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STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

March 18, 2024
Honolulu, Hawai'i

Adoption of the 2019 Agricultural Water Use and Development Plan Update (Revised 2021) with Conditions for Incorporation into the Hawai'i Water Plan

SUMMARY OF REQUEST:

Staff recommends the Commission on Water Resource Management (Commission) adopt the 2019 Agricultural Water Use and Development Plan Update (AWUDP) (Revised 2021)[1] with conditions.

BACKGROUND:

The Hawai'i Department of Agriculture (DOA) is responsible for the preparation of the AWUDP. The original AWUDP was drafted in 2004. The update process for the 2019 AWUDP began in 2014 and was completed in 2021 with the help of EKNA Services, Inc. (consultant). Table 1 summarizes the process taken in developing the 2019 AWUDP (Revised 2021).

Table 1. Development of the AWUDP

Year	Status
2014	AWUDP update process begins
2017	In-progress briefing to the Commission
2019	Pre-final consultation with Commission staff, agricultural industry and water system managers
June 2020	2019 AWUDP received by Commission staff for review
July 2020	2019 AWUDP briefing to the Commission
August 2020 – December 2020	Public review period begins. Commission holds public hearings on Nov. 18th and 19th
January 2023	2019 AWUDP (Revised 2021) submitted to the Commission

[1] Link to 2019 Agricultural Water Use Development Plan (Revised 2021)
https://hdoa.hawaii.gov/arm/files/2023/02/Final-AWUDP-with-Appendices-B-to-F-webview.pdf

February 2025	Submittal to the Commission to adopt the 2019 AWUDP (Revised 2021)

AUTHORITY:

The State Water Code, Chapter §174C-2(b), Hawai‘i Revised Statues (Water Code), requires that the Commission implement and utilize comprehensive, long-range water resources planning in its regulation and management of the State's water resources. To implement this mandate, the Hawai‘i Water Plan (HWP) is intended to serve as the long-range guide for managing water resources in Hawai‘i by providing direction and general guidance for making water use decisions.

The HWP currently consists of five major components (plans)[2] identified as the: 1) Water Resource Protection Plan, 2) Water Quality Plan, 3) State Water Projects Plan, 4) Agricultural Water Use and Development Plan, and 5) County Water Use and Development Plans.

The Water Code recognizes that the HWP must be continually updated to remain useful and relevant and further specifies that the DOA shall modify and update the AWUDP as necessary (§174C-31(e) Hawai‘i Revised Statutes (HRS).

AGRICULTURAL WATER USE AND DEVELOPMENT PLAN (AWUDP)

The AWUDP was added as a component plan to the HWP in 1998 (H.B. 1332, Act 101, Session Laws of Hawai‘i (SLH) 1998). Based on the provisions of Act 101, which were codified in HRS §174C-31(e), the main objectives of the AWUDP are to develop a long-range management plan that assesses state and private agricultural water use, addresses projected agricultural water demands (over the next 20 years), identifies system rehabilitation needs and prioritizes system repairs.

HRS §174C-31(e) states that the AWUDP shall include, but not be limited to, a master irrigation inventory plan that shall:

(1) Inventory public and private irrigation water systems;
(2) Identify the extent of rehabilitation needed for each system;
(3) Identify source of water used by agricultural operations and particularly those on land identified and designated as important agricultural lands under part III of chapter 205;
(4) Identify current and future water needs for agricultural operations and particularly those on lands identified and designated as important agricultural lands under part II of chapter 205;
(5) Subsidize the cost of repair and maintenance of the systems;

[2] Exhibit 1 summarizes the agencies responsible for preparing each of the five components and the primary objectives of each plan.

(6) Establish criteria to prioritize the rehabilitation of systems;
(7) Develop a five-year program to repair the systems; and
(8) Set up a long-range plan to manage the systems.

Unlike other component plans of the HWP, guidance for the preparation of the AWUDP was never added to Hawai'i Administrative Rules (HAR) chapter 13-170. However, additional guidelines for preparing the AWUDP are provided in the 2000 Statewide Framework for Updating the Hawai'i Water Plan.

STATEWIDE FRAMEWORK FOR UPDATING THE HAWAI'I WATER PLAN

Hawai'i Revised Statutes (HRS) Section 174C-31(n) states that "[t]he commission may add to the Hawai'i water plan any other information, directions, or objectives it feels necessary or desirable for the guidance of the counties in the administration and enforcement of this chapter."

In February 2000, the Commission adopted the Statewide Framework for Updating the Hawai'i Water Plan (Framework)[3]. The Framework itself is intended to provide additional instructions to help with the preparation and update of the component plans of the HWP. The objectives of the Framework are:

- To achieve integration of land use and water planning efforts that are undertaken by federal, state, county, and private entities so that a consistent and coordinated plan for the protection, conservation and management of our water resources is achieved;
- To recommend guidelines for the Framework update so that the plan and its component parts are useful to the Commission, other state agencies, the counties, and the general public;
- To develop a dynamic planning process that results in a "living document" for each component of the Framework which will provide county and state decision-makers with well formulated options and strategies for addressing future water resource management and development issues;
- To better define roles and responsibilities of all state and county agencies with respect to the development and updating of the Framework components;
- To describe and outline the techniques and methodologies of integrated resource planning as the basic approach that should be utilized in developing and updating the major components;
- To facilitate permitting and to identify potential critical resource areas where increased monitoring or baseline data gathering should proceed;
- To establish an overall schedule for phased updating of the Framework; and
- To outline an Implementation Plan for near-term and long-term actions.

