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

PETITION
FOR
WATER MANAGEMENT AREA ACTION
for

☒ **Ground Water** ☐ **Surface Water**

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. For assistance, call the Regulation Branch at 587-0225.

1. PETITIONER

Firm/Name: Kīhei Community Association, Maui Meadows Neighborhood Assn, Wailea808

Contact Person: John Laney, Leslie Iczkovitz, Kay Anderson Phone: (808) 633-1030 (Laney)

Address: P.O. BOX 662 Kīhei, Hawai'i 96753 Kihei (Kīhei Community Association)

2. PROPOSED WATER MANAGEMENT AREA(S)

Island: MAUI

Aquifer Sector(s): CENTRAL

Aquifer System(s): KAMA'OLE

Watershed(s): Waiakoa, Hapapa, Wailea, Mooloa, Ahihi Kinau (portions)

3. PROPOSED ACTION (Check one only): ☒DESIGNATION ☐MODIFICATION ☐RESCINDMENT

4. JUSTIFICATION FOR PROPOSED ACTION ON WATER MANAGEMENT AREA(S)

Please attach a sheet to state reasons why the above hydrologic unit(s) under item 2 should be designated as a ground and/or surface water management area(s) or the boundaries of an existing water management area(s) modified or rescinded. If petition is for water management area designation, please state which criteria specified by 13-171-7 and/or 13-171-8, HAR, are met and why (see back of form). If petition is for modifying or rescinding existing water management area boundaries, please establish your standing to petition (13-171-10 HAR). Complete and detailed explanations are encouraged.

Submitted by (print): _____ **Title:** _____

Signature _____ **Date:** _____

RELEVANT SECTIONS OF 13-171, HAR & 174C, HRS
REGARDING WATER MANAGEMENT AREA PETITIONS

§13-171-3 Initiation by chairperson. The designation of a water management area by the commission may be initiated upon recommendation by the chairperson. In addition to this prerogative, it shall be the duty of the chairperson to make the recommendations from time to time when it is desirable or necessary to designate a water management area for the purposes stated in this chapter and there is data for a decision by the commission. [Eff. MAY 27 88] (Auth: HRS §174C-8) (Imp: HRS §§174C-5, 174C-41)

§13-171-4 Initiation by petition. (a) The designation of a water management area by the commission may also be initiated by any interested person by written petition to the chairperson proposing the designation of a specified area and presenting the reasons for such designation. The petition for designation of a water management area shall be made on forms provided by the commission. It shall be the duty of the chairperson, after consultation with the appropriate county mayor and county water board, to act upon the petition by making a recommendation for or against the proposed designation to the commission within sixty days after receipt of the petition or additional time as may be reasonably necessary to determine whether there is factual data to warrant the proposed designation.

(b) Designated ground water areas established under chapter 177, HRS, the Ground Water Use Act, and remaining in effect at the effective date of this chapter shall continue as water management areas. [Eff. MAY 27 88] (Auth: HRS §174C-8) (Imp: HRS §§174C-5,174C-41)

§13-171-7 Ground water criteria for designation. In designating an area for ground water use regulation, the commission shall consider the following:

(1) Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach ninety percent of the sustainable yield of the proposed water management area;
(2) That the rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water;
(3) That the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;
(4) Whether excessive preventable waste of water is occurring;
(5) There is an actual or threatened water quality degradation as determined by the department of health;
(6) Serious disputes respecting the use of ground water resources are occurring;
(7) Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels; or
(8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.

Notwithstanding an imminent designation of a water management area conditioned on a rise in the rate of ground water withdrawal to a level of ninety percent of the area's sustainable yield, the commission, when such level reaches the eighty percent level of the sustainable yield, may invite the participation of water users in the affected area to an informational hearing for the purposes of assessing the ground water situation and devising mitigative measures. [Eff. MAY 27 88] (Auth: HRS §174C-8) (Imp: HRS §§174C-5, 174C-44)

§13-171-8 Surface water criteria for designation. In designating an area for surface water use regulation, the commission shall consider the following:

(1) Whether regulation is necessary to preserve the diminishing surface water supply for future needs, as evidenced by excessively declining surface water levels, not related to rainfall variations, or increasing or proposed diversions of surface waters to levels which may detrimentally affect existing instream uses or prior existing off stream uses;
(2) Whether additions to or the diversions of stream waters are reducing the capacity of the stream to assimilate pollutants to an extent which adversely affects public health or existing instream uses; or
(3) Whether serious disputes respecting the use of surface water resources are occurring.

[Eff. MAY 27 88] (Auth: HRS §174C-8) (Imp: HRS §§174C-5, 174C-45)

§13-171-10 Modifying and rescinding designated areas. The modification of the boundaries or the rescinding of existing water management areas by the commission may be initiated by the chairperson or by a petition

to the commission by any person with proper standing. The procedure for modifying the boundaries of an existing water management area or for rescinding an existing water management area shall be as provided in subchapter 2 for the designation of a water management area. [Eff. MAY 27 88] (Auth: HRS §174C-8) (Imp: HRS §§174C-5, 174C-47)

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BEFORE THE COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I

In the Matter of the Petition of:	Docket. No. ____
KĪHEI COMMUNITY ASSOCIATION AND MAUI MEADOWS NEIGHBORHOOD ASSOCIATION, nonprofit organizations	PETITION TO DESIGNATE KAMA'OLE AQUIFER SYSTEM AREA AS A GROUND WATER MANAGEMENT AREA
For designation of the Kama'ole Aquifer System Area as a Ground Water Management Area.	APPENDICES "A"-"C"

PETITION TO DESIGNATE KAMA'OLE AQUIFER SYSTEM AREA AS A GROUND WATER MANAGEMENT AREA

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PETITION TO DESIGNATE KAMA‘OLE AQUIFER SYSTEM AREA AS A GROUND WATER MANAGEMENT AREA

I. INTRODUCTION & SCOPE OF PETITION

Petitioners Kīhei Community Association, Maui Meadows Neighborhood Association, and Wailea 808 (collectively, “Petitioners”) request the Commission designate the Kama‘ole aquifer system area (“Kama‘ole ASA”), Hydrologic Unit No. 60304, within the Central Maui aquifer sector, as a ground water management area (“WMA”). This petition is submitted pursuant to Hawai‘i Revised Statutes (“HRS”) § 174C-41(b) and Hawai‘i Administrative Rules (“HAR”) § 13-171-4, which permits initiation of WMA designation proceedings upon a written petition submitted by an interested person. A completed WMA designation form is attached to this petition.

Kama‘ole ASA is threated by growing demand, reduced recharge, climate-driven variability, and potential exceedance of sustainable withdrawal rates. Designation is necessary to protect public trust water resources, ensure sustainable yields are not compromised, and allow the Commission full regulatory oversight over groundwater withdrawals in the region.

Petitioners are nonprofit organizations based in South Maui. The Kīhei Community Association is organized for community education and advocacy for South Maui. The Maui Meadows Neighborhood Association is organized to promote the well-being and interests of all residents of the Maui Meadows neighborhood, which is located in South Maui and atop the Kama‘ole ASA. Wailea 808 is organized for charitable, educational, and environmental purposes, and its principal place of business is at 51 Kainehe Place in Wailea, South Maui.

Different reports demonstrate current, existing, and proposed withdrawals, including authorized planned uses, of Kama‘ole ASA exceed ninety percent of its 11 million gallons per day (“mgd”) sustainable yield. Kama‘ole ASA thus meets the first criterion considered in designating a WMA. HRS §174C-44(1) (“Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach ninety per cent of the sustainable yield of the proposed ground water management area”).

Groundwater withdrawals may exceed ninety percent of the Kama‘ole ASA sustainable yield operate through “water development projects” with certain government approvals, which meets the eighth criterion considered in determining whether to designate a WMA. HRS §174C-44(8) (“Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions”).

Commission well data demonstrate water levels in Kama‘ole ASA are declining by 0.07 feet per year. Because recorded water levels are only between +6 and +5 feet above mean sea level (“msl”), this relative decline may be considered “excessive” and thus support designation under the third criterion. HRS §174C-44(3) (“Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels”).

Other WMA designation criteria may also be met, but this petition focuses on evidence supporting the Commission’s considerations under HRS §174C-44 (1), (3) and (8).

Petitioners would support designation of the larger Central aquifer sector of which the Kama‘ole ASA is a part, but have concentrated their resources to presently seek ground water management area designation of the Kama‘ole ASA.

II. BACKGROUND ON KAMA‘OLE AQUIFER SYSTEM AREA

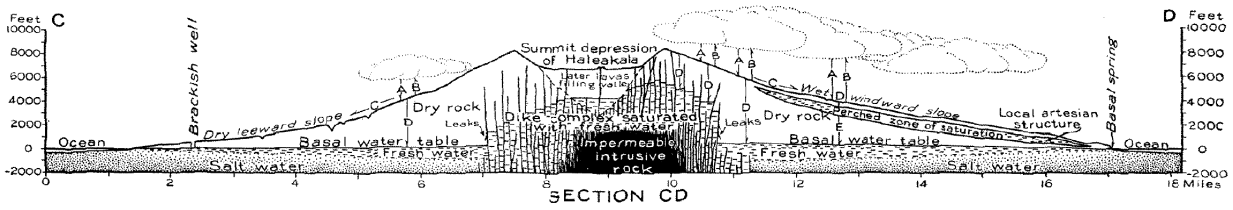
A. Geology of the Kama‘ole ASA

The Kama‘ole ASA “contains ground water as basal, perched, and high level. The majority reported ground water use is pumped from the basal zone and with lesser amounts removed from perched.”[1] The sustainable yield for Kama‘ole ASA has remained 11 mgd since at least 1980.[2]

Kama‘ole ASA is a division of the Central aquifer sector, which also includes the Kahului, Pā‘ia, and Makawao aquifer system areas. The divisions between the four ASA comprising the Central Sector are administrative and “do not correspond to any known geologic structures and therefore neither impede flow from one aquifer system to another, nor exert control on the effects of withdrawal from one aquifer system on groundwater conditions in other aquifer systems.”[3] That is, boundaries separating Central Sector ASAs were not established based on known hydrogeologic boundaries, but were rather based on selected topographic, geographic, political, and surface-ditch features as described below.[4]

Kama‘ole ASA boundaries follow Kolekole (Haleakalā) west along Waiakoa Gulch to Kīhei; Kīhei south to Cape Kīna‘u; Cape Kīna‘u northeast along crest of southwest rift of Halekalā to Kolekole.[5] The geology of this area is predominantly the andesitic rocks of the Kula volcanic series, which overlay unexposed Honomanu basalt and olivine basalt.[6] There is some Hana volcanic series near southwest rift zone; dikes at depth along rift; virtually no alluvium.

Fig. 01: Schematic diagram of Central to East Maui aquifers (Stearns & Macdonald 1942)



SIMPLIFIED SECTIONS OF WEST MAUI (AB) AND EAST MAUI (CD) SHOWING THE SOURCE AND DISPOSAL OF RAINFALL. A, Rainfall; B, fly-off or evaporation and transpiration; C, run-off; D, run-in or recharge to zone of saturation; E, percolation from perched zone of saturation to basal water table. Shows the various high- and low-level springs and the bodies of rock saturated with ground water.

Source: H. T. Stearns & G.A. Macdonald, U.S. Geological Survey, *Geology and Ground-Water*

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[1] Commission on Water Resource Management, State of Hawai‘i, *Water Resource Protection Plan,* 2019 Update, Appx. F at 101 (2019) (“WRPP”).

[2] WRPP, Appx. F at 76.

[3] U.S. Geological Survey, Pacific Islands Water Center, “Analysis of Groundwater Flow in the Central Aquifer Sector, Maui, Hawai‘i” at 2-3 (Jan. 2025).

[4] John Mink & L. Stephen Lau, Water Resources Research Center, University of Hawai‘i at Mānoa, “Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawai‘i” Technical Rep. No. 185, at 19 (Feb. 1990) https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/ed898a10-53a0-451a-b963-60e5d5ac58c9/content (“Mink & Lau 1990).

[5] Mink & Lau 1990 at 19

[6] Mink & Lau 1990 at 11.

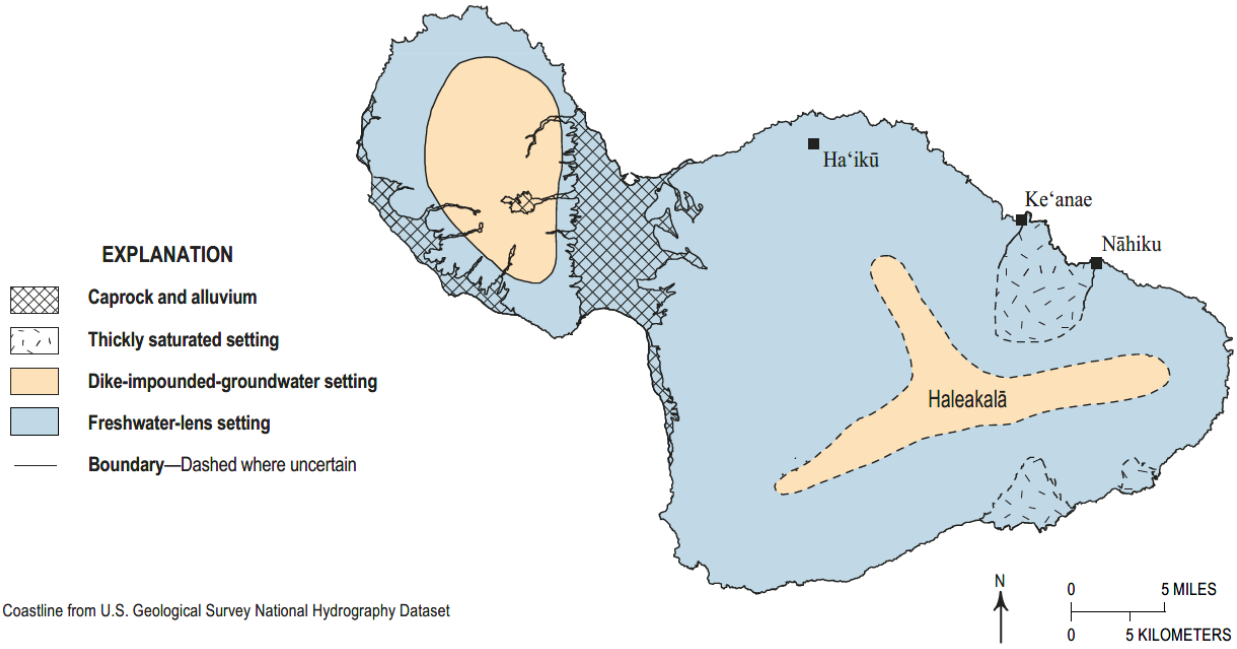
Resources of the Island of Maui, Hawaii, Bulletin No. 7 at 32a (Terr. Hawai'i 1942) (portion).

Kama'ole ASA hydrology consists in volcanic aquifers, unconfined high level dikes, unconfined high-level perched water, and an unconfined basal aquifer. Basal groundwater extends from three to five miles inland to the coast. According to Mink & Lau (1990):

> The dominant rock is Kula volcanics, but the Hana series covers the Kula formation in the south part of the System. The region beyond the basal sector contains deep high-level water in Honomanu volcanics associated with an original rift zone of Haleakalā. Spotty accumulations of sediments along the coast do not act as caprock.[7]

The majority of ground water within the Kama'ole ASA is basal with its most inland boundary terminating near the high-level dike impounded complex in the Haleakalā rift zones as shown in Figure 02 below.

Fig. 02: Map of the principal groundwater settings on Maui (Izuka et. al 2021)



Source: Scot K. Izuka, K. Rotzoll, and T. Nishikawa, K., *Volcanic aquifers of Hawai'i—Construction and calibration of numerical models for assessing groundwater availability on Kaua'i, O'ahu, and Maui*, U.S. Geological Survey Scientific Investigations Report 2020-5126, Fig. 41 (2021) https://doi.org/10.3133/sir20205126.

The basal lens in the Kama'ole ASA reportedly ranges up to approximately +10 ft above mean sea level (msl), but most recorded water levels are under +5 ft msl.[8] Based on Commission

[7] Mink & Lau 1990 at 11.

[8] Appendix "C" (AREG AC Makena Propco LLC, Draft Environmental Impact Statement for the Proposed Mākena Mauka Project at Tax Map Key (TMKs) Nos. (2)2-1-005:108, (2)2-1-006:036 and 057, (2)2-1-007:068, 092 and 093, (2)2-1-008:078, 079, 081, and 090, and (2)2-1-031:036

data from the relatively-inland Waiohuli Observation Well No. 6-4422-001, there is a decreasing water level trend of 0.07 feet per year over the past 23 years.[9] These decreasing water levels may reflect lower recharge, drought, and/ or increased pumping, amongst other factors. This 0.07 foot/ year decline is relatively excessive given recorded water levels are only between +6 and +5 ft msl.[10]

B. Water import to Kama'ole ASA and the Central Sector

Much of the water used in South Maui comes from the Wailuku aquifer sector. The Central aquifer sector is a net importer of water.[11]

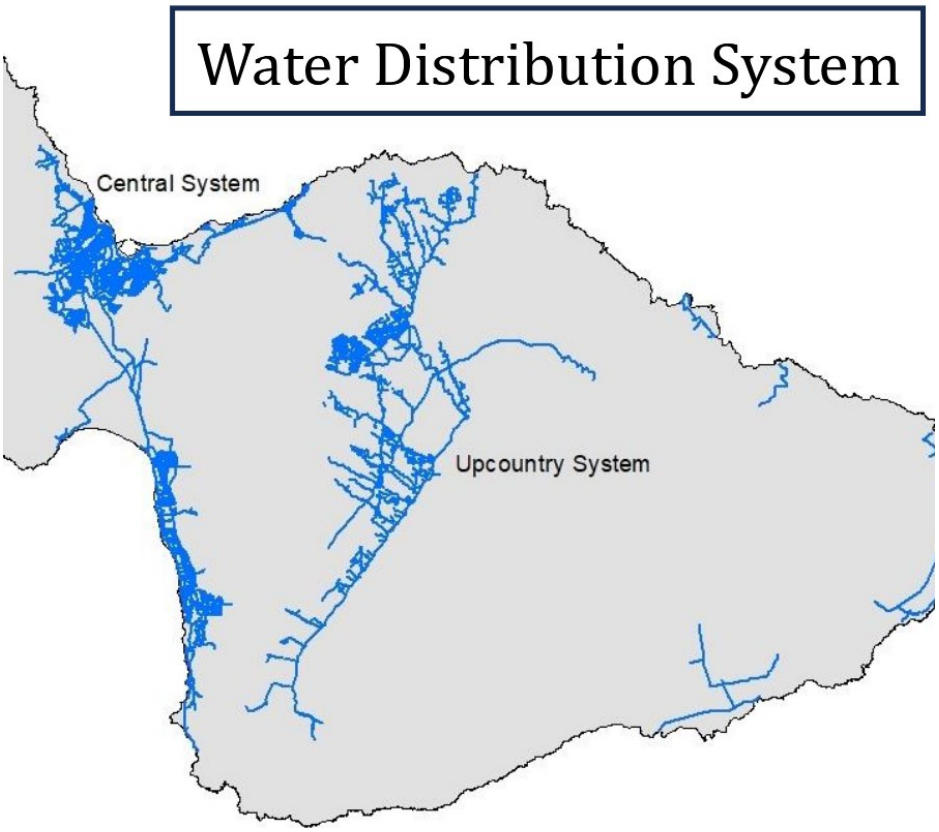
Fig. 03: Maui DWS Central water distribution system

(por.), Wailea-Makena, Maui" Vol. VI, Appx. M, at 25 (Akinaka & Assoc., dated Nov. 2025) (noticed Dec. 8, 2025) *available at* https://files.hawaii.gov/dbedt/erp/Doc_Library/2025-12-08-MA-DEIS-Makena-Mauka-Part-3.pdf ("Mākena Mauka DEIS") (citing Appx. M, appx D)).

[9] Mākena Mauka DEIS Appx. M at 38 (citing Stephen Gingerich and David Sherrod, "Drilling and Construction Data for the Waiohuli Exploratory Well (State Well 6-4421-01), Island of Maui, Hawaii, OFR 02-477," U.S Geological Survey in co-operation with Department of Hawaiian Home Lands (2002)).

[10] Mākena Mauka DEIS, Appx. M at 38. U.S. Geological Survey drilled the well and recorded water levels between +6 and +% ft msl from 2001 to 20003. *Id.* (citing Stephen Gingerich and David Sherrod, "Drilling and Construction Data for the Waiohuli Exploratory Well (State Well 6-4421-01), Island of Maui, Hawaii, OFR 02-477," U.S Geological Survey in co-operation with Department of Hawaiian Home Lands (2002).

[11] *Maui Water Use and Development Plan* (March 2019), adopted under Ordinance No. 5335, at 187 (2022) ("Maui WUDP").



Source: County of Maui, Dep't Water Supply, "Water Source Development" presentation, slide 6 (2025) *available at*: https://www.mauicounty.gov/DocumentCenter/View/151618/Sources-2025-for-Board (excerpt).

The Central aquifer sector utilizes the 62.71 mgd of groundwater developed within the Central aquifer sector and additionally obtains 27.87 mgd from Wailuku aquifer sector (12.52 mgd of surface water, 15.35 mgd of ground water) and 183.18 from the Koolau aquifer sector (182.16 mgd of surface water, 1.02 mgd of ground water).[12] The majority of potable water used in South Maui is provided via Maui DWS' water distribution system, which provided 12.462 Mgd of water to the Kīhei-Mākena Community Plan area (approximately overlying the Kama'ole ASA) in 2014.

C. Hawaiian Home Lands water reservation from Kama'ole ASA.

The Department of Hawaiian Home Lands ("DHHL") holds a reservation of ground water from the Kama'ole ASA of 2.547 mgd, effective September 18, 2018.[13] Full build out of DHHL's planned Keokea / Waiohuli project which overlays the Kama'ole ASA would utilize 0.8097 mgd of potable water from Maui DWS water credits using upcountry Maui sources; 0.5287 mgd of potable water "New State System" and 0.578 mgd of nonpotable water from the upcountry Maui Irrigation System.[14] DHHL's Ulupalakua project would use 0.0034 mgd of Maui DWS

[12] Maui WUDP at 187 (citing CWRM 2014 Well Pumpage and Diversion Data, MDWS 2014 Billing and Production, 2010 Instream Flow Standards CCHMA 06-01-2 Decision and Order).
[13] WRPP at 43 (Table 2-7).
[14] Maui WUDP at 189.

water, but the source was not identified. *Id.*

DHHL has also acquired land in Kīhei (the former Alexander and Baldwin "Kamalani" project for which it has no reservation but additional priority needs. In addition, DHHL has announced plans to its beneficiaries to develop three wells on its lands at Waiohuli and export that water into the Maui DWS central system in 2025.[15] Therefore, to plan for DHHL's reservation, the Commission should consider 2.547 mgd as an authorized planned use of Kama'ole ASA, and in addition included as known and proposed uses of Kama'ole ground water by DHHL.

D. Surface waters within Kama'ole ASA

Kama'ole ASA lies atop surface water hydrologic units no. 6107 (Kanalo), 6108 (Ahihi Kinau), 6109 (Mooloa), 6110 (Wailuea), and 6111 (Hapapa). WRPP, Appx. F at 157. Wailea has four (4) registered diversions. WRPP, Appx. F at 190; Maui WUDP at 21. No other unit is reported to have diversions. *Id.* There are no perennial streams in the Kama'ole ASA.[16] Intermittent streams within Kama'ole ASA include Kulanihakoi gulch, Waipulani gulch, Waimahaihai, Liliiholo, Keawekapu, Wai Lea, and Kapuaikea.[17] This petition does not seek designation of any surface water management areas.

Fig. 04: Diagram of streams and historical water development structures (Stearns & Macdonald 1942)

[15] *See* DHHL, Waiohuli Water Agreement Consultation, (accessed Jan. 18, 2026) https://dhhl.hawaii.gov/po/maui/waiohuli-water-agreement-beneficiary-consultation/.
[16] Maui WUDP at 19.
[17] Maui WUDP at 20.

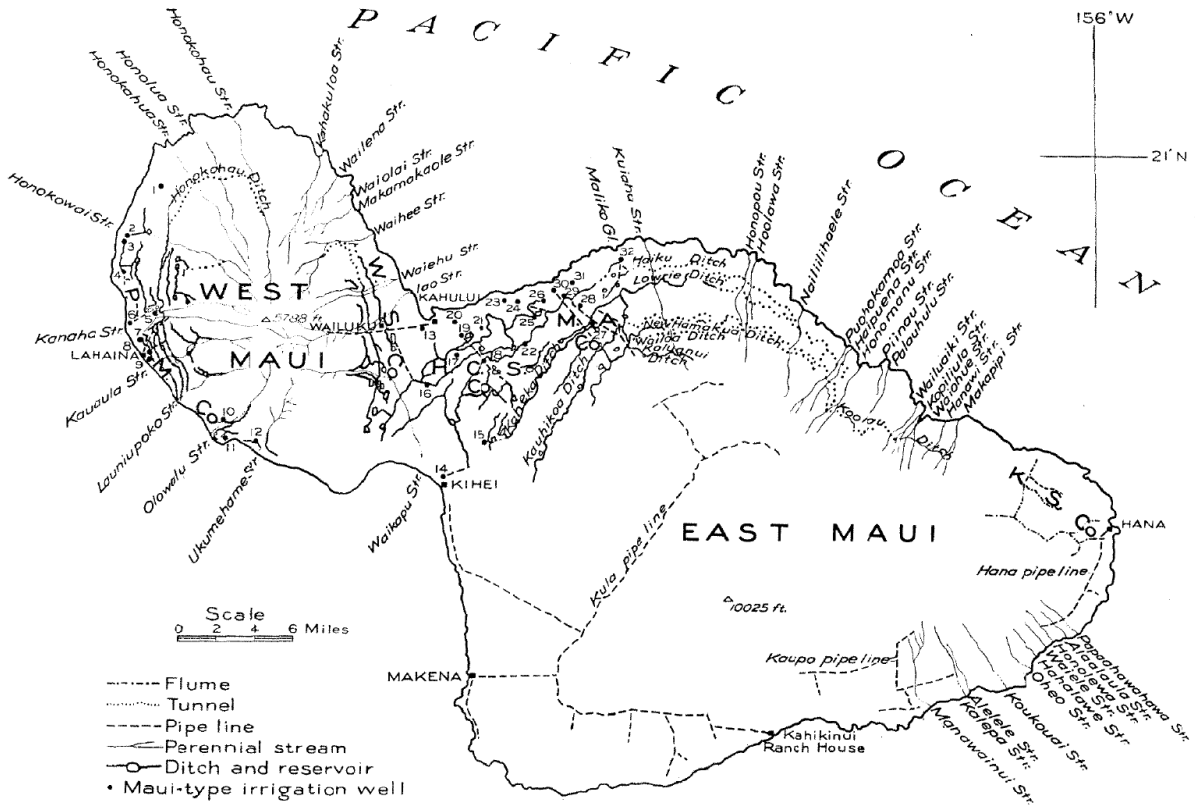


Figure 9. Map of Maui showing perennial streams, pipe lines, and irrigation ditches and wells.

Source: H. T. Stearns & G.A. Macdonald, U.S. Geological Survey, *Geology and Ground-Water Resources of the Island of Maui, Hawaii,* Bulletin No. 7 at 47 (Terr. Hawai'i 1942) (portion). (historical pipelines shown from Kula to Kīhei and Mākena).

E. Underground freshwater flows to the coast.

In addition to intermittent streams, the Kama'ole ASA harbors nearshore and submarine groundwater discharge documented along the Mākena coastline. Maui Nui Marine Resources' has documented significant salinity changes along the coast, indicating the presence of submarine releases of freshwater in this area. Other researchers have observed submarine groundwater discharge in Ahihi Bay and increasing towards the Ahihi-Kinau Area Reserve and Ma'alaea Bay Kīhei.[18] These underground flows constitute natural, ecological functions and cultural resources that support Native Hawaiian traditions and customs, and are thus part of the Commission's purview as public trustees.[19] These resources and practices include limu, fishing, gathering, prayer and other rituals along the coast.

[18] Mākena Mauka Vol. VI, Appx. M at 48 (citing J. Kennedy, "Coupling Aircraft and Unmanned Aerial Vehicle Remote Sensing with Simultaneous In Situ Coastal Measurement to Monitor the Dynamics of Submarine Groundwater Discharge, Thesis Submitted for Master of Science in Geology and Geophysics," University of Hawai'i at Mānoa (July 2016)).

[19] *Robinson v. Ariyoshi,* 65 Haw. 641, 674-76, 658 P.2d 287, 310-11 (1982) (upholding the continued existence and preservation of the waters of the state as part of the water resources public trust"); *see also In re Water Use Permit Applications,* 94 Hawai'i 97, 136, 9 P.3d 409, 448 (2000).

III. SCIENTIFIC FINDINGS CAN MANDATE KAMA‘OLE ASA DESIGNATION

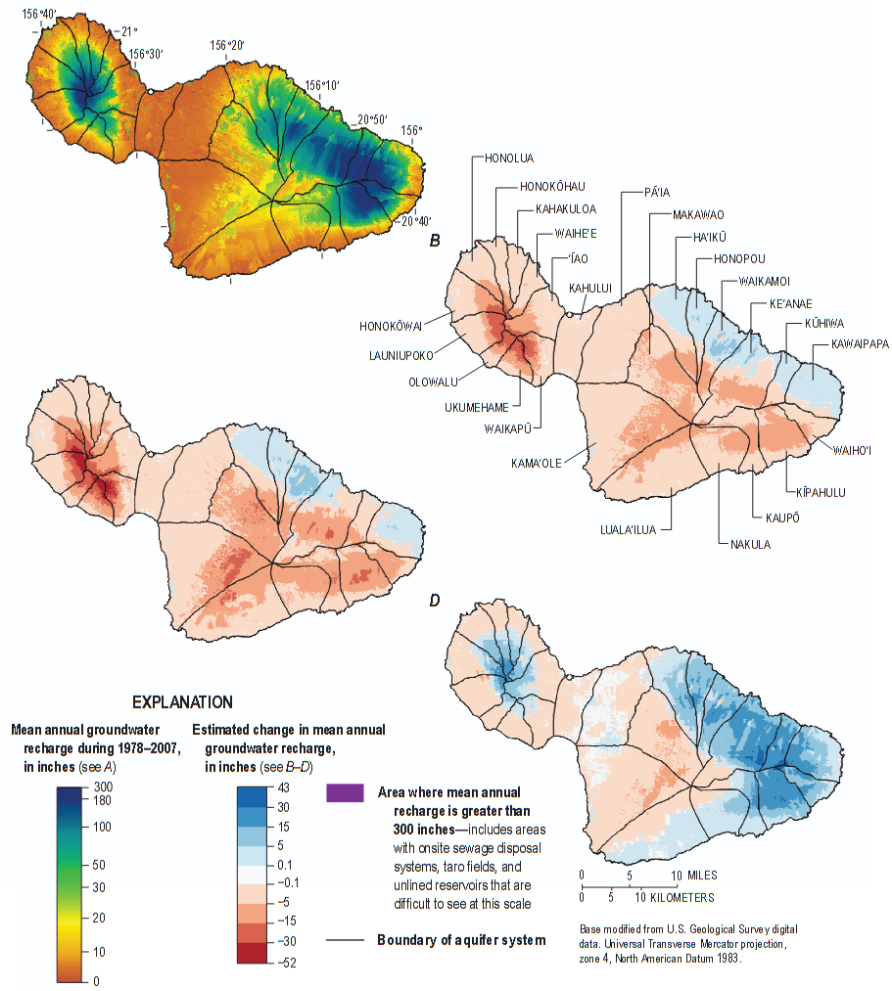
A. Threats to Kama‘ole ASA resources mandate WMA designation.

The Commission is *required* to designate an area as a WMA, "[w]hen it can be reasonably determined, after conducting scientific investigations and research, that the water resources in an area may be threatened by existing or proposed withdrawals or diversions of water[.]" HRS § 174C-41(a). Recent and pending scientific investigations demonstrate existing and proposed withdrawals may threaten Kama‘ole ASA water resources due to decreases in recharge, which will thus no longer support current and proposed increased water use. This information mandates designation of Kama‘ole ASA as a WMA.

In addition to the scientific investigations described below, the Commission chair is authorized to conduct further study or cooperate with other agencies and entities in doing so, for "any scientific investigation or study deemed necessary for the commission to make a decision to designate a water management area." HRS § 174C-43.

B. Studies demonstrate increased drying trends for Kama‘ole ASA

Fig. 05: Estimated recharge rates for mid- to end-of-century climate projections for Maui (U.S. Geological Survey 2024)



Source: U.S. Geological Survey 2024, at 68.

General circulation models of climate change impacts are generally not detailed enough to provide meaningful information about Hawai‘i-based regions. Researchers have been able to downscale these general models using dynamical and statistical downscaling to produce mid- and late-21st-century high-resolution climate projection datasets for the Hawaiian Islands.[20]

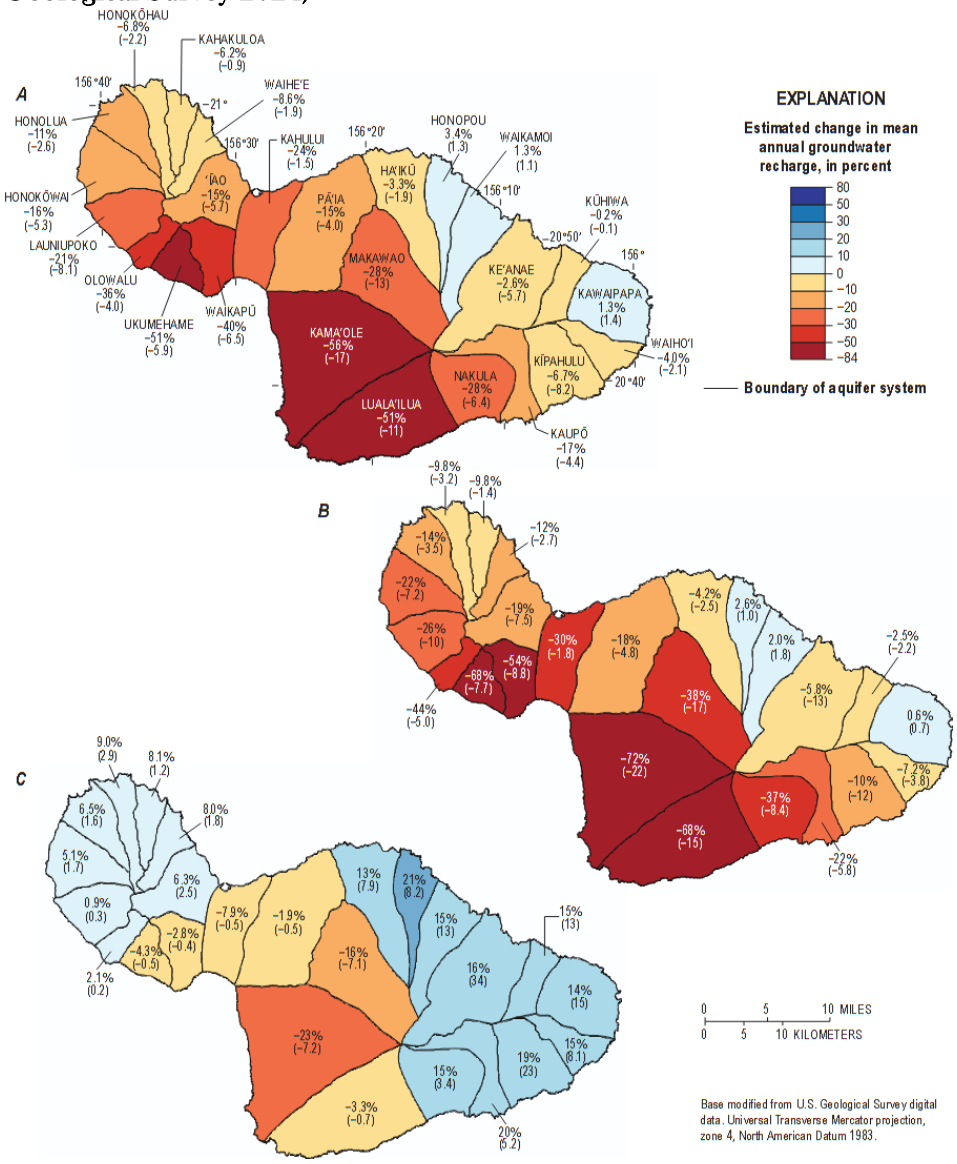
In 2024, the U.S. Geological Survey published maps showing mean annual groundwater recharge for 1978-2007 based on 2020 land cover conditions by adapting data from three future-climate scenarios: (top left) "Statistical Downscaling (SD) Representative Concentration Pathway (RCP) 8.5 2041-71 scenario from Elison Timm and others (2015)" (top right); "SD RCP8.5 2-71-99 scenario from Elison Timm and others (2015)" (bottom left) and "Hawai‘i Regional Climate Model version 1 (HRCM1) A1B 2080-00 scenario from Zhang and others (2016)" (bottom right).[21] Under all three scenarios, recharge across most of Kama‘ole ASA will decrease as compared to the mean annual groundwater recharge for 1978-2007, with isolated patches of increases of between zero to five (5) inches.

The U.S. Geological Survey also quantified estimated changes in mean annual groundwater recharge by aquifer system by, again, adapting data from these three future-climate scenarios.

[20] *See* O. Elison Timm, T.W. Giambelluca, H.F. Diaz, "Statistical downscaling of rainfall changes in Hawai'i based on the CMIP5 global model projections," 120 *J. Geophys. Res. Atmos.* 92–112 (2015); C. Zhang, Y. Wang, K. Hamilton, K. Lauer, "A. Dynamical downscaling of the climate for the Hawaiian Islands. Part I: Present day" 29 *J. Clim.* 3027–3048 (2016).

[21] H.L. Kāne, A. Mair, A.G. Johnson, et. al, "Estimated groundwater recharge for mid-century and end-of-century climate projections, Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and the Island of Hawai‘i" U.S. Geological Survey Scientific Investigations Report 2023–5130, at 68 (2024) *available at:* https://pubs.usgs.gov/sir/2023/5130/sir20235130.pdf.

Fig. 06: Estimated recharge rates for mid- to end-of-century climate projections for Maui (U.S. Geological Survey 2024)



Source: U.S. Geological Survey 2024 at 70 (figure 24).

The diagrams from Figure 06 depicts three future climate scenarios: the Statistical Downscaling RCP 8.5 2041-71 (top); Statistical Downscaling RCP 8.5 2071-99 (middle); and, the Hawai'i Regional Climate Model version 1 AIB 2080-99 (bottom). The percentage change is relative to mean annual recharge for 1978-2007 data. Values in parentheses refer to change in mgd.[22] The "Statistical Downscaling RCP 8.5 2071-99" is sometimes referred to the "dry" climate scenario and the Dynamic Downscaling A1B emission scenario during 2080–99 referred to as a

[22] U.S. Geological Survey 2024, at 70 (figure 24).

"wet" climate scenario.[23] Under both dry- and wet-climate scenarios, Kama'ole ASA will see reduced rainfall and thus aquifer recharge.

Maui DWS also notes a historical drying trend: "Irrigation rates in the Wailuku and Central Maui regions have been steadily decreasing since the 1970s. This decrease coincided with periods of below-average rainfall, leading to substantially reduced recharge rates. Estimated recharge for Central and West Maui declined 44 percent during the period 1926 – 2004. Groundwater recharge during average climate conditions and drought conditions was estimated by the U.S Geological Survey (USGS). A drought scenario based on rainfall during the 1998–2002 period yielded a 29 percent reduction in recharge compared to average climate conditions."[24]

These trends in lowered rainfall recharge and drought may be reflected in a decreasing water levels of 0.07 feet per year over the past 23 years as observed via the Waiohuli Observation Well No. 6-4422-001.[25] Declining water levels may constitute evidence of diminishing water resources. This consideration further weighs towards WMA designation. HRS § 174C-44(3); *see infra* Part VI.

C. Pending Central Sector study may reduce developable water in Kama'ole ASA.

Completed and ongoing scientific investigations support more focused management of water resources of the Kama'ole ASA and surrounding areas. As discussed further *infra,* WMA designation should not be deferred until completion of studies that are aimed at redrawing aquifer boundaries in ways that may only *reduce* Kama'ole sustainable yield.

The Central aquifer sector has a total sustainable yield of 26 mgd, with an installed pump capacity of 239.657 mgd, and a reported use of 62.72 mgd.[26] There is at least one pending study concerning the "poorly understood" groundwater development of the Central aquifer sector, which has a combined sustainable yield of 26 mgd, but has been pumped up to 120 mgd in 1996.[27] In 2025, the Hawai'i legislature allocated $250,000 for a Central Maui hydrological boundary study, upon the Commission's request, to be carried out by the U.S. Geological Survey.[28]

The study's objective is "to provide information needed to evaluate the validity of existing aquifer-system boundaries and potentially revise existing boundaries."[29] Over three years, the U.S. Geological Survey plans to complete an existing island-wide groundwater-flow model of Maui that will be used to simulate steady-state conditions for selected recharge and withdrawal scenarios

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[23] *See e.g.* Laura Brewington, Victoria Keener, and Alan Mair, "Simulating Land Cover Change Impacts on Groundwater Recharge under Selected Climate Projections, Maui, Hawai'i" *Remote Sensing* 11, no. 24: 3048 (2019) https://doi.org/10.3390/rs11243048.

[24] Maui WUDP at 14.

[25] Mākena Mauka DEIS Appx. M at 38 (citing Stephen Gingerich and David Sherrod, "Drilling and Construction Data for the Waiohuli Exploratory Well (State Well 6-4421-01), Island of Maui, Hawaii, OFR 02-477," U.S Geological Survey in co-operation with Department of Hawaiian Home Lands (2002)).

[26] Maui WUDP at 141.

[27] U.S. Geological Survey, Pacific Islands Water Center, "Analysis of Groundwater Flow in the Central Aquifer Sector, Maui, Hawai'i" at 2, 6 (Jan. 2025) (obtained via HRS chapter 92F request from CWRM, Oct. 23, 2025) ("U.S. Geological Survey 2025").

[28] H.B. 300, C.D. 1 33rd Leg., Reg. Sess. (2025) ("Executive Budget – FY 26-27").

[29] U.S. Geological Survey 2025, at 2.

specifically for the Central Sector.[30] Development of new aquifer boundaries is outside the scope of this study.[31] In its request for funding, Commission staff stated:

> Current data suggests that groundwater withdrawals from aquifer systems in Central Maui are at 590% (Kahului) and 110% (Paia) of their respective sustainable yields. If the current Aquifer Boundaries were considered accurate, those aquifer system areas would meet one criterion for designation as ground water management areas. However, water levels and salinity observed don't support the notion that water is overwithdrawn. A more accurate management approach would consider redrawing aquifer boundary lines that match groundwater flow direction, rather than defining aquifer boundaries lateral to groundwater flow.[32]

The scope of the study does not include reviewing boundaries of adjoining aquifer sectors (Wailuku, Ko'olau, Kahikinui). Therefore, the pending Central sector hydrologic boundary study, if actionable, may result in redrawing aquifer system boundary lines within the Central sector where aquifer systems *other* than Kama'ole ASA are overdrawn.[33] Because Kama'ole ASA is currently drawing less than half of its 11 mgd sustainable yield, any redrawing of internal Central sector boundaries would likely usurp part of that 11 mgd and not add to it. That is, any actionable result of the Central sector hydrological boundary study would only increase the need to designate Kama'ole ASA.

In any case, the factors motivating the need for a Central sector boundary study arise from permitting complications due to competition for water resources. These factors also counsel designation of Kama`ole ASA, and likely other Central sector ASAs as well.

IV. CURRENT, EXISTING WATER USE OF KAMA'OLE ASA

1. Data sources used to estimate current Kama'ole ASA water use.

Data on existing and proposed water uses of Kama'ole ASA are limited by a lack of reporting. However, even using this partial picture of Kama'ole ASA water usage supports WMA designation under the first criterion. The Commission's well database lists 149 wells in Kama'ole ASA.[34] Many operators of wells developed in Kama'ole ASA do not file water use reports. Most of the reporting well data comes from well sources within 3 miles of the coast in the Kama'ole ASA.[35]

2. Current Kama'ole ASA usage is conservatively estimated at 3.66 mgd.

Akinaka & Associates stated the current twelve-month moving average ("12-MAV") of

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[30] U U.S. Geological Survey 2025, at 6.
[31] U.S. Geological Survey 2025, at 6.
[32] Dep't of Land & Nat. Resources – CWRM, "FY 2025-2027 Budget Requests Detail" at C-5 (Feb. 3, 2024) (obtained via HRS chapter 92F request from CWRM, Oct. 23, 2025).
[33] The 12-MAV for Makawao ASA during 2024-25 was 1.9 mgd or about 27 percent of its 7 mgd sustainable yield. J. Stufflebean, Director, Maui DWS, "Upcountry Water Source Development" at 26 (Oct. 8, 2025) *available at*: https://mauicounty.us/wp-content/uploads/2025/10/2025-10-08-Final-Upcountry-Water-Source-Development-Presentation-UPDATED-002.pdf.
[34] Mākena Mauka DEIS Vol. VI, Appx. M at 29 (citing Appx. M, exh. 1, appx. D).
[35] Mākena Mauka DEIS Vol. VI, Appx. M at 29 (citing Appx. M, exh. 1, appx. D).

pumpage from the Kama‘ole ASA as of January 2025 is 3.660 mgd based on water use reports submitted to the Commission.[36] This figure varies from month to month. On December 31, 2024, the 12-MAV was 3.805 mgd.[37] The County reported 2.826 mgd of irrigation pumping and 0.027 mgd of municipal use for Kama‘ole ASA or a total of 2.853 existing use in 2019.[38]

There is no rule requiring the Commission to use the 12-MAV to determine existing use. The daily use of Kama‘ole ASA based on an average of all Commission water use reports from 2024 through November 2025 is 4 mgd. *See* **Appendix "A".** However, in the below calculations, Petitioners use the latest 12-MAV from January 2025 of 3.66 mgd. Even assuming the lower 3.66 mgd figure, Kama‘ole ASA meets the first criterion for WMA designation due to increased and authorized planned uses of water for the area. HRS § 174C-44(1).

V. INCREASED, AUTHORIZED PLANNED USES, AND APPROVED PROJECTS

A. Designation appropriate where planned water use exceeds 90% of sustainable yield.

The first consideration in determining whether to designate a WMA is:

> (1) Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach ninety per cent of the sustainable yield of the proposed ground water management area[.]

HRS §174C-44(1). "[A]n increase in water use" has no technical definition under HRS chapter 174C and therefore is interpreted according to its plain, ordinary meaning. "Authorized planned use" 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. HRS §174C-3.

The Commission, however, may anyway consider water development projects with any government approval in assessing whether 90% of sustainable yield is met. The eighth criterion is:

> (8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.

HRS § 174C-44(8). Taken together, these criteria require the Commission to consider the cumulative impact of any increase in water use, uses that have received State land use and County plan approvals, and water development projects that have received any government approval. For Kama‘ole ASA, each of these, separately and together, may cause withdrawals from Kama‘ole ASA to reach 90% of sustainable yield, rendering designation appropriate. HRS §174C-44(1).

B. Water development projects that received Commission approvals.

Petitioners reviewed the Commission's Water Resources Bulletins since 1998. Many of the well developers did not propose an amount of expected water use associated with Commission-

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[36] Mākena Mauka DEIS Vol. VI, Appx. M, at 6, 37 On page 6, Akinaka & Associates state the 12-MAV of Kama‘ole ASA as of January 2025 is 3.66 mgd, however on page 37 the 12-MAV of Kama‘ole ASA as of January 2025 is reported as 3.8025 mgd in a chart and text, therefore Petitioners use the 3.66 mgd figure.

[37] Mākena Mauka DEIS, Appx. M at 37 (citing appendix F of Appx. M at PDF 255).

[38] Maui WUDP at 37 (Table 15-4).

approved well construction and pump installation. Those that did propose a use volume for wells developed in Kama‘ole ASA cumulatively proposed a use of 10.031 mgd. *See* **Appendix "B".**

Most, if not all, of these wells obtained approvals to install pumps. The same Water Resources Bulletin reports demonstrate the reported capacity of Kama‘ole ASA wells is 39.31 mgd. *See* **Appendix "B"**. In 2019, the County reported the installed pump capacity in Kama‘ole is 18.827 mgd.[39] The Commission reports an installed well capacity of 21.563 mgd.[40]

Whether all State land use and county plan approvals for proposed uses documented in the Water Resources' Bulletin or potential uses of well pump capacity have been obtained requires further research. Therefore, these figures are not assumed to constitute "authorized planned uses" within the meaning of the first criterion for WMA designation. However, these reports constitute an evidentiary basis establishing an "increase in water use" or "water development projects" that "may cause the maximum rate of withdrawal from the ground water source to reach ninety per cent" of Kama‘ole ASA's sustainable yield. HRS §174C-44(1) & (8).

C. Proposed uses of selected projects exceed 90 percent of sustainable yield.

1. Increased use and authorized planned uses exceed 90% of sustainable yield.

Kama‘ole ASA will see "an increase in water use" of at least 5.335 mgd and "authorized planned uses" of 4.934 mgd in light of the below referenced planned developments in South Maui. Limiting estimates to only authorized planned use (4.934 mgd), the 12-MAV ending in January 2025 (3.660 mgd), and DHHL's 2.547 mgd reservation, means 11.140 mgd would be the maximum rate of withdrawal from Kama‘ole ASA. This constitutes 101% of Kama‘ole ASA's 11 mgd sustainable yield.

Therefore increases in water use and authorized planned uses "may cause the maximum rate of withdrawal from the ground water source to reach ninety per cent" of Kama‘ole ASA.[41]

Fig. 07: Increased Use and Authorized Planned Uses of Kama‘ole ASA

Project	Increased use (mgd)	% of 11 mgd SY	Authorized planned use (mgd)	% of 11 mgd SY
Mākena Mauka	1.464	13.31%	1.0623	9.66%
H2R, LLC	0.0996	0.91%	0.0996	0.91%
Pi‘ilani Promenade	0.081	0.74%	0.081	0.74%
Honua‘ula Partners	2.1049	19.14%	2.1049	19.14%
Mākena U-1 project	0.415938	3.78%	0.415938	3.78%
Maui Tech	1.17	10.64%	1.17	10.64%

[39] Maui WUDP at 185.
[40] Mākena Mauka DEIS, Appx. M at 29 (citing Appx. M, exh. 1, appx. D).
[41] HRS §174C-44(1).

Park				
12 MAV (Mākena DEIS)	3.66	33.27%	3.66	33.27%
DHHL reservation	2.547	23.15%	2.547	23.15%
Total	**11.542 mgd**	**105%**	**11.141 mgd**	**101%**

Similarly, Akinaka & Associates recently reported: "In the Kama[ʻ]ole ASA, we estimate the future pumpage to rise to a maximum/peak of 8.190 Mgd. Including DHHL reservations would increase the maximum/peak pumpage to 10.737 Mgd. Although this would be below the SY of 11 Mgd, this would raise the pumpage to greater than 90% of the SY, which is something that could initiate designation of a GWMA under the CWRM."[42] Akinaka & Associates developed the following table to describe existing and planned demand for Kamaʻole ASA water resources.[43]

Fig. 08: Akinaka & Associates' Future Demands on Kamaʻole Aquifer

Total Demands on Kama'ole Aquifer		
Development	Total Average Demands on Aquifer	Maximum Average Demands on Aquifer
Current 12-MAV Use	3,660,000	3,660,000
MMP	976,036	1,464,054
U-1 Makena Ranch	277,292	415,938
Wailea 670/Honua'ula	1,700,000	2,550,000
H-2 Irrigation Non-Potable	66,400	99,600
Total Additional Pumpage (Excluding 12-MAV)	3,019,728	4,529,593
Total Pumpage (Including 12-MAV)	6,679,728	8,189,593
DHHL Reservations	2,547,000	2,547,000
Total Including DHHL Reservations	9,226,728	10,736,593

Source: "Summary of New Water Demands in the Mākena Area", appendix Q to Appendix M of the Mākena Mauka DEIS, at PDF 359.

In arriving at the water use amounts described in Figure 07 *supra*, Petitioners reviewed the Akinaka & Associates report and augmented their findings to account for revised estimates of Kamaʻole ASA water use and to differentiate between future demand and authorized planned uses of water.

First, in 2022, Honuaʻula Partners, LLC revised its proposed water use downward from its

[42] Mākena Mauka DEIS Vol. VI, Appx. M, at 11.

[43] In 2014, Maui DWS projected Kamaʻole ASA nonpotable demand to increase to only 5.59 mgd between 2015 and 2035. Maui WUDP § 15.6.6. However, these "projections were made in 2014 with information that does not include the expected development details" described by Akinaka & Associates. Mākena Mauka DEIS Vol. VI, Appx. M at 65.

2.55 mgd maximum demand reported in its 2012 Final EIS to 2.1049 mgd in its application for a County Phase II approval.[44] Therefore, Petitioners use 2.1049 mgd to estimate the Honua'ula Partners/ Wailea 670 water demand.

Second, of the above projects, portions of the "MMP" or the Mākena Mauka Project represented it may require further State and county land use approvals for certain portions, thereby taking those portions out of the definition of "authorized planned use". HRS § 174C-44(1). For this reason, Petitioners calculated 1.0623 mgd as the authorized planned use of the Mākena Mauka Project as distinguished from the 1.464 mgd of maximum use.

Third, an additional project, the Maui Technology Park (kna the Līpoa project) entails both "an increase in water use" and an authorized planned use of 1.17 mgd of Kama'ole ASA and is therefore included in Petitioners' calculations.

2. Adjustment to Mākena Mauka authorized planned uses of Kama'ole ASA.

The Mākena Mauka project's maximum demand is premised on planned uses that may require a district boundary amendment ("DBA") from the Land Use Commission ("LUC") and a community plan amendment.[45] Although these plans constitute "an increase in water use", they would not constitute an authorized planned use under criterion 1.[46]

Mākena Mauka plans to seek LUC approval to redistrict parcels named F-1, B-1, S-3, M-1, S-2, S-4, and portions of S-1 into the "rural" designation and then seek a change in zoning for 302.29 acres from the county.[47] Mākena Mauka plans 149 residential units for these parcels.[48] The larger project consists in 652 housing units—including 109 onsite workforce units.[49] The 109 workforce units are planned to be supplied by Maui DWS while the rest of the water demands will be supplied by a private water system.[50] The potable and nonpotable water provided by the private water system is 1.464 mgd, with an additional 0.0925 mgd from Maui DWS.[51]

Subtracting the 109 workforce units from the 652 unit total results in 543 units using the private water system, or approximately 0.0027 mgd per unit. Removing the 149 units that require a DBA from 543 total, results in 394 units that are authorized planned uses ("APU"), which will use 1.0623 mgd. This constitutes 1.0623 mgd of authorized planned use by the Mākena Mauka project, and a proposed 1.464 mgd increase in use.

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[44] Tom Nance Water Resource Engineering, "Calculations as of 3/22/2022 for Required Well Development for the Honua'ula Project," filed July 11, 2022 with the Maui Planning Commission as exhibit "44" *available at*: https://www.mauicounty.gov/DocumentCenter/View/134425/071222_Agenda-Item-C1_Honuaula-Contested-Case_Applicants-Exhibit-44_received-071122.

[45] Mākena Mauka DEIS V.1 at 25-27.

[46] HRS §174C-44(1).

[47] Mākena Mauka DEIS V.1 at 26-27.

[48] Mākena Mauka DEIS, Appx. G at 67 (wastewater calculations).

[49] Mākena Mauka DEIS V.3, Appx. M at 5.

[50] Mākena Mauka DEIS V.3, Appx. M at 5.

[51] Mākena Mauka DEIS V.3, Appx. M at 5.

Total water use:	1.464 mgd (private)	0.0925 mgd (Maui DWS)
Total units:	543 market units	109 workforce units
Use per unit:	0.0027 mgd/ unit	849 gpd/ unit

Authorized planned uses: 394 units are x 0.0027 mgd = **total 1.0623 mgd APU**

The above estimates assume the Mākena Mauka project will successfully operate a reverse osmosis desalination project with a recovery efficiency of 65%.[52]

Petitioners are not aware that other listed projects report requiring further LUC or County discretionary permits or approvals.

3. Maui Tech Park's increased use, authorized planned uses, for water development.

The Maui Research & Technology Park is also known as the Kīhei Research & Technology Park or the Līpoa project ("Maui Tech Park") and is governed under Maui County Code ("MCC") chapter 19.33. The Maui Tech Park project is projected to use 1.17 mgd in addition to that expected to be supplied by Maui DWS.[53] As an alternative to Maui DWS supply, the Maui Tech Park proposed "a privately-owned and operated system" for 0.798 mgd of potable drinking water and to supply its 0.37 mgd of non-drinking water for landscape irrigation via R-1 treated wastewater supplemented by brackish groundwater."[54]

In 2013, the Maui Tech Park's existing lots obtain potable water from existing wells in upper Waiehu and North Waihe'e via the Maui DWS central transmission system and R-1 irrigation water from the Kīhei Wastewater Reclamation Facility ("KWWRF).[55] Maui DWS and County KWWRF operators did not commit to providing potable and non-potable water for the Maui Tech Park expansion.[56]

For proposed expansion, the Maui Tech Park will construct a privately owned and maintained potable water source and distribution system.[57] Because the Maui Upcountry Community Plan prohibits the use of wells developed in the Upcountry plan area from being used as water source for another plan area, "wells developed to serve the [Maui Tech Park] must be located below" the 600-foot elevation contour defining the Upcountry Community Plan

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[52] Mākena Mauka DEIS Vol. VI, Appx. M, at 7.

[53] *In re Petition of Maui R & T Partners, LLC*, Findings of Fact, Conclusions of Law, and Decision and Order, LUC Dkt. Nos. A10-787 (Nov. 22, 2013) and A84-585(a) (Nov. 22, 2013) (FOF ¶165: "Total average daily water demand for the Project expansion not supplied by the DWS is 1.17 MGD. Average daily demand for both phases for drinking water and non-drinking water is 798,065 gallons per day ('GPD') and 373,329 GPD, respectively").

[54] LUC Dkt. A10-787 and A84-585(a), FOF ¶¶166-67 (Nov. 22, 2013).

[55] Maui R&T Partners, LLC, Final Environmental Impact Statement, Maui Research & Technology Park Master Plan Update, Kīhei, Maui, Hawai'i, Vol. 3 Appx. F at 3-1, 3-2 (Prelim. Engineering Report) (March 5, 2013) *available at:* https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-03-23-MA-FEIS-Maui-Research-and-Technology-Park-Volumes-3-4.pdf ("Tech Park FEIS").

[56] Tech Park FEIS V.3, Appx. F at 3-2 through 3-8.

[57] Tech Park FEIS V.3, Appx. F at 3-4.

boundary.[58] The first source alternative consists in five offsite brackish wells with a capacity of 360 gallons per minute ("gpm") located at the 580-foot elevation on land currently owned by Haleakala Ranch Company, which would pump brackish water to be subjected to a desalination process.[59] These wells would be located in the Kama'ole ASA, nearby the Keokea Highands Well Nos. 6-4424-001 and 6-4524-001.[60] The second alternative would consist in five on-site wells with a pump capacity of 400 gpm per well, which would also require desalination.

Similarly, for nonpotable irrigation water, the Maui Tech Park proposes to develop additional non-potable sources and construct a distribution system.[61] The nonpotable source alternatives are: (1) five wells at the 580 foot elevation to supplement shortfalls in supply from KWWRF; and, (2) five wells at the Tech Park site.[62]

All such wells would be located within the Kama'ole ASA and are therefore considered under HRS § 174C-44(1) & (8).

Fig. 09: Alternative 1 Offsite Brackish Wells for the Maui Tech Park

[58] Tech Park FEIS, V.3, Appx. F at 3-4.
[59] Tech Park FEIS, V.3, Appx. F at 3-5.
[60] Tech Park FEIS V.3, Appx. F (Figure 3-2a).
[61] Tech Park FEIS, V.3, Appx. F at 3-8.
[62] Tech Park FEIS, V.3, Appx. F at 3-9.

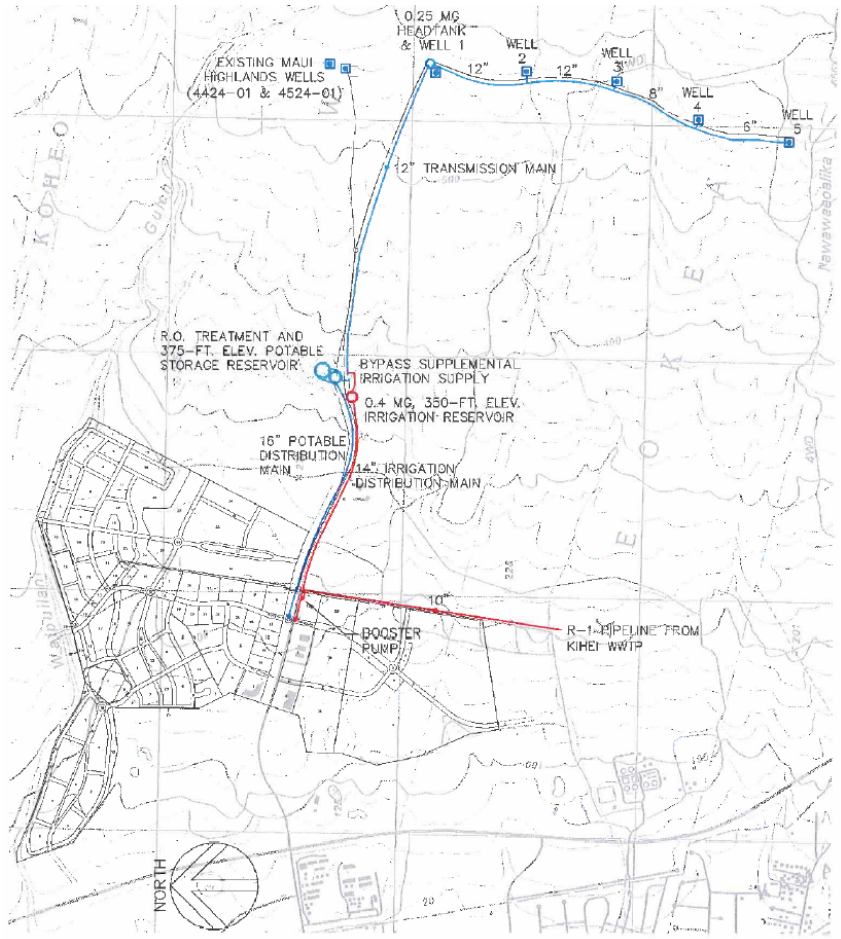

FIGURE 3-2a

Source: Tech Park FEIS V.3, Appx. F, Fig. 3-2a (citing Tom Nance Water Resource Engineering "Evaluation of Source Supply Alternatives for the Planned Expansion of the Maui Research and Technology Park" February 7, 2012).

The Tech Park's annual reports to the LUC in 2025 state the project is in compliance with conditions requiring that they "provide the necessary water source, storage, and transmission facilities and improvements to the satisfaction of the [Maui] DWS and/of [Department of Health] to service the Petition Area."[63] Petitioners requested Maui DWS provide public records of ongoing development of the Tech Park's water systems, particularly in regard to development of sources in Kama'ole ASA, but Maui DWS has not returned these records as of this writing.[64]

D. County's potential strategy of developing Kama'ole ASA constrained.

[63] Lipoa Investments LLC to D. Orodenker, Executive Director, LUC, Annual Report for Docket Nos. A84-585 & A10-787, at 1 (Aug. 6, 2025) *available at*: https://files.hawaii.gov/luc/dockets/a84-585/annual-reports/joint/2025.pdf.

[64] Petitioners submitted their request on December 3, 2025 pursuant to HRS chapter 92F. On December 10, 2025, Maui DWS acknowledged their request and stated a response would be forthcoming twenty days from December 3, 2025.

The Commission may consider whether the above-referenced projects, including pre-existing wells that would be pumped further in order to meet increased demand, may result in water withdrawals reaching or exceeding the 11 mgd Kama'ole ASA sustainable yield. HRS § 174C-44(1) & (8). In forming an opinion about these projects, the Commission may consider the County's pending water development plans.

The County considered multiple strategies to meet a projected additional 14 mgd demand from the Maui DWS Upcountry and Central Maui systems.[65] The County's preliminary strategies for meeting demand include Kama'ole ASA basal well development of brackish water for nonpotable uses for new development. This is expected to supply another 5 mgd.[66] Though it notes Kama'ole ASA brackish water is "appropriate for irrigation and other nonpotable uses", the County further states: "[r]eported pumpage incomplete to assess remaining yield."[67] Indeed, as discussed herein, existing and planned uses already exceed the sustainable yield of Kama'ole ASA even prior to accounting for County municipal water development.

VI. DECLINING GROUND WATER LEVELS

In considering a petition to designate Kama'ole ASA as a ground WMA, the Commission examines:

> Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels

HRS § 174C-44(3). Even where there was "no evidence for excessively declining ground water levels", the Commission found this criterion met in light of the U.S. Geological Survey's forecasts and limitations on data where only one deep monitoring well existed in the Lahaina aquifer sector.[68] For the Kama'ole ASA, the U.S. Geological Survey forecasts a decrease of -23 percent or -16 mgd in annual mean rainfall recharge for the (*see supra* Fig. XX) under the mid-century dry climate scenario. This reduction in recharge is likely to diminish groundwater supply in Kama'ole ASA.

Based on Commission data from the relatively-inland Waiohuli Observation Well No. 6-4422-001, there is a decreasing water level trend of 0.07 feet per year over the past 23 years.[69] In 2001 to 2003, the U.S. Geological Survey measured water levels in this well between +6 and +5 feet msl. Data from October 2018 to July 2023 show water levels ranging from +4.3 and +5 feet

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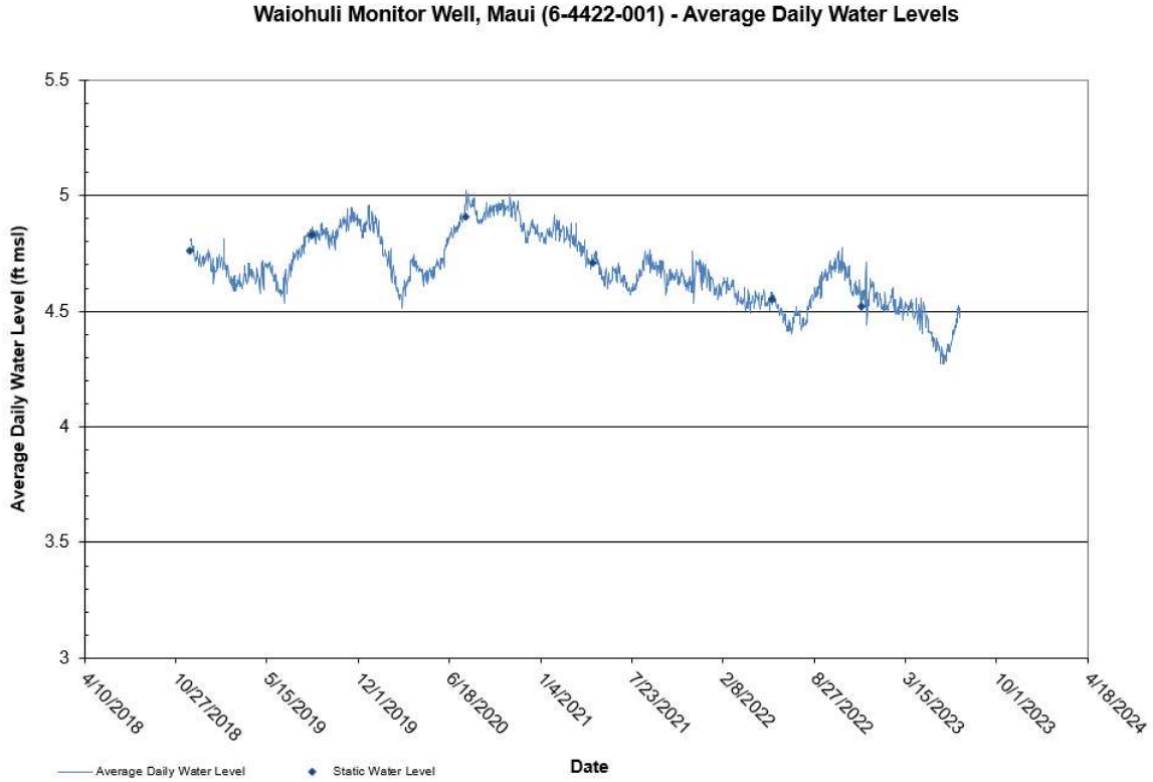
[65] Maui WUDP, Appx. B at 318.
[66] Maui WUDP, Appx. B at 319 (Preliminary strategies).
[67] Maui WUDP, Appx. B at 319 (Preliminary strategies).
[68] *In re Chairperson Recommendation to Designate Lahaina Aquifer Sector Area as Surface and Ground Water Management Areas,* Findings of Fact Report, §5.3.2.3 at 122 (Jun. 8, 2022) https://files.hawaii.gov/dlnr/cwrm/gwma/lahaina/20220608_Lahaina_FinalFOF.pdf.
[69] Mākena Mauka DEIS Appx. M at 38 (citing Stephen Gingerich and David Sherrod, "Drilling and Construction Data for the Waiohuli Exploratory Well (State Well 6-4421-01), Island of Maui, Hawaii, OFR 02-477," U.S Geological Survey in co-operation with Department of Hawaiian Home Lands (2002)); Ledcor Maui LP, Final Environmental Impact Statement for the Ledcor South Maui Properties and Improvements, Kamaole, Paeahu, Palauea, Maui, Hawai'i, Vol. 1, Appx. B at 32 (Feb. 23, 2025) *available at*: https://files.hawaii.gov/dbedt/erp/Doc_Library/2025-02-23-MA-FEIS-Ledcor-South-Maui-Properties-and-Improvements-Vol-I.pdf ("Ledcor FEIS").

msl.[70]

Fig. 10: Commission Waiohuli Monitoring Well Water Level Data through July 2023



Source: Akinaka & Associates, Mākena Mauka DEIS Appx. M at 39 (Exhibit 15).

Data collected from Maui Meadows Observation Well 6-4225-001 shows a similar trend to the Waiohuli monitoring well since 2020, except from a significant water level rise in the summer.[71]

A 0.07 foot per year water level decrease may indicate diminishing water resources and thereby constitute "excessively declining ground water levels" when considered in the context of the overall drying trend facing Kama'ole ASA and expected increased pumpage from the aquifer system. The Commission may determine the third criterion met. HRS § 174C-44(3).

VII. REQUESTED ACTION

Based on the foregoing, Petitioners respectfully request the Commission:

1. Initiate proceedings to designate the Kama'ole Aquifer System Area as a Ground Water Management Area pursuant to HRS §§174C-41 through -44;

2. Publish public notice and hold public hearings in the affected area as required by HAR §13-171-6;

[70] Mākena Mauka DEIS Appx. M at 39 (Exhibit 15. CWRM Waiohuli Monitor Well Water-Level Data through July 2023).

[71] Mākena Mauka DEIS Appx. M at 39 (citing exhibit 16).

