



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

**STAFF SUBMITTAL**

for the meeting of the  
**COMMISSION ON WATER RESOURCE MANAGEMENT**

February 18, 2015  
Honolulu, Hawaii

Approval of the Project Description for the  
Hawaii County Water Use and Development Plan Update for the  
Keauhou and Waimea Aquifer System Areas

SUMMARY OF REQUEST

Staff requests that the Commission grant conditional approval of the project description for the County of Hawaii's Water Use and Development Plan update for the Keauhou and Waimea Aquifer System Areas (Exhibit 1).

BACKGROUND

The State Water Code, Chapter 174C, HRS, requires that the Commission on Water Resource Management (Commission) implement and utilize comprehensive water resources planning in its regulation and management of our State's water resources. The Water Code sets forth the requirement for initial development and updating of the Hawaii Water Plan (HWP) to guide the Commission in executing its general powers, duties, and responsibilities assuring economic development, good municipal services, agricultural stability, and environmental protection.

The HWP is intended to serve as a continuing long-range guide for water resource management. The HWP currently consists of five major components (plans) 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 (WUDP). The Water Code mandates that these individual plans be prepared and integrated into a comprehensive "master plan" to provide for effective coordination and long-range planning between state and county agencies.

To fulfill this mandate, the components of the HWP must be reviewed and updated on a regular basis. The initial HWP adopted by the Commission in 1990, provided the means to address many issues, including but not limited to, establishment of ground water hydrologic units, estimates of sustainable ground water yields and surface water flows by island, existing water systems, and an initial evaluation of current and projected water needs for the State and the Counties.

An updated HWP is considered essential to effective coordination and integration of State and County actions related to sustainable water resource development and enables the Commission to more effectively implement the statutory objectives of the Water Code. Absence of updated information can lead to preparation and implementation of inadequate or unrealistic plans for development of existing and alternative water resources, and may result in conflicting objectives or uses that threaten our State's limited water resources. The lack of up-to-date demand projections and proposed strategies to meet such demands limit the State's and Counties' ability to address future water development and resource protection issues.

In updating the HWP components, there is consensus agreement among State and County agencies that a comprehensive water resource planning process is needed to address the problems of supply, demand, and conservation of water. Accordingly, the required updates/revisions to the HWP should follow and utilize an evaluation and assessment process that emphasizes the consideration of various planning scenarios incorporating uncertainties, environmental externalities, and public needs into a strategic decision-making process.

Under a comprehensive resource planning approach, all types of resources would be assessed and weighed in the context of new/existing supply-side resources, alternative source development such as wastewater reuse, conservation, alternative rate structures, as well as other demand-side management methods. In this process, the concept of least-cost planning can be pursued while balancing supply-side and demand-side management issues. A major outcome of this effort will be the development of coordinated strategies to meet future water demands, including greater use of alternative water sources, wherever possible.

### STATEWIDE FRAMEWORK

Updating the various components of the HWP should take into consideration current statutory objectives that include, but are not limited to, obtaining maximum reasonable-beneficial uses of water; protection of natural resources, existing water rights (including the Department of Hawaiian Homelands) and traditional and customary Hawaiian practices; protection and procreation of fish and wildlife; and the maintenance of proper ecological balance, scenic beauty, and recreation.

In addition, the updating process should lead to refinement of demand projections, planning principles, and strategies associated with water resource planning and development. Such efforts should result in: identification and assessment of potential new sources; more realistic demand projections/forecasts; improvements in the operation of existing systems; application of various screening criteria/analyses; more effective integration between demand- and supply-side resource options; and overall improved coordination between State and County WUDPs.

Another element of the updating process should include a facilitated public participation process involving the community, public interest groups, and government agencies involved in the preparation of the County WUDPs. Under such a process, it is envisioned that stakeholder and/or community groups may be formed by the county to scope issues and address water-related concerns using a collaborative (as opposed to an adversarial) process.

The planning objectives described above are clearly set forth and established within *The Statewide Framework for Updating the Hawaii Water Plan* (Framework) adopted by the Commission in February 2000. Recommended planning elements for each component of the HWP are prescribed in the adopted Framework, including issues that should be addressed as part a comprehensive updating process.

In addition to the statutory requirements set forth in the Water Code, key elements of the Framework pertaining to the update of the County WUDPs include, but are not limited to:

- Submission of a County-Specific WUDP Project Description for review and approval by the Commission. The Project Description should include:
  - Identification of specific issues relating to land use, water use and resource development, and the relative priority of the issues to be addressed in the WUDP update;
  - An outline of the County's plan for establishment of planning objectives and evaluation criteria;
  - A description of its public/stakeholder participation and public information program;
  - A description of its plans for identification of: water demand forecasts (and the consideration of future uncertainties) within the hydrologic units and water availability limits established by the Commission, conservation and demand-side management programs, source development options and any potential impacts to the resource, and the development and integration of resource development strategies;
  - A schedule for the County's updating of the WUDP, which shall:
    - Outline the different stages and activities of the County's planning effort;
    - Indicate the approximate times and anticipated duration for public participation activities;
    - Indicate the approximate timeframe for County approval of the WUDP and submission of the WUDP to the Commission for adoption;
  - A description on how information from the State Water Projects Plan and the Agricultural Water Use and Development Plan will be integrated and used in updating the WUDP.
- Each County shall brief the Commission and its staff regarding any planned updates of the County WUDP; and
- Lastly, periodic milestone briefings to the Commission by the County shall also be required as part of the WUDP updating process.

Key statutory requirements that should be addressed as part of the WUDP update include:

- Consistency with:
  - The Water Resource Protection Plan and Water Quality Plan;
  - County land use plans and policies; and
  - State land use classification and policies.
- The status of water and related land development including an inventory of existing water uses;
- Future land uses and related water needs;
- Regional plans for water developments including recommended and alternative plans, costs, and adequacy of plans;
- Consultation and careful evaluation of recommendations of concerned Federal, State and County agencies;
- Incorporation of the current and foreseeable development and use needs of the Department of Hawaiian Home Lands (DHHL); and
- Lastly, updating and modification of the WUDP as necessary to maintain consistency with its zoning and land use policies.

The statutory and Framework provisions described above set forth the minimum requirements for updating the WUDP component of the HWP, including the overall-planning framework that should be followed by the Counties in updating their respective WUDPs. The required elements are consistent with the goals and policy of the Water Code and the Commission's mandate to manage and protect the State's water resources. The envisioned outcomes, benefits, and products are directly supportive of the Commission's duties and responsibilities set forth in §174C-5, HRS, and the requirements of the HWP described in §174C-31, HRS.

#### HAWAII COUNTY WUDP UPDATE (2010)

In 2011, the Commission adopted the 2010 WUDP update for Hawaii County. It was the first update of a County WUDP since 1990. In the 2010 update, Hawaii County looked at water needs island-wide and employed a uniform approach to evaluate the sustainability of the County's General Plan and then-current zoning designations. Demand analyses based on full buildout of the General Plan's Land Use Pattern Allocation Guideline and zoning were conducted. These analyses fulfilled a key objective of the WUDP – to initially assess the long-term sustainability of county land use plans with regard to water resources.

Early assessment of demand projections relative to water resource availability can inform subsequent land use decisions and policies by the counties and provide the opportunity to attach appropriate conditions to development approvals that will help to address water issues. It can provide the county time to adjust its land use vision as well as to develop alternative water sources, storage or transmission system improvements, and implement water conservation or other measures to help meet future demands within the sustainable limits set in the Water Resource Protection Plan. The County WUDP is a means to integrate land and water planning and can help to ensure stakeholders and regulatory agencies that the county has a plan to meet existing and future water needs that recognizes, respects, and protects public trust resources and uses.

While 20-year demand projections based on growth rates established in the General Plan were also provided in the 2010 WUDP update, the buildout scenarios were primarily designed to identify “sensitive” areas in order to prioritize future assessment areas. Accordingly, the 2010 WUDP update identified the Keauhou and Waimea Aquifer System Areas (ASYA) as hydrologic units in need of more detailed evaluation and assessment (see Exhibit 2 for a location map). Focusing on a smaller geographic area facilitates more detailed planning and the identification of region-specific issues and solution strategies.