[3] https://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/framework

The Framework (2000) includes the following recommended plan elements[4] for a more complete AWUDP:

- Identify the costs and sources of funding for repair and maintenance
- Incorporation of the AWUDP into the State Water Projects Plan (SWPP)
- Assess the existing agricultural water irrigation needs of each of the counties
- Develop a range of future agricultural irrigation water needs for each of the counties, including the water needs of the Department of Hawaiian Home Lands (DHHL)
- Identify existing sources for irrigation water
- Identify options for development of additional and alternative irrigation water sources
- Identify options for conserving irrigation water to reduce total water demand
- Develop strategies for demand management and resource development options
- Consistency with the Water Resource Protection Plan (WRPP)
- Evaluate current and future water demands for agricultural programs and projects statewide
- Include a range of water demand forecasts of the amount of water required over the 20-year planning horizon
- Include water system profiles and a thorough description of the current supplies, major conveyance facilities and storage reservoirs, re-use programs, and conservation programs that are currently in operation
- Include a source development plan broken down by near-term (initial 5 years), medium-term (subsequent 5 years), and long-term (final 10 years)

The AWUDP was developed using the Framework (2000). However, DOA acknowledged they prioritized the statutory requirements over the Framework elements during their planning process.

UPDATING THE HAWAI‘I WATER PLAN FRAMEWORK (2000)

It has been 25 years since the Framework was last updated. During that time, various component plans of the HWP have been drafted and amended. However, questions remain about the utility of these plans and if they provide sufficient guidance for the proper protection, conservation and management of the waters of the State. Commission staff have begun an update of the Framework (2000) document. This update began in 2019 and is nearing completion within the next 6-12 months. The goal of the Framework update is to make the HWP and its component plans more integrated, enabling better holistic decision making across various sectors and agencies. It also attempts to build more explicitly on the unique cultural foundation and values of Native Hawaiians with a focus on the interconnectedness and sanctity of wai (water). Once completed, this update will undergo a formal adoption process, which includes statewide public hearings, and a vote by the Commission. Subsequent HWP component plans will need to be consistent with the new Framework once adopted. This includes the AWUDP. A methodology

[4] Bulleted plan elements are summarized. See chart beginning on Page 7 of the Framework (2000) for exact language.

for ensuring timely and consistent plan updates across all HWP component plans is intended as part of the Framework update.

AWUDP COMMUNITY OUTREACH AND PUBLIC COMMENTS

Stakeholder outreach occurred throughout the development of the AWUDP. Between 2016 to 2018 interviews were conducted with farmers, irrigation system managers, operators, and property owners. A survey (see Appendix C in the AWUDP) was also sent to farmers to inform actual water use and estimate water demands. In July 2020, the DOA gave a briefing on the 2019 AWUDP to the Commission. At that time, DOA considered the plan to be complete and final but was informed that a public comment period and public hearing(s) were required as part of the Commission's adoption process. Between August 4 and December 18, 2020, the plan was available for public review and comment. Commission staff held two public hearings on November 18 and November 19, 2020. Comments received during the public review period were shared with the DOA. Upon receipt of the comments, the DOA reviewed and responded in writing to each comment. See Exhibit 3 for all comments received during the public review period and the DOA's responses. Non-substantive comments, such as changing the name of a stream, etc. were addressed in the revised 2021 AWUDP. However, other comments which the DOA viewed as outside the scope of the AWUDP and beyond the DOA's ability to investigate, analyze, and incorporate into the plan were not addressed as part of the revised 2021 AWUDP. No additional outreach was conducted by the DOA or its consultant after the 2020 public review process.

Revised 2021 Agricultural Use and Development Plan (AWUDP) – Outreach and Public Meetings List

Date/Location	Description of Outreach/Public Meetings
2016-2018	Interviews with farmers, irrigation system managers, operators, and property owners
May 16, 2017	HDOA Progress Update to CWRM Board
June 2019 – August 2019	HDOA initiated request for Industry review and comment on Pre-Final AWUDP Update. The document was sent to CWRM, 14 agricultural associations, and 13 irrigation water managers/operators/property owners.
August 4 - December 18, 2020	CWRM hosted public review and comment period
November 18, 2020 Online	Online public hearing, hosted by CWRM, with presentation by HDOA
November 19, 2020 Online	Online public hearing, hosted by CWRM, with presentation by HDOA

Some of the common comments received during the AWUDP planning process, the 2020 public review period and subsequent reviews by Commission staff since the release of the revised 2021 AWUDP are listed below.

1. Why did it take so long to recommend plan adoption?
2. Why did the DOA prioritize the statutory requirements over the Framework elements?
3. Why does the 2021 AWUDP not include the irrigation systems studied in the 2004 plan?
4. Not enough information about the rehabilitation needs for each system and no comprehensive strategy for capital improvements.
5. How were the agricultural water demands of farmers estimated and why are they so high?
6. More emphasis needed on developing alternative water sources such as reused (R-1) water and initiating conservation programs.
7. The plan does not adequately assess existing and future irrigation needs, specifically the needs of the Department of Hawaiian Home Lands (DHHL).

ANALYSIS/ISSUES

Commission staff would like to offer the following responses to the comments identified above. Underlined and *italicized* text has been made part of the staff recommendation as conditions of plan adoption.

1. Why did it take so long to recommend plan adoption?

   Response:

   It has been over 20 years since the original AWUDP was drafted in 2004. The update process for the 2019 AWUDP began in 2014 and was completed in 2021. While the DOA and its consultant worked diligently during that time, certain factors like the inability to access private irrigation systems, resulted in significant delays. The consultant contract with EKNA Services ended in 2018, and all revisions completed after this date were unpaid services outside the scope of the contract. Nonetheless, the DOA informally consulted with Commission staff regarding the AWUDP between 2017 and 2018. After such discussions, revisions were made to the document, information was added, and a rehaul of the maps was completed. The informal discussions with Commission staff were also part of the decision to re-engage with industry (agricultural associations and irrigation water managers/owners/property owners) on a pre-final version of the document in June 2019. Around that time, the DOA was made aware of the Commission's intent to initiate a public hearing process, and Commission staff was made aware of the DOA's limited ability to participate and respond. After the DOA transmitted the AWUDP to Commission staff in June 2020, the DOA participated in the Commission's public comment period and hearings, despite the lack of resources required for participation and to address public comments. The review, incorporation, and preparation of responses to the public comment period delayed the transmission of the final AWUDP to January 2023. The 2019 AWUDP (Revised 2021) was submitted to

Commission staff on January 31, 2023 and then posted on the DOA's website. However, Commission staff were not aware that a hard copy of the revised 2021 AWUDP was submitted until July 2024 after DOA inquired about the status of plan adoption. Due to the change in administration in January 2023, the hard copy plan and memo from the DOA requesting Commission adoption was never sent to Commission staff from the Department of Land and Natural Resources (DLNR) Chair's Office. This resulted in an 18-month delay, during which time Commission staff did not know that a revised 2021 AWUDP was in circulation and publicly available. In the future the DOA will submit requests for adoption in writing *and* via email to avoid unnecessary delays.