3. Prepare findings regarding hydrologic stress, water use, sustainable yield, cultural impacts, and ecosystem needs; and,

4. Issue an order of designation subjecting all existing and new groundwater withdrawals in the Kama‘ole Aquifer System Area to the water-use permitting requirements of HRS §174C-48.

DATED: Kīhei, Maui, Hawai‘i February __, 2026

_____
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KĪHEI COMMUNITY ASSOCIATION

_____
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WAILEA808

VIII. REFERENCES

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	A	B	C	D	E	F	G
1	**Well.Number**	**Well.Name**	**Start.Date**	**End.Date**	**Days**	**Pumpage (mgd)**	**2024-25 avg (mgd)**
2	6-3725-002	Polena 1	12/1/2024	12/31/2024	31	0.0005	**0.0003**
3	6-3725-002	Polena 1	11/1/2024	11/30/2024	30	0.0002	
4	6-3725-002	Polena 1	10/1/2024	10/31/2024	31	0.0002	
5	6-3725-002	Polena 1	9/1/2024	9/30/2024	30	0.0006	
6	6-3725-002	Polena 1	8/1/2024	8/31/2024	31	0.0001	
7	6-3725-002	Polena 1	7/1/2024	7/31/2024	31	0.0002	
8	6-3725-002	Polena 1	6/1/2024	6/30/2024	30	0.0004	
9	6-3725-002	Polena 1	5/1/2024	5/31/2024	31	0.0001	
10	6-3725-002	Polena 1	4/1/2024	4/30/2024	30	0.0002	
11	6-3725-002	Polena 1	4/1/2024	4/30/2024	30	0.0002	
12	6-3725-002	Polena 1	3/1/2024	3/31/2024	31	0.0003	
13	6-3725-002	Polena 1	2/1/2024	2/29/2024	29	0.0004	
14	6-3725-002	Polena 1	1/1/2024	1/31/2024	31	0.0002	
15	6-3725-004	Polena 2A	3/1/2025	3/31/2025	31	0.0003	**0.0003**
16	6-3725-004	Polena 2A	2/1/2025	2/28/2025	28	0.0005	
17	6-3725-004	Polena 2A	1/1/2025	1/31/2025	31	0.0002	
18	6-3725-004	Polena 2A	12/1/2024	12/31/2024	31	0.0003	
19	6-3725-004	Polena 2A	11/1/2024	11/30/2024	30	0.0004	
20	6-3725-004	Polena 2A	10/1/2024	10/31/2024	31	0.0001	
21	6-3725-004	Polena 2A	9/1/2024	9/30/2024	30	0.0007	
22	6-3725-004	Polena 2A	8/1/2024	8/31/2024	31	0.0000	
23	6-3725-004	Polena 2A	7/1/2024	7/31/2024	31	0.0002	
24	6-3725-004	Polena 2A	6/1/2024	6/30/2024	30	0.0003	
25	6-3725-004	Polena 2A	5/1/2024	5/31/2024	31	0.0002	
26	6-3725-004	Polena 2A	4/1/2024	4/30/2024	30	0.0003	
27	6-3725-004	Polena 2A	4/1/2024	4/30/2024	30	0.0003	
28	6-3725-004	Polena 2A	3/1/2024	3/31/2024	31	0.0002	
29	6-3725-004	Polena 2A	2/1/2024	2/29/2024	29	0.0001	
30	6-3725-004	Polena 2A	1/1/2024	1/31/2024	31	0.0002	
31	6-3826-002	Seibu 3	3/1/2025	3/31/2025	31	0.3795	**0.3313**
32	6-3826-002	Seibu 3	2/1/2025	2/28/2025	28	0.2210	
33	6-3826-002	Seibu 3	1/1/2025	1/31/2025	31	0.2212	
34	6-3826-002	Seibu 3	12/1/2024	12/31/2024	31	0.2437	
35	6-3826-002	Seibu 3	11/1/2024	11/30/2024	30	0.3002	
36	6-3826-002	Seibu 3	10/1/2024	10/31/2024	31	0.3648	
37	6-3826-002	Seibu 3	9/1/2024	9/30/2024	30	0.3762	
38	6-3826-002	Seibu 3	8/1/2024	8/31/2024	31	0.4456	
39	6-3826-002	Seibu 3	7/1/2024	7/31/2024	31	0.5301	
40	6-3826-002	Seibu 3	6/1/2024	6/30/2024	30	0.4895	
41	6-3826-002	Seibu 3	5/1/2024	5/31/2024	31	0.3244	
42	6-3826-002	Seibu 3	4/1/2024	4/30/2024	30	0.5180	
43	6-3826-002	Seibu 3	3/1/2024	3/31/2024	31	0.3084	

APPENDIX "A"

	A	B	C	D	E	F	G
44	6-3826-002	Seibu 3	2/1/2024	2/29/2024	29	0.1677	
45	6-3826-002	Seibu 3	1/1/2024	1/31/2024	31	0.0789	
46	6-3826-003	Seibu 4	3/1/2025	3/31/2025	31	0.1213	**0.1237**
47	6-3826-003	Seibu 4	2/1/2025	2/28/2025	28	0.1149	
48	6-3826-003	Seibu 4	1/1/2025	1/31/2025	31	0.0327	
49	6-3826-003	Seibu 4	12/1/2024	12/31/2024	31	0.1281	
50	6-3826-003	Seibu 4	11/1/2024	11/30/2024	30	0.1314	
51	6-3826-003	Seibu 4	10/1/2024	10/31/2024	31	0.1092	
52	6-3826-003	Seibu 4	9/1/2024	9/30/2024	30	0.1917	
53	6-3826-003	Seibu 4	8/1/2024	8/31/2024	31	0.1199	
54	6-3826-003	Seibu 4	7/1/2024	7/31/2024	31	0.1373	
55	6-3826-003	Seibu 4	6/1/2024	6/30/2024	30	0.0776	
56	6-3826-003	Seibu 4	5/1/2024	5/31/2024	31	0.1462	
57	6-3826-003	Seibu 4	4/1/2024	4/30/2024	30	0.0522	
58	6-3826-003	Seibu 4	3/1/2024	3/31/2024	31	0.2019	
59	6-3826-003	Seibu 4	2/1/2024	2/29/2024	29	0.2090	
60	6-3826-003	Seibu 4	1/1/2024	1/31/2024	31	0.0820	
61	6-3920-001	Waikaalu Spring	3/1/2025	3/31/2025	31	0.0029	**0.0028**
62	6-3920-001	Waikaalu Spring	2/1/2025	2/28/2025	28	0.0035	
63	6-3920-001	Waikaalu Spring	1/1/2025	1/31/2025	31	0.0033	
64	6-3920-001	Waikaalu Spring	12/1/2024	12/31/2024	31	0.0029	
65	6-3920-001	Waikaalu Spring	11/1/2024	11/30/2024	30	0.0027	
66	6-3920-001	Waikaalu Spring	10/1/2024	10/31/2024	31	0.0023	
67	6-3920-001	Waikaalu Spring	9/1/2024	9/30/2024	30	0.0022	
68	6-3920-001	Waikaalu Spring	8/1/2024	8/31/2024	31	0.0017	
69	6-3920-001	Waikaalu Spring	7/1/2024	7/31/2024	31	0.0020	
70	6-3920-001	Waikaalu Spring	6/1/2024	6/30/2024	30	0.0026	
71	6-3920-001	Waikaalu Spring	5/1/2024	5/31/2024	31	0.0031	
72	6-3920-001	Waikaalu Spring	5/1/2024	5/31/2024	31	0.0031	
73	6-3920-001	Waikaalu Spring	4/1/2024	4/30/2024	30	0.0029	
74	6-3920-001	Waikaalu Spring	4/1/2024	4/30/2024	30	0.0029	
75	6-3920-001	Waikaalu Spring	3/1/2024	3/31/2024	31	0.0031	
76	6-3920-001	Waikaalu Spring	2/1/2024	2/29/2024	29	0.0031	
77	6-3920-001	Waikaalu Spring	1/1/2024	1/31/2024	31	0.0028	
78	6-3921-001	Waihou Spring	3/1/2025	3/31/2025	31	0.0046	**0.0059**
79	6-3921-001	Waihou Spring	2/1/2025	2/28/2025	28	0.0055	
80	6-3921-001	Waihou Spring	1/1/2025	1/31/2025	31	0.0054	
81	6-3921-001	Waihou Spring	12/1/2024	12/31/2024	31	0.0049	
82	6-3921-001	Waihou Spring	11/1/2024	11/30/2024	30	0.0057	
83	6-3921-001	Waihou Spring	10/1/2024	10/31/2024	31	0.0059	
84	6-3921-001	Waihou Spring	9/1/2024	9/30/2024	30	0.0067	
85	6-3921-001	Waihou Spring	8/1/2024	8/31/2024	31	0.0057	
86	6-3921-001	Waihou Spring	7/1/2024	7/31/2024	31	0.0061	
87	6-3921-001	Waihou Spring	6/1/2024	6/30/2024	30	0.0069	

APPENDIX "A"

	A	B	C	D	E	F	G
88	6-3921-001	Waihou Spring	5/1/2024	5/31/2024	31	0.0058	
89	6-3921-001	Waihou Spring	5/1/2024	5/31/2024	31	0.0058	
90	6-3921-001	Waihou Spring	4/1/2024	4/30/2024	30	0.0064	
91	6-3921-001	Waihou Spring	4/1/2024	4/30/2024	30	0.0064	
92	6-3921-001	Waihou Spring	3/1/2024	3/31/2024	31	0.0058	
93	6-3921-001	Waihou Spring	2/1/2024	2/29/2024	29	0.0069	
94	6-3921-001	Waihou Spring	1/1/2024	1/31/2024	31	0.0057	
95	6-3926-002	Makena 1	3/1/2025	3/31/2025	31	0.1288	**0.1151**
96	6-3926-002	Makena 1	2/1/2025	2/28/2025	28	0.0712	
97	6-3926-002	Makena 1	1/1/2025	1/31/2025	31	0.0711	
98	6-3926-002	Makena 1	12/1/2024	12/31/2024	31	0.0692	
99	6-3926-002	Makena 1	11/1/2024	11/30/2024	30	0.0997	
100	6-3926-002	Makena 1	10/1/2024	10/31/2024	31	0.0936	
101	6-3926-002	Makena 1	9/1/2024	9/30/2024	30	0.1194	
102	6-3926-002	Makena 1	8/1/2024	8/31/2024	31	0.0701	
103	6-3926-002	Makena 1	7/1/2024	7/31/2024	31	0.1326	
104	6-3926-002	Makena 1	6/1/2024	6/30/2024	30	0.0835	
105	6-3926-002	Makena 1	5/1/2024	5/31/2024	31	0.1110	
106	6-3926-002	Makena 1	4/1/2024	4/30/2024	30	0.1310	
107	6-3926-002	Makena 1	3/1/2024	3/31/2024	31	0.2558	
108	6-3926-002	Makena 1	2/1/2024	2/29/2024	29	0.2267	
109	6-3926-002	Makena 1	1/1/2024	1/31/2024	31	0.0623	
110	6-3926-003	Wailea 8	4/1/2025	4/30/2025	30	0.0000	**0.0029**
111	6-3926-003	Wailea 8	3/1/2025	3/31/2025	31	0.0001	
112	6-3926-003	Wailea 8	2/1/2025	2/28/2025	28	0.0001	
113	6-3926-003	Wailea 8	1/1/2025	1/31/2025	31	0.0001	
114	6-3926-003	Wailea 8	12/1/2024	12/31/2024	31	0.0131	
115	6-3926-003	Wailea 8	11/1/2024	11/30/2024	30	0.0023	
116	6-3926-003	Wailea 8	10/1/2024	10/31/2024	31	0.0000	
117	6-3926-003	Wailea 8	9/1/2024	9/30/2024	30	0.0001	
118	6-3926-003	Wailea 8	8/1/2024	8/31/2024	31	0.0026	
119	6-3926-003	Wailea 8	7/1/2024	7/31/2024	31	0.0039	
120	6-3926-003	Wailea 8	6/1/2024	6/30/2024	30	0.0050	
121	6-3926-003	Wailea 8	5/1/2024	5/31/2024	31	0.0037	
122	6-3926-003	Wailea 8	5/1/2024	5/31/2024	31	0.0037	
123	6-3926-003	Wailea 8	4/1/2024	4/30/2024	30	0.0040	
124	6-3926-003	Wailea 8	4/1/2024	4/30/2024	30	0.0040	
125	6-3926-003	Wailea 8	3/1/2024	3/31/2024	31	0.0097	
126	6-3926-003	Wailea 8	2/1/2024	2/29/2024	29	0.0000	
127	6-3926-003	Wailea 8	1/1/2024	1/31/2024	31	0.0002	
128	6-3926-004	Seibu 5	3/1/2025	3/31/2025	31	0.2083	**0.1611**
129	6-3926-004	Seibu 5	2/1/2025	2/28/2025	28	0.1191	
130	6-3926-004	Seibu 5	1/1/2025	1/31/2025	31	0.0717	
131	6-3926-004	Seibu 5	12/1/2024	12/31/2024	31	0.1373	

APPENDIX "A"

	A	B	C	D	E	F	G
132	6-3926-004	Seibu 5	11/1/2024	11/30/2024	30	0.1582	
133	6-3926-004	Seibu 5	10/1/2024	10/31/2024	31	0.1829	
134	6-3926-004	Seibu 5	9/1/2024	9/30/2024	30	0.1939	
135	6-3926-004	Seibu 5	8/1/2024	8/31/2024	31	0.1956	
136	6-3926-004	Seibu 5	7/1/2024	7/31/2024	31	0.2257	
137	6-3926-004	Seibu 5	6/1/2024	6/30/2024	30	0.1792	
138	6-3926-004	Seibu 5	5/1/2024	5/31/2024	31	0.1781	
139	6-3926-004	Seibu 5	4/1/2024	4/30/2024	30	0.2121	
140	6-3926-004	Seibu 5	3/1/2024	3/31/2024	31	0.1713	
141	6-3926-004	Seibu 5	2/1/2024	2/29/2024	29	0.1403	
142	6-3926-004	Seibu 5	1/1/2024	1/31/2024	31	0.0423	
143	6-3926-005	Seibu 6	3/1/2025	3/31/2025	31	0.0889	0.0881
144	6-3926-005	Seibu 6	2/1/2025	2/28/2025	28	0.0778	
145	6-3926-005	Seibu 6	1/1/2025	1/31/2025	31	0.0559	
146	6-3926-005	Seibu 6	12/1/2024	12/31/2024	31	0.0817	
147	6-3926-005	Seibu 6	11/1/2024	11/30/2024	30	0.1116	
148	6-3926-005	Seibu 6	10/1/2024	10/31/2024	31	0.1140	
149	6-3926-005	Seibu 6	9/1/2024	9/30/2024	30	0.1246	
150	6-3926-005	Seibu 6	8/1/2024	8/31/2024	31	0.0707	
151	6-3926-005	Seibu 6	7/1/2024	7/31/2024	31	0.1140	
152	6-3926-005	Seibu 6	6/1/2024	6/30/2024	30	0.0832	
153	6-3926-005	Seibu 6	5/1/2024	5/31/2024	31	0.0889	
154	6-3926-005	Seibu 6	4/1/2024	4/30/2024	30	0.0921	
155	6-3926-005	Seibu 6	3/1/2024	3/31/2024	31	0.0871	
156	6-3926-005	Seibu 6	2/1/2024	2/29/2024	29	0.0882	
157	6-3926-005	Seibu 6	1/1/2024	1/31/2024	31	0.0429	
158	6-3926-011	Makena Surf	3/1/2025	3/31/2025	31	0.0000	0.0003
159	6-3926-011	Makena Surf	2/1/2024	2/29/2024	29	0.0002	
160	6-3926-011	Makena Surf	1/1/2024	1/31/2024	31	0.0008	
161	6-4021-001	Waikaahi Tunn	3/1/2025	3/31/2025	31	0.0045	0.0046
162	6-4021-001	Waikaahi Tunn	2/1/2025	2/28/2025	28	0.0053	
163	6-4021-001	Waikaahi Tunn	1/1/2025	1/31/2025	31	0.0051	
164	6-4021-001	Waikaahi Tunn	12/1/2024	12/31/2024	31	0.0048	
165	6-4021-001	Waikaahi Tunn	11/1/2024	11/30/2024	30	0.0044	
166	6-4021-001	Waikaahi Tunn	10/1/2024	10/31/2024	31	0.0040	
167	6-4021-001	Waikaahi Tunn	9/1/2024	9/30/2024	30	0.0032	
168	6-4021-001	Waikaahi Tunn	8/1/2024	8/31/2024	31	0.0034	
169	6-4021-001	Waikaahi Tunn	7/1/2024	7/31/2024	31	0.0039	
170	6-4021-001	Waikaahi Tunn	6/1/2024	6/30/2024	30	0.0042	
171	6-4021-001	Waikaahi Tunn	5/1/2024	5/31/2024	31	0.0054	
172	6-4021-001	Waikaahi Tunn	5/1/2024	5/31/2024	31	0.0054	
173	6-4021-001	Waikaahi Tunn	4/1/2024	4/30/2024	30	0.0054	
174	6-4021-001	Waikaahi Tunn	4/1/2024	4/30/2024	30	0.0054	
175	6-4021-001	Waikaahi Tunn	3/1/2024	3/31/2024	31	0.0048	

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176	6-4021-001	Waikaahi Tunn	2/1/2024	2/29/2024	29	0.0055	
177	6-4021-001	Waikaahi Tunn	1/1/2024	1/31/2024	31	0.0041	
178	6-4026-006	Wailea 7	4/1/2025	4/30/2025	30	0.4855	0.5573
179	6-4026-006	Wailea 7	3/1/2025	3/31/2025	31	0.5621	
180	6-4026-006	Wailea 7	2/1/2025	2/28/2025	28	0.3968	
181	6-4026-006	Wailea 7	1/1/2025	1/31/2025	31	0.3870	
182	6-4026-006	Wailea 7	12/1/2024	12/31/2024	31	0.6499	
183	6-4026-006	Wailea 7	11/1/2024	11/30/2024	30	0.6717	
184	6-4026-006	Wailea 7	10/1/2024	10/31/2024	31	0.6508	
185	6-4026-006	Wailea 7	9/1/2024	9/30/2024	30	0.7033	
186	6-4026-006	Wailea 7	8/1/2024	8/31/2024	31	0.6414	
187	6-4026-006	Wailea 7	7/1/2024	7/31/2024	31	0.6455	
188	6-4026-006	Wailea 7	6/1/2024	6/30/2024	30	0.5597	
189	6-4026-006	Wailea 7	5/1/2024	5/31/2024	31	0.5903	
190	6-4026-006	Wailea 7	5/1/2024	5/31/2024	31	0.5903	
191	6-4026-006	Wailea 7	4/1/2024	4/30/2024	30	0.6134	
192	6-4026-006	Wailea 7	4/1/2024	4/30/2024	30	0.6134	
193	6-4026-006	Wailea 7	3/1/2024	3/31/2024	31	0.5814	
194	6-4026-006	Wailea 7	2/1/2024	2/29/2024	29	0.4813	
195	6-4026-006	Wailea 7	1/1/2024	1/31/2024	31	0.2071	
196	6-4026-007	Wailea 6A	6/1/2024	6/30/2024	30	0.4383	0.4022
197	6-4026-007	Wailea 6A	5/1/2024	5/31/2024	31	0.5010	
198	6-4026-007	Wailea 6A	5/1/2024	5/31/2024	31	0.5010	
199	6-4026-007	Wailea 6A	4/1/2024	4/30/2024	30	0.4870	
200	6-4026-007	Wailea 6A	4/1/2024	4/30/2024	30	0.4870	
201	6-4026-007	Wailea 6A	3/1/2024	3/31/2024	31	0.4821	
202	6-4026-007	Wailea 6A	2/1/2024	2/29/2024	29	0.1133	
203	6-4026-007	Wailea 6A	1/1/2024	1/31/2024	31	0.2079	
204	6-4126-003	Wailea 3	4/1/2025	4/30/2025	30	0.4176	0.3546
205	6-4126-003	Wailea 3	3/1/2025	3/31/2025	31	0.3899	
206	6-4126-003	Wailea 3	2/1/2025	2/28/2025	28	0.1848	
207	6-4126-003	Wailea 3	1/1/2025	1/31/2025	31	0.1808	
208	6-4126-003	Wailea 3	12/1/2024	12/31/2024	31	0.3498	
209	6-4126-003	Wailea 3	11/1/2024	11/30/2024	30	0.3732	
210	6-4126-003	Wailea 3	10/1/2024	10/31/2024	31	0.4255	
211	6-4126-003	Wailea 3	9/1/2024	9/30/2024	30	0.4467	
212	6-4126-003	Wailea 3	8/1/2024	8/31/2024	31	0.4428	
213	6-4126-003	Wailea 3	7/1/2024	7/31/2024	31	0.2997	
214	6-4126-003	Wailea 3	6/1/2024	6/30/2024	30	0.5242	
215	6-4126-003	Wailea 3	5/1/2024	5/31/2024	31	0.3289	
216	6-4126-003	Wailea 3	5/1/2024	5/31/2024	31	0.3289	
217	6-4126-003	Wailea 3	4/1/2024	4/30/2024	30	0.4572	
218	6-4126-003	Wailea 3	4/1/2024	4/30/2024	30	0.4572	
219	6-4126-003	Wailea 3	3/1/2024	3/31/2024	31	0.3961	

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220	6-4126-003	Wailea 3	2/1/2024	2/29/2024	29	0.2622	
221	6-4126-003	Wailea 3	1/1/2024	1/31/2024	31	0.1175	
222	6-4126-004	Grand Wailea S	2/1/2025	2/28/2025	28	0.0383	**0.0287**
223	6-4126-004	Grand Wailea S	1/1/2025	1/31/2025	31	0.0370	
224	6-4126-004	Grand Wailea S	12/1/2024	12/31/2024	31	0.0333	
225	6-4126-004	Grand Wailea S	11/1/2024	11/30/2024	30	0.0370	
226	6-4126-004	Grand Wailea S	10/1/2024	10/31/2024	31	0.0401	
227	6-4126-004	Grand Wailea S	9/1/2024	9/30/2024	30	0.0402	
228	6-4126-004	Grand Wailea S	7/1/2024	8/31/2024	62	0.0423	
229	6-4126-004	Grand Wailea S	6/1/2024	6/30/2024	30	0.0057	
230	6-4126-004	Grand Wailea S	5/1/2024	5/31/2024	31	0.0311	
231	6-4126-004	Grand Wailea S	5/1/2024	5/31/2024	31	0.0311	
232	6-4126-004	Grand Wailea S	3/1/2024	4/30/2024	61	0.0094	
233	6-4126-004	Grand Wailea S	2/1/2024	2/29/2024	29	0.0036	
234	6-4126-004	Grand Wailea S	1/1/2024	1/31/2024	31	0.0240	
235	6-4126-005	Wailea Ike Irr	3/5/2025	4/1/2025	28	0.0000	**0.0008**
236	6-4126-005	Wailea Ike Irr	2/5/2025	3/4/2025	28	0.0000	
237	6-4126-005	Wailea Ike Irr	10/5/2024	11/5/2024	32	0.0002	
238	6-4126-005	Wailea Ike Irr	12/2/2023	1/10/2024	40	0.0028	
239	6-4126-006	Wailea 2A	4/1/2025	4/30/2025	30	0.3209	**0.2384**
240	6-4126-006	Wailea 2A	3/1/2025	3/31/2025	31	0.3697	
241	6-4126-006	Wailea 2A	2/1/2025	2/28/2025	28	0.2851	
242	6-4126-006	Wailea 2A	1/1/2025	1/31/2025	31	0.2222	
243	6-4126-006	Wailea 2A	12/1/2024	12/31/2024	31	0.3231	
244	6-4126-006	Wailea 2A	11/1/2024	11/30/2024	30	0.3961	
245	6-4126-006	Wailea 2A	10/1/2024	10/31/2024	31	0.4000	
246	6-4126-006	Wailea 2A	9/1/2024	9/30/2024	30	0.3285	
247	6-4126-006	Wailea 2A	8/1/2024	8/31/2024	31	0.3748	
248	6-4126-006	Wailea 2A	7/1/2024	7/31/2024	31	0.4166	
249	6-4126-006	Wailea 2A	6/1/2024	6/30/2024	30	0.3007	
250	6-4126-006	Wailea 2A	5/1/2024	5/31/2024	31	0.1028	
251	6-4126-006	Wailea 2A	5/1/2024	5/31/2024	31	0.1028	
252	6-4126-006	Wailea 2A	4/1/2024	4/30/2024	30	0.1057	
253	6-4126-006	Wailea 2A	4/1/2024	4/30/2024	30	0.1057	
254	6-4126-006	Wailea 2A	3/1/2024	3/31/2024	31	0.1287	
255	6-4126-006	Wailea 2A	2/1/2024	2/29/2024	29	0.0087	
256	6-4126-006	Wailea 2A	1/1/2024	1/31/2024	31	0.0000	
257	6-4226-003	Tmk 2-1-10-04	3/14/2025	4/16/2025	34	0.0015	**0.0028**
258	6-4226-003	Tmk 2-1-10-04	2/14/2025	3/13/2025	28	0.0008	
259	6-4226-003	Tmk 2-1-10-04	1/15/2025	2/13/2025	30	0.0027	
260	6-4226-003	Tmk 2-1-10-04	12/17/2024	1/14/2025	29	0.0019	
261	6-4226-003	Tmk 2-1-10-04	11/16/2024	12/16/2024	31	0.0027	
262	6-4226-003	Tmk 2-1-10-04	10/17/2024	11/15/2024	30	0.0029	
263	6-4226-003	Tmk 2-1-10-04	9/16/2024	10/16/2024	31	0.0029	

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264	6-4226-003	Tmk 2-1-10-04	8/9/2024	9/15/2024	38	0.0047	
265	6-4226-003	Tmk 2-1-10-04	7/16/2024	8/8/2024	24	0.0046	
266	6-4226-003	Tmk 2-1-10-04	6/11/2024	7/15/2024	35	0.0044	
267	6-4226-003	Tmk 2-1-10-04	5/16/2024	6/10/2024	26	0.0035	
268	6-4226-003	Tmk 2-1-10-04	5/16/2024	6/10/2024	26	0.0035	
269	6-4226-003	Tmk 2-1-10-04	4/12/2024	5/15/2024	34	0.0025	
270	6-4226-003	Tmk 2-1-10-04	4/12/2024	5/15/2024	34	0.0025	
271	6-4226-003	Tmk 2-1-10-04	3/14/2024	4/11/2024	29	0.0027	
272	6-4226-003	Tmk 2-1-10-04	2/8/2024	3/13/2024	35	0.0020	
273	6-4226-003	Tmk 2-1-10-04	12/12/2023	2/7/2024	58	0.0013	
274	6-4226-012	Wailea 5	4/1/2025	4/30/2025	30	0.2193	**0.1951**
275	6-4226-012	Wailea 5	3/1/2025	3/31/2025	31	0.2575	
276	6-4226-012	Wailea 5	2/1/2025	2/28/2025	28	0.2003	
277	6-4226-012	Wailea 5	1/1/2025	1/31/2025	31	0.1679	
278	6-4226-012	Wailea 5	12/1/2024	12/31/2024	31	0.2207	
279	6-4226-012	Wailea 5	11/1/2024	11/30/2024	30	0.2675	
280	6-4226-012	Wailea 5	10/1/2024	10/31/2024	31	0.2678	
281	6-4226-012	Wailea 5	9/1/2024	9/30/2024	30	0.3530	
282	6-4226-012	Wailea 5	8/1/2024	8/31/2024	31	0.3139	
283	6-4226-012	Wailea 5	7/1/2024	7/31/2024	31	0.2735	
284	6-4226-012	Wailea 5	6/1/2024	6/30/2024	30	0.2100	
285	6-4226-012	Wailea 5	5/1/2024	5/31/2024	31	0.1729	
286	6-4226-012	Wailea 5	5/1/2024	5/31/2024	31	0.1729	
287	6-4226-012	Wailea 5	4/1/2024	4/30/2024	30	0.1284	
288	6-4226-012	Wailea 5	4/1/2024	4/30/2024	30	0.1284	
289	6-4226-012	Wailea 5	3/1/2024	3/31/2024	31	0.0799	
290	6-4226-012	Wailea 5	2/1/2024	2/29/2024	29	0.0654	
291	6-4226-012	Wailea 5	1/1/2024	1/31/2024	31	0.0121	
292	6-4226-013	Wailea 9	6/1/2024	6/30/2024	30	0.3946	**0.3331**
293	6-4226-013	Wailea 9	5/1/2024	5/31/2024	31	0.3716	
294	6-4226-013	Wailea 9	5/1/2024	5/31/2024	31	0.3716	
295	6-4226-013	Wailea 9	4/1/2024	4/30/2024	30	0.2639	
296	6-4226-013	Wailea 9	4/1/2024	4/30/2024	30	0.2639	
297	6-4226-014	Wailea 10	4/1/2025	4/30/2025	30	0.4557	**0.4324**
298	6-4226-014	Wailea 10	3/1/2025	3/31/2025	31	0.4975	
299	6-4226-014	Wailea 10	2/1/2025	2/28/2025	28	0.5086	
300	6-4226-014	Wailea 10	1/1/2025	1/31/2025	31	0.4321	
301	6-4226-014	Wailea 10	12/1/2024	12/31/2024	31	0.4562	
302	6-4226-014	Wailea 10	11/1/2024	11/30/2024	30	0.5366	
303	6-4226-014	Wailea 10	10/1/2024	10/31/2024	31	0.5151	
304	6-4226-014	Wailea 10	9/1/2024	9/30/2024	30	0.6093	
305	6-4226-014	Wailea 10	8/1/2024	8/31/2024	31	0.5579	
306	6-4226-014	Wailea 10	7/8/2024	7/31/2024	24	0.6214	
307	6-4226-014	Wailea 10	4/1/2024	4/30/2024	30	0.2626	

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308	6-4226-014	Wailea 10	4/1/2024	4/30/2024	30	0.2626	
309	6-4226-014	Wailea 10	3/1/2024	3/31/2024	31	0.3735	
310	6-4226-014	Wailea 10	2/1/2024	2/29/2024	29	0.2798	
311	6-4226-014	Wailea 10	1/1/2024	1/31/2024	31	0.1175	
312	6-4226-015	Hale Kamaole	11/21/2024	3/27/2025	127	0.0251	0.0254
313	6-4226-015	Hale Kamaole	8/6/2024	11/20/2024	107	0.0258	
314	6-4226-016	Maui Kamaole A	4/4/2025	5/2/2025	29	0.2216	0.1353
315	6-4226-016	Maui Kamaole A	3/3/2025	4/3/2025	32	0.1924	
316	6-4226-016	Maui Kamaole A	2/1/2025	2/28/2025	28	0.2089	
317	6-4226-016	Maui Kamaole A	12/3/2024	1/2/2025	31	0.1752	
318	6-4226-016	Maui Kamaole A	11/2/2024	12/2/2024	31	0.1681	
319	6-4226-016	Maui Kamaole A	10/4/2024	11/1/2024	29	0.1621	
320	6-4226-016	Maui Kamaole A	9/4/2024	10/3/2024	30	0.1567	
321	6-4226-016	Maui Kamaole A	8/2/2024	9/3/2024	33	0.1351	
322	6-4226-016	Maui Kamaole A	7/2/2024	8/1/2024	31	0.1340	
323	6-4226-016	Maui Kamaole A	6/5/2024	7/1/2024	27	0.1430	
324	6-4226-016	Maui Kamaole A	5/2/2024	6/4/2024	34	0.1064	
325	6-4226-016	Maui Kamaole A	5/2/2024	6/4/2024	34	0.1064	
326	6-4226-016	Maui Kamaole A	4/2/2024	5/1/2024	30	0.0779	
327	6-4226-016	Maui Kamaole A	4/2/2024	5/1/2024	30	0.0779	
328	6-4226-016	Maui Kamaole A	3/5/2024	4/1/2024	28	0.1102	
329	6-4226-016	Maui Kamaole A	2/2/2024	3/4/2024	32	0.0843	
330	6-4226-016	Maui Kamaole A	1/5/2024	2/1/2024	28	0.0959	
331	6-4226-016	Maui Kamaole A	11/4/2023	1/4/2024	62	0.0787	
332	6-4226-017	Kamaole Sands	3/27/2025	4/30/2025	35	0.0573	0.0405
333	6-4226-017	Kamaole Sands	2/26/2025	3/26/2025	29	0.0336	
334	6-4226-017	Kamaole Sands	1/11/2025	2/25/2025	46	0.0302	
335	6-4226-017	Kamaole Sands	9/14/2024	11/27/2024	75	0.0291	
336	6-4226-017	Kamaole Sands	6/6/2024	9/13/2024	100	0.0491	
337	6-4226-017	Kamaole Sands	4/26/2024	6/5/2024	41	0.0481	
338	6-4226-017	Kamaole Sands	4/26/2024	6/5/2024	41	0.0481	
339	6-4226-017	Kamaole Sands	3/12/2024	4/25/2024	45	0.0490	
340	6-4226-017	Kamaole Sands	1/16/2024	3/11/2024	56	0.0292	
341	6-4226-017	Kamaole Sands	12/1/2023	1/15/2024	46	0.0310	
342	6-4226-018	Maui Hill AOA	11/23/2024	4/2/2025	131	0.0328	0.0536
343	6-4226-018	Maui Hill AOA	7/2/2024	11/22/2024	144	0.0561	
344	6-4226-018	Maui Hill AOA	12/27/2023	3/25/2024	90	0.0720	
345	6-4326-011	Ocean Villas	2/8/2025	3/6/2025	27	0.0872	0.0755
346	6-4326-011	Ocean Villas	1/8/2025	2/7/2025	31	0.0606	
347	6-4326-011	Ocean Villas	12/7/2024	1/7/2025	32	0.0927	
348	6-4326-011	Ocean Villas	11/8/2024	12/6/2024	29	0.0677	
349	6-4326-011	Ocean Villas	10/5/2024	11/7/2024	34	0.1037	
350	6-4326-011	Ocean Villas	9/7/2024	10/4/2024	28	0.1009	
351	6-4326-011	Ocean Villas	8/6/2024	9/6/2024	32	0.0774	

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352	6-4326-011	Ocean Villas	7/6/2024	8/5/2024	31	0.0843	
353	6-4326-011	Ocean Villas	6/8/2024	7/5/2024	28	0.0599	
354	6-4326-011	Ocean Villas	5/2/2024	6/7/2024	37	0.0667	
355	6-4326-011	Ocean Villas	5/2/2024	6/7/2024	37	0.0667	
356	6-4326-011	Ocean Villas	4/2/2024	5/1/2024	30	0.0915	
357	6-4326-011	Ocean Villas	4/2/2024	5/1/2024	30	0.0915	
358	6-4326-011	Ocean Villas	3/2/2024	4/1/2024	31	0.0784	
359	6-4326-011	Ocean Villas	2/8/2024	3/1/2024	23	0.0643	
360	6-4326-011	Ocean Villas	1/18/2024	2/7/2024	21	0.0238	
361	6-4326-011	Ocean Villas	12/2/2023	1/17/2024	47	0.0658	
362	6-4326-012	Moana Estates	3/1/2025	3/31/2025	31	0.0124	0.0288
363	6-4326-012	Moana Estates	2/1/2025	2/28/2025	28	0.0294	
364	6-4326-012	Moana Estates	1/1/2025	1/31/2025	31	0.0171	
365	6-4326-012	Moana Estates	12/1/2024	12/31/2024	31	0.0610	
366	6-4326-012	Moana Estates	11/1/2024	11/30/2024	30	0.0325	
367	6-4326-012	Moana Estates	10/1/2024	10/31/2024	31	0.0379	
368	6-4326-012	Moana Estates	9/1/2024	9/30/2024	30	0.0279	
369	6-4326-012	Moana Estates	8/1/2024	8/31/2024	31	0.0352	
370	6-4326-012	Moana Estates	6/28/2024	7/31/2024	34	0.0327	
371	6-4326-012	Moana Estates	5/31/2024	6/27/2024	28	0.0353	
372	6-4326-012	Moana Estates	5/1/2024	5/30/2024	30	0.0020	
373	6-4326-012	Moana Estates	4/2/2024	4/30/2024	29	0.0227	
374	6-4326-014	Wailea Inn	2/1/2024	2/18/2024	18	0.0010	0.0010
375	6-4424-001	Keokea Highlan	1/1/2025	1/31/2025	31	0.0000	0.0039
376	6-4424-001	Keokea Highlan	11/27/2024	12/23/2024	27	0.0001	
377	6-4424-001	Keokea Highlan	10/29/2024	11/26/2024	29	0.0002	
378	6-4424-001	Keokea Highlan	9/24/2024	10/28/2024	35	0.0003	
379	6-4424-001	Keokea Highlan	8/28/2024	9/23/2024	27	0.0002	
380	6-4424-001	Keokea Highlan	7/29/2024	8/27/2024	30	0.0004	
381	6-4424-001	Keokea Highlan	6/25/2024	7/28/2024	34	0.0001	
382	6-4424-001	Keokea Highlan	5/29/2024	6/24/2024	27	0.0056	
383	6-4424-001	Keokea Highlan	5/1/2024	5/28/2024	28	0.0065	
384	6-4424-001	Keokea Highlan	2/28/2024	3/25/2024	27	0.0097	
385	6-4424-001	Keokea Highlan	1/26/2024	2/27/2024	33	0.0026	
386	6-4424-001	Keokea Highlan	12/27/2023	1/25/2024	30	0.0207	
387	6-4425-001	Keokea Highlan	4/2/2025	4/30/2025	29	0.0338	0.0250
388	6-4425-001	Keokea Highlan	3/1/2025	3/31/2025	31	0.0265	
389	6-4425-001	Keokea Highlan	2/1/2025	2/28/2025	28	0.0200	
390	6-4425-001	Keokea Highlan	1/1/2025	1/31/2025	31	0.0199	
391	6-4425-001	Keokea Highlan	11/27/2024	12/23/2024	27	0.0179	
392	6-4425-001	Keokea Highlan	10/29/2024	11/26/2024	29	0.0161	
393	6-4425-001	Keokea Highlan	10/24/2024	10/28/2024	5	0.1034	
394	6-4425-001	Keokea Highlan	8/28/2024	9/23/2024	27	0.0189	
395	6-4425-001	Keokea Highlan	7/30/2024	8/27/2024	29	0.0222	

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	A	B	C	D	E	F	G
396	6-4425-001	Keokea Highlan	6/25/2024	7/29/2024	35	0.0199	
397	6-4425-001	Keokea Highlan	5/29/2024	6/24/2024	27	0.0185	
398	6-4425-001	Keokea Highlan	5/1/2024	5/28/2024	28	0.0088	
399	6-4425-001	Keokea Highlan	2/28/2024	3/25/2024	27	0.0109	
400	6-4425-001	Keokea Highlan	1/26/2024	2/27/2024	33	0.0184	
401	6-4425-001	Keokea Highlan	12/27/2023	1/25/2024	30	0.0204	
402	6-4427-009	Kihei Baptist Ch	4/1/2025	4/30/2025	30	0.0014	0.0016
403	6-4427-009	Kihei Baptist Ch	3/1/2025	3/31/2025	31	0.0014	
404	6-4427-009	Kihei Baptist Ch	1/28/2025	2/24/2025	28	0.0015	
405	6-4427-009	Kihei Baptist Ch	1/1/2025	1/27/2025	27	0.0016	
406	6-4427-009	Kihei Baptist Ch	11/1/2024	11/29/2024	29	0.0017	
407	6-4427-009	Kihei Baptist Ch	10/1/2024	10/31/2024	31	0.0015	
408	6-4427-009	Kihei Baptist Ch	8/27/2024	9/30/2024	35	0.0014	
409	6-4427-009	Kihei Baptist Ch	8/6/2024	8/26/2024	21	0.0025	
410	6-4427-009	Kihei Baptist Ch	7/11/2024	8/5/2024	26	0.0017	
411	6-4427-009	Kihei Baptist Ch	5/30/2024	7/10/2024	42	0.0012	
412	6-4427-009	Kihei Baptist Ch	5/1/2024	5/29/2024	29	0.0014	
413	6-4427-009	Kihei Baptist Ch	5/1/2024	5/29/2024	29	0.0014	
414	6-4427-009	Kihei Baptist Ch	4/4/2024	4/30/2024	27	0.0017	
415	6-4427-009	Kihei Baptist Ch	4/4/2024	4/30/2024	27	0.0017	
416	6-4427-009	Kihei Baptist Ch	3/5/2024	4/2/2024	29	0.0016	
417	6-4427-009	Kihei Baptist Ch	1/31/2024	3/4/2024	34	0.0015	
418	6-4427-009	Kihei Baptist Ch	1/10/2024	1/30/2024	21	0.0019	
419	6-4427-009	Kihei Baptist Ch	11/29/2023	1/9/2024	42	0.0012	
420	6-4526-002	Kihei HS-1	3/29/2025	4/25/2025	28	0.0338	0.0554
421	6-4526-002	Kihei HS-1	3/1/2025	3/28/2025	28	0.0441	
422	6-4526-002	Kihei HS-1	1/3/2025	2/28/2025	57	0.0559	
423	6-4526-002	Kihei HS-1	12/3/2024	1/2/2025	31	0.0609	
424	6-4526-002	Kihei HS-1	11/7/2024	12/2/2024	26	0.0703	
425	6-4526-002	Kihei HS-1	10/1/2024	11/6/2024	37	0.0462	
426	6-4526-002	Kihei HS-1	8/13/2024	8/30/2024	18	0.0496	
427	6-4526-002	Kihei HS-1	7/6/2024	8/12/2024	38	0.0542	
428	6-4526-002	Kihei HS-1	6/1/2024	7/5/2024	35	0.0737	
429	6-4526-002	Kihei HS-1	5/2/2024	5/31/2024	30	0.0527	
430	6-4526-002	Kihei HS-1	5/2/2024	5/31/2024	30	0.0527	
431	6-4526-002	Kihei HS-1	4/2/2024	5/1/2024	30	0.0636	
432	6-4526-002	Kihei HS-1	4/2/2024	5/1/2024	30	0.0636	
433	6-4526-002	Kihei HS-1	3/1/2024	4/1/2024	32	0.0704	
434	6-4526-002	Kihei HS-1	2/1/2024	2/29/2024	29	0.0391	
435	6-4526-002	Kihei HS-1	1/3/2024	1/31/2024	29	0.0577	
436	6-4526-002	Kihei HS-1	12/1/2023	1/2/2024	33	0.0533	
437	6-4526-003	KHS-2	3/29/2025	4/25/2025	28	0.0698	0.0685
438	6-4526-003	KHS-2	3/1/2025	3/28/2025	28	0.0894	
439	6-4526-003	KHS-2	1/3/2025	2/28/2025	57	0.0527	

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	A	B	C	D	E	F	G
440	6-4526-003	KHS-2	12/3/2024	1/2/2025	31	0.0708	
441	6-4526-003	KHS-2	11/7/2024	12/2/2024	26	0.0922	
442	6-4526-003	KHS-2	10/1/2024	11/6/2024	37	0.0693	
443	6-4526-003	KHS-2	8/13/2024	8/30/2024	18	0.0670	
444	6-4526-003	KHS-2	7/6/2024	8/12/2024	38	0.0761	
445	6-4526-003	KHS-2	6/1/2024	7/5/2024	35	0.0810	
446	6-4526-003	KHS-2	5/2/2024	5/31/2024	30	0.0701	
447	6-4526-003	KHS-2	5/2/2024	5/31/2024	30	0.0701	
448	6-4526-003	KHS-2	4/2/2024	5/1/2024	30	0.0690	
449	6-4526-003	KHS-2	4/2/2024	5/1/2024	30	0.0690	
450	6-4526-003	KHS-2	3/1/2024	4/1/2024	32	0.0655	
451	6-4526-003	KHS-2	2/1/2024	2/29/2024	29	0.0360	
452	6-4526-003	KHS-2	1/3/2024	1/31/2024	29	0.0542	
453	6-4526-003	KHS-2	12/1/2023	1/2/2024	33	0.0624	
454	6-4527-002	Tmk 3-9-02-32	3/1/2025	3/31/2025	31	0.0536	0.0614
455	6-4527-002	Tmk 3-9-02-32	2/1/2025	2/28/2025	28	0.0570	
456	6-4527-002	Tmk 3-9-02-32	1/2/2025	1/31/2025	30	0.0598	
457	6-4527-002	Tmk 3-9-02-32	12/1/2024	12/31/2024	31	0.0536	
458	6-4527-002	Tmk 3-9-02-32	11/1/2024	11/30/2024	30	0.0532	
459	6-4527-002	Tmk 3-9-02-32	10/1/2024	10/31/2024	31	0.0536	
460	6-4527-002	Tmk 3-9-02-32	9/1/2024	9/30/2024	30	0.0665	
461	6-4527-002	Tmk 3-9-02-32	8/1/2024	8/31/2024	31	0.0697	
462	6-4527-002	Tmk 3-9-02-32	7/1/2024	7/31/2024	31	0.0751	
463	6-4527-002	Tmk 3-9-02-32	6/1/2024	6/30/2024	30	0.0693	
464	6-4527-002	Tmk 3-9-02-32	5/1/2024	5/31/2024	31	0.0697	
465	6-4527-002	Tmk 3-9-02-32	4/1/2024	4/30/2024	30	0.0554	
466	6-4527-008	Kihei-Piilani	2/27/2025	4/14/2025	47	0.0157	0.0089
467	6-4527-008	Kihei-Piilani	1/17/2025	2/26/2025	41	0.0032	
468	6-4527-008	Kihei-Piilani	12/13/2024	1/16/2025	35	0.0057	
469	6-4527-008	Kihei-Piilani	10/16/2024	12/12/2024	58	0.0087	
470	6-4527-008	Kihei-Piilani	9/17/2024	10/15/2024	29	0.0132	
471	6-4527-008	Kihei-Piilani	8/6/2024	9/16/2024	42	0.0115	
472	6-4527-008	Kihei-Piilani	7/10/2024	8/5/2024	27	0.0095	
473	6-4527-008	Kihei-Piilani	6/21/2024	7/9/2024	19	0.0055	
474	6-4527-008	Kihei-Piilani	5/15/2024	6/20/2024	37	0.0106	
475	6-4527-008	Kihei-Piilani	3/13/2024	5/14/2024	63	0.0078	
476	6-4527-008	Kihei-Piilani	2/15/2024	3/12/2024	27	0.0079	
477	6-4527-008	Kihei-Piilani	1/21/2024	2/14/2024	25	0.0078	
478	6-4527-008	Kihei-Piilani	12/13/2023	1/20/2024	39	0.0086	
479	6-4527-016	St. Theresa Chu	2/6/2025	4/17/2025	71	0.0106	0.0100
480	6-4527-016	St. Theresa Chu	1/24/2025	2/5/2025	13	0.0097	
481	6-4527-016	St. Theresa Chu	11/7/2024	1/23/2025	78	0.0103	
482	6-4527-016	St. Theresa Chu	10/2/2024	11/6/2024	36	0.0079	
483	6-4527-016	St. Theresa Chu	9/7/2024	10/1/2024	25	0.0107	

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	A	B	C	D	E	F	G
484	6-4527-016	St. Theresa Chu	8/7/2024	9/6/2024	31	0.0106	
485	6-4527-016	St. Theresa Chu	7/3/2024	8/6/2024	35	0.0123	
486	6-4527-016	St. Theresa Chu	6/5/2024	7/2/2024	28	0.0118	
487	6-4527-016	St. Theresa Chu	5/24/2024	6/4/2024	12	0.0133	
488	6-4527-016	St. Theresa Chu	5/24/2024	6/4/2024	12	0.0133	
489	6-4527-016	St. Theresa Chu	3/6/2024	5/23/2024	79	0.0079	
490	6-4527-016	St. Theresa Chu	2/17/2024	3/5/2024	18	0.0081	
491	6-4527-016	St. Theresa Chu	1/10/2024	2/16/2024	38	0.0031	
492	6-4527-016	St. Theresa Chu	11/14/2023	1/9/2024	57	0.0110	
493	6-4527-019	Rixey	1/21/2025	4/17/2025	87	0.0015	**0.0025**
494	6-4527-019	Rixey	7/17/2024	1/20/2025	188	0.0027	
495	6-4527-019	Rixey	2/17/2024	3/25/2024	38	0.0024	
496	6-4527-019	Rixey	10/7/2023	2/16/2024	133	0.0034	
497	6-4527-020	Haleakala Gard	4/1/2025	4/30/2025	30	0.0158	**0.0172**
498	6-4527-020	Haleakala Gard	3/1/2025	3/31/2025	31	0.0149	
499	6-4527-020	Haleakala Gard	2/1/2025	2/28/2025	28	0.0027	
500	6-4527-020	Haleakala Gard	1/1/2025	1/31/2025	31	0.0095	
501	6-4527-020	Haleakala Gard	12/1/2024	12/31/2024	31	0.0149	
502	6-4527-020	Haleakala Gard	11/1/2024	11/30/2024	30	0.0164	
503	6-4527-020	Haleakala Gard	10/1/2024	10/31/2024	31	0.0139	
504	6-4527-020	Haleakala Gard	9/1/2024	9/30/2024	30	0.0253	
505	6-4527-020	Haleakala Gard	8/1/2024	8/31/2024	31	0.0222	
506	6-4527-020	Haleakala Gard	7/1/2024	7/31/2024	31	0.0245	
507	6-4527-020	Haleakala Gard	6/1/2024	6/30/2024	30	0.0242	
508	6-4527-020	Haleakala Gard	5/1/2024	5/31/2024	31	0.0149	
509	6-4527-020	Haleakala Gard	4/1/2024	4/30/2024	30	0.0277	
510	6-4527-020	Haleakala Gard	3/1/2024	3/31/2024	31	0.0208	
511	6-4527-020	Haleakala Gard	2/1/2024	2/29/2024	29	0.0119	
512	6-4527-020	Haleakala Gard	1/1/2024	1/31/2024	31	0.0161	
513	6-4627-002	Tmk 3-9-06-08	3/18/2025	4/24/2025	38	0.0001	**0.0006**
514	6-4627-002	Tmk 3-9-06-08	2/25/2025	3/17/2025	21	0.0005	
515	6-4627-002	Tmk 3-9-06-08	1/21/2025	2/24/2025	35	0.0003	
516	6-4627-002	Tmk 3-9-06-08	1/1/2025	1/20/2025	20	0.0007	
517	6-4627-002	Tmk 3-9-06-08	12/11/2024	12/31/2024	21	0.0004	
518	6-4627-002	Tmk 3-9-06-08	11/5/2024	12/10/2024	36	0.0003	
519	6-4627-002	Tmk 3-9-06-08	10/1/2024	11/4/2024	35	0.0003	
520	6-4627-002	Tmk 3-9-06-08	8/19/2024	9/30/2024	43	0.0007	
521	6-4627-002	Tmk 3-9-06-08	7/21/2024	8/18/2024	29	0.0007	
522	6-4627-002	Tmk 3-9-06-08	6/17/2024	7/20/2024	34	0.0008	
523	6-4627-002	Tmk 3-9-06-08	5/26/2024	6/16/2024	22	0.0008	
524	6-4627-002	Tmk 3-9-06-08	5/1/2024	5/25/2024	25	0.0008	
525	6-4627-002	Tmk 3-9-06-08	2/9/2024	3/1/2024	22	0.0008	
526	6-4627-002	Tmk 3-9-06-08	1/2/2024	2/8/2024	38	0.0006	
527	6-4627-002	Tmk 3-9-06-08	12/21/2023	1/1/2024	12	0.0008	

APPENDIX "A"

	A	B	C	D	E	F	G
528	6-4627-004	Tmk 3-9-06-07	2/1/2025	3/31/2025	59	0.0004	**0.0004**
529	6-4627-004	Tmk 3-9-06-07	12/13/2024	1/31/2025	50	0.0003	
530	6-4627-004	Tmk 3-9-06-07	11/4/2024	12/12/2024	39	0.0004	
531	6-4627-004	Tmk 3-9-06-07	10/8/2024	11/3/2024	27	0.0004	
532	6-4627-004	Tmk 3-9-06-07	9/4/2024	10/7/2024	34	0.0003	
533	6-4627-004	Tmk 3-9-06-07	7/30/2024	9/3/2024	36	0.0004	
534	6-4627-004	Tmk 3-9-06-07	5/19/2024	7/29/2024	72	0.0004	
535	6-4627-004	Tmk 3-9-06-07	1/7/2024	5/18/2024	133	0.0005	
536	6-4627-004	Tmk 3-9-06-07	12/11/2023	1/6/2024	27	0.0003	
537	6-4627-019	Maui Lu	3/1/2025	3/31/2025	31	0.0000	**0.0007**
538	6-4627-019	Maui Lu	2/1/2025	2/28/2025	28	0.0001	
539	6-4627-019	Maui Lu	1/1/2025	1/31/2025	31	0.0000	
540	6-4627-019	Maui Lu	12/1/2024	12/31/2024	31	0.0000	
541	6-4627-019	Maui Lu	11/1/2024	11/30/2024	30	0.0001	
542	6-4627-019	Maui Lu	10/1/2024	10/31/2024	31	0.0000	
543	6-4627-019	Maui Lu	9/1/2024	9/30/2024	30	0.0001	
544	6-4627-019	Maui Lu	8/1/2024	8/31/2024	31	0.0018	
545	6-4627-019	Maui Lu	7/1/2024	7/31/2024	31	0.0018	
546	6-4627-019	Maui Lu	6/1/2024	6/30/2024	30	0.0017	
547	6-4627-019	Maui Lu	5/1/2024	5/31/2024	31	0.0001	
548	6-4627-019	Maui Lu	4/1/2024	4/30/2024	30	0.0001	
549	6-4627-019	Maui Lu	3/1/2024	3/31/2024	31	0.0014	
550	6-4627-019	Maui Lu	2/1/2024	2/29/2024	29	0.0015	
551	6-4627-019	Maui Lu	1/1/2024	1/31/2024	31	0.0013	
552						**2024-25 Avg**	**3.9979**

APPENDIX "A"

	A	B	C	D	E	F
1	**Well #**	**Name**	**TMK**	**Use type**	**Proposed use (mgd)**	**Well capacity (mgd)**
2	6-3725-001	Moomuku 1	(2) 2-1-005:0026			
3	6-3725-002	Polena 1	(2) 2-1-005:135	MUNPR		0.18
4	6-3725-003	Polena 2	(2) 2-1-005:135	ABNSLD		
5	6-3725-004	Polena 2A				
6	6-3726-001	Kanahena	(2) 2-1-006:083	UNU		
7	6-3726-003	Millar 1	(2) 2-1-005:079	ABNSLD		
8	6-3726-004	Kamahena-Erniss	(2) 2-1-006:007	DOM	0.00035	
9	6-3726-005	Millar 2	(2) 2-1-005:079	IRR	0.03	0.086
10	6-3726-006	Ron Jacintho	(2) 2-1-006:089	IRRLA	0.012	0.094
11	6-3824-001	Ulupalakua-Berkowicz	(2) 2-1-005:049	MUN	0.84	1.541
12	6-3824-002	ATC Mākena 1	(2) 2-1-008:108	MUN	0.021	0.317
13	6-3826-001	Seibu 2		IRRGC		0.576
14	6-3826-002	Seibu 3		IRRGC		0.576
15	6-3826-003	Seibu 4		IRRGC		0.576
16	6-3826-004	Seibu 7		UNU		0.216
17	6-3826-005	Seibu 12		UNU		
18	6-3920-001	Waikaalu spring	(2) 2-1-009:001	AGRLI		
19	6-3921-001	Waihou Spring	(2) 2-1-009:001	AGRLI		
20	6-3925-001	Makena Well 68	(2) 2-1-008:001	ABNLOS*		
21	6-3925-002	ATC Mākena 3	(2) 2-1-008:108	MUNPR	0.36	0.54
22	6-3925-003	ATC Mākena 7	(2) 2-1-008:108	MUNPR	0.25	0.504
23	6-3925-004	ATC Mākena 8	(2) 2-1-008:108	MUNPR	0.25	0.504
24	6-3926-001	Makena		UNU		
25	6-3926-002	Makena 1	(2) 2-1-008:079	IRRGC		0.576
26	6-3926-003	Wailea 8		IRRGC		0.504
27	6-3926-004	Seibu 5	(2) 2-1-009:078	IRRGC		0.576
28	6-3926-005	Seibu 6		IRRGC		0.576
29	6-3926-006	Seibu 8		IRRGC		0.432
30	6-3926-007	Seibu 9		UNU		0.576
31	6-3926-008	Seibu 10		IRRGC		
32	6-3926-009	Seibu 11		IRRGC		0.288
33	6-3926-10	Makena-Kaufman	(2) 2-1-006:075	DOM	0.002	0.072
34	6-3926-011	Makena Surf	(2) 2-1-007:095	IRR		0.302
35	6-4019-001	Polipoli Tunnel	(2) 2-2-007:001	UNU		
36	6-4020-001	Waikaukane Tunnel	(2) 2-2-007:001	AGRLI		
37	6-4020-002	Cornwall Tunnel	(2) 2-2-001:001	AGRLI		
38	6-4020-003	Morton Tunnel	(2) 2-2-001:112	AGRLI		

APPENDIX "B"

	A	B	C	D	E	F
39	6-4021-001	Waikaahi Tunnel	(2) 2-2-001:001	AGRLI		
40	6-4023-001	Pu`u Loa	(2) 2-1-008:001	IND	0.35	0.504
41	6-4024-001	Keawekapu	(2) 2-1-008:001	OTH	0.1	0.216
42	6-4026-001	TMK 2-1-11-3	(2) 2-1-011:003			
43	6-4026-002	Tmk 2-1-11-1	(2) 2-1-011:001			
44	6-4026-003	Makena	(2) 2-1-011:008			
45	6-4026-004	Wailea 4	(2) 2-1-008:042	IRRGC		1.008
46	6-4026-005	Wailea 6	(2) 2-1-008:092	OBS		0.259
47	6-4026-006	Wailea 7	(2) 2-1-008:092	IRRGC		1.008
48	6-4026-007	Wailea 6A	(2) 2-1-008:092	IRRGC		0.54
49	6-4026-013	Fairmont Kea Lani	(2) 2-1-023:003	IRR	0.09	0.36
50	6-4122-001	Keawakapu	20.684444, -156.364444			
51	6-4122-003	OW Ranch LLC	(2) 2-2-001:008	AGRON	0.1	0.101
52	6-4122-002	Kamaole Mauka	(2) 2-2-001:061	IRR	0.03	0.072
53	6-4124-001	Paeahu 1	(2) 2-1-008:054	MUN	1	1.008
54	6-4124-002	Paeahu 2	(2) 2-1-008:054	DOM	1	1.584
55	6-4124-003	Paehu 3	(2) 2-1-008:054	DOM	1	1.584
56	6-4125-001	Wailea 670 1	(2) 2-1-008:056			0.72
57	6-4125-002	Wailea 670 2	(2) 2-1-008:056			0.72
58	6-4126-001	Wailea 1	(2) 2-1-008:069	OBS		0.036
59	6-4126-002	Wailea 2	(2) 2-1-008:155	ABNSLD		1.008
60	6-4126-003	Wailea 3	(2) 2-1-008:092	IRRGC		0.907
61	6-4126-004	Grand Wailea Salt	(2) 2-1-008:109	AGRAQ		0.36
62	6-4126-005	Wailea Ike	(2) 2-1-008:042	IRR		0.259
63	6-4126-006	Wailea 2A	(2) 2-2-001:028	IRRGC		1.008
64	6-4221-001	Kamaole Mauka	(2) 2-2-001:023	IRR	0.03	0.072
65	6-4225-001	Maui Meadows Tank	(2) 2-1-008:057	MUN	0.001	1.008
66	6-4225-002	Kamaole Wailea 1	(2) 2-2-002:050	DOM	0.5	0.756
67	6-4225-003	Kamaole Wailea 2	(2) 2-2-002:050	DOM	0.5	0.756
68	6-4225-004	Makoa/ Kula Makai Ranch	(2) 2-2-002:024/ (2) 2-2-002:002	MUN	0.22	0.432
69	6-4226-001	Tmk 2-1-10-07	(2) 2-1-010:007	ABNLOS*		
70	6-4226-002	Granito	(2) 2-1-010:005	ABN		
71	6-4226-003	Tmk 2-1-10-04	(2) 2-1-010:004	IRR		
72	6-4226-004	2-1-10-20	(2) 2-1-010:020	ABNSLD		
73	6-4226-005	Tmk 2-1-10-01	(2) 2-1-010:001	UNU		

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74	6-4226-006	Tmk 3-9-04-98	(2) 3-9-004:098	ABNLOS*		
75	6-4226-007	Tmk 3-9-04-75	(2) 3-9-004:075	UNU		
76	6-4226-008	Kiyan	(2) 3-9-004:078	ABNSLD	0	0
77	6-4226-009	Maui Hill	(2) 3-9-004:081	ABNLOS*		
78	6-4226-010	Tmk 3-9-04-86	(2) 3-9-004:086	ABNLOS*		
79	6-4226-011	Tmk 3-9-04-125	(2) 3-9-042:050	IRR		
80	6-4226-012	Wailea 5	(2) 2-1-008:140	IRRGC		0.36
81	6-4226-013	Wailea 9	(2) 2-1-008:114	IRRGC		0.576
82	6-4226-014	Wailea 10	(2) 2-1-008:115	IRRGC		1.008
83	6-4226-015	Hale Kamaole	(2) 3-9-004:084	IRRLA		0.18
84	6-4226-016	Maui Kamaole	(2) 3-9-004:082	IRRLA		0.216
85	6-4226-017	Kamaole-Maui Hill	(2) 3-9-004:004	IRRLA		0.216
86	6-4226-018	Maui Hill AOAO	(2) 3-9-004:081	IRRLA		0.216
87	6-4226-019	Kilohana Waena Subdivis	(2) 3-9-004:075	IRRLA	0.18	0.432
88	6-4226-020	Keawakapu	(2) 2-1-010:028	UNU		0.144
89	6-4326-001	Tmk 3-9-20-26	(2) 3-9-020:034	ABNLOS*		
90	6-4326-002	Tmk 3-9-20-17	(2) 3-9-020:015	ABNLOS*		
91	6-4326-003	Tmk 3-9-20-14	(2) 3-9-020:014	ABNLOS*		
92	6-4326-004	Tmk 3-9-19-02	(2) 3-9-043:085	ABNLOS*		
93	6-4326-005	Tmk 3-9-20-20	(2) 3-9-020:020	ABNLOS*		
94	6-4326-006	Tmk 3-9-18-09	(2) 3-9-018:009	ABNLOS*		
95	6-4326-007	Kamaole-Bosa	(2) 3-9-004:005	UNU		
96	6-4326-009	Kihei-Maui Vista	(2) 3-9-018:003	IRR	0.144	0.288
97	6-4326-010	Kamaole Sands	(2) 3-9-004:004	IRR	0.075	0.259
98	6-4326-011	Ke Alii 1/ Ocean Villas	(2) 3-9-020:020	IRR		0.504
99	6-4326-012	Ke Alii 2/ Moana Estates	(2) 3-9-020:027	IRR		0.504
100	6-4326-013	Kamaole-Aloha Village	(2) 3-9-020:007	IRR	0	0.18
101	6-4326-014	Wailea Inn	(2) 3-9-005:039	IRR		0.094
102	6-4327-001	TMK 3-9-16-25	(2) 3-9-016:025	ABNLOS*		
103	6-4327-002	TMK 3-9-17-37	(2) 3-9-017:037	ABN		
104	6-4327-003	TMK 3-9-05-51	(2) 3-9-005:051	UNU		

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105	6-4327-004	TMK 3-9-05-25	(2) 3-9-005:025	ABNLOS*		
106	6-4327-005	TMK 3-9-05-22	(2) 3-9-005:022	ABNLOS*		
107	6-4327-006	Kihei Akahi Irr	(2) 3-9-020:001	DOM	0.05	0.18
108	6-4327-007	Kihei-Akahi	(2) 3-9-020:001	ABNLOS*		0.216
109	6-4327-008	USGS Kihei B1	(2) 3-9-005:052	OBS		
110	6-4327-008	Kīhei Fire A1	(2) 3-9-005:052	OBS		
111	6-4327-009	USGS Kihei B2	(2) 3-9-005:052	OBS		
112	6-4327-010	Kīhei Fire A3	(2) 3-9-005:052	OBS		
113	6-4327-011	Maui Beach Place	(2) 3-9-005:033	DOM	0.003	0.072
114	6-4421-001	Waiohuli Exploratory	(2) 2-2-002:014	OTH		
115	6-4422-001	Waiohuli		OBS		
116	6-4423-001	Puu O Kali Expl	(2) 2-2-002:014	OTH		
117	6-4424-001	Keokea Maui Highlands 2	(2) 2-2-002:054	MUNPR		0.432
118	6-4425-001	Keokea Maui Highlands	(2) 2-2-002:054	MUNPR	0.01	0.432
119	6-4426-001	Kihei Inject TH	(2) 2-2-002:014	OBSOTH		
120	6-4426-002	Kihei Injection	(2) 2-2-002:069	ABNLOS*		
121	6-4426-003	Kihei-Maui R&T	(2) 2-2-002:054	UNU	0.242	
122	6-4426-010	USGS Kihei C1	(2) 2-2-002:073	OBS		
123	6-4427-001	TMK 3-9-05-52	(2) 3-9-005:052	IRR		
124	6-4427-002	TMK 3-9-02-8	(2) 3-9-040:082	UNU		
125	6-4427-003	Medo/ Miranda Well	(2) 3-9-002:014	DOM		
126	6-4427-004	TMK 3-9-11-38	(2) 3-9-011:038	UNU		
127	6-4427-005	TMK 3-9-02-02	(2) 0-0-000:000	ABNLOS*		
128	6-4427-006	USGS Kihei A1	(2) 3-9-012:036	OBS		
129	6-4427-006	Kalama B1	(2) 3-9-012:036	OBS		
130	6-4427-007	USGS Kihei A2	(2) 3-9-005:052	OBS		
131	6-4427-007	Kalama B2	(2) 3-9-012:036	OBS		
132	6-4427-008	Kalama B3	(2) 3-9-012:036	OBS		
133	6-4427-009	Kihei Baptist Chapel		IRRLA		0.021
134	6-4427-010	Burdick	(2) 3-9-010:018	IRRLA		
135	6-4427-011	1506 Halama Irrrigation	(2) 3-9-010:015	IRR	0.022	0.086
136	6-4427-012	Passon	(2) 3-9-009:008	IRRLA	0.144	0.144
137	6-4519-001	Kula Ridge	(2) 2-3-001:023	MUNPR	0.3	1.728

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138	6-4524-001	Kaonoulu Ranch 1	(2) 2-2-002:015	MUN	0.5	0.648
139	6-4524-002	Kaonoulu 1	(2) 2-2-002:015	MUN	0.4	0.648
140	6-4526-002	KHS-1	(2) 2-2-002:081	IRRSC		0.432
141	6-4526-003	KHS-2	(2) 2-2-002:081	IRRSC		0.36
142	6-4527-001	TMK 3-9-02-36	(2) 3-9-046:032	ABNLOS*		
143	6-4527-002	Tmk 3-9-02-32	(2) 3-9-046:017	AGRCP		
144	6-4527-003	Tmk 3-9-01-02	(2) 3-9-001:002	IRRLA		
145	6-4527-004	Tmk 3-9-08	(2) 3-9-008:003	ABNLOS*		
146	6-4527-005	Tmk 3-9-08	(2) 3-9-008:001	ABNLOS*		
147	6-4527-006	Tmk 3-9-01-9	(2) 3-9-058:023	ABNLOS*		
148	6-4527-007	Tmk 3-9-23-30	(2) 3-9-023:030	UNU		
149	6-4527-008	Kihei-Piilani	(2) 2-2-025:111	IRRLA		0.057
150	6-4527-010	Kihei-Koa	(2) 3-9-001:134	UNU		0.043
151	6-4527-012	Waiohuli 1	(2) 2-2-024:020	ABBSLD	0	0
152	6-4527-014	Kihei-Kauhale Makai	(2) 3-9-004:001 or (2) 3-9-001:075	IRRPA	0.065	0.216
153	6-4527-015	Luana Kai	(2) 3-9-001:006	IRR	0.045	0.317
154	6-4527-016	Waiohuli-St. Theresa Church	(2) 3-9-009:028	IRR		0.086
155	6-4527-017	Kihei	(2) 3-9-002:076	UNU		
156	6-4527-018	Kaonoulu 5	(2) 3-9-001:161	IRR	0.044	0.086
157	6-4527-019	Rixey	(2) 3-9-007:002	IRR		0.072
158	6-4527-020	Haleakalā Gardens Irrigation	(2) 3-9-044:041	IRR		0.13
159	6-4621-001	Kula 1800 No. 1	(2) 2-2-002:017	Mun	0.45	0.72
160	6-4621-002	Kula 1800 No. 2	(2) 2-2-002:017	MUN	0.45	0.72
161	6-4626-001	Waiakoa Gulch				
162	6-4626-002	Kaonoulu Irr 1	(2) 3-9-001:169	IRR	0.12	0.216
163	6-4627-001	Tmk 3-9-01-24	(2) 3-9-015:015	OTH		
164	6-4627-002	Tmk 3-9-06-08	(2) 3-9-006:008	DOM		
165	6-4627-003	Tmk 3-9-01-54	(2) 3-9-001:064	ABNLOS*		
166	6-4627-004	Tmk 3-9-06-07	(2) 3-9-006:007	DOM		
167	6-4627-005	Tmk 3-9-06-09	(2) 3-9-006:009	IRRLA		
168	6-4627-006	Tmk 3-9-06-13	(2) 3-9-006:013	UNU		
169	6-4627-007	Tmk 3-9-01-29				
170	6-4627-008	Tmk 3-9-01-33	(2) 3-9-045:014	ABNLOS*		
171	6-4627-009	Tmk 3-9-01-50	(2) 3-9-050:011	ABN		

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172	6-4627-010	Tmk 3-9-06-06	(2) 3-9-006:006	ABNLOS*		
173	6-4627-011	Tmk 3-9-01-99	(2) 3-9-001:099	ABNLOS*		
174	6-4627-012	Tmk 3-9-15-12	(2) 3-9-015:012	IRRLA		
175	6-4627-013	Tmk 3-9-15-14	(2) 3-9-015:014	IRR		
176	6-4627-014	Tmk 3-9-01-34	(2) 3-9-001:034	AGRCP		
177	6-4627-015	Tmk 3-9-26-43	(2) 3-9-026:043	ABNLOS*		
178	6-4627-016	Tmk 3-9-26-67	(2) 3-9-026:067	ABNLOS*		
179	6-4627-017		(2) 3-9-026:066	DOM		
180	6-4627-018	Kihei Rd Assoc.	(2) 3-9-041:026	IRR		0.072
181	6-4627-019	Maui Lu	(2) 3-9-001:086	IRRLA		
182	6-4627-020	Kai Makani	(2) 3-9-041:002	IRRLA	0.101	0.101
183		**Totals**			**10.03135**	**39.31**

APPENDIX "B"

WATER RESOURCES REPORT (AKINAKA & ASSOCIATES, LTD.)