#### PRELIMINARY ORDER (HA-WMA 2013-1)

On December 10, 2014, the Commission held a public meeting in Kona to review the Preliminary Findings of Fact and to hear public testimony on the National Park Service’s Petition to Designate the Keauhou Aquifer System Area as a Water Management Area. Following public testimony and deliberation, and based upon more than fourteen (14) months of investigations, site visits, consultation, and scientific reports and studies, the Commission issued Preliminary Order (HA-WMA 2013-1; Exhibit 3). Among other things, the Commission’s Preliminary Order requested:

...that the County of Hawaii submit a revised project description and revised scope of work by January 15, 2015 for the proposed revision to the County of Hawaii’s Water Use and Development Plan (“WUDP”) that will include the considerations discussed in these proceedings. The Commission staff will provide comments back to the County by February 1, 2015. The County will then provide a draft of the revised WUDP to the Commission by May 15, 2015. (HA-WMA 2013-1, Order #2)

Hawaii Department of Water Supply (HDWS) transmitted an electronic copy of their revised project description and scope of work to the Commission on January 14, 2015 (Exhibit 1). A hardcopy was received on January 20, 2015.

The Commission staff mailed its comments on the project description to HDWS on January 30, 2015 (Exhibit 4) and emailed an electronic copy to HDWS on February 2, 2015.

#### PROJECT DESCRIPTION FOR THE 2015 WUDP UPDATE

Following transmittal of the comments, the Commission staff, HDWS, and its consultants discussed the comments and questions raised in the letter and worked out a path forward which staff believes is reasonable and will address the concerns and information needs of the Commission.

Staff is recommending that the update of the WUDP for the Keauhou and Waimea ASYAs proceed in two phases. The first phase will be a refinement of the WUDP demand projections and a new calculation of authorized planned use. These are two different calculations, as will be explained in further detail in the Issues/Analysis Section of this submittal.

The second phase will involve the development of source development strategies and scenarios. In order to fulfill the intent and purpose of the WUDP, both projected demands as well as strategies to meet demands need to be identified. Questions regarding new source development

and water infrastructure needs have been raised by the Commission, and these may be appropriately addressed in the second phase and included in the WUDP update. Strategies for meeting agricultural and other non-potable demands will be identified in this second phase. Potential impacts of the source development strategies on cultural resources and traditional and customary practices will also be studied, and appropriate mitigation measures identified. Finally, an implementation plan and schedule will be developed to outline specific near-term capital expenditures and infrastructure improvements. Longer term actions and projects will be described in more conceptual terms.

Staff believes it is practical and necessary to proceed in two phases because it not reasonable to expect that this WUDP address both demand and source strategies by the May 30, 2015 deadline. The County has also expressed a need for an extension of time to program the necessary funds and contract for the second phase. The County's original intent for this WUDP update was to focus primarily on refinement of demand projections and calculation of authorized planned use as this is critical information that the Commission needs to move forward on the petition to designate the Keauhou ASYA as a ground water management area. However, the Commission has also expressed a desire for information regarding source and infrastructure planning and development, which is also a key component of the WUDP. Therefore, the County's willingness to package source strategies as part of the WUDP is appreciated. Finally, the Commission also requested that the County engage stakeholders and conduct outreach as part of this process. This process will also take additional time.

On May 30, 2015, the County will present its refined analysis of projected demands and authorized planned use for the two aquifer system areas for vetting by the Commission and the public. At that time, the County will also present additional information on the approach and schedule for the second phase of the update that will focus on source development strategies. This will be considered an addendum to the project description and will be reviewed by the Commission staff and submitted to the Commission for approval.

## ISSUES AND ANALYSIS

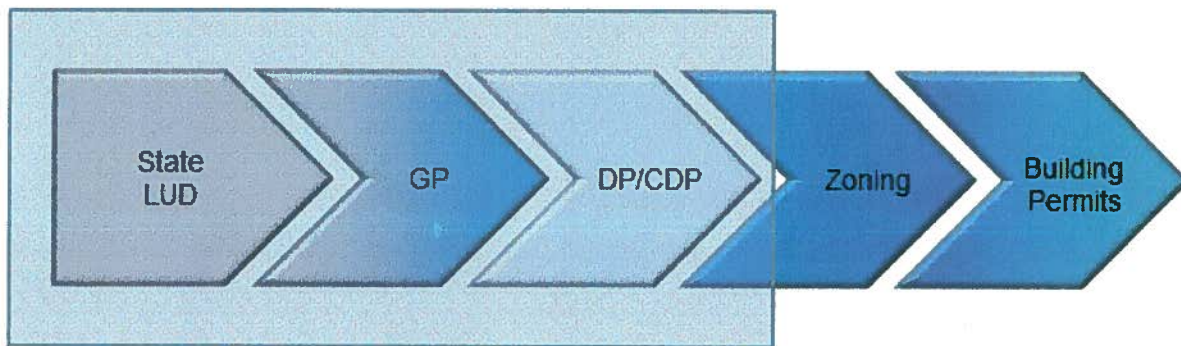
### I. WUDP Demand Projections vs Authorized Planned Use

The calculation of WUDP demand projections and authorized planned use are two different calculations that serve two different purposes. One difference is timeframe – there is no timeframe associated with authorized planned use, whereas WUDPs have a 20-year planning horizon (§13-170-32 HAR). Another difference is the point in the land use approvals process where these calculations should be based.

The following diagram illustrates a general and simplified land use approvals process.



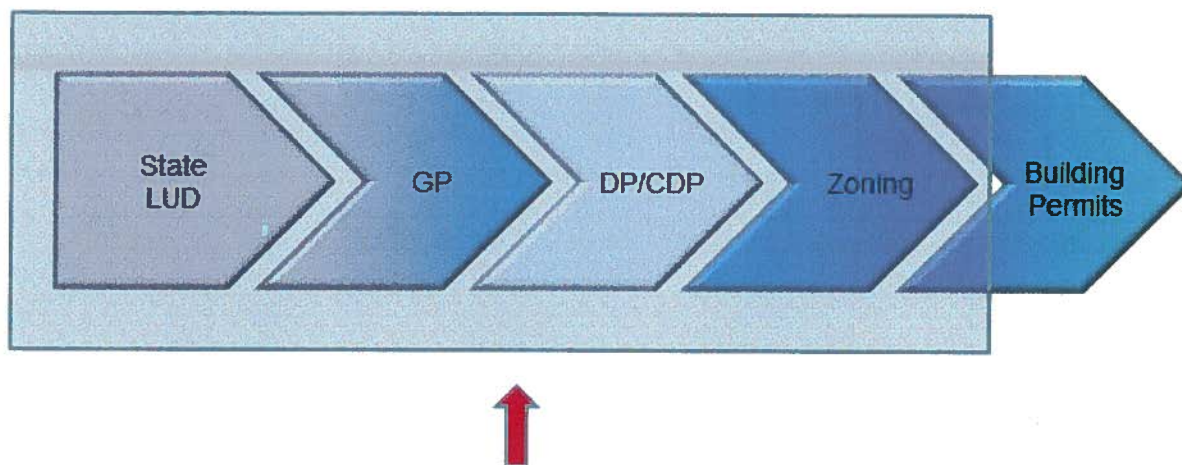
Under the Water Code, authorized planned use (APU) means “the use or projected use of water by a development that has received the proper state land use designation and county development plan/community plan approvals”. Section 174C-3 HRS Therefore, calculation of APU should be based on approvals up to and including county development plans/community plans, as shown below.



**Authorized Planned Use**

Whereas, §174C-31 HRS requires WUDPs to be consistent with State land use classifications and policies and the respective county land use plans and policies including both the general plan and zoning, as illustrated below.





WUDP Demand Projections

The only reference to APU in the Water Code appears in PART IV. REGULATION OF WATER USE where it is included under §174C-44 HRS as one of eight criteria that the Commission shall consider in designating a ground water management area. Therefore, the calculation of APU is exclusively tied to ground water management area designation. APU is not mentioned in PART III. HAWAII WATER PLAN, which provides guidance on the development of County WUDPs.

