Wai‘anae Stream and Valley: Faces challenges in water quality and managing perennial streams essential for local wildlife. • Lualualei: Wetlands and reservoirs here are vital for waterbird habitats and ecological functions but face threats from pollution and development. • Coastal Areas: Nearshore resources support food and cultural practices but are threatened by pollution and overuse. • Anchialine Ponds: Sensitive coastal ecosystems at risk from water quality and quantity changes. • Wai‘anae and Mākaha Aquifer System Areas: Aquifers with limited sustainable yields, raising concerns about over-extraction and their ability to meet the growing water demands of the district. • Agricultural and Unimproved Lands: Potential development of large parcels of unimproved lands raises concerns about water supply, environmental integrity, and the need for responsible management practices. • Nānākuli and Lualualei Brackish Water Sources: Potential for irrigation use, but seawater intrusion complicates feasibility. • Cesspools: Numerous cesspools can be found in this area, which can threaten water quality.
WATER & INFRASTRUCTURE CONCERNS	• Water Quantity: Concerns over the sustainability of water resources, including groundwater depletion and drought impacts on surface water supplies. • Groundwater Management: Protect aquifers from contamination and over-extraction, with a focus on monitoring groundwater levels and quality. • Surface Water Management: Address challenges in maintaining healthy stream flows, ecological integrity, and the effects of water diversion and land use changes. • Ecosystem Health: Ensure water management supports terrestrial and aquatic ecosystems, protecting habitats for native and endangered species. • Cultural Resources: Highlight water's importance to traditional practices and cultural identity, integrating cultural values into water management strategies. • Community Engagement: Promote local involvement in water management decisions and fostering partnerships to address water-related issues effectively. • Climate Change Impacts: Prepare for climate-related changes in precipitation, water availability, and the resilience of water infrastructure. • Community-Based Programs: Implement initiatives like education and conservation efforts to engage residents in sustainable water practices and resource stewardship. • Nearshore Waters: Control nonpoint source pollution to protect water quality and marine ecosystems critical to the environment and community use. • Seawater Intrusion: Address risks of seawater intrusion into sewer lines and brackish water sources to ensure water quality for reuse and irrigation. • Brackish Water Sources: Identify brackish water sources, such as the Nānākuli and Lualualei Shafts, for potential rehabilitation, contingent on mitigating seawater intrusion. • Non-Point Source Pollution: Developing programs to reduce pollution entering nearshore waters, vital for maintaining water quality and marine health. • Water Supply and Demand: Manage groundwater sustainably to meet current and future demands, especially in urbanizing areas like Mākaha. • Infrastructure Capacity: Upgrading sewer and drainage systems to handle increased flows from development and reduce risks of flooding and other water issues. • Flooding Risks: Addressing recurring flooding in areas like Kepue and Water Streets by improving stormwater drainage systems. • Sedimentation and Stream Health: Manage sedimentation and debris in Mākaha Stream to protect stream banks, reduce flooding risks, and ensure environmental and community safety. • Pollution and Water Quality: Mitigate the effects of urbanization on water quality by reducing pollutants entering nearshore waters and protecting ocean resources. • Recycled Water Use: Expand the use of recycled water for irrigation and non-potable purposes to conserve potable water and support sustainable practices. • Community Engagement: Encourage active participation in planning and decision making to ensure local needs and perspectives in resource management.