APPENDIX

M

APPENDIX "C"

Mākena Mauka Project
WATER RESOURCES REPORT

Prepared For:

AREG AC Makena Propco LLC dba Mākena Golf & Beach Club Owners
5415 Makena Alanui Road
Wailea-Makena, Hawai‘i 96753

Prepared By:

AKINAKA & ASSOCIATES, LTD.
CONSULTING CIVIL ENGINEERS

November 2025

Mākena Mauka Project
WATER RESOURCES REPORT

Wailea-Mākena, Maui

Prepared For:

AREG AC Makena Propco LLC dba Mākena Golf & Beach Club Owners
5415 Makena Alanui Road
Wailea-Makena, Hawai'i 96753

Prepared By:

Akinaka & Associates, Ltd.
1100 Alakea Street, Suite 1800
Honolulu, Hawai'i 96813

November 2025

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Table of Acronyms

Acronym	Definition
12-MAV	12-month moving average (CWRM)
AMI	Advanced Metering Infrastructure
ASA	Aquifer System Area (CWRM)
CIP	Capital Improvement Project
CMS	Central Maui System (MDWS)
CWRM	Commission of Water Resource Management (SOH)
DLNR	Department of Land and Natural Resources (SOH)
DOH	Department of Health (SOH)
ET	Evapotranspiration
GPD	Gallons per day
GWMA	Ground Water Management Area (CWRM)
GWUP	Ground Water Use Permit
HRS	Hawai'i Revised Statutes (SOH)
IIFS	Interim Instream Flow Standard
LEED	Leadership in Energy and Environmental Design
MDWS	Maui Department of Water Supply
Mgd	Million gallons per day
MMP	Mākena Mauka Project
PET	Potential Evapotranspiration
RAM	Robust Analytical Model
RF	Rainfall
RO	Reverse Osmosis
SDWB	Safe Drinking Water Branch (DOH)
SOH	State of Hawai'i
SWHU	Surface Water Hydrologic Unit (CWRM)
SWUP	Surface Water Use Permit (CWRM)
SY	Sustainable Yield (CWRM)
USACE	U.S. Army Corp of Engineers
WUDP	Water Use and Development Plan (MDWS)
WUP	Water Use Permit (CWRM)
WWRF	Wastewater Reclamation Facility

1. EXECUTIVE SUMMARY

Purpose of Report

The purpose of this report is to provide an assessment of water resources within the Mākena Mauka project area (referred to herein as "MMP", "Mākena Mauka", or "the project") that lie within the Kamaʻole Aquifer System Area (ASA)[1], the Wailea Surface Water Hydrologic Unit (SWHU), and the Moʻoloa SWHU[2] in the Wailea area on the leeward Haleakalā portion of the Island of Maui. Mākena Mauka is a low-density, master-planned residential community featuring market-rate and workforce housing, with a mix of rural, single-family, and multi-family units. Planned for such uses for decades, the project integrates the existing Mākena North and South Golf Courses (with renovations to the South Course) and includes community amenities such as gathering spaces, hiking trails, pedestrian and bike-friendly pathways, public beach parking, and designated conservation areas. The land plan consists of 652 housing units—including 109 onsite workforce units—and approximately 135,000 ft^2 of operational support buildings for golf operations, maintenance, staff offices, and related uses. The 109 workforce units are planned to be supplied by the Maui Department of Water Supply (MDWS), while the rest of the water demands will be supplied by a private water system. The total project area covers approximately 1,044 acres, with 473 acres designated for residential development. Since the project anticipates making improvements in various County and State right of ways, Mākena Golf & Beach Club Owners, herein referred to as "the Client," is preparing an Environmental Impact Statement (EIS) to satisfy Hawai'i Revised Statutes (HRS) 343. This report informs the ground and surface water resources portions for the future EIS.

The report is partially based on information relayed to Akinaka and Associates, Ltd. by the Client for analysis. Additional historical and the latest best ground and surface water information available for the hydrologic units of ground water (Kamaʻole ASA) and surface water (Wailea SWHU and Moʻoloa SWHU) are included in this report. Additionally, since

[1] The Kamaʻole ASA [60304] is a ground water hydrologic unit as defined in the 2019 WRPP [4].
[2] Wailea (6110) and Moʻoloa (6109) SWHU are surface water hydrologic units as defined in the 2019 WRPP [4]

improvements in Mākena Mauka are anticipated to be partly serviced by the MDWS through their Central Maui System (CMS) the ground water hydrologic units of ʻĪao, Waiheʻe , Haiku, and Waikapū ASAs that provide ground water to the CMS and allocations from the ʻĪao-Waikapū Ditch for the CMS are also reviewed in this report.

The State Commission on Water Resource Management (CWRM) is the regulatory body in Hawaiʻi that ultimately manages the ground and surface water resources at the source statewide through the setting of SY, interim instream flow standards (IIFS), monitoring monthly pumpage and diversions from these sources, and approving well and pump installation, stream diversion, and stream channel alteration permits. Additionally, CWRM determines the reasonable and beneficial allocations through water use permits (WUPs) in areas duly designated as water management areas. The Kamaʻole ASA and Wailea & Moʻoloa SWHUs are **not** designated water management areas and as such any wells or stream diversions in those hydrologic units do not require a WUP.

The current SY of the Kamaʻole ASA is 11 million gallons per day (Mgd) and reflects the historically dry and brackish conditions of this large leeward aquifer area. Pumpage (statewide) and allocations (in ground water management areas (GWMA)) are managed on a 12-month moving average (12-MAV) basis.[3] The current 12-MAV pumpage from the Kamaʻole ASA as of January 2025 is 3.660 Mgd, which is 7.340 Mgd lower than and constitutes 33% utilization of the Kamaʻole ASA's (60304) 11 Mgd SY. Based on this and the historically dry and brackish conditions of the Kamaʻole ASA the utility of the hydrologic unit as a water source does not appear to be threatened by current pumpage from the aquifer.

Potable demands for the general Mākena area are currently serviced through the MDWS CMS while future alternative sources are being explored (i.e., local reverse osmosis (RO) or future Haiku ASA sources to feed into the MDWS CMS). The CMS serves the Kīhei-Mākena Community Plan districts within which the MMP resides. According to the County of Maui MDWS 2023 Maui Island Water Use and Development Plan (WUDP) [1], the CMS

[3] 12-month moving average, or 12-MAV, is a rolling 12-month period such that at any point in time the previous 11 months of pumpage are made part of the average to cover complete annual seasonal variations. This is the statistic the CWRM uses to manage pumpages against SY.

provided 12.462 Mgd of water to the Kīhei-Mākena Community Plan area (or Kama‘ole ASA) in 2014.[4] The total average daily water use demand without RO recovery for the MMP is estimated to be 0.917 Mgd while the maximum/peak daily demand is 1.375 Mgd. Excluding golf course demands, the average water use demand is estimated to be 0.528 Mgd and maximum/peak day demand is 0.792 Mgd, which are consistent with recent developments in Maui (see Appendix N). Water meter records from 2024 from recently built multi-family projects in Wailea show annual consumption of 0.659 Mgd for Makali’i (built in 2022) and 0.688 Mgd for Keala O Wailea (built in 2018). Neither of these two projects were LEED certified so additional conservation savings could be realized. These usage figures are generally consistent with MDWS Water System Standards Table 100-18 as well.

The total average water demand with RO recovery is 1.038 Mgd and maximum/peak day water demand is 1.557 Mgd. Ninety-four percent (94%) of the demand will be met by a private water system pumping from the Kama’ole ASA and treated with RO. Due to a RO recovery efficiency of 65%, 1.464 Mgd will be required to be pumped to meet the maximum/peak demand. The rest (6%) of water demand is for the development’s affordable housing, which will be supplied completely by the MDWS CMS. Table 1 summarizes these demands by category.

[4] Table 8-10 MDWS Maui Island WUDP [1]

Table 1. Demand Summary for the Mākena Mauka Project with RO Recoveryby Category

Category	Total Average Demand GPD (with RO Recovery)	Total Maximum/peak Demand GPD (with RO Recovery)
Potable Residential Housing (supplied by private water system)	**345,846**	**518,769**
Potable Affordable Housing (supplied by MDWS CMS)	**61,640**	**92,460**
Non-Potable Irrigation (supplied by private water system)	**630,190**	**945,285**
Total Average Demand	**1,037,676**	**1,556,514**

MDWS can meet the affordable housing potable water needs of the MMP within the CMS from various sources that serve the CMS, and MMP is capable of meeting their other average water demands through a private water system as follows:

- First, MMP plans to rely primarily on private brackish wells as their source to minimize reliance on County water. Akinaka estimates a maximum pumpage of 1.464 Mgd for their uses (see Appendix N). Considering other planned projects in the area and the DHHL reservations, the total additional average pumpage would be within the total 11 Mgd SY established by CWRM for the Kama'ole ASA. Only the planned affordable housing –about 6% of their maximum day water demand or 0.092 Mgd—will be supplied by the MDWS CMS.

- Second, the actual reported non-caprock use from the ʻĪao ASA, where the CMS is mainly sourced from, is 13.157 Mgd based on a 12-MAV as of January 2025, typically the lower pumpage time of the year. This is 6.843 Mgd below the 20

Mgd SY for the ʻĪao ASA and 2.694 Mgd below the current total allocations that count against SY. This is in part due to conservation efforts of the MDWS where metered water use in the CMS has declined over 4% from 2006 to 2020 while water meters increased by 14% from 2006 to 2020 (based on MDWS annual reports). Other non-MDWS allocations amount to 0.026 Mgd, leaving the MDWS with 2.688 Mgd of unused allocation as of January 2025 that could be re-allocated within the MDWS CMS. Under HRS 174C-48, the CWRM must also delegate to the county boards of water supply the authority to allocate the use of water for municipal purposes, subject to the limits of water supply allocated to the county boards of water supply in their role as water purveyors. Therefore, it would appear MDWS and the ʻĪao ASA alone have enough cushion between actual pumpage vs. allocated use to manage and provide for the MMP future needs within the MDWS current allocations.

- Third, the CMS is also supplied by other ASAs, primarily the Waiheʻe ASA (60103), which is currently pumping 69% of its 8 Mgd SY and permitted surface water use from the CWRM designated Na Wai Eha surface water management area. For Waiheʻe ASA, there is a new capital improvement project (CIP) for a 0.5 Mgd Waiheʻe well anticipated to be online by FY28 and for Na Wai Eha.

- Fourth, two additional future ASA sources to increase source supplies are identified in the MDWS 2023 Maui Island WUDP are: 1) from the Haiku ASA that is currently pumping only 3% of its 24 Mgd SY and 2) from the Waikapū ASA, currently pumping only 1% of its 3 Mgd SY. MDWS is currently pursuing feasibility studies required under the East Maui Consent Decree to implement the source strategy for the Haiku ASA, while strategy #3 of the Maui Island WUDP for the Waikapū ASA (60101) adjacent to and south of the ʻĪao ASA is to adapt pumpage of constructed wells in Waikapū ASA with guidance from the 2015 USGS groundwater flow model results.

- Fifth, MMP will be designed to use County R-1 recycled water when available, which will reduce the need for groundwater pumping.

- Sixth, through imported return-irrigation recharge, use of imported R-1 recycled water will help minimize groundwater salinity increases within the project area.

- Seventh, at full build out, the MMP reverse osmosis (RO) treatment process to meet new non-affordable housing related potable demands is expected to produce 181,569 GPD of RO concentrate that can be mixed with brackish well water to offset well pumpage. Overtime, combined with recycled R-1 water availability from the County, there will be an inverse relationship between residential occupancy and the amount of non-potable groundwater pumping required for golf course irrigation.

- Eighth, conservation measures, primarily through Leadership in Energy and Environmental Design (LEED) certified construction for buildings greater than 500 square feet, will be incorporated into the MMP development to continue and further the conservation efforts that have proven effective in the ʻĪao ASA.

Thus, for the reasons stated above, the wells pumping from the Kama'ole ASA and the MDWS CMS can meet the future potable and non-potable average and maximum/peak day demands of the MMP improvements. However, the cumulative maximum/peak day demand for MMP along with other future planned developments and DHHL reservations will be nearing the Kama'ole Aquifer System Area sustainable yield of 11 Mgd.

It is important to note and consider there are recently released U.S. Geological Survey (USGS) scientific studies [2] [3] that predict lower recharge that could result in lowered ground water availability in the future as evidenced by declining rainfall and stream flow over the past several decades. However, these predictions are for mid-to-end of century years (2071 to 2099 (47 to 75 years) with several different scenarios and models. It is not clear if the impacts are correlated more with upper recharge and SY range estimates

specified in the CWRM Water Resource Protection Plan (WRPP) [4] rather than the conservative minimum values that are used. The CWRM will be reviewing these new predictions in an update to the 2019 WRPP and determine if revising current recharge and SY range estimates are required to accommodate these future recharge predictions.

This report also determined the water demands of future development projects in the area to ensure that the cumulative impacts of these projects (including MMP) will not overpump the Kama'ole ASA and the ASAs that CMS is tapping from. In the Kama'ole ASA, we estimate the future pumpage to rise to a maximum/peak of 8.190 Mgd. Including DHHL reservations would increase the maximum/peak pumpage to 10.737 Mgd. Although this would be below the SY of 11 Mgd, this would raise the pumpage to greater than 90% of the SY, which is something that could initiate designation of a GWMA under the CWRM.

To mitigate impacts, MMP will be looking to reduce water demands. They will be ensuring LEED certified construction for buildings 500 square feet and larger and shall implement the following measures:

- Low flow faucets, fixtures, and toilets.
- Utilize R-1 water when available
- Encourage pool evaporation covers.
- Use of non-potable water for landscaping.
- Irrigation systems that use drip lines and moisture sensors.
- Irrigation scheduling during morning and evening hours to avoid high-evaporation times of the day.
- Xeriscaping and use of drought tolerant plants in landscaping, while encouraging native species.
- Rainwater/stormwater catchment and reuse.

2. INTRODUCTION

2.1. Scope

The scope of this report is to primarily:

- Research existing available information including existing utilities and reports within the proximity of the MMP area;
- Provide analysis of water resources portion of the EIS for the MMP;
- Review past reports and public information available at Department of Land and Natural Resources CWRM and other appropriate agencies primarily regarding the status of the Kama‘ole ASA ground water availability.

3. MMP WATER NEEDS

Appendix N summarizes the water demands for MMP. It is based on Table 2 in the November 2025 Water Resource Assessment for the Mākena Mauka Project from Tom Nance Water Resource Engineering (TNWRE) [5] as well as estimates using average consumption demand from Table 100-18 from the MDWS Water System Standards [6]. The total estimated maximum/peak demand for MMP is 1,374,945 gpd. However, MMP is planning to develop their own privately owned and operated water system to supply around 94% of their water demand. The Client plans to use three wells on their property to pump brackish water for their supply, using RO to treat the water for potable demands and leaving the water untreated for irrigation demands.

Of the total maximum/peak demand to be supplied privately, 429,660 gpd will be used for potable use and 945,285 gpd will be used for irrigation. The water planned for potable use must go through RO treatment with 65% recovery, meaning 65% of the water that goes through the treatment is suitable for potable use while the rest (35%) is disposed as brine waste. Thus, it requires the wells to pump up to 518,769 gpd, so that 337,200 gpd (65% of 518,769 gpd) can be yielded for potable use through RO. In total, this requires the wells to pump a total of 1,464,054 gpd or 1.464 MGD of brackish water

from the Kama'ole ASA. This additional pumping by itself would still be well below the aquifer's 11 MGD SY.

The estimated maximum brine waste requiring disposal would be 181,569 gpd (35% of 518,769). TNWRE believes that the brine would likely be too saline for irrigation but may be appropriate for golf course irrigation. However, the DOH maintains that RO reuse cannot be reused for irrigation, and if this stance remains, a disposal well would ultimately be required. Currently, the Client plans to dispose of the waste in a 400,000-gallon lined basin at their own existing private wastewater treatment facility. The RO waste would be allowed to evaporate, leaving behind the salt. These salts would then need to be periodically hauled off to a landfill for disposal. In addition, the Client will consult with the State DOH to assess whether the waste could instead be mixed with irrigation water for the golf course for irrigation purposes.

The total maximum/peak demand that is estimated to be supplied by MDWS CMS is 92,460 gpd or 0.092 Mgd. MMP is already connected to the CMS via a 4" County water line at TMK 2-1-005:108, and this amount of additional pumping will not stress the ʻĪao ASA, where the majority of CMS water comes from, past its SY.

Additionally, the affordable housing project within MMP, which is slated to be 100 percent affordable under section 2.96 of the Maui County Code, is exempt from the "Show Me the Water" requirement under section 14.12 of the Maui County Code. This exemption applies to "subdivisions that will not be regulated as a public water system under department of health rules" and "residential development projects with 100 percent affordable housing units and are within the service area of the department's central or west Maui water system. Consequently, the MMP affordable housing project will be exempt from the "Show Me the Water" requirement and will be served by the MDWS CMS. The remainder of the development will be supplied by a private water system.

4. EXISTING WATER SUPPLY ENVIRONMENT

4.1. Location

Exhibits 1, 2, & 3 are summary maps of the ground and surface water supply and regulatory regimes within which the proposed 1,044 acres of the MMP improvements reside (see also **Appendix A**). Mākena Mauka lies within the Kamaʻole ASA (60304), the Wailea SWHU (6110), and Moʻoloa (6109) SWHU and includes western portions of the Leeward Haleakalā Watershed Restoration Partnership (LHWRP) that are mostly outside Papa'ainui Tract of the Kahikinui Forest Reserve [7] and bordering Department of Hawaiian Home Lands (DHHL) at its most mauka limits. Good historical references for the geology, hydrology, and water distribution systems in the Kamaʻole ASA, the Wailea SWHU, and the Moʻoloa SWHU can be found in Yuen 1990 [8], Stearns [9] [10], Lau [11], and more recently the CWRM's 2019 WRPP [4] and the MDWS 2023 Maui Island WUDP [1]. More detailed localized descriptions of climate, ground water, and surface water sources within the project area are discussed in the following sections of this report.

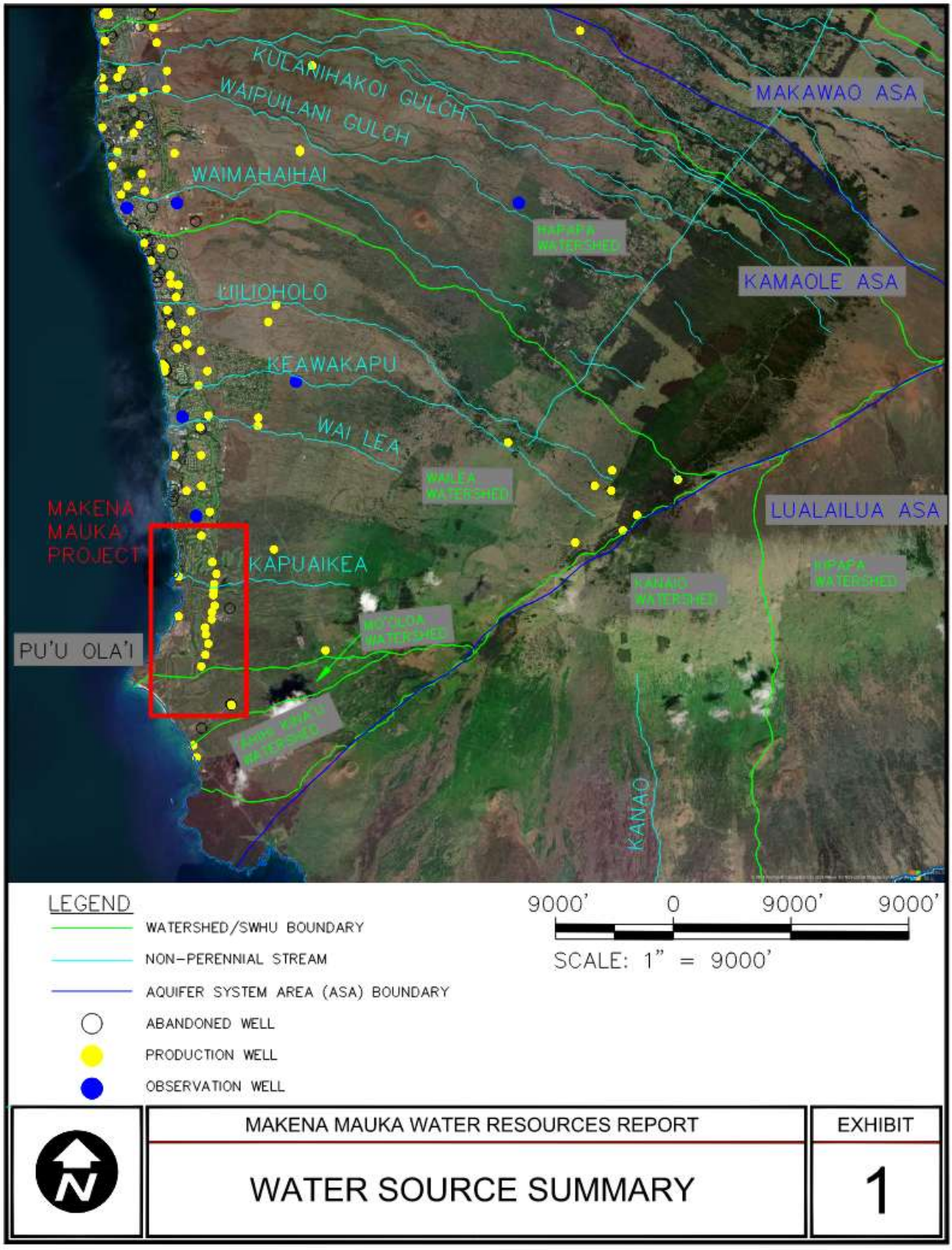

Exhibit 1. Water Source Summary Map

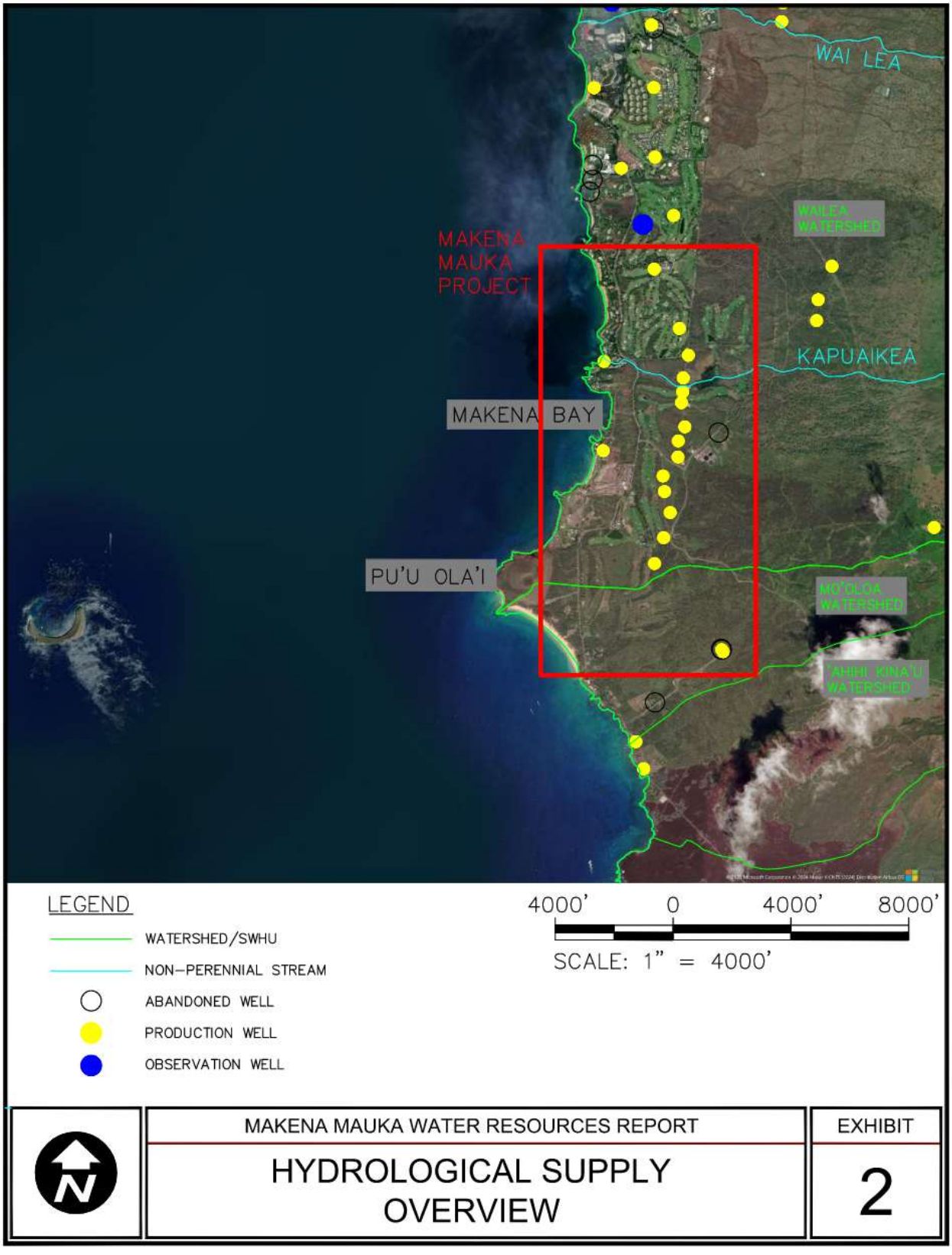

Exhibit 2. Hydrological Supply Overview

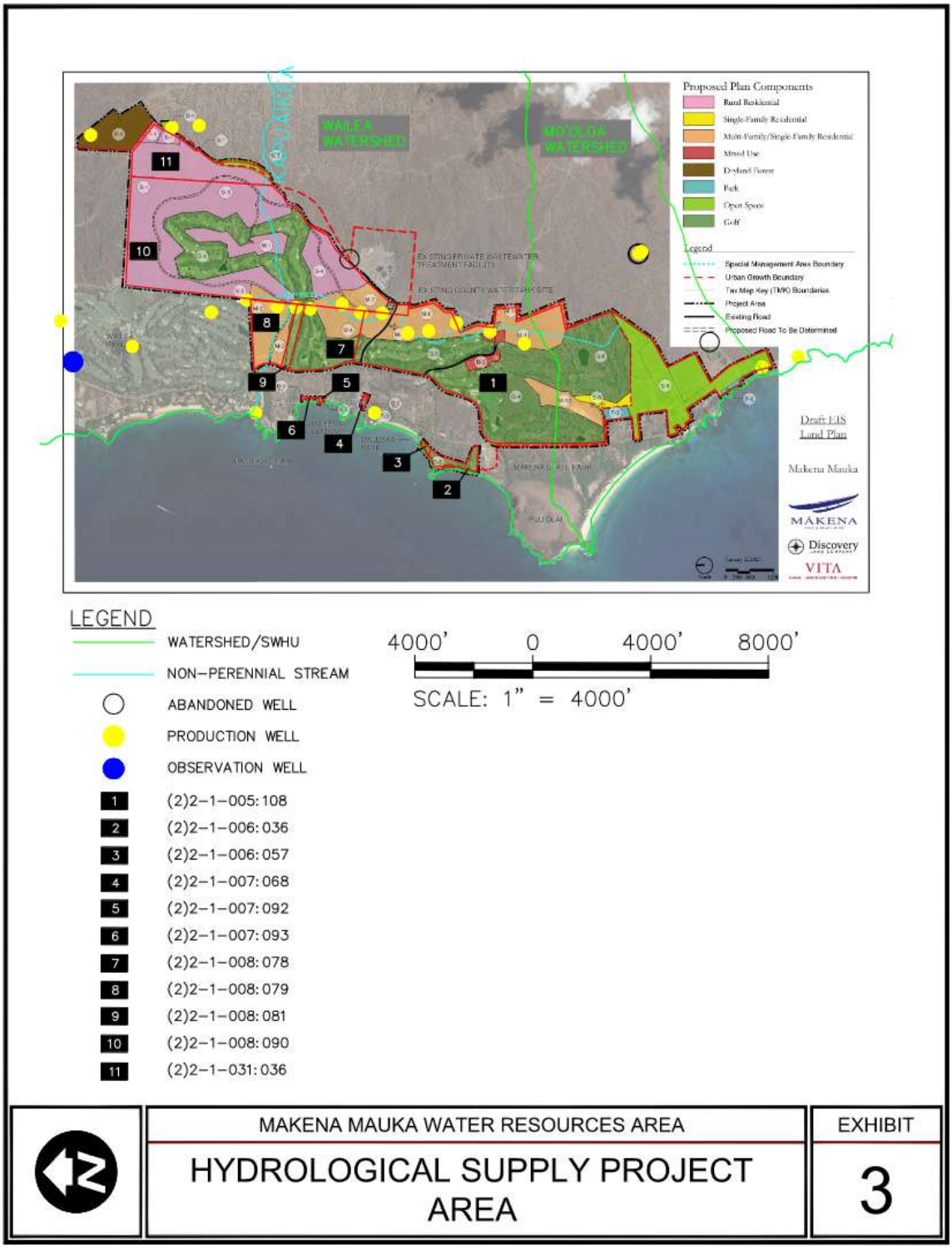

Exhibit 3. Mākena Mauka Project Area Water Source Map (modified Fig. 1 TNWRE [5])

4.2. Climate

The hydrologic water cycle and local climate are the fundamental source for all water of an area. Rainfall (RF) and evapotranspiration (ET) are reviewed in the following sections showing that spatial variations in rainfall and potential evapotranspiration (PET) vary significantly over the region and in the MMP area. Climate change is also a significant issue of concern, and it should be noted there are future pending predictions that raise the uncertainty of how much the climate will remain consistent with long-term trends in the region and the project area. Predicted climate changes could affect the availability of ground water for various drinking and irrigation needs of the MMP while the surface water effects will be more related to water quality and intermittent storm flood events in the historically dry area.

Table 2 summarizes the general climate through RF, ET, and PET ranges for the hydrologic units and MMP areas to show and quantify the "dryness" of the area, which is exemplified by maximum PET exceeding rainfall by approximately five (5) times. **Appendix A** photos show the dry conditions of the project area parcels next to or containing well irrigated golf turf area. **Appendix B and C** provide areas detailed in **Table 2** with more detailed discussions of these parameters explained in the respective following sections of this report.

Table 2. Annual Mean (inches) Ranges

	Annual Mean (inches) Range					
	RF[1]		ET[2]		PET[3]	
Area/Gage	Min	Max	Min	Max	Min	Max
Kama'ole ASA[4]	11	41	3	49[9]	35	285
Red Hill[5]		41[10]	13 – withing range		177 – within range	
Wailea SWHU[6]	11	36	3	45	35	227
Polipoli Spring		36[11]	23 – within range		76 – within range	
MMP[8]	13	16	23	45	79	138
Mākena	5	30	N/A	N/A	N/A	N/A

Notes:
[1] RF = Rainfall
[2] ET = Evapotranspiration
[3] PET = Potential Evapotranspiration
[4] ASA = Aquifer System Area, which is a ground water hydrologic unit
[5] Red Hill is located at HaleNet SKN 339.6
[6] SWHU = Surface water hydrologic unit
[7] Polipoli Spring location is SKN 339.6 gaging system
[8] MMP = Mākena Mauka Project
[9] A 67-inch data point is an anomaly, and all other data is below 41 inches
[10] Annual average since 1955
[11] Annual average since 1990
[12] NOAA Sta – USC00515842 at Mākena Golf Course from 1982 to 2024

4.2.1. Rainfall

RF is spatially variable because of the islands' topography and the persistent northeasterly trade winds. The Hawai'i Climate Data Portal [12] (URL: https://www.hawaii.edu/climate-data-portal/data-portal/) website provides the best estimates for mean RF ranges based on complete historic RF gage records statewide and near Mākena Mauka (see **Appendix B**).

Generally, mean annual RF historical data from seven (7) active and twelve (12) discontinued RF stations spanning various periods over the years between 1903 to the present within the Kama'ole ASA demonstrate the dryness of the region. Along the Kama'ole ASA coastline from Kenolio Park to La Perouse Bay the mean annual RF is approximately between 11 to 14 inches while the maximum near the top of Haleakalā at the active HaleNet SKN 339.6 station is 41 inches. Therefore, the range of mean annual RF in the Kama'ole ASA is roughly between 11 to 41 inches while the mean annual RF of

the Wailea SWHU within the Kama'ole ASA ranges between 11 to a max of 36 inches at the active Polipoli Spring SKN 267.2 station.[5]

Additionally, National Oceanic and Atmospheric Administration (NOAA) has a precipitation gauge on Mākena Golf Course in the project area measuring daily RF data since May 1, 1982 as shown in **Exhibit 4**. This gives a more direct localized sense of what the RF is within the MMP. Like the surrounding region, MMP is a very dry area with annual RF ranging from 5 to 30 inches over the 32-year period since 1982, and the average annual RF is 14 inches.

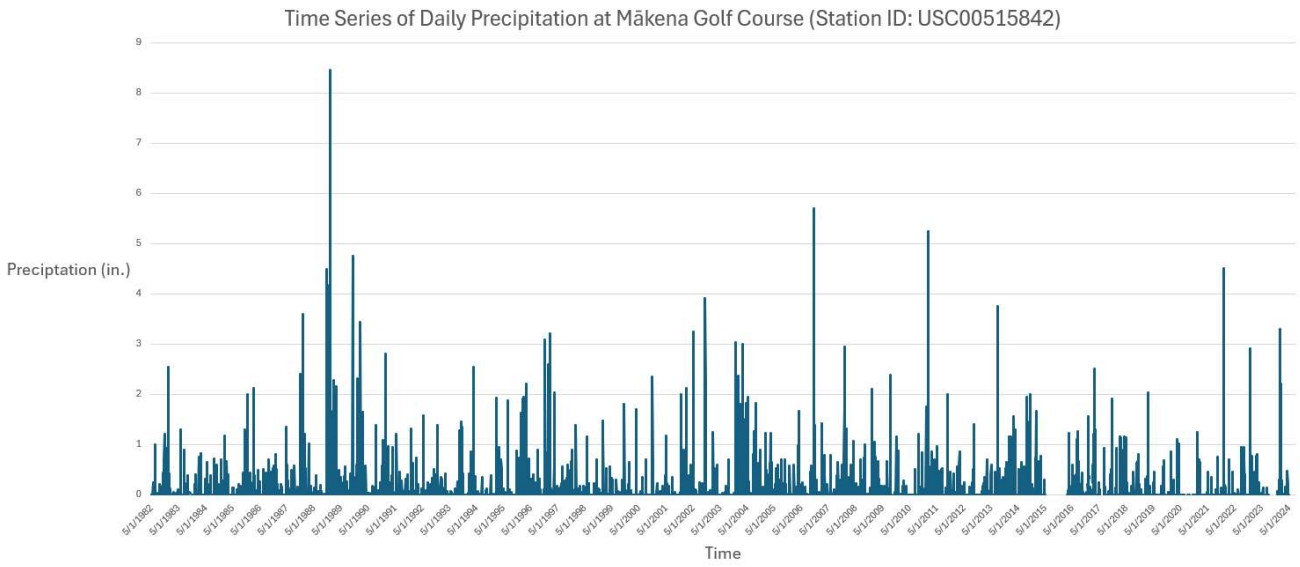

Exhibit 4. Time Series of Daily Precipitation at Mākena Mauka Golf Course

[5] For comparative purposes between older vs. newer methods and additional data, it should be noted that the older annual mean rainfall rate isohyets from the 1986 Rainfall Atlas of Hawai'i, Giambelluca [47] mean annual rainfall was under 16 inches along the Wailea coastline to under 49 inches near summit of Haleakalā.

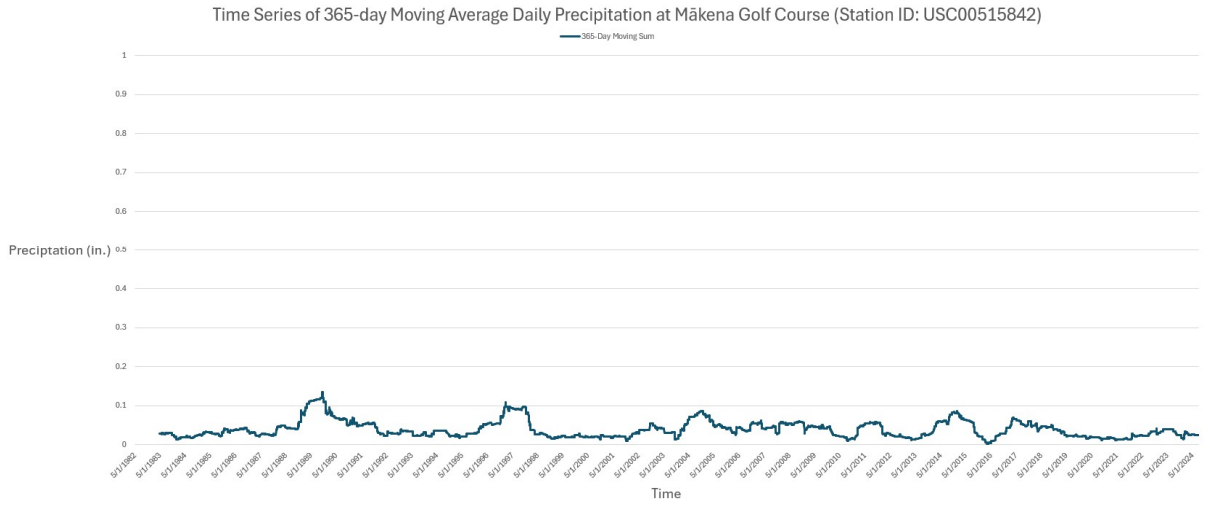

Exhibit 5. Time Series of 365-Day Moving Average Daily Precipitation at Mākena Golf Course

The complete time-series of the daily precipitation highlights large storm events very well and the time series of the 365-day moving average (**Exhibit 5**) visually depicts the daily dryness much more accurately, showing less than 0.2 inches/day. There is usually little to no rain in the MMP area on a daily basis.

It is important to note there are also recent uncertainty analysis based on observed declines in RF from 1920-2012 based on analysis by Frazier and Giambelluca [13]. This will be addressed in the SY Section 3.3.2 of this report.

4.2.2. Evapotranspiration

ET is the combination of evaporation off a water surface exposed to the atmosphere and transpiration, which is the process where vegetation takes up soil-moisture water through its root system and releases additional water vapor into the atmosphere. Again, the Hawai'i Climate Data Portal [14] (URL https://www.hawaii.edu/climate-data-portal/evapotranspiration-atlas/) website provides the best maps for estimates of various actual mean ET and mean annual PET ranges near

Mākena Mauka (see **Appendix C**). **Table 2** summarizes the ET ranges for the various hydrologic units and the project area.

Actual annual mean ET ranges from 3 to 67 inches along the same coastal segment of the Kama‘ole ASA as described previously in the Rainfall Section 3.2.1 to 13 to 67 inches near the active rain gage station at the HaleNet SKN 339.6 station near the Red Hill summit of Haleakalā. Therefore, the range of mean annual ET in the Kama‘ole ASA is roughly between 3 to 67 inches while the mean annual ET of the Wailea SWHU within the Kama‘ole ASA ranges between 3 to a max of 45 inches at the active Polipoli Spring SKN 267.2 station. However, the 67-inch estimate is an anomaly near the intersection of E Lipoa Street and Liloa Drive approximately 2.7 miles north of the MMP area. In fact, there are two large swimming pools just makai and mauka of the intersection.[6] The next highest ET nodal estimate is approximately 49 inches with the remaining estimates all lower than the 49-inch estimate in the Kama‘ole ASA. Therefore, it is reasonable to say the more accurate range of actual annual mean ET is between 3 to 49 inches within the Kama‘ole ASA. These estimates are relatively low due to the dryness of the area where there is normally little water to evaporate or transpire, which the 67-inch anomaly clearly demonstrates.

Evaporation from a pan evaporation station where water is always present combined with land cover and vegetative correlation coefficients that multiply additional transpiration effects based on type of vegetation and soil characteristics can help to estimate the *PET* if water were always available through additional RF or irrigation. The Penman-Monteith PET model gives the highest maximum PET if water was always present. Based on the online tool, the mean annual PET range for the Kama'ole ASA is roughly 35 to 285 along the same coastal segment, as described previously in the RF Section 3.2.1, to 177 inches near the active rain gage station at the HaleNet SKN 339.6 station near the Red Hill summit of Haleakalā. Therefore, the range of mean annual PET in the Kama‘ole ASA is roughly between 35 to 285 inches while the

[6] The two pools are located at the Haggai International Institute and the Kihei Aquatic Center that explain the high ET rate.

mean annual PET of the Wailea SWHU within the Kama‘ole ASA ranges between 35 to 227 near the coast to 76 inches at the active Polipoli Spring SKN 267.2 station in the upper elevations of the area.

It should also be noted that based on older annual adjusted mean pan evaporation rate isopleths from the 1985 Ekern report [15] potential ET was estimated to range from 90 to 70 inches along the Kama‘ole ASA coastline from Kihei to the Mākena Mauka areas, respectively.

Generally, PET is 3 to 10 times the available RF in areas within the project area, which is why it is necessary to augment RF to meet annual irrigation needs.

4.2.3. Climate Change

Climate change is occurring in the Hawaiian Islands. Shifting and declining patterns in RF [13] and streamflows [16] are proof of this, which can then affect available ground and surface water in the future. Ground water availability has the advantage of having large storage capabilities to buffer these changes compared to streams and surface water availability. This is why dams for surface water reservoirs can and have been used in the past to function as buffers to capture and store large RF event runoff that can be used during drier times of the year.

Studies on future climate scenarios have been and continues to be developed. The USGS Oki study on declining trends of streamflow [16] and more recently by Kāne Mair [17] show that climate change may have significant impacts on water availability in Hawai’i.

4.3. Ground Water Availability and Impacts

4.3.1. Occurrence of Ground Water in the Kama‘ole ASA

The nature and occurrence of ground water is well established in Hawai’i. Much of the regional geology and hydrology of the Wailea region has its origins from Stearns [9] [10] and later more detailed studies by Rosenau [18] and Dale [19]. The 2019 WRPP [4]

is a good summary of the various seminal studies that support this conceptual model of Hawaiian aquifers. The traditional conceptual diagram showing the basal, dike complex, perched, and caprock aquifer zones are shown in **Exhibit 6.**

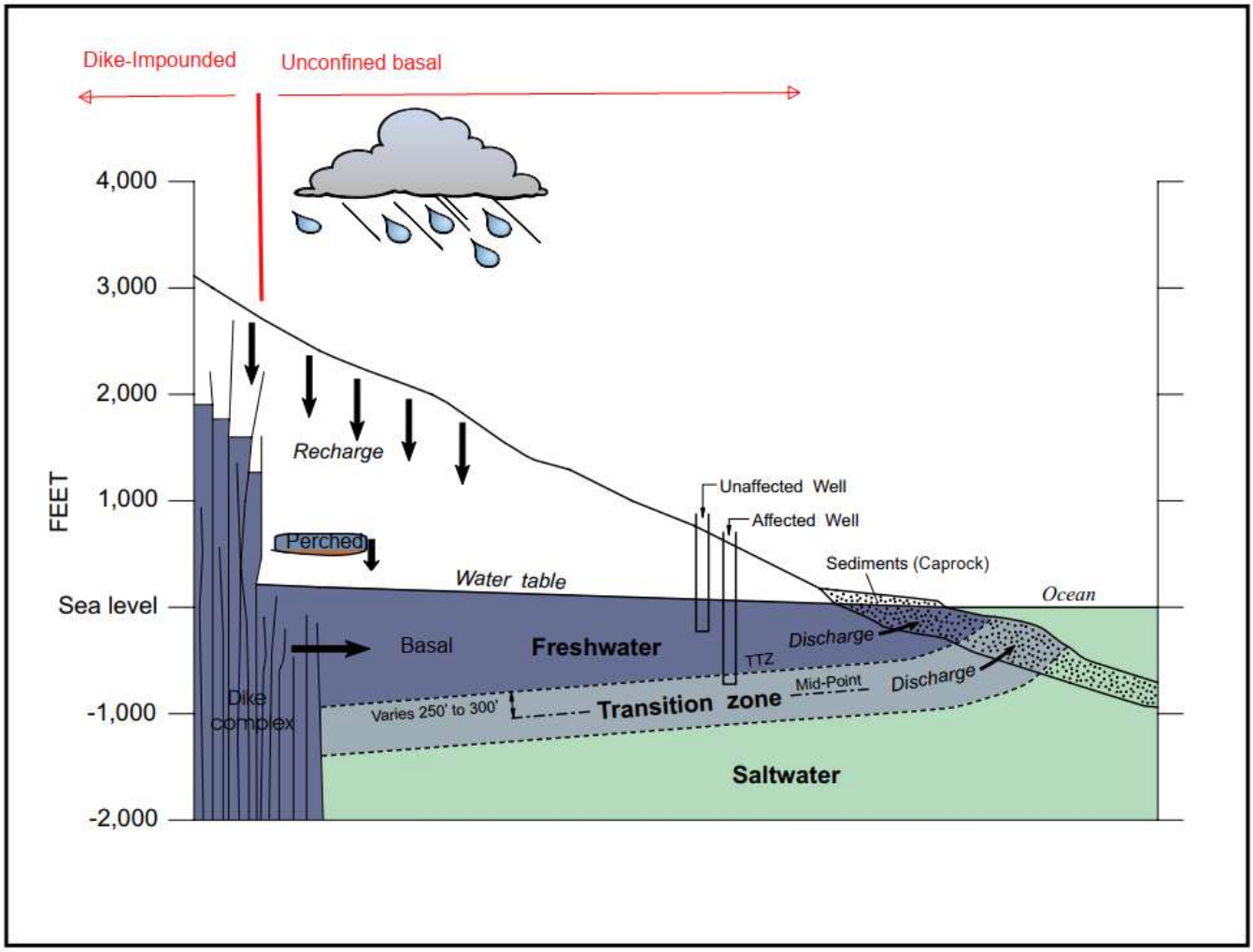

Exhibit 6. Ground Water Occurrence in Kamaʻole ASA
(modified from CWRM https://files.hawaii.gov/dlnr/cwrm/maps/hydrodisplay.pdf)

Recent deep monitor wells have found deep-confined freshwater underlying both the basal and saltwater aquifer zones on the Big Island in both the Hilo and Kona areas. However, there are no deep monitor wells on Maui or the Kamaʻole ASA that have encountered such a zone and it is not currently an issue. The majority of ground water occurrence within the Kamaʻole ASA is basal with its most inland boundary

terminating near the high-level dike impounded complex in the Haleakalā rift zones as shown in **Exhibit 7** [20].

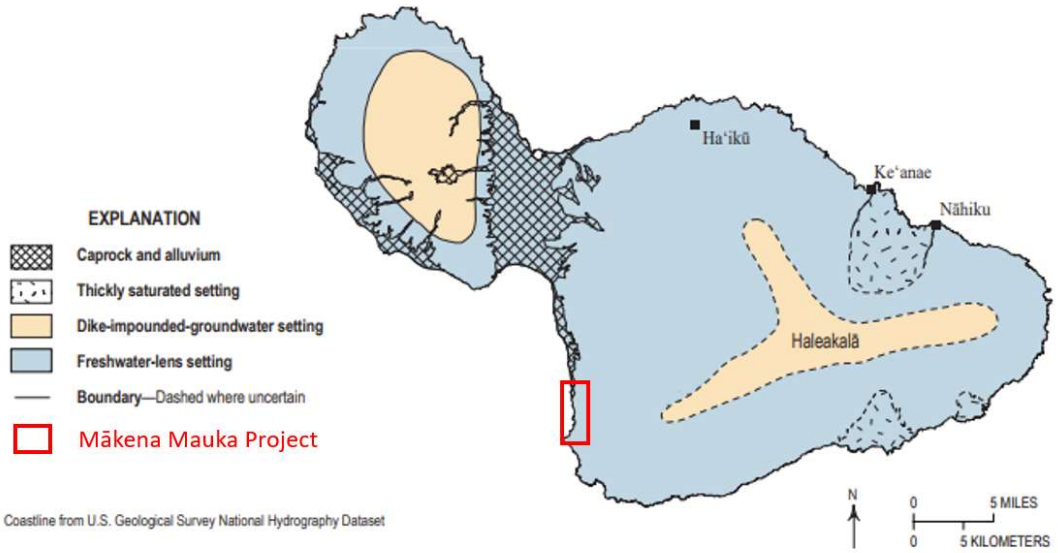

Figure 41. Map of the principal groundwater settings on Maui, Hawai'i. Modified from Izuka and others (2018).

Exhibit 7. Geologic based groundwater occurrence on Maui (modified Fig. 41 Izuka & Rotzoll [21])

Basal aquifers in Hawai'i typically have tremendous storage compared to high-level dike complex and perched aquifers. As such, they can sustain large pumping with little reduction in water levels. However, basal aquifers are more susceptible to saltwater intrusion from the underlying saltwater upon which the less dense freshwater floats. This saltwater intrusion into wells and the basal aquifer are not a concern in high-level dike complex and perched aquifers unless geothermal activity is present. There is no such evidence of geothermal activity in the Kama'ole ASAs. Based on CWRM well data information, the basal lens in the Kama'ole ASA ranges up to approximately +10 ft above mean sea level (msl), but most recorded water levels are under +5 ft msl (see **Appendix D**). Water-level data in the project area range between 1-3 ft above sea level, so the ground water is at a depth well below any typical excavation required for construction of a residential project. Any new well drilling near or within the project area must go down to that elevation to encounter the basal aquifer. The reasons for the

relatively thin basal lens are that 1) most wells are drilled near the coastline where the lens is thinnest and 2) the general lack of significant caprock to impede ground water discharge to the ocean to increase ground water levels and storage (see **Exhibit 7** and **Appendix E**).

The Kama'ole ASA lies within the larger Central Aquifer Sector Area as shown in **Exhibit 8** below.

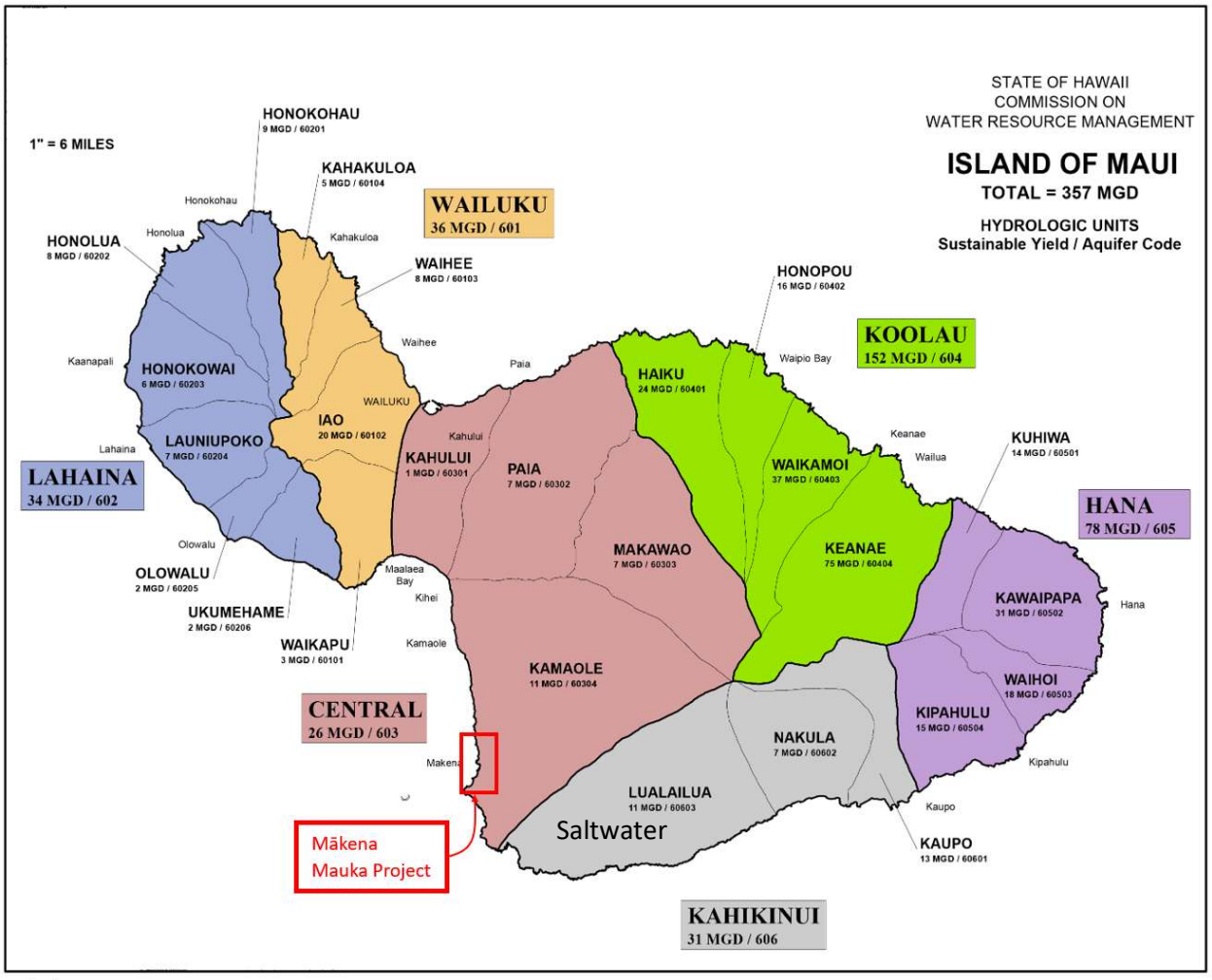

Exhibit 8. Ground Water Hydrologic Units for Maui (WRPP [4]) and Mākena Mauka Location

Covering an area of 91.4 mi^2 (including 2.2 mi^2 of caprock near the coast) the Kamaʻole ASA extends from the mauka to Red Hill at the top of Haleakalā. The caprock is very thin near the coast and only exists in the northern coast of the ASA (See **Exhibit 7** and **Appendix E**) and is composed mostly of Hana volcanics [11]. It is within these boundaries that localized water budgets estimating recharge that contribute to SYs are computed in the management scheme of setting water availability for ASAs statewide [8], [22], [4].

4.3.2. Sustainable Yield

SY under the State Water Code, HRS 174C-3 is defined as:

> *"Sustainable yield" means the maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the commission.*

SY is the measure against which available water is managed and determined by the CWRM, especially within GWMAs such as the ʻĪao ASA.

The CWRM currently determines ground water SYs in the 2019 WRPP [4] of the Hawai'i Water Plan (HWP) using the Robust Analytical Model (RAM) model(s).[7] The CWRM normally selects the minimum from a range of SY estimates to address the precautionary principle unless there are groundwater numerical models, data from deep monitor wells and sufficient historical pumpage and chloride records to support a higher SY than the minimum estimated by recharge ranges and RAM. Numerical models have the advantage of estimating future temporal, spatial, and quality changes if sufficient observed data exists and require calibration analysis with assumed geologic boundaries to match observed steady states (if they exist) of water levels, pumpage, and chlorides

[7]The CWRM uses the analytical Robust Analytical Model (RAM) [52] or RAM2 [51] approved by CWRM [4]. More detail on this approach is discussed in the 2019 WRPP [4] and why it is useful for planning and regulatory purposes and forms the foundation for most SY estimates in the state when compared to the more complex numerical models.

to make future predictions reasonable. If calibrated and validated, numerical models can help estimate impacts to ground water resources for various scenarios of pumpage or recharge. A numerical model [23] has been developed specifically to assess ʻĪao, Waiheʻe, and Waikapū ASAs but not for the Kamaʻole ASA. The current best conservative estimate of SY for the Kamaʻole ASA is 11 Mgd from a range of 11-16 Mgd [4], which is 44% of the minimum recharge range estimated between 24-37 Mgd [4] for the area. The SY is a daily use figure averaged annually and the CWRM uses a 12-month moving average of pumpage to assess the impact on the aquifer resource.

Since drinking water is supplied to the Mākena area from the MDWS CMS, then the primary sources of the ʻĪao (60102) and Waiheʻe (60103) ASAs for this distribution system are also important to consider. Also, according to the MDWS 2023 Maui Island WUDP [1], the Haiku ASA (60401) will play a key role planning for future growth and relieving current reliance on the ʻĪao and Waiheʻe ASAs for drinking water.

The current best estimate of SY for the ʻĪao ASA is 20 Mgd from a range of 10-28 Mgd [4], which is based on a significant amount of data and analysis.[8] The current best estimate of SY for the Waiheʻe ASA is 8 Mgd from a range of 6-15 Mgd [4], based on similar related analysis with the ʻĪao ASA. Lastly, the current best conservative estimate for the Haiku ASA is 24 Mgd based on a range of 24-27 Mgd.

Normally, the minimum of the estimated SY range is selected as the SY to be conservative as discussed in more detail in the 2019 WRPP [4]. The latest published recharge studies by Engott [24] based on the online RF and ET data described above provided the basis for updated recharges for the Kamaʻole, ʻĪao, Waiheʻe, Haiku, and the Waikapū ASAs. More details of these latest assumptions for the best estimate of minimum recharges for the Kamaʻole, ʻĪao, Waiheʻe , Haiku, and Waikapū ASAs can be found in the 2019 WRPP [4]. However, the more recent recharge estimates use a more

[8] In accordance with the 2019 WRPP , the alternative minimum SY for ʻĪao and Waiheʻe were based on complete historical data record from production wells, monitor wells, three (3) deep monitor wells, the RAM2 model, and pre-2019 USGS/MDWS numerical models [23] [50]. Post-2019 USGS numerical and recharge models also cover various pumpage scenarios that indicate the reasonableness of the current ʻĪao and Waiheʻe SYs [21] [26] [54].

detailed soil-moisture storage model that is not as conservative as the older annual recharge estimates made in the original 1990 WRPP [8] that overestimate the effects of ET. The current 2019 WRPP still uses older annual average recharge estimates for most SY estimates to address the precautionary principal policy of the CWRM including the Kama‘ole ASA. This original older method significantly overestimates ET and is typically still more conservative than the newer recharge methods that observed and predicted reduced RF in the future. **Table 3** provides a summary of this discussion in the pumpage Section 4.3.3 of this report.

Despite the breadth of data, research, and public involvement for the CWRM approval process that back up the current and reasonable minimum SYs within the 2019 WRPP there are two (2) significant uncertainties to SYs in all ASAs statewide:

- First, in January 2022, the USGS presented unpublished analyses to the CWRM that considers future climate change scenarios where recharge is predicted to be significantly reduced; hence, possibly reducing estimated SYs [17]. However, it is not clear if this reduction is related to the more recent and higher estimates of the recharge range rather than the minimum recharge used based on older but more conservative recharge calculations and estimates.
- Second, the 2019 WRPP acknowledges the emerging issue of ground water dependent ecosystems (GDE) that have not been explicitly addressed in establishing SYs. Although targeted as a test case in the Keauhou ASA (80901) [25] to assess how to address this GDE issue, current policy of the CWRM appears to have moved this issue into more recent regulatory approvals statewide for all well construction permits.

4.3.3. Well Sources, Pumpage, Water Levels, and Salinity

According to the CWRM well index database as of January 2025, there are 149 known well sources with a total installed pumping capacity of 21.563 Mgd in the Kama‘ole ASA that are not abandoned or lost (see **Exhibit 1** and **Appendix D**). All wells not sealed are required to report total pumpage, water levels, and salinity to the CWRM monthly as defined under HAR 13-168-7. Most of the ground water data comes from well sources within 3 miles of the coast in the Kama‘ole ASA.

The historical pumpage for the Kamaʻole ASA is summarized in **Exhibit 9** and **Appendix F**. Similar pumpages for ʻĪao (**Exhibit 10/Appendix G**), Waiheʻe (**Exhibit 11/Appendix H**), and Haiku (**Exhibit 12/Appendix I**) ASAs are included in this section as these aquifers would provide potable water for MMP via the MDWS CMS as specified in the MDWS 2023 Maui Island WUDP.

Although the MDWS CMS does not have any sources in the Waikapū ASA, pumpage information is also included as it is also a potential future alternative source for potable water (**Exhibit 13/Appendix O**). Additionally, scenario 3 of the numerical modelling efforts [26] by MDWS and USGS show that Waikapū ASA could be pumped as high as 4.117 Mgd, while the ʻĪao ASA is pumped to ground water use permit allocated amounts of 19.064 Mgd and Waiheʻe ASA is pumped to 5.039 Mgd with chlorides remaining below the EPA secondary guidelines of 250 mg/l in all modelled production wells with the exception of 1 source (see **Exhibit 14).**

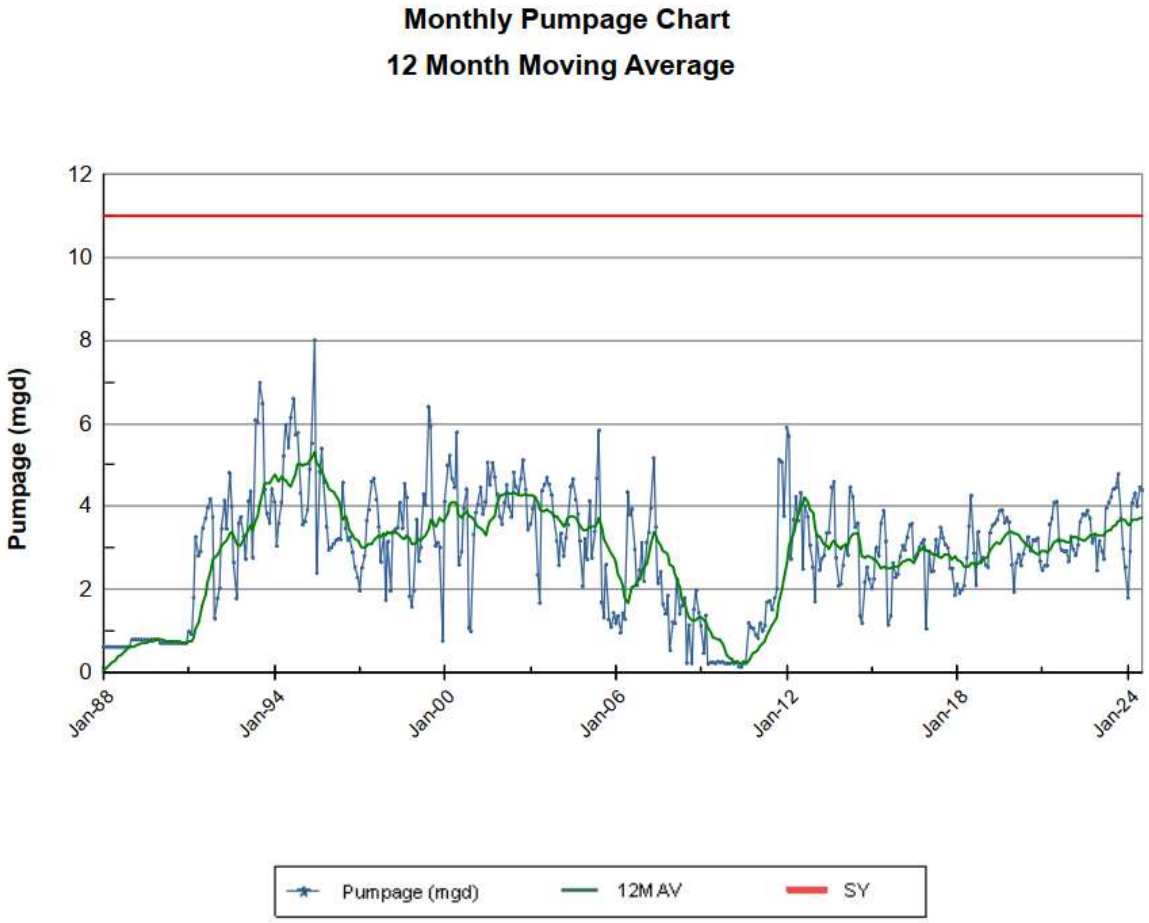

Exhibit 9. CWRM Historical Kama‘ole ASA Pumpage as of January 2025 (See **Appendix F**)

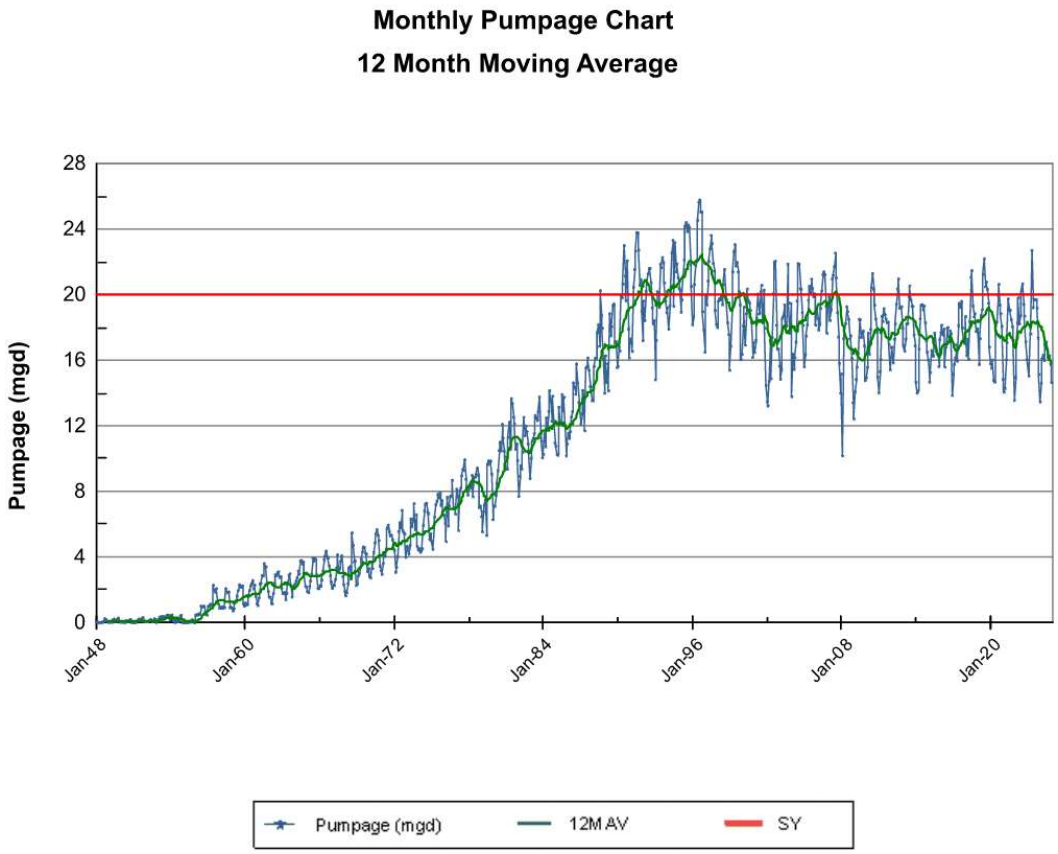

Exhibit 10. CWRM Historical ʻĪao ASA Pumpage as of January 2025 (See **Appendix G**)

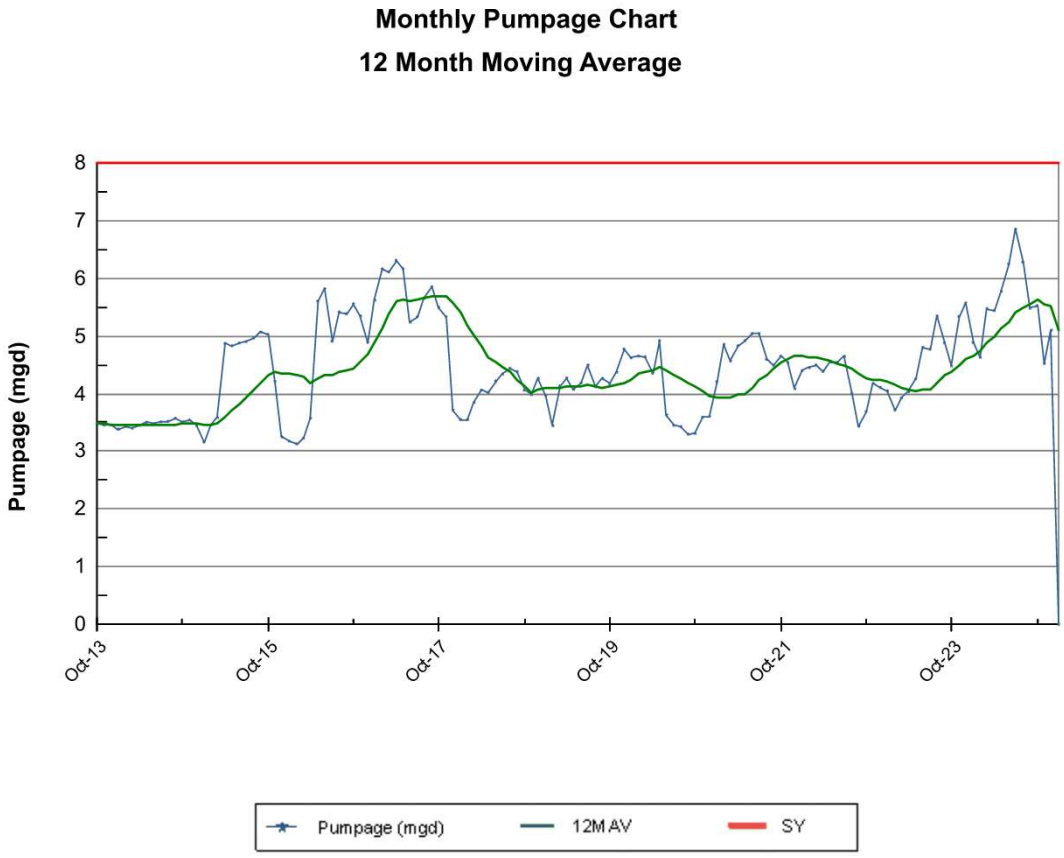

Exhibit 11. CWRM Historical Waiheʻe ASA Pumpage as of January 2025 (See **Appendix H**)

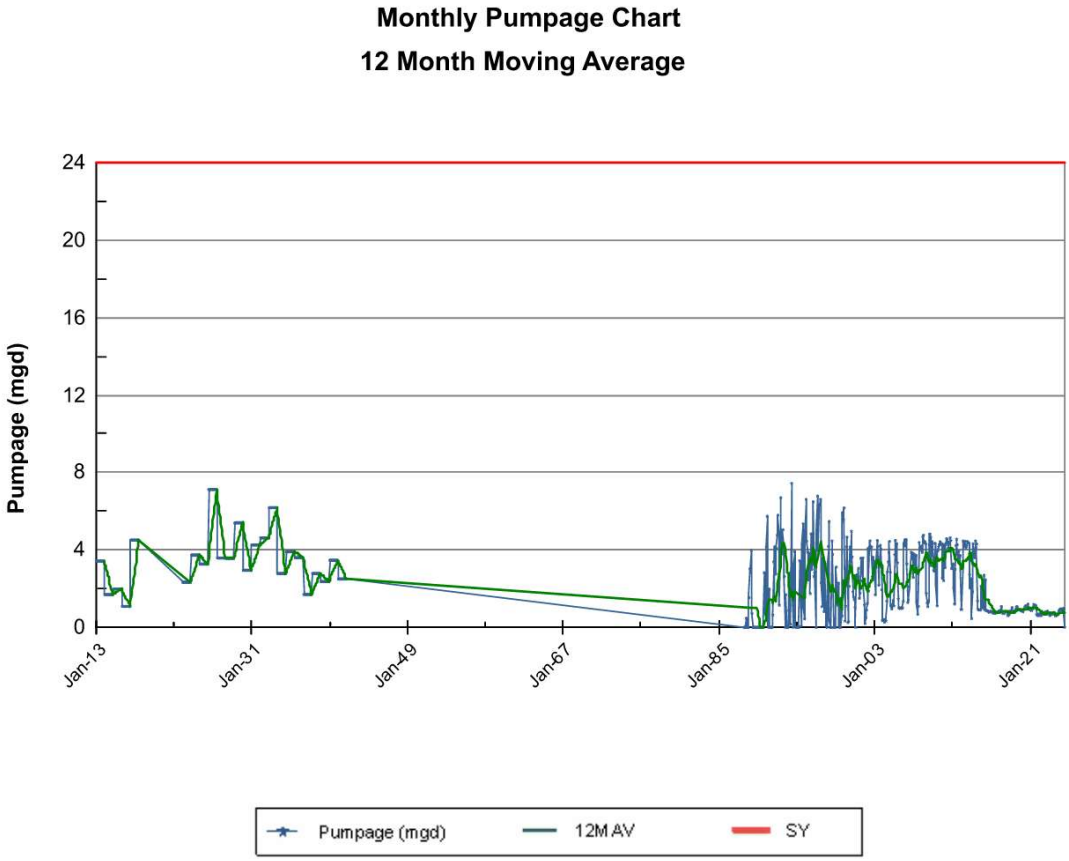

Exhibit 12. CWRM Historical Haiku ASA Pumpage as of January 2025 (See **Appendix I**)

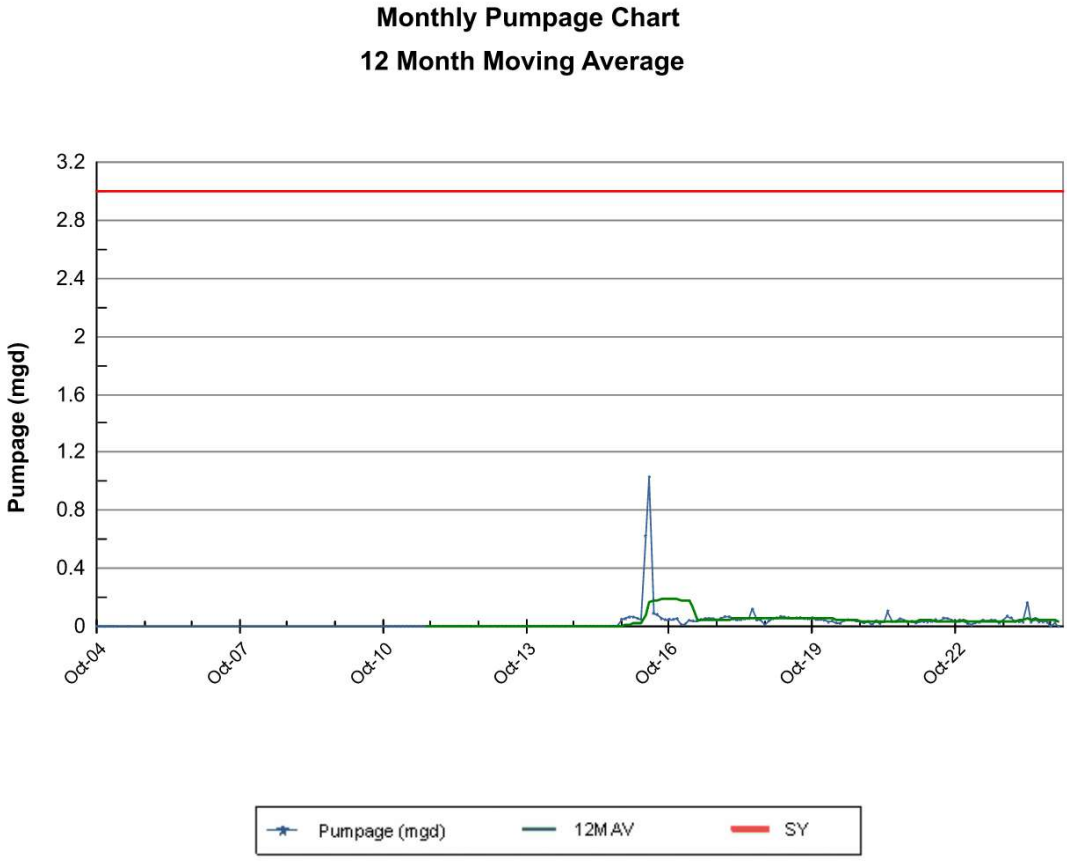

Exhibit 13. CWRM Historical Waikapū ASA Pumpage as of January 2025 (See **Appendix O**)

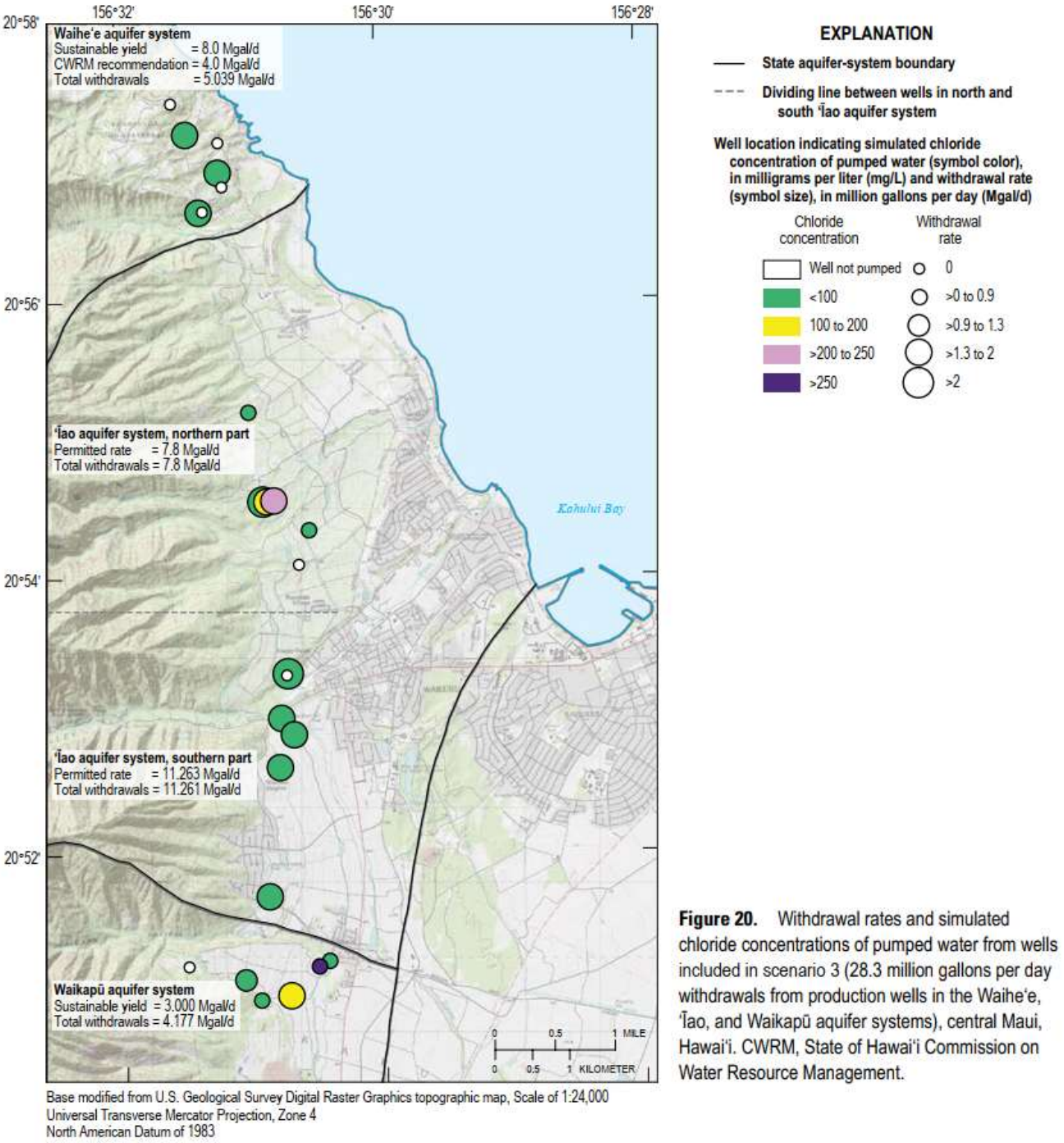

Figure 20. Withdrawal rates and simulated chloride concentrations of pumped water from wells included in scenario 3 (28.3 million gallons per day withdrawals from production wells in the Waihe'e, 'Īao, and Waikapū aquifer systems), central Maui, Hawai'i. CWRM, State of Hawai'i Commission on Water Resource Management.