The assessment of APU is solely to determine whether Criterion 1 under the ground water management area designation is met. On the other hand, WUDP demand projections are used as a mechanism to integrate the implications of a county’s current land use vision with a strategy and plan to meet associated water needs within the limits of available supply established by the Commission in the Water Resource Protection Plan. The WUDP is also used by the Commission as a guide for water use permitting.

It makes sense that calculation of APU occurs early in the land use approvals process prior to the attainment of zoning entitlements, whereas WUDP demand projections additionally require proper zoning, as zoning is also a condition for obtaining a water use permit in designated ground water management areas.

II. Proposed Refinement of WUDP Demand Projections

The proposed methodology for refining demand projections in the WUDP is to: 1) update the zoning information in the 2010 WUDP update, 2) refine the planning unit rates for undeveloped parcels with more realistic unit rates based on actual metered data for the different end use types, and 3) replace planning unit rates for developed parcels with actual water use data. For private wells that are not reporting their water use, use will be estimated based on installed pump capacities assuming 16 hours of pumping each day.



A range of forecasts will be included. Potable and non-potable needs will be broken down so that appropriate source strategies to meet these demands may be established in the second phase of the WUDP update. DHHL water needs will be based on preliminary data from the ongoing State Water Projects Plan update focusing on DHHL, which is nearing completion. Identified needs for State water projects in the 2003 State Water Projects Plan will be updated with known water needs and actual activities in the region (i.e., water needs for State projects that were actually built or are imminent).

### III. Proposed Calculation of Authorized Planned Use

While an analysis of APU is not required for the County WUDP, and the 2010 WUDP did not include a calculation of APU, demand projections in the 2010 WUDP were cited as a basis for designation in the petition to designate the Keauhou ASYA as a ground water management area. Therefore, the County is proposing to include in this update both an assessment of APU, as well as the required WUDP demand projections. As long as the minimum requirements for a WUDP are met, the County may include additional information and analyses that it feels would be beneficial to include in its WUDP.

To recap, under the legal definition, APU calculations must include current uses, as well as the projected use of water by developments that have received the proper State land use designation and county development plan/community plan approvals. There is no timeframe associated with APU.

In its project description, and as clarified through subsequent discussions, the County is proposing to calculate APU for the Keauhou ASYA by assessing:

- 1) Current water use (i.e., 12-MAV pumpage as reported to the Commission. For private wells that are not reporting their water use, use will be estimated based on installed pump capacities assuming 16 hours a day of pumping.);
- 2) Water entitlements, including vacant service laterals, approved building permits, developer agreements with approved zoning (whether or not there is a development schedule or established timeframe), and potential future uses of existing private wells; and
- 3) Community development plan information. Specifically, the Domestic Consumption Guidelines in the County Water System Standards (2002; Exhibit 5) will be applied to the projected buildout densities provided in the *Kona CDP Public Facilities Financing Plan* (January 2011) to calculate associated water needs. While it is our understanding that the financing plan is not technically a part of the Kona Community Development Plan (Kona CDP), according to the project description, its purpose is to “evaluate the financial feasibility of the new development proposed in the Kona CDP. The financing plan provides a Buildout Scenario with an estimate of the number of dwelling units and commercial/industrial area proposed by the Kona CDP. This estimate will be used to project water demand associated with the Kona CDP.”

For the Waimea ASYA, the available information in existing community plans for the region will be used. These will be supplemented with additional information from development master plans to further refine water needs.

For both the Keauhou and Waimea ASYAs, DHHL needs will be incorporated. DHHL has filed a petition for water reservation from the Keauhou ASYA for 3.398 million gallons per day (mgd) for full buildout of its lands. In discussions with the County, they have committed to include the full 3.398 mgd in their APU calculation.

For both areas, needs for State water projects will be incorporated. The methodology is the same as will be employed in the refinement of WUDP demand projections, described above.

#### IV. History of APU

Commission staff conducted research to help clarify APU. It was discovered that in 1987, the year the Water Code was promulgated and the legal definition of APU established, the City and County of Honolulu (C&C Honolulu) amended its Ewa Development Plan. Exhibit 6 shows a summary of the proposed amendment. Specific development details are provided, including a description of the location of the development, a map showing its location, the type of development (e.g., single and multi-family housing), and the number of units proposed for development. Further research reveals the 1995 summary of revisions to the Ewa DP shows both previously approved developments and proposed new developments for approval (Exhibit 7). Therefore, at the time of the passage of the Water Code in 1987, calculation of APU would have been relatively straightforward.

The Central Oahu Sustainable Communities Plan (December 2002) notes that

“In 1992 the City Charter Commission recommended, and the voters of Honolulu adopted, amendments to the City Charter. Chief among its findings, the Charter Commission concluded that the Development Plans were overly detailed and had created processes that duplicated the zoning process. To eliminate this unnecessary duplication, the 1992 Charter amendments changed the definition of Development Plans from “relatively detailed plans” to ‘conceptual schemes.’”

This change resulted in developments no longer being approved in the development plans. Staff surmises that the legal definition of APU was based on C&C Honolulu’s development plan models at the time. It should be noted that Hawaii County did not create any development plans or community plans until 2008.

Therefore, while the definition of APU includes the “...projected use of water by a development that has received county development plan/community plan approvals”, it would not be possible to calculate water demands based on the approved Kona CDP alone because it does not contain specific development projects identifying the number of units or acreages by which water needs may be calculated. The Kona CDP is also more of a conceptual and visionary plan, rather than a prescriptive plan. However, the 2011 financing plan does provide the needed density information. Similarly, a review of recently updated development plans/sustainable community plans for the C&C Honolulu shows that the C&C Honolulu plans are also more conceptual and visionary and no longer contain densities that may be translated to water needs.

## V. Prior Analysis of APU

The Commission has acted on four ground water management area designation petitions in the past: the Island of Lanai, Windward Oahu, the Island of Molokai, and the Iao and Waihee ASYAs on Maui. A synopsis of the APU calculation applied for each follows.

- a. Island of Lanai (March 1990). APU was calculated based on “conservative estimates and consideration of maximum demands stated from all development related reports”. (March 29, 1990 Staff Submittal). Where provided, the highest projected estimates were used. Where not provided, the County Water System Standards Domestic Consumption Guidelines were used. Alternative non-potable sources were identified which served to reduce projected aquifer withdrawals. The Commission found that none of the criteria for ground water management area were met and did not designate the Island. Instead, the decision required specific actions and measures to be taken by Lanai Company to ensure protection of Lanai’s water resources (such as requiring water use reporting and monitoring and the formulation of a water shortage plan) and identified triggers that would prompt re-institution of water management area designation proceedings (such as water-level controls, timely development of alternative supplies, and a limit on actual withdrawals).
- b. Windward Oahu (May 1992). APU was based on the upper limit of the General Plan population growth limits in the C&C Honolulu’s WUDP for a 20-year projection period for the entire island. Although the water resources of Windward Oahu were the subject of the designation petition, the Commission noted the Honolulu Board of Water Supply’s Final Environmental Impact Statement for an island-wide integrated system and plans to move water from windward to leeward Oahu to satisfy increasing urban demands. The use of zoning to calculate APU was discussed but ultimately discarded because the Commission decided that proper zoning along with adequate financing and other requirements must be in place for development to occur. Forecasts based on zoning would be much higher than suggested by APU in the Water Code.
- c. Island of Molokai (May 1992). The decision to designate the island of Molokai was made eight days after the decision to designate Windward Oahu. Similar to Oahu, APU was calculated based on 20-year population projections. However, APU also assumed all agriculturally zoned lands would be irrigated with ground water.
- d. Iao and Waihee ASYAs (2002). The Iao and Waihee ASYAs are the sole sources of water for the Maui Department of Water Supply’s Central Maui Service Area (CMSA). In addition to current uses within the CMSA, APU included projected additional demand from the CMSA by tallying existing water commitments and pending and approved building permits. This resulted in a calculated APU that exceeded the combined sustainable yield of both aquifers. Projected allocation of total demands for the two aquifers was based on plans for new well development. The Findings of Fact showed that Criteria 1 and 4 were met for the Iao ASYA and Criterion 1 was met for the Waihee ASYA. However, the Commission declined to designate the aquifers and instead set triggers for automatic designation if current pumpage exceeded 90 percent of sustainable yield or if the mid-point of the deep monitor well rose above a specific level. The Commission also

conditioned the deferral of designation on the requirement for Maui County to develop a numerical model for managing the Iao and Waihee ASYAs, with a sixty-day deadline to execute the contract. Automatic designation of the Iao ASYA occurred in 2003 when pumpage exceeded sustainable yield. The Commission subsequently rescinded all triggers for both ASYAs.