WILDFIRE POLICIES

- **Specific Areas:** Wai‘anae has areas subject to PSPS by HECO during periods of high risk of wildfire and wildfire prevention is needed. The areas include Wai‘anae, Nānākuli, Mā‘ili, and Mākaha.
- **Prevention and Mitigation:** Implement measures to prevent wildfires and mitigate their impacts, including promoting fire-safe practices in land management and community planning.
- **Community Education and Engagement:** Educate residents about wildfire risks and encourage participation in fire prevention programs to reduce hazards.
- **Management of Invasive Species:** Address the spread of invasive plant species that increase wildfire risks, as they often have fire regimes different from native vegetation, leading to more frequent and intense wildfires.
- **Collaboration with Agencies:** Work with local, state, and federal agencies to develop and implement effective wildfire management strategies, sharing resources and information to improve preparedness and response.
- **Monitoring and Research:** Conduct ongoing monitoring of fire-prone areas and research to guide future wildfire management policies and practices.
- **Land Use Planning:** Establish policies to minimize wildfire risks, such as restricting development in high-risk areas and promoting fire-resistant landscaping practices.
- **Emergency Response Coordination:** Strengthen coordination between local emergency services and community organizations, including regular drills and updates to emergency response plans for wildfire scenarios.
- **Vegetation Management:** Reduce fuel loads around residential areas through controlled burns, brush clearing, and maintenance of firebreaks to limit wildfire spread.
- **Building Codes and Standards:** Enforce building codes that mandate fire-resistant materials and designs for new construction in wildfire-prone areas, including fire-safe roofing, siding, and landscaping guidelines.

FUTURE
RECOMMENDATIONS
FROM PREVIOUS
PLANNING EFFORTS

- **Protect Native Hawaiian Rights and Practices:** Respect Native Hawaiian rights and traditional practices reliant on healthy land and water resources. Foster collaboration with Wai‘anae’s Native Hawaiian community to incorporate cultural values, practices, and water rights into modern water management.
- **Community Engagement:** Create forums and outreach programs to involve residents in water management discussions and gather input on strategies.
- **Preservation of Natural Resources:** Prioritize conservation of open spaces, stream banks, and watershed areas through policies that support ecology and water quality.
- **Promote Sustainable Watersheds:** Protect and enhance natural resources, including land, streams, and nearshore ecosystems, to achieve regional self-sufficiency in water resources where feasible. Safeguard the community from natural and human-induced hazards.
- **Protect and Enhance Water Quality and Quantity:** Restore and maintain sustainable quantities of groundwater and surface water in the Wai‘anae District. Ensure high-quality water is available for potable, recreational, and habitat needs while protecting ground, surface, and nearshore waters.
- **Facilitate Public Participation and Education:** Engage stakeholders, including landowners, water purveyors, and agencies, in collaborative water management. Promote water resource education in schools and the community to encourage informed collaboration and future stewardship.
- **Meet Water Demands at Reasonable Costs:** Develop efficient water systems that promote public health and safety while meeting current and future demands cost-effectively. Allocate water resources appropriately, using high-quality water for drinking and lower-quality water for irrigation and industrial needs.
- **Sustainable Water Supply:** Enhance local water sources and reduce reliance on imported water by implementing strategies that maintain watershed health.
- **Infrastructure Improvements:** Assess and upgrade wastewater and drainage systems to prevent flooding and ensure efficient water management.
- **Flood Mitigation:** Implement effective stormwater management practices, including maintaining drainage systems and designing infrastructure to handle increased flows.
- **Water Quality Protection:** Reduce urban runoff pollution and adopt BMPs for sustainable land use and development.
- **Recycling and Conservation:** Encourage dual water systems in new developments and educate residents about water-saving practices to promote conservation.

PLANS REVIEWED &
SUMMARIZED

Area-Specific Plans:

- 2009 Mākaha Special Area Plan (DPP)
- 2009 Wai‘anae Watershed Management Plan (BWS)
- 2012 Wai‘anae Sustainable Communities Plan (DPP)

State and Islandwide Plans:

- 2019 Water Master Plan Summary Update (BWS)
- 2019 Hawai‘i Water Plan – Water Resources Protection Plan (CWRM)
- 2021 City Storm Water Management Program Plan (DFM Storm Water Quality Division)
- 2023 Storm Water Strategic Plan (DFM Storm Water Quality Division)
- 2024 Climate Ready O‘ahu (CCSR)