2. Why did the DOA prioritize the statutory requirements over the Framework elements?

   Response:

   While the intent of the Framework is to provide more detailed guidance to plan preparers about the specific elements that need to be included in each HWP component plan, the Framework refers to them as "Recommended Plan Elements." The term "recommended" could be interpreted by a preparing agency to mean optional. In the case of the AWUDP, the DOA followed the recommended plan elements to the extent possible, as allowed by funding and time. As part of the Framework update, Commission staff will make it clear that the plan elements outlined in the Framework are required and must be sufficiently satisfied for plans to be adopted by the Commission.

3. Why does the 2021 AWUDP not include detailed information about the irrigation systems studied in the 2004 plan?

   Response:

   According to the DOA, the 2021 AWUDP is intended to build upon and supplement the 2004 AWUDP. It does not supersede the 2004 plan but rather provides additional information that was not included in the original plan. A comparison of the agricultural water systems reviewed in the 2004 plan vs. the updated 2021 plan can be found on page xxiv (Table ES-1) of the 2021 AWUDP and are listed below. The next update of the AWUDP will inventory all (new and previously studied) public and private agricultural water systems within a single plan and comply with any other updated Framework requirements.

Table ES-1
Hawai'i Agricultural Water Systems Reviewed for the AWUDP Update and 2004 AWUDP

AWUDP Update	2004 AWUDP
Kaua'i – Kaloko and Pu'u Ka Ele Ditches – Stone Dam and Kalihiwai Irrigation Subsystems – Anahola Ditch – Upper and Lower Līhu'e Ditches and portion of Waiahi-'Ili'ili'ula Ditch – Upper and Lower Ha'ikū Ditches – Wai'aha-Ku'ia Aqueduct, por. Waiahi-'Ili'ili'ula Ditch, and Kōloa & Wilcox Ditches – Olokele Ditch O'ahu – O'ahu Ditch (Wahiawā, Helemano, Tanaka, and Ito Ditches) – 'Ōpae'ula, and Kamananui Ditches – Kahuku Irrigation System – Galbraith Lands Irrigation System Hawai'i – Ka'ū Agribusiness Irrigation System – Kohala Ditch – Kehena Ditch	Kaua'i – East Kaua'i Irrigation System – Kekaha Ditch Irrigation System – Kōke'e Ditch Irrigation System – Kaua'i Coffee Irrigation System O'ahu – Waiāhole Ditch Irrigation System – Waimānalo Irrigation System Molokai – Moloka'i Irrigation System Maui – Maui Land and Pineapple/Pioneer Mill Irrigation System – East Maui Irrigation System – West Maui Irrigation System – Upcountry Maui Irrigation System Hawai'i – Lower Hāmākua Ditch Irrigation System – Waimea Irrigation System

4. Not enough information about the rehabilitation needs for each system and no comprehensive strategy for capital improvements.

   Response:

   Both the Water Code (HRS §174C-31(e)) and the Framework (2000) require and recommend that the AWUDP include the following elements as it relates to capital improvements.

   - *Identify the extent of rehabilitation needed for each system;*
   - *Establish criteria to prioritize the rehabilitation of the systems;*
   - *Develop a five-year program to repair the systems;*
   - *Set up a long-range plan to manage the systems;*
   - *Identify the costs and sources of funding for repair and maintenance*

Chapter 3 of the 2021 AWUDP provides general system information, including an assessment of needs and proposed capital improvement projects (CIP) for the public and private water systems that were *not* studied in the 2004 AWUDP. Chapter 4 provides an update of the water systems studied in the 2004 AWUDP, including basic information about modifications to the systems since 2004 and provides the current CIP needs and estimated costs (in 2018 dollars) for each system. Unfortunately, of the 14 systems inventoried in the 2021 plan, eight (8) privately managed irrigation systems would not allow visual inspections. Similarly, of the 13 systems inventoried in the 2004 plan, four (4) private systems declined to provide updates as part of Chapter 4. Chapter 9 is intended to provide a short-term (5-year) repair plan, suggestions for long-term management, and funding options based on the information provided in Chapters 3 and 4. However, the information presented in Chapter 9 lacks the detail needed for a long-term management strategy and proposed CIP projects could not be identified for all the private systems. Of the systems for which a CIP is developed, there is no criteria to prioritize rehabilitation needs. DOA acknowledged the inability to gain access to certain private irrigation systems was a significant challenge that prevented them from developing a comprehensive CIP strategy. In fact, many of the private systems did not want to discuss repair, maintenance needs, etc. and considered that information proprietary and confidential. The DOA is unable to require owners to grant access to irrigation systems. As a result, the AWUDP falls short when it comes to identifying strategies for near and long-term repair and rehabilitation needs, especially of the private systems. Access to information about private irrigation systems is something that will be considered as part of the Framework update. To make the information about current CIP needs and estimated costs more relevant and applicable to future legislative requests by the DOA and others, *the DOA will update the 2018 dollar amounts to reflect 2025 cost estimates.* While there are restrictions on the use of State CIP funds for only State-owned projects, the AWUDP is expected to include information about the improvement and rehabilitation costs needed for *all* irrigation systems.[5] Whether or not State CIP can be used, information about funding needs for the public *and* private systems should be included within the plan. *The DOA will also commit to participating in the Agribusiness Development Corporation's (ADC) Strategic Planning effort to identify a 5-year CIP plan for the ADC systems*. Information from the ADC plan will help inform the next AWUDP update.