RECOMMENDATIONS

Staff recommends that the Commission grant conditional approval of the County of Hawaii’s project description for updating the water use and development plans for the Keauhou and Waimea Aquifer System Areas:

1. The updates shall proceed in two phases:
  - i. The first phase shall refine demand projections and calculate authorized planned use in accordance with the project description and based on the project description clarifications discussed in this submittal. A draft of the Phase 1 update shall be submitted to the Commission by May 15., 2015
  - ii. The second phase will involve the development of source development strategies and scenarios. The County shall submit additional information on the project description approach and schedule for this second phase by May 30, 2105. This additional information will be considered an addendum to the project and will be submitted to the Commission for approval.
  
2. Direct Commission staff to work with the Office of the Attorney General to review the legal definition of authorized planned use and determine whether additional clarification in the law is warranted.

Respectfully submitted,



W. ROY HARDY  
Acting Deputy Director

- Exhibit 1 2015 WUDP Update Project Description
- Exhibit 2 Location Map
- Exhibit 3 Preliminary Order (HA-WMA 2013-1)
- Exhibit 4 Commission Comments on the 2015 WUDP Update Project Description
- Exhibit 5 Domestic Consumption Guidelines
- Exhibit 6 1987 Proposed Amendment to Ewa DP
- Exhibit 7 1995 Summary of Revisions to the Ewa DP

APPROVED FOR SUBMITTAL:



CARTY S. CHANG  
Interim Chairperson



**DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I**

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January 14, 2015

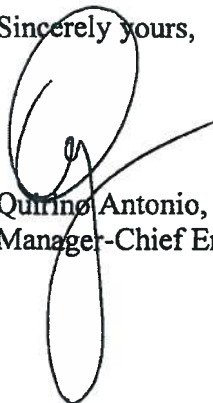
Mr. Carty S. Chang  
Interim Chair and Director  
Department of Land and Natural Resources  
ATTENTION: MR. ROY HARDY & MS. LENORE OHYE  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

**HAWAI'I COUNTY DEPARTMENT OF WATER SUPPLY  
WATER USE AND DEVELOPMENT PLAN UPDATE PROJECT DESCRIPTION**

The Department of Water Supply is sending you the draft project description for the current Water Use and Development Plan Update for your review and comment.

Should you have any questions, please call Mr. Lawrence Beck of our Engineering Division at (808) 961-8070, extension 260.

Sincerely yours,

  
Quirino Antonio, Jr., P.E.  
Manager-Chief Engineer

LB:dmj

Enc.

copy – (w/o enc.) Fukunaga & Associates, Inc.

**Exhibit 1**

*... Water, Our Most Precious Resource ... Ka Wai A Kāne ...*

The Department of Water Supply is an Equal Opportunity provider and employer.

**TECHNICAL MEMORANDUM**  
**Water Use & Development Plan Update –**  
**Keauhou and Waimea Aquifer Systems**  
**Project Description**

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**I. INTRODUCTION**

The primary objective of the Water Use and Development Plan (WUDP) is to set forth the allocation of water to land use. As required by the Hawai'i Administrative Rules (HAR) Title 13, Chapter 170, *Hawai'i Water Plan*, each of the four counties is responsible to prepare a WUDP to include, but not be limited to, the following:

- (1) Status of county water and related land development including an inventory of existing water uses for domestic, municipal, and industrial users, agriculture, aquaculture, hydropower development, drainage, reuse, reclamation, recharge, and resulting problems and constraints;*
- (2) Future land uses and related water needs; and*
- (3) Regional plans for water developments including recommended and alternative plans, costs, adequacy of plans, and relationship to the water resource protection plan and water quality plan.*

The County of Hawai'i adopted by ordinance the current Water Use and Development Plan Update dated August 2010 (2010 HWUDP), and the Commission on Water Resource Management (CWRM) granted approval in December 2011. The 2010 HWUDP update implemented a broad, uniform approach island-wide to conservatively evaluate the County's land use policies set forth in the County General Plan and Zoning Code. The General Plan is the long-range conceptual land use plan for the island of Hawai'i; whereas the Zoning Code is the legal instrument that regulates land development, and implements the General Plan policies. The intent of the 2010 HWUDP was to guide the County in prioritization and focus of future assessment efforts.

The 2010 HWUDP identified 2 aquifer sectors to be considered for further evaluation and detailed assessment. Prioritization of the aquifer areas identified resulted in the selection of the West Mauna Kea ASEA [803]/Waimea ASYA [80301] and the Keauhou ASYA [80901] for this update.

## **II. OBJECTIVE**

The objective of this update is to provide a more detailed evaluation of the Keauhou Aquifer System and Waimea Aquifer System, and refine demand projections based on the best, currently available information. The update also intends to provide conceptual source development and infrastructure improvement plans to serve projected growth scenarios, generally associated with the County's community development plans.

## **III. PROPOSED TECHNICAL APPROACH**

The County of Hawai'i proposes to implement the following technical approach. The detailed evaluation will involve identification of existing developed parcels and assessment of their respective average water use, compilation of and estimation of Authorized Planned Water Use, evaluation of updated planning information such as the Community Development Plans, and assessment of future water use (projections).

### **A. Existing Use/Pumpage**

All well owners, municipal and private, are required to report water use to the CWRM; and the CWRM is responsible to maintain a database. The CWRM database is the best available information and will be used to determine existing use or the current ground water well pumpage. Ground water use will be assessed based on the 12-month moving average (12-MAV), as required by CWRM to address seasonal fluctuations.

### **B. Planning Unit Rates for Water Demand**

The planning unit rates that were used in the 2010 HWUDP are listed in **Table 1**. These rates are planning level rates used for design of water systems, including pumping, storage and distribution facilities, and should be considered conservative since they are established to properly design water systems for service reliability. These rates will be verified with recorded water meter data for a comparison with actual consumption unit rates. Preliminary analysis of meter data indicates that the Single Family long-term Average Daily Demand (ADD) water use is closer to 400 gals/unit instead of the 1,000 gals/unit previously used in the 2010 HWUDP, and also used by DWS for water system design and water connection permits.

Existing information on non-potable water uses will be compiled from DWS and CWRM records for municipal and private well sources. More detailed information is available for DWS metered services, including those serving agricultural users and separate irrigation meters. These data will be analyzed to verify the validity of planning unit rates that are currently being used for demand projections.



**Table 1 – 2010 HWUDP Unit Rates**

<b>Zoning Designation</b>	<b>Average Daily Demand (ADD)</b>
<b>RESIDENTIAL:</b>	
Single Family	1,000 gals/unit
Duplex	400 gals/unit
Multi-Family Low Rise	400 gals/unit
Multi-Family High Rise	400 gals/unit
<b>COMMERCIAL:</b>	
Commercial Only	3000 gals/acre
<b>RESORT:</b>	400 gals/unit or 17,000 gal/acre*
<b>LIGHT INDUSTRY:</b>	4000 gals/acre
<b>SCHOOLS, PARKS:</b>	4000 gals/acre or 60 gals/student
<b>AGRICULTURE:</b>	3400 gals/acre**

\* Resort ADD of 17,000 gal/acre based on ADD for Maui.

\*\* Agriculture ADD based on AWUDP.

### **C. Authorized Planned Use**

Authorized planned use is defined by the State Water Code (Hawai'i Revised Statutes Chapter 174C) as "the use or projected use of water by a development that has received the proper state land use designation and county development plan/community plan approvals." The State Land Use classification has no guidelines to identify the level of development densities within the various districts, and therefore cannot be used for water demand projections.