Exhibit 14. Fig 20. from MDWS/USGS Numerical Model Scenario 3 Chloride Results [26]

The CWRM tracks total pumpage against SY by using the 12-MAV to protect the ASA based on current pumpage. The 12-MAV is a rolling 12-month period such that at any particular month the previous 11 months of pumpage are made part of the average to cover complete annual seasonal variations. **Table 3** is a summary of the current pumpage vs. SY in Kamaʻole, ʻĪao, Waiheʻe, Haiku, and Waikapū ASAs.

Table 3. SY vs. Pumpage

	Mgd					
ASA[1]	Recharge Range	SY[2]	12-MAV[3]	Unused SY	% SY Used	As of WUR Date
Kama'ole	24-37	11	3.805	7.195	35%	12/31/2024
ʻĪao [4]	15-42	20	13.157	6.843	66%	12/31/2024
Waiheʻe [5]	12-30	8	5.518	2.482	69%	12/31/2024
Haiku	54-61	24	0.837	23.277	3%	12/31/2024
Waikapū	6-18	3	0.037	2.968	1%	12/31/2024
Total	111-188	66	22.517	43.483	34%	

Notes:

[1] ASA = Aquifer System Area, which is a CWRM ground water hydrologic unit as defined in the 2019 WRPP

[2] SY = Sustainable Yield as defined by HRS 174C-3, 31(i)(2), & 2019 WRPP

[3] 12-MAV = 12-month moving average for non-caprock sources which do not count against SY, including high-level dike sources

[4] ʻĪao is a designated ground water management area where the SY is an alternative minimum due to data record, multiple deep monitor wells, RAM2, and a numerical ground water model developed and used by the USGS and MDWS.

[5] Waiheʻe has an alternative minimum SY due to data record, a deep monitor well, RAM2, and a numerical ground water model developed and used by the USGS and MDWS.

The current 12- MAV pumpage from the Kamaʻole ASA as of January 2025 is 3.805 Mgd (see **Appendix F**), which is 7.195 Mgd lower than and using only 35% of the Kamaʻole ASA's 11 Mgd SY (or 10-15% of the recharge range). Thus, based on actual use it would appear there is ample ground water available for reasonable and beneficial uses within the Kama'ole ASA at this time. It is important to note that the CWRM approved a reservation of 2.547 Mgd to DHHL from the Kama'ole ASA on September 18, 2018 for potable needs and this should be considered as future pumpage against the SY. The DHHL reservation raises the authorized planned use in the Kama'ole ASA to at least 58% of the 11 Mgd SY, which indicates that the utility of the Kamaʻole ASA ground water

is still not threatened and could provide reasonable and beneficial irrigation water on a sustainable basis.

Water levels in the Kama‘ole ASA range up to approximately +10 ft above mean sea level (msl) but most recorded water levels are under +5 ft msl (see **Appendix D**). Near and within the project area water levels are expected to range between 1-3 ft above mean sea level. Unfortunately, monthly water-level reporting is not as robust as monthly pumpage reporting and there is little reporting from most wells in the Kama‘ole ASA including observation monitor wells of: 1) USGS Observation Wells Kihei Fire Well Nos. 6-4427-006 to 008; 2) Kalama Beach Well Nos. 6-4327-008 to 010; and the 3) County Observation Kihei Injection Well No. 6-4426-001 (personal communication with CWRM staff).

CWRM staff directly collect water-level data from the more inland Waiohuli Observation Well No. 6-4422-001 (see **Exhibit 15**). The USGS drilled the well and recorded water levels between +6 to +5 ft msl from 2001 to 2003 [27]. This indicates a decreasing trend of 0.07 ft/yr over the past 23 years.

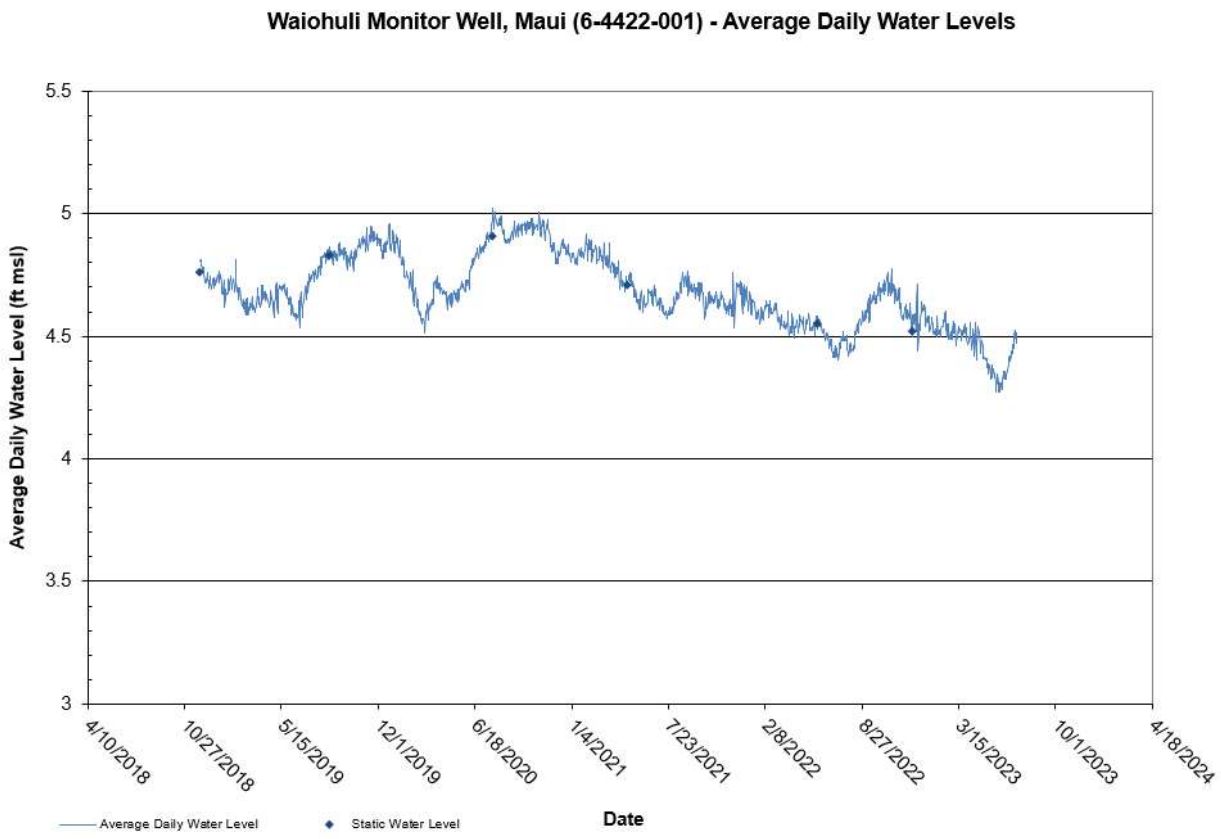

Exhibit 15. CWRM Waiohuli Monitor Well Water-Level Data through July 2023

The trend may be due to larger hydrologic changes from island wide climate change, diminished importation of surface water from East Maui into the Upcountry Maui Irrigation System and the adjacent Makawao, Pāʻia, and Kahului ASAs, the closure of HC&S Sugar operations in 2016, or a cumulative impact from all these events.

CWRM has collected data (**Exhibit 16**) for Maui Meadows Observation Well 6-4225-001, which is a more proximal observation well just under a mile north of the MMP (see **Exhibits 1 & 2**). Water levels are lower at this site as it is nearer to the coast, and it has a similar trend to Waiohuli (**Exhibit 15**) since 2020 except for a significant rise during the summer.

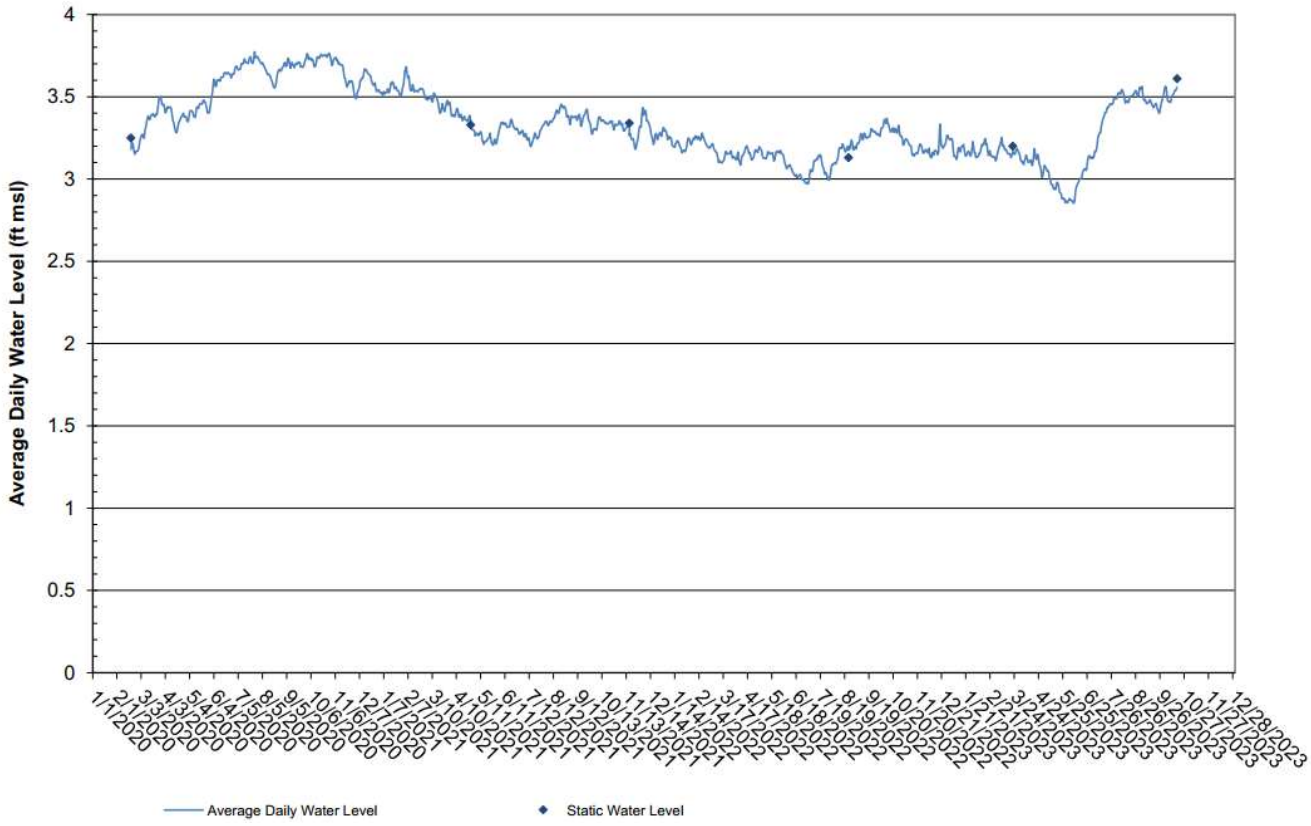

Exhibit 16. CWRM Maui Meadows Monitor Well Water-Level Data January 2020 through July 2023

It is highly unlikely that pumping from the existing and new well sources near the coast in the MMP vicinity would have any impact towards the inland area of the Kama‘ole ASA. Instead, once a commensurate amount of coastal discharge is captured by irrigation pumpage near the coast, water-level impacts will cease to extend inland within the Kama‘ole ASA from the MMP irrigation well sources. Given the Kama‘ole ASA shoreline is 16.6 miles long, uniform coastal discharge estimates would range between 1.446 to 2.229 Mgd/mile based on recharge estimates (see **Table 3**). At this rate, the natural discharge along the MMP coastline (5 miles) would be approximately 7 to 11 Mgd. However, assuming uniform coastal discharge, the SY of the Kama‘ole ASA would suggest that ground water discharge along the MMP coastline should be limited to a total of 1.79 Mgd, or 30% to 46% of the recharge range of the natural ground water

coastal discharge to the area.[9] As of January 2025, the reported actual 12-MAV pumpage from wells within and mauka of the MMP coastline is 0.844 Mgd (see **Appendix R**), which suggests current localized pumpage at the MMP is currently within sustainable localized coastal discharge limits. Even so, spreading out the distribution of localized pumpage stresses north and south of the MMP to minimize further impacts on water levels, chloride concentration, and coastal discharge would be good management practice.

Some of the irrigation pumpage will also have mitigated impacts due to return-irrigation recharge contributions back to the aquifer; however, efficient irrigation practices would limit return irrigation by avoiding overwatering. Soil-moisture-sensor based irrigation is one example of efficient irrigation that while promoting efficient use of water would reduce return-irrigation recharge benefits to the aquifer.

Much of the ground water chloride and water-level data in the Kama‘ole ASA comes from well sources within 3 miles of the coast where most have chloride concentrations that exceed the U.S. Environmental Protection Agency (EPA) Secondary guideline of 250 mg/L (https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals). The initial chlorides encountered from wells within the MMP and outside the MMP owned by Wailea Golf Course averaged 536 Mg/L, showing these wells are naturally brackish and making the utility of the Kama‘ole ASA as an irrigation water supply near the coastline (see **Appendix D**).

Despite the brackish nature of wells in the vicinity of MMP, saltwater upconing and intrusion are still concerns to maintain the irrigation utility of ground water wells as the upper tolerance limit for most plants is generally 1,000 mg/L and well depths and pumpage rates will need to follow the CWRM’s 2004 Hawai’i Well Construction and Pump Installation Standards (HWCPIS [28]). The two major protection components of the CWRM 2004 HWCPIS are: 1) limits the depth of new wells to ¼ the depth of the

[9] The Kama‘ole ASA RAM D/I, or simply pumpage to recharge, ratio of 44% used to calculate SY lies within this range and shows that a minimum of 54% to 70% ground water discharge would always continue to ocean under the current 11 Mgd SY limit.

basal lens based on the original water-level encountered during the initial well construction and 2) well (step-drawdown) and aquifer (long-term) pump testing. The average of reported initial water-levels encountered by 20 wells within the vicinity of the MMP (see **Exhibits 2 & 3** and **Appendix D**) is approximately +2 ft above mean sea level (msl). Thus, new wells drilled should anticipate a drilling depth limit of approximately -18 ft msl to keep the bottom of the well bore sufficiently above the transition zone to protect against upconing. The pump tests to assess water level and chloride changes are predicated on the size of the pump to be installed. However, well pump capacities below 50 gallons per minute (gpm) do not require testing as the impacts from these capacities are generally less than natural tidal and barometric variation and impacts to ground water-levels and changes to chlorides at this pumping rate are rarely observed.

4.3.4. Ground Water Contamination Concerns

The State of Hawai'i (SOH) Department of Health Groundwater Protection Program Safe Drinking Water Branch (DOH SDWB) provides groundwater contamination maps through their online viewer located at https://health.hawaii.gov/sdwb/groundwater-contamination-viewer/. The intent of these maps is to identify only those wells with current detectable levels of groundwater contamination as shown in **Exhibit 17** for the island of Maui with the MMP area.

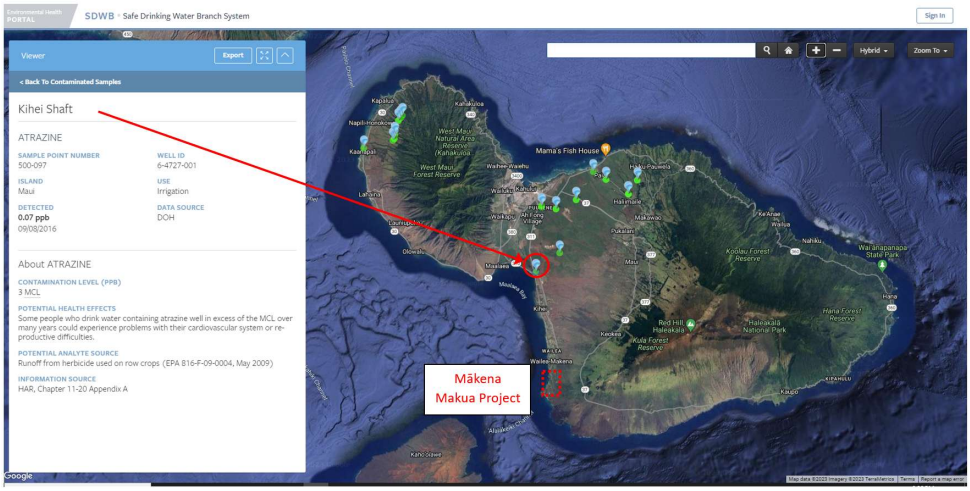

Exhibit 17. DOH Groundwater Contamination Map
(source: https://eha-cloud.doh.hawaii.gov/sdwb/#!/viewer)

There are no reported contaminants in the MMP area or the Kama‘ole ASA. The closest detect has been 9 miles north of the MMP at the Kihei Shaft (Well No 6-4727-001) owned by Alexander & Baldwin, Inc. for the herbicide atrazine. The 2016 0.07 ppb detection is under the 3-ppb maximum contaminant level (MCL), from this irrigation well.

However, there are concerns regarding elevated levels of nitrate and nitrite, ortho-phosphate, turbidity, and chlorophyll α based on a 2024 annual water quality monitoring report for the Client by AECOS, Inc. [29]. The AECOS report recognizes that outbreaks of excessive amounts of algae off West Maui have been attributed to elevated concentrations of both dissolved inorganic nitrogen (DIN) and inorganic phosphorus (DIP) in sewage effluent injected into groundwater and migrating to nearshore waters but that no such algal outbreaks have been recorded for nearshore waters off the MMP area.

The AECOS report states that the nutrients in groundwater near Mākena have two possible origins: (1) a remote source: present in groundwater that originates upslope of the resort and that can be measured in well water; and (2) a local source: seepage of MG&BC excess irrigation water into the groundwater [29]. There are no

cesspools in the immediate area around the MMP (see **Appendix J**) that would be a source concern of nutrient or microbiological ground water contamination. However, the two to three annual discharges of R-2 effluent into the unlined basin (See Section 3.6.1) may be a source of nutrient contamination.[10] MMP intends to be sewered to its own privately owned and maintained Mākena Wastewater Reclamation Facility and while there is no current estimate of wastewater demands; a preliminary engineering and drainage report (PEDR) will be prepared to assess the wastewater needs of the project .

Finally, it should be acknowledged that pumpage from current and future wells within and around the MMP should reduce the mass loading of nutrient contamination to the aquifer so long as good irrigation and fertilization practices are followed (See **Appendix K** for DOH guidelines).

4.4. Surface Water Availability and Impacts

4.4.1. Occurrence of Surface Water in the Wailea and Mo‘oloa SWHUs

The MMP lies within the Wailea SWHU (6110) and Mo‘oloa SWHU (6109) drainage area of the greater Kahikinui Region (see **Exhibit 18**).[11] It is one of thirty-five drainage areas in the region and covers an area of 35.76 mi^2. The Intermittent riverine of Keawakapu transect the MMP mauka to makai is within the Wailea SWHU (see **Exhibit 3**). This is not a significant source of surface water and will be left undiverted.

[10] R-2 effluent is recycled water that has been oxidized and disinfected to remove contaminants making the resuse water available for landscape irrigation such as landscape, golf course, parks and certain agricultural crops.
[11] The Wailea SWHU (6110) and Mo‘oloa SWHU (6109) as defined in 2019 WRPP [4] and is shown in Exhibit 1.

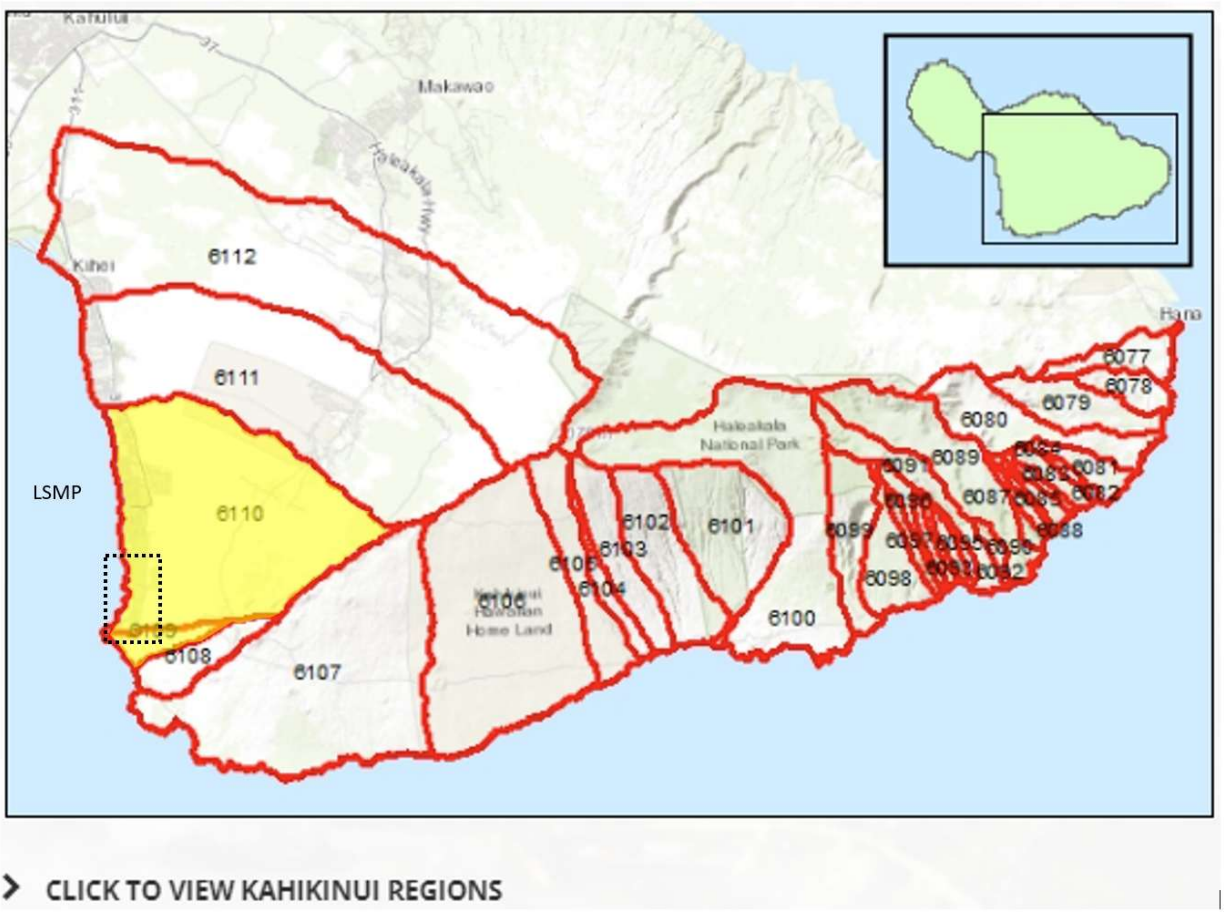

Exhibit 18. CWRM Wailea and Mo'oloa SWHU, Kahikinui Region
(Source : https://dlnr.hawaii.gov/cwrm/surfacewater/ifs/maui/)

4.4.2. Interim Instream Flow Standards

The CWRM has the duty to reasonably protect instream flows. This is done through interim and permanent instream flow standards (IIFS & IFS) that identify minimum flows that must pass through a specific point or reach of a stream.

There are no Instream Flow Standard Assessment Reports (IFSARs) available from the CWRM for any of the Kahikinui Region of the dry leeward side of Haleakalā including the Wailea Watershed/SWHU (6110) and Mo'oloa SWHU (6109). Based on communications with CWRM staff, there are no pending plans to do IFSARs or update

IIFSs since streams are historically intermittent in this dry area. Further, the USGS has no surface water monitoring stations in the region.

Like ground water, an uncertainty to consider related to climate change is that results from USGS Oki study [16] show that long-term stream baseflow trends have been declining since 1913 – 2002 statewide. This will impact surface water availability more than ground water as ground water has much greater storage capacity in aquifers. Although it shows a significant decreasing trend in streamflows statewide from the 1940's, the report itself also concludes further study is needed to see if this observation may be part of a long-term cycle that may return to a wetter period similar to the years between 1913 and 1940's. Since the MMP is already in a dry area with no perennial streams this is likely to have insignificant impacts on the area with respect to water availability and IIFS/IFS.

4.4.3. Diversions

According to CWRM, there are four surface water diversions with no declared water uses that were registered with CWRM within the Wailea and Mo'oloa SWHUs [30] [31]. These diversions identified by CWRM are approximately 8-11 miles mauka upcountry with locations shown in **Exhibit 19**. These divert surface water from Waihou (1116), Waikaalu (1117), an unmapped spring on Ulupalakua Ranch (1118), and Polipoli (1075) springs. There are seven other ground water tunnels near these diversions not shown **Exhibit 19** but listed in **Appendix D** and are identified as the Cornwall Tunnel (4020-002), Waikaalu Spring (3920-002), Polipoli Tunnel (4019-001), Morton Tunnel (4020-003), Waihou Spring (3921-001), Waikaukane Tunnel (4020-001), and Waikaahi Tunnel (4021-001) that may be confused with these four surface water springs. No reported flows from these diversions or tunnels have been made to the CWRM for irrigation and livestock watering and some domestic supply for remote camps.

Given the distance and non-reporting of flows, the MMP is not expected to impact these registered mauka diversions.

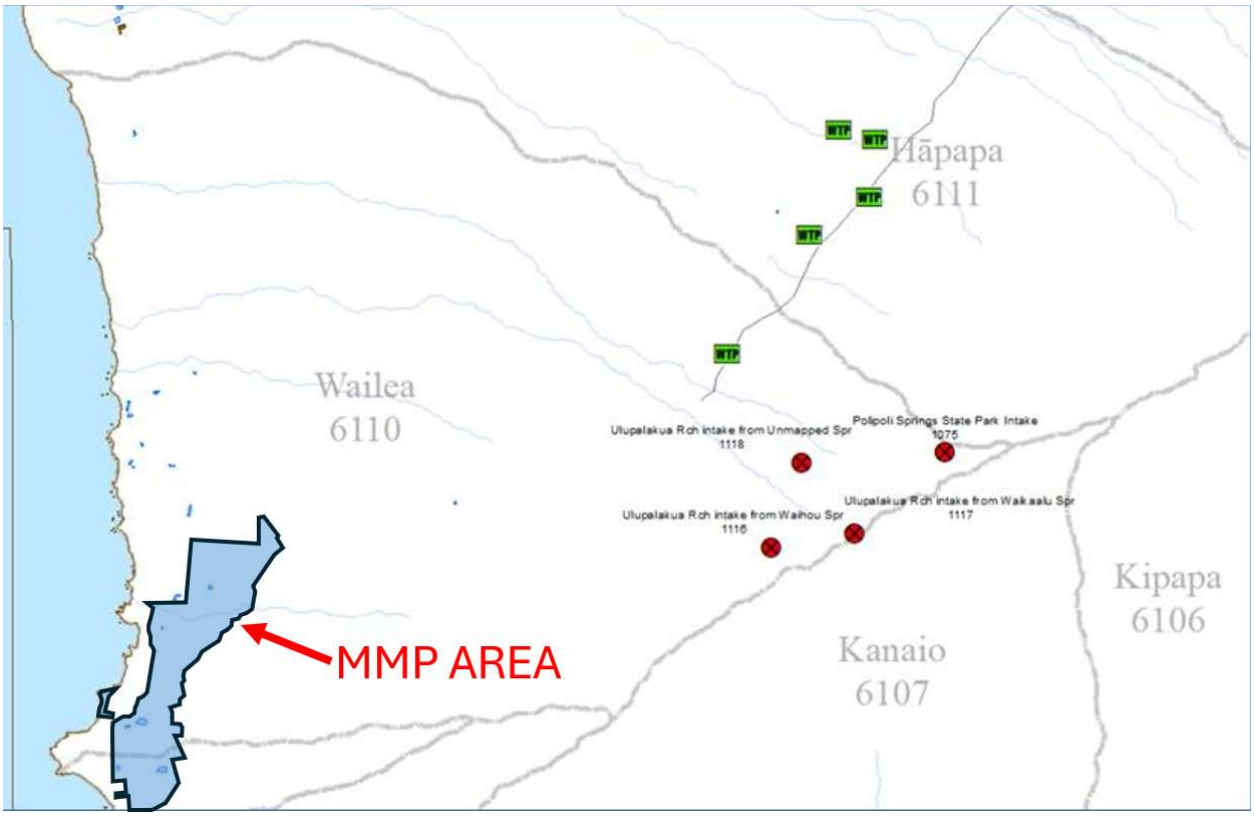

Exhibit 19. CWRM Wailea SWHU, Registered Diversions

4.4.4. Springs and Wetlands

Naturally occurring artesian springs and wetlands are considered surface water under the CWRM management (174C-3, HRS & 2019 WRPP [4]). There are significant wetlands of interest 0.8 to 5.4 miles north of the MMP from Auhana Road to the intersection of Pi'ilani Highway where there exists Kealia Pond and streams and wetlands in what is called the Kula Kai Area. [12,13] However, there are no anticipated impacts from the MMP on these northern drainage areas.

[12] Approximately 6 miles north of MMP in the Kahului ASA (60301).

[13] Beginning approximately 1.5 miles north of MMP with 13 ephemeral and intermittent streams (Keahuaiwi, Waiakoa, Ohukai, Kulanihakoi, Ko'ie'ie, Waiohuli, Waipuilani, Kawililipoa, Lā'ie, Kēōkea, Waimahaihai, Kīhei, Kaluaihakoko) (see https://savethewetlands.org/south-maui-gulches-and-streams/). None of these are monitored by the USGS streamflow data network.

Further review of published reports from the USGS [9] [10] and DLNR [32] and other professional hydro-geologist reports [33] [34] did not reveal significant springs in or near the MMP though the presence of small seeps is mentioned. A 2016 Master of Science Thesis using thermal imaging to locate significantly cooler coastal discharge indicated a significant spring source visible at low tides inside the southern corner of Kihei Boat Harbor, which is on the north side of the MMP; otherwise, there were no significant plumes revealed [35].

Further research of older published reports of from the USGS [9] [36] and DLNR [37] and other professional hydro-geologist reports [33] [34] for the Mākena area did not reveal significant springs in or near the MMP though the presence of small seeps along the coastline near sea level is mentioned in the 1969 Bowles reports. Bowles reported: "*On April 4 and 5, a traverse was made along the coastline from Keawakapu to Makena. Water samples and temperature data were collected in order to further delineate ground water flow through the property. The traverse as made between 11 a.m. and 12 noon during the lowest stage of the diurnal tides for that month. No large basal springs were located, however, numerous small seeps were found.*" Seeps are slow and intermittent while springs are faster continuous flow. Since the project is located near or above the 100-ft contour elevation and the seeps are near sea level, it is not anticipated that any land or excavation disturbances in the project area would impact these coastal seeps.

A more recent 2016 Master of Science Thesis [35] using thermal infrared imaging in conjunction with radon monitoring spatially located submarine discharge anomalies to qualify submarine groundwater discharge (SGD) on regional and local scales. On the regional scale, significant SGD was observed beginning 3 miles north of the Wailea project area in Ma'alaea Bay Kihei and 3.3 miles south of the project in Ahihi Bay and increasing towards the Ahihi-Kinau Area Reserve (see **Exhibit 20**). Therefore, regional scale anomalies indicate less potential for significant SGD in the MMP area. However, on the smaller local scale the study did observe a significant cooler plume visible at low tides inside the southern corner of the Kihei Boat Ramp (see **Exhibits 20 &**

21). This cooler plume is on the north makai corner of the MMP area but appears to be significant only during low tides and could be classified more like a large seep since the flow seems to be dependent on the tides. It is not known if this is a natural source or was created or modified by the construction of the boat ramp. Also, it is known that water from boat washing discharges into the area of the plume and may be related to the temporary cooler water spot observed. Regardless of the origin, this potential spring source seems to flow only at low tides and when the higher hydrostatic pressure from high tides exists and diminishes the cooler water anomaly. Otherwise, no other significant plumes were included in this reference or revealed in the MMP area.

Based on published hydrologic reports it is anticipated there will be little to no impact on springs, wetlands, and coastline seeps from the MMP

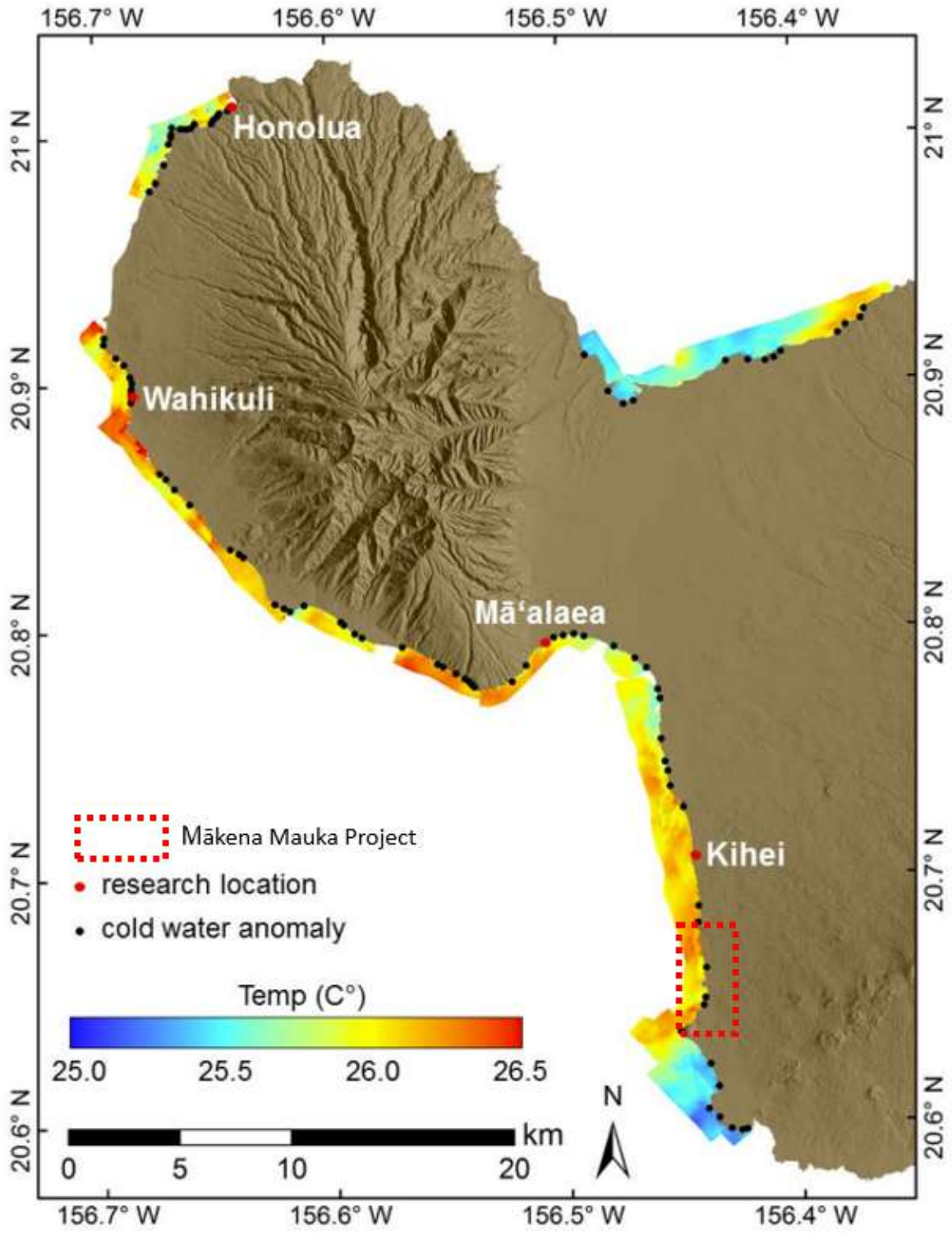

Figure 8: Regional scale TIR imagery of Maui obtained 07-08 June 2014 showing locations of potential SGD.

Exhibit 20. Regional Thermal Imaging of Potential SGD (modified Fig 8. from Kennedy, [35])

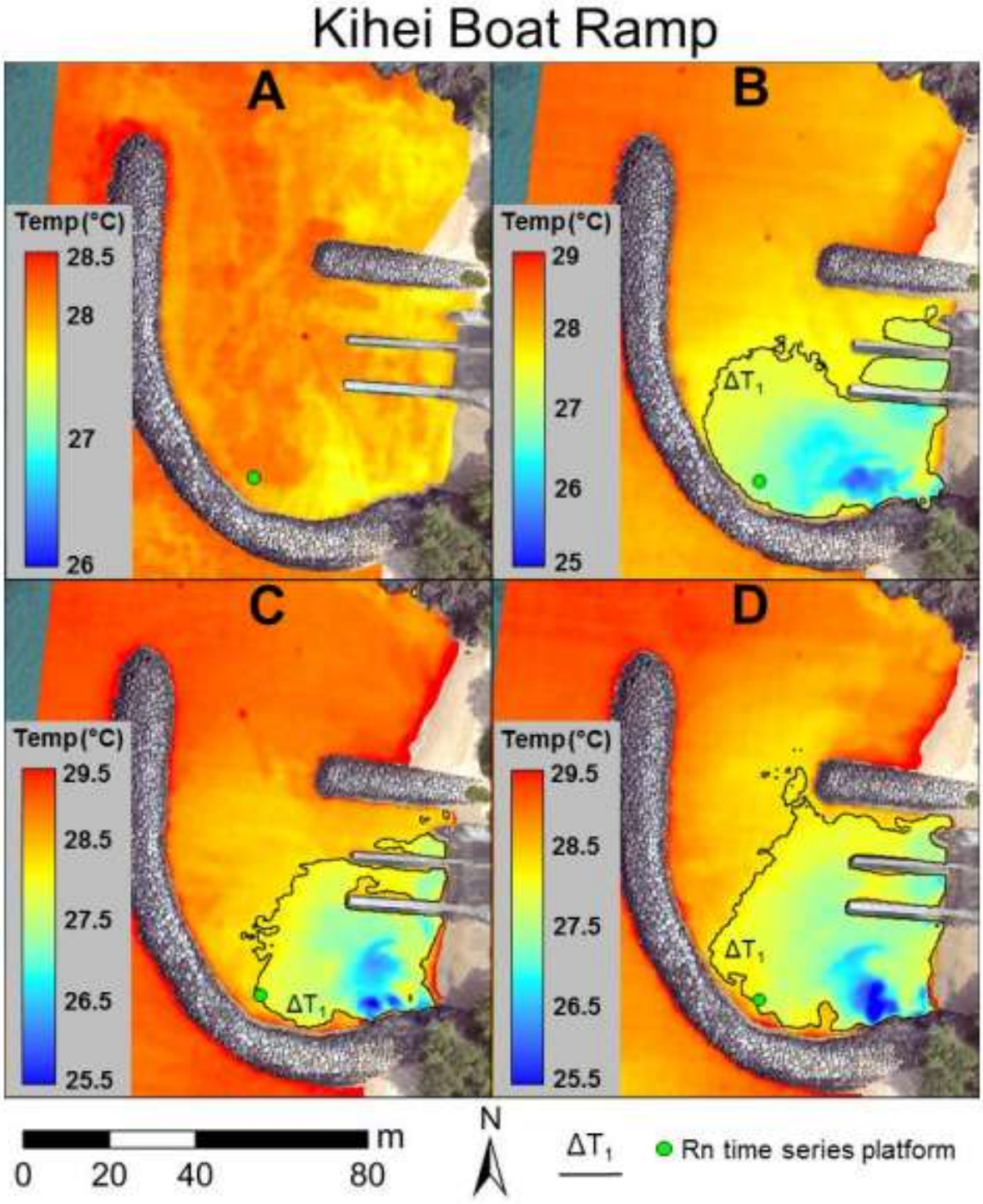

Figure 10: Kihei boat ramp UAV-TIR imagery showing the ΔT_1 plume contour over the course of dropping tide. (A) 07:00 High tide, (B) 10:00 dropping tide, (C) 11:00 dropping tide and (D) 12:00 low tide.

Exhibit 21. Local Thermal Imaging of Potential SGD at Kihei Boat Ramp (Fig 10. from Kennedy, [35])

4.4.5. Surface Water Quality Issues

The State Department of Health, Clean Water Branch (DOH CWB) and U.S. Army Corp of Engineers (USACE) are the responsible entities in regulating surface water quality issues statewide under the Clean Water Act. There are 19 active National Pollutant Discharge Elimination System (NPDES) permits within the Kamaʻole ASA [38].

The main concern for surface water quality is runoff from storm events where contaminant concentrations increase. The proposed MMP is not expected to significantly add to nutrient loads in surface water during storm events given 1) the MMP's relatively small size relative to the overall drainage area, 2) the use of LEED certification in individual MMP design and maintenance, and 3) compliance with the County's recent stormwater quality runoff regulations.

4.5. MDWS CMS

Figure ES.3 Wailuku and Central Aquifer Sectors, Maui Department of Water Supply Central Maui System

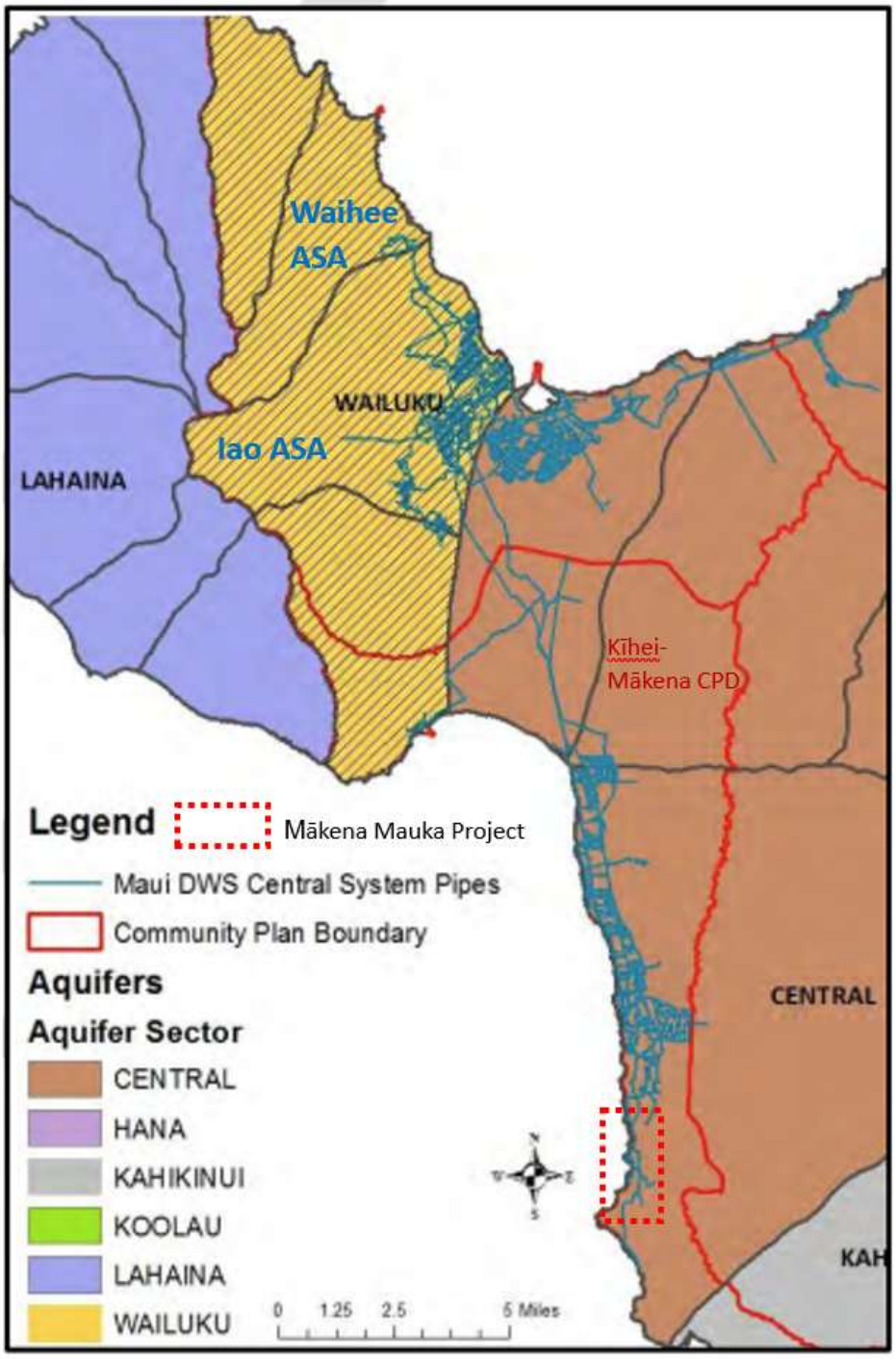

Exhibit 22. MDWS CMS (PWS 212) (modified from Maui Island WUDP [1])

Exhibit 22 is a source and transmission map detailing the general areas served by the MDWS CMS. The MDWS CMS provides ground and surface water for both potable and non-potable needs in and or from the ASA of Haiku (60401), Pāʻia (60302), Kahului (60301), Waiheʻe (60103), ʻĪao (60102), Waikapū (60101), and Kamaʻole (60304). These hydrologic unit areas historically and currently closely entwine water imports and exports between these areas. Surface water sources from ʻĪao and Waiheʻe also contribute to the CMS. There are no MDWS sources in the Kamaʻole ASA, but the area is dependent on the CMS for its potable needs.

The MMP is part of the MDWS CMS service area having been one of the original partners (along with MDWS and others) in bringing the transmissions lines from Central to South Maui, later building three MDWS water tanks to service Wailea, and installing all MDWS water distribution lines to the MMP parcels.

4.5.1. CWRM ʻĪao Allocations

Since the MMP plans to obtain around 7golffdd% of its maximum/peak day water demands (0.092 Mgd) from the MDWS CMS while exploring other source options as discussed, ground water use permits (GWUP) that limit the 12-MAV pumpage from individual wells in the ʻĪao ASA (60102) GWMA (see **Exhibit 10**) are relevant to the MMP and are discussed in this section.

There are currently fourteen (14) wells under twelve (12) basal ground water use permits (GWUPs) for a total allocation of 19.089 Mgd (see **Appendix L**) in the ʻĪao

GWMA.[14] Therefore, 0.911 Mgd is currently available for allocation from the basal ʻĪao GWMA.

If more ʻĪao ASA ground water allocation is required by MDWS for the MMP then a ground water use permit application (GWUPA) must be submitted by MDWS. However, according to the CWRM January 2, 2025, Monthly Bulletin (**Appendix M**), there are five (5) pending GWUPAs totaling 0.982 Mgd, the bulk of which is MDWS' GWUPA 852 for 0.841 Mgd from the high-level Kepaniwai Well (5332-002), which would not count against SY. Therefore, there are four (4) pending requests totaling 0.222 Mgd that can be accommodated by the currently available 0.911 Mgd from the ʻĪao GWMA.

Also, four (4) of these applications have been pending for more than 8 years with no clear movement forward, while the recently published GWUPA 1187 for a county park irrigation water from a new well has been requested. Even MDWS's GWUPA 852 path forward is not addressed in the MDWS Maui Island WUDP. However, GWUPA 852 could be amended and moved forward for CWRM consideration without having to wait for the other long-pending GWUPAs. Regardless of the status of all the published pending GWUPAs for ʻĪao there is sufficient allocation available for the MMP from the ʻĪao GWMA should all these pending applications be approved as requested.

A flowchart of the GWUPA process can be found at the CWRM website at https://files.hawaii.gov/dlnr/cwrm/forms/dgwup.pdf. It is statutorily a 90- to 180-day process to appear before the CWRM for decision making but has proven to be very contentious and takes much longer, as is shown in the CWRM Monthly Bulletins.

MDWS appears to be managing their current GWUPs in ʻĪao adequately. Actual reported pumpage from the ʻĪao ASA basal and high-level dike areas as of June 2024, is currently 16.395 Mgd based on a 12-MAV, which is 3.605 Mgd below the 20 Mgd SY for the ʻĪao ASA and 2.694 Mgd below the current total non-caprock allocations that count

[14] Three (3) allocations from high-level sources currently do not count against the ground SY as they were instead combined with and considered for impacts to interim instream flow accounting by virtue of the CWRM decision and order from Na Wai Eha CCH MA0601-1 for GWUP 691: ʻĪao Tunnel (Puako) 5330-002 and GWUP 920 ʻĪao Tunnel (Kepaniwai) 5332-005 & GWUP 921 Kepaniwai well 5332-005. This may change in future CWRM decisions.

against SY. This is in part due to conservation efforts of the MDWS where metered water use in the CMS has declined by over 4% from 2006 to 2020 while water meters increased by 14% from 2006 to 2020 (based on MDWS annual reports) and by leak detection and water auditing analysis performed by MDWS.

Under HRS 174C-48, the CWRM must delegate to the county boards of water supply the authority to allocate municipal use of water within their distribution systems, subject to the limits of water supply allocated to the county boards of water supply in their role as water purveyors. Other non-MDWS allocations in ʻĪao ASA amount to 0.026 Mgd, leaving the MDWS with 2.688 Mgd of unused allocation that could be allocated within the MDWS CMS. Therefore, it would appear MDWS and the ʻĪao ASA alone have enough cushion between actual pumpage vs. allocated use to manage and provide for the MMP future needs within the MDWS current allocations, long-pending competing GWUPAs notwithstanding.

The CMSA is also serviced by other ASAs, primarily the Waiheʻe ASA (60103), which is pumping only 51% of its SY of 8 Mgd. Third, the MDWS 2023 Maui Island WUDP identifies the primary alternative source strategy for CMS, as well as MDWS Upcountry System, as developing more water from the Haiku ASA that is pumping only 3% of its 24 Mgd SY. MDWS is currently pursuing feasibility studies required under the East Maui Consent Decree to implement this source strategy.

The MDWS CMS also incorporates a single microfiltration surface water treatment plant, the ʻĪao Water Treatment Facility, which is currently able to produce an average of approximately 1.7 Mgd of drinking water from the ʻĪao-Waikapū Ditch. According to the Maui WUDP [1], MDWS plans to increase capacity of the treatment facility for wet season use and new capacity has already been added to treat up to 3.2 Mgd in the future to be consistent with the CWRM Na Wai Eha surface water allocations

totaling 3.2 Mgd.[15] The latest 12-MAV of reported use from for the ʻĪao-Waikapū Ditch as of August 2024 is 1.894 Mgd.[16]

Other alternatives are also available to relieve the need for additional allocation from MDWS CMS. MMP will also be designed to use County R-1 when it becomes available for non-potable needs. Conservation measures will be incorporated into the MMP development to continue and further the conservation efforts that have proven effective in the ʻĪao ASA by MDWS. Existing ground water sources in the project area may have additional capacity brought about by conservation of existing users. Lastly, new ground water sources could be drilled for non-potable uses to reduce the reliance on the CMS source or existing unused wells near the MMP for irrigation needs without impacting the Kamaʻole ASA. Thus, the MDWS CMS should be able to meet the future potable demands of the MMP within the current MDWS allocations, though supplementing the irrigation demands of the MMP through other non-potable sources would further lessen demand of the MDWS CMS.

4.6. Alternative Water Sources

Alternative water sources are those other than the available natural ground or surface water sources covered in Sections 3.3, 3.4, and 3.5 of this report.

4.6.1. Wastewater Reclamation Facilities (WWRF)

Presently, the Mākena WWRF does not produce R-1 quality effluent and the WWRF R-2 effluent discharges into an unlined basin two to three times a year. Discharge amounts varied from 50,000 gallons from the reuse tank to 96,000 gallons directly from the clarifier. In the past, the Mākena WWRF used to produce R-1 effluent that was pumped into No. 10 Lake, where it mixed with well water, and then was used

[15] The total of 3.2 Mgd consists of surface water use permits SWUP.2178.6 for existing uses of 1.784 Mgd & SWUP.2179.6 for future new uses of 1.416 mgd from the ʻĪao-Waikapū Ditch.
[16] As reported to CWRM from MDWS as of January 2025.

to supply water for irrigation purposes. So, this is an underutilized alternative water source.

Also, the Kīhei WWRF serves the South Maui area from Wailea to Sugar Beach with an R-1 production capacity of 8.0 Mgd (Table 14-20 [1]) but the average dry weather flow to the WWRF for FY2024 is only 3.831 Mgd. As of FY2024 it is estimated that 2.005 Mgd of excess R-1 is available. The MMP may be designed to use and accept any available County R-1 water for the new MMP parcels should they need to augment or replace their own Mākena WWRF reuse abilities.

4.6.2. New MDWS Infrastructure Supply

The only current MDWS CIP to increase the CMS infrastructure supply is a 0.5 Mgd Waiheʻe ASA Well by FY28. Current SY, pumpage and monitoring data from CWRM for the Waiheʻe ASA indicate that this should be a reasonable source though it must be monitored closely as more than one-half (1/2) total pumpage is concentrated in the southern half of the ASA.

Additionally, the ʻĪao surface water treatment plant has the potential to increase their current limited use of ʻĪao ditch water. Presently, MDWS is awaiting their official approved surface WUP from the Na Wai Eha Contested Cased Hearing (CCH-MA15-01) decision for 3.2 Mgd.[17] MDWS is presently limiting their use of ʻĪao-Waikapū ditch water to 3.2 Mgd on a daily basis but was hoping this 3.2 Mgd limit will be on the more flexible moving average annual basis. So long as the interim IIFSs are met there are times when more than 3.2 Mgd on a daily basis can be taken so long as the average annual remains below 3.2 Mgd. The moving average annual basis will allow MDWS to make use of high flows and get credit for when less than 3.2 Mgd can be diverted so long as the IIFS minimum is satisfied. For example, at times the treatment plant cannot take ditch water when ditch water turbidity is too high and must shut down to avoid

[17] See https://dlnr.hawaii.gov/cwrm/newsevents/cch/cch-ma15-01/

damage to the filtration system, yet this non-diversion event cannot be credited towards the average annual need of 3.2 Mgd. However, the Supreme Court issued an opinion in June 2024 and approved Na Wai Eha surface WUPs should be issued as prescribed by the CWRM on a daily rather than a 12-MAV basis.[18] To date, Na Wai Eha surface WUPs have not been issued.

4.6.3. Desalination

Brown and Caldwell (B&C) performed a desalination feasibility study for the MDWS in 2024, and the following information is a summary of their presentation at the 2025 Pacific Water Conference. B&C estimates that the MDWS CMS will need an additional 7-11 Mgd of water by 2040. They recommend three desalination sites in the Kama'ole ASA – two in the Kihei area and one in the Wailea area - using brackish groundwater as the source. Their suggested plant would be a 0.5 Mgd capacity (expandable to 2 Mgd) RO facility powered with solar energy and sited with a deep injection well to dispose of the brine waste. In terms of cost, the 0.5 Mgd facility is estimated to cost $119 million with annual operating costs of $2 million. The expanded 2 Mgd facility is estimated to cost $261 million with annual operating costs of $3 million. Both facilities would produce water at a unit cost of $25/1000 gallon. In comparison, MDWS single family dwelling monthly billing rates beginning at $2.13/1000 gallons for the first 5,000 gallons to a maximum of $8.12/1000 gallons for usage amounts over 35,000 gallons.

Maui Island WUDP identifies three crucial issues with desalination: 1) cost; 2) pesticide contamination in brackish source water for desalination; and 3) disposal of the reject brine water [1]. However, the Shores of Kohanaiki in Keauhou, Hawai'i has successfully addressed these issues. The Shores of Kohanaiki is an exclusive housing and golf course development like the MMP that desalts brackish ground water for golf

[18] See https://files.hawaii.gov/dlnr/cwrm/cch/cchma1501/2024-SCOT-21-0000581.pdf

course irrigation needs and injects the reject brine deep into saltwater below the thin brackish basal aquifer in the Keauhou ASA. It has been operating and monitoring ground water since 2007 without observing any negative impacts to the resource or marine environment.

MMP is planning to supplement all of their irrigation needs with 65% RO recovery desalination of brackish well water according to TNWRE [5] from their own water system. This would require them to pump a maximum/peak of 1.464 Mgd to supply 1.282 Mgd of potable and irrigation water demand (**Appendix N**). The report also estimates the generation of a maximum/peak of around 0.182 Mgd of concentrate from RO treatment at full build-out that would require disposal. The report states DOH's current position is that it cannot be reused for irrigation (though the mixing with brackish ground water could potentially be appropriate for golf course irrigation if DOH changes its position) and a disposal [injection] well would need to be installed for proper disposal [5].

4.6.4. Conservation

Conservation is considered an alternative source by using water more efficiently to reduce water demands and thereby increasing the availability of supply. Current conservation efforts by MDWS in the ʻĪao ASA have shown to be effective as the MDWS metered water use in the CMS has declined over 4% since 2006 to 2020 while water meters increased by 14% from 2006 to 2020 (based on MDWS annual reports). The 12-MAV for the ʻĪao ASA has declined by more than 17% from 2006 to 2023 based on reported pumpage to the CWRM.

Conservation is a recommended strategy for all regions serviced by MDWS for both agricultural and non-agricultural uses under the MDWS WUDP [1]. Additionally, MDWS recently adopted its Water Shortage and Conservation Plan (WSCP) [39] in April of 2024. The WSCP follows the American Water Works Association's (AWWA) guidelines of AWWA-M52 [40] for Conservation Planning and AWWA-M60 [41] for Drought

Preparedness and Response. The main long-term goal of the WSCP is an overall 20% reduction of per capita water demand by 2040 in all their service systems. This includes the CMS that will service MMP's potable needs.

Conservation can be characterized as **demand side strategies** that generally promote reduction in water use, and **supply side strategies** that focus on water system efficiency and loss control from source to end use. Demand-side management options are usually programs undertaken by a water utility to encourage the use of efficient and low-flow fixtures and appliances or practices by its customers, or to encourage customers to shift their time of use. Such programs often provide direct installation or incentives such as rebates to encourage the purchase of efficient fixtures or appliances. As described in the MDWS 2024 WSCP, MDWS has implemented replacement and rebate incentive programs to increase use of Advanced Metering Infrastructure (AMI) smart meters, rain barrels, low flow showerheads, ultra-high efficiency toilets (WaterSense® certified 1.28 gals per flush vs. older 3.5 gals per flush), and other low flow fixtures. Other products such as Smart Rain, a smart leak detection system for irrigation systems, are estimated to save 25-30% of water annually. Products such as Smart Rain optimize water usage and reduce waste by automatically adjusting watering schedules based on real-time conditions and cutting off water flow in the event of a leak. Utilizing this technology, moving forward reduces future demand and retrofitting existing subdivisions, such as Wailea Palms has done, will lead to major water savings.

MDWS also provides public outreach to raise customer awareness and feedback through online educational conservation content, feedback surveys, and QR codes on the monthly water billing to link to MDWS news and water savings tips including a comprehensive landscaping water conservation handbook [42] as irrigation is a significant portion of average domestic demand.

Other demand components focus on regulatory controls (e.g., 2024 MDWS WSCP recommends a new ordinance requiring WaterSense low flow fixtures for new developments, tiered rate structure modification, etc.) and continued MDWS

educational outreach programs to instill a conservation mindset and support other programs. MDWS is working on a conservation bill that would restrict domestic irrigation to no more than 3 days a week and between the hours of 8a-6p. If passed, this would save an estimated 6 Mgd from and for MDWS customers alone and would additionally result in significant irrigation savings from private wells.

Supply side measures include water audit/non-revenue water analysis, leak detection and meter maintenance and replacement [1]. Smart meters or other AMIs will take another 2 years to fully implement for existing users.

MDWS conducts annual water audits following the AWWA M36 [43] and uses the AWWA Free Water Audit Software © in compliance with the CWRM published Hawai'i Water System Audits and Water Loss Control Manual and the 2016 Hawai'i State Legislature Act 169. CWRM reviews and validates these annual water audits and considers them to be acceptable.[19]

Although not currently part of MDWS conservation programs, MDWS is working towards an ordinance to address concerns about evaporation losses from residential pools. It is unknown at this time the amount of new and existing pool area for MMP that would translate into a range of a total additional demand based on the evaporation atlas [14] rates for the MMP area. The following LEED guidelines will help to reduce these pool losses and if MDWS's overall goal of 20% reduction in average daily demand for new projects can be realized then the total domestic demand could approximate 654,000 gpd. MMP specifically has committed to adhere to LEED certification for all buildings greater than 500 square feet within the SMA (phase 1) lands.

Although conservation appears to have contributed to reducing pumpage from the ʻĪao ASA, MDWS would rather increase supply through CIP projects that increase system capacity. MDWS does not want to rely on individual customer responsible

[19] Personal communication with CWRM State drought coordinator.

behavior without ordinances in place that can allow MDWS to turn off water meters per DWS Rules and Regulations, Section 3-10, to enforce such an ordinance.

4.6.5. Storm Water

The MDWS Maui Island WUDP [1] addresses stormwater reuse as capturing and reusing surface water runoff from storm events. Stormwater reclamation can potentially provide water for non-potable water demands such as irrigation and toilets. There are a variety of stormwater technologies as illustrated in **Table 3** (from Table 8.25 from the MDWS Maui Island WUDP [1]) below ranging from small rainwater catchment systems to reservoir storage systems. The entire MMP lies makai of the DOH's Underground Injection Control (UIC) Line; therefore, dry wells may be used to capture stormwater runoff and inject it into the brackish portions of the aquifer.

Due to contaminants picked up by stormwater runoff, various levels of treatment may be necessary. Stormwater reclamation methods that employ capture and storage technologies must be planned, constructed, and operated to ensure minimal impact to streams, riparian environments, conservation lands, water rights, cultural practices, and community lifestyles. Reduced reliance on ground water and surface water for landscape irrigation may be appropriate, especially when incorporated into the design of development projects to maximize water retention and minimize infrastructure costs. However, there is no code requirement for development projects to incorporate water retention or reclamation design features for the purpose of supplementing non-potable water supplies.

Table 4. Table 8-25 Stormwater Reclamation Technologies

Technology	Description
Source Reuse	Use rain barrels or cisterns to collect precipitation or stormwater runoff at the source to provide water for a variety of non-potable purposes or, with treatment, potable water.
Small Lot Reuse	Manage precipitation or runoff as close to source as feasible. Examples: infiltration planter boxes, vegetated infiltration basins, eco roofs (vegetated roofs), porous pavements, depressed parking lot planter strips for biofiltration, narrowed street sections with parallel or pocket bioswales.
Stormwater Capture	Employ ditches, storm drainage system interception, dry wells, infiltration galleries, and injection wells to capture stormwater.
Stormwater Storage	Use aquifer storage and recovery, stream-bank storage, detention basins, and surface reservoirs to store stormwater.
Stormwater Distribution	Distribute stormwater via gravity ditch or pipe networks, operated/regulated ditch systems, pressure pipe networks, onsite wells.
Source: CH2MHill. *Hawaii Stormwater Reclamation Appraisal Report.* Prepared for the U.S. Bureau of Reclamation and the State of Hawaii Commission on Water Resource Management. July 2005	

4.6.6. New Private Brackish Wells

As described in Section 4.3.3 of this report, one new brackish well could be drilled within the MMP to develop approximately 350 gpm or 0.5 Mgd and stay within the SY limits established by the CWRM assuming uniform spacing coastal discharge. This new well is the ATC Mākena 8 (3925-004) which has been recently constructed and tested to show a yield of 350 gpm [5] [44]. To further minimize impacts on the water levels, chloride concentrations, and coastal leakage along the MMP shoreline, other new brackish irrigation wells could also be drilled north and south of the MMP area to meet the same demands and spread pumpage stress over a greater area to lessen localized ground water impacts. However, this would incur additional costs of drilling, transmission, operation, and maintenance.