Climate change and correlated impacts, such as drought, directly impact farmers and the agricultural industry. Given this reality, the AWUDP should not be limited to an inventory of the existing historic irrigation systems. The AWUDP should also identify other irrigation infrastructure needs such as improvements to reservoirs, the construction of new ground water wells, etc. that may be needed to mitigate and alleviate the effects of climate change and aid farmers in ensuring reliable sources of fresh water. When the AWUDP was added as a component plan to the HWP in 1998 and codified in HRS §174C-31(e), the plan was intended to focus on transforming former plantation systems,

[5] HRS 174C-31(e)

which no longer served the needs of the sugar and pineapple industries, to diversified agriculture use. The Framework (2000) expanded that intent to include:

- *Identify options for development of additional and alternative irrigation water sources;*
- *Develop strategies encompassing both demand management and resource development options;*
- *Resource Development Options – as applicable, the AWUDP shall address the following types of resource options: supply sources (ground and surface water), transmission and other infrastructure, storage facilities, conservation programs, direct and indirect use of reclaimed wastewater;*
- *Source Development Plan – the AWUDP must include a source development plan based upon selected resource options for near-term (initial 5 years), medium-term (subsequent 5 years), long-term (final 10 years).*

The 2021 AWUDP does not achieve this intent and often defers to the individual system manager or operator to determine what source and development strategies should look like. Chapter 9.2.2 of the 2021 AWUDP does provide a list of suggested best practices that can be implemented by system owners but lacks specificity about what projects and irrigation systems could benefit from these practices. In January 2025, the State Legislature introduced a measure (Senate Bill 563) that would require the DOA in collaboration with the ADC to conduct an agricultural water infrastructure study. While the measure may seem duplicative of the AWUDP, testimony from other agencies and organizations spoke to the need to identify current challenges and future opportunities related to agricultural water access, efficiency, and distribution beyond the plantation irrigation systems. The Framework update will provide clearer guidance about what is expected of the DOA when preparing the AWUDP and think through the challenges shared by the DOA that limit their ability to address certain plan recommendations identified in the current Framework.

5. How were the agricultural water demands of farmers estimated and why are they so high?

   Response:

   Agricultural "water demand" is the quantity of water needed by farmers as measured at the farm's water meter. The 2004 AWUDP found the water demand rate for diversified crop farming in Hawai'i to be 3,400 gallons per day per acre, based on an analysis of actual metered water demand from one growing area. The 2021 AWUDP revisits the recommended water demand estimate for diversified agriculture and expands on this analysis by evaluating water demand from 113 farms growing different crops in various growing regions throughout the State. The new water demand rates are detailed in the table below. To determine the new agricultural water demand rates, the DOA conducted surveys and interviews with farmers throughout the State. The water demand rates provided in the 2021 AWUDP are based on averages of actual metered water use by

individual farms. Actual water use data was collected using two different methods: a formal survey of farmers in agricultural areas (see Appendix C in the AWUDP and Tables beginning on page 191 of the AWUDP) and informal interviews with farmers and system managers. System losses in inefficient delivery systems are not captured in the water rates.

Table 130
Agricultural Water Demand Planning Rates
(at the farm meter)

Description	Water Demand (gpd/acre)
Diversified agriculture (for usable acreage that is 50 percent planted)(average condition) (e.g. leafy vegetables and truck crops)	3,900
Diversified agriculture (for usable acreage that is 100 percent planted) (e.g. nursery, feed, and forage crops)	7,800
Diversified agriculture (for usable acreage that is 50 percent planted) under drought conditions or in dry areas	8,100
Diversified agriculture (for usable acreage that is 100 percent planted) under drought conditions or in dry areas	16,200
Irrigated pastures dependent on grass varietal, soil, and climatic conditions (for usable acreage that is 100 percent planted)	8,000
Aquaculture, taro, and other wet crops	Dependent on crop and location

The water demand rates in the 2021 AWUDP are considerably higher than the estimated water duties used by the Commission. To estimate the water needs of specific crop types, the Commission uses a model called the Irrigation Water Requirement Estimation Decision Support System (IWREDSS). IWREDSS considers several crop factors including but not limited to rooting depths, crop coefficients, and duration of cropping season, and uses the effects of day-to-day distributions of rainfall, evapotranspiration (ET), and soil water-holding capacity. These climate datasets were derived from 67 locations across Hawai‘i. The idea to use IWREDSS to inform water demands was shared with the DOA and its consultant as part of the planning process (see Exhibit 3 comments from CWRM). However, the DOA believes IWREDSS may not reflect the actual or future water use required by crops given the area, crop type and climatic condition. Due to these presumed uncertainties in the IWREDSS model, it was not used to inform the water demand rates and actual field data as reported via the survey and metered use was used instead. The Framework (2000) gives guidance to plan preparers and states “the

review of all existing and contemplated agricultural projects shall be based upon water consumption guidelines and water demand unit rates used by the CWRM for the purposes of its water permit application review process." This implies the use of IWREDSS, which is used by Commission staff when conducting their analysis for agricultural/irrigation water needs for specific crops identified in Water Use Permit applications.

Commission staff are concerned that the water demand rates reflected in the 2021 AWUDP may be inflated and do not consider system losses due to aging and decrepit infrastructure. If the water demand rates are in fact too high or not represented in the plan, this has implications for other HWP component plans, including the county WUDPs, which reference the AWUDP's water demand rates when preparing their estimates for current and future water needs for the county. In response to this concern, the DOA pointed out that the water demand rates are planning considerations and do not preclude an individual farmer or system owner/operator from determining their own individual needs.

As an immediate step, *the DOA will add a statement to relevant sections of the AWUDP stating that the water demand data in the plan may not apply to all locations in the State and there are other methods for estimating water demands which should be explored by the reader, including IWREDSS.* As part of the Framework update, Commission staff are exploring how to quantify the water needs of traditional and customary practices, including traditional agriculture, so the information can be used by other agencies to better inform current and future water demands. Commission staff recognize that the IWREDSS model is not perfect and *will explore how updated climate change data sourced from the Hawai'i Climate Data Portal and updated Rainfall Atlas of Hawai'i can be incorporated into the IWREDSS model for future use by the Commission and partner agencies like the DOA*.