Authorized planned use is 1 of 8 ground water criteria considered by the CWRM for designation of an area for ground water use regulation. If authorized planned use may cause the maximum rate of withdrawal from a ground water source to reach 90% of the sustainable yield, CWRM may consider designation of the area as a ground water management area.

#### **1. Existing Use and Entitlements**

Calculation of existing water use and water entitlements in the Keauhou ASYA and Waimea ASYA will include demands associated with developments that have received or are in the process of obtaining the proper State and County approvals. Existing water use and water entitlements include the following:

- Existing Use/Current 12-MAV pumpage

- Vacant service laterals (service lateral installation charge paid)
- Approved building permits on parcels in proximity to existing distribution system
- Developer agreements with approved zoning and established development schedules; developments with no established time frame will not be considered.
- Other private well demands (not included in 12-MAV pumpage and to be provided by CWRM)

## **2. Updated Planning Information**

The County Planning Department will cooperatively provide their latest updates and refinements of planning information for the study areas. As described in the 2005 General Plan, community development plans (CDP) are intended to be the forum for community input, and will translate the broad General Plan statements to specific actions and more detailed land use refinements as they apply to specific geographical areas. The Kona CDP and the South Kohala CDP were both adopted in 2008.

### **a. Kona Community Development Plan**

The Kona CDP encompasses the judicial districts of North and South Kona, and delineates Urban and Rural areas where future growth should be directed. Most of the future growth should be directed to 10 compact villages identified as transit oriented development (TOD) zones and located within the Keauhou ASYA. Development outside of the Kona Urban Area should be directed to existing rural towns and villages. Outside of these Rural areas, protection of the existing agricultural land is a priority.

The Urban Area identified by the Kona CDP encompasses the area spanning from Kona International Airport to Keauhou, makai of Māmalahoa Highway, designated by the General Plan as urban expansion, high density, medium density, low density, resort node, resort area, and industrial area. It excludes the area designated resort node in Kaupulehu (located and served by sources in the Kiholo ASYA; and therefore will not be included in this study) and the medium and low density area in Holualoa. Holualoa is identified as a Rural area, and will be evaluated as such. The Urban Area TODs are listed below:

- 1) University Village (Regional Center)
- 2) Kalaoa Village (Neighborhood)
- 3) Kaloko Makai Village (Neighborhood)

- 4) Honokōhau Village (Regional Center)
- 5) Keahuolū Village (Neighborhood)
- 6) Maka'eo Village (Regional Center)
- 7) Kailua Village Redevelopment (Regional Center)
- 8) Pua'a-Wai'aha Village (Neighborhood)
- 9) Kahului-Puapua'a Village (Neighborhood)
- 10) Kahalu'u Makai Village (Neighborhood)

The Kona CDP Financing Plan for Public Facilities and Backbone Infrastructure, dated January 2011 was prepared to evaluate the financial feasibility of the new development proposed in the Kona CDP. The financing plan provides a Buildout Scenario with an estimate of the number of dwelling units and commercial/industrial area proposed by the Kona CDP. This estimate will be used to project water demand associated with the Kona CDP.

**b. South Kohala Community Development Plan**

The South Kohala CDP separates the district into four specific communities and outlines separate community plans for each as follows:

- Waimea Town Plan
- Waikoloa Village Plan
- Kawaihae Community Plan
- Puakō Community Plan

Waimea Town is served by the County Waimea Water System, which is supplied by wells located in the adjacent Kohala ASEA to the north. Therefore, Waimea Town will not be included in the assessment of the Waimea ASYA. The remaining plans for Waikoloa, Kawaihae and Puakō have varying degrees of detail on future development. These community plans and additional development master plans that are made available will be used to refine the general plan water demand projections.

**c. State Water Projects Plan Updates**

The State Water Projects Plan (SWPP) is currently being updated by the State of Hawai'i, Department of Land & Natural Resources (DLNR), Engineering Division. A partial update of the SWPP, currently in the Prefinal Draft stage, covers projects for the Department of Hawaiian Homelands (DHHL). DLNR also is preparing a separate SWPP for the West Hawai'i region, focusing on projected State agency demands proposed in the area. These State agency

demands will be incorporated into the projected demands for the study areas as they are made available. In particular, DHHL water needs will be explicitly addressed in accordance with regulatory and constitutional requirements.

#### **D. Agricultural Water Use Projections**

Based on initial review of the Kona CDP and discussions with the State Department of Agriculture, no intensive agricultural developments (requiring extensive irrigation) are proposed in the Keauhou study area. The requirements for proposed agricultural development in Waimea will be coordinated with the State of Hawai'i Department of Agriculture and the ongoing Agricultural Water Use and Development Plan.

#### **E. Cultural and Native Hawaiian Water Uses**

The County proposes to work with the community and other stakeholders to identify known cultural and native Hawaiian uses of water in the study areas. Quantifying the amount of surface or groundwater necessary for these uses is expected to be difficult. The information gathered will be shared with the CWRM with the hope that sustainable yields for aquifers or minimum instream use values for surface waters can be adjusted to take into account these valuable needs.

### **IV. IMPLEMENTATION PLAN**

Water is a precious resource held in trust by the State for the benefit of the citizens of the State, and is a high priority in land use policy formulation and decisions. There are several stages and approvals required for water resource development to support land development; and each stage potentially could require substantial capital investment and potentially could stop the process. Most of the major well drilling and pumping approvals are under the jurisdiction of CWRM as part of its function to protect the State's water resources. CWRM manages both municipal (County) and private wells, potable and non-potable sources. County and privately operated potable (public) water systems also must comply with the Department of Health Safe Drinking Water regulations that require system reliability, including backup capability and water quality monitoring. The following is a list of typical stages for drilling and developing a groundwater well source:

- Acquisition of potential well site
- Well drilling permit from the CWRM
- Successful well exploration
- Pump installation permit from the CWRM

- Outfitting of well with pump, piping, valves and controls
- Infrastructure or agreement with existing water system owner to store, transmit and distribute water to demand location.

Please note that this list does not include land use approvals (State Land Use Commission, Zoning, Special Management Area Permit, environmental clearances, etc.) or other utility development that may be required (access, power, etc.).

An implementation plan for the WUDP Update – Keauhou and Waimea Aquifer Systems will be developed to provide guidance for further integration of water resource management with the development of land use policies to ensure sustainable management of this vital resource. Data gaps will be identified and recommendations will be developed to further improve the County's land and water resource planning coordination.

Development timetables are difficult to predict since development projects are often market and economically driven. Therefore, the update will provide conceptual options for source development and infrastructure improvements linked to possible land development scenarios.

#### **A. Source Development Strategies**

The WRPP will continue to be the guiding document to establish the availability of water resources. However, whenever more current information is available, the latest data will be used to guide the strategies for source development. In line with the WUDP's guiding principles, the highest quality water shall be used for the communities' highest beneficial uses. Generally, potable groundwater will be reserved primarily for domestic uses and human consumption.

For the Keauhou ASYA, the DWS sources in the basal aquifer historically have experienced rising chloride levels with pumping. The DWS has actively been moving to reduce its dependence on the basal sources by developing high level sources and related major infrastructure such as storage and transmission in the region. The high level sources have shown to be of high quality, and thus more suitable for domestic uses and human consumption. The DWS proposed to expand its development of high level sources and interconnecting its transmission/distribution system to increase system capacity and reliability.

#### **B. Conservation**

Water is a most precious resource and shall be used wisely and shall be conserved and waste shall be minimized. The County has implemented an aggressive leak and loss detection program and will continue its efforts to prevent the waste of water.

Public education programs will continue to be promoted so that the community will consistently act to achieve this goal.

**C. Reuse Water**

Treated wastewater, or reuse water is a resource that warrants further consideration for non-domestic needs. The County currently proposes to initiate the development of a larger scale reuse water system at the Kealakehe Wastewater Treatment Plant. More information on the proposed system will be provided as details on the system improvements and timetable are available.