5. CUMULATIVE/SECONDARY IMPACTS TO WATER RESOURCES & NEARBY DEVELOPMENT

This section seeks to understand the hydrological impacts MMP will have on these developments and the hydrological impacts these planned developments (MMP included) will cumulatively have on the Kama'ole ASA and the MDWS CMS.

Appendix P shows excerpts from the 2019 Maui County Water Use Development Plan (MWUDP) with the state's projected demands in the relevant aquifer sectors. Section 15.6.6 states that the Kama'ole ASA irrigation demands--the majority use in the ASA--will be expected to increase from 3.68 Mgd to 5.59 Mgd (an increase of 1.91 Mgd) in the 2015-2035 planning period, still well below the 11 Mgd SY. Tables 14-30 and 14-33, along with figure 14-28 of the MWDUP, illustrate the projected future demands served by MDWS CMS. The projected 34.673 Mgd by 2035 is nearing the 36 Mgd SY of the Wailuku aquifer sector, but the Haiku ASA is also viable to pump from due to its relatively low pumping compared to its SY. Table 16-31 of the Maui Island WUDP shows the projected local demands of the Ko'olau aquifer sector, which Haiku ASA is in. The 1 Mgd expected demand by 2035 is far below the 24 Mgd SY of Haiku ASA. In summary, the groundwater sources are capable of sustainably supplying the future projected demands of the Kama'ole ASA and CMS based on the MWUDP projections [1].

However, the Maui Island WDUP projections were made in 2014 with information that does not include the expected development details in **Exhibit 23** below. **Appendix Q** is a summary of Akinanka estimates of additional water demands of known planned development near the MMP area within the Kama'ole ASA. **Exhibit 23** details the locations of the ongoing and potential future projects listed in **Appendix Q.** Most of the projects are in progress and have either taken steps towards approval or have already undergone construction. A few projects shown are ideas of future projects and not currently in the planning stage.

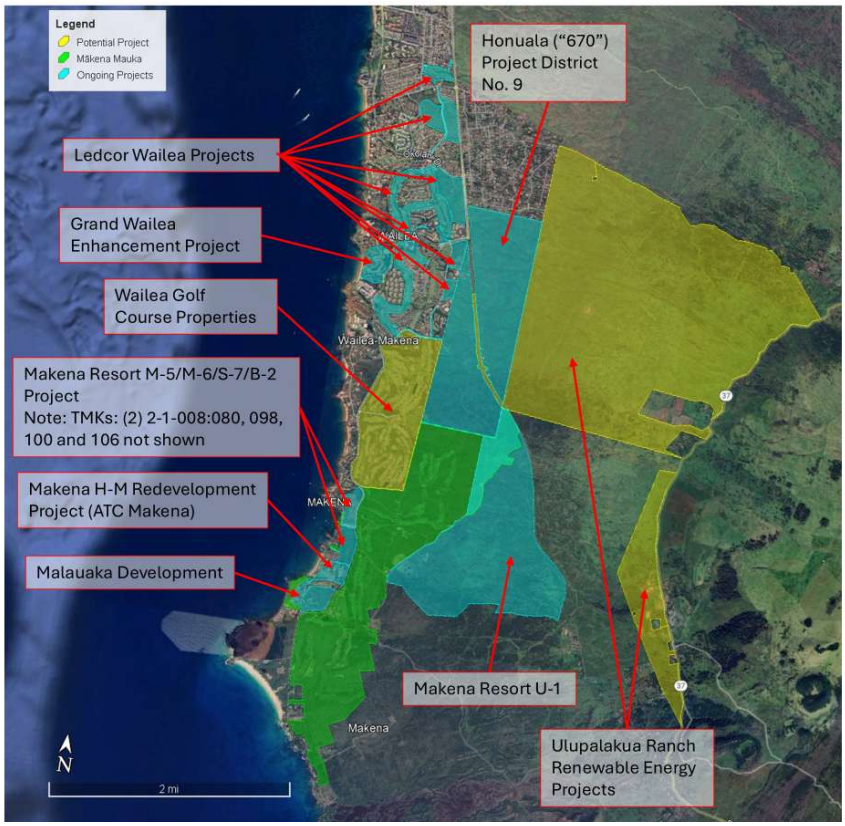

Exhibit 23. Map of Planned and Potential Projects Nearby

Combining MMP demands with other projects and DHHL reservations within the Kama'ole ASA, the total demands are summarized in Table 5 below. Both the average and maximum/peak day operational pumpage will remain below the 11 Mgd SY of the Kama'ole ASA.

Table 5. Total Demands on Kama'ole Aquifer (Including MMP)

	Total Average	Maximum/Peak Day
Current 12-Mav Use[1]	3,660,000	3,660,000
Planned Developments	3,019,728	4,529,593
DHHL Reservations	2,547,000	2,547,000
Total	9,226,728	10,736,593

[1] As of January 2025

.

Though these projected demands are both below the conservative Kama'ole ASA sustainable yield of 11 Mgd, they are near enough to warrant attention from the CWRM. The projected average use is 84% of SY and may trigger informational public hearings by the CWRM to assess the ground water situation to devise mitigative measures[20], such as those described in Section 6 of this report. Though more relevant to operational hydraulic, backup, and fire flow considerations rather than impacts to the aquifer, the projected maximum/peak day use is 98% of the SY and may trigger designation proceedings whereby regulation of pumpage will be increased through water use permits.

From the MDWS CMS, it is estimated that an additional average demand of 0.792 Mgd and a maximum demand of 1.188 Mgd will be needed for the cumulative proposed future projects in the Kama'ole ASA. This would may require MDWS to develop new groundwater well sources for the CMS. As described in section 4.3.3, the Waiheʻe (**Exhibit 11/Appendix H**) and Haiku (**Exhibit 12/Appendix I**) ASAs are not being pumped to their SY and are viable sources to supply all the projected new development in the area.

As previously discussed in Section 4.3.3 of this report, the other cause for concern would be localized saltwater intrusion caused by concentrated pumping in one area. Pumping groundwater reduces the freshwater zone that floats above a saltwater zone in the aquifer, allowing the saltwater to encroach further inland and cause thinning of the basal lens. The immediate adverse effect would be that wells spaced too close together would cause chloride levels to increase due to well interference. Ideally, a adequately calibrated numerical model would help to answer these concerns but one does not exist for the Kama'ole ASA like it does for Waiheʻe, ʻĪao, and Waikapū ASAs (MDWS/USGS, [26]).

In lieu of a numerical model, observational data over time can be just as effective. Closely spaced wells would need to be closely monitored to adjust pumpages

[20] HRS §174C-44

to ensure chloride levels do not reach undesirable levels that reduce the utility of the pumped water. The twelve (12) Mākena-Seibu golf course irrigation wells constructed between 1977 to 1988 average approximately 670-feet apart from each other along a 7,250-ft long line at the average ground elevation of +216-ft msl have been operating for decades. As discussed in Section 4.3.3, the coastal discharge range should be limited to between 1.446 to 2.229 Mgd/mile and the current total 12-MAV pumpage from the ATC Mākena wells is 0.844 Mgd (see **Appendix R**), which is within the estimated 1.79 pumpage for the MMP coastline discharge limitations within the estimate SY for the ASA. Pumpage for ATC Mākena has decreased over time and managing pumpage such that current chlorides have remained below 1,000 ppm chlorides over the past 20 years except between 2012-2014. Original chlorides encountered and reported were only gathered for three wells and are shown by hashed lines for Seibu 4 (1000 mg/L in 1978), Seibu 6 (668 in 1984), and Seibu 12 (1,900 in 1989). Seibu 12 is not pumped. The important take away from **Exhibit 24** is that the chloride trends have been relatively stable with Seibu 4 seemingly improving with pumpage over time. In short, the pumpage at the Mākena wells has been managed well to keep chlorides stable in the area since 2016.

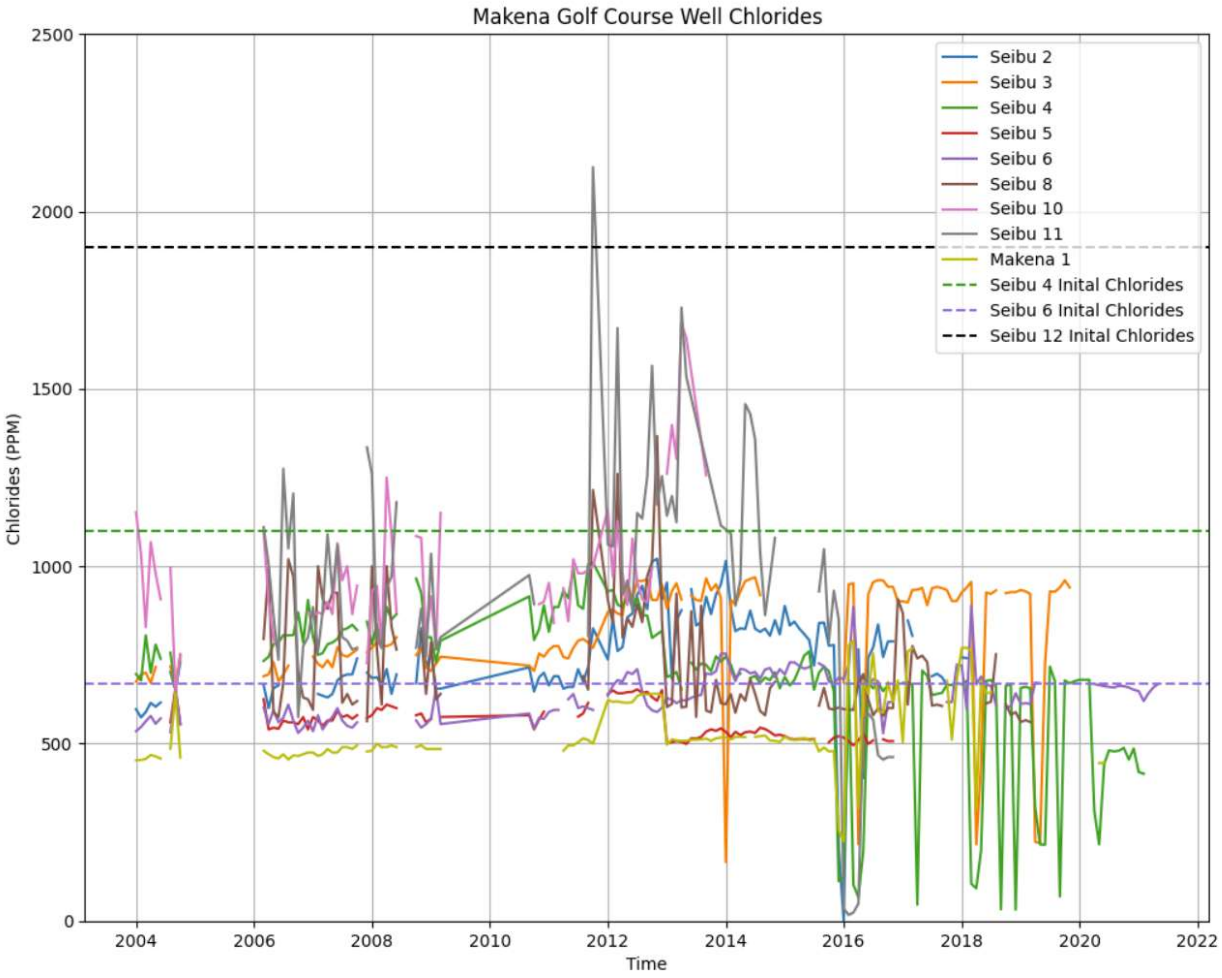

Exhibit 24. ATC Mākena Well Chlorides (as reported to CWRM March 2025)

6. MITIGATION MEASURES

To minimize the adverse effects on the MDWS CMS and Kama'ole ASA, we will primarily be focusing on water conservation strategies to reduce the water demands. 5This involves implementing strategies such as:

1. Installation of Low-Flow Fixtures: Utilizing low-flow faucets, showerheads, and toilets can significantly reduce indoor water consumption and lead to substantial water savings over time.

2. Pool Evaporation Covers: Pool evaporation covers will be used to minimize water loss due to evaporation. These covers can reduce evaporation by up to 95% according to the EPA [45].

3. Use of Non-Potable Water for Landscaping: Non-potable groundwater well sources and collected rainwater will be prioritized for landscape irrigation. This approach decreases the demand for RO treated potable water.

4. Efficient Irrigation Systems: The implementation of advanced irrigation systems, including drip lines and moisture sensors, will optimize water use. These systems deliver water directly to plant roots, reducing water loss due to runoff or evaporation.

5. Irrigation Scheduling: Irrigation will be scheduled during early morning and late evening hours to minimize evaporation losses. Midday watering will be avoided because that is when evaporation rates are the highest.

6. Xeriscaping and Drought-Tolerant Landscaping: Landscaping will incorporate xeriscaping principles and drought-tolerant, native plant species that require minimal watering. This practice not only reduces water demand but also promotes local biodiversity.

7. Rainwater and Stormwater Harvesting: Systems for rainwater and stormwater collection and reuse will be installed to capture runoff for non-potable uses, such as irrigation and exterior cleaning. This practice reduces reliance on groundwater and potable water sources.

7. CONCLUSION

MMP plans to minimize the use of MDWS water by developing their own water system with RO treatment to supply about 94% of their maximum water demands. This requires them to pump a maximum of 1.464 Mgd of water from the Kama'ole ASA, still very much below the 11 Mgd SY of the ASA when added to the current 3.660 Mgd pumping (33% of SY).

The remaining 6% of MMP's water demand (0.092 Mgd) will be supplied by the Maui MDWS CMS, sourced by the ʻĪao and Waihe'e ASA. As of January 2025, the actual reported non-caprock use is 13.157 Mgd, which is 2.694 Mgd below the current total allocations that count against SY. The Waihe'e ASA is pumping 5.518 Mgd, 69% of the 8 Mgd SY. Also, this is within the recent MDWS maximum reliable capacity and recent 3-

year forecast projections[21]. MDWS can also expand into the nearby Haiku and Waikapū ASAs, which have very low pumpage relative to their SYs. Given the current water availability in both the aquifer source and CMS, MMP's water demands will not overstress the groundwater resources of the CMS.

Considering the cumulative impact from future projects of developments in the area to the Kama'ole ASA, pumpage would rise to a maximum of 8.190 Mgd. If DHHL reservations of 2.547 Mgd were to be implemented, this would put the maximum future pumpage at 10.737 Mgd if the full amount of the reservations were to be pumped from the Kama'ole ASA. Although this would be below the SY of 11 Mgd, this would raise the pumpage to greater than 90% of the SY, which is something that could initiate designation of a GWMA under the CWRM.

To mitigate the impacts, MMP will be implementing conservation strategies to reduce their water demands. They will be ensuring LEED certified construction for buildings greater than 500 square feet.

[21] August 26, 2025 MDWS Notice https://www.mauicounty.gov/DocumentCenter/View/155090/Maximum-Reliable-Capacity-Analysis-2025-AUGUST-REVISE-20250826

8. REFERENCES

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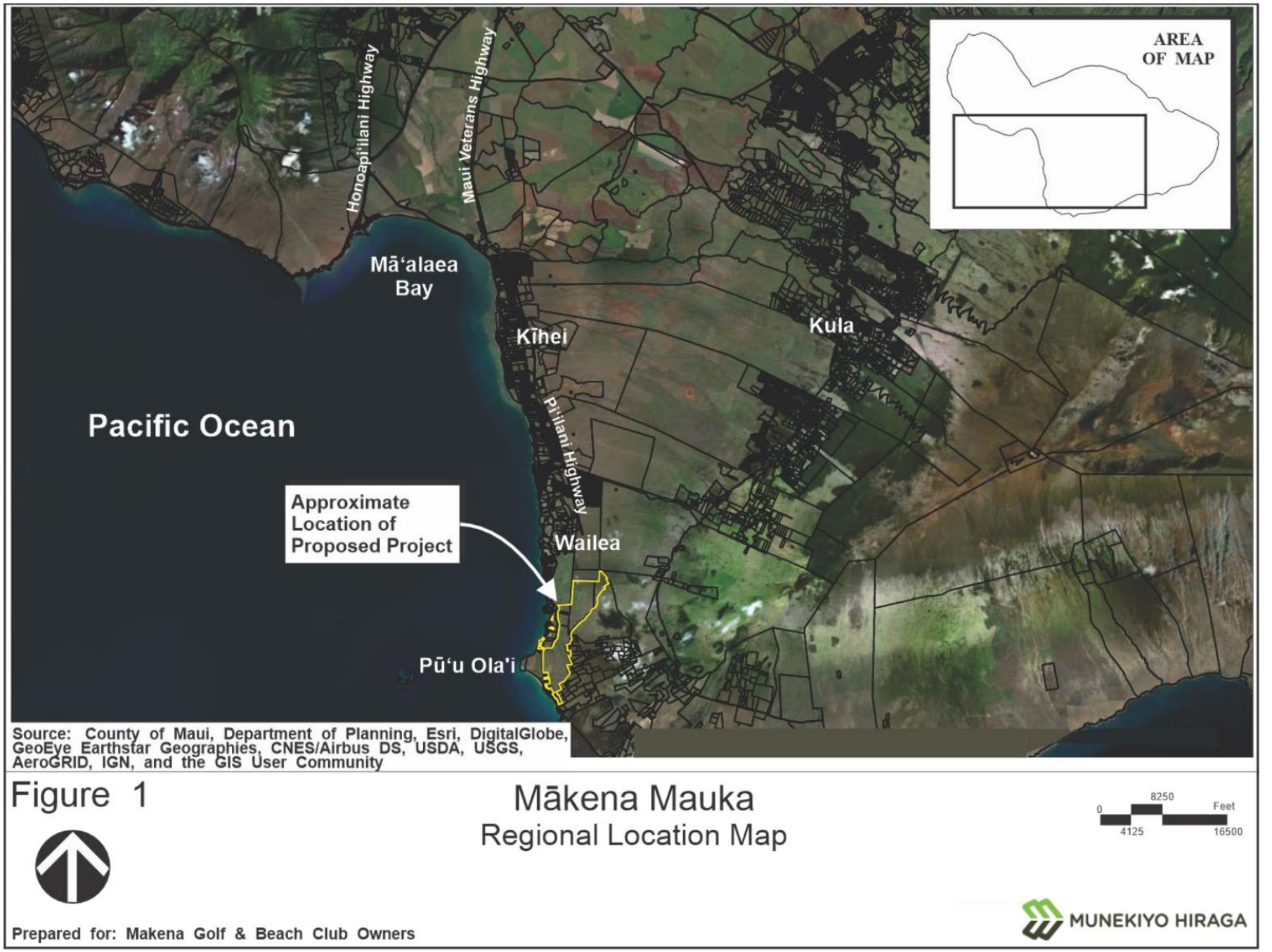
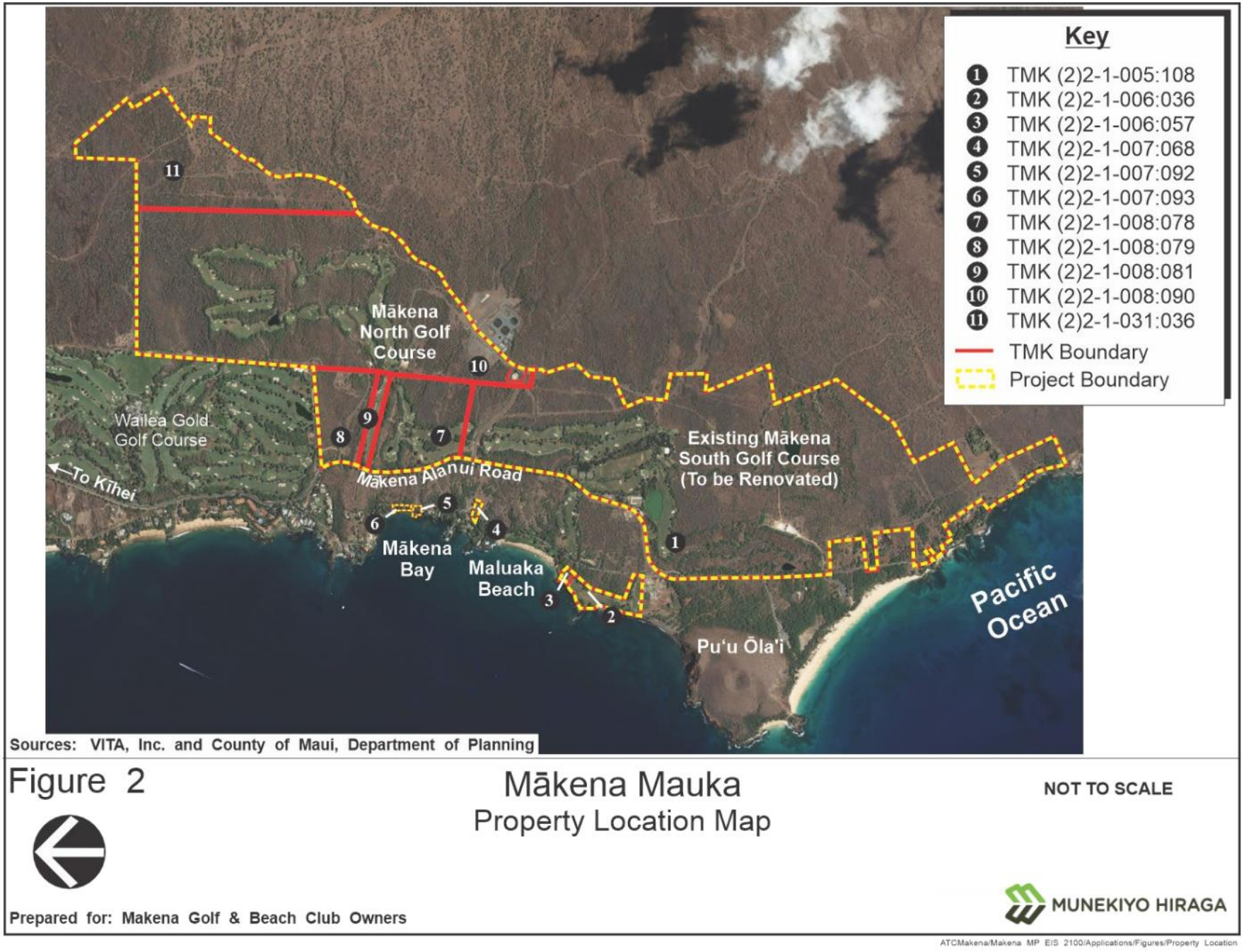
APPENDICES

APPENDIX A



Source: Makena Mauka, Environmental Impact Statement Preparation Notice , Munekiyo Hiraga, June 2024 Figure 1



Source: Makena Mauka, Environmental Impact Statement Preparation Notice , Munekiyo Hiraga, June 2024 Figure 2

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Aerial Close-up of TMK 2-1-005:108 Boundary

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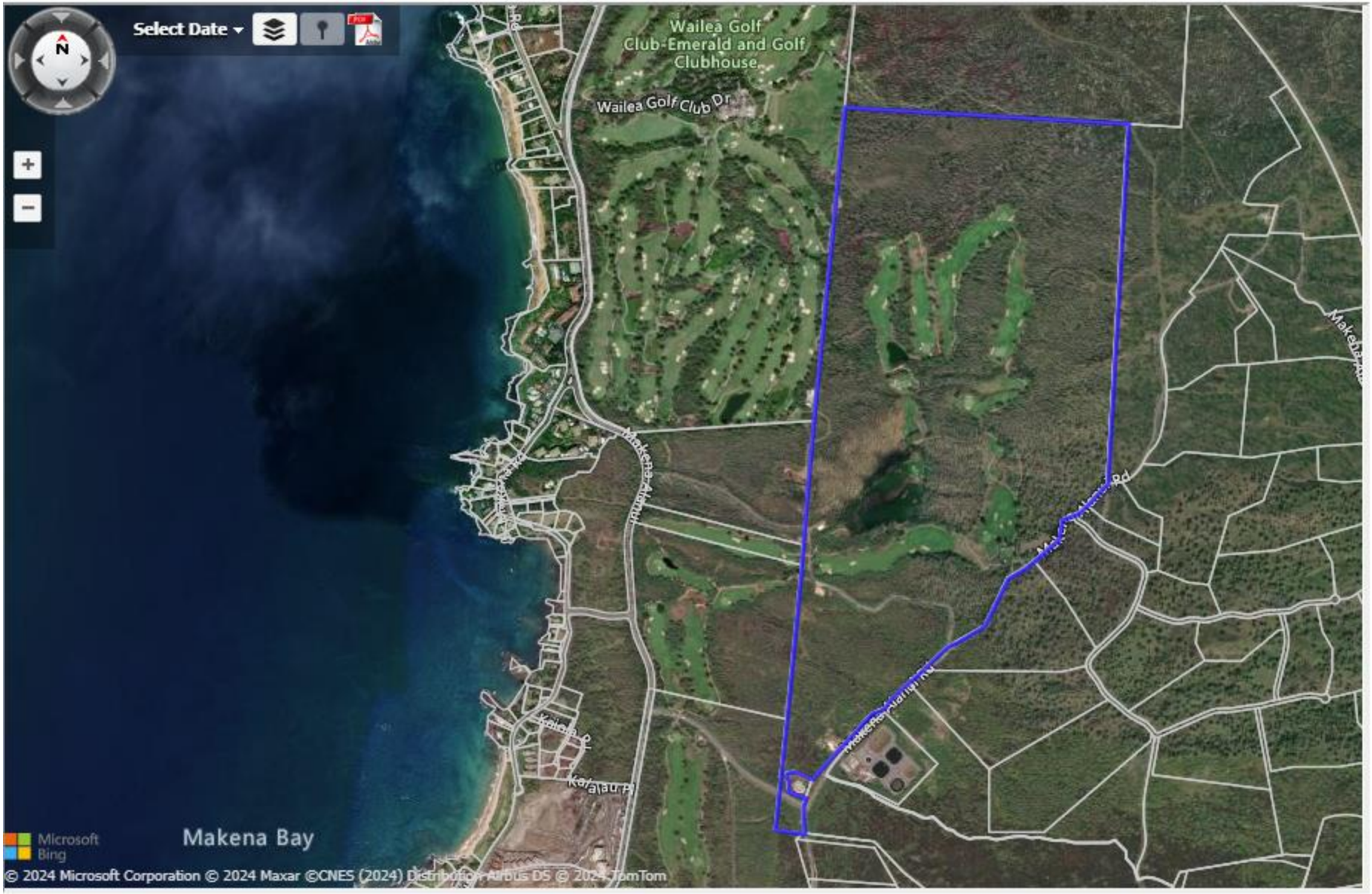

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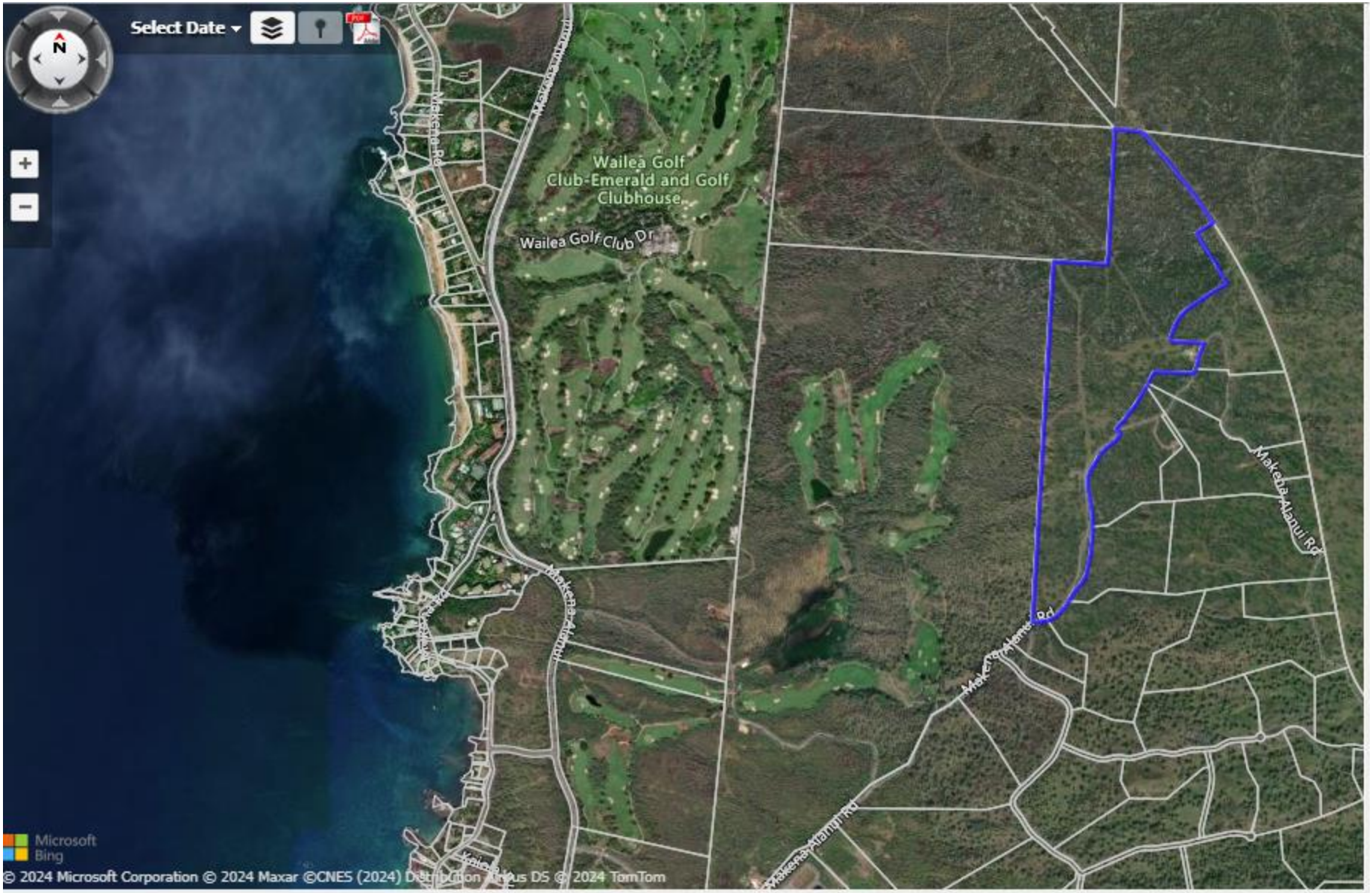

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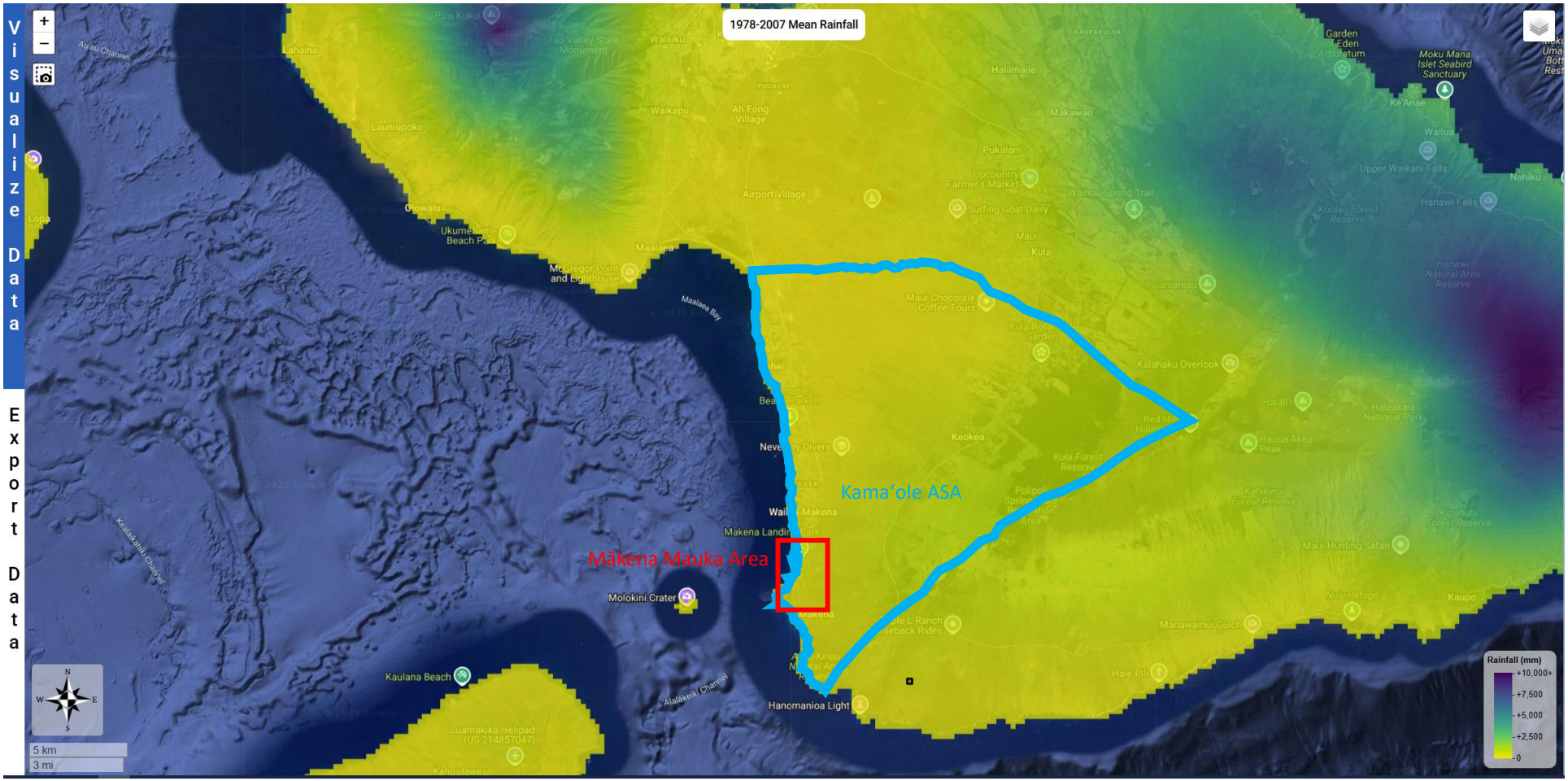
Aerial Close-up of TMK 2-1-031:036 Boundary

APPENDIX B



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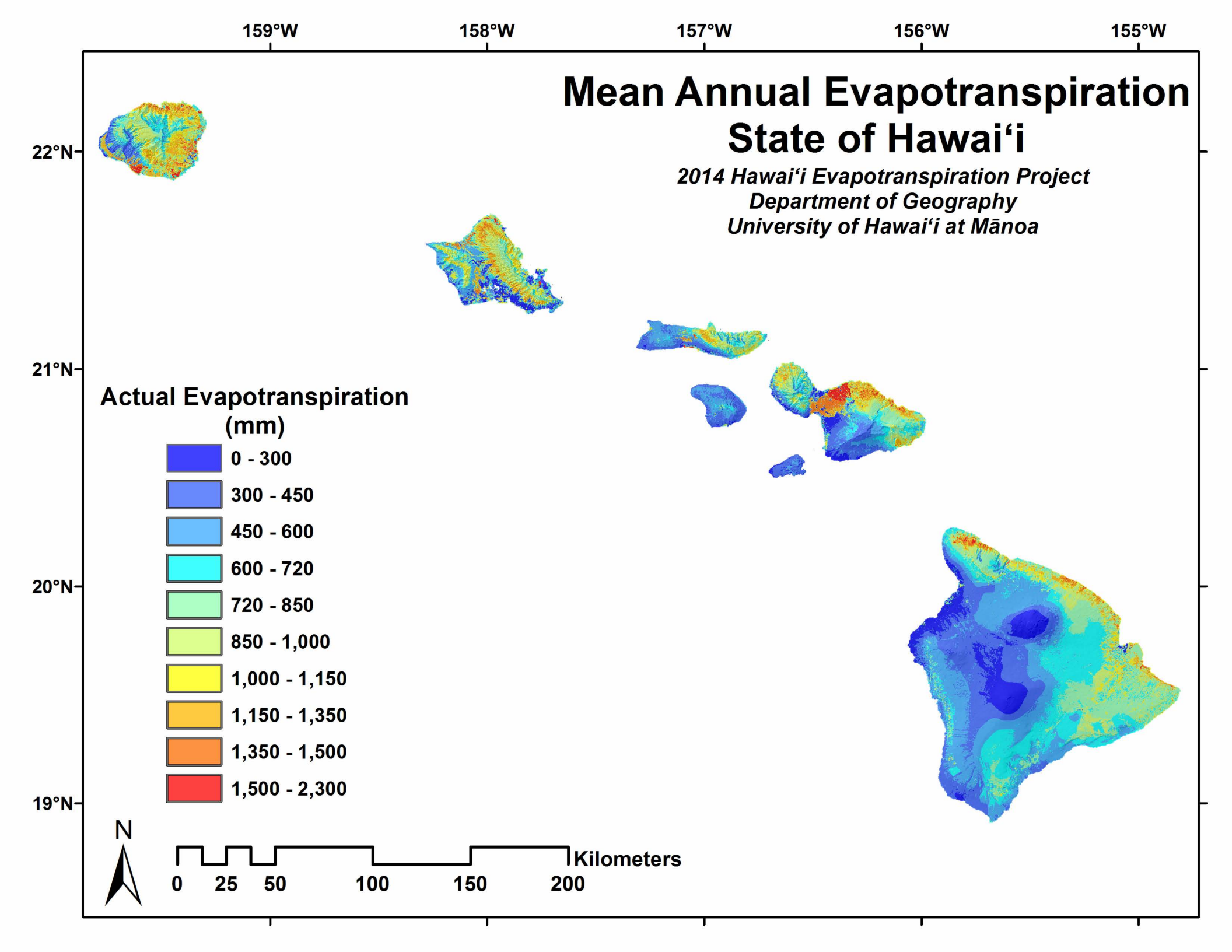
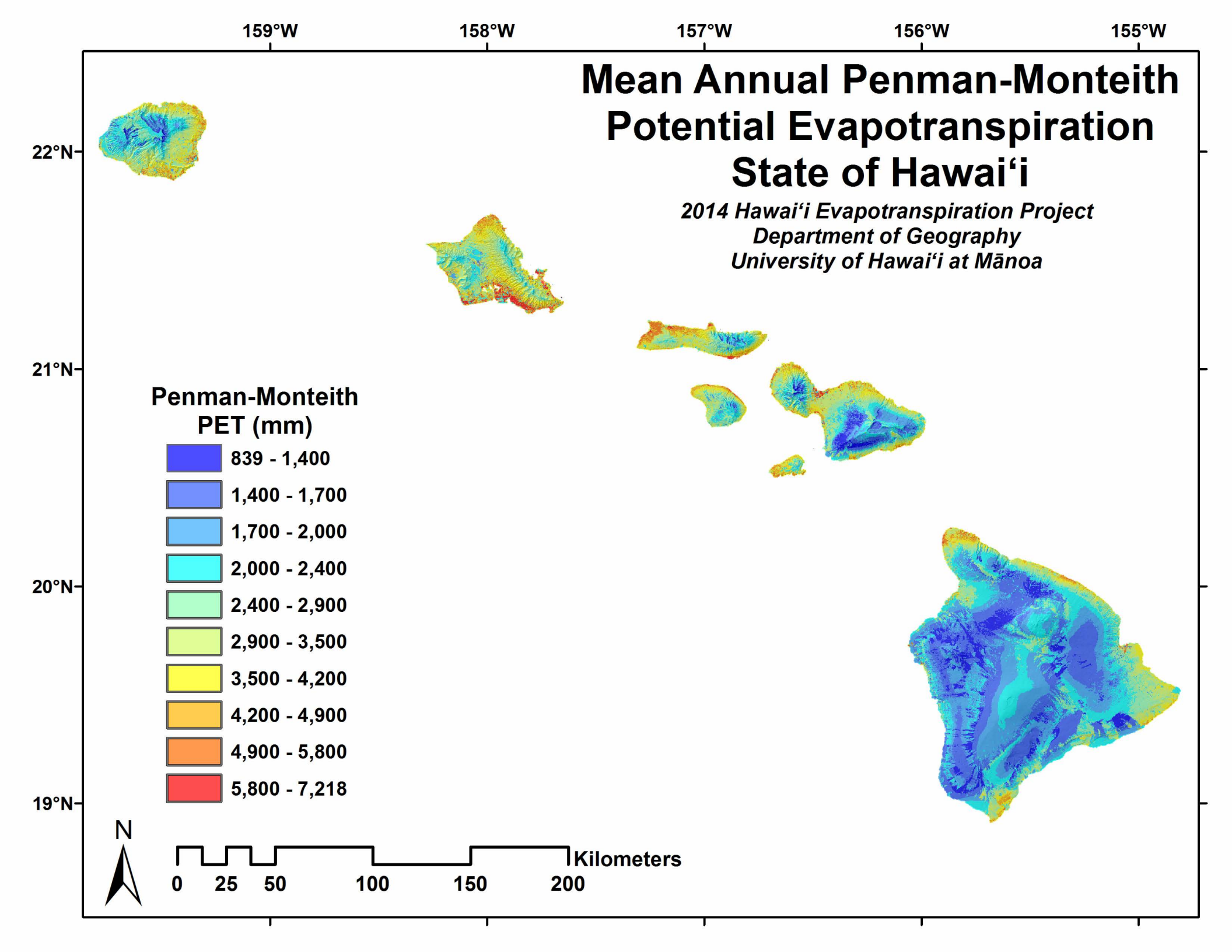
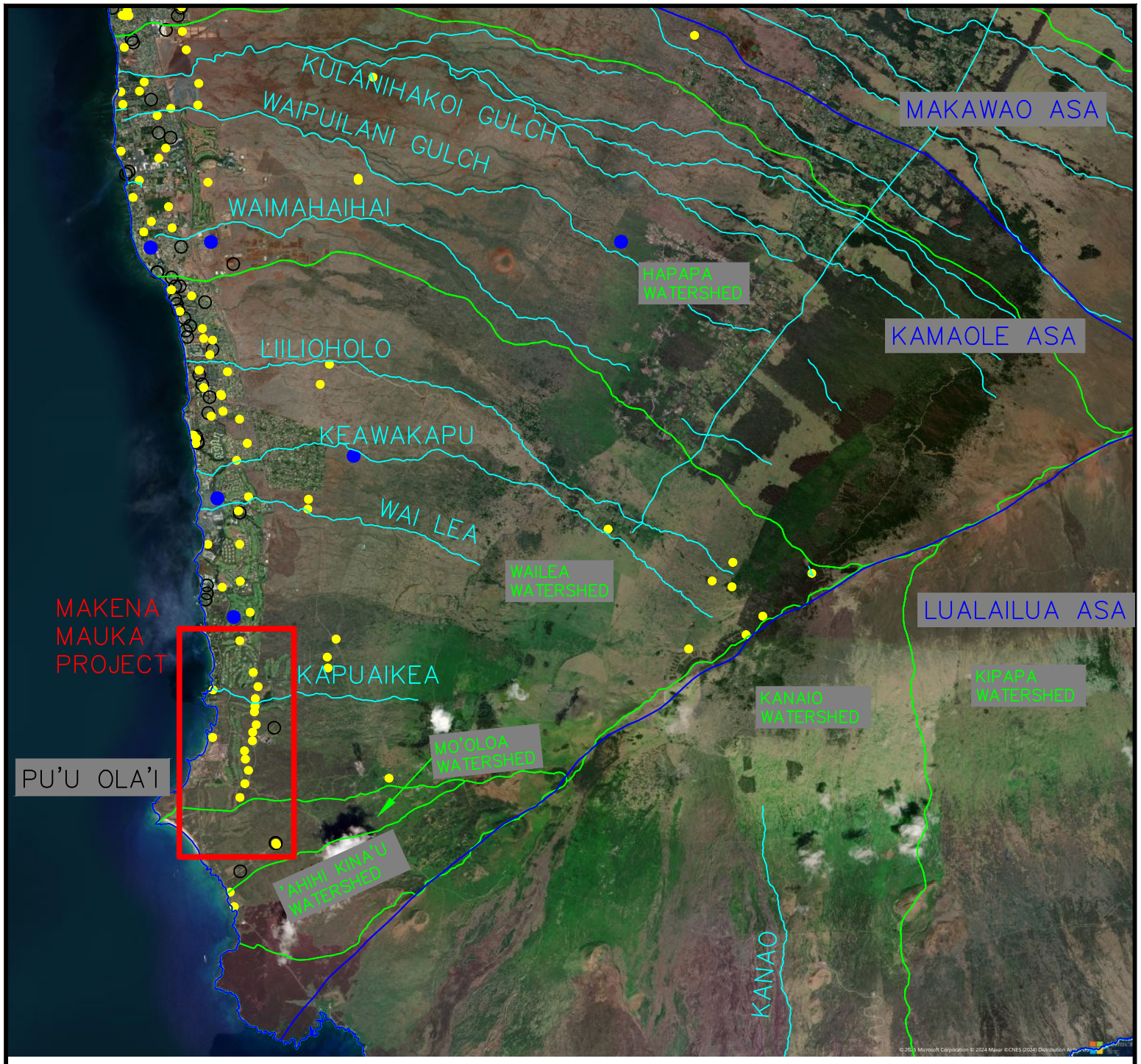
APPENDIX C


159°W
158°W
157°W
156°W
155°W
22°N
21°N
20°N
19°N
Mean Annual Evapotranspiration
State of Hawai‘i
2014 Hawai‘i Evapotranspiration Project
Department of Geography
University of Hawai‘i at Mānoa
Actual Evapotranspiration
(mm)
0 - 300
300 - 450
450 - 600
600 - 720
720 - 850
850 - 1,000
1,000 - 1,150
1,150 - 1,350
1,350 - 1,500
1,500 - 2,300
N
0 25 50 100 150 200
Kilometers


159°W
158°W
157°W
156°W
155°W
22°N
21°N
20°N
19°N
Mean Annual Penman-Monteith Potential Evapotranspiration State of Hawai'i
2014 Hawai'i Evapotranspiration Project
Department of Geography
University of Hawai'i at Mānoa
Penman-Monteith PET (mm)
839 - 1,400
1,400 - 1,700
1,700 - 2,000
2,000 - 2,400
2,400 - 2,900
2,900 - 3,500
3,500 - 4,200
4,200 - 4,900
4,900 - 5,800
5,800 - 7,218
N
0 25 50 100 150 200
Kilometers

APPENDIX D



LEGEND

- WATERSHED/SWHU BOUNDARY
- NON–PERENNIAL STREAM
- AQUIFER SYSTEM AREA (ASA) BOUNDARY
- ABANDONED WELL
- PRODUCTION WELL
- OBSERVATION WELL

9000' 0 9000' 9000'

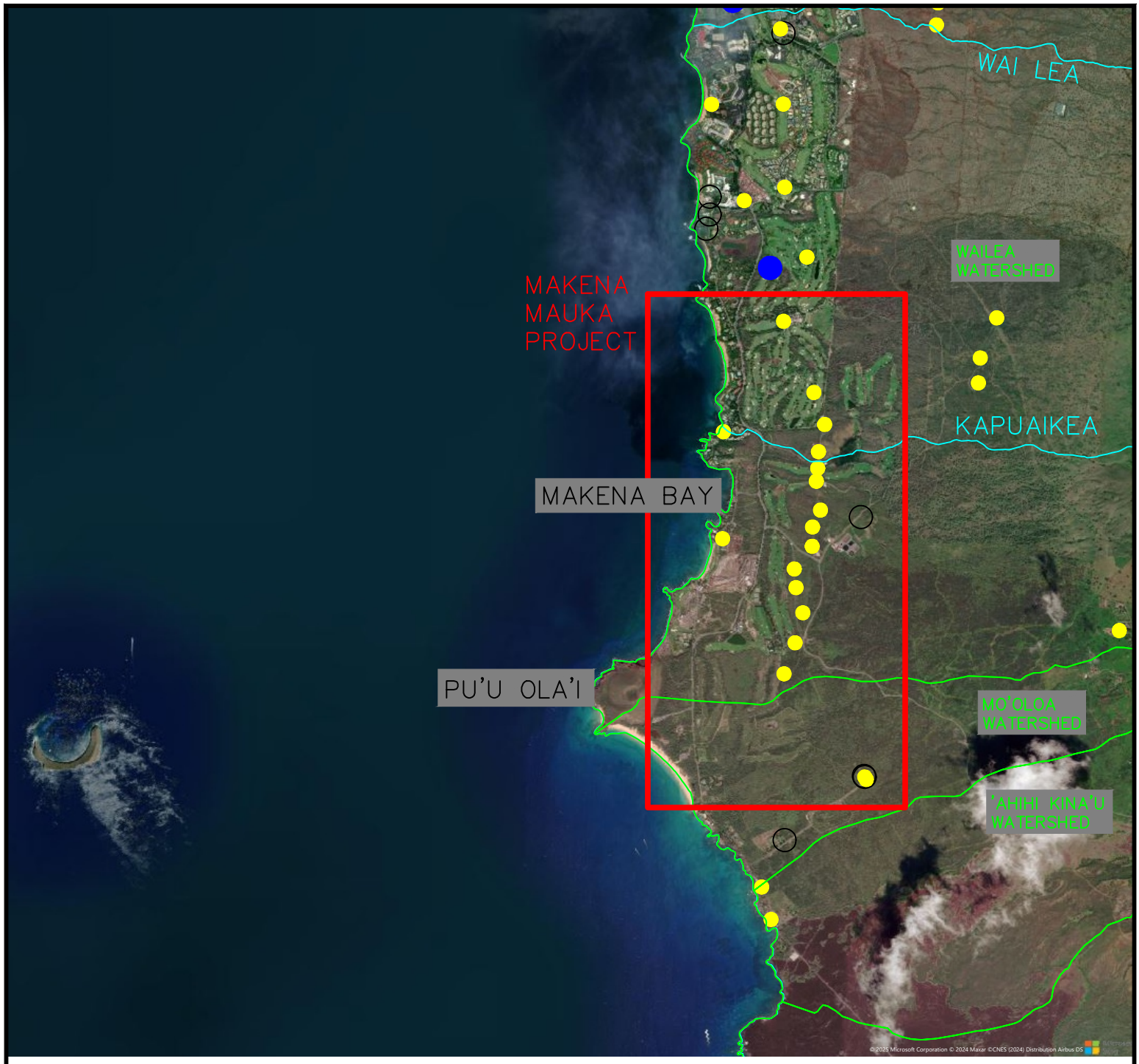
SCALE: 1" = 9000'

MAKENA MAUKA WATER RESOURCES REPORT

APPENDIX

WATER SOURCE SUMMARY

D



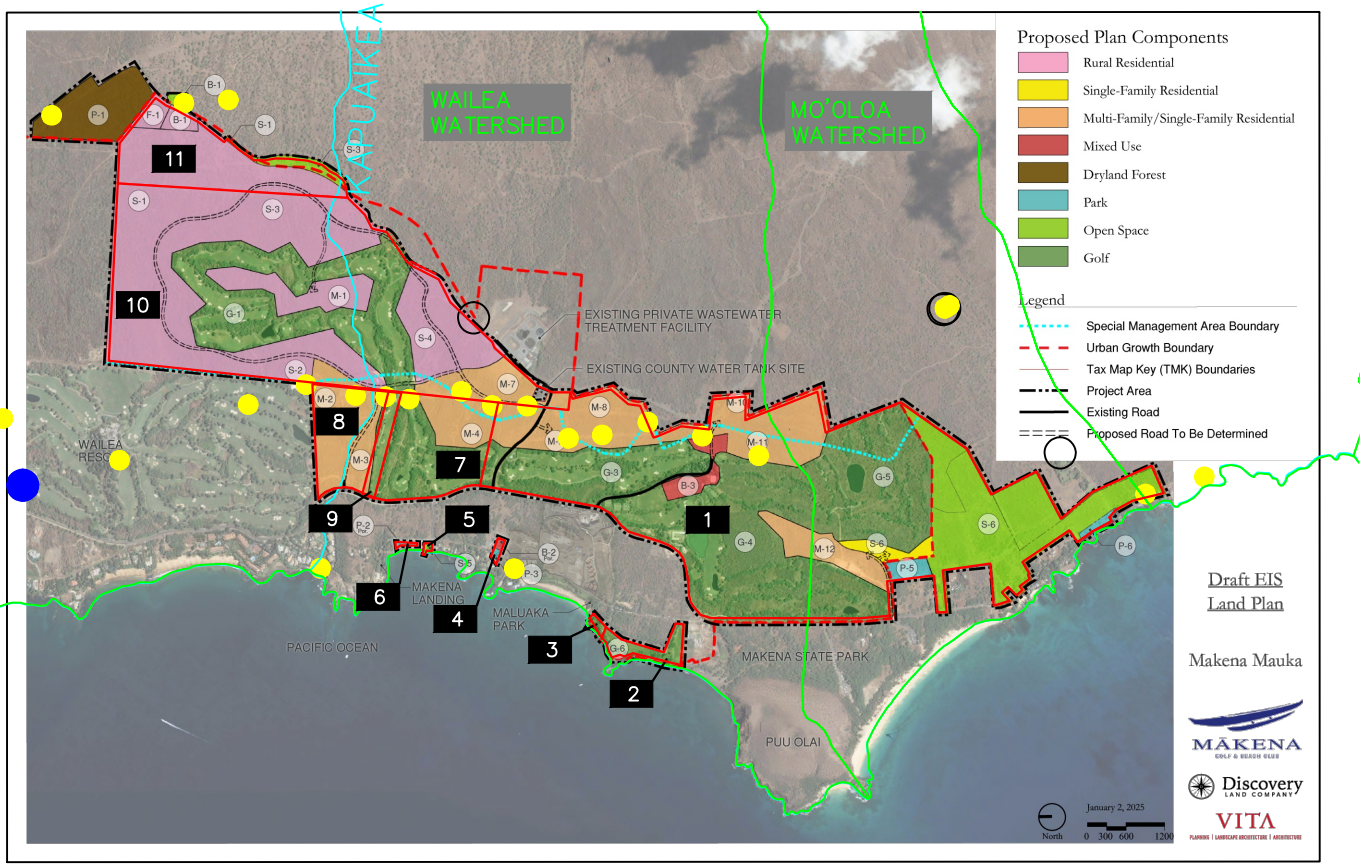
LEGEND

- WATERSHED/SWHU
- NON-PERENNIAL STREAM
- ABANDONED WELL
- PRODUCTION WELL
- OBSERVATION WELL

4000' 0 4000' 8000'

SCALE: 1" = 4000'

	MAKENA MAUKA WATER RESOURCES REPORT	APPENDIX
N	HYDROLOGICAL SUPPLY OVERVIEW	D



LEGEND

- WATERSHED/SWHU
- NON-PERENNIAL STREAM
- ABANDONED WELL
- PRODUCTION WELL
- OBSERVATION WELL

1	(2)2-1-005:108
2	(2)2-1-006:036
3	(2)2-1-006:057
4	(2)2-1-007:068
5	(2)2-1-007:092
6	(2)2-1-007:093
7	(2)2-1-008:078
8	(2)2-1-008:079
9	(2)2-1-008:081
10	(2)2-1-008:090
11	(2)2-1-031:036

4000' 0 4000' 8000'

SCALE: 1" = 4000'

MAKENA MAUKA WATER RESOURCES AREA

HYDROLOGICAL SUPPLY PROJECT AREA

APPENDIX

D

Wells Reviewed in Report

Island:	All
Well Owner:	ATC Makena Holdings, LLC
Well Reporter:	All
Land Owner:	All
Contractor:	All
Aquifer Sector:	All
Aquifer:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not Specified
TMK:	All
PWS:	All
Water Quality:	Fresh;Brackish;Salt;other
Well Type:	Coring, Dug, Percussion, Rotary, Shaft, Tunnel, Not Specified
Well Use:	All

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
Island: Maui																				
60304 Kamaole																				
6-3826-001	Seibu 2	60304	ATC Makena Holdings, LLC	1978	20.640472	-156.435756	PER	12	222	202	8	-20	-20	2.21					0.576	IRRGC
6-3826-002	Seibu 3	60304	ATC Makena Holdings, LLC	1978	20.642814	-156.435100	PER	12	220	199	9	-21	-21	2.08					0.576	IRRGC
6-3826-003	Seibu 4	60304	ATC Makena Holdings, LLC	1978	20.646233	-156.435811	PER	12	228	207	9	-21	-21	1.58	1,100		667		0.576	IRRGC
6-3826-004	Seibu 7	60304	ATC Makena Holdings, LLC	1985	20.638056	-156.436667	PER	12	195	173	128	45	-22	0.00	0		250		0.216	UNU
6-3826-005	Seibu 12	60304	ATC Makena Holdings, LLC	1989	20.644778	-156.435667	PER	12	231	203	10	-20	-28	2.57	1,900		875			UNU
6-3925-002	ATC Makena 3	60304	ATC Makena Holdings, LLC	2020	20.662671	-156.420371	ROT	14	740	703	7	-23	-35	2.77	260	68.1	623	100,782		MUNPR
6-3926-002	Makena 1	60304	ATC Makena Holdings, LLC	1977	20.655378	-156.433789	PER	12	211	190	11	-20	-21	1.75					0.576	IRRGC
6-3926-004	Seibu 5	60304	ATC Makena Holdings, LLC	1984	20.653072	-156.433969	PER	12	230	212	12	-18	-18	0.00					0.576	IRRGC
6-3926-005	Seibu 6	60304	ATC Makena Holdings, LLC	1984	20.654086	-156.433853	PER	12	224	203	9		-21		668		470	2,090,259	0.576	IRRGC
6-3926-006	Seibu 8	60304	ATC Makena Holdings, LLC	1988	20.650822	-156.433636	PER	12	263	241	8	-22	-22	1.00			300		0.432	IRRGC
6-3926-007	Seibu 9	60304	ATC Makena Holdings, LLC	1988	20.657500	-156.433278	PER	12	242	220	8	-22	-22	1.00			33		0.576	UNU
6-3926-008	Seibu 10	60304	ATC Makena Holdings, LLC	1988	20.647997	-156.434325	PER	12	290	268			-22	0.93			350			IRRGC
6-3926-009	Seibu 11	60304	ATC Makena Holdings, LLC	1988	20.649503	-156.434289	PER	12	278	257	9	-21	-21	2.00			357		0.288	IRRGC

Total Installed Pump Capacity in Aquifer in mgd: 4.968

Total Number of wells in Aquifer: 13

Total Number of wells on Island: 13

Total Number of Wells in the State: 13

Wells Reviewed in Report

Island:	Maui
Well Owner:	All
Well Reporter:	All
Land Owner:	All
Contractor:	All
Aquifer Sector:	All
Aquifer:	60304 Kamaole
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not Specified
TMK:	All
PWS:	All
Water Quality:	Fresh;Brackish;Salt;other
Well Type:	Coring, Dug, Percussion, Rotary, Shaft, Tunnel, Not Specified
Well Use:	All

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
Island: Maui																				
60304 Kamaole																				
6-3725-001	Moomuku 1	60304	Olsen Trust LLC	2004	20.630080	-156.430060	ROT	6	280	263	4	-16	-16	2.10	600			100,000	0.432	ABNSLD
6-3725-002	Polena 1	60304	Evans Holdings, Inc.	2016	20.629801	-156.429867	ROT	10	275	262	12	-8	-8	1.95	769	72.6			0.180	MUNPR
6-3725-003	Polena 2	60304	Evans Holdings, Inc.	2016	20.630000	-156.430000	ROT	10	276	262	12	-8	-8	1.78	939	73.4	983	697,160		ABNSLD
6-3725-004	Polena 2A	60304	Evans Holdings, Inc.	2016	20.630000	-156.430000		10	275	262	7	-13	-13	1.78	810	73.2			0.180	IRRLA
6-3726-001	Kanahena	60304	Jacintho, Ronald R. Sr. Trust	1975	20.618889	-156.437778		4	31					0.00						UNU
6-3726-003	Millar 1	60304	Chester F. Millar	1985	20.625085	-156.436640		4	125	110			-15	1.00	16,000					ABN
6-3726-004	Kanahena-Erniss	60304	Lisa A. Dennis	1990	20.621426	-156.438544	DUG	48	19						4				0.014	IRRLA
6-3824-001	Berkowicz	60304	Rocavallo Estates - Condo Master	2005	20.641389	-156.408889	ROT	6	1,322	1,294	-8	-28	-28	5.16	160		24	600	0.065	MUNPR
6-3826-001	Seibu 2	60304	ATC Makena Holdings, LLC	1978	20.640472	-156.435756	PER	12	222	202	8	-20	-20	2.21					0.576	IRRGC
6-3826-002	Seibu 3	60304	ATC Makena Holdings, LLC	1978	20.642814	-156.435100	PER	12	220	199	9	-21	-21	2.08					0.576	IRRGC
6-3826-003	Seibu 4	60304	ATC Makena Holdings, LLC	1978	20.646233	-156.435811	PER	12	228	207	9	-21	-21	1.58	1,100		667		0.576	IRRGC
6-3826-004	Seibu 7	60304	ATC Makena Holdings, LLC	1985	20.638056	-156.436667	PER	12	195	173	128	45	-22	0.00	0		250		0.216	UNU
6-3826-005	Seibu 12	60304	ATC Makena Holdings, LLC	1989	20.644778	-156.435667	PER	12	231	203	10	-20	-28	2.57	1,900		875			UNU
6-3920-001	Waikaalu Spring	60304	Ulupalakua Ranch, Inc.	1942	20.666468	-156.342289	TUN			5,400				5,400.00						AGRLI
6-3921-001	Waihou Spring	60304	Ulupalakua Ranch, Inc.	1942	20.664000	-156.353000	TUN			4,750										AGRLI
6-3925-001	Makena Well 68	60304	Land Division Oahu, DLNR-LD	1964	20.650278	-156.430278	ROT	8	382	352	9	-11	-30	0.80	465		188			ABNLOS*
6-3925-002	ATC Makena 3	60304	ATC Makena Holdings, LLC	2020	20.662671	-156.420371	ROT	14	740	703	7	-23	-35	2.77	260	68.1	623	100,782		MUNPR
6-3926-001	Makena	60304	Samuel M. Garcia Jr. Trust	1972	20.648603	-156.441749	ROT	4	32						1,080					UNU
6-3926-002	Makena 1	60304	ATC Makena Holdings, LLC	1977	20.655378	-156.433789	PER	12	211	190	11	-20	-21	1.75					0.576	IRRGC

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-3926-003	Wailea 8	60304	Wailea Golf LLC	1976	20.660000	-156.434167	PER	12	208	179	-1	-21	-29	1.57	666		27		0.504	IRRGC
6-3926-004	Seibu 5	60304	ATC Makena Holdings, LLC	1984	20.653072	-156.433969	PER	12	230	212	12	-18	-18	0.00					0.576	IRRGC
6-3926-005	Seibu 6	60304	ATC Makena Holdings, LLC	1984	20.654086	-156.433853	PER	12	224	203	9		-21		668		470	2,090,259	0.576	IRRGC
6-3926-006	Seibu 8	60304	ATC Makena Holdings, LLC	1988	20.650822	-156.433636	PER	12	263	241	8	-22	-22	1.00			300		0.432	IRRGC
6-3926-007	Seibu 9	60304	ATC Makena Holdings, LLC	1988	20.657500	-156.433278	PER	12	242	220	8	-22	-22	1.00			33		0.576	UNU
6-3926-008	Seibu 10	60304	ATC Makena Holdings, LLC	1988	20.647997	-156.434325	PER	12	290	268			-22	0.93			350			IRRGC
6-3926-009	Seibu 11	60304	ATC Makena Holdings, LLC	1988	20.649503	-156.434289	PER	12	278	257	9	-21	-21	2.00			357		0.288	IRRGC
6-3926-011	Makena Surf	60304	Makena Surf AOAO	2002	20.656944	-156.441667	ROT	6	55	41	-4	-14	-14	0.93	680			45,900	0.331	IRRLA
6-4019-001	Polipoli Tunnel	60304	Ulupalakua Ranch, Inc.		20.677222	-156.330000	TUN			6,200										UNU
6-4020-001	Waikaukane Tunnel	60304	Ulupalakua Ranch, Inc.	1934	20.669722	-156.339167	TUN			5,750										AGRLI
6-4020-002	Cornwall Tunnel	60304	Ulupalakua Ranch, Inc.		20.674877	-156.344894	TUN			4,850				4,850.00						AGRLI
6-4020-003	Morton Tunnel	60304	Ulupalakua Ranch, Inc.		20.679167	-156.344722	TUN			4,850										AGRLI
6-4021-001	Waikaahi Tunnel	60304	Ulupalakua Ranch, Inc.		20.675916	-156.348602	TUN			4,600				4,600.00						AGRLI
6-4026-001	TMK 2-1-11-3	60304	Polo Beachfront	1950	20.673889	-156.442778		8	24					10.80						ABNLOS*
6-4026-002	Tmk 2-1-11-1	60304	Polo Beachfront	1950	20.675278	-156.442778		8	32											ABNLOS*
6-4026-003	Makena	60304	Stephen A. Finn 2001 Trust	1951	20.672778	-156.443056		8	32											ABNLOS
6-4026-004	Wailea 4	60304	Wailea Golf LLC	1972	20.676009	-156.436553	ROT	12	210	179	0	-21	-31	1.04	363		32		1.008	IRRGC
6-4026-005	Wailea 6	60304	Wailea Golf LLC	1975	20.669722	-156.437778	PER	12	189	158	8	-12	-31	2.00	600		20		0.259	OBS
6-4026-006	Wailea 7	60304	Wailea Golf LLC	1975	20.665556	-156.436667	PER	12	204	184	5	-15	-20	2.00	620		350		1.008	IRRGC
6-4026-007	Wailea 6A	60304	Wailea Golf LLC	1994	20.670556	-156.434722	ROT	12	272	252	0	-20	-20	0.50	460		30		0.540	IRRGC
6-4026-013	Kea Lani Irr	60304	Fairmont Kea Lani, The	2002	20.674970	-156.439914	ROT	6	94	83	-2	-11	-11	0.90	520			84,634	0.331	UNU
6-4122-003	OW Ranch LLC	60304	Oprah's Farm LLC	2021	20.685051	-156.367980	ROT	9	3,082	3,000	0	-81	-81	9.58	100	71.0				AGRCP
6-4125-001	Wailea 670 1	60304	Kauapea Papaya, LLC	1991	20.690377	-156.423829	ROT	12	559	522	-27	-37	-37	2.80			500		0.720	UNU
6-4125-002	Wailea 670 2	60304	Kauapea Papaya, LLC	1991	20.688655	-156.423961	ROT	12	550	523	-6	-26	-27	3.70			210		0.720	UNU
6-4126-001	Wailea 1	60304	Wailea Golf LLC	1950	20.690556	-156.440833	PER	10	90	85		-5	-5	7.00	590				0.036	OBS
6-4126-002	Wailea 2	60304	Wailea Golf LLC	1969	20.688029	-156.436636	PER	12	198	181	3	-17	-17	2.00	490		620		1.008	ABNSLD
6-4126-003	Wailea 3	60304	Wailea Golf LLC	1969	20.682500	-156.436667	PER	12	174	152	-1	-21	-22	1.00	555		383		0.907	IRRGC
6-4126-004	Grand Wailea Salt	60304	Stephen J. Ast (Grand Wailea Resort Inc.)	1991	20.682487	-156.442607		4	80										0.360	AGRAQ
6-4126-005	Wailea Ike Irr	60304	Toni Fowler (Grand Champion Villas)	2004	20.690833	-156.435000	ROT	6	206	189	-2	-17	-17	1.77	700			10,056	0.216	IRRLA
6-4126-006	Wailea 2A	60304	Wailea Golf LLC	2018	20.688361	-156.436889	ROT	14	195	179	5	-15	-15	2.60	885	69.6	646	360,959	0.576	IRRGC
6-4225-001	Maui Meadows	60304	County of Maui	2006	20.697979	-156.415391	ROT	16	802	763	-17	-39	-39	0.29	146		25			OBSWL

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-4225-002	Wailea 670 No. 1	60304	Honuaula Partners, LLC	2007	20.710549	-156.421590	ROT	12	581	545	7	-33	-36	2.22	240		26	27,000		UNU
6-4225-003	Wailea 670 No. 2	60304	Honuaula Partners, LLC	2007	20.714042	-156.419880	ROT	12	604	573	9	-31	-31	3.15	210					UNU
6-4226-001	Tmk 2-1-10-07	60304	Hahn Family Trust	1946	20.700278	-156.444444			41											ABNLOS*
6-4226-002	Granito	60304	PEM Trust	1946	20.700556	-156.444444		5	45											ABN
6-4226-003	Tmk 2-1-10-04	60304	William D. & Marjarie A. Pabst Trust	1946	20.701111	-156.444722			31											IRR
6-4226-004	2-1-10-20	60304	Jeremy Kimura	1946	20.701389	-156.444722			30											ABNSLD
6-4226-005	Tmk 2-1-10-01	60304	Paylor Developments	1949	20.701667	-156.445278		8	22											UNU
6-4226-006	Tmk 3-9-04-98	60304	Maui Parkshore	1949	20.712222	-156.444167		6	59											ABNLOS*
6-4226-007	Tmk 3-9-04-75	60304	Kilohana Waena Corp.	1951	20.705000	-156.441944		8	65											UNU
6-4226-008	TMK 3-9-04-78	60304	S. Kiyan	1951	20.705556	-156.442500		8	75											ABNSLD
6-4226-009	Maui Hill	60304	Maui Hill AOAO	1951	20.708333	-156.442222		8	114											ABNLOS*
6-4226-010	Tmk 3-9-04-84	60304	Hale Kamaole Homeowners Co.	1951	20.710556	-156.443611		8	63											ABNLOS*
6-4226-011	Tmk 3-9-04-125	60304	Norman Mattson	1956	20.712778	-156.438889		10	157											IRR
6-4226-012	Wailea 5	60304	Wailea Golf LLC	1972	20.697222	-156.437222	ROT	12	202	179	0	-21	-23	1.04	1,050		444		0.360	IRRGC
6-4226-013	Wailea 9	60304	Wailea Golf LLC	1989	20.704444	-156.436667	PER	12	222	202	0	-20	-20	1.40			51		0.576	IRRGC
6-4226-014	Wailea 10	60304	Wailea Golf LLC	1990	20.701944	-156.436111	PER	12	248	234	6	-14	-14		600		219		1.008	IRRGC
6-4226-015	Hale Kamaole	60304	Hale Kamaole Homeowners Co.	1999	20.710000	-156.443333	ROT	6	105	77	-8	-28	-28	3.72	600		400	45,200	0.180	IRRLA
6-4226-016	Maui Kamaole AOAO	60304	Maui Kamaole Enterprises III	2001	20.708801	-156.440170	ROT	6	155	129	4	-16	-26	0.23	560			303,258	0.216	IRRLA
6-4226-017	Kamaole Sands	60304	AOAO Kamaole Sands	2002	20.713056	-156.444167	ROT	6	59	52	2	-6	-6	2.20	500			35,994	0.216	IRRLA
6-4226-018	Maui Hill AOAO	60304	Maui Hill AOAO	2003	20.708611	-156.440000	ROT	6	147	134	-3	-13	-13	1.18	320			532,012	0.216	IRRLA
6-4226-019	Kilohana Waena	60304	Kilohana Waena Corp.	2006	20.705833	-156.439722	ROT	6	135	117	3	-17	-17	2.10	600	71.0			0.072	IRRLA
6-4226-020	Keawakapu	60304	Jacqueline T Tavares		20.700186	-156.444842													0.144	UNU
6-4326-001	Tmk 3-9-20-26	60304	County of Maui	1945	20.722222	-156.446944		6	28											ABNLOS*
6-4326-002	Tmk 3-9-20-17	60304	Dragon Pacific Investment Inc.	1946	20.720000	-156.446667		8	23								266			ABNLOS*
6-4326-003	Tmk 3-9-20-14	60304	Rose Royce Trust	1947	20.718889	-156.446389		8	34											ABNLOS*
6-4326-004	Tmk 3-9-19-02	60304	Ulrich R. Klinkhammer	1948	20.716667	-156.441667		7	103											ABNLOS*
6-4326-005	Tmk 3-9-20-20	60304	Ke Alii Villas LLC	1951	20.720833	-156.445833		8	47											ABNLOS*
6-4326-006	Tmk 3-9-18-09	60304	Dan Charles Phillips	1959	20.725000	-156.443056		8	110	75	-19		-35							ABNLOS*
6-4326-007	Kamaole-Bosa	60304	Maui Banyan	1990	20.715770	-156.442173	ROT	6	84	64	0	-20	-20	2.90	60					UNU