6. More emphasis needed on developing alternative water sources such as reused (R-1) water and initiating conservation programs.

   Response:

   Per the Framework (2000), the AWUDP should identify options for alternative irrigation water sources and opportunities for water conservation.

   - *Identify options for conserving irrigation water and/or managing the uses to reduce the total irrigation water demand;*
   - *Water System Profiles – the AWUDP shall include a thorough description of current supplies, major conveyance facilities and storage reservoirs, re-use programs, and conservation programs that are currently in operation;*
   - *Resource Development Options – as applicable, the AWUDP shall address the following types of resource options: supply sources (ground and surface water),*

transmission and other infrastructure, storage facilities, conservation programs, direct and indirect use of reclaimed wastewater.

The 2021 AWUDP does not adequately analyze or give weight to the importance of recycled and reused water for use on agricultural lands. Reclaimed water is briefly discussed in Chapter 9.2.2 of the AWUDP, but the document lacks a robust discussion about specific opportunities or projects related to water conservation, efficiency or the use of recycled water for agriculture. In their formal response to the Commission the DOA noted the high cost of developing reclaimed water systems and said, "the use of reuse water in farming is likely to adversely impact the product marketability and acceptance by consumers." While Commission staff do not dispute these statements, they should not be used to justify the omission of the topic from the document. Throughout the State, Commission staff are noticing declines in water availability. As drought and more episodic rain events become more common because of climate change, it is critical to think about opportunities for water storage (e.g.: rehabilitating reservoirs that are slotted for decommissioning), improvements to aging infrastructure (e.g.: ditch systems that are over a hundred years old and likely leaking water), and opportunities to use recycled water instead of potable water for growing food and watering golf courses. In January 2025, the Commission received $1 million to develop a Statewide Study for Water Reuse. This study will build on the "2013 Update of the Hawaii Water Reuse Survey and Report" and is intended to provide a comprehensive assessment of the potential for recycled water use statewide and identify strategies to increase the use of recycled water. The study will begin by assessing where wastewater is currently treated in the state and evaluate the steps necessary to convert these wastewater treatment plants (WWTPs) into facilities capable of producing recycled water on a more regional basis. Additionally, the study will examine the existing infrastructure and logistical requirements for distributing the recycled water to end users, including farmers. Completion of the Statewide Study for Water Reuse is anticipated to be complete within the next 2 years. *The study should be used by the DOA to inform the next update of the AWUDP.*

7. The plan does not adequately assess existing and future irrigation needs, specifically the needs of the Department of Hawaiian Home Lands (DHHL).

   Response:

   Both the Water Code (HRS §174C-31(e)) and the Framework (2000) require and recommend that the AWUDP include the following elements[6] as it relates to current and future water needs for agriculture.

   - *Identify current and future water needs for agricultural operations and particularly those on lands identified and designated as important agricultural lands under part III of chapter 205;*

[6] Refer to Table 1 of submittal for full list of required and recommended elements. Certain bulleted elements have been synthesized for brevity.

- *Based on existing statewide agricultural land uses, assess the existing agricultural water irrigation needs of each of the counties;*
- *Based on long-term agricultural crop development plans, develop a range of future agricultural irrigation water needs for each of the counties, including projected agricultural water demands of the DHHL;*
- *Evaluate current and future water demands for agricultural programs and projects statewide over the next twenty-year (20) period;*
- *Include a range of forecasts of the amount of water required over the planning horizon based on a base case scenario (the most likely), a high-growth scenario, and a low-growth scenario.*

The 2021 AWUDP is limited to plantation irrigation systems and the associated water demands for each system. Since the plan is limited in scope to these historic and legacy irrigation systems, it fails to consider the irrigation needs of projects and programs that are not within the focus lines directly related to the old plantation irrigation ditches. This oversight directly affects DHHL, which has lands designated for agriculture use that are not currently connected to legacy systems. The 2017 Update to the State Water Projects Plan (SWPP), specifically focused on the water needs of DHHL over the next 20 years, including DHHL's agriculture water needs. The 2021 AWUDP fails to include this information and does not account for the full scope of DHHL agriculture water demands. While HRS §174C-31 does state the Commission shall coordinate the incorporation of the AWUDP into the SWPP, it is the responsibility of the DOA as the preparing agency to review and incorporate relevant information from existing HWP component plans such as the most recent SWPP into the AWUDP. Moreover, direct collaboration with DHHL at multiple points during plan development should have taken place. DHHL was not included in the DOA's initial stakeholder outreach and interviews. The Framework update will better articulate how preparing agencies should coordinate with relevant stakeholders, specifically DHHL, and how HWP component plans can be better integrated. As a first step, *DOA will incorporate a reference and hyperlink to the 2020 SWPP into relevant sections of the plan so that the AWUDP can be used by others to understand the full scope of the projected agricultural water demands of DHHL. In future updates of the AWUDP, the DOA will consult with DHHL in a timely manner on current and future water needs for all DHHL agricultural areas (current and proposed) not just lands directly related to the old plantation irrigation systems.*

Consistency with the State Water Code Requirements and Recommended Framework Elements:

Table 1

#	**Requirement/ Recommendation**	**Compliance achieved? Responses from the Hawai'i Department of Agriculture (DOA)**
1	*Inventory public and private irrigation water systems.*	Chapter 3 provides an inventory of private water systems. Chapter 4, and the AWUDP (2004),