**V. UPDATING AND ADOPTION PROCESS**

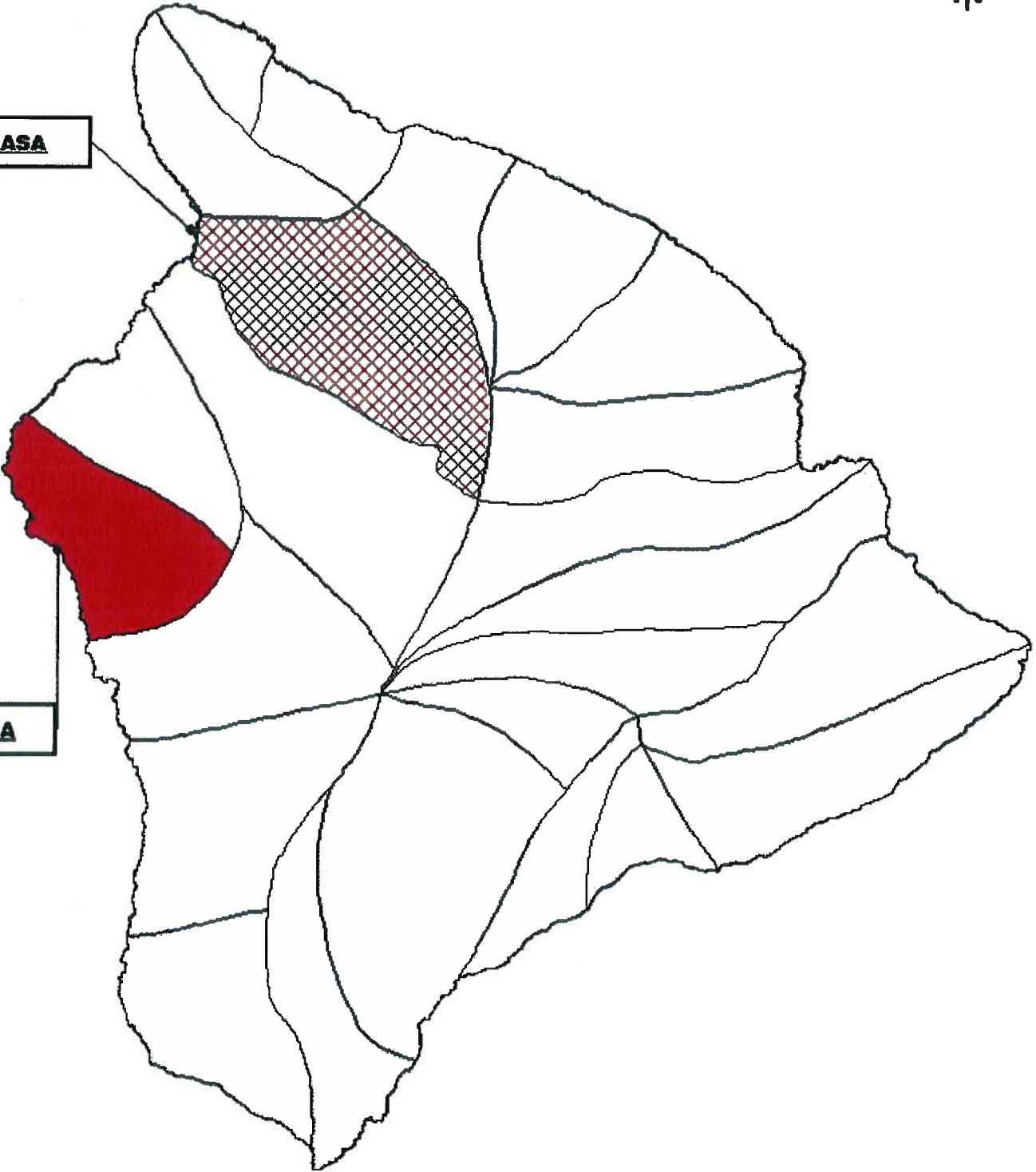
This Project Description initiates the process to update the WUDP focusing on the Keauhou and Waimea Aquifer Systems for the County of Hawai'i, and notifies the CWRM of the County's intent and proposed technical approach. The CWRM will be briefed on the findings of the WUDP update prior to finalizing the document.

A series of public informational meetings are proposed with the community stakeholders, including the Kona Water Roundtable and reviving the Waimea Water Roundtable group. Two rounds of meetings will be held, one after the initial findings are compiled and the second to present the prefinal draft update. Public input will be incorporated when applicable into the draft documents.

The draft plans will be presented to the County and the CWRM for review and comments. The plan will then be revised to incorporate comments and submitted to CWRM for approval and adoption.

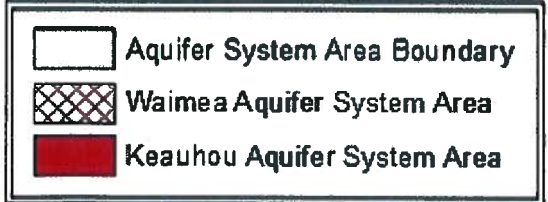


**Waimea ASA**



**Keauhou ASA**

**Exhibit 2**





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COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII

IN RE: ) HA - WMA 2013-1  
)  
UNITED STATES NATIONAL PARK ) PRELIMINARY ORDER  
SERVICE PETITION TO DESIGNATE )  
THE KEAUHOU AQUIFER SYSTEM, )  
KAILUA-KONA, HAWAII AS A GROUND )  
WATER MANAGEMENT AREA )

**PETITION TO DESIGNATE  
KEAUHOU AQUIFER SYSTEM AREA, KAILUA-KONA, HAWAII  
(STATE AQUIFER CODE 80901)  
AS A GROUND WATER MANAGEMENT AREA**

**PRELIMINARY ORDER  
(December 10, 2014 Meeting)**

**DECEMBER 29, 2014**

## **A. BACKGROUND**

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On September 13, 2013, the United States National Park Service (“NPS”) (Tammy A. Duchesne, Superintendent, Kaloko-Honokohau National Park) submitted a petition to the Commission on Water Resource Management (“Commission”) to designate the Keauhou Aquifer System Area, Kailua-Kona, Island of Hawaii as ground water management area under the Hawaii Water Code (“Water Code”), Hawaii Revised Statutes (“Haw. Rev. Stat.”) chapter 174C, Part IV Regulation of Water Use.

On October 16, 2013, the Commission voted to extend the time period from November 20, 2013 to December 31, 2014 in order to undertake further “scientific investigations and study” that would provide a better factual basis on which to decide whether to continue the process for designation.

Immediately thereafter, The Commission directed its staff to investigate the Keauhou Aquifer System Area, Kailua-Kona, Hawaii for possible designation as a ground water management area and begin preparation of the Preliminary Findings of Fact pursuant to the requirements of the Hawaii Water Code, Haw. Rev. Stat. chapter 174C, Part IV Regulation of Water Use. The Commission staff began to monitor the progress of technical studies and other information, including articles and individual testimony. Commission staff attended public forums, received technical information on the scientific and other issues, and sought technical information on the subject.

On September 17, 2014 and October 9, 2014 the Commission made site visits and held informational meetings in Kailua-Kona to become familiar with the conditions in Keauhou and to receive information from experts, government officials, and individuals with special knowledge of the area.

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On November 19, 2014, the Commission received additional information from the Hawaii County Planning Department and Hawaii Department of Water Supply (“HDWS”) regarding projected water demand, “authorized planned uses” of water, County-approved projects, and planned land use developments.

**B. DECEMBER 10, 2014 MEETING**

On December 10, 2014, the Commission held a public meeting at the West Hawaii Civic Center, Kailua-Kona, to review the Preliminary Findings of Fact (“FOF”) and to hear public testimony. The Commission staff made a presentation of the preliminary findings. The Commission then heard and received testimony from the County of Hawaii Mayor, National Park Service representatives, County of Hawaii Department of Water Supply and Hawaii County Planning Department representatives, the United States Geological Survey, and more than 170 members of the public. The testimony was informed, fairly presented, and well received. Seventy people signed up to testify. More than forty (40) people actually spoke. Everyone who asked to testify was given time and did so.

Following nearly nine and one half (9.5) hours of testimony, the Commission deliberated in an open meeting for more than one hour.