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-4326-009	Kihei-Maui Vista	60304	Maui Vista AOAO	2001	20.726111	-156.445556	ROT	6	95	64	-7	-27	-31	1.58	660			85,416	0.288	IRRLA
6-4326-011	Ocean Villas	60304	Ke Alii Villas LLC	2004	20.720362	-156.443550	ROT	6	100	83	3	-17	-17	1.91	680		57	2,500	0.331	IRRLA
6-4326-012	Moana Estates	60304	Ke Alii Villas LLC	2004	20.718333	-156.441667	ROT	6	95	80	5	-15	-15	1.92	680		71		0.216	IRRLA
6-4326-013	Aloha Village	60304	Nokaoi Development LP	2005	20.718611	-156.443333	ROT	6	80	66	4	-14	-14	1.56	700		67		0.180	UNU
6-4326-014	Wailea Inn	60304	Wailea Inn LLC	2019	20.727172	-156.449308	ROT	8	25	12	3	-7	-12	-11.00	109				0.065	IRR
6-4327-001	TMK 3-9-16-25	60304	Hale Kanani Condominium - Condo Master	1947	20.727778	-156.447778		8	38											ABNLOS*
6-4327-002	TMK 3-9-17-37	60304	Ranjit Sivaprakasam	1947	20.729341	-156.449276		10	31											ABN
6-4327-003	TMK 3-9-05-51	60304	LDB Trust	1949	20.723378	-156.447769		8	26											UNU
6-4327-004	TMK 3-9-05-25	60304	2260 South Kihei Road Condo	1949	20.723611	-156.448056		8	22											ABNLOS*
6-4327-005	TMK 3-9-05-22	60304	Hansen Ohana Security LLC	1949	20.724722	-156.448333		8	38											ABNLOS*
6-4327-006	TMK 3-9-16-03	60304	Hale Kanani Condominium - Condo Master	1967	20.727778	-156.448611			45											ABNLOS*
6-4327-007	Kihei-Akahi	60304	Kihei Akahi Condominium	2000	20.725556	-156.448611	ROT	6	80	56	5		-24	1.12	640		727	860,006	0.216	ABNLOS*
6-4327-008	Kalama Beach A1	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.730278	-156.451944	ROT	2	16						2,900					ABNLOS*
6-4327-009	Kalama Beach A2	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.730278	-156.451944	ROT	2	45						2,500					ABNLOS*
6-4327-010	Kalama Beach A3	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.730278	-156.451944	ROT	2	70						17,900					ABNLOS*
6-4422-001	Waiohuli	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2001	20.735480	-156.365452	ROT	4	1,940	1,864	34	-56	-72	5.58	66					OBSWL
6-4424-001	Keokea Highlands 2	60304	Doyle Betsill (Maui Highlands Properties, LLC) 1	2005	20.746350	-156.414440	ROT	8	577	553	-4	-24	-24	2.60	320	66.4	94	179,588	0.432	MUNPR
6-4425-001	Keokea Highlands	60304	Doyle Betsill (Maui Highlands Properties, LLC) 1	2004	20.746683	-156.414448	ROT	6	570	551	1	-19	-19	2.76	300			17,033	0.432	MUNPR
6-4426-001	Kihei Inject TH	60304	County of Maui, Department of Environmental Management, Solid Waste Division	1972	20.735556	-156.441944	ROT	2	203											OBSOTH

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-4426-002	Kihei Injection	60304	County of Maui, Department of Environmental Management, Solid Waste Division	1974	20.731667	-156.437778	PER	18	230	109	-51		-121	4.00			524			ABNLOS*
6-4426-003	Kihei-Maui R&T	60304	Maui Research & Technology Partners, LLC	1990	20.746047	-156.442494	ROT	8	157	124	-3	-33	-33	1.87	369					UNU
6-4427-001	TMK 3-9-05-52	60304	County of Maui Dept. of Parks and Recreation, Central Maui		20.734279	-156.453722														IRR
6-4427-002	TMK 3-9-02-8	60304	Laura Marie Gleason Trust	1945	20.738056	-156.449167		8	30											UNU
6-4427-003	Medo	60304	Giampaolo Paul Boschetti	1948	20.741766	-156.449839	DUG	10	22											DOM
6-4427-004	TMK 3-9-11-38	60304	Nathan C. S. Kim	1949	20.737334	-156.454469		8	24											UNU
6-4427-005	TMK 3-9-02-02	60304	County of Maui	1950	20.734722	-156.447500		8	82											ABNLOS*
6-4427-006	Kihei Fire B1	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.734583	-156.453194	ROT	2	16						2,100					OBS
6-4427-007	Kihei Fire B2	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.734556	-156.453222	ROT	2	40						1,600					OBS
6-4427-008	Kihei Fire B3	60304	Pacific Islands Water Science Center, USGS, U.S. Geological Survey	2009	20.734556	-156.453194	ROT	2	70						8,000					OBS
6-4427-009	Kihei Baptist Chapel	60304	Kihei Baptist Chapel	1978	20.739167	-156.453056	DUG	20	15										0.021	IRRLA
6-4427-010	Burdick	60304	Charles & WF Cronce		20.743400	-156.456460	DUG													IRRLA
6-4524-002	Kaonoulu 1	60304	Kaonoulu Ranch, LLLP	2010	20.764444	-156.411667	ROT	14	589	524	-30	-60	-62	3.66	262					MUNPR
6-4526-002	Kihei HS-1	60304	Hawaii State Department of Education, DOE	2016	20.763394	-156.444175	ROT	12	136	106	9	-11	-27	3.08	330	70.0	346	2,604,923	0.432	IRRSC
6-4526-003	KHS-2	60304	Hawaii State Department of Education, DOE	2016	20.759600	-156.444347	ROT	13	112	92	5	-15	-17	3.43	300	69.5	123	289,352	0.360	IRRSC
6-4527-001	TMK 3-9-02-36	60304	Burchell P. Smith	1945	20.754722	-156.451667		6	30								125		0.170	ABNLOS*
6-4527-002	Tmk 3-9-02-32	60304	Yees Orchard	1946	20.752034	-156.450349		8	35											AGRCP
6-4527-003	Tmk 3-9-01-02	60304	Maui Sunset - Condo Master	1947	20.775380	-156.458416		8	20											IRRLA
6-4527-004	Tmk 3-9-08	60304	County of Maui	1948	20.747936	-156.457255		7	47											ABNLOS*
6-4527-005	Tmk 3-9-08	60304	County of Maui	1948	20.747500	-156.457778			70											ABNLOS*
6-4527-006	Tmk 3-9-01-9	60304	Pascal Gendron-Hardy	1948	20.760556	-156.453056		6	28											ABNLOS*
6-4527-007	Tmk 3-9-23-30	60304	Karen S. Aguinaldo Trust	1949	20.757778	-156.451944		8	42											UNU

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-4527-008	Kihei-Piilani	60304	Piilani Villages Homeowners Association	1990	20.759022	-156.449391	ROT	10	71	41	3	-17	-30	0.75	0		83		0.057	IRRLA
6-4527-010	Kihei-Koa	60304	Koa Resorts Association	1992	20.761930	-156.458710	DUG	24	14	7	0	-5	-7		335		11		0.043	UNU
6-4527-012	Waiohuli 1	60304	County of Maui	1989	20.753889	-156.449444	DUG	60	20											ABNSLD
6-4527-014	Kauhale Makai	60304	Kauhale Makai	2001	20.759722	-156.458333	ROT	6	86	9	-48		-77	1.69	2,518		17	4,552	0.216	IRRPA
6-4527-016	St. Theresa Church	60304	St. Theresa Church	2007	20.746389	-156.455278	ROT	6	45	8	-17	-37	-37	4.00	300	71.0			0.086	IRRLA
6-4527-017	Kihei	60304	Krausz Kihei Two, LLC		20.750278	-156.451667	DUG	66	11											UNU
6-4527-018	Kaonoulu 5	60304	Charles & Valerie Kulesa Trust	2007	20.763657	-156.454346	ROT	6	50	18	-2	-32	-32	3.14	184				0.086	UNU
6-4527-019	Rixey	60304	George Allen Rixey Trust	2010	20.751525	-156.458694	DUG	30	12	8	0	-3	-4	1.00	160				0.058	DOM
6-4527-020	Haleakala Gardens Irrigation	60304	Haleakala Gardens, AOAO	2012	20.762039	-156.455236		6	60	11	-23		-48	2.65	120	71.0	100		0.130	IRR
6-4621-001	Kula 1800 No. 1	60304	RIC (Kula Ranch) LLC	2007	20.771667	-156.351667	ROT	16	1,832	1,760	8	-72	-72	5.19	50		196	170,000		UNU
6-4626-002	Kaonoulu Irr 1	60304	Honuaula Partners, LLC	2012	20.769303	-156.446497	ROT	10	133	118	-5	-15	-15	1.12	180				0.216	UNU
6-4627-001	Tmk 3-9-01-24	60304	Kenji Yamada Trust		20.776111	-156.457500														OTH
6-4627-002	Tmk 3-9-06-08	60304	Harry Vant Groenewout Trust	1946	20.778295	-156.460401		8	20								89		0.119	DOM
6-4627-003	Tmk 3-9-01-54	60304	Southpoint at Waiakoa PH	1947	20.771111	-156.456667		10	29											ABNLOS*
6-4627-004	Tmk 3-9-06-07	60304	Michael John Poulter	1947	20.777762	-156.460167		10	18										0.058	DOM
6-4627-005	Tmk 3-9-06-09	60304	Herman A. Schwarz Trust	1947	20.778626	-156.460485		10												IRRLA
6-4627-006	Tmk 3-9-06-13	60304	Hawaii Conference Foundation	1947	20.867475	-156.482674		6	23											UNU
6-4627-008	Tmk 3-9-01-33	60304	Kihei Commercial Condominium	1948	20.772778	-156.450278		6	116											ABNLOS*
6-4627-009	Tmk 3-9-01-50	60304	Archie Caballero Domingo	1948	20.778056	-156.458611		4	35											ABN
6-4627-010	Tmk 3-9-06-06	60304	LILI Kai Limited Partnership	1948	20.776667	-156.460278		7	19											ABNLOS*
6-4627-011	Tmk 3-9-01-99	60304	Southpoint at Waiakoa PH II	1949	20.770556	-156.456389		8	19											ABNLOS*
6-4627-012	Tmk 3-9-15-12	60304	Maui United Pentecostal Church	1950	20.775284	-156.457204		8	31											IRRLA
6-4627-013	Tmk 3-9-15-14	60304	Aurelia Bosque	1950	20.775278	-156.457778		8	29	20	9		-9	3.10						IRR
6-4627-014	Tmk 3-9-01-34	60304	Christopher Hayes (C. Hayes Excavation)	1969	20.772526	-156.447217	ROT		200	130			-70							AGRCP
6-4627-015	Tmk 3-9-26-43	60304	Douglals C. Baker	1969	20.775278	-156.448056	ROT	4	110											ABNLOS*
6-4627-016	Tmk 3-9-26-67	60304	Bruce M Sandler Trust	1969	20.776667	-156.447500	ROT	4	161											ABNLOS*
6-4627-017	Tmk 3-9-26-66	60304	Clyde Aschoff	1969	20.776825	-156.447351	ROT	4	120											DOM

					Coordinates(NAD83)		Physical Data			Elevations in feet (msl)				Initial				Pump Test Result		
Well No	Well Name	Aquifer	Well Owner/Operator	Year Drilled	Latitude DD	Longitude DD	Type	Casing Dia in.	Total Depth ft.	Ground	Bottom Solid Casing	Bottom Perf Casing	Bottom of Hole	Static Head (ft MSL)	Cl (ppm)	Temp	Spec Cap (gpm/ft)	T ft²/d	Installed Capacity mgd	Use
6-4627-019	Maui Lu	60304	Maui Bay Villas	1956	20.769722	-156.458056	DUG													IRRLA

Total Installed Pump Capacity in Aquifer in mgd: **21.563**

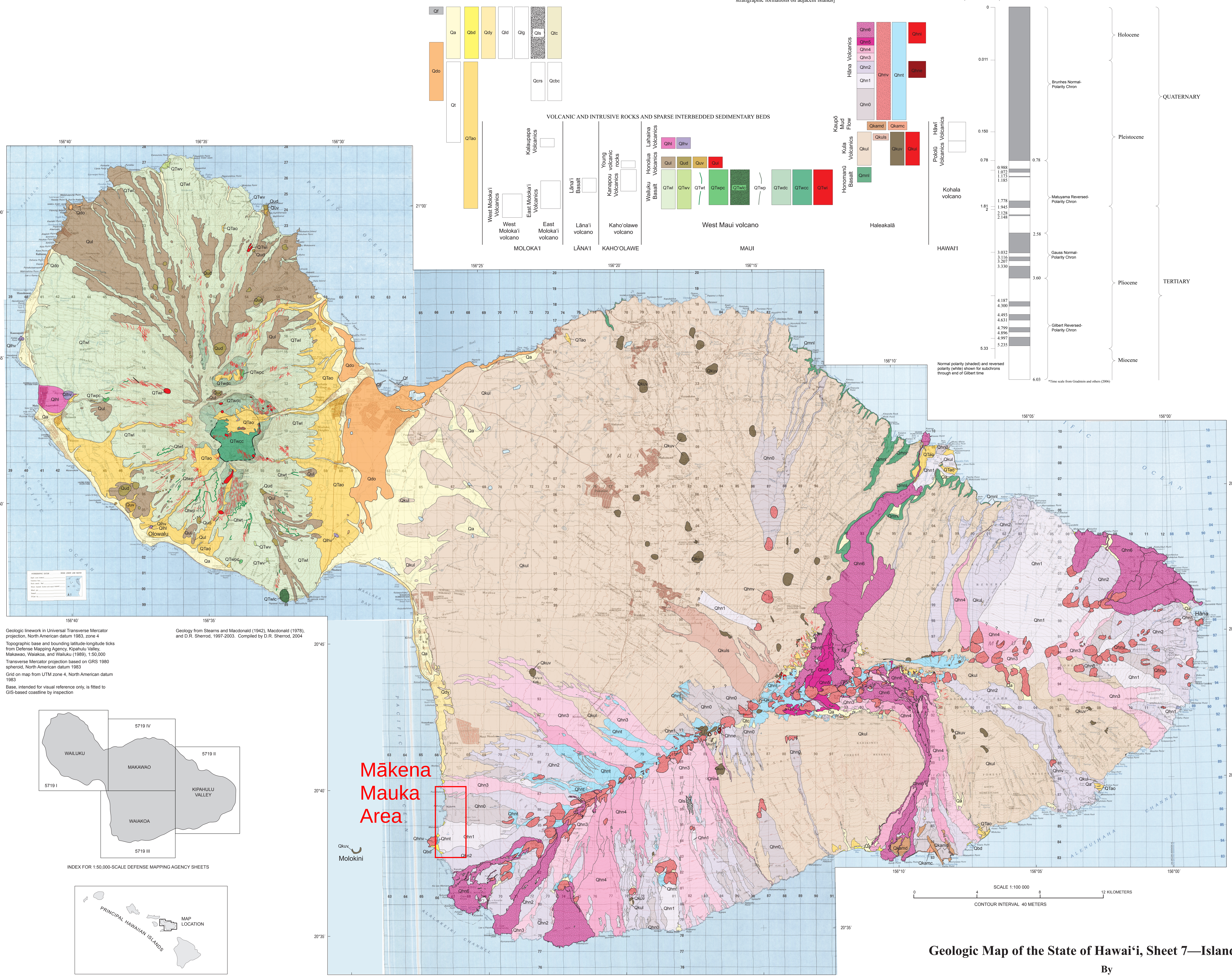
Total Number of wells in Aquifer: **148**

APPENDIX E

CORRELATION OF MAP UNITS

[Boxes without color show ages of corrective stratigraphic formations on adjacent islands]

SURFICIAL DEPOSITS COMMON TO SEVERAL OF THE ISLANDS
VOLCANIC AND INTRUSIVE ROCKS AND SPARSE INTERBEDDED SEDIMENTARY BEDS
West Moloka'i volcano
East Moloka'i volcano
MOLOKA'I
Lāna'i volcano
LĀNA'I
Kaho'olawe volcano
KAHO'OLAWE
West Maui volcano
Haleakalā
MAUI
Kohala volcano
HAWAI'I
Approximate age, in millions of years*
(nonlinear scale)
Polarity Chrons
Brunhes Normal-Polarity Chron
Matuyama Reversed-Polarity Chron
Gauss Normal-Polarity Chron
Gilbert Reversed-Polarity Chron
Holocene
Pleistocene
Pliocene
Miocene
QUATERNARY
TERTIARY
Normal polarity (shaded) and reversed polarity (white) shown for subchrons through end of Gilbert time
*Time scale from Gradstein and others (2004)



Geologic linework in Universal Transverse Mercator projection, North American datum 1983, zone 4

Topographic base and bounding latitude-longitude ticks from Defense Mapping Agency, Kipahulu Valley, Makawao, Waiakoa, and Wailuku (1989), 1:50,000

Transverse Mercator projection based on GRS 1980 spheroid, North American datum 1983

Grid on map from UTM zone 4, North American datum 1983

Base, intended for visual reference only, is fitted to GIS-based coastline by inspection

Geology from Stearns and Macdonald (1942), Macdonald (1978), and D.R. Sherrod, 1997-2003. Compiled by D.R. Sherrod, 2004

WAILUKU
MAKAWAO
KIPAHULU VALLEY
WAIAKOA
5719 IV
5719 I
5719 II
5719 III

INDEX FOR 1:50,000-SCALE DEFENSE MAPPING AGENCY SHEETS

PRINCIPAL HAWAIIAN ISLANDS
MAP LOCATION

SCALE 1:100 000

0 4 8 12 KILOMETERS

CONTOUR INTERVAL 40 METERS

LIST OF MAP UNIT ON SHEET 7 (THIS MAP)

See explanatory pamphlet for complete descriptions

SURFICIAL DEPOSITS COMMON TO SEVERAL OF THE ISLANDS

Qf	**Fill (Holocene)**
Qa	**Alluvium (Holocene)**
Qbd	**Beach deposits (Holocene)**
Qdy	**Younger dune deposits (Holocene)**
Qls	**Landslide deposits (Holocene)**
Qtc	**Talus and colluvium (Holocene)**
Qdo	**Older dune deposits (Holocene and Pleistocene)**
Qcbc	**Calcareous breccia and conglomerate (Pleistocene)**
QTao	**Older alluvium (Pleistocene and Pliocene)**

VOLCANIC AND INTRUSIVE ROCKS ON THE ISLAND OF MAUI

Hāna Volcanics (Holocene and Pleistocene)—Divided into:

Lava flows (Holocene and Pleistocene)—Divided into:

Lava flows	Age, years
Qhn6	0 - 1500
Qhn5	1500 - 3000
Qhn4	3000 - 5000
Qhn3	5000 - 13,000
Qhn2	13,000 - 30,000
Qhn1	30,000 - 50,000
Qhn0	50,000 - 140,000

Qhnv	**Vent deposits (Holocene and Pleistocene)**
Qhnt	**Tephra deposits (Holocene and Pleistocene)**
Qhni	**Intrusive rocks (Holocene and Pleistocene)**
Qhne	**Explosion crater deposits (Pleistocene)**
Qkamd	**Kaupō Mud Flow (Pleistocene)**—Mapped separately is:
Qkamc	**Conglomerate**
	Kula Volcanics (Pleistocene)—Divided into:
Qkul	**Lava flows**—Mapped separately is:
Qkuls	**Summit ankaramite**
Qkuv	**Vent deposits**
Qkui	**Intrusive rocks**
Qmnl	**Honomanū Basalt (Pleistocene)**
	Lahaina Volcanics (Pleistocene)—Divided into:
Qlhl	**Lava flows**
Qlhv	**Vent deposits**
	Honolua Volcanics (Pleistocene)—Divided into:
Qul	**Lava flows**
Qud	**Domes**
Quv	**Vent deposits**
Qui	**Intrusive rocks**
	Wailuku Basalt (Pleistocene and Pliocene(?))—Divided into:
QTwl	**Lava flows**
QTwv	**Vent deposits**
QTwt	**Tuff**
QTwpc	**Pit crater deposits**
QTwlc	**Lava cone**
QTwp	**Phreatic explosion debris**
QTwdc	**Dike complex**
QTwcc	**Caldera complex**
QTwi	**Intrusive rocks**

—— **Contact—Approximately located**

—— **Fault—Approximately located; dotted where concealed**

Geologic Map of the State of Hawai'i, Sheet 7—Island of Maui

By

David R. Sherrod, John M. Sinton, Sarah E. Watkins, and Kelly M. Brunt

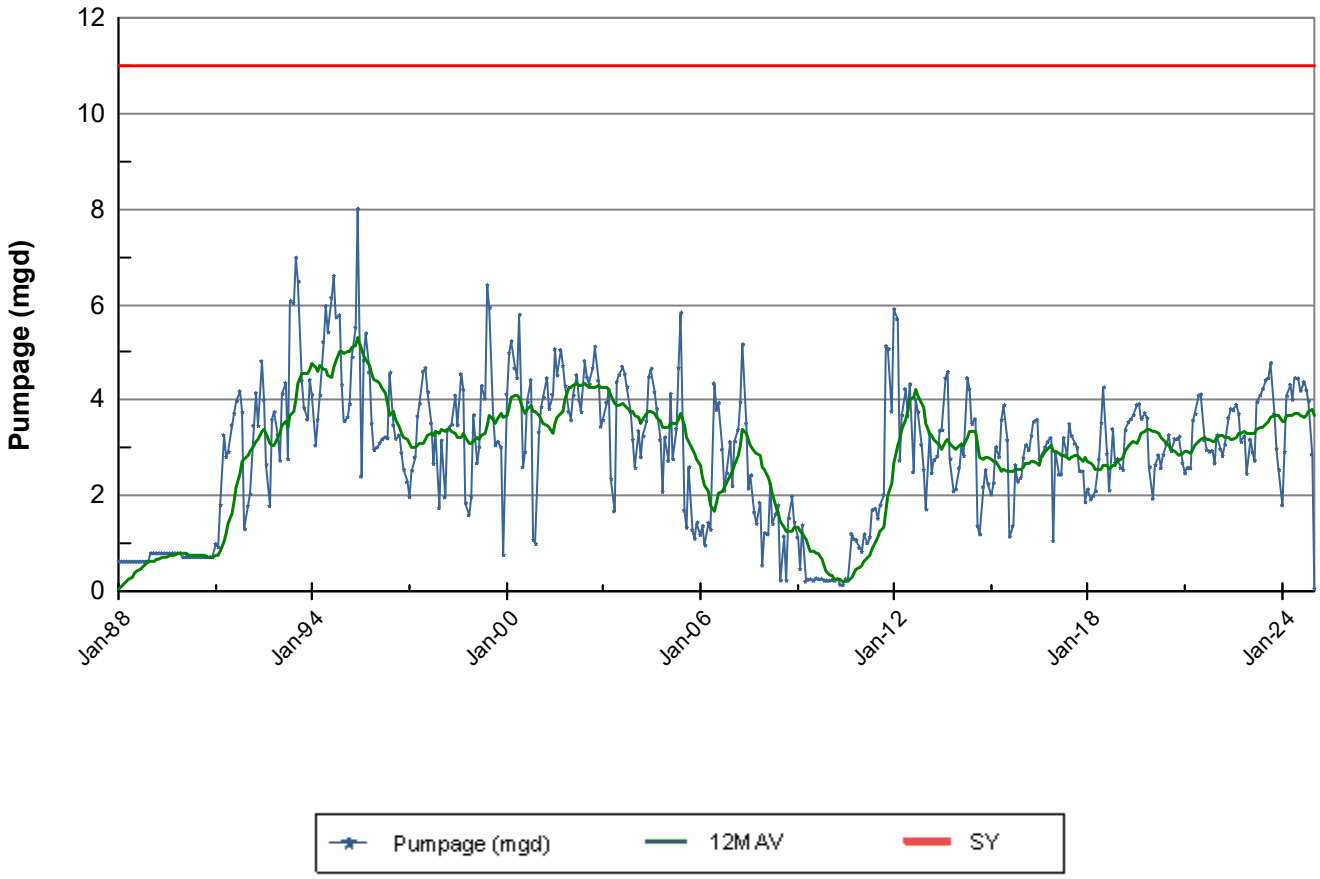
2007

Available on World Wide Web at http://pubs.usgs.gov/of/2007/1089/

APPENDIX F

Monthly Pumpage Chart

12 Month Moving Average



Report Parameters

Date:	01/01/1988 - 01/13/2025
Island:	Maui
Well Owner:	All
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	Central
Aquifer:	60304 Kamaole
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 1988	0.619	0.052	11.000
February 1988	0.619	0.103	11.000
March 1988	0.619	0.155	11.000
April 1988	0.619	0.206	11.000
May 1988	0.618	0.258	11.000
June 1988	0.618	0.309	11.000
July 1988	0.618	0.361	11.000
August 1988	0.618	0.412	11.000
September 1988	0.619	0.464	11.000
October 1988	0.619	0.515	11.000
November 1988	0.619	0.567	11.000
December 1988	0.619	0.619	11.000
January 1989	0.794	0.633	11.000
February 1989	0.794	0.648	11.000
March 1989	0.794	0.662	11.000
April 1989	0.794	0.677	11.000
May 1989	0.793	0.692	11.000
June 1989	0.793	0.706	11.000
July 1989	0.793	0.721	11.000
August 1989	0.793	0.735	11.000
September 1989	0.794	0.750	11.000
October 1989	0.794	0.764	11.000
November 1989	0.794	0.779	11.000
December 1989	0.794	0.794	11.000
January 1990	0.713	0.787	11.000
February 1990	0.713	0.780	11.000
March 1990	0.713	0.773	11.000
April 1990	0.712	0.766	11.000
May 1990	0.711	0.760	11.000
June 1990	0.711	0.753	11.000
July 1990	0.711	0.746	11.000
August 1990	0.711	0.739	11.000
September 1990	0.712	0.732	11.000
October 1990	0.713	0.726	11.000
November 1990	0.713	0.719	11.000
December 1990	0.712	0.712	11.000
January 1991	0.989	0.735	11.000
February 1991	0.926	0.753	11.000
March 1991	1.803	0.844	11.000
April 1991	3.270	1.057	11.000
May 1991	2.811	1.232	11.000
June 1991	2.917	1.416	11.000
July 1991	3.473	1.646	11.000
August 1991	3.715	1.896	11.000
September 1991	3.973	2.168	11.000
October 1991	4.181	2.457	11.000
November 1991	3.746	2.710	11.000
December 1991	1.298	2.758	11.000
January 1992	1.787	2.825	11.000
February 1992	2.031	2.917	11.000
March 1992	3.463	3.055	11.000
April 1992	4.145	3.128	11.000
May 1992	3.461	3.183	11.000
June 1992	4.811	3.340	11.000
July 1992	3.999	3.384	11.000
August 1992	2.651	3.295	11.000
September 1992	1.783	3.113	11.000
October 1992	3.588	3.064	11.000
November 1992	3.748	3.064	11.000
December 1992	3.278	3.229	11.000
January 1993	2.734	3.308	11.000
February 1993	4.130	3.483	11.000
March 1993	4.359	3.557	11.000
April 1993	2.766	3.442	11.000
May 1993	6.079	3.660	11.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
June 1993	6.028	3.762	11.000
July 1993	6.980	4.010	11.000
August 1993	6.477	4.329	11.000
September 1993	4.404	4.548	11.000
October 1993	3.830	4.568	11.000
November 1993	3.592	4.555	11.000
December 1993	4.416	4.650	11.000
January 1994	4.114	4.765	11.000
February 1994	3.049	4.675	11.000
March 1994	3.590	4.611	11.000
April 1994	4.102	4.722	11.000
May 1994	5.214	4.650	11.000
June 1994	5.969	4.645	11.000
July 1994	5.417	4.515	11.000
August 1994	6.142	4.487	11.000
September 1994	6.599	4.670	11.000
October 1994	5.730	4.828	11.000
November 1994	5.775	5.010	11.000
December 1994	4.320	5.002	11.000
January 1995	3.560	4.956	11.000
February 1995	3.641	5.005	11.000
March 1995	3.916	5.032	11.000
April 1995	4.898	5.098	11.000
May 1995	5.520	5.124	11.000
June 1995	8.004	5.294	11.000
July 1995	2.401	5.042	11.000
August 1995	4.831	4.933	11.000
September 1995	5.397	4.833	11.000
October 1995	4.579	4.737	11.000
November 1995	3.509	4.548	11.000
December 1995	2.955	4.434	11.000
January 1996	3.008	4.388	11.000
February 1996	3.099	4.343	11.000
March 1996	3.179	4.282	11.000
April 1996	3.219	4.142	11.000
May 1996	3.200	3.948	11.000
June 1996	4.578	3.663	11.000
July 1996	3.471	3.752	11.000
August 1996	3.192	3.616	11.000
September 1996	3.260	3.437	11.000
October 1996	2.898	3.297	11.000
November 1996	2.542	3.217	11.000
December 1996	2.288	3.161	11.000
January 1997	1.972	3.075	11.000
February 1997	2.525	3.027	11.000
March 1997	2.801	2.995	11.000
April 1997	3.658	3.032	11.000
May 1997	3.923	3.092	11.000
June 1997	4.597	3.094	11.000
July 1997	4.675	3.194	11.000
August 1997	4.166	3.275	11.000
September 1997	3.511	3.296	11.000
October 1997	2.667	3.277	11.000
November 1997	3.333	3.343	11.000
December 1997	1.740	3.297	11.000
January 1998	3.155	3.396	11.000
February 1998	1.964	3.349	11.000
March 1998	3.373	3.397	11.000
April 1998	3.443	3.379	11.000
May 1998	3.487	3.343	11.000
June 1998	4.096	3.301	11.000
July 1998	3.471	3.201	11.000
August 1998	4.546	3.232	11.000
September 1998	4.218	3.291	11.000
October 1998	1.843	3.222	11.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
November 1998	1.589	3.077	11.000
December 1998	1.976	3.097	11.000
January 1999	3.684	3.141	11.000
February 1999	2.678	3.200	11.000
March 1999	3.014	3.170	11.000
April 1999	4.295	3.241	11.000
May 1999	4.031	3.287	11.000
June 1999	6.402	3.479	11.000
July 1999	5.931	3.684	11.000
August 1999	3.621	3.607	11.000
September 1999	3.051	3.510	11.000
October 1999	3.128	3.617	11.000
November 1999	3.013	3.735	11.000
December 1999	0.758	3.634	11.000
January 2000	4.119	3.670	11.000
February 2000	4.986	3.862	11.000
March 2000	5.230	4.047	11.000
April 2000	4.666	4.078	11.000
May 2000	4.461	4.114	11.000
June 2000	5.787	4.063	11.000
July 2000	2.595	3.785	11.000
August 2000	2.912	3.725	11.000
September 2000	3.953	3.801	11.000
October 2000	4.416	3.908	11.000
November 2000	1.076	3.747	11.000
December 2000	0.988	3.766	11.000
January 2001	3.324	3.699	11.000
February 2001	3.856	3.605	11.000
March 2001	4.050	3.507	11.000
April 2001	4.456	3.489	11.000
May 2001	3.816	3.436	11.000
June 2001	4.114	3.296	11.000
July 2001	5.063	3.502	11.000
August 2001	4.516	3.636	11.000
September 2001	5.046	3.727	11.000
October 2001	4.713	3.751	11.000
November 2001	4.298	4.020	11.000
December 2001	3.758	4.251	11.000
January 2002	3.577	4.272	11.000
February 2002	4.096	4.292	11.000
March 2002	4.520	4.331	11.000
April 2002	4.001	4.293	11.000
May 2002	3.750	4.288	11.000
June 2002	4.821	4.347	11.000
July 2002	4.473	4.297	11.000
August 2002	4.328	4.282	11.000
September 2002	4.667	4.250	11.000
October 2002	5.120	4.284	11.000
November 2002	4.408	4.293	11.000
December 2002	3.445	4.267	11.000
January 2003	3.584	4.268	11.000
February 2003	3.944	4.255	11.000
March 2003	4.212	4.229	11.000
April 2003	2.349	4.092	11.000
May 2003	1.671	3.919	11.000
June 2003	4.380	3.882	11.000
July 2003	4.527	3.886	11.000
August 2003	4.699	3.917	11.000
September 2003	4.538	3.906	11.000
October 2003	4.276	3.836	11.000
November 2003	3.753	3.781	11.000
December 2003	3.168	3.758	11.000
January 2004	2.580	3.675	11.000
February 2004	3.353	3.625	11.000
March 2004	2.803	3.508	11.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
April 2004	3.242	3.582	11.000
May 2004	3.563	3.740	11.000
June 2004	4.483	3.749	11.000
July 2004	4.659	3.760	11.000
August 2004	4.164	3.715	11.000
September 2004	3.820	3.655	11.000
October 2004	3.167	3.563	11.000
November 2004	2.080	3.423	11.000
December 2004	3.219	3.428	11.000
January 2005	2.729	3.440	11.000
February 2005	4.131	3.505	11.000
March 2005	2.764	3.502	11.000
April 2005	3.399	3.515	11.000
May 2005	4.676	3.608	11.000
June 2005	5.832	3.720	11.000
July 2005	1.688	3.472	11.000
August 2005	1.329	3.236	11.000
September 2005	2.601	3.134	11.000
October 2005	1.278	2.977	11.000
November 2005	1.098	2.895	11.000
December 2005	1.440	2.747	11.000
January 2006	1.180	2.618	11.000
February 2006	1.362	2.387	11.000
March 2006	0.958	2.237	11.000
April 2006	1.434	2.073	11.000
May 2006	1.286	1.791	11.000
June 2006	4.347	1.667	11.000
July 2006	3.796	1.843	11.000
August 2006	3.941	2.060	11.000
September 2006	2.965	2.091	11.000
October 2006	2.106	2.160	11.000
November 2006	2.469	2.274	11.000
December 2006	3.123	2.414	11.000
January 2007	2.198	2.499	11.000
February 2007	3.133	2.646	11.000
March 2007	3.375	2.848	11.000
April 2007	3.952	3.058	11.000
May 2007	5.164	3.381	11.000
June 2007	3.509	3.311	11.000
July 2007	2.148	3.174	11.000
August 2007	2.426	3.047	11.000
September 2007	1.650	2.938	11.000
October 2007	1.413	2.880	11.000
November 2007	1.854	2.829	11.000
December 2007	0.538	2.613	11.000
January 2008	1.217	2.532	11.000
February 2008	1.190	2.370	11.000
March 2008	2.241	2.275	11.000
April 2008	1.406	2.063	11.000
May 2008	1.614	1.767	11.000
June 2008	1.795	1.624	11.000
July 2008	0.225	1.464	11.000
August 2008	1.145	1.357	11.000
September 2008	0.224	1.239	11.000
October 2008	1.525	1.248	11.000
November 2008	1.983	1.259	11.000
December 2008	1.441	1.334	11.000
January 2009	1.124	1.326	11.000
February 2009	0.465	1.266	11.000
March 2009	1.378	1.194	11.000
April 2009	0.201	1.093	11.000
May 2009	0.241	0.979	11.000
June 2009	0.249	0.850	11.000
July 2009	0.222	0.850	11.000
August 2009	0.268	0.777	11.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
September 2009	0.249	0.779	11.000
October 2009	0.260	0.673	11.000
November 2009	0.223	0.527	11.000
December 2009	0.222	0.425	11.000
January 2010	0.223	0.350	11.000
February 2010	0.235	0.331	11.000
March 2010	0.221	0.234	11.000
April 2010	0.261	0.239	11.000
May 2010	0.136	0.231	11.000
June 2010	0.132	0.221	11.000
July 2010	0.259	0.224	11.000
August 2010	0.247	0.222	11.000
September 2010	1.196	0.301	11.000
October 2010	1.093	0.371	11.000
November 2010	1.065	0.441	11.000
December 2010	0.909	0.498	11.000
January 2011	0.825	0.548	11.000
February 2011	1.189	0.628	11.000
March 2011	1.006	0.693	11.000
April 2011	1.133	0.766	11.000
May 2011	1.696	0.896	11.000
June 2011	1.727	1.029	11.000
July 2011	1.519	1.134	11.000
August 2011	1.796	1.263	11.000
September 2011	2.021	1.332	11.000
October 2011	5.130	1.668	11.000
November 2011	5.068	2.002	11.000
December 2011	3.761	2.239	11.000
January 2012	5.900	2.662	11.000
February 2012	5.694	3.038	11.000
March 2012	2.736	3.182	11.000
April 2012	3.684	3.394	11.000
May 2012	4.229	3.605	11.000
June 2012	3.662	3.767	11.000
July 2012	4.329	4.001	11.000
August 2012	2.488	4.059	11.000
September 2012	4.014	4.225	11.000
October 2012	3.754	4.110	11.000
November 2012	3.065	3.943	11.000
December 2012	2.539	3.841	11.000
January 2013	1.710	3.492	11.000
February 2013	3.299	3.293	11.000
March 2013	2.471	3.270	11.000
April 2013	2.741	3.192	11.000
May 2013	2.822	3.075	11.000
June 2013	3.362	3.050	11.000
July 2013	3.371	2.970	11.000
August 2013	4.462	3.134	11.000
September 2013	4.588	3.182	11.000
October 2013	2.765	3.100	11.000
November 2013	2.089	3.018	11.000
December 2013	2.130	2.984	11.000
January 2014	2.581	3.057	11.000
February 2014	3.080	3.038	11.000
March 2014	2.830	3.068	11.000
April 2014	4.463	3.212	11.000
May 2014	4.231	3.329	11.000
June 2014	3.499	3.341	11.000
July 2014	3.599	3.360	11.000
August 2014	1.369	3.102	11.000
September 2014	1.189	2.819	11.000
October 2014	2.177	2.770	11.000
November 2014	2.534	2.807	11.000
December 2014	2.250	2.817	11.000
January 2015	2.024	2.770	11.000

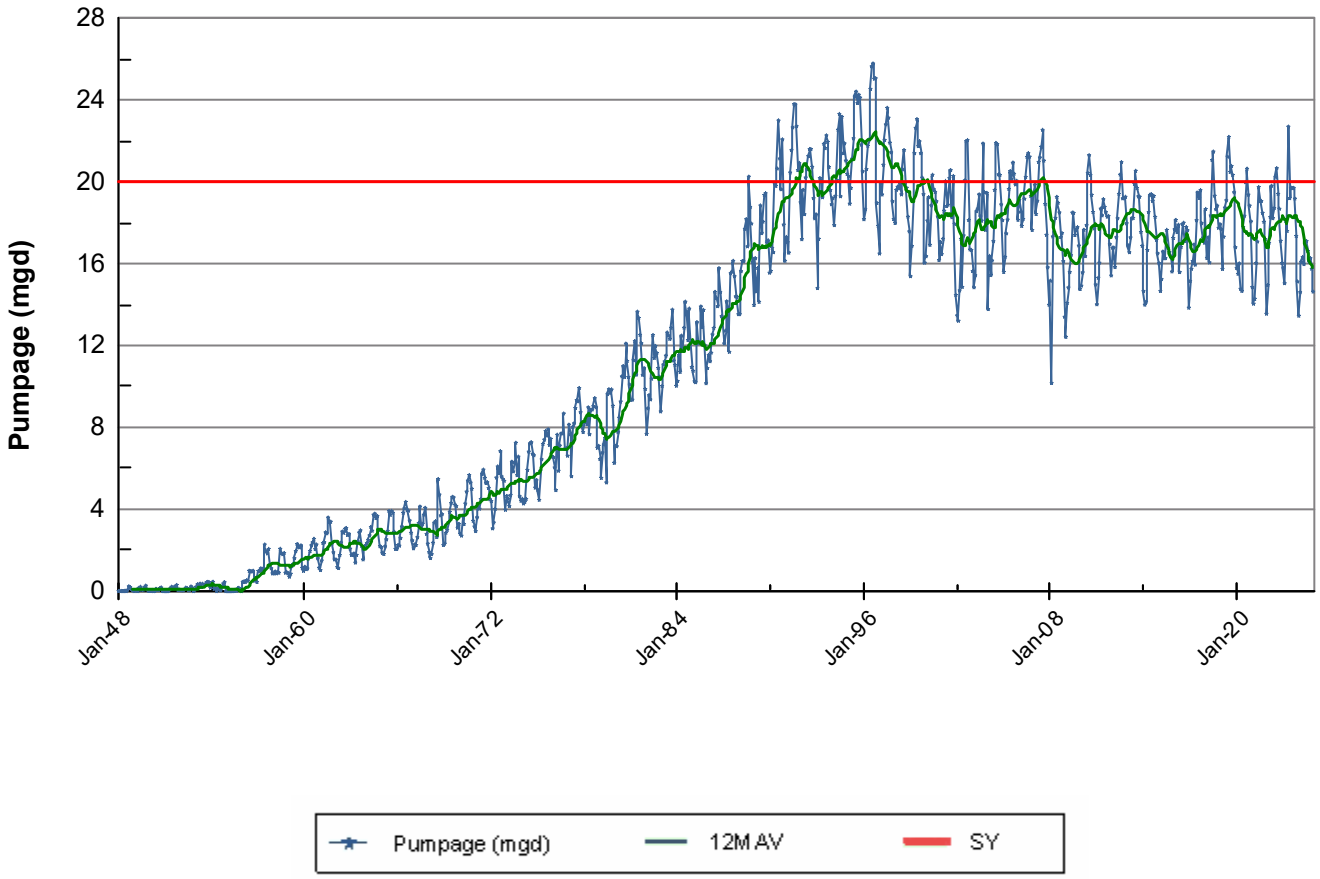
Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
February 2015	2.258	2.702	11.000
March 2015	3.014	2.717	11.000
April 2015	2.805	2.579	11.000
May 2015	3.586	2.525	11.000
June 2015	3.900	2.559	11.000
July 2015	3.160	2.522	11.000
August 2015	1.144	2.503	11.000
September 2015	1.364	2.518	11.000
October 2015	2.639	2.556	11.000
November 2015	2.292	2.536	11.000
December 2015	2.372	2.546	11.000
January 2016	2.791	2.610	11.000
February 2016	3.057	2.677	11.000
March 2016	2.950	2.672	11.000
April 2016	3.255	2.709	11.000
May 2016	3.547	2.706	11.000
June 2016	3.589	2.680	11.000
July 2016	2.765	2.647	11.000
August 2016	2.840	2.788	11.000
September 2016	3.011	2.926	11.000
October 2016	3.122	2.966	11.000
November 2016	3.202	3.042	11.000
December 2016	1.054	2.932	11.000
January 2017	2.919	2.942	11.000
February 2017	2.441	2.891	11.000
March 2017	2.446	2.849	11.000
April 2017	3.205	2.845	11.000
May 2017	2.862	2.788	11.000
June 2017	3.497	2.780	11.000
July 2017	3.248	2.821	11.000
August 2017	3.087	2.841	11.000
September 2017	3.008	2.841	11.000
October 2017	2.513	2.790	11.000
November 2017	2.507	2.732	11.000
December 2017	1.863	2.800	11.000
January 2018	2.130	2.734	11.000
February 2018	1.919	2.690	11.000
March 2018	1.995	2.653	11.000
April 2018	2.091	2.560	11.000
May 2018	2.757	2.551	11.000
June 2018	3.520	2.553	11.000
July 2018	4.264	2.638	11.000
August 2018	2.875	2.620	11.000
September 2018	2.110	2.545	11.000
October 2018	3.392	2.619	11.000
November 2018	2.687	2.634	11.000
December 2018	2.768	2.709	11.000
January 2019	2.581	2.747	11.000
February 2019	2.537	2.798	11.000
March 2019	3.368	2.912	11.000
April 2019	3.544	3.033	11.000
May 2019	3.597	3.103	11.000
June 2019	3.681	3.117	11.000
July 2019	3.900	3.087	11.000
August 2019	3.913	3.173	11.000
September 2019	3.609	3.298	11.000
October 2019	3.729	3.326	11.000
November 2019	3.623	3.404	11.000
December 2019	2.597	3.390	11.000
January 2020	1.938	3.336	11.000
February 2020	2.642	3.345	11.000
March 2020	2.843	3.301	11.000
April 2020	2.575	3.221	11.000
May 2020	2.853	3.159	11.000
June 2020	3.073	3.108	11.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
July 2020	3.266	3.055	11.000
August 2020	2.932	2.973	11.000
September 2020	3.190	2.938	11.000
October 2020	3.184	2.893	11.000
November 2020	3.236	2.861	11.000
December 2020	2.683	2.868	11.000
January 2021	2.467	2.912	11.000
February 2021	2.580	2.907	11.000
March 2021	2.574	2.884	11.000
April 2021	3.572	2.967	11.000
May 2021	3.712	3.039	11.000
June 2021	4.095	3.124	11.000
July 2021	4.118	3.195	11.000
August 2021	3.166	3.215	11.000
September 2021	2.958	3.195	11.000
October 2021	2.921	3.173	11.000
November 2021	2.935	3.148	11.000
December 2021	2.674	3.148	11.000
January 2022	3.273	3.215	11.000
February 2022	2.972	3.248	11.000
March 2022	2.829	3.269	11.000
April 2022	3.068	3.227	11.000
May 2022	3.625	3.220	11.000
June 2022	3.816	3.196	11.000
July 2022	3.785	3.169	11.000
August 2022	3.902	3.230	11.000
September 2022	3.712	3.293	11.000
October 2022	3.127	3.310	11.000
November 2022	3.243	3.336	11.000
December 2022	2.457	3.317	11.000
January 2023	3.173	3.309	11.000
February 2023	2.919	3.305	11.000
March 2023	2.733	3.297	11.000
April 2023	3.962	3.371	11.000
May 2023	4.099	3.411	11.000
June 2023	4.232	3.445	11.000
July 2023	4.415	3.498	11.000
August 2023	4.457	3.544	11.000
September 2023	4.780	3.633	11.000
October 2023	3.711	3.682	11.000
November 2023	2.982	3.660	11.000
December 2023	2.539	3.667	11.000
January 2024	1.795	3.552	11.000
February 2024	2.916	3.552	11.000
March 2024	4.089	3.665	11.000
April 2024	4.320	3.695	11.000
May 2024	4.008	3.687	11.000
June 2024	4.465	3.706	11.000
July 2024	4.450	3.709	11.000
August 2024	4.198	3.688	11.000
September 2024	4.382	3.655	11.000
October 2024	4.207	3.696	11.000
November 2024	3.972	3.778	11.000
December 2024	2.863	3.805	11.000
January 2025	0.052	3.660	11.000

APPENDIX G

Monthly Pumpage Chart

12 Month Moving Average



Report Parameters

Date:	01/01/1948 - 01/13/2025
Island:	Maui
Well Owner:	All
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	Wailuku
Aquifer:	60102 Iao
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 1948	0.013		20.000
February 1948	0.007		20.000
March 1948	0.013		20.000
April 1948	0.000		20.000
May 1948	0.000		20.000
June 1948	0.027		20.000
July 1948	0.000		20.000
August 1948	0.073		20.000
September 1948	0.240		20.000
October 1948	0.195		20.000
November 1948	0.104		20.000
December 1948	0.050	0.060	20.000
January 1949	0.000	0.059	20.000
February 1949	0.031	0.061	20.000
March 1949	0.083	0.067	20.000
April 1949	0.000	0.067	20.000
May 1949	0.166	0.081	20.000
June 1949	0.222	0.097	20.000
July 1949	0.071	0.103	20.000
August 1949	0.071	0.103	20.000
September 1949	0.193	0.099	20.000
October 1949	0.277	0.106	20.000
November 1949	0.080	0.104	20.000
December 1949	0.026	0.102	20.000
January 1950	0.015	0.103	20.000
February 1950	0.020	0.102	20.000
March 1950	0.058	0.100	20.000
April 1950	0.004	0.100	20.000
May 1950	0.006	0.087	20.000
June 1950	0.117	0.078	20.000
July 1950	0.055	0.077	20.000
August 1950	0.070	0.077	20.000
September 1950	0.153	0.073	20.000
October 1950	0.184	0.066	20.000
November 1950	0.010	0.060	20.000
December 1950	0.000	0.058	20.000
January 1951	0.000	0.057	20.000
February 1951	0.005	0.055	20.000
March 1951	0.000	0.050	20.000
April 1951	0.028	0.052	20.000
May 1951	0.133	0.063	20.000
June 1951	0.221	0.072	20.000
July 1951	0.188	0.083	20.000
August 1951	0.157	0.090	20.000
September 1951	0.263	0.099	20.000
October 1951	0.305	0.109	20.000
November 1951	0.064	0.114	20.000
December 1951	0.079	0.120	20.000
January 1952	0.058	0.125	20.000
February 1952	0.040	0.128	20.000
March 1952	0.047	0.132	20.000
April 1952	0.118	0.140	20.000
May 1952	0.175	0.143	20.000
June 1952	0.154	0.137	20.000
July 1952	0.048	0.126	20.000
August 1952	0.065	0.118	20.000
September 1952	0.236	0.116	20.000
October 1952	0.178	0.105	20.000
November 1952	0.000	0.100	20.000
December 1952	0.077	0.100	20.000
January 1953	0.222	0.113	20.000
February 1953	0.338	0.138	20.000
March 1953	0.209	0.152	20.000
April 1953	0.374	0.173	20.000
May 1953	0.202	0.175	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
June 1953	0.363	0.193	20.000
July 1953	0.316	0.215	20.000
August 1953	0.339	0.238	20.000
September 1953	0.437	0.255	20.000
October 1953	0.458	0.278	20.000
November 1953	0.442	0.315	20.000
December 1953	0.175	0.323	20.000
January 1954	0.362	0.335	20.000
February 1954	0.462	0.345	20.000
March 1954	0.121	0.338	20.000
April 1954	0.160	0.320	20.000
May 1954	0.000	0.303	20.000
June 1954	0.131	0.284	20.000
July 1954	0.133	0.268	20.000
August 1954	0.048	0.244	20.000
September 1954	0.228	0.227	20.000
October 1954	0.380	0.220	20.000
November 1954	0.440	0.220	20.000
December 1954	0.000	0.205	20.000
January 1955	0.000	0.175	20.000
February 1955	0.000	0.137	20.000
March 1955	0.000	0.127	20.000
April 1955	0.000	0.113	20.000
May 1955	0.000	0.113	20.000
June 1955	0.009	0.103	20.000
July 1955	0.065	0.097	20.000
August 1955	0.022	0.095	20.000
September 1955	0.139	0.088	20.000
October 1955	0.166	0.070	20.000
November 1955	0.089	0.041	20.000
December 1955	0.000	0.041	20.000
January 1956	0.452	0.078	20.000
February 1956	0.483	0.119	20.000
March 1956	0.452	0.156	20.000
April 1956	0.533	0.201	20.000
May 1956	0.516	0.244	20.000
June 1956	1.000	0.326	20.000
July 1956	0.968	0.402	20.000
August 1956	0.968	0.480	20.000
September 1956	1.000	0.552	20.000
October 1956	0.516	0.581	20.000
November 1956	0.533	0.618	20.000
December 1956	0.452	0.656	20.000
January 1957	0.992	0.701	20.000
February 1957	1.005	0.745	20.000
March 1957	1.116	0.800	20.000
April 1957	1.039	0.842	20.000
May 1957	1.128	0.893	20.000
June 1957	2.280	1.000	20.000
July 1957	1.956	1.082	20.000
August 1957	1.844	1.155	20.000
September 1957	2.071	1.244	20.000
October 1957	1.311	1.311	20.000
November 1957	1.117	1.359	20.000
December 1957	0.871	1.394	20.000
January 1958	0.871	1.384	20.000
February 1958	0.964	1.381	20.000
March 1958	0.871	1.360	20.000
April 1958	0.933	1.351	20.000
May 1958	0.903	1.333	20.000
June 1958	2.076	1.316	20.000
July 1958	1.867	1.308	20.000
August 1958	1.806	1.305	20.000
September 1958	1.867	1.288	20.000
October 1958	0.903	1.254	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
November 1958	0.933	1.239	20.000
December 1958	0.871	1.239	20.000
January 1959	0.710	1.225	20.000
February 1959	0.857	1.216	20.000
March 1959	1.226	1.246	20.000
April 1959	1.333	1.279	20.000
May 1959	1.613	1.338	20.000
June 1959	1.959	1.329	20.000
July 1959	2.301	1.365	20.000
August 1959	2.186	1.397	20.000
September 1959	2.137	1.419	20.000
October 1959	2.239	1.530	20.000
November 1959	1.133	1.547	20.000
December 1959	1.000	1.558	20.000
January 1960	1.197	1.598	20.000
February 1960	1.077	1.617	20.000
March 1960	1.115	1.607	20.000
April 1960	1.600	1.630	20.000
May 1960	1.962	1.659	20.000
June 1960	2.242	1.682	20.000
July 1960	2.385	1.689	20.000
August 1960	2.559	1.720	20.000
September 1960	2.056	1.714	20.000
October 1960	2.283	1.717	20.000
November 1960	1.606	1.757	20.000
December 1960	1.149	1.769	20.000
January 1961	1.032	1.755	20.000
February 1961	1.500	1.791	20.000
March 1961	2.355	1.894	20.000
April 1961	2.392	1.960	20.000
May 1961	2.876	2.036	20.000
June 1961	2.828	2.085	20.000
July 1961	3.598	2.186	20.000
August 1961	3.384	2.255	20.000
September 1961	3.396	2.367	20.000
October 1961	2.328	2.370	20.000
November 1961	1.900	2.395	20.000
December 1961	1.548	2.428	20.000
January 1962	1.548	2.471	20.000
February 1962	1.179	2.444	20.000
March 1962	1.129	2.342	20.000
April 1962	1.767	2.290	20.000
May 1962	2.378	2.249	20.000
June 1962	2.917	2.256	20.000
July 1962	2.857	2.194	20.000
August 1962	3.050	2.166	20.000
September 1962	3.087	2.141	20.000
October 1962	2.749	2.176	20.000
November 1962	2.787	2.250	20.000
December 1962	2.079	2.294	20.000
January 1963	1.769	2.312	20.000
February 1963	1.786	2.363	20.000
March 1963	1.842	2.422	20.000
April 1963	1.400	2.392	20.000
May 1963	1.774	2.341	20.000
June 1963	2.433	2.301	20.000
July 1963	2.867	2.302	20.000
August 1963	2.969	2.295	20.000
September 1963	2.208	2.222	20.000
October 1963	1.548	2.122	20.000
November 1963	2.133	2.067	20.000
December 1963	2.258	2.082	20.000
January 1964	2.355	2.131	20.000
February 1964	2.504	2.191	20.000
March 1964	2.724	2.264	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
April 1964	3.136	2.409	20.000
May 1964	2.956	2.508	20.000
June 1964	3.739	2.616	20.000
July 1964	3.787	2.693	20.000
August 1964	3.572	2.743	20.000
September 1964	3.670	2.865	20.000
October 1964	2.989	2.985	20.000
November 1964	2.200	2.991	20.000
December 1964	2.161	2.983	20.000
January 1965	1.871	2.942	20.000
February 1965	1.821	2.886	20.000
March 1965	2.194	2.841	20.000
April 1965	2.530	2.791	20.000
May 1965	2.948	2.790	20.000
June 1965	3.913	2.805	20.000
July 1965	3.729	2.800	20.000
August 1965	3.922	2.829	20.000
September 1965	3.832	2.843	20.000
October 1965	2.904	2.836	20.000
November 1965	2.067	2.824	20.000
December 1965	2.065	2.816	20.000
January 1966	2.258	2.849	20.000
February 1966	2.226	2.882	20.000
March 1966	2.596	2.916	20.000
April 1966	3.159	2.968	20.000
May 1966	3.834	3.042	20.000
June 1966	4.047	3.053	20.000
July 1966	4.361	3.106	20.000
August 1966	3.974	3.110	20.000
September 1966	3.936	3.119	20.000
October 1966	3.455	3.165	20.000
November 1966	2.858	3.231	20.000
December 1966	2.483	3.265	20.000
January 1967	2.097	3.252	20.000
February 1967	2.286	3.257	20.000
March 1967	2.258	3.229	20.000
April 1967	2.633	3.185	20.000
May 1967	3.334	3.143	20.000
June 1967	4.134	3.151	20.000
July 1967	3.152	3.050	20.000
August 1967	3.296	2.993	20.000
September 1967	3.741	2.977	20.000
October 1967	4.075	3.029	20.000
November 1967	2.800	3.024	20.000
December 1967	2.323	3.011	20.000
January 1968	1.903	2.995	20.000
February 1968	1.621	2.939	20.000
March 1968	1.806	2.902	20.000
April 1968	2.367	2.879	20.000
May 1968	3.351	2.881	20.000
June 1968	3.412	2.821	20.000
July 1968	2.644	2.778	20.000
August 1968	5.476	2.960	20.000
September 1968	4.724	3.042	20.000
October 1968	3.700	3.011	20.000
November 1968	3.757	3.090	20.000
December 1968	2.258	3.085	20.000
January 1969	2.326	3.120	20.000
February 1969	2.857	3.223	20.000
March 1969	3.000	3.323	20.000
April 1969	3.367	3.406	20.000
May 1969	3.871	3.449	20.000
June 1969	4.300	3.523	20.000
July 1969	4.613	3.687	20.000
August 1969	4.581	3.613	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
September 1969	4.229	3.572	20.000
October 1969	4.163	3.610	20.000
November 1969	3.102	3.556	20.000
December 1969	3.290	3.642	20.000
January 1970	2.806	3.682	20.000
February 1970	2.714	3.670	20.000
March 1970	3.689	3.727	20.000
April 1970	3.282	3.720	20.000
May 1970	4.280	3.754	20.000
June 1970	4.867	3.801	20.000
July 1970	5.404	3.867	20.000
August 1970	5.672	3.958	20.000
September 1970	5.307	4.048	20.000
October 1970	5.004	4.118	20.000
November 1970	3.442	4.147	20.000
December 1970	3.161	4.136	20.000
January 1971	2.935	4.147	20.000
February 1971	3.607	4.221	20.000
March 1971	4.161	4.260	20.000
April 1971	4.033	4.323	20.000
May 1971	4.509	4.342	20.000
June 1971	5.716	4.413	20.000
July 1971	5.939	4.457	20.000
August 1971	5.538	4.446	20.000
September 1971	5.289	4.445	20.000
October 1971	5.319	4.471	20.000
November 1971	5.043	4.604	20.000
December 1971	4.490	4.715	20.000
January 1972	4.402	4.837	20.000
February 1972	3.069	4.792	20.000
March 1972	3.355	4.725	20.000
April 1972	4.018	4.724	20.000
May 1972	5.550	4.811	20.000
June 1972	6.093	4.842	20.000
July 1972	5.763	4.827	20.000
August 1972	6.840	4.936	20.000
September 1972	5.608	4.962	20.000
October 1972	5.484	4.976	20.000
November 1972	5.391	5.005	20.000
December 1972	3.976	4.962	20.000
January 1973	4.645	4.983	20.000
February 1973	4.522	5.104	20.000
March 1973	4.161	5.171	20.000
April 1973	4.704	5.228	20.000
May 1973	6.323	5.292	20.000
June 1973	5.849	5.272	20.000
July 1973	6.294	5.316	20.000
August 1973	7.250	5.351	20.000
September 1973	5.668	5.356	20.000
October 1973	6.575	5.446	20.000
November 1973	4.636	5.384	20.000
December 1973	4.419	5.420	20.000
January 1974	4.516	5.410	20.000
February 1974	4.286	5.390	20.000
March 1974	4.355	5.406	20.000
April 1974	4.508	5.390	20.000
May 1974	5.926	5.357	20.000
June 1974	6.820	5.438	20.000
July 1974	7.217	5.515	20.000
August 1974	7.269	5.516	20.000
September 1974	6.716	5.604	20.000
October 1974	6.638	5.609	20.000
November 1974	5.060	5.644	20.000
December 1974	5.417	5.727	20.000
January 1975	4.955	5.764	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
February 1975	4.464	5.779	20.000
March 1975	5.885	5.906	20.000
April 1975	6.441	6.067	20.000
May 1975	7.193	6.173	20.000
June 1975	7.401	6.221	20.000
July 1975	7.827	6.272	20.000
August 1975	7.598	6.300	20.000
September 1975	7.902	6.399	20.000
October 1975	7.142	6.441	20.000
November 1975	7.443	6.639	20.000
December 1975	6.580	6.736	20.000
January 1976	6.553	6.869	20.000
February 1976	6.044	7.001	20.000
March 1976	4.937	6.922	20.000
April 1976	7.644	7.022	20.000
May 1976	5.885	6.913	20.000
June 1976	7.114	6.889	20.000
July 1976	7.700	6.879	20.000
August 1976	7.715	6.888	20.000
September 1976	8.678	6.953	20.000
October 1976	6.963	6.938	20.000
November 1976	6.983	6.900	20.000
December 1976	6.616	6.903	20.000
January 1977	8.135	7.035	20.000
February 1977	7.662	7.169	20.000
March 1977	5.613	7.226	20.000
April 1977	8.030	7.258	20.000
May 1977	8.198	7.451	20.000
June 1977	8.950	7.604	20.000
July 1977	9.337	7.740	20.000
August 1977	9.268	7.869	20.000
September 1977	9.921	7.973	20.000
October 1977	8.740	8.121	20.000
November 1977	8.148	8.218	20.000
December 1977	7.770	8.314	20.000
January 1978	8.262	8.325	20.000
February 1978	8.390	8.386	20.000
March 1978	8.170	8.599	20.000
April 1978	8.977	8.678	20.000
May 1978	7.663	8.633	20.000
June 1978	8.859	8.625	20.000
July 1978	8.873	8.587	20.000
August 1978	9.040	8.568	20.000
September 1978	9.421	8.526	20.000
October 1978	8.979	8.546	20.000
November 1978	7.004	8.451	20.000
December 1978	7.097	8.395	20.000
January 1979	6.452	8.244	20.000
February 1979	5.536	8.006	20.000
March 1979	6.774	7.889	20.000
April 1979	7.167	7.739	20.000
May 1979	7.491	7.724	20.000
June 1979	5.311	7.429	20.000
July 1979	9.625	7.491	20.000
August 1979	9.863	7.560	20.000
September 1979	9.697	7.583	20.000
October 1979	9.852	7.656	20.000
November 1979	9.054	7.826	20.000
December 1979	6.273	7.758	20.000
January 1980	7.097	7.812	20.000
February 1980	7.075	7.940	20.000
March 1980	7.762	8.022	20.000
April 1980	8.474	8.131	20.000
May 1980	9.262	8.279	20.000
June 1980	10.492	8.710	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
July 1980	10.986	8.824	20.000
August 1980	10.460	8.874	20.000
September 1980	12.092	9.073	20.000
October 1980	11.245	9.189	20.000
November 1980	10.463	9.307	20.000
December 1980	10.091	9.625	20.000
January 1981	9.346	9.812	20.000
February 1981	9.358	10.003	20.000
March 1981	11.283	10.296	20.000
April 1981	12.215	10.608	20.000
May 1981	10.575	10.717	20.000
June 1981	13.652	10.980	20.000
July 1981	13.345	11.177	20.000
August 1981	12.522	11.349	20.000
September 1981	12.107	11.350	20.000
October 1981	10.569	11.294	20.000
November 1981	10.884	11.329	20.000
December 1981	9.875	11.311	20.000
January 1982	7.684	11.172	20.000
February 1982	8.926	11.136	20.000
March 1982	9.572	10.994	20.000
April 1982	9.363	10.756	20.000
May 1982	10.379	10.740	20.000
June 1982	12.507	10.645	20.000
July 1982	11.392	10.482	20.000
August 1982	11.979	10.436	20.000
September 1982	11.629	10.397	20.000
October 1982	10.901	10.424	20.000
November 1982	10.475	10.390	20.000
December 1982	8.779	10.299	20.000
January 1983	10.017	10.493	20.000
February 1983	11.070	10.672	20.000
March 1983	11.219	10.809	20.000
April 1983	11.505	10.988	20.000
May 1983	12.632	11.175	20.000
June 1983	12.489	11.174	20.000
July 1983	12.325	11.252	20.000
August 1983	12.863	11.325	20.000
September 1983	13.751	11.502	20.000
October 1983	11.264	11.532	20.000
November 1983	11.051	11.580	20.000
December 1983	10.035	11.685	20.000
January 1984	10.263	11.705	20.000
February 1984	11.534	11.744	20.000
March 1984	10.712	11.702	20.000
April 1984	12.482	11.783	20.000
May 1984	11.802	11.714	20.000
June 1984	12.865	11.745	20.000
July 1984	14.139	11.897	20.000
August 1984	13.514	11.951	20.000
September 1984	12.265	11.827	20.000
October 1984	13.803	12.039	20.000
November 1984	12.151	12.130	20.000
December 1984	10.946	12.206	20.000
January 1985	10.763	12.248	20.000
February 1985	10.252	12.141	20.000
March 1985	10.201	12.099	20.000
April 1985	13.132	12.153	20.000
May 1985	12.097	12.177	20.000
June 1985	12.122	12.115	20.000
July 1985	13.902	12.096	20.000
August 1985	12.894	12.044	20.000
September 1985	13.741	12.167	20.000
October 1985	12.010	12.018	20.000
November 1985	10.154	11.851	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
December 1985	10.898	11.847	20.000
January 1986	11.545	11.912	20.000
February 1986	11.226	11.994	20.000
March 1986	11.647	12.114	20.000
April 1986	12.538	12.064	20.000
May 1986	12.860	12.128	20.000
June 1986	14.618	12.336	20.000
July 1986	14.316	12.370	20.000
August 1986	13.914	12.456	20.000
September 1986	15.769	12.625	20.000
October 1986	14.607	12.841	20.000
November 1986	13.426	13.114	20.000
December 1986	13.306	13.314	20.000
January 1987	12.100	13.361	20.000
February 1987	12.726	13.486	20.000
March 1987	14.155	13.695	20.000
April 1987	13.794	13.799	20.000
May 1987	11.691	13.702	20.000
June 1987	15.528	13.778	20.000
July 1987	15.603	13.885	20.000
August 1987	16.135	14.070	20.000
September 1987	15.381	14.038	20.000
October 1987	14.396	14.020	20.000
November 1987	14.371	14.099	20.000
December 1987	13.528	14.117	20.000
January 1988	13.526	14.236	20.000
February 1988	15.625	14.478	20.000
March 1988	16.125	14.642	20.000
April 1988	16.110	14.835	20.000
May 1988	17.696	15.335	20.000
June 1988	18.166	15.555	20.000
July 1988	16.838	15.658	20.000
August 1988	20.243	16.000	20.000
September 1988	18.752	16.281	20.000
October 1988	17.952	16.578	20.000
November 1988	16.084	16.721	20.000
December 1988	13.980	16.758	20.000
January 1989	16.257	16.986	20.000
February 1989	14.638	16.904	20.000
March 1989	15.784	16.875	20.000
April 1989	14.132	16.710	20.000
May 1989	18.836	16.805	20.000
June 1989	17.482	16.748	20.000
July 1989	18.045	16.849	20.000
August 1989	19.349	16.774	20.000
September 1989	19.433	16.831	20.000
October 1989	17.032	16.754	20.000
November 1989	17.126	16.841	20.000
December 1989	15.557	16.973	20.000
January 1990	15.636	16.921	20.000
February 1990	16.767	17.098	20.000
March 1990	16.554	17.162	20.000
April 1990	19.912	17.644	20.000
May 1990	19.793	17.724	20.000
June 1990	20.638	17.987	20.000
July 1990	22.985	18.399	20.000
August 1990	21.131	18.547	20.000
September 1990	19.624	18.563	20.000
October 1990	22.063	18.982	20.000
November 1990	17.903	19.047	20.000
December 1990	16.137	19.095	20.000
January 1991	17.299	19.234	20.000
February 1991	17.046	19.257	20.000
March 1991	16.536	19.256	20.000
April 1991	20.444	19.300	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
May 1991	21.540	19.446	20.000
June 1991	22.650	19.613	20.000
July 1991	23.782	19.680	20.000
August 1991	23.764	19.899	20.000
September 1991	22.711	20.156	20.000
October 1991	20.566	20.032	20.000
November 1991	20.914	20.282	20.000
December 1991	18.990	20.520	20.000
January 1992	17.188	20.511	20.000
February 1992	19.599	20.724	20.000
March 1992	18.408	20.880	20.000
April 1992	20.203	20.859	20.000
May 1992	20.606	20.782	20.000
June 1992	21.244	20.664	20.000
July 1992	21.594	20.482	20.000
August 1992	21.586	20.301	20.000
September 1992	20.729	20.135	20.000
October 1992	19.191	20.021	20.000
November 1992	18.203	19.795	20.000
December 1992	18.395	19.745	20.000
January 1993	14.802	19.547	20.000
February 1993	17.207	19.347	20.000
March 1993	20.170	19.494	20.000
April 1993	20.002	19.477	20.000
May 1993	19.233	19.363	20.000
June 1993	21.848	19.413	20.000
July 1993	21.632	19.416	20.000
August 1993	22.259	19.473	20.000
September 1993	21.942	19.574	20.000
October 1993	20.717	19.701	20.000
November 1993	19.592	19.817	20.000
December 1993	18.892	19.858	20.000
January 1994	19.189	20.224	20.000
February 1994	17.876	20.279	20.000
March 1994	19.309	20.208	20.000
April 1994	20.088	20.215	20.000
May 1994	22.535	20.490	20.000
June 1994	23.305	20.611	20.000
July 1994	19.282	20.415	20.000
August 1994	23.166	20.491	20.000
September 1994	21.387	20.445	20.000
October 1994	21.866	20.541	20.000
November 1994	21.032	20.661	20.000
December 1994	20.373	20.784	20.000
January 1995	20.284	20.875	20.000
February 1995	18.925	20.963	20.000
March 1995	19.684	20.994	20.000
April 1995	21.120	21.080	20.000
May 1995	22.114	21.045	20.000
June 1995	24.152	21.115	20.000
July 1995	24.397	21.542	20.000
August 1995	23.838	21.598	20.000
September 1995	24.244	21.836	20.000
October 1995	24.102	22.022	20.000
November 1995	21.810	22.087	20.000
December 1995	20.499	22.097	20.000
January 1996	18.163	21.921	20.000
February 1996	18.661	21.899	20.000
March 1996	20.615	21.976	20.000
April 1996	21.753	22.029	20.000
May 1996	22.067	22.025	20.000
June 1996	24.529	22.057	20.000
July 1996	25.629	22.159	20.000
August 1996	25.768	22.320	20.000
September 1996	25.028	22.385	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
October 1996	25.042	22.464	20.000
November 1996	18.959	22.226	20.000
December 1996	17.840	22.005	20.000
January 1997	16.492	21.865	20.000
February 1997	19.896	21.968	20.000
March 1997	19.371	21.864	20.000
April 1997	20.827	21.787	20.000
May 1997	22.033	21.785	20.000
June 1997	22.792	21.640	20.000
July 1997	23.605	21.471	20.000
August 1997	23.123	21.251	20.000
September 1997	21.906	20.991	20.000
October 1997	21.430	20.690	20.000
November 1997	19.041	20.696	20.000
December 1997	18.176	20.724	20.000
January 1998	17.987	20.849	20.000
February 1998	19.601	20.824	20.000
March 1998	19.754	20.856	20.000
April 1998	19.669	20.760	20.000
May 1998	19.898	20.582	20.000
June 1998	19.376	20.297	20.000
July 1998	20.598	20.046	20.000
August 1998	21.537	19.914	20.000
September 1998	19.948	19.751	20.000
October 1998	19.702	19.607	20.000
November 1998	18.287	19.544	20.000
December 1998	17.571	19.494	20.000
January 1999	15.379	19.277	20.000
February 1999	16.850	19.047	20.000
March 1999	19.101	18.993	20.000
April 1999	21.389	19.136	20.000
May 1999	22.629	19.364	20.000
June 1999	23.048	19.670	20.000
July 1999	21.731	19.764	20.000
August 1999	21.967	19.800	20.000
September 1999	21.388	19.920	20.000
October 1999	20.199	19.962	20.000
November 1999	19.384	20.053	20.000
December 1999	16.044	19.926	20.000
January 2000	16.356	20.007	20.000
February 2000	18.098	20.111	20.000
March 2000	19.238	20.123	20.000
April 2000	16.918	19.750	20.000
May 2000	18.839	19.434	20.000
June 2000	20.335	19.208	20.000
July 2000	19.622	19.032	20.000
August 2000	19.494	18.826	20.000
September 2000	19.036	18.630	20.000
October 2000	18.299	18.472	20.000
November 2000	16.167	18.204	20.000
December 2000	17.052	18.288	20.000
January 2001	16.458	18.296	20.000
February 2001	17.210	18.222	20.000
March 2001	18.578	18.167	20.000
April 2001	20.034	18.427	20.000
May 2001	18.808	18.424	20.000
June 2001	18.873	18.303	20.000
July 2001	20.175	18.349	20.000
August 2001	20.563	18.438	20.000
September 2001	18.259	18.373	20.000
October 2001	20.275	18.538	20.000
November 2001	17.942	18.686	20.000
December 2001	14.467	18.470	20.000
January 2002	13.467	18.221	20.000
February 2002	13.209	17.888	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
March 2002	14.688	17.563	20.000
April 2002	17.207	17.328	20.000
May 2002	14.862	16.999	20.000
June 2002	17.371	16.874	20.000
July 2002	20.062	16.864	20.000
August 2002	21.978	16.982	20.000
September 2002	22.029	17.296	20.000
October 2002	18.126	17.117	20.000
November 2002	16.687	17.013	20.000
December 2002	16.667	17.196	20.000
January 2003	15.635	17.377	20.000
February 2003	14.835	17.512	20.000
March 2003	15.430	17.574	20.000
April 2003	18.557	17.686	20.000
May 2003	18.687	18.005	20.000
June 2003	19.375	18.172	20.000
July 2003	18.301	18.026	20.000
August 2003	18.097	17.702	20.000
September 2003	21.863	17.688	20.000
October 2003	19.490	17.802	20.000
November 2003	17.645	17.882	20.000
December 2003	19.454	18.114	20.000
January 2004	13.774	17.959	20.000
February 2004	16.372	18.087	20.000
March 2004	15.438	18.088	20.000
April 2004	16.149	17.887	20.000
May 2004	17.094	17.754	20.000
June 2004	19.598	17.773	20.000
July 2004	21.894	18.072	20.000
August 2004	21.834	18.384	20.000
September 2004	20.353	18.258	20.000
October 2004	20.319	18.327	20.000
November 2004	18.887	18.430	20.000
December 2004	18.118	18.319	20.000
January 2005	15.591	18.470	20.000
February 2005	16.329	18.467	20.000
March 2005	17.470	18.636	20.000
April 2005	18.150	18.803	20.000
May 2005	19.641	19.015	20.000
June 2005	20.513	19.092	20.000
July 2005	20.126	18.944	20.000
August 2005	20.930	18.869	20.000
September 2005	20.387	18.872	20.000
October 2005	19.862	18.834	20.000
November 2005	20.043	18.930	20.000
December 2005	18.136	18.932	20.000
January 2006	19.118	19.226	20.000
February 2006	18.535	19.409	20.000
March 2006	17.840	19.440	20.000
April 2006	18.181	19.443	20.000
May 2006	19.166	19.403	20.000
June 2006	20.230	19.380	20.000
July 2006	21.210	19.470	20.000
August 2006	21.394	19.509	20.000
September 2006	21.220	19.578	20.000
October 2006	19.294	19.531	20.000
November 2006	17.641	19.330	20.000
December 2006	19.441	19.439	20.000
January 2007	19.857	19.501	20.000
February 2007	18.419	19.491	20.000
March 2007	19.070	19.594	20.000
April 2007	20.962	19.825	20.000
May 2007	21.179	19.993	20.000
June 2007	21.700	20.116	20.000
July 2007	22.533	20.226	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
August 2007	21.025	20.195	20.000
September 2007	18.906	20.002	20.000
October 2007	17.406	19.845	20.000
November 2007	15.812	19.693	20.000
December 2007	13.988	19.238	20.000
January 2008	15.163	18.847	20.000
February 2008	10.165	18.159	20.000
March 2008	17.323	18.013	20.000
April 2008	17.524	17.727	20.000
May 2008	18.235	17.482	20.000
June 2008	19.258	17.278	20.000
July 2008	18.967	16.981	20.000
August 2008	18.497	16.770	20.000
September 2008	17.293	16.636	20.000
October 2008	17.482	16.642	20.000
November 2008	16.113	16.667	20.000
December 2008	13.404	16.619	20.000
January 2009	12.422	16.390	20.000
February 2009	14.077	16.716	20.000
March 2009	14.833	16.509	20.000
April 2009	15.581	16.347	20.000
May 2009	16.406	16.194	20.000
June 2009	18.490	16.130	20.000
July 2009	18.469	16.089	20.000
August 2009	17.395	15.997	20.000
September 2009	17.629	16.025	20.000
October 2009	17.778	16.050	20.000
November 2009	16.878	16.113	20.000
December 2009	14.759	16.226	20.000
January 2010	14.921	16.434	20.000
February 2010	15.565	16.559	20.000
March 2010	17.646	16.793	20.000
April 2010	16.361	16.858	20.000
May 2010	17.876	16.981	20.000
June 2010	20.428	17.142	20.000
July 2010	21.288	17.377	20.000
August 2010	20.324	17.621	20.000
September 2010	19.358	17.765	20.000
October 2010	18.520	17.827	20.000
November 2010	17.718	17.897	20.000
December 2010	14.978	17.915	20.000
January 2011	14.008	17.839	20.000
February 2011	15.307	17.818	20.000
March 2011	16.043	17.684	20.000
April 2011	18.685	17.878	20.000
May 2011	18.352	17.917	20.000
June 2011	19.139	17.810	20.000
July 2011	18.765	17.600	20.000
August 2011	18.509	17.449	20.000
September 2011	18.293	17.360	20.000
October 2011	18.322	17.343	20.000
November 2011	16.941	17.279	20.000
December 2011	15.417	17.315	20.000
January 2012	16.777	17.546	20.000
February 2012	16.784	17.669	20.000
March 2012	15.825	17.651	20.000
April 2012	17.279	17.534	20.000
May 2012	18.209	17.522	20.000
June 2012	19.407	17.544	20.000
July 2012	20.345	17.676	20.000
August 2012	20.954	17.879	20.000
September 2012	19.181	17.953	20.000
October 2012	19.197	18.026	20.000
November 2012	19.262	18.220	20.000
December 2012	17.963	18.432	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 2013	16.896	18.442	20.000
February 2013	16.552	18.422	20.000
March 2013	17.274	18.543	20.000
April 2013	18.198	18.620	20.000
May 2013	18.231	18.622	20.000
June 2013	19.895	18.662	20.000
July 2013	20.529	18.678	20.000
August 2013	19.687	18.572	20.000
September 2013	19.279	18.580	20.000
October 2013	19.266	18.586	20.000
November 2013	17.537	18.442	20.000
December 2013	16.869	18.351	20.000
January 2014	14.656	18.165	20.000
February 2014	13.995	17.951	20.000
March 2014	14.130	17.689	20.000
April 2014	16.668	17.562	20.000
May 2014	18.516	17.585	20.000
June 2014	19.358	17.541	20.000
July 2014	19.387	17.446	20.000
August 2014	19.064	17.394	20.000
September 2014	19.299	17.395	20.000
October 2014	18.280	17.313	20.000
November 2014	17.161	17.282	20.000
December 2014	16.497	17.251	20.000
January 2015	16.011	17.364	20.000
February 2015	14.661	17.419	20.000
March 2015	15.241	17.512	20.000
April 2015	16.589	17.505	20.000
May 2015	16.252	17.317	20.000
June 2015	16.262	17.059	20.000
July 2015	17.643	16.913	20.000
August 2015	16.754	16.721	20.000
September 2015	16.555	16.492	20.000
October 2015	16.357	16.332	20.000
November 2015	15.609	16.203	20.000
December 2015	17.249	16.265	20.000
January 2016	17.670	16.404	20.000
February 2016	18.131	16.693	20.000
March 2016	17.534	16.884	20.000
April 2016	17.896	16.993	20.000
May 2016	15.579	16.937	20.000
June 2016	16.804	16.982	20.000
July 2016	17.928	17.006	20.000
August 2016	17.995	17.109	20.000
September 2016	17.105	17.155	20.000
October 2016	17.788	17.274	20.000
November 2016	17.623	17.442	20.000
December 2016	13.846	17.158	20.000
January 2017	15.147	16.948	20.000
February 2017	15.748	16.749	20.000
March 2017	16.129	16.632	20.000
April 2017	16.927	16.552	20.000
May 2017	15.949	16.582	20.000
June 2017	18.114	16.692	20.000
July 2017	19.466	16.820	20.000
August 2017	19.195	16.920	20.000
September 2017	19.586	17.127	20.000
October 2017	17.969	17.142	20.000
November 2017	17.269	17.112	20.000
December 2017	17.022	17.377	20.000
January 2018	18.665	17.670	20.000
February 2018	16.266	17.713	20.000
March 2018	17.277	17.809	20.000
April 2018	16.054	17.736	20.000
May 2018	18.347	17.936	20.000