	HRS §174C-31; Act 101, SLH 1998	provides an inventory of public and other private plantation irrigation water systems.
2	*Identify the extent of rehabilitation needed for each system.* *HRS §174C-31; Act 101, SLH 1998*	Chapters 3 and 4 identify the extent of rehabilitation needed for each system with the exception of certain private systems that did not participate.
3	*Establish criteria to prioritize the rehabilitation of the systems.* *HRS §174C-31*	The AWUDP (2004) provided system-specific criteria to rank system improvements. However, since the 2021 Update inventory analysis focuses on privately owned systems, the previous methodology was considered an overreach into private business decisions. Instead of dicating project priorities to private owners, the 2021 Update provides an overall assessment of rehabilitation potential. Priority and compliance is addressed via Chapter 2.1, which discusses that a system's condition rating is a criteria in determining improvements or priority. Though not specifically outlined, other criteria are implied via the descriptions of each system and the disucssion of regulatory, legal, and institutional factors. For state water systems, the priority will also depend on the funding available and approved by the Legislature and Governor.
4	*Identify the costs and sources of funding for repair and maintenance.* *Hawai'i Water Plan Framework; Act 101, SLH 1998*	Chapters 3 and 4 include capital improvement costs for individual plantation irrigation systems. Chapter 9.1 summarizes CIP costs by county and Chapter 9.3 discusses funding options for state and private entities. The cost of maintenance differs for each system. Due to the known confidentiality of private business expenses, especially personnel costs, maintenance costs are not included in this document.

5	*Subsidize the cost of repair and maintenance of the systems.* *HRS §174C-31*	9.3 discusses funding options for state and private entities. Chapter 9.2 also discusses management strategies to support operation and maintenance costs.
6	*Develop a five-year program to repair the systems.* *HRS §174C-31; Act 101, SLH 1998*	Chapter 9.1 includes a five-year capital improvement program.
7	*Set up a long-range plan to manage the systems.* *HRS §174C-31; Act 101, SLH 1998;*	Chapter 9.2 includes a long-range plan for system management, including long-term development plan projects and potential management strategies.
8	*Identify source of water used by agricultural operations and particularly those on lands identified and designated as important agricultural lands under part III of chapter 205.* *HRS §174C-31*	Chapter 2.5 identifies Important Ag Lands (IAL) by island, including the water source and associated agricultural water system. Chapter 3 inventories systems and water sources important to the agricultural economies on each island, including identification of any IALs associated with each system.
9	*Identify current and future water needs for agricultural operations and particularly those on lands identified and designated as important agricultural lands under part III of chapter 205.* *HRS §174C-31*	Chapters 8.2-8.4 discuss current and future water needs, with a summary of county water demand forecasts in Table 144. These water demands include IALs within each county. While the 2021 Update ventures a future water need overall and includes IALs, it does not provide a specific water need for IALs. IALs are neither HDOA managed nor operated, and placing a specific future water demand on these properties is difficult.
10	*Incorporation of the AWUDP into the SWPP.* *HRS §174C-31; Hawai'i Water Plan Framework*	Pursuant to the statute, the commission shall coordinate the incorporation of the AWUDP into the state water projects plan.

11	*Based on existing statewide agricultural land uses, assess the existing agricultural water irrigation needs of each of the counties.* *Hawai'i Water Plan Framework*	The plan is limited to plantation irrigation systems, and the water needs are reflected in the current water demand at each system (Chapter 3). In addition, Chapter 8.4.2.1 includes existing and future water demand forecasts for each County based on the irrigation water systems studied in the AWUDP. Other water planners should use the agricultural water demand discussion as a planning guideline to estimate potential water use in their Counties.
12	*Based on long-term agricultural crop development plans, develop a range of future agricultural irrigation water needs for each of the counties, including projected agricultural water demands of the Department of Hawaiian Homelands (DHHL).* *Hawai'i Water Plan Framework*	Chapter 8.4.2.1 includes existing and future water demand forecasts by County. The Department of Agriculture focused on the statutory requirements to provide an AWUDP that could be used as a planning tool in the realm of the Hawai'i Water Plan. The AWUDP provides information from the agricultural community using public and private irrigation systems for their crops. This information may be used by counties to supplement their own water planning data. In addition, the current plan for all of the water systems is to maintain the existing capacity of the water system to the extent feasible with available funding. Certain systems, as detailed in Chapter 3, may want to increase their capacity in the future. However, those long-term improvement plans may not be funded and are not ripe for decision making at this time. Therefore, the water forecast in the AWUDP is based on capital investment as the driving factor to show potential for agricultural growth and the associated upper limit on water demand to achieve this goal. Consistent with the water demand concept above, current DHHL water use was considered reflective of DHHL water demand from the Waimea, Waimānalo, and Moloka'i Irrigation Systems. DHHL water use in Waimea, Waimānalo, and Moloka'i are included in the AWUDP, but the water users are treated as farmers on the system and not separated from the other users. The water use for DHHL lands that are serviced by the

		Anahola Ditch System is discussed in Chapter 3.1.2.
13	*Based on the information from the WRPP and the "master irrigation inventory plan," identify existing sources for irrigation water and assess any shortfalls or excess capacities in existing irrigation systems.* *Hawai'i Water Plan Framework*	Chapter 3. Each irrigation system inventory includes an introductory discussion of capacity, a table showing current and plantation era water use volumes, and a subsection called, "Assessment of Needs," which discusses other irrigation capacity considerations, if applicable. Currently, most of the irrigation water system owners are working to maintain their capacity to meet the existing demands.
14	*Identify options for development of additional and alternative irrigation water sources.* *Hawai'i Water Plan Framework*	Chapter 3 mentions potential development of additional water sources as determined by the respective water system manager. Chapter 5 discusses proposed new irrigation systems. Chapters 7.6.5 and 9.2.2 discuss additional and alternative irrigation water sources.
15	*Identify options for conserving irrigation water and/or managing the uses to reduce the total irrigation water demand.* *Hawai'i Water Plan Framework*	Chapters 7.6, 9.2.2, and 9.2.3 discuss options for conserving and managing water.
16	*Develop strategies encompassing both demand management and resource development options.* *Hawai'i Water Plan Framework*	Chapters 7.6, 9.2.2, and 9.2.3 discuss options for conserving and managing water.
17	*Consistency with the WRPP.* *Hawai'i Water Plan Framework*	The AWUDP, to the extent practical, is consistent with the WRPP. The purpose of the AWUDP is to maintain and develop these legacy systems to support the development of diversified agriculture. The WRPP assumption that the State can easily replace these legacy systems, would prove to be extremely costly, regulatorily challenging, and a great detriment to agriculture. That being said, as stated in the AWUDP, the legacy systems should be studied and efforts should be made to increase their efficiency in delivering water to diversified agricultural crops as