Based upon more than fourteen (14) months of investigations, two day-long site visits by the Commission to the Keauhou Aquifer System Area, numerous scientific reports and studies, meetings with both public and private hydrologic experts, many (and repeated) consultations with federal, state, and county officials and departments (all outlined in the Preliminary Findings of Fact and included through the web links provided on the Commission website <http://dlnr.hawaii.gov/cwrm/groundwater/activities/keauhou/>), and after public

meetings and deliberations, the Commission made the following decision and preliminary order:

**C. PRELIMINARY RECOMMENDATIONS AND BENCHMARKS**

In light of the record and proceedings to date, and the Preliminary Findings of Fact, the Commission extends the investigation and study period to a date no later than May 30, 2015. Prior to the May 30, 2015 date, there are a series of benchmarks that are to be met.

Commissioner Buck made three recommendations. Commissioner Starr amended, expanded, and clarified the recommendations, which are clarified and broken into subparts as follows:

1. The purpose of the time extension to May 30, 2015 is to allow some of the important and ongoing hydrologic studies of the area to be completed and/or analyzed.
2. The Commission specifically requests that the County of Hawaii submit a revised project description and revised scope of work by January 15, 2015 for the proposed revision to the County of Hawaii's Water Use and Development Plan ("WUDP") that will include the considerations discussed in these proceedings. The Commission staff will provide comments back to the County by February 1, 2015. The County will then provide a draft of the revised WUDP to the Commission by May 15, 2015.
3. The National Park Service (Kaloko-Honokohau National Historical Park) is requested to provide specific information to the Commission about:
  - a) The quantity of ground water needed to support 1) natural resources, and 2) cultural resources of the Kaloko-Honokohau National Historical Park.
  - b) Specific traditional and customary practices that are exercised in the Kaloko-Honokohau National Historical Park.

c) How NPS manages traditional and customary practices in the Kaloko-Honokohau National Historical Park.

4. The County of Hawaii is requested to create a scope, timeline, and funding methodology for an infrastructure improvement plan to alleviate existing source, chloride, transmission, storage, and well interaction issues in the Keauhou Aquifer System Area and submit it to the Commission by May 30, 2015.
5. The County of Hawaii and the National Park Service (at Kaloko-Honokohau National Historical Park) (with the participation of the Commission staff) are requested to meet and, in good faith, explore and negotiate alternative paths of action, other than ground water designation of the Keauhou aquifer to address the issues in these proceedings. The Commission requests that both the County and the National Park Service report back to the Commission on the status of the discussions not later than Monday, May 4, 2015, to provide the Commission sufficient time to evaluate the situation.
6. While the negotiations between the County of Hawaii and the National Park Service proceed, the County is requested to refine its projected water demands and “authorized planned uses” by working with the Commission staff to clarify the methodology used under different scenarios.
7. The County of Hawaii, the National Park Service, and members of the public are requested to submit any additional information they believe important regarding the petition to the Commission by January 30, 2015 in order for it to receive full consideration.

**D. ACTION**

At the December 10, 2014 Commission meeting in Keauhou, Kona, Hawaii, Commissioner Buck moved to approve the recommendations, as amended by Commissioner Starr. The amended motion was adopted 5-0-1. Chair Aila and Commissioners Antolini, Beamer, Buck, Starr voted in the affirmative; Commissioner Pavao abstained. That Motion as further clarified in the above text is hereby adopted and ordered by the Commission.

This Preliminary Order continues the scientific investigation and study period under the Water Code, and is not a decision on the merits of the Petition.

This Order may be approved in counterparts.

APPROVED AND SO ORDERED. December 29, 2014

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William J. Aila Jr.

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Kamana Beamer

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Jonathan Starr

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Denise Antolini

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Michael Buck

Abstain  
\_\_\_\_\_  
Milton Pavao

Vacant  
\_\_\_\_\_  
Department of Health Director

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Petition To Designate Keauhou Aquifer System Area, Kailua-Kona, Hawaii (State Aquifer Code 80901) As A Ground Water Management Area, Preliminary Order (December 10, 2014 Meeting) December 29, 2014 Order.

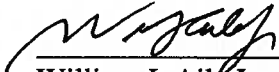
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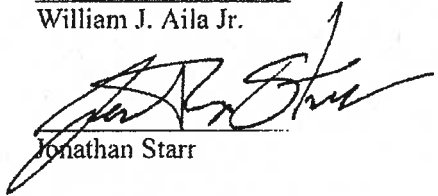
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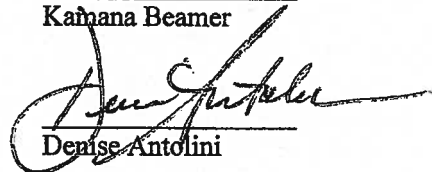
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STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
P.O. BOX 621  
HONOLULU, HAWAII 96809

January 30, 2015

Mr. Quirino Antonio, Jr., P.E.  
Manager-Chief Engineer  
Department of Water Supply  
County of Hawaii  
345 Kekuanaoa Street, Ste. 20  
Hilo, Hawaii 96720

Dear Mr. Antonio:

Hawaii County Water Use and Development Plan Update Project Description

Thank you for providing your project description for the update to the County of Hawaii's Water Use and Development Plan (WUDP) for the Keauhou and Waimea Aquifer System Areas. We have reviewed the project description in relation to the Commission on Water Resource Management's (CWRM) December 29, 2014 Preliminary Order that requested, among other things, the submittal of a project description that includes "the considerations discussed" in the initial fact-finding phase. In reviewing the project description, CWRM discussion points, and the requirements under the State Water Code and Framework for Updating the Hawaii Water Plan (Framework), we have the following questions and comments:

1. III.B. Planning Unit Rates for Water Demand. In addition to aiding in the verification of planning unit rates for non-potable water, existing information on non-potable water uses should be used to examine potential opportunities to convert existing non-potable uses (currently using potable water sources) to non-potable sources.
2. III.C.1. 4<sup>th</sup> bullet. Why are developer agreements that have zoning but no established time frame excluded from the calculation of authorized planned use? There is no time frame associated with authorized planned use.
3. III.C.1. 5<sup>th</sup> bullet. We are unsure what is meant by this item. What information on other private well demands do you anticipate CWRM would provide to aid in the determination of authorized planned use?
4. III.C.2.a. Kona Community Development Plan. The Buildout Scenario provided by the financing plan for the Kona CDP appears to estimate projected water demand for residential units and commercial/industrial areas within the Urban Area TODs. Is the financing plan limited to the Urban Area TODs? If so, what is the approach for estimating projected water demands for areas outside the Urban Area TODs (e.g., Rural areas and agricultural lands)?
5. III.C.2.c State Water Projects Plan (SWPP) Updates. With regard to Department of Hawaiian Homelands (DHHL) water needs, DHHL has submitted a petition for water reservation for 3.398

Exhibit 4

mgd from the Keauhou Aquifer System Area. We understand it is based on the preliminary findings of the ongoing SWPP update for DHHL. DHHL future water needs must be included in projections of future demand. The SWPP update for the West Hawaii region is just beginning and other state agencies will most likely not be able to provide any demand estimates within the timeframe of this WUDP update. Therefore, we recommend that demand projections be based on consultation with State agencies that own land or have indicated development plans.

6. III.D. Agricultural Water Use Projections. Agricultural water needs must be incorporated in the WUDP. While all counties have expressed difficulty in projecting agricultural demands, some method must be applied to provide reasonable estimates. For example, the City and County of Honolulu use ALISH land classifications and refine projections based on average rainfall amounts.
7. III.E. Cultural and Native Hawaiian Water Uses. The information gathered should also be used to inform proposed source development strategies to meet projected demands. If the preferred source development use strategy proposed in the WUDP may impact cultural uses and rights or other public trust purposes, appropriate mitigation measures or alternative strategies should be identified in the WUDP.
8. IV. Implementation Plan. Under the CWRM's Statewide Framework for Updating the Hawaii Water Plan, the WUDP should describe all resource options that were considered. Resource options include supply sources (wells), transmission and other infrastructure, storage, conservation, and reclaimed water or other alternative water sources. A near-term (initial 5 years) implementation plan should be developed that detail the specific actions and schedule to accomplish the preferred strategy. While we understand development timetables may be difficult to predict, the near-term plan could incorporate elements of the DWS's 5-year CIP plan as well as your response to the CWRM's 12/29/14 Preliminary Order requesting the County to "create a scope, timeline, and funding methodology for an infrastructure improvement plan to alleviate existing source, chloride, transmission, storage, and well interaction issues in the Keauhou Aquifer System Area". Longer-term plans may be more conceptual in nature.