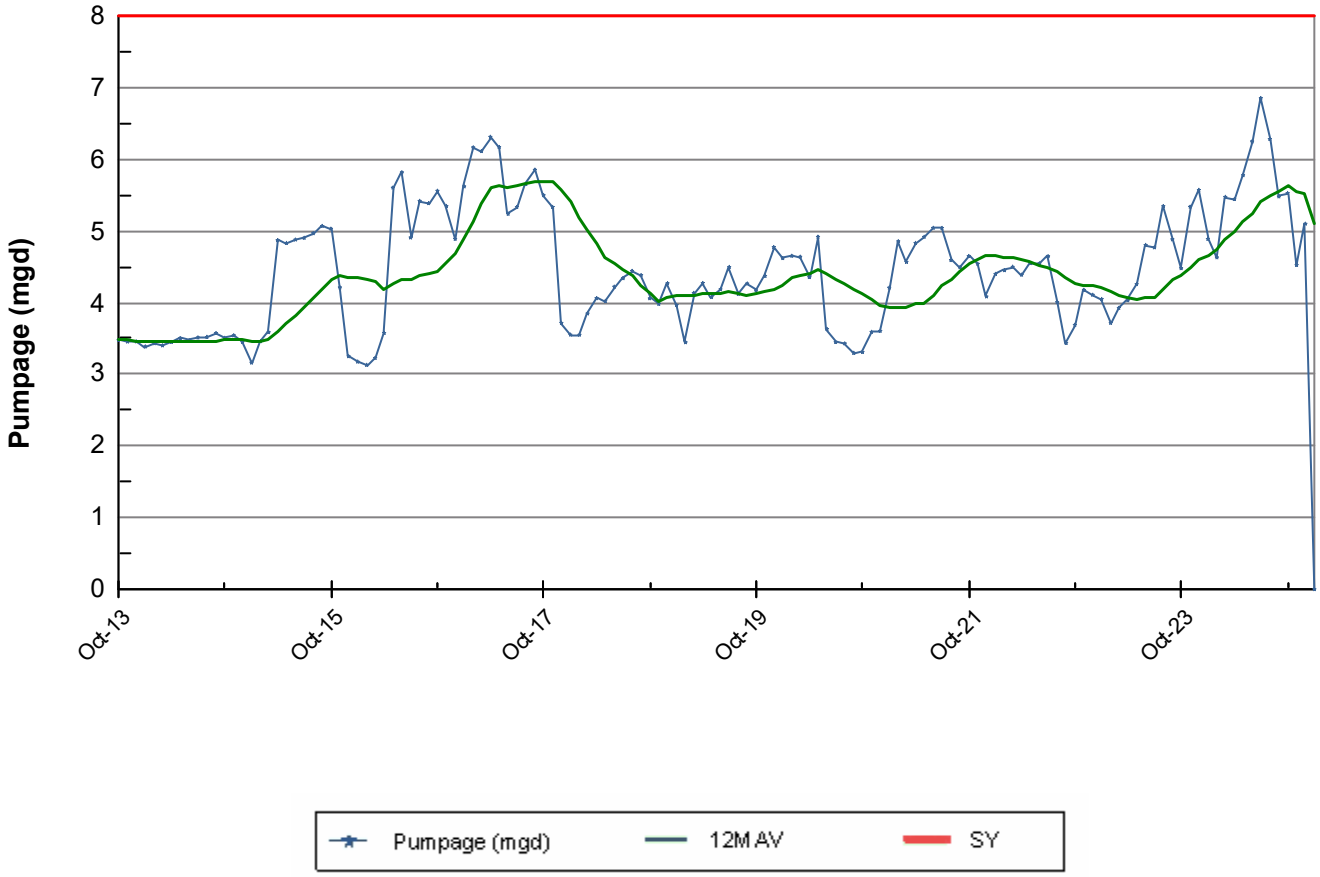
Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
June 2018	21.050	18.180	20.000
July 2018	21.468	18.347	20.000
August 2018	19.315	18.357	20.000
September 2018	18.647	18.279	20.000
October 2018	18.829	18.351	20.000
November 2018	17.744	18.390	20.000
December 2018	17.914	18.465	20.000
January 2019	17.675	18.382	20.000
February 2019	15.740	18.338	20.000
March 2019	17.314	18.341	20.000
April 2019	18.734	18.565	20.000
May 2019	19.089	18.627	20.000
June 2019	21.223	18.641	20.000
July 2019	22.186	18.701	20.000
August 2019	20.476	18.798	20.000
September 2019	20.766	18.974	20.000
October 2019	20.328	19.099	20.000
November 2019	19.479	19.244	20.000
December 2019	16.793	19.150	20.000
January 2020	15.783	18.993	20.000
February 2020	15.500	18.973	20.000
March 2020	16.007	18.864	20.000
April 2020	14.771	18.533	20.000
May 2020	14.668	18.165	20.000
June 2020	17.779	17.878	20.000
July 2020	18.338	17.557	20.000
August 2020	19.973	17.515	20.000
September 2020	20.632	17.504	20.000
October 2020	19.364	17.424	20.000
November 2020	18.828	17.370	20.000
December 2020	18.059	17.475	20.000
January 2021	14.846	17.397	20.000
February 2021	14.042	17.276	20.000
March 2021	14.280	17.132	20.000
April 2021	16.026	17.236	20.000
May 2021	17.074	17.437	20.000
June 2021	19.738	17.600	20.000
July 2021	19.052	17.659	20.000
August 2021	19.052	17.583	20.000
September 2021	18.478	17.403	20.000
October 2021	18.039	17.293	20.000
November 2021	17.195	17.157	20.000
December 2021	13.550	16.781	20.000
January 2022	14.945	16.789	20.000
February 2022	17.014	17.037	20.000
March 2022	18.270	17.369	20.000
April 2022	19.799	17.684	20.000
May 2022	18.212	17.779	20.000
June 2022	18.715	17.693	20.000
July 2022	20.232	17.792	20.000
August 2022	20.652	17.925	20.000
September 2022	19.405	18.002	20.000
October 2022	18.681	18.056	20.000
November 2022	17.111	18.049	20.000
December 2022	16.025	18.255	20.000
January 2023	15.768	18.324	20.000
February 2023	15.040	18.159	20.000
March 2023	18.077	18.143	20.000
April 2023	17.594	17.959	20.000
May 2023	22.684	18.332	20.000
June 2023	19.195	18.372	20.000
July 2023	19.707	18.328	20.000
August 2023	19.675	18.247	20.000
September 2023	19.698	18.271	20.000
October 2023	19.171	18.312	20.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
November 2023	17.346	18.332	20.000
December 2023	15.123	18.257	20.000
January 2024	13.452	18.064	20.000
February 2024	14.600	18.027	20.000
March 2024	16.076	17.860	20.000
April 2024	16.318	17.754	20.000
May 2024	15.970	17.194	20.000
June 2024	16.962	17.008	20.000
July 2024	17.098	16.791	20.000
August 2024	16.614	16.536	20.000
September 2024	16.090	16.235	20.000
October 2024	16.265	15.993	20.000
November 2024	15.748	15.860	20.000
December 2024	14.631	15.819	20.000
January 2025			20.000

APPENDIX H

Monthly Pumpage Chart

12 Month Moving Average



Report Parameters

Date:	10/1/2013 - 01/13/2025
Island:	Maui
Well Owner:	All
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	Wailuku
Aquifer:	60103 Waihee
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

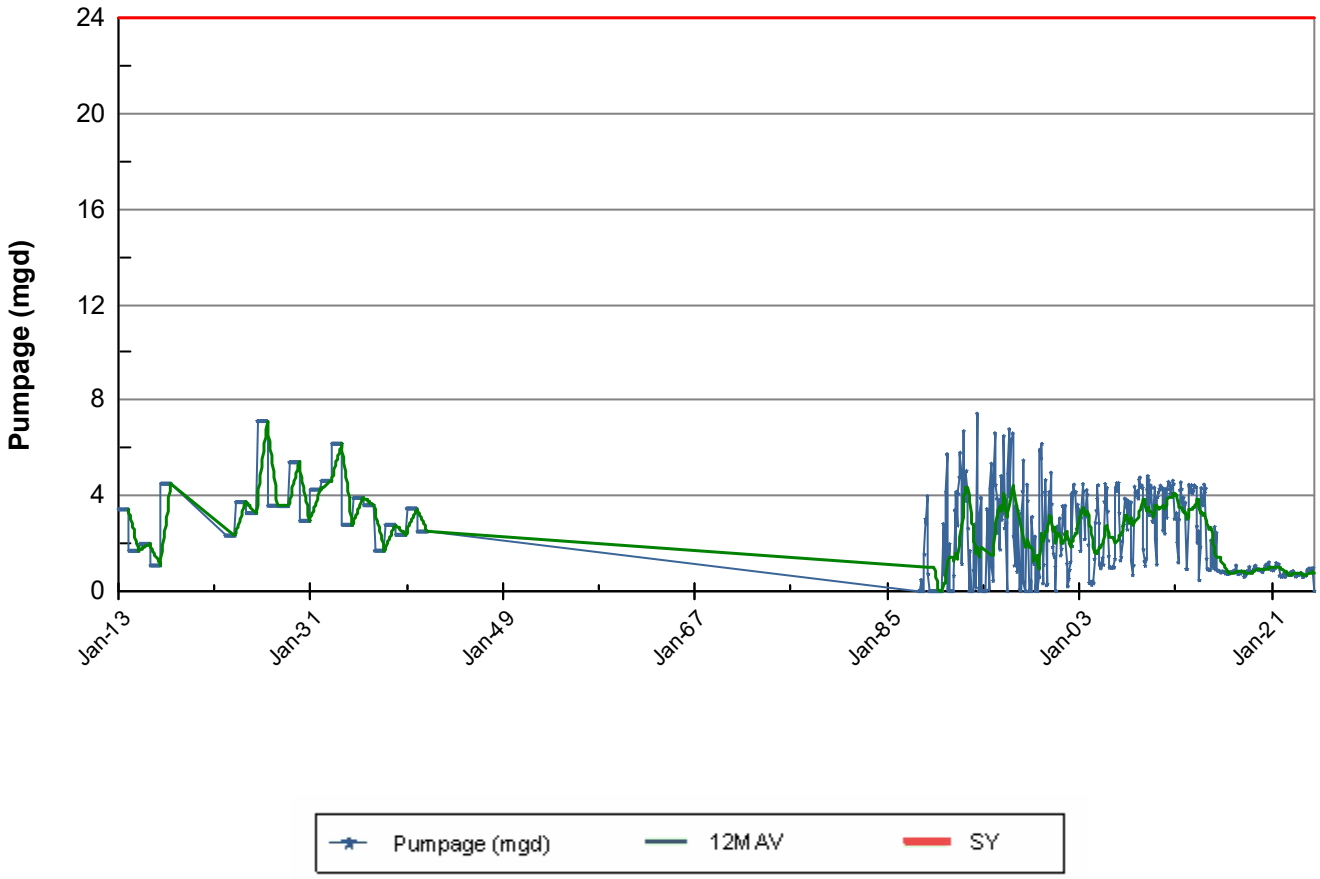
Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
October 2013	3.476	3.471	8.000
November 2013	3.455	3.471	8.000
December 2013	3.456	3.469	8.000
January 2014	3.387	3.462	8.000
February 2014	3.431	3.457	8.000
March 2014	3.401	3.450	8.000
April 2014	3.449	3.449	8.000
May 2014	3.502	3.454	8.000
June 2014	3.472	3.453	8.000
July 2014	3.512	3.458	8.000
August 2014	3.520	3.461	8.000
September 2014	3.574	3.470	8.000
October 2014	3.507	3.472	8.000
November 2014	3.541	3.479	8.000
December 2014	3.448	3.479	8.000
January 2015	3.163	3.460	8.000
February 2015	3.460	3.462	8.000
March 2015	3.586	3.478	8.000
April 2015	4.870	3.596	8.000
May 2015	4.831	3.707	8.000
June 2015	4.879	3.824	8.000
July 2015	4.903	3.940	8.000
August 2015	4.967	4.061	8.000
September 2015	5.069	4.185	8.000
October 2015	5.030	4.312	8.000
November 2015	4.210	4.368	8.000
December 2015	3.249	4.351	8.000
January 2016	3.175	4.352	8.000
February 2016	3.130	4.325	8.000
March 2016	3.227	4.295	8.000
April 2016	3.576	4.187	8.000
May 2016	5.603	4.252	8.000
June 2016	5.815	4.330	8.000
July 2016	4.907	4.330	8.000
August 2016	5.418	4.368	8.000
September 2016	5.385	4.394	8.000
October 2016	5.560	4.438	8.000
November 2016	5.346	4.533	8.000
December 2016	4.889	4.669	8.000
January 2017	5.620	4.873	8.000
February 2017	6.164	5.126	8.000
March 2017	6.112	5.366	8.000
April 2017	6.312	5.594	8.000
May 2017	6.168	5.641	8.000
June 2017	5.238	5.593	8.000
July 2017	5.333	5.629	8.000
August 2017	5.654	5.648	8.000
September 2017	5.853	5.687	8.000
October 2017	5.498	5.682	8.000
November 2017	5.333	5.681	8.000
December 2017	3.716	5.583	8.000
January 2018	3.553	5.411	8.000
February 2018	3.550	5.193	8.000
March 2018	3.848	5.005	8.000
April 2018	4.061	4.817	8.000
May 2018	4.021	4.638	8.000
June 2018	4.221	4.553	8.000
July 2018	4.339	4.471	8.000
August 2018	4.441	4.369	8.000
September 2018	4.382	4.247	8.000
October 2018	4.059	4.127	8.000
November 2018	3.981	4.014	8.000
December 2018	4.269	4.060	8.000
January 2019	3.965	4.095	8.000
February 2019	3.446	4.086	8.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
March 2019	4.135	4.110	8.000
April 2019	4.273	4.127	8.000
May 2019	4.076	4.132	8.000
June 2019	4.185	4.129	8.000
July 2019	4.496	4.142	8.000
August 2019	4.120	4.115	8.000
September 2019	4.266	4.106	8.000
October 2019	4.169	4.115	8.000
November 2019	4.372	4.148	8.000
December 2019	4.773	4.190	8.000
January 2020	4.619	4.244	8.000
February 2020	4.651	4.345	8.000
March 2020	4.640	4.387	8.000
April 2020	4.354	4.393	8.000
May 2020	4.918	4.464	8.000
June 2020	3.632	4.418	8.000
July 2020	3.449	4.330	8.000
August 2020	3.429	4.273	8.000
September 2020	3.297	4.192	8.000
October 2020	3.310	4.120	8.000
November 2020	3.591	4.055	8.000
December 2020	3.605	3.958	8.000
January 2021	4.208	3.924	8.000
February 2021	4.855	3.941	8.000
March 2021	4.567	3.934	8.000
April 2021	4.832	3.974	8.000
May 2021	4.917	3.974	8.000
June 2021	5.042	4.092	8.000
July 2021	5.040	4.224	8.000
August 2021	4.592	4.321	8.000
September 2021	4.492	4.421	8.000
October 2021	4.648	4.532	8.000
November 2021	4.540	4.611	8.000
December 2021	4.084	4.651	8.000
January 2022	4.399	4.667	8.000
February 2022	4.450	4.634	8.000
March 2022	4.499	4.628	8.000
April 2022	4.390	4.591	8.000
May 2022	4.549	4.561	8.000
June 2022	4.545	4.519	8.000
July 2022	4.645	4.486	8.000
August 2022	4.004	4.437	8.000
September 2022	3.436	4.349	8.000
October 2022	3.689	4.269	8.000
November 2022	4.176	4.239	8.000
December 2022	4.108	4.241	8.000
January 2023	4.049	4.212	8.000
February 2023	3.718	4.151	8.000
March 2023	3.926	4.103	8.000
April 2023	4.031	4.073	8.000
May 2023	4.256	4.049	8.000
June 2023	4.803	4.070	8.000
July 2023	4.768	4.080	8.000
August 2023	5.345	4.192	8.000
September 2023	4.881	4.313	8.000
October 2023	4.478	4.378	8.000
November 2023	5.337	4.475	8.000
December 2023	5.571	4.597	8.000
January 2024	4.888	4.667	8.000
February 2024	4.630	4.743	8.000
March 2024	5.474	4.872	8.000
April 2024	5.443	4.990	8.000
May 2024	5.776	5.116	8.000
June 2024	6.247	5.237	8.000
July 2024	6.851	5.410	8.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
August 2024	6.281	5.488	8.000
September 2024	5.479	5.538	8.000
October 2024	5.528	5.625	8.000
November 2024	4.524	5.558	8.000
December 2024	5.100	5.518	8.000
January 2025	0.000	5.111	8.000

APPENDIX I

Monthly Pumpage Chart
12 Month Moving Average



Report Parameters

Date:	01/01/1913 - 01/15/2025
Island:	Maui
Well Owner:	All
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	Koolau
Aquifer:	60401 Haiku
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 1913	3.425		24.000
February 1913	3.425		24.000
March 1913	3.425		24.000
April 1913	3.425		24.000
May 1913	3.425		24.000
June 1913	3.425		24.000
July 1913	3.425		24.000
August 1913	3.425		24.000
September 1913	3.425		24.000
October 1913	3.425		24.000
November 1913	3.425		24.000
December 1913	3.425	3.425	24.000
January 1914	1.696	3.281	24.000
February 1914	1.696	3.137	24.000
March 1914	1.696	2.992	24.000
April 1914	1.696	2.848	24.000
May 1914	1.696	2.704	24.000
June 1914	1.696	2.560	24.000
July 1914	1.696	2.416	24.000
August 1914	1.696	2.272	24.000
September 1914	1.696	2.128	24.000
October 1914	1.696	1.984	24.000
November 1914	1.696	1.840	24.000
December 1914	1.696	1.696	24.000
January 1915	1.984	1.720	24.000
February 1915	1.984	1.744	24.000
March 1915	1.984	1.768	24.000
April 1915	1.984	1.792	24.000
May 1915	1.984	1.816	24.000
June 1915	1.984	1.840	24.000
July 1915	1.984	1.864	24.000
August 1915	1.984	1.888	24.000
September 1915	1.984	1.912	24.000
October 1915	1.984	1.936	24.000
November 1915	1.984	1.960	24.000
December 1915	1.984	1.984	24.000
January 1916	1.079	1.908	24.000
February 1916	1.079	1.833	24.000
March 1916	1.079	1.757	24.000
April 1916	1.079	1.682	24.000
May 1916	1.079	1.607	24.000
June 1916	1.079	1.531	24.000
July 1916	1.079	1.456	24.000
August 1916	1.079	1.381	24.000
September 1916	1.079	1.305	24.000
October 1916	1.079	1.230	24.000
November 1916	1.079	1.155	24.000
December 1916	1.079	1.079	24.000
January 1917	4.504	1.365	24.000
February 1917	4.504	1.650	24.000
March 1917	4.504	1.935	24.000
April 1917	4.504	2.221	24.000
May 1917	4.504	2.506	24.000
June 1917	4.504	2.792	24.000
July 1917	4.504	3.077	24.000
August 1917	4.504	3.362	24.000
September 1917	4.504	3.648	24.000
October 1917	4.504	3.933	24.000
November 1917	4.504	4.219	24.000
December 1917	4.504	4.504	24.000
January 1918			24.000
February 1918			24.000
March 1918			24.000
April 1918			24.000
May 1918			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
June 1918			24.000
July 1918			24.000
August 1918			24.000
September 1918			24.000
October 1918			24.000
November 1918			24.000
December 1918			24.000
January 1919			24.000
February 1919			24.000
March 1919			24.000
April 1919			24.000
May 1919			24.000
June 1919			24.000
July 1919			24.000
August 1919			24.000
September 1919			24.000
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February 1920			24.000
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April 1920			24.000
May 1920			24.000
June 1920			24.000
July 1920			24.000
August 1920			24.000
September 1920			24.000
October 1920			24.000
November 1920			24.000
December 1920			24.000
January 1921			24.000
February 1921			24.000
March 1921			24.000
April 1921			24.000
May 1921			24.000
June 1921			24.000
July 1921			24.000
August 1921			24.000
September 1921			24.000
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January 1922			24.000
February 1922			24.000
March 1922			24.000
April 1922			24.000
May 1922			24.000
June 1922			24.000
July 1922			24.000
August 1922			24.000
September 1922			24.000
October 1922			24.000
November 1922			24.000
December 1922			24.000
January 1923	2.329		24.000
February 1923	2.329		24.000
March 1923	2.329		24.000
April 1923	2.329		24.000
May 1923	2.329		24.000
June 1923	2.329		24.000
July 1923	2.329		24.000
August 1923	2.329		24.000
September 1923	2.329		24.000
October 1923	2.329		24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
November 1923	2.329		24.000
December 1923	2.329	2.329	24.000
January 1924	3.727	2.445	24.000
February 1924	3.727	2.562	24.000
March 1924	3.727	2.678	24.000
April 1924	3.727	2.795	24.000
May 1924	3.727	2.911	24.000
June 1924	3.727	3.028	24.000
July 1924	3.727	3.144	24.000
August 1924	3.727	3.261	24.000
September 1924	3.727	3.377	24.000
October 1924	3.727	3.494	24.000
November 1924	3.727	3.610	24.000
December 1924	3.727	3.727	24.000
January 1925	3.268	3.689	24.000
February 1925	3.268	3.650	24.000
March 1925	3.268	3.612	24.000
April 1925	3.268	3.574	24.000
May 1925	3.268	3.536	24.000
June 1925	3.268	3.498	24.000
July 1925	3.268	3.459	24.000
August 1925	3.268	3.421	24.000
September 1925	3.268	3.383	24.000
October 1925	3.268	3.345	24.000
November 1925	3.268	3.307	24.000
December 1925	3.268	3.268	24.000
January 1926	7.121	3.589	24.000
February 1926	7.121	3.911	24.000
March 1926	7.121	4.232	24.000
April 1926	7.121	4.553	24.000
May 1926	7.121	4.874	24.000
June 1926	7.121	5.195	24.000
July 1926	7.121	5.516	24.000
August 1926	7.121	5.837	24.000
September 1926	7.121	6.158	24.000
October 1926	7.121	6.479	24.000
November 1926	7.121	6.800	24.000
December 1926	7.121	7.121	24.000
January 1927	3.581	6.826	24.000
February 1927	3.581	6.531	24.000
March 1927	3.581	6.236	24.000
April 1927	3.581	5.941	24.000
May 1927	3.581	5.646	24.000
June 1927	3.581	5.351	24.000
July 1927	3.581	5.056	24.000
August 1927	3.581	4.761	24.000
September 1927	3.581	4.466	24.000
October 1927	3.581	4.171	24.000
November 1927	3.581	3.876	24.000
December 1927	3.581	3.581	24.000
January 1928	3.560	3.579	24.000
February 1928	3.560	3.577	24.000
March 1928	3.560	3.576	24.000
April 1928	3.560	3.574	24.000
May 1928	3.560	3.572	24.000
June 1928	3.560	3.570	24.000
July 1928	3.560	3.569	24.000
August 1928	3.560	3.567	24.000
September 1928	3.560	3.565	24.000
October 1928	3.560	3.564	24.000
November 1928	3.560	3.562	24.000
December 1928	3.560	3.560	24.000
January 1929	5.395	3.713	24.000
February 1929	5.395	3.866	24.000
March 1929	5.395	4.019	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
April 1929	5.395	4.172	24.000
May 1929	5.395	4.324	24.000
June 1929	5.395	4.477	24.000
July 1929	5.395	4.630	24.000
August 1929	5.395	4.783	24.000
September 1929	5.395	4.936	24.000
October 1929	5.395	5.089	24.000
November 1929	5.395	5.242	24.000
December 1929	5.395	5.395	24.000
January 1930	2.948	5.191	24.000
February 1930	2.948	4.987	24.000
March 1930	2.948	4.783	24.000
April 1930	2.948	4.579	24.000
May 1930	2.948	4.375	24.000
June 1930	2.948	4.171	24.000
July 1930	2.948	3.967	24.000
August 1930	2.948	3.763	24.000
September 1930	2.948	3.560	24.000
October 1930	2.948	3.356	24.000
November 1930	2.948	3.152	24.000
December 1930	2.948	2.948	24.000
January 1931	4.255	3.057	24.000
February 1931	4.255	3.166	24.000
March 1931	4.255	3.275	24.000
April 1931	4.255	3.384	24.000
May 1931	4.255	3.492	24.000
June 1931	4.255	3.601	24.000
July 1931	4.255	3.710	24.000
August 1931	4.255	3.819	24.000
September 1931	4.255	3.928	24.000
October 1931	4.255	4.037	24.000
November 1931	4.255	4.146	24.000
December 1931	4.255	4.255	24.000
January 1932	4.620	4.285	24.000
February 1932	4.620	4.316	24.000
March 1932	4.620	4.346	24.000
April 1932	4.620	4.377	24.000
May 1932	4.620	4.407	24.000
June 1932	4.620	4.438	24.000
July 1932	4.620	4.468	24.000
August 1932	4.620	4.498	24.000
September 1932	4.620	4.529	24.000
October 1932	4.620	4.559	24.000
November 1932	4.620	4.590	24.000
December 1932	4.620	4.620	24.000
January 1933	6.175	4.750	24.000
February 1933	6.175	4.879	24.000
March 1933	6.175	5.009	24.000
April 1933	6.175	5.139	24.000
May 1933	6.175	5.268	24.000
June 1933	6.175	5.398	24.000
July 1933	6.175	5.527	24.000
August 1933	6.175	5.657	24.000
September 1933	6.175	5.787	24.000
October 1933	6.175	5.916	24.000
November 1933	6.175	6.046	24.000
December 1933	6.175	6.175	24.000
January 1934	2.781	5.892	24.000
February 1934	2.781	5.610	24.000
March 1934	2.781	5.327	24.000
April 1934	2.781	5.044	24.000
May 1934	2.781	4.761	24.000
June 1934	2.781	4.478	24.000
July 1934	2.781	4.195	24.000
August 1934	2.781	3.912	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
September 1934	2.781	3.629	24.000
October 1934	2.781	3.347	24.000
November 1934	2.781	3.064	24.000
December 1934	2.781	2.781	24.000
January 1935	3.910	2.875	24.000
February 1935	3.910	2.969	24.000
March 1935	3.910	3.063	24.000
April 1935	3.910	3.157	24.000
May 1935	3.910	3.251	24.000
June 1935	3.910	3.345	24.000
July 1935	3.910	3.439	24.000
August 1935	3.910	3.533	24.000
September 1935	3.910	3.627	24.000
October 1935	3.910	3.721	24.000
November 1935	3.910	3.816	24.000
December 1935	3.910	3.910	24.000
January 1936	3.598	3.884	24.000
February 1936	3.598	3.858	24.000
March 1936	3.598	3.832	24.000
April 1936	3.598	3.806	24.000
May 1936	3.598	3.780	24.000
June 1936	3.598	3.754	24.000
July 1936	3.598	3.728	24.000
August 1936	3.598	3.702	24.000
September 1936	3.598	3.676	24.000
October 1936	3.598	3.650	24.000
November 1936	3.598	3.624	24.000
December 1936	3.598	3.598	24.000
January 1937	1.701	3.440	24.000
February 1937	1.701	3.282	24.000
March 1937	1.701	3.124	24.000
April 1937	1.701	2.966	24.000
May 1937	1.701	2.808	24.000
June 1937	1.701	2.650	24.000
July 1937	1.701	2.492	24.000
August 1937	1.701	2.334	24.000
September 1937	1.701	2.176	24.000
October 1937	1.701	2.018	24.000
November 1937	1.701	1.859	24.000
December 1937	1.701	1.701	24.000
January 1938	2.781	1.791	24.000
February 1938	2.781	1.881	24.000
March 1938	2.781	1.971	24.000
April 1938	2.781	2.061	24.000
May 1938	2.781	2.151	24.000
June 1938	2.781	2.241	24.000
July 1938	2.781	2.331	24.000
August 1938	2.781	2.421	24.000
September 1938	2.781	2.511	24.000
October 1938	2.781	2.601	24.000
November 1938	2.781	2.691	24.000
December 1938	2.781	2.781	24.000
January 1939	2.364	2.746	24.000
February 1939	2.364	2.711	24.000
March 1939	2.364	2.677	24.000
April 1939	2.364	2.642	24.000
May 1939	2.364	2.607	24.000
June 1939	2.364	2.573	24.000
July 1939	2.364	2.538	24.000
August 1939	2.364	2.503	24.000
September 1939	2.364	2.468	24.000
October 1939	2.364	2.434	24.000
November 1939	2.364	2.399	24.000
December 1939	2.364	2.364	24.000
January 1940	3.467	2.456	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
February 1940	3.467	2.548	24.000
March 1940	3.467	2.640	24.000
April 1940	3.467	2.732	24.000
May 1940	3.467	2.824	24.000
June 1940	3.467	2.916	24.000
July 1940	3.467	3.008	24.000
August 1940	3.467	3.100	24.000
September 1940	3.467	3.192	24.000
October 1940	3.467	3.283	24.000
November 1940	3.467	3.375	24.000
December 1940	3.467	3.467	24.000
January 1941	2.499	3.386	24.000
February 1941	2.499	3.306	24.000
March 1941	2.499	3.225	24.000
April 1941	2.499	3.144	24.000
May 1941	2.499	3.064	24.000
June 1941	2.499	2.983	24.000
July 1941	2.499	2.902	24.000
August 1941	2.499	2.821	24.000
September 1941	2.499	2.741	24.000
October 1941	2.499	2.660	24.000
November 1941	2.499	2.579	24.000
December 1941	2.499	2.499	24.000
January 1942			24.000
February 1942			24.000
March 1942			24.000
April 1942			24.000
May 1942			24.000
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May 1945			24.000
June 1945			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
July 1945			24.000
August 1945			24.000
September 1945			24.000
October 1945			24.000
November 1945			24.000
December 1945			24.000
January 1946			24.000
February 1946			24.000
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June 1950			24.000
July 1950			24.000
August 1950			24.000
September 1950			24.000
October 1950			24.000
November 1950			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
December 1950			24.000
January 1951			24.000
February 1951			24.000
March 1951			24.000
April 1951			24.000
May 1951			24.000
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September 1955			24.000
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November 1955			24.000
December 1955			24.000
January 1956			24.000
February 1956			24.000
March 1956			24.000
April 1956			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
May 1956			24.000
June 1956			24.000
July 1956			24.000
August 1956			24.000
September 1956			24.000
October 1956			24.000
November 1956			24.000
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December 1960			24.000
January 1961			24.000
February 1961			24.000
March 1961			24.000
April 1961			24.000
May 1961			24.000
June 1961			24.000
July 1961			24.000
August 1961			24.000
September 1961			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
October 1961			24.000
November 1961			24.000
December 1961			24.000
January 1962			24.000
February 1962			24.000
March 1962			24.000
April 1962			24.000
May 1962			24.000
June 1962			24.000
July 1962			24.000
August 1962			24.000
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June 1966			24.000
July 1966			24.000
August 1966			24.000
September 1966			24.000
October 1966			24.000
November 1966			24.000
December 1966			24.000
January 1967			24.000
February 1967			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
March 1967			24.000
April 1967			24.000
May 1967			24.000
June 1967			24.000
July 1967			24.000
August 1967			24.000
September 1967			24.000
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December 1971			24.000
January 1972			24.000
February 1972			24.000
March 1972			24.000
April 1972			24.000
May 1972			24.000
June 1972			24.000
July 1972			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
August 1972			24.000
September 1972			24.000
October 1972			24.000
November 1972			24.000
December 1972			24.000
January 1973			24.000
February 1973			24.000
March 1973			24.000
April 1973			24.000
May 1973			24.000
June 1973			24.000
July 1973			24.000
August 1973			24.000
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July 1977			24.000
August 1977			24.000
September 1977			24.000
October 1977			24.000
November 1977			24.000
December 1977			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 1978			24.000
February 1978			24.000
March 1978			24.000
April 1978			24.000
May 1978			24.000
June 1978			24.000
July 1978			24.000
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January 1983			24.000
February 1983			24.000
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April 1983			24.000
May 1983			24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
June 1983			24.000
July 1983			24.000
August 1983			24.000
September 1983			24.000
October 1983			24.000
November 1983			24.000
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June 1987			24.000
July 1987			24.000
August 1987			24.000
September 1987			24.000
October 1987			24.000
November 1987			24.000
December 1987	0.000		24.000
January 1988	0.000		24.000
February 1988	0.000		24.000
March 1988	0.471		24.000
April 1988	0.000		24.000
May 1988	0.000		24.000
June 1988	0.000		24.000
July 1988	1.535		24.000
August 1988	3.026		24.000
September 1988	2.817		24.000
October 1988	3.974		24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
November 1988	0.713	1.045	24.000
December 1988	0.000	1.045	24.000
January 1989	0.000	1.045	24.000
February 1989	0.000	1.045	24.000
March 1989	0.000	1.005	24.000
April 1989	0.000	1.005	24.000
May 1989	0.000	1.005	24.000
June 1989	0.000	1.005	24.000
July 1989	0.000	0.878	24.000
August 1989	0.000	0.625	24.000
September 1989	0.000	0.391	24.000
October 1989	0.000	0.059	24.000
November 1989	0.000	0.000	24.000
December 1989	0.000	0.000	24.000
January 1990	0.000	0.000	24.000
February 1990	0.000	0.000	24.000
March 1990	0.000	0.000	24.000
April 1990	2.820	0.235	24.000
May 1990	0.716	0.295	24.000
June 1990	0.660	0.350	24.000
July 1990	4.155	0.696	24.000
August 1990	5.729	1.173	24.000
September 1990	1.413	1.291	24.000
October 1990	0.000	1.291	24.000
November 1990	1.970	1.455	24.000
December 1990	0.000	1.455	24.000
January 1991	0.000	1.455	24.000
February 1991	0.000	1.455	24.000
March 1991	0.000	1.455	24.000
April 1991	0.647	1.274	24.000
May 1991	3.387	1.497	24.000
June 1991	1.547	1.571	24.000
July 1991	4.161	1.571	24.000
August 1991	2.748	1.323	24.000
September 1991	4.083	1.545	24.000
October 1991	4.768	1.943	24.000
November 1991	5.800	2.262	24.000
December 1991	4.906	2.671	24.000
January 1992	1.142	2.766	24.000
February 1992	4.228	3.118	24.000
March 1992	6.697	3.676	24.000
April 1992	5.013	4.040	24.000
May 1992	3.781	4.073	24.000
June 1992	5.040	4.364	24.000
July 1992	4.219	4.369	24.000
August 1992	2.626	4.359	24.000
September 1992	0.000	4.018	24.000
October 1992	1.684	3.761	24.000
November 1992	0.000	3.278	24.000
December 1992	0.000	2.869	24.000
January 1993	0.000	2.774	24.000
February 1993	0.886	2.495	24.000
March 1993	2.032	2.107	24.000
April 1993	2.820	1.924	24.000
May 1993	0.148	1.621	24.000
June 1993	7.433	1.821	24.000
July 1993	2.077	1.642	24.000
August 1993	0.000	1.423	24.000
September 1993	3.253	1.695	24.000
October 1993	3.913	1.880	24.000
November 1993			24.000
December 1993	0.000		24.000
January 1994	0.000		24.000
February 1994	0.000		24.000
March 1994	0.000		24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
April 1994	0.000		24.000
May 1994	3.439		24.000
June 1994	2.213		24.000
July 1994	0.065		24.000
August 1994	1.432		24.000
September 1994	4.293		24.000
October 1994	5.342		24.000
November 1994	1.027	1.484	24.000
December 1994	0.439	1.521	24.000
January 1995	4.858	1.926	24.000
February 1995	6.614	2.477	24.000
March 1995	4.445	2.847	24.000
April 1995	3.880	3.171	24.000
May 1995	2.445	3.088	24.000
June 1995	3.307	3.179	24.000
July 1995	3.823	3.492	24.000
August 1995	1.741	3.518	24.000
September 1995	4.817	3.561	24.000
October 1995	2.994	3.366	24.000
November 1995	3.272	3.553	24.000
December 1995	6.488	4.057	24.000
January 1996	2.638	3.872	24.000
February 1996	2.796	3.554	24.000
March 1996	2.843	3.420	24.000
April 1996	0.000	3.097	24.000
May 1996	4.903	3.302	24.000
June 1996	6.780	3.591	24.000
July 1996	3.968	3.603	24.000
August 1996	6.334	3.986	24.000
September 1996	6.337	4.113	24.000
October 1996	6.605	4.414	24.000
November 1996	2.303	4.333	24.000
December 1996	1.071	3.881	24.000
January 1997			24.000
February 1997	3.576		24.000
March 1997	0.815		24.000
April 1997	3.367		24.000
May 1997	1.146		24.000
June 1997	0.075		24.000
July 1997	0.000		24.000
August 1997	3.267		24.000
September 1997	4.180		24.000
October 1997	5.471		24.000
November 1997	0.367		24.000
December 1997	0.000		24.000
January 1998	0.000	1.855	24.000
February 1998	4.457	1.929	24.000
March 1998	3.774	2.175	24.000
April 1998	0.000	1.895	24.000
May 1998	0.000	1.799	24.000
June 1998	0.443	1.830	24.000
July 1998	0.000	1.830	24.000
August 1998	3.116	1.817	24.000
September 1998	2.033	1.638	24.000
October 1998	1.135	1.277	24.000
November 1998	2.283	1.437	24.000
December 1998	0.000	1.437	24.000
January 1999	1.110	1.529	24.000
February 1999	0.000	1.158	24.000
March 1999	0.690	0.901	24.000
April 1999	0.593	0.950	24.000
May 1999	5.935	1.445	24.000
June 1999	5.556	1.871	24.000
July 1999	6.168	2.385	24.000
August 1999	0.327	2.153	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
September 1999	1.103	2.075	24.000
October 1999	4.158	2.327	24.000
November 1999	4.648	2.524	24.000
December 1999	0.247	2.545	24.000
January 2000	0.295	2.477	24.000
February 2000	2.115	2.653	24.000
March 2000	4.147	2.941	24.000
April 2000	3.051	3.146	24.000
May 2000	4.962	3.065	24.000
June 2000	3.640	2.905	24.000
July 2000	1.845	2.545	24.000
August 2000	1.569	2.648	24.000
September 2000	1.426	2.675	24.000
October 2000	1.019	2.414	24.000
November 2000	0.003	2.027	24.000
December 2000	2.706	2.231	24.000
January 2001	2.708	2.433	24.000
February 2001	2.506	2.465	24.000
March 2001	3.050	2.374	24.000
April 2001	1.496	2.244	24.000
May 2001	1.770	1.978	24.000
June 2001	3.570	1.972	24.000
July 2001	3.178	2.083	24.000
August 2001	2.407	2.153	24.000
September 2001	3.582	2.333	24.000
October 2001	2.166	2.428	24.000
November 2001	1.150	2.524	24.000
December 2001	0.200	2.315	24.000
January 2002	0.516	2.133	24.000
February 2002	0.890	1.998	24.000
March 2002	1.223	1.846	24.000
April 2002	4.056	2.059	24.000
May 2002	1.887	2.069	24.000
June 2002	4.153	2.117	24.000
July 2002	4.463	2.224	24.000
August 2002	4.134	2.368	24.000
September 2002	4.150	2.416	24.000
October 2002	2.609	2.453	24.000
November 2002	3.624	2.659	24.000
December 2002	3.409	2.926	24.000
January 2003	2.777	3.115	24.000
February 2003	1.684	3.181	24.000
March 2003	3.088	3.336	24.000
April 2003	3.309	3.274	24.000
May 2003	4.486	3.490	24.000
June 2003	4.164	3.491	24.000
July 2003	2.175	3.301	24.000
August 2003	3.130	3.217	24.000
September 2003	4.224	3.223	24.000
October 2003	4.049	3.343	24.000
November 2003	1.946	3.203	24.000
December 2003	0.351	2.949	24.000
January 2004	0.338	2.745	24.000
February 2004	0.399	2.638	24.000
March 2004	0.268	2.403	24.000
April 2004	0.407	2.161	24.000
May 2004	0.329	1.815	24.000
June 2004	1.346	1.580	24.000
July 2004	2.870	1.638	24.000
August 2004	3.376	1.658	24.000
September 2004	3.865	1.629	24.000
October 2004	4.440	1.661	24.000
November 2004	2.843	1.736	24.000
December 2004	1.118	1.800	24.000
January 2005	0.960	1.852	24.000

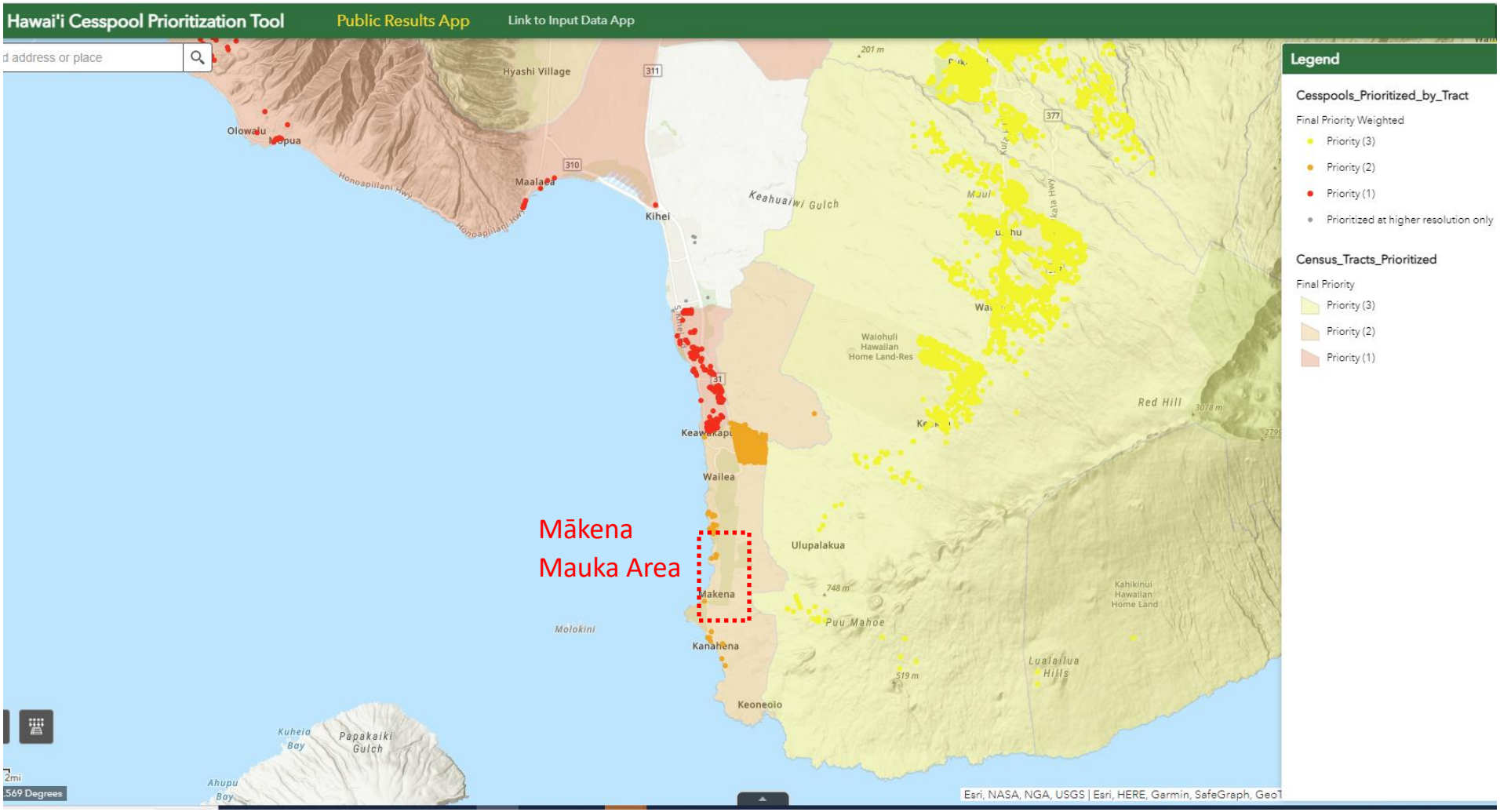
Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
February 2005	1.178	1.917	24.000
March 2005	1.396	2.011	24.000
April 2005	1.107	2.069	24.000
May 2005	3.748	2.354	24.000
June 2005	4.492	2.616	24.000
July 2005	3.468	2.666	24.000
August 2005	4.323	2.745	24.000
September 2005	3.333	2.701	24.000
October 2005	1.464	2.453	24.000
November 2005	0.980	2.297	24.000
December 2005	1.013	2.289	24.000
January 2006	0.969	2.289	24.000
February 2006	1.008	2.275	24.000
March 2006	0.982	2.241	24.000
April 2006	1.005	2.232	24.000
May 2006	1.343	2.032	24.000
June 2006	4.329	2.018	24.000
July 2006	4.524	2.106	24.000
August 2006	4.192	2.095	24.000
September 2006	4.535	2.195	24.000
October 2006	3.274	2.346	24.000
November 2006	1.286	2.372	24.000
December 2006	1.429	2.406	24.000
January 2007	2.093	2.500	24.000
February 2007	2.707	2.642	24.000
March 2007	2.785	2.792	24.000
April 2007	3.880	3.031	24.000
May 2007	3.527	3.213	24.000
June 2007	3.825	3.171	24.000
July 2007	2.578	3.009	24.000
August 2007	3.773	2.974	24.000
September 2007	3.305	2.872	24.000
October 2007	3.040	2.852	24.000
November 2007	3.716	3.055	24.000
December 2007	1.280	3.042	24.000
January 2008	0.672	2.924	24.000
February 2008	1.080	2.788	24.000
March 2008	4.380	2.921	24.000
April 2008	4.114	2.941	24.000
May 2008	3.997	2.980	24.000
June 2008	4.195	3.011	24.000
July 2008	3.879	3.119	24.000
August 2008	4.670	3.194	24.000
September 2008	4.757	3.315	24.000
October 2008	4.364	3.425	24.000
November 2008	4.429	3.485	24.000
December 2008	4.331	3.739	24.000
January 2009	1.745	3.828	24.000
February 2009	1.251	3.843	24.000
March 2009	1.064	3.566	24.000
April 2009	1.363	3.337	24.000
May 2009	4.256	3.359	24.000
June 2009	4.814	3.410	24.000
July 2009	4.643	3.474	24.000
August 2009	3.183	3.350	24.000
September 2009	4.427	3.323	24.000
October 2009	4.341	3.321	24.000
November 2009	2.941	3.197	24.000
December 2009	2.893	3.077	24.000
January 2010	4.336	3.293	24.000
February 2010	3.534	3.483	24.000
March 2010	2.175	3.576	24.000
April 2010	1.114	3.555	24.000
May 2010	3.943	3.529	24.000
June 2010	4.151	3.474	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
July 2010	4.280	3.443	24.000
August 2010	4.421	3.546	24.000
September 2010	4.271	3.533	24.000
October 2010	4.315	3.531	24.000
November 2010	2.543	3.498	24.000
December 2010	4.283	3.614	24.000
January 2011	2.411	3.453	24.000
February 2011	4.273	3.515	24.000
March 2011	3.074	3.590	24.000
April 2011	4.276	3.853	24.000
May 2011	4.581	3.907	24.000
June 2011	4.529	3.938	24.000
July 2011	4.079	3.921	24.000
August 2011	4.395	3.919	24.000
September 2011	4.327	3.924	24.000
October 2011	4.628	3.950	24.000
November 2011	4.478	4.111	24.000
December 2011	3.032	4.007	24.000
January 2012	3.090	4.064	24.000
February 2012	3.275	3.980	24.000
March 2012	2.028	3.893	24.000
April 2012	1.204	3.637	24.000
May 2012	3.002	3.506	24.000
June 2012	4.231	3.481	24.000
July 2012	4.556	3.520	24.000
August 2012	4.266	3.510	24.000
September 2012	3.445	3.436	24.000
October 2012	3.921	3.377	24.000
November 2012	3.570	3.302	24.000
December 2012	3.707	3.358	24.000
January 2013	0.926	3.178	24.000
February 2013	0.928	2.982	24.000
March 2013	3.037	3.066	24.000
April 2013	4.457	3.337	24.000
May 2013	4.359	3.450	24.000
June 2013	4.149	3.443	24.000
July 2013	4.449	3.435	24.000
August 2013	4.100	3.421	24.000
September 2013	4.208	3.484	24.000
October 2013	4.432	3.527	24.000
November 2013	4.354	3.592	24.000
December 2013	4.357	3.646	24.000
January 2014	2.712	3.795	24.000
February 2014	2.024	3.886	24.000
March 2014	2.509	3.842	24.000
April 2014	0.460	3.509	24.000
May 2014	1.853	3.301	24.000
June 2014	4.308	3.314	24.000
July 2014	3.752	3.256	24.000
August 2014	3.591	3.213	24.000
September 2014	4.463	3.235	24.000
October 2014	4.130	3.209	24.000
November 2014	4.296	3.205	24.000
December 2014	1.362	2.955	24.000
January 2015	0.922	2.806	24.000
February 2015	0.914	2.713	24.000
March 2015	0.887	2.578	24.000
April 2015	0.902	2.615	24.000
May 2015	2.126	2.638	24.000
June 2015	2.072	2.451	24.000
July 2015	1.034	2.225	24.000
August 2015	0.972	2.007	24.000
September 2015	2.697	1.859	24.000
October 2015	0.915	1.592	24.000
November 2015	2.451	1.438	24.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
December 2015	0.875	1.397	24.000
January 2016	0.860	1.392	24.000
February 2016	0.852	1.387	24.000
March 2016	0.825	1.382	24.000
April 2016	0.780	1.372	24.000
May 2016	0.816	1.262	24.000
June 2016	0.831	1.159	24.000
July 2016	0.811	1.140	24.000
August 2016	0.808	1.127	24.000
September 2016	0.746	0.964	24.000
October 2016	0.753	0.951	24.000
November 2016	0.732	0.807	24.000
December 2016	0.726	0.795	24.000
January 2017	0.773	0.788	24.000
February 2017	0.746	0.779	24.000
March 2017	0.788	0.776	24.000
April 2017	0.788	0.776	24.000
May 2017	0.818	0.777	24.000
June 2017	0.853	0.778	24.000
July 2017	0.863	0.783	24.000
August 2017	0.820	0.784	24.000
September 2017	1.080	0.812	24.000
October 2017	0.802	0.816	24.000
November 2017	0.730	0.816	24.000
December 2017	0.712	0.814	24.000
January 2018	0.749	0.812	24.000
February 2018	0.742	0.812	24.000
March 2018	0.833	0.816	24.000
April 2018	0.808	0.817	24.000
May 2018	0.802	0.816	24.000
June 2018	0.602	0.795	24.000
July 2018	0.640	0.777	24.000
August 2018	0.665	0.764	24.000
September 2018	0.839	0.744	24.000
October 2018	0.824	0.745	24.000
November 2018	0.846	0.755	24.000
December 2018	1.025	0.781	24.000
January 2019	0.828	0.788	24.000
February 2019	0.819	0.794	24.000
March 2019	0.787	0.790	24.000
April 2019	0.856	0.794	24.000
May 2019	0.941	0.806	24.000
June 2019	1.035	0.842	24.000
July 2019	1.070	0.878	24.000
August 2019	0.956	0.902	24.000
September 2019	0.935	0.910	24.000
October 2019	0.894	0.916	24.000
November 2019	0.915	0.922	24.000
December 2019	0.870	0.909	24.000
January 2020	0.881	0.913	24.000
February 2020	0.841	0.915	24.000
March 2020	0.800	0.916	24.000
April 2020	0.925	0.922	24.000
May 2020	0.946	0.922	24.000
June 2020	1.049	0.923	24.000
July 2020	1.120	0.928	24.000
August 2020	1.097	0.939	24.000
September 2020	1.139	0.956	24.000
October 2020	1.210	0.983	24.000
November 2020	0.985	0.988	24.000
December 2020	0.936	0.994	24.000
January 2021	0.897	0.995	24.000
February 2021	0.924	1.002	24.000
March 2021	0.870	1.008	24.000
April 2021	0.960	1.011	24.000

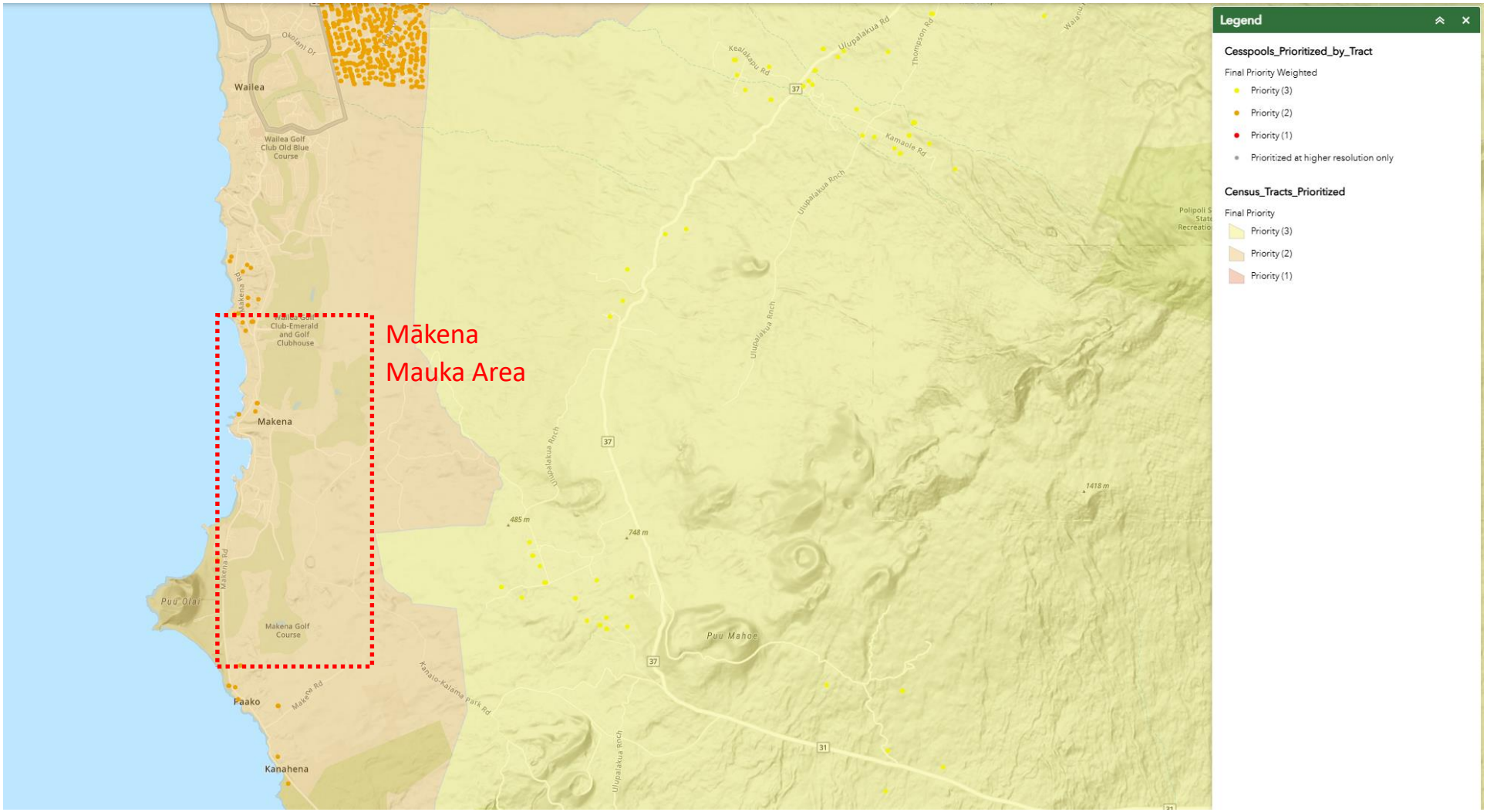
Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
May 2021	0.975	1.013	24.000
June 2021	1.183	1.025	24.000
July 2021	1.158	1.028	24.000
August 2021	1.111	1.029	24.000
September 2021	1.123	1.028	24.000
October 2021	0.652	0.981	24.000
November 2021	0.674	0.955	24.000
December 2021	0.602	0.927	24.000
January 2022	0.634	0.905	24.000
February 2022	0.696	0.886	24.000
March 2022	0.744	0.876	24.000
April 2022	0.604	0.846	24.000
May 2022	0.644	0.819	24.000
June 2022	0.702	0.779	24.000
July 2022	0.698	0.740	24.000
August 2022	0.734	0.709	24.000
September 2022	0.710	0.674	24.000
October 2022	0.680	0.677	24.000
November 2022	0.807	0.688	24.000
December 2022	0.781	0.703	24.000
January 2023	0.849	0.721	24.000
February 2023	0.758	0.726	24.000
March 2023	0.752	0.727	24.000
April 2023	0.613	0.727	24.000
May 2023	0.638	0.727	24.000
June 2023	0.724	0.729	24.000
July 2023	0.672	0.726	24.000
August 2023	0.726	0.726	24.000
September 2023	0.702	0.725	24.000
October 2023	0.771	0.733	24.000
November 2023	0.702	0.724	24.000
December 2023	0.594	0.708	24.000
January 2024	0.616	0.689	24.000
February 2024	0.691	0.683	24.000
March 2024	0.650	0.675	24.000
April 2024	0.678	0.680	24.000
May 2024	0.872	0.700	24.000
June 2024	0.923	0.716	24.000
July 2024	0.950	0.740	24.000
August 2024	0.881	0.753	24.000
September 2024	0.949	0.773	24.000
October 2024	0.949	0.788	24.000
November 2024	0.908	0.805	24.000
December 2024	0.972	0.837	24.000
January 2025	0.005	0.786	24.000

APPENDIX J



Source: Hawai'i Cesspool Prioritization Tool

https://seagrant.soest.hawaii.edu/app/



Source: **Hawai'i Cesspool Prioritization Tool**

https://seagrant.soest.hawaii.edu/app/

APPENDIX K

STATE OF HAWAI'I
DEPARTMENT OF HEALTH
July 2002 (Version 6)

GUIDELINES APPLICABLE TO GOLF COURSES IN HAWAI'I

The State Department of Health recommends the following guidelines for all golf courses in Hawai`i to promote, protect, and enhance environmental quality and public health. These recommendations cover measures that could prevent groundwater and surface water pollution, soil contamination, chemical spills, noise and solid waste nuisances, and unsafe exposure to applied chemicals. Under certain situations, a state or county regulation may be necessarily applicable to a given activity, and such a regulation would require mandatory compliance. However, the intent of these guidelines is to voluntarily foster environmental protection and safety. Thank you for supporting these guidelines and caring about Hawai`i.

1. A groundwater or soil water monitoring plan for the purpose of preventing or minimizing groundwater contamination should be established with the following components:

    a. Baseline groundwater quality;

    b. Monitoring locations consisting of monitoring wells or lysimeters, or combination of both;

    c. Routine groundwater and/or soil water monitoring at frequencies such as quarterly, semiannually, or annually depending on the use of chemicals and the detection of contaminants;

    d. A list of chemicals and fertilizers that will be or have been used that may affect soil or groundwater adversely, and the analyses for such contaminants;

    e. Recordkeeping of monitoring results and a system of tracking trends in order to prevent, minimize, or mitigate occurrences of contamination;

    f. A procedure to notify all affected parties and the Department of Health of occurrences of contamination that pose, or may pose, a threat to public health or the environment.

    g. Availability of monitoring data to any interested person.

2. A surface water monitoring plan, if applicable, for the purpose of preventing or minimizing surface water contamination should be established using the principles of item No. 1.

3. If the golf course uses recycled water (treated wastewater) for irrigation, please refer to the Department of Health's Guidelines for the Treatment and Use of Recycled Water, May 15, 2002, for recycled water requirements. Information about this subject may be obtained from the Department's Wastewater Branch at 586-4294 (Honolulu).

4. The use of an above-ground storage tank with applicable safety considerations for petroleum products, used for fueling golf carts, maintenance vehicles, or emergency generators, should be preferred over an underground storage tank in order to easily detect leaks and minimize the risk of soil and groundwater contamination resulting from a leaking storage tank. Information about underground storage tanks may be obtained from the Department's Solid and Hazardous Waste Branch at 586-4226 (Honolulu).