		needed by each system. In addition, the AWUDP provides various on-farm methods to reduce irrigation water demand.
18	*The AWUDP should evaluate <u>current</u> and <u>future</u> water demands for agricultural programs and projects statewide to insure orderly authorization and development of existing water resources. The AWUDP shall consider a twenty-year projection period for analysis purposes. The review of all existing and contemplated agricultural projects shall be based upon water consumption guidelines and water demand unit rates used by the Commission for the purposes of its water permit application review process. All projects should indicate the following information, at a minimum:* *a) Type of project;* *b) Source of water;* *c) Existing uses;* *d) Contemplated uses;* *e) System capacity;* *f) Location/Tax Map Key (TMK);* *g) Project schedule;* *h) Quality of water needed;* *i) Basis for water demand projections (e.g. area, units, etc.); and* *j) Primary source development plan for the project(s).* *Hawai'i Water Plan Framework*	Chapter 8 includes water demand projects and Chapter 3 provides the information on current water use and any planned future projects. As stated above, the system managers are trying to maintain their existing systems. Those systems which have long-range projects are mentioned in Chapter 3. However, most of these long-range projects mentioned have not been fully vetted to provide accurate detail as requested by the Commission. The expectations regarding review of all existing and contemplated agricultural projects to ensure orderly authorization and development of existing water sources is beyond the scope of the AWUDP.
19	*Water Demand Forecasts – The AWUDP shall include a range of forecasts of the amount of water*	Chapter 8 provides the pertinent information and forecast scenarios for agriculture water, water demand projects, and reiterates the 20-year

	required over the planning horizon. The HDOA shall develop forecasts for multiple scenarios that are necessary or appropriate in the development of the SWPP and the County WUDP. Among the scenarios are the base case scenario (a scenario based on the most likely assumptions), a high-growth scenario, and a low-growth scenario. *Forecasts shall be based on yearly increments for the first 5 years. Thereafter, forecasts shall be based on 5-year increments to the year 2020. The HDOA is encouraged to extend their forecasts beyond the year 2020, particularly when the forecasts for the initial 20-year period indicates that the limits of particular resources are within reach.* *The forecasts developed by the HDOA should identify the significant demand determinants used by the agency which may include but are not limited to:* *a) The data, the sources of data, the assumptions, and the analysis upon which the forecast is based;* *b) The relative sensitivity of the forecasts to changes in assumptions and varying conditions; and* *c) The procedures, methodologies, and models used in the forecast, together with the rationale underlying the use of such*	demand forecast presented in the AWUDP (2004). The forecasts provide a range of forecasts from low to high water demand. The sensitivity of the development of water is based on the development of agriculture, which also includes other factors such as, but not limited to, the availability of labor, resources and inputs, market, plant type, plant diseases and pests, profit, and available land. This information and analysis are beyond the scope of the AWUDP. Therefore, the forecast provides the potential high water demand scenario which may occur if all agricultural development factors are favorable.

	procedures, methodologies, and models. *The approach used by the HDOA in their forecasts should be based on sufficient historical data and at a minimum should result in high, medium, and low forecasts of average day demands. Additional forecasts of annual, seasonal, and peak-day system demands, as may be necessary should be based upon forecasted average day demands. The validity and reliability of the approach used by the HDOA must be demonstrated and the agency must be prepared to discuss unexplained variation in demand.* *Hawai'i Water Plan Framework*	
20	*Water System Profiles – The AWUDP shall include a thorough description of current supplies, major conveyance facilities and storage reservoirs, re-use programs, and conservation programs that are currently in operation. This description shall also include resources, if any, to which the State, county, or private agricultural entities have made commitments. The ability of the current (and, if applicable, committed) system to meet future demands should be explored.* *HWP Framework*	To the extent possible, Chapters 3 and 4 provide an inventory of irrigation systems. The remainder of this request is beyond the scope of the AWUDP. As stated in the AWUDP, the plantation water systems had the capacity to meet the potential future demand. However, for these irrigation systems to be restored to their original capacity and meet the high-water demands identified in the forecast, it will require a large capital investment. At this point in time, no funds have been committed to make these improvements, and most of these projects are not ripe for decision making.
21	*Resource Development Options – As applicable, the AWUDP shall address the following types of resource options:*	Chapters 3 and 4 provide an inventory of irrigation systems. The AWUDP (2004) also provides an inventory of irrigation systems. The remainder of this request is beyond the scope of the AWUDP.

	• ***Supply sources**, including both surface-water and ground-water supplies and various combined uses of the two. The issue of inter-basin transfers should be examined, with due regard to the environmental and cultural impacts in the basin of origin.* • ***Transmission and other infrastructure**, including, but not limited to, major conveyance, treatment, and pumping facilities to relieve existing or anticipated constraints on effectively utilizing existing supplies.* • ***Storage facilities,** to take advantage of annual, seasonal, daily, or diurnal variations in demands and/or available supplies.* • ***Conservation programs** for agricultural water users. Conservation options should be considered as carefully as supply and facility options as to their ability to achieve objectives. In particular, the estimates for future program participation, costs, and savings should be enumerated and explained. As used here, the term "conservation programs" also includes conservation-oriented rate designs.* • ***Direct and indirect use of reclaimed wastewater** for irrigation uses. Such*	It is acknowledged that some legacy irrigation water systems move water from one aquifer and transfer water to land areas associated with other aquifer systems. This practice was originally developed to promote agricultural development of fertile soil which had limited water resources and could not sustain agriculture without it. The total evaluation of these environmental, cultural, social, economic resources and other related impacts of these legacy systems is beyond the scope of the AWUDP. The 2021 Update also includes discussion of improving infrastructures, reopening of inactive intakes, increasing water storage, conservation, and reclaimed water in Chapters 7.6, 9.2.2, and 9.2.3. The HDOA urges CWRM to consider that the framework request speaks to scenarios of unlimited financial and time resources. As documented in the system inventories, the systems are deteriorating and lacking the resources to operate at full capacity, making the framework requirements unrealistic.