We will schedule your project description for action by the CWRM at the February 18, 2015 meeting. A copy of the meeting agenda and staff submittal will be sent to you in advance.

If you have any questions, please contact Lenore Ohye at 808-587-0220 or toll-free at 974-4000, extension 70220.

Sincerely,



WILLIAM M. TAM  
Deputy Director

c: Larry Beck, DWS  
Jon Nishimura, FAINC

**Table 100-18 - DOMESTIC CONSUMPTION GUIDELINES**

**AVERAGE DAILY DEMAND\***

ZONING DESIGNATION	HAWAII	KAUAI	MAUI	OAHU
<b>RESIDENTIAL:</b>				
Single Family or Duplex	400 gals/unit	500 gals/unit	600 gals/unit or 3000 gals/acre	500 gals/unit or 2500 gals/acre
Multi-Family Low Rise	400 gals/unit	350 gals/unit	560 gals/unit or 5000 gals/acre	400 gals/unit or 4000 gals/acre
Multi-Family High Rise	400 gals/unit	350 gals/unit	560 gals/unit	300 gals/unit
<b>COMMERCIAL:</b>				
Commercial Only	3000 gals/acre	3000 gals/acre	6000 gals/acre	3000 gals/acre
Commercial/Industrial Mix	--	5000 gals/acre	140 gals/1000 sq. ft.	100 gals/1000 sq. ft.
Commercial/Residential Mix	--	3000 gals/acre	140 gals/1000 sq. ft.	120 gals/1000 sq. ft.
<b>RESORT (To include hotel for Maui only)</b>	400 gals/unit (1)	350 gals/unit	350 gals/unit or 17000 gals/acre	350 gals/unit or 4000 gals/acre
<b>LIGHT INDUSTRY:</b>	4000 gals/acre	4000 gals/acre	6000 gals/acre	4000 gals/acre
<b>SCHOOLS, PARKS:</b>	4000 gals/acre or 60 gals/student	4000 gals/acre or 60 gals/student	1700 gals/acre or 60 gals/student	4000 gals/acre or 60 gals/student
<b>AGRICULTURE:</b>		2,500 gals/acre	5000 gals/acre	4000 gals/acre

Exhibit 5

- \* - Where two or more figures are listed for the same zoning, the daily demand resulting in higher consumption use shall govern the design unless specified otherwise.
- (1) - Subject to special review and control by the Manager.



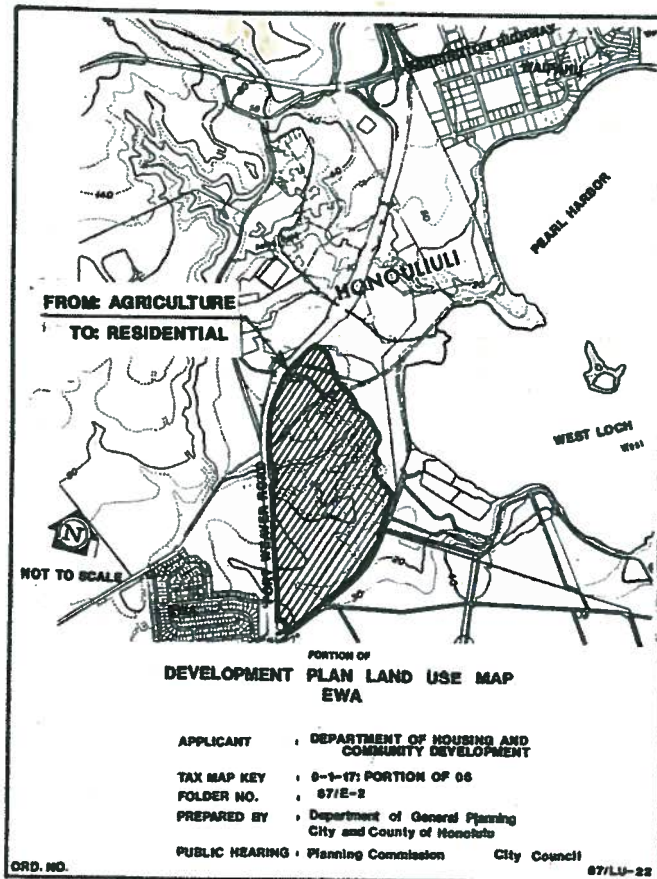
# 1987 Proposed Amendment to Ewa DP

DGP REF. NO.: 87/E-2  
 MAP REF. NO.: A-4  
 NB AREA: Ewa NB 23  
 ACREAGE: 165.82 acres  
 TRK: 9-1-17: por. of 6

Development Details Included (location, type, # units, etc)

EXHIBIT A  
 EWA  
 DEVELOPMENT PLAN LAND USE AMENDMENTS  
 BEING PROPOSED

Exhibit 6



## Amendment/Project Information

**Amendment Request:** From Agriculture and Residential to Residential, Low Density Apartment, Park, School and Golf Course

**Location:** South of Farrington Highway, east of Fort Weaver Road to Renton Road, west of West Loch

**Owner/Developer:** Campbell/City Department of Housing and Community Development

**Requested By:** Department of Housing and Community Development

**Initiated By:** Chief Planning Officer

**Basis for Request:** Provide affordable housing

**Type of Project:** Single and multi-family housing

**Impact on Provision of Housing:** Potential development of 880 residential units

## Existing Conditions

**Land Use:** Sugarcane, junkyard, residential, vacant

## Structures

**Number:** 30  
**Type:** Single family homes  
**Height:** One story

**Height:** One story

## Present Plan/Zoning Designations

**State Land Use:** Agriculture

**DP Public Facilities Map:** Kunia Road, Fort Weaver Road, Transit Corridor Improvements

**DP Special Provisions:** N/A

**Zoning:** AG-1 and AG-2 Agricultural Districts and R-5 Residential District

**ALISH:** Prime 50%  
 Other Important AG Land 30%

**Soil Features:** 70% Honouliuli clay (HxA and HxB), 0-2% slopes, moderately slow permeability, slow runoff, slight erosion hazard, low shear strength, high shrink-swell potential

**Possible Constraints:** Portion in flood hazard district and SPA

**1995 Summary of  
revisions to the  
Ewa DP**

Proposed new  
developments for  
approval

**TABLE 3: PHASING OF EWA DEVELOPMENT  
(Acres)**

<u>Project Area</u>	<u>Resid.</u>	<u>Comm.</u>	<u>Ind.</u>	<u>Total</u>
<b>Phase I (1995 - 2005) (1)</b>				
<b>Previously Approved</b>	2,920	669	1,154	4,743
<b>Proposed Projects</b>				
DHHL/State Land Bank	200			200
Fairways Residential	115			115
East Kapolei	919			919
Kapolei North	130			130
Kapolei LDA	90			90
Laulani Commercial		20		20
Laulani Residential	168			168
Makaiwa Hills Phase II	1,311			1,311
Makakilo Extension	87			87
<b>TOTAL</b>	<b>5,940</b>	<b>689</b>	<b>1,154</b>	<b>7,783</b>
<b>Phase II (2005-2015) (2)</b>				
Kapolei East	1,187			1,187
<b>TOTAL</b>	<b>7,127</b>	<b>689</b>	<b>1,154</b>	<b>8,970</b>

**NOTES:**

(1) Lands indicated as included in the first phase of development (1995 - 2005) would be eligible for processing of zoning change and other development applications starting with adoption of the Plan.

(2) Lands in the second phase of development (2005 - 2015) would be eligible for processing of zoning change and other development applications starting in 2005.