	options must be consistent with federal, state, and county laws and regulations. *Hawai'i Water Plan Framework*	
22	*Source Development Plan – The AWUDP must include a source development plan based upon selected resource options. The plan shall be divided into three periods as follows:* • ***Near-term (initial 5 years)**: For this period, the source development plan must detail all of the actions that need to take place to accommodate the projected agricultural water demands anticipated for the initial 5-year timeframe. A near-term implementation schedule and a detailed description of each action shall be presented. This schedule shall reflect the anticipated timing and sequencing of all near-term actions. The schedule shall also include expected supply-side capacity additions and demand-side program penetration levels by year. Near-term actions may include, but are not limited to pre-design, design, construction, obtaining financing, information gathering, staff hiring, execution of initial conservation program*	Chapter 3 includes limited discussion of inactive sources, intakes, and potential for rehabilitation. More importantly, it should be noted that the existing irrigation systems are in need of attention, repair, improvements, and maintenance. As discussed in the 2021 Updates, the short-term CIP repairs will already require much dedication and resources from irrigation system owners and operators. The framework request to develop new sources is a monumental ask of an industry struggling to keep basic infrastructure operational.

	phases, and additional stakeholder and public involvement activities. The 5-year plan should also include estimates of incremental annual capital and operating costs. • ***Medium-term (subsequent 5 years)**: The source development plan for the medium-term will require less detail, and should focus on major decision points and actions such as plan reassessments, and other actions that may require substantial advance preparation. Precise scheduling and sequencing of events is not critical. However, such information will need to be developed as part of subsequent updates to the AWUDP.* • ***Long-term (final 10 years)**: The long-term source development plan should serve to highlight major events that are anticipated in the final portion of the planning period. It is expected that detailed information may not be available for long-term plans, however, available data should be identified and sufficiently described.* *Hawai'i Water Plan Framework*	

Chapter 343 – Environmental Assessment (EA) Compliance:

Chapter 343 is not applicable to the proposed action. HAR §11-200-5(d) provides:

> *For agency actions, chapter 343, HRS, exempts from applicability any feasibility or planning study for possible future programs which the agency has not approved, adopted, or funded. Nevertheless, if an agency is studying the feasibility of a proposal, it shall consider environmental factors and available alternatives and disclose these in any future assessment or subsequent statement. If, however, the planning and feasibility studies involve testing or other actions which may have significant impact on the environment, then an environmental assessment shall be prepared.*

The components of the HWP, including the AWUDP, are planning studies, which do not involve testing or other actions that will impact the environment. Therefore, HRS Chapter 343 is not applicable to this agency action.

RECOMMENDATION:

After reviewing the 2019 AWUDP (Revised 2021) submitted to the Commission for adoption, staff concludes that while the plan provides important information about legacy irrigation systems and updated water demand rates for agriculture, it does not meet the full intent of the AWUDP. The statutory requirements and recommended plan elements are covered to varying extents, resulting in a document that does not adequately satisfy many of the plan objectives, specifically the objectives outlined in the Framework (2000). With that said, Commission staff recognize the required and recommended plan elements are an enormous undertaking and in some cases beyond the DOA's ability to complete to the extent intended. Commission staff are sympathetic to this challenge and are actively crafting amendments to the AWUDP required plan elements as part of the Framework update. Thus, while the 2021 AWUDP is not perfect, it is a significant improvement to the 2004 AWUDP.

Accordingly, staff recommends that the Commission adopt the 2019 Agricultural Water Use and Development Plan (AWUDP) (Revised 2021) for incorporation into the Hawai'i Water Plan (HWP) with the following modified conditions:

1. The DOA will work with Commission staff to add hyperlinks to the Table of Contents, List of Appendices, List of Tables, List of Exhibits, and List of Maps in the AWUDP.
2. The DOA will work with Commission staff to include a link and reference to the 2004 AWUDP in appropriate sections of the plan, so electronic readers can pull up the document to access information more easily about the agricultural water systems inventoried in the 2004 AWUDP.
3. ~~The DOA will update the 2018 capital improvement project dollar amounts to reflect 2025 cost estimates.~~ [Stricken]
4. The DOA will commit to participating in the ADC's Strategic Planning effort to identify a 5-year CIP plan for the ADC systems to inform the next update of the AWUDP.

5. The DOA will work with Commission staff to add a statement to relevant sections of the AWUDP stating that the water demand data in the plan may not apply to all locations in the State and there are other methods for estimating water demands which should be explored by the reader, including IWREDSS.
6. A future statewide study by the Commission to identify strategies to increase the use of recycled water will be used by the DOA to inform the next update of the AWUDP.
7. The DOA will work with Commission staff to incorporate a reference and hyperlink to the 2020 SWPP into relevant sections of the plan so that the AWUDP can be used by others to understand the full scope of the projected agricultural water demands of DHHL.
8. In future updates of the AWUDP, the DOA will consult with DHHL in a timely manner on current and future water needs for all DHHL agricultural areas (current and proposed) not just lands directly related to the old plantation irrigation systems.

In addition to the above conditions and to help address concerns regarding water demand rates used in the AWUDP, Commission staff will explore how updated climate change data sourced from the Hawai‘i Climate Data Portal and updated Rainfall Atlas of Hawai‘i can be incorporated into the IWREDSS model for future use by the Commission and partner agencies like the DOA.

Respectfully submitted,

CIARA W.K. KAHAHANE
Deputy Director

Exhibit(s):
1. Agricultural Water Use and Development Plan (AWUDP) Scope of Work
2. Hawai‘i Water Plan (HWP) Component Plans
3. DOA Response to Comments (AWUDP, Appendix F)

APPROVED FOR SUBMITTAL:

Dawn N. S. Chang
Chairperson

Adopted and Approved by the Commission: March 18, 2025, April 1, 2025