5. Buildings used to store fertilizers, pesticides, algicides, fungicides, herbicides, and other chemicals especially in liquid form should be designed purposely for the containment and recovery of a catastrophic spill or leak of contents. An early warning system for spill or leak detection is advantageous.

6. Noise and dust from maintenance or construction activities should not disturb neighbors. Maintenance or construction activities should be scheduled and conducted accordingly.

7. Solid wastes should be managed without creating a nuisance. Furthermore, all green waste generated by the golf course should be reused on-site. Shredding and composting are activities that precede the reuse of green waste as a soil conditioner or a ground cover for weed control. Space and equipment should be provided to accomplish these activities. Additionally, where practicable, locally produced compost and soil amendments should be used whenever available.

8. Chemicals should be handled and applied according to instructions, and offsite drift during application should not occur. Methods of application and weather conditions should be chosen to optimize success.

9. A Best Management Practices (BMP) plan should be made for the golf course. The BMP plan functions as a hands-on environmental and worker safety maintenance manual that describes in plain English the elements and procedures for irrigation, chemical use, processing and reuse of green wastes, minimizing or preventing runoff, soil erosion and nuisance conditions, and sustaining worker safety. Use of the BMP should prevent the occurrence or recurrence of environmental or safety problems. The BMP should be available to any interested person.

10. Agencies or organizations such as the State Department of Agriculture, the Federal National Resource Conservation Service, and the Golf Course Superintendents Association of America may provide ideas or practices that would help to achieve the intent of these guidelines. Inquiries to these sources of information are advantageous.

The Department of Health appreciates your cooperation to preserve and protect environmental quality in Hawai`i. Questions about these guidelines may be directed to the Groundwater Pollution Control Section of the Safe Drinking Water Branch at 586-4258 (Honolulu). Direct toll free calls can be made from Kaua`i: 274-3141, ext. 64258; Maui: 984-2400, ext. 64258; Big Island: 974-4000, ext. 64258; Molokai and Lana`i: 1-800-468-4644, ext. 64258.

APPENDIX L

Water Use Permit

Report Parameters

WUP Type:	Water Use Permit, Administrative Modification, Reservation, Transfer, CWRM Decision and Orders, Court Orders, Other
Island:	Maui
Applicant:	All
Well # Prefix:	All
Date:	All
Issued Date:	All
Date Accepted:	All
Aquifer Sector:	All
Aquifer:	60102 Iao
Source or End Use TMK:	All
Aquifer Type:	Alluvial, Basal, Deep Fresh Water, Dike, Perched, Not Specified
Water Quality:	Fresh, Brackish, Potable, Non-Potable, Not Specified
Not	Salt
Proposed Use:	All

WUP = Water Use Permit, 12-MAV = 12 month moving average, Diff = WUP-12-MAV, mgd = million gallons per day

Island of Maui

Aquifer System Ground Water Management Area: 60102 Iao

Sustainable Yield (mgd): 20

Wup No	Approved	Permittee	Well No	Well Name	WUP (mgd)	12-MAV (mgd)	Diff (mgd)	Date Last Reported
00691	06/10/2010	Hawaiian Commercial & Sugar Co. (HC&S)	6-5330-002	Iao Tunnel (Puako)	0.100	0.098	0.002	09/30/2023
00704	02/15/2006	Living Water Foundation, LLC	6-5531-001	Living Waters #1	0.020	0.001	0.019	05/31/2019
00815	02/15/2006	Department of Water Supply Maui, MDWS	6-5330-009	Mokuhau 1	1.500			07/31/2023
00825	02/18/2009	John Varel Trust	6-5631-007	Varel	0.003	0.038	-0.035	07/31/2023
00847	02/18/2009	Department of Water Supply Maui, MDWS	6-5330-011	Mokuhau 3	2.353	0.150	2.203	07/31/2023
00853	02/18/2009	Bryan Sarasin	6-5631-008	Sarasin	0.003	0.000	0.003	07/31/2023
00920	06/10/2010	Department of Water Supply Maui, MDWS	6-5332-002	Iao Tunnel (Kepaniwai)	1.610	1.559	0.051	07/31/2023
00921	06/10/2010	Department of Water Supply Maui, MDWS	6-5332-005	Kepaniwai	0.791	0.646	0.145	07/31/2023
00980	06/06/2013	Department of Water Supply Maui, MDWS	6-5430-001	Waiehu Heights 1	0.000	0.000	0.000	07/31/2023
00981	06/06/2013	Department of Water Supply Maui, MDWS	6-5430-002	Waiehu Heights 2	1.000	1.345	-0.345	07/31/2023
01016	01/31/2007	Department of Water Supply Maui, MDWS	6-5230-005	Wailuku 2	1.852	0.299	1.553	07/31/2023
01027	02/18/2009	Department of Water Supply Maui, MDWS	6-5230-003	Iao Tank Site	2.083	1.515	0.568	07/31/2023
01028	02/18/2009	Department of Water Supply Maui, MDWS	6-5230-004	Wailuku 1	2.190	1.368	0.822	07/31/2023
01041	02/15/2006	Department of Water Supply Maui, MDWS	6-5431-002	Waihee 1	6.800	2.625	-0.555	07/31/2023
			6-5431-003	Waihee 2		2.218		07/31/2023
			6-5431-004	Waihee 3		2.513		07/31/2023
01043	05/02/2017	Department of Water Supply Maui, MDWS	6-5131-001	Waikapu Tank Site	1.285	1.106	0.179	07/31/2023
Summary for Iao (17 detail records)				**Total:**	21.590	15.480	6.110	
				SY Available:	-1.590			

tunnel sources do not count against SY

APPENDIX M

WATER RESOURCE BULLETIN

COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

JANUARY 2025

The **Water Resource Bulletin** is published monthly to provide timely notice of important events under the purview of the Commission. Tentative Commission agenda dates should be confirmed with staff. Recent approvals are also listed. For inquiries about any item listed, please call 587-0225. **For more information, see our website at: http://dlnr.hawaii.gov/cwrm/**

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Effective August 1, 2009, the monthly bulletin will only be available on our website at http://dlnr.hawaii.gov/cwrm/.
To receive an email notice when the bulletin is posted on the Commission website please notify the Commission at 808.587.0234 or dlnr.cwrm@hawaii.gov. To continue to receive the bulletin by postal mail, please submit a request in writing to the Commission at P.O. Box 621, Honolulu, HI 96809.

A. New Notices/Announcements

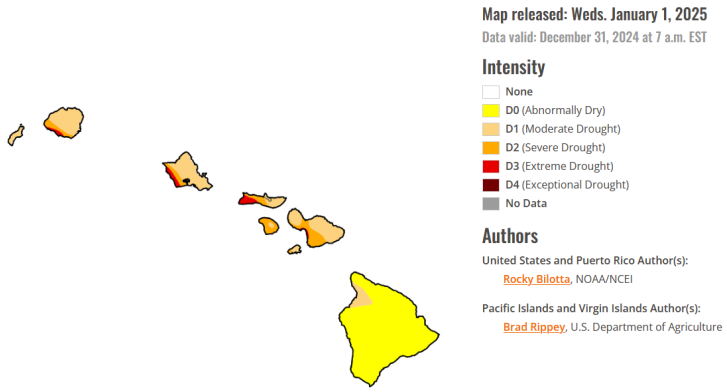
Drought Updates
The Wildfire & Drought LOOKOUT! campaign kicked off June 4, 2024 on Maui (https://dlnr.hawaii.gov/blog/2024/06/04/nr-66/). This comprehensive public information campaign to raise awareness about wildfire, drought, and water conservation, For more information please visit the Hawaii Wildfire Management Organization website: https://www.hwmo.org/lookout. Also check out water conservation and fire prevention tips in DLNR's social media posts https://www.instagram.com/hawaiidlnr/ and https://www.facebook.com/HawaiiDLNR/

See the NOAA Drought Information Statement for the Hawaiian Islands, valid November 15, 2024, here: https://www.weather.gov/media/hfo/DGT/DGT_HFO_11152024.pdf

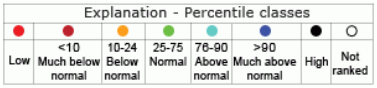
The NWS issued its Hawaiian Islands 2024-2025 Wet Season Outlook. http://weather.gov/media/hfo/MediaAdvisory-2024-2025HawaiiWetSeasonOutlook.pdf

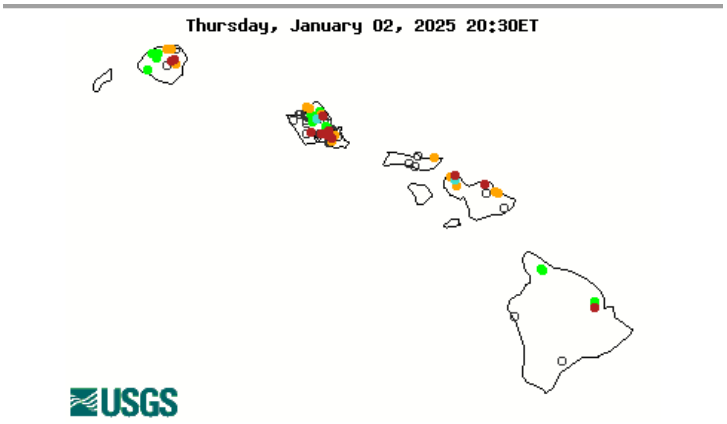
County of Maui: The County of Maui Department of Water Supply Water Shortage declaration: Stage 1 Water Shortage for Central Maui. The Central Maui service area includes Waiheʻe, Waiehu, Wailuku, Kahului, Spreckelsville, Pāʻia, Kūʻau, Māʻalaea, Kīhei, Wailea and Mākena. https://www.mauicounty.gov/CivicAlerts.aspx?AID=15800. Stage 1 Water Shortage is still in effect for West Maui. The West Maui service area includes Lahaina, Kaanapali, Kahana, Mahinahina, Napili-Honokowai, and Honokohau. https://www.mauicounty.gov/CivicAlerts.aspx?AID=15799 The Department is asking all customers throughout West, Central and South Maui to follow all water use restrictions to conserve water supply and protect our water resources. Stage 1 Water Shortage in Upcountry ended September 3, 2024. https://www.mauicounty.gov/CivicAlerts.aspx?AID=15798

The **U.S. Drought Monitor (USDM)** is a map released every Thursday, showing drought intensity across the U.S. and its territories. The map uses six classifications: normal conditions, abnormally dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought: moderate (D1), severe (D2), extreme (D3) and exceptional (D4). The weekly map for Hawai'i can be viewed online at: https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?HI



The **U.S. Geological Survey (USGS)** maintains a summary map of daily mean streamflow conditions at its network of real-time gaging stations statewide. The current map, along with station-specific information on all streamflow, precipitation (rainfall), reservoir, and groundwater stations monitored by the USGS, can be viewed at: https://waterdata.usgs.gov/hi/nwis/rt.





The colored dots on this map depict streamflow conditions as a percentile, which is computed from the period of record for the current day of the year. Only stations with at least 30 years of record are used. The gray circles indicate other stations that were not ranked in percentiles either because they have fewer than 30 years of record or because they report parameters other than streamflow. Some stations, for example, measure stage only.

Streams across Hawai'i are experiencing record low-flows as normally wet conditions observed in December have eluded the islands. Streams that support traditional kalo cultivation, habitat for native freshwater species, and instream hydropower production are experiencing critically low-flows. Conditions are affecting the availability of water for drinking water supply on Hawai'i and Maui as well as irrigation water supply on Hawai'i, Maui, Moloka'i, O'ahu, and Kaua'i.

B. Upcoming Meetings and Hearings*

The Commission on Water Resource Management's monthly meeting agenda and staff submittals are available on our website at http://dlnr.hawaii.gov/cwrm/.

Subscribe to the Commission's YouTube Channel to follow livestream events including monthly Commission meetings and public hearings. https://www.youtube.com/user/dlnrcwrm/

Follow the Commission's Vimeo Channel to view videos including online Commission meetings, public hearings, limited meetings, and more. https://vimeo.com/cwrm

Date	Time	Location	Type
January 28, 2025	9:00 am	Online Meeting: Live Stream via YouTube and DLNR Boardroom, 1st Floor 1151 Punchbowl Street Honolulu, HI 96813	Regular Meeting
February 18, 2025	9:00 am	Online Meeting: Live Stream via YouTube and DLNR Boardroom, 1st Floor 1151 Punchbowl Street Honolulu, HI 96813	Regular Meeting

Commission meetings can be viewed via live stream at https://www.youtube.com/user/dlnrcwrm/

***Meeting dates, times, & locations should be confirmed with staff.**

C. Petitions for Reservation of Water

- **CWRM.5641.6** – The State Department of Hawaiian Home Lands has filed a petition for reservation of 11,177,500 gallons per day originating from the watershed of, and tributaries to, the East Maui streams diverted by the East Maui Irrigation system for non-potable water use in Pūlehunui and Kēōkea-Waiohuli Hawaiian Home Lands.

D. Designation of Water Management Areas

- **Lahaina Aquifer Sector Area:** The Chair of the Commission on Water Resource Management has recommended to designate the Lahaina Aquifer Sector Area (ASA), Maui, as a Surface and Ground Water Management Area under Section 174C-41. The proposed Lahaina ASA Surface Water Management Areas include the Honokōhau (6014), Honolua (6013), Honokahua (6012), Kahana (6011), Honokōwai (6010), Wahikuli (6009), Kahoma (6008), Kaua'ula (6007), Launiupoko (6006), Olowalu (6005), and Ukumehame (6004) surface water hydrologic units. The

proposed Lahaina ASA Ground Water Management Areas include the Honokōhau (60201), Honolua (60202), Honokōwai (60203), Launiupoko (60204), Olowalu (60205), Ukumehame (60206) ground water hydrologic units. On June 14, 2022, the Commission accepted the Findings of Fact and Chairperson's Recommendation to designate the Lahaina Aquifer Sector Area as both a Surface Water and Ground Water Management Area. A public notice was issued on July 29, 2022, and published in The Maui News issue of August 6, 2022.

Applications for water use permits to continue an existing use of surface or ground water had to be filed with the Commission within a period of one year from the effective date of designation, that is between August 6, 2022 (the date this Public Notice is published) and no later than August 7, 2023 (as August 5, 2023 fell on a Saturday).

The Commission is currently reviewing filed water use permit applications for both existing and new uses. Applications for new uses of both ground or surface water may continue to be filed with the Commission. More information is available online at: https://dlnr.hawaii.gov/cwrm/groundwater/gwma/lahaina/.

E. Contested Case Hearings Pending at the Commission:

- **CCH-MA15-01** – Surface Water Use Permit Applications, Nā Wai ʻEhā Surface Water Management Area, Waiheʻe, Waiehu, ʻĪao, Waikapū Streams, Maui, Hawaiʻi. On January 28, 2015, the Commission determined that a contested case hearing is required to hear and determine all surface water use permits applications in the Nā Wai ʻEhā Surface Water Management Areas, Maui, and delegated authority to the Chairperson to appoint a Hearings Officer. The Hearings Officer issued his Proposed Findings of Fact, Conclusions of Law and Decision and Order on November 1, 2017. The Commission issued its Findings of Fact, Conclusions of Law, and Decision and Order on June 28, 2021, along with an Executive Summary. On June 30, 2021, the Commission issued an Errata to the Findings of Fact, Conclusions of Law, and Decision and Order. On October 22 and 25, 2021, MMK Maui, LP, Hui O Na Wai Eha and Maui Tomorrow Foundation, Inc. and Office of Hawaiian Affairs filed an Appeal to the Commission's Decision. On October 25 and 28, 2021, Mahi Pono, LLC and Wailuku Water Company, LLC filed a Cross-Appeal. The deadline to file the Record on Appeal with the Supreme Court of the State of Hawaii is March 21, 2022. On March 14, 2022 the Supreme Court granted the Commission's request for an extension of time to transmit the Record on Appeal to April 20, 2022. Oral arguments in the State Supreme Court for SCOT-21-0000581 (Case Number CCH-MA 15-01) were heard on December 5, 2023. The Supreme Court issued its Opinion on June 20, 2024. The Opinion and contested case information are available online at http://dlnr.hawaii.gov/cwrm/newsevents/cch/cch-ma15-01/. The contested case has been remanded back to the Commission for further proceedings.

- **CCH-MA20-01** – On June 16, 2020, the Commission granted a petition for a contested case hearing filed by Wailuku Water Company, LLC to enter into a contested case hearing on the Issuance of Written Notice of Violation for Enforcement Against Waste, and Recommendation to Impose Fines Against Wailuku Water Company, LLC, Owner/Operator of Waiheʻe Ditch, in Response to HRS §174C-13, Citizen Complaint filed by Hui o Nā Wai ʻEhā Alleging Waste by Wailuku Water Company at Paleʻaʻahu Gulch, Nā Wai ʻEhā Surface Water Management Area, Maui, TMK No. (2) 3-6-004:003.

- **CCH-OA20-04** – On November 17, 2020, the Commission granted a petition for contested case hearing from Protect Mokulēʻia Hui to enter into contested case for GWUPA 1088 for Dillingham Ranch for modified withdrawals of ground water from the Mokulēʻia Aquifer System Area. The Contested Case Hearing is currently held in abeyance and a new water use permit application quantity will be considered.

Well Construction and Pump Installation Permit Applications (WCPIPA) Bulletin

Hawaii

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
SE.Mauna Loa	Kalae	(3) 9-3-004:027	8-0240-001	Kau Citrus 1	Morton Bassan, Jr.	Both	IRR		250	0.360	10/31/1995	01/29/1996		02/07/1996
Kilauea	Pahoa	(3) 1-5-056:001	8-3686-001	McDonald	Jane McDonald	Both	IRR		30	0.043	03/11/1997	06/09/1997		04/18/1997
Kohala	Mahukona	(3) 5-7-001:020	8-6953-002	Pao'o-Gordy	Dennis D. Gordy	Both	UNU			0.864	05/07/1999	08/05/1999		06/01/1999
Kohala	Mahukona	(3) 5-9-006:011	8-6451-004	Kohala Estates Lot 6	Gerry Reilly	Both	IRR	0.005	8	0.012	06/06/2000	09/04/2000		07/27/2000
E. Mauna Kea	Hakalau	(3) 3-4-003:056	8-5711-002	Letterman 2	Mary K. Letterman	Both	DOM	0.000	20	0.029	04/20/2001	07/19/2001		02/27/2002
NW.Mauna Loa	Anaehoomalu	(3) 6-8-002:027	8-5548-001	Parker 1	West Hawaii Water Co.	Both	IRR	0.720	600	0.864	06/24/2001	09/22/2001		07/18/2001
Kilauea	Pahoa	(3) 1-5-028:144	8-3587-005	Bazin	Barney Bazin	Both	DOM	0.001	25	0.036	05/01/2002	07/30/2002		06/12/2002
Kilauea	Pahoa	(3) 1-5-062:096	8-3787-004	Gudrun	Gudrun Valdis Maurins Family Trust	Both	DOM	0.001	15	0.022	10/03/2002	01/01/2003		11/18/2002
Kilauea	Pahoa	(3) 1-5-054:049	8-3687-007	Noni Kai	Patrick T Fix	Both	DOM	0.001	25	0.036	07/23/2003	10/21/2003		11/14/2003
Kilauea	Pahoa	(3) 1-5-026:226	8-3487-002	Luawai	Patrick St. Laurence	Both	DOM	0.002	20	0.029	12/09/2003	03/08/2004		02/27/2004
NE.Mauna Loa	Keaau	(3) 1-5-057:088	8-3687-009	Hale O Kai	Bennet Taylor Jr.	Both	DOM	0.000	15	0.022	12/09/2003	03/08/2004		02/27/2004
Kilauea	Pahoa	(3) 1-5-051:146	8-3687-011	Webb 2	Charles Webb	Both	DOM	0.000	20	0.029	04/20/2004	07/19/2004		06/14/2004
Kilauea	Pahoa	(3) 1-5-054:100	8-3687-012	That's a deep subject	Tom King	Both	DOM	0.001	20	0.029	05/19/2004	08/17/2004		07/02/2004
NW.Mauna Loa	Anaehoomalu	(3) 6-8-033:049	8-5652-001	Borkan	Bill Borkan	Both	OTH	0.288	200	0.288	05/20/2004	08/18/2004		06/30/2004
Kilauea	Pahoa	(3) 1-5-008:001	8-3088-001	Makuu	Department of Hawaiian Home Lands, East Hawaii, DHHL	Both	UNU	1.000	700	1.008	05/26/2004	08/24/2004	02/14/2006	06/30/2004
Kilauea	Pahoa	(3) 1-5-057:080	8-3687-015	Greenlaw 2	Daniel Greenlaw	Both	DOM	0.000	15	0.022	06/30/2004	09/28/2004		08/27/2004
NE.Mauna Loa	Keaau	(3) 1-7-017:128	8-3505-002	Puna Certified Nursery 1	Puna Certified Nursery, Inc.	Both	IRR	0.004	45	0.065	07/01/2004	09/29/2004		08/13/2004
Hualalai	Keauhou	(3) 7-7-026:014	8-3558-001	Keauhou-Robertson	Michael H. Robertson (Wailani Drilling Services Inc)	Both	IRR	0.010	100	0.144	11/08/2004	02/06/2005		01/03/2005
E. Mauna Kea	Onomea	(3) 2-7-039:001	8-4707-001	JJCO	Jack Jackson (JJCO Properties, LLC)	Both	DOM	0.001	30	0.043	11/10/2004	02/08/2005		01/03/2005
Kilauea	Pahoa	(3) 1-5-032:052	8-3586-005	Mika 1	Noi Phanucharas	Both	DOM	0.001	10	0.014	11/15/2004	02/13/2005		01/03/2005
NE.Mauna Loa	Keaau	(3) 1-6-141:012	8-3802-007	Laka	Rulin Xiu	Both	DOM	0.001	60	0.086	11/15/2004	02/13/2005		01/03/2005
Kilauea	Kalapana	(3) 1-2-009:029	8-2484-002	Kalani Kai 2	Kalani Honua	Both	AGRCP	0.017	55	0.079	12/28/2015	03/27/2016		
NE.Mauna Loa	Keaau	(3) 1-6-151:020	8-3703-003	Double D	Louis Anthony Nobriga	Both	INDOTH	0.050	300	0.432	02/21/2017	05/22/2017		
Kilauea	Kalapana	(3) 1-2-014:005	8-2059-001	Clean Water	Tzvi G & Rachel S Kipnis Bradshaw	Both	DOM	0.001	25	0.036	05/18/2018	08/16/2018	07/11/2018	

NOTES: gpm = gallons per minute, mgd = million gallons per day, DOM = individual domestic, IND = industrial, IRR = irrigation, MIL = military, MUN = municipal, OBS = observation, OTH = other use, SLD = well has been sealed, BOTH = WELL + PUMP combined with pump approval pending pump test results. WCPIA are acted upon by the Chairperson unless deferred before and by the Commission. LOA = letter of assurance.

Hawaii

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Hualalai	Keauhou	(3) 7-5-001:165	8-3957-006	Ota	Natural Energy Laboratory of Hawaii Authority, NELHA	Well	MUNST	0.672	700	1.008	10/18/2018	01/16/2019		
Kilauea	Pahoa	(3) 1-5-010:028	8-3485-001	Remi	Lorraine A Melella	Both	DOM	0.001	25	0.036	02/25/2019	05/26/2019	05/22/2019	
Kilauea	Pahoa	(3) 1-5-030:158	8-3586-131	el158	Emanual Joseph Leonard	Both	DOM	0.001	25	0.036	02/16/2020	05/16/2020	06/04/2020	
Kilauea	Pahoa	(3) 1-5-030:150	8-3586-132	el150	Emanual Joseph Leonard	Both	DOM	0.001	25	0.036	02/16/2020	05/16/2020	06/04/2020	
Kilauea	Pahoa	(3) 1-5-054:169	8-3687-201	el169	Emanual Joseph Leonard	Both	DOM	0.001	25	0.036	02/16/2020	05/16/2020		
Kilauea	Pahoa	(3) 1-5-028:117	8-3587-073	Sun	Dexue Sun	Both	DOM	0.002	25	0.036	05/04/2020	08/02/2020		
Kilauea	Pahoa	(3) 1-5-057:030	8-3687-207	Maciel 3	Charles Allen Maciel	Both	DOM	0.004	25	0.036	05/04/2020	08/02/2020	08/04/2020	
Kilauea	Pahoa	(3) 1-5-054:120	8-3687-209	WBH	Jonathan Santiago-Braga	Both	DOM	0.003	35	0.050	05/04/2020	08/02/2020	09/18/2020	
Kilauea	Pahoa	(3) 1-5-059:019	8-3786-010	Agua Dulce	Andrea Gonzalez-Capilla	Both	DOM	0.000	25	0.036	05/11/2020	08/09/2020	07/06/2020	
Kilauea	Pahoa	(3) 1-4-028:141	8-3282-003	Waa Waa	Pauncer's Trust	Both	DOM	0.004	35	0.050	06/04/2020	09/02/2020	07/21/2020	
Kilauea	Pahoa	(3) 1-5-054:157	8-3687-215	Island Sustenance	Elissa Yamamoto & Dustin Sweeny	Both	DOM	0.001	25	0.036	08/26/2020	11/24/2020	12/24/2020	
Kilauea	Pahoa	(3) 1-5-025:057	8-3486-033	Nitta 2	Frederick Alan Nitta	Both	DOM	0.001	25	0.036	12/14/2020	03/14/2021		
Kilauea	Pahoa	(3) 1-5-060:041	8-3787-032	Fontana	Lori Morrey	Both	DOM	0.004	35	0.050	04/01/2021	06/30/2021		
Hualalai	Kiholo	(3) 7-2-028:020	8-4860-030	KukioMV20	Nisshin Hawaii, Inc.	Both	IRRLA	0.003	25	0.036	10/08/2021	01/06/2022		
SE.Mauna Loa	Naalehu	(3) 9-5-016:036	8-0632-002	Namaste	Robert Taylor (Taylor Built Construction, Inc.)	Both	DOM	0.001	25	0.036	12/21/2022	03/21/2023		
Kilauea	Pahoa	(3) 1-5-031:062	8-3585-012	Source 1	Gold Coast SP LLC	Both	DOM	0.000	25	0.036	07/07/2023	10/05/2023		
Kilauea	Pahoa	(3) 1-5-032:049	8-3586-170	15-1859 Beach Road	Patricia Lynn Sather	Both	DOM	0.001	25	0.036	09/11/2023	12/10/2023		11/10/2024
E. Mauna Kea	Hakalau	(3) 2-9-006:026	8-5307-010	Obi Roschi Pisi	Andrei Burghelea	Both	DOM	0.001	25	0.036	03/14/2024	06/12/2024		
Kilauea	Pahoa	(3) 1-5-031:067	8-3586-175	Ala Heiau	Kermit Johnson	Both	DOM	0.001	25	0.036	04/10/2024	07/09/2024		
Kilauea	Pahoa	(3) 1-5-054:066	8-3687-271	LBB 2024	David Jefferson Calley	Both	DOM	0.001	25	0.036	04/10/2024	07/09/2024		12/03/2024
E. Mauna Kea	Honokaa	(3) 4-5-002:016	8-6527-001	HHL Irrigation	Stephen D Winter	Both	IRROTH	0.003	40	0.058	05/22/2024	08/20/2024		11/10/2024
Kilauea	Pahoa	(3) 1-5-054:143	8-3687-270	Cani 2nd C	Edmond Cani (Edmond & Marsela Cani Trust)	Both	DOM	0.001	25	0.036	06/03/2024	09/01/2024		
Kilauea	Pahoa	(3) 1-5-053:037	8-3687-260	Phase III	Hawaiian Shellfish, LLC	Both	AGRAQ	0.200	250	0.360	06/05/2024	09/03/2024		
NE.Mauna Loa	Hilo	(3) 2-3-036:018	8-4205-001	Da	Justin Clayton (The Food Basket, Inc.)	Both	AGRCP	0.020	45	0.065	07/30/2024	10/28/2024		11/19/2024
Kilauea	Pahoa	(3) 1-5-050:034	8-3587-100	Keaau Point 6th	John D. Lemery (Keaau Point LLC)	Both	DOM	0.001	25	0.036	08/07/2024	11/05/2024		
Kilauea	Pahoa	(3) 1-5-045:008	8-3688-083	Derbyshire 10th	Robert Paul Derdyshire	Both	DOM	0.001	25	0.036	08/07/2024	11/05/2024		

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Hawaii

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Kohala	Mahukona	(3) 5-5-005:030	8-7552-004	Bhanot	Aditi Bhargava (Alok & Aditi Trust)	Both	DOM	0.001	25	0.036	08/16/2024	11/14/2024		
Kilauea	Pahoa	(3) 1-5-039:175	8-3489-020	Paliku O Ka'awali'i	Leroy Kunio Padilla	Both	DOM	0.001	25	0.036	09/05/2024	12/04/2024		
Kilauea	Pahoa	(3) 1-5-028:036	8-3586-181	Leah	Lawrence Scanlon	Both	DOM	0.001	25	0.036	09/19/2024	12/18/2024		
Kilauea	Pahoa	(3) 1-5-054:038	8-3687-275	Loke	Laura Jane Mader	Both	DOM	0.001	25	0.036	09/19/2024	12/18/2024		
Kohala	Mahukona	(3) 5-8-001:033	8-6853-006	Levanta	James & Loretta Wickenden	Both	DOM	0.001	25	0.036	09/19/2024	12/18/2024		
Kilauea	Pahoa	(3) 1-5-030:012	8-3586-180	Magnum Properties	Sharon Takabayashi (Magnum Investment Properties Inc.)	Both	DOM	0.001	25	0.036	09/27/2024	12/26/2024		11/23/2024
W. Mauna Kea	Waimea	(3) 6-6-002:041	8-5849-008	Waimea DMW	State of Hawaii, DLNR, Engineering Division	Well	OBS				10/09/2024	01/07/2025		
Kohala	Hawi	(3) 5-6-002:013	8-7453-001	PBR 13 #1	Lambert Theodore Van Eerden Jr.	Both	DOM	0.001	26	0.037	10/18/2024	01/16/2025		
Kilauea	Pahoa	(3) 1-5-055:050	8-3687-276	Mateo 050 2nd Avenue	Cris Mateo	Both	DOM	0.001	25	0.036	11/07/2024	02/05/2025		
Kilauea	Pahoa	(3) 1-5-051:143	8-3587-101	Living Water	Vladamir Berezyuk	Both	DOM	0.001	25	0.036	11/18/2024	02/16/2025		

60 records listed for the island of Hawaii

Kauai

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Lihue	Kilauea	(4) 5-2-012:035	2-1224-006	Waipua	Charles M Somers Living Trust	Pump	AGR	0.072	50	0.072	07/25/2022	10/23/2022		
Lihue	Anahola	(4) 4-9-014:016	2-1120-070	Moloaa Kai	The Moloa'a Kai Partnership	Both	DOM	0.001	25	0.036	09/06/2023	12/05/2023		
Lihue	Anahola	(4) 4-9-011:021	2-1120-071	Sweet Mango	Malia Powers	Both	DOM	0.002	26	0.037	07/01/2024	09/29/2024		
Lihue	Anahola	(4) 4-9-014:008	2-1119-004	Wells 6618	Michael Wells Trust	Both	DOM	0.002	26	0.037	09/05/2024	12/04/2024		
Lihue	Anahola	(4) 4-9-009-009-0007	2-1119-006	Wailele	Timothy Webar (Halewood Gardens LLC)	Both	DOM	0.005	26	0.037	09/26/2024	12/25/2024		
Lihue	Anahola	(4) 4-9-009-009-0005	2-1119-005	Kahawai	Timothy Webar (Halewood Gardens LLC)	Both	DOM	0.005	26	0.037	10/01/2024	12/30/2024		
Lihue	Koloa	(4) 2-7-003-005-018	2-5429-003	ORL24	Daryl Kaneshiro (Omao Ranch Lands LLC)	Both	DOM	0.035	26	0.037	10/10/2024	01/08/2025		

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Kauai

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Lihue	Anahola	(4) 4-9-013:012	2-1120-072	Kawaiolamomona	Kuuleialoha Punua Johnson (Robert HK & Kuuleialoha Punua Johnson Trust)	Both	DOM	0.002	20	0.029	12/18/2024	03/18/2025		

8 records listed for the island of Kauai

Maui

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Central	Kahului	(2) 3-8-006:007	6-5227-008	Puunene-First Assembly	Maui First Assembly of God - Kahului, Maui "King's Cathedral and Chapel"	Both	IRR	0.048	60	0.086	01/10/1991	04/10/1991		02/13/1990
Hana	Kipahulu	(2) 1-7-002:001	6-3806-004	Punahoa	Kaupo Ranch Ltd	Both	OTH	0.080	100	0.144	12/22/2003	03/21/2004		02/27/2004
Central	Kamaole	(2) 2-2-002:017	6-4621-001	Kula 1800 No. 1	Kula 1800 Investment Partners LLC	Both	MUN	0.450	500	0.720	11/21/2006	02/19/2007	08/15/2006	11/21/2006
Wailuku	Iao	(2) 3-8-046:043	6-5229-007	Maui Memorial Park	Maui Memorial Park LLC	Both	IRR	0.030	50	0.072	01/09/2012	04/08/2012		11/05/2012
Koolau	Haiku	(2) 2-7-004:007	6-5519-009	Nalu Ola	Makai Hana V, LLC	Both	MUNPR	0.215	225	0.324	08/29/2012	11/27/2012	09/17/2013	09/10/2013
Central	Kamaole	(2) 3-9-009:008	6-4427-012	Passon	Passon Family Trust	Both	IRRLA	0.144	100	0.144	12/12/2012	03/12/2013		02/20/2012
Central	Kamaole	(2) 2-1-005:079	6-3726-005	Millar 2	Mana Ohana Kai Trust	Both	IRR	0.030	60	0.086	02/17/2016	05/17/2016		06/20/2017
Central	Kahului	(2) 3-8-057:030	6-5228-023	BEST	Eddie Bautista	Both	IRRLA	0.001	30	0.043	01/13/2017	04/13/2017		03/20/2017
Central	Kamaole	(2) 2-1-006:089	6-3726-006	Ron Jacintho	Waiko Baseyard, LLC	Both	IRRLA	0.012	65	0.094	08/30/2017	11/28/2017		
Central	Paia	(2) 3-8-002:044	6-5424-020	Bendon	John Bendon (John Bendon Trust)	Both	IRRLA	0.008	35	0.050	09/12/2017	12/11/2017		11/02/2017
Central	Paia	(2) 3-8-004:028	6-4626-003	Kaiwahine	Ikaika Ohana	Both	IRRLA	0.072	100	0.144	09/20/2018	12/19/2018	03/22/2018	
Lahaina	Olowalu	(2) 4-8-003:092	6-4936-003	McGee	James B. & Nancy E. McGee	Both	DOM	0.005	55	0.079	07/29/2019	10/27/2019		
Lahaina	Ukumehame	(2) 4-8-002:102	6-4834-003	Ukumehame Well 5	Ukumehame Water Association, Inc.	Both	MUNPR	0.250	350	0.504	08/21/2020	11/19/2020		
Lahaina	Ukumehame	(2) 4-8-002:119	6-4834-002	UKA-4	Ukumehame Water Association, Inc.	Both	MUNPR	0.030	40	0.058	09/23/2020	12/22/2020		
Central	Paia	(2) 2-5-004:029	6-5620-007	Stice	Tracy S & Laura T Stice	Both	AGR	0.003	10	0.014	12/31/2020	03/31/2021	11/15/2015	
Central	Makawao	(2) 2-3-007:037	6-4918-001	Kealaloa Tank	State of Hawaii, DLNR, Engineering Division	Both	MUN	0.672	700	1.008	01/12/2021	04/12/2021		
Wailuku	Waihee	(2) 3-1-001:042	6-5731-010	EX 1	Mendes Ranch Water	Both	MUNCO	1.000	800	1.152	01/13/2021	04/13/2021		

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Maui

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Wailuku	Waihee	(2) 3-1-001:042	6-5731-011	EX 2	Mendes Ranch Water	Both	MUNCO	1.000	800	1.152	01/13/2021	04/13/2021		
Lahaina	Launiupoko	(2) 4-7-001:054	6-5138-005	LIC-2	Launiupoko Irrigation Co., Inc.	Both	AGR	0.700	500	0.720	06/28/2021	09/26/2021		
Lahaina	Olowalu	(2) 4-8-003:108	6-4936-004	Olowalu 2	Olowalu Water Company LLC	Both	MUN	0.360	250	0.360	07/21/2021	10/19/2021		
Central	Paia	(2) 2-5-003:010	6-5120-001	Hoku'ula 1	Hoku'ula Water Association, Inc.	Both	MUN	0.270	350	0.504	07/21/2021	10/19/2021		
Central	Paia	(2) 2-5-003:010	6-5120-002	Hoku'ula 2	Hoku'ula Water Association, Inc.	Both	MUN	0.270	350	0.504	07/21/2021	10/19/2021		
Lahaina	Honolua	(2) 4-3-001:084	6-5839-005	Pulelehua 1	Maui Oceanview, LP	Both	MUN	0.280	600	0.864	07/30/2021	10/28/2021		
Lahaina	Honolua	(2) 4-3-001:084	6-5839-006	Pulelehua 2	Maui Oceanview, LP	Both	MUN	0.280	600	0.864	07/30/2021	10/28/2021		
Central	Kahului	(2) 3-8-006:069	6-5227-009	Kings	Maui First Assembly of God - Kahului, Maui "King's Cathedral and Chapel"	Both	DOMNRI	0.005	155	0.223	08/10/2021	11/08/2021		
Lahaina	Olowalu	(2) 4-8-003:093	6-4936-005	Kahili	Francis Cornelis & Nadja Cornelis Koole	Both	DOM	0.009	45	0.065	10/04/2021	01/02/2022		
Central	Kamaole	(2) 2-2-001:008	6-4122-003	OW Ranch LLC	Oprah's Farm LLC	Pump	AGR	0.157	145	0.209	02/02/2022	05/03/2022		
Central	Kahului	(2) 3-8-007:101	6-5129-008	Waiale 3	Maui Business Park Phase II Owner's Association	Both	MUNPR	0.300	450	0.648	02/02/2022	05/03/2022		
Koolau	Haiku	(2) 2-8-004:009	6-5516-003	Mahana View	Steve Rodgers Frey	Both	DOM	0.001	25	0.036	02/14/2022	05/15/2022		
Kahikinui	Lualailua	(2) 2-1-004:039	6-3625-003	Files Water	Jon File (Party of Five, LLLP)	Both	IRROTH	0.011	15	0.022	03/21/2022	06/19/2022		
Koolau	Honopou	(2) 2-9-007:052	6-5413-017	Bolles	David Bolles (Eco Farms LLC)	Both	IRRLA	0.050	70	0.101	03/21/2022	06/19/2022		
Central	Kamaole	(2) 2-2-002-002-24	6-4225-004	Makoa	Covoste, LLC	Both	MUN	0.220	300	0.432	02/23/2023	05/24/2023		
Lahaina	Honolua	(2) 4-3-001:084	6-5839-007	Pulelehua 3	Maui Oceanview, LP	Both	MUN	0.180	250	0.360	02/27/2023	05/28/2023		
Central	Kamaole	(2) 3-9-041:002	6-4627-020	Kai Makani	Quam Properties Hawaii, Inc.	Both	IRRLA	0.101	70	0.101	03/07/2023	06/05/2023		
Central	Makawao	(2) 2-3-003:002	6-4821-004	SGD Springs	Jason Garnett	Both	DOM	0.072	50	0.072	03/20/2023	06/18/2023		
Wailuku	Waihee	(2) 3-1-001:042	6-5731-010	Mendes EX-1	Mendes Ranch Real Estate, LLC	Both	AGRLI	0.024	25	0.036	03/31/2023	06/29/2023		
Wailuku	Waihee	(2) 3-1-001:042	6-5731-011	Mendes EX-2	Mendes Ranch Real Estate, LLC	Both	AGRLI	0.024	25	0.036	03/31/2023	06/29/2023		
Wailuku	Iao	(2) 3-5-001:080	6-5230-006	Kehalani Mauka Park	County of Maui, Department of Parks and Recreation	Both	IRRPA	0.090	150	0.216	04/06/2023	07/05/2023		
Wailuku	Waikapu	(2) 3-6-004:003	6-5030-001	WCT 1	Waikapu Properties, LLC (Albert Boyce)	Pump	MUNPR	0.683	712	1.025	05/10/2023	08/08/2023		
Central	Paia	(2) 2-5-005-020-0003	6-5422-002	Paia Pump 17	Mahi Pono, LLC	Both	AGRCP		6250	9.000	06/28/2023	09/26/2023		
Central	Kahului	(2) 3-8-006:003	6-5128-002	Waikapu Shaft Pump F Well 7	Mahi Pono LLC	Both	AGR		8400	12.096	06/30/2023	09/28/2023		

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Well Construction and Pump Installation Permit Applications (WCPIPA) Bulletin

Maui

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Lahaina	Launiupoko	(2) 4-7-003:021	6-5139-004	Rogers Well	Kahalawai Holdings LLC	Both	DOM	0.020	70	0.101	07/13/2023	10/11/2023		
Central	Makawao	(2) 2-3-003:033	6-4821-005	Tafuna Ranch LLC	Maui Oil Company	Both	MUNPR	0.101	70	0.101	08/30/2023	11/28/2023		

43 records listed for the island of Maui

Molokai

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Central	Palaau	(2) 5-2-011:007	4-0705-005	Naiwa-CIBA-GEIGY Irrigation	Ciba-Giegy Seed Division	Both	AGRCP	0.500	350	0.504	07/24/1989	10/22/1989		09/13/1989
Southeast	Waialua	(2) 5-8-015:003	4-0844-001	Puu O Hoku 1	Puu O Hoku Ranch, Limited	Pump	DOM	0.235	350	0.504	10/10/2001	01/08/2002		10/10/2001
Southeast	Kawela	(2) 5-5-001:007	4-0354-008	Keonekuino Pond -Teves	Irrevocable Harvey A. Teves Family Trust	Pump			10	0.014	11/11/2011	02/09/2012		
West	Kaluakoi	(2) 5-1-007:048	4-0916-002	Papohaku-Foster	Richard John Ward Foster	Both	AGRAQ	0.006	15	0.022	05/13/2013	08/11/2013		
West	Kaluakoi	(2) 5-1-006:072	4-1015-001	Papohaku-Rizk	Norman Wade Rizk	Both	IRR	0.021	15	0.022	05/13/2013	08/11/2013		
West	Kaluakoi	(2) 5-1-006:073	4-1015-002	Papohaku Beach Park	County of Maui, Parks and Recreation	Both	IRRPA	0.060	100	0.144	04/06/2023	07/05/2023		

6 records listed for the island of Molokai

Oahu

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Pearl Harbor	Waipahu-Waiawa	(1) 9-6-003:005	3-2359-016	Waipahu Asato	Fred Asato	Both					09/08/1977	12/07/1977		09/08/1977
Honolulu	Waialae-East	(1) 3-5-023:039	3-1646-006	Kahala 2	The Kahala Hotel & Resort	Both	INDOTH	4.000	2800	4.032	01/12/1981	04/12/1981		02/11/1981
Ewa Caprock	Malakole	(1) 9-1-031:028	3-1805-015	Kalaeloa Basalt	Honolulu Board of Water Supply, BWS	Both	MUN	0.000	4200	6.048	05/14/2003	08/12/2003		07/07/2003
Pearl Harbor	Waipahu-Waiawa	(1) 9-6-005:003	3-2658-007	Gentry Waiawa 1	Waiawa Development, LLC	Both	IRR	0.650	800	1.152	02/11/2004	05/11/2004	11/18/2005	
Pearl Harbor	Waipahu-Waiawa	(1) 9-6-005:003	3-2658-008	Gentry Waiawa 2	Waiawa Development, LLC	Both	IRR	0.650	800	1.152	02/11/2004	05/11/2004	11/18/2005	
Ewa Caprock	Malakole	(1) 9-1-031:003	3-1805-017	TSO06FW-2	Tesoro Hawaii Corp.	Both	OTH	0.000	2000	2.880	06/05/2006	09/03/2006	05/12/2006	06/05/2006
Ewa Caprock	Malakole	(1) 9-1-031:003	3-1805-018	TSO06FW-3	Tesoro Hawaii Corp.	Both	OTH	0.000	2000	2.880	06/05/2006	09/03/2006	05/12/2006	06/05/2006
Windward	Koolauloa	(1) 5-3-011:008	3-3353-005	PBC 1	Pan-Buddhist Center	Both	DOM	0.001	30	0.043	06/28/2008	09/26/2008		

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Well Construction and Pump Installation Permit Applications (WCPIPA) Bulletin

Oahu

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Windward	Koolauloa	(1) 5-5-008:043	3-3955-003	Kuanonoehu	Dawn K. Wasson	Both	IRR	0.100	70	0.101	02/12/2009	05/13/2009		
Waianae	Makaha	(1) 8-4-002:055	3-2811-006	DU-2	Hawaii Golf Properties LLC	Both	IRR		350	0.504	06/15/2012	09/13/2012		04/01/2013
Ewa Caprock	Kapolei	(1) 9-1-134:029	3-1802-003	Hoakalei	Haseko Development, Inc.	Both	OTH	1.000	1000	1.440	01/15/2013	04/15/2013	03/28/2013	03/28/2013
Ewa Caprock	Puuloa	(1) 9-1-134:014	3-1802-004	HL Makai	Haseko Development, Inc.	Well	OBS	0.000	0	0.000	03/06/2013	06/04/2013		
Ewa Caprock	Puuloa	(1) 9-1-134:014	3-1802-005	HL Mauka	Haseko Development, Inc.	Well	OBS	0.000	0	0.000	03/06/2013	06/04/2013		
Honolulu	Nuuanu	(1) 2-3-001:004	3-1751-010	Waiea Source 1	Victoria Ward Ltd.	Both	INDOTH	0.037	2600	3.744	05/16/2014	08/14/2014	08/12/2014	09/16/2014
Honolulu	Nuuanu	(1) 2-3-001:004	3-1751-011	Waiea Source 2	Victoria Ward Ltd.	Both	INDOTH	0.037	2600	3.744	05/16/2014	08/14/2014	08/12/2014	09/16/2014
North	Waialua	(1) 6-2-010:001	3-3505-008	Opaeula Pump 3 Well H	Kamehameha Schools, KS	Pump	AGRCP	1.552	1400	2.016	03/18/2015	06/16/2015	01/15/2014	
North	Mokuleia	(1) 6-7-003:019	3-3307-004	Waialua P2 Battery, Well "G"	Dole Food Company, Inc. Hawaii	Both	MUNPR	0.220	500	0.720	07/21/2016	10/19/2016		09/01/2016
North	Waialua	(1) 6-5-001:040	3-3306-032	Kemoo 1	Pioneer Hi-Bred International, Inc.	Both	AGR	0.010	1400	2.016	12/19/2016	03/19/2017		
North	Waialua	(1) 6-5-005:001	3-3406-019	Helemano Fields 2&4	Pioneer Hi-Bred International, Inc.	Both	AGR	0.010	1400	2.016	12/19/2016	03/19/2017		
Windward	Koolauloa	(1) 5-6-003:053	3-4258-019	North Pond	Makai Ranch, LLC	Well					08/22/2017	11/20/2017		
Windward	Koolauloa	(1) 5-6-003:053	3-4258-020	Retention Pond Mauka	Makai Ranch, LLC	Well					08/22/2017	11/20/2017		
Windward	Koolauloa	(1) 5-6-003:053	3-4258-021	Retention Pond Makai	Makai Ranch, LLC	Well					08/22/2017	11/20/2017		
North	Mokuleia	(1) 6-8-003:009	3-3411-016	4Rs	Mokuleia Ag Lands LLC	Both	AGRCP	0.058	250	0.360	06/18/2019	09/16/2019		09/17/2019
North	Mokuleia	(1) 6-7-002:034	3-3308-009	Legend Farms	Legend Farms USA, Inc.	Both	DOM	0.000	25	0.036	12/18/2020	03/18/2021		
Pearl Harbor	Waipahu-Waiawa	(1) 9-4-003:002	3-2501-002	HTGI	Hawaiian Turfgrass Inc.	Both	IRRLA	0.400	300	0.432	01/14/2021	04/14/2021		
Pearl Harbor	Ewa-Kunia	(1) 9-2-003:098	3-2104-002	The Groves	White Labels Venture LLC	Both	AGRCP	0.151	120	0.173	04/09/2021	07/08/2021		
North	Waialua	(1) 6-6-027:010	3-3306-033	Ka'ala Ranch 2	Ka'ala Ranch 2 LLC	Both	AGR	0.360	250	0.360	04/15/2021	07/14/2021		
Windward	Koolauloa	(1) 5-3-003:005	3-3453-019	Phillip 2021	Solomon & Serena Stephanie Phillip	Both	DOM	0.001	25	0.036	05/03/2021	08/01/2021		
North	Waialua	(1) 6-5-004:012	3-3205-005	Sharipov	Russ Sharipova	Both	DOM	0.001	20	0.029	06/02/2021	08/31/2021		
Windward	Koolauloa	(1) 5-5-008:060	3-3856-011	Kahawaii 2022	Harlan Kahawaii	Both	DOM	0.001	25	0.036	03/18/2022	06/16/2022		
Windward	Koolauloa	(1) 5-6-005:002	3-4158-019	Maluhia 2021	Patrick Morris (Kahuku Maluhia LLC)	Both	AGRAQ	0.038	40	0.058	03/18/2022	06/16/2022		

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Well Construction and Pump Installation Permit Applications (WCPIPA) Bulletin

Oahu

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Windward	Waimanalo	(1) 4-1-024:081	3-2043-003	KNICHOLS 2022	Nichols, Kitty D Trust	Both	DOMNCB	0.006	40	0.058	05/18/2022	08/16/2022		
Windward	Koolauloa	(1) 5-5-008:055	3-3856-010	Ohana Well	Ohana Water LLC	Both	AGR	0.472	500	0.720	08/29/2022	11/27/2022		
Windward	Koolauloa	(1) 5-5-008:040	3-3956-007	Kaio	Ohana Water LLC	Pump	AGR	0.017	40	0.058	08/29/2022	11/27/2022		
Pearl Harbor	Waimalu	(1) 9-9-010:010	3-2253-024	BWS2253-H1	Honolulu Board of Water Supply, BWS	Both	OBSOTH	0.000	1	0.001	09/19/2022	12/18/2022		
North	Waialua	(1) 6-2-006:020	3-3405-006	Ozzy 2022	Rodrigo Gonzalez	Both	DOM	0.001	20	0.029	02/02/2023	05/03/2023		
North	Waialua	(1) 6-4-001:014	3-3405-008	Laukiha'a Farms 2	Laukiha'a Farms	Both	AGRCP	1.285	900	1.296	04/06/2023	07/05/2023		
Waianae	Keaau	(1) 8-3-002:011	3-2913-004	Kea'au Beachfront	Monte Castro	Both	IRROTH	0.064	50	0.072	04/24/2023	07/23/2023		
Pearl Harbor	Waimalu	(1) 9-9-067:001	3-2354-003	Aiea 497 Exploratory	Honolulu Board of Water Supply, BWS	Well	MUNCO				07/13/2023	10/11/2023		
Pearl Harbor	Ewa-Kunia	(1) 9-1-056:015	3-2006-019	KO-1	Ko Olina Golf Club LLC	Both	IRRLA	0.400	900	1.296	07/20/2023	10/18/2023		
North	Waialua	(1) 6-4-001:014	3-3403-001	Laukiha'a Farms 1	Laukiha'a Farms	Both	AGRCP	0.877	625	0.900	07/25/2023	10/23/2023		
Pearl Harbor	Waipahu-Waiawa	(1) 9-2-001:013	3-2202-023	Ewa Shaft Well 1	Honolulu Board of Water Supply, BWS	Both	MUNCO	2.000	1400	2.016	10/12/2023	01/10/2024		
Pearl Harbor	Waipahu-Waiawa	(1) 9-2-001:013	3-2202-024	Ewa Shaft Well 1A	Honolulu Board of Water Supply, BWS	Both	MUNCO	2.000	1400	2.016	10/12/2023	01/10/2024		
Pearl Harbor	Waipahu-Waiawa	(1) 9-2-001:013	3-2202-025	Ewa Shaft Well 2	Honolulu Board of Water Supply, BWS	Both	MUNCO	2.000	1400	2.016	10/12/2023	01/10/2024		
Pearl Harbor	Waipahu-Waiawa	(1) 9-2-001:013	3-2202-026	Ewa Shaft Well 2A	Honolulu Board of Water Supply, BWS	Both	MUNCO	2.000	1400	2.016	10/12/2023	01/10/2024		
Pearl Harbor	Waipahu-Waiawa	(1) 9-2-001:013	3-2202-027	Ewa Shaft Well 3	Honolulu Board of Water Supply, BWS	Both	MUNCO	2.000	1400	2.016	10/12/2023	01/10/2024		
Pearl Harbor	Waimalu	(1) 9-8-062:099	3-2456-006	Newtown 550 Exploratory	Honolulu Board of Water Supply, BWS	Well	MUNCO				12/13/2023	03/12/2024		
North	Waialua	(1) 6-6-019-046-0006	3-3406-022	Nitahara	Reid Nitahara	Both	IRR	0.015	30	0.043	12/14/2023	03/13/2024		
Pearl Harbor	Waimalu	(1) 9-9-010:010	3-2253-030	NMW22	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBSOTH				12/22/2023	03/21/2024		
Pearl Harbor	Waimalu	(1) 9-9-010:010	3-2254-027	NMW23	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBSOTH				12/22/2023	03/21/2024		

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Oahu

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Pearl Harbor	Waimalu	(1) 1-1-012:013	3-2153-014	Site S	Honolulu Board of Water Supply, BWS	Both	OBSOTH		2	0.003	03/12/2024	06/10/2024	07/01/2024	
Honolulu	Waialae-West	(1) 3-3-014:016	3-1747-005	Waialae West	Honolulu Board of Water Supply, BWS	Pump	MUNCO	0.504	350	0.504	03/25/2024	06/23/2024		
North	Kawailoa	(1) 6-2-008:042	3-3505-033	Anahulu	Anahulu River Farms LLC	Both	AGRCP	0.039	80	0.115	05/22/2024	08/20/2024		
Pearl Harbor	Waimalu	(1) 9-9-076:002	3-2155-007	NMW33A	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				07/03/2024	10/01/2024		10/25/2024
Honolulu	Nuuanu	(1) 2-9-054:033	3-1948-005	Manoa Wells II	Honolulu Board of Water Supply, BWS	Well	MUNCO				08/23/2024	11/21/2024		
Pearl Harbor	Waimalu	(1) 9-9-072:044	3-2254-025	Site A	Honolulu Board of Water Supply, BWS	Both	OBSOTH		2	0.003	08/29/2024	11/27/2024	07/01/2024	
North	Waialua	(1) 6-2-007:002	3-3405-007	Robinson Ranch	Leif Robinson	Both	DOM	0.001	26	0.037	09/04/2024	12/03/2024		
Pearl Harbor	Waimalu		3-2255-043	NMW41	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				09/11/2024	12/10/2024		
Pearl Harbor	Waimalu	(1) 9-9-010:058	3-2254-026	Site D1	Board of Water Supply, City and County of Honolulu	Both	OBSOTH		2	0.003	09/13/2024	12/12/2024	07/01/2024	10/25/2024
Pearl Harbor	Waimalu		3-2254-028	NMW38	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				09/19/2024	12/18/2024		
Pearl Harbor	Waimalu		3-2254-029	NMW38A	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				09/19/2024	12/18/2024		
Pearl Harbor	Waimalu		3-2254-030	NMW31	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				09/19/2024	12/18/2024		
North	Kawailoa	(1) 6-2-008:036	3-3505-034	Freed	Chris Freed (Chris & Julie Freed)	Both	DOM	0.001	26	0.037	09/25/2024	12/24/2024		
Pearl Harbor	Waimalu	(1) 1-1-012:013	3-2153-015	NMW43	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				10/10/2024	01/08/2025		
Pearl Harbor	Waimalu	(1) 1-1-012:013	3-2153-016	NMW43A	Naval Facilities Engineering Command Hawaii, NAVFAC Hawaii	Well	OBS				10/10/2024	01/08/2025		
Windward	Koolauloa	(1) 5-5-007:001	3-3856-012	Laie Mauka Tank	Laie Water Co.	Both	MUNPR	0.500	1050	1.512	10/23/2024	01/21/2025		
Windward	Koolauloa	(1) 5-5-007:001	3-3856-013	Laie Makai Tank	Laie Water Co.	Both	MUNPR	0.500	1050	1.512	10/23/2024	01/21/2025		

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Oahu

Aquifer Sector	Aquifer System	TMK	Well No	Well Name	Applicant	Permit Type	-Proposed Use- Type	mgd	-Pump Capacity- gpm	mgd	Accept	90 Day Deadline	LOA Issued	Permit(s) Approved
Pearl Harbor	Ewa-Kunia	(1) 9-2-019:089	3-2005-002	Kawaiola 2024	Shaun Kauihou	Both	DOM	0.001	26	0.037	11/27/2024	02/25/2025		

68 records listed for the island of Oahu

NOTES: gpm = gallons per minute, mgd = million gallons per day, DOM = individual domestic, IND = industrial, IRR = irrigation, MIL = military, MUN = municipal, OBS = observation, OTH = other use, SLD = well has been sealed, BOTH = WELL + PUMP combined with pump approval pending pump test results. WCPIA are acted upon by the Chairperson unless deferred before and by the Commission. LOA = letter of assurance.

Ground Water Use Permit Applications (WUPA) Bulletin

Report Parameters

WUP Type:	Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action
Island:	All
Applicant:	All
Well # Prefix:	All
Date:	All
Aquifer Sector:	All
Aquifer:	All
Source or End Use TMK:	All
Aquifer Type:	Alluvial, Basal, Deep Fresh Water, Dike, Perched, Not Specified
Water Quality:	Fresh, Brackish, Potable, Non-Potable, Not Specified
Not:	Salt
Proposed Use:	All

Maui

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Iao	00852	Department of Water Supply Maui, MDWS	Iao Tunnel (Kepaniwai)	6-5332-002	0.841		Municipal needs	10/01/2008	10/30/2008	11/14/2008	12/16/2008	03/30/2009	02/18/2009	
Iao	00872	Maui Economic Concerns of the Community	Ka Hale A Ke Ola	6-5230-001	0.018	238046033	17.5 acres of landscape irrigation at Waiale County Park & affodable homes	06/08/2010	06/23/2010	07/08/2010		09/06/2010		
Iao	00901	Maui Memorial Park LLC	Maui Memorial Park	6-5229-007	0.014	238046000	irrigation of 14.3 acres of graveyard grass.	01/09/2012	02/10/2012	02/24/2012		04/08/2012		
Iao	01001	Hawaiian Commercial & Sugar Co. (HC&S)	Iao Tunnel (Puako)	6-5330-002	0.100	238000000	Irrigation of HC&S Lands	06/18/2015				09/16/2015		

4 records listed for the island of Maui

Molokai

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Kualapuu	00499	Department of Water Supply Maui, MDWS	Kualapuu Mauka	4-0801-003	0.900		Municipal	10/12/2015	10/27/2015	06/14/2016		06/14/2016		

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Molokai

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Kualapuu	00973	Molokai Public Utilities, Inc., MPU	Well 17	4-0901-001	1.026		10% addition to MIS	10/12/2015	10/30/2015	06/14/2016		06/14/2016		
						251003005	Kaluakoi Hotel Landscaping							
						251003005	Kaluakoi Hotel Units							
						251003006	Kaluakoi Resort Condos Units							
						251003006	Kaluakoi Resort Condos Landscaping							
						251003007	Kaluakoi Golf Course							
						251003011	Kaluakoi Resort Condos Units							
						251003011	Kaluakoi Resort Condos Landscaping							
						251003013	Kaluakoi Resort Condos Units							
						251003013	Kaluakoi Resort Condos Landscaping							
						251003021	Kaluakoi Golf Course							
						251003022	Kaluakoi Golf Course							
						251003024	Kaluakoi Golf Course							
						251003027	Kaluakoi Golf Course							
						251004000	Kaluakoi Resort Residences Homes							
						251004000	Kaluakoi Resort Residences Irrigation							
						251005000	Kaluakoi Resort Residences Homes							
						251005000	Kaluakoi Resort Residences Irrigation							
						251006000	Kaluakoi Resort Residences Homes							
						251006000	Kaluakoi Resort Residences Irrigation							
						251006073	Papohaku Beach Park							
						251007000	Kaluakoi Resort Residences Irrigation							
						251007000	Kaluakoi Resort Residences Homes							
						251008000	Kaluakoi Resort Residences Irrigation							
						251008000	Kaluakoi Resort Residences Homes							
						252028000	Kualapu'u							

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Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Molokai

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
						252029000	Kualapu'u Landscaping							

2 records listed for the island of Molokai

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Koolaupoko	00403	Honolulu Board of Water Supply, BWS	Waihee Tunnel	3-2651-002	4.500		MUNICIPAL USE	10/01/1993	11/10/1993	11/26/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00404	Honolulu Board of Water Supply, BWS	Waihee Incline 1	3-2652-002	1.000		MUNICIPAL USE	10/01/1993	11/10/1993	11/26/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00404	Honolulu Board of Water Supply, BWS	Waihee Incline 2	3-2652-003				10/01/1993	11/10/1993	11/26/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00404	Honolulu Board of Water Supply, BWS	Waihee Incline 3	3-2652-001				10/01/1993	11/10/1993	11/26/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00404	Honolulu Board of Water Supply, BWS	Waihee Incline 4	3-2652-004				10/01/1993	11/10/1993	11/26/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00471	Honolulu Board of Water Supply, BWS	Haiku	3-2450-002	0.543		DEFERRED PORTION OF EXISTING/FUTURE USE WUPNO.330	10/01/1993	11/10/1993	11/24/1993	02/02/1994	03/30/1994	08/16/1995	
Koolaupoko	00472	Honolulu Board of Water Supply, BWS	Kahaluu	3-2651-003	0.073		DEFERRED PORTION OF EXISTING/FUTURE USE WUP NO.333	10/01/1993	11/10/1993	11/24/1993	02/02/1994	03/30/1994	08/16/1995	
Malakole	00430	West Beach Estates	W. Beach Non-potable	3-2006-017	1.636	191000000	KO OLINA PHASE II G.COURSE; PHASE I&II LANDSCAPING	01/30/1996	03/06/1996	03/20/1996		03/20/1996	04/15/1996	
Nuuanu	00460	Honolulu Board of Water Supply, BWS	Nuuanu Aerator	3-2149-003	0.500		REPLACEMENT FOR SW SOURCES; MUNICIPAL GROWTH	11/22/1996	01/28/1997	02/11/1997		02/20/1997	02/18/1997	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Kahana Tunnel 1	3-3154-001	0.064	148012005	IRRIGATION OF VARIOUS CROPS & FLOWERS	12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Uwao Tunnel Ext	3-2953-003				12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Waiahole Main Tunnel	3-2853-001				12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Waiahole Uwao Tunnel	3-2953-001				12/27/2002	04/07/2003	04/21/2003			05/21/2003	

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Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Waiahole Ditch	00648	Susan J.O. Tamashiro	Waiawa Dev Tun Exit	3-2657-005				12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Waikane Tunnel 1	3-3053-001				12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00648	Susan J.O. Tamashiro	Waikane Tunnel 2	3-2953-002				12/27/2002	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Kahana Tunnel 1	3-3154-001	0.021	148012005	IRRIGATION OF FARM CROPS	01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Uwao Tunnel Ext	3-2953-003				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Waiahole Main Tunnel	3-2853-001				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Waiahole Uwao Tunnel	3-2953-001				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Waiawa Dev Tun Exit	3-2657-005				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Waikane Tunnel 1	3-3053-001				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00649	Anthony J. Fraiola, Jr.	Waikane Tunnel 2	3-2953-002				01/14/2003	04/07/2003	04/21/2003			05/21/2003	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Kahana Tunnel 1	3-3154-001	1.284	192004001 192004003 192004005 192004006	Irrigation for 849 acres of seed corn, soy, & livestock	08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Waiahole Main Tunnel	3-2853-001				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Uwao Tunnel Ext	3-2953-003				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Waiahole Uwao Tunnel	3-2953-001				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Waiawa Dev Tun Exit	3-2657-005				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Waikane Tunnel 1	3-3053-001				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	
Waiahole Ditch	00875	Syngenta Hawaii LLC	Waikane Tunnel 2	3-2953-002				08/26/2009	09/18/2009	10/02/2009		04/30/2010	01/20/2011	

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Kahana Tunnel 1	3-3154-001	0.422	194002080	Irrigation for 123 acres diversified crops over 26 lots (ave 4.7 acres)	01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Uwao Tunnel Ext	3-2953-003				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Waiahole Main Tunnel	3-2853-001				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Waiahole Uwao Tunnel	3-2953-001				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Waiawa Dev Tun Exit	3-2657-005				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Waikane Tunnel 1	3-3053-001				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waiahole Ditch	00907	State of Hawaii Department of Agriculture Oahu, HDOA	Waikane Tunnel 2	3-2953-002				01/03/2011	02/04/2011	02/21/2011		04/03/2011		
Waipahu-Waiawa	00954	Monsanto Company - Oahu	Kunia Farm 1	3-2402-006	2.636	192001001	backup to WUP 828 in emergencies (if existing Waiahole Ditch system fails)	05/04/2012	05/25/2012	06/11/2012		08/02/2012	12/19/2012	

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Ewa-Kunia	01105	White Labels Venture LLC	The Groves	3-2104-002	0.151	192003098	AGRCP (coconut)	04/09/2021	06/25/2021	07/09/2021		07/08/2021	09/21/2021	
						192003098	AGRCP (citrus)							
						192003098	AGRCP (mango)							
						192003098	AGRON (flowering trees)							
						192003098	AGRLI (5 horses)							
						192003098	AGRCP (vertical farming)							
						192003098	AGRCP (vine crops dragon fruit)							
						192003098	AGROTH (grass-habitat maintenance)							
						192003098	ACRCP (avocado)							
						192003098	AGROTH (grass-landscaping areas)							
Waialua	01109	Ka'ala Ranch LLC	Ka'ala Ranch 2	3-3306-033	0.360	166027010	Irrigation for 20 acres Cacao	04/15/2021	12/13/2024	12/30/2024		07/14/2021		
						166027010	Irrigation 70 acres for cattle livestock							
						166027010	6 domestic units							
						166027010	Irrigation for 34 acres Hemp							
						166027010	Irrigation for 20 acres Tumeric							
Waimanalo	01121	Nichols, Kitty D Trust	KNICHOLS 2022	3-2043-003	0.006	141024081	Existing farm dwelling	05/18/2022	03/08/2024	03/22/2024		08/16/2022		
						141024081	Turf							
						141024081	Ornamentals and nursery plants							
Koolauloa	01119	Patrick Morris (Kahuku Maluhia LLC)	Maluhia 2021	3-4158-019	0.038	156005002	AGRAQ	07/10/2023	08/25/2023	09/08/2023		10/08/2023		
						156005002	Domestic							
Waipahu-Waiawa	01185	Guyland LLC	Hawaii Country Club	3-2603-001	0.446	194004009	DOM	01/23/2024	03/22/2024	04/09/2024		04/22/2024		
						194004020	DOMNC							
						194004020	IRRGC							

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
Waipahu-Waiawa	01117	Honolulu Board of Water Supply, BWS	Waipio Hts III-3	3-2659-005	1.750	194003004	Municipal (A29 to A31 single family development)	09/23/2024	11/29/2024	12/13/2024		12/22/2024		
						194005052	Municipal (existing Kipapa Acres)							
						194006058	Municipal (A1 single family development)							
						194006059	Municipal (A1 single family development)							
						194006060	Municipal (A1 single family development)							
						194006061	Municipal (A1 single family development)							
						194006062	Municipal (A2 single family development)							
						194006063	Municipal (A1 single family development)							
						194006064	Municipal (A2 single family development)							
						194006068	Municipal (M2 multi-family development)							
						194006069	Municipal (A2 single family development)							
						194006077	Municipal (A3 single family development)							
						194006078	Municipal (A3 single family development)							
						194006079	Municipal (A3 single family development)							
						194006080	Municipal (A3 single family development)							
						194006081	Municipal (A3 single family development)							
						194006082	Municipal non-potable (Community Park)							
						194006084	Municipal (A2 single family development)							
						194006085	Municipal (A2 single family development)							
						194006086	Municipal (A1 single family development)							
						194006087	Municipal (A1 single family development)							
						194006088	Municipal (A1 single family							

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
							development)							
						194006090	Municipal (A1 single family development)							
						194006091	Municipal (A4 single family development)							
						194006091	Municipal non-potable (Kalahikiola Park)							
						194006093	Municipal (I1 light industry development)							
						194006094	Municipal (I1 light industry development)							
						194006095	Municipal (I1 light industry development)							
						194006096	Municipal (I1 light industry development)							
						194006097	Municipal (I1 light industry development)							
						194006098	Municipal (I1 light industry development)							
						194006099	Municipal (I1 light industry development)							
						194006101	Municipal (I1 light industry development)							
						194006102	Municipal (I1 light industry development)							
						194006103	Municipal (I1 light industry development)							
						194006104	Municipal (I1 light industry development)							
						194006105	Municipal (I1 light industry development)							
						194006107	Municipal (M1b senior housing development)							
						194006108	Municipal (M1b senior housing development)							
						194006109	Municipal (M1a single family development)							
						194006110	Municipal (M1 medical center development)							
						194006113	Municipal (M7 commercial development)							
						194006115	Municipal (Fire Station, Community Center, and Neighborhood							

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Report Parameters

WUP Type: Water Use Permit Application, Administrative Modification, Transfer, CWRM Revocation Action

Oahu

Aquifer System	WUP No	Applicant	Well Name	Well No.	mgd	TMK	Use Description	Accepted	PN2	Object	PH	Deadline	Agenda	Final Action
							Businesses) 194006115 Municipal non-potable (Parks P1 and P3 to P8) 194006115 Municipal (A13, A14, A1, A23, A24, A28, M10 to M14, and M17 multi-family development) 194006115 Municipal (M8 and M9 commercial/residential mixed use development - commercial water use) 194006115 Municipal (A5 to A12, A17 to A22, and A25 to A27 single family development) 194006115 Municipal (M8 and M9 commercial/residential mixed use development - multi-family water use) 194006115 Municipal (Church, Day Care, and School) 194006117 Municipal (M3 commercial development) 194006119 Municipal (M5 commercial development) 194006122 Municipal (M6 commercial development) 194006123 Municipal (M4 commercial development)							
Waipahu-Waiawa	01117	Honolulu Board of Water Supply, BWS	Waipio Hts III-4	3-2659-006				09/23/2024	11/29/2024	12/13/2024		12/22/2024		
Waipahu-Waiawa	01199	Kunia Village Development Corporation	KVDC	3-2703-007	0.150	192005023 192005023 192005023	Marijuana Farm Hydroponic Lettuce / Fish Domestic	10/25/2024	12/13/2024	12/30/2024		01/23/2025		

46 records listed for the island of Oahu

Notes: WMA = Water Management Area; WUP = Water use permit; mgd = million gallons per day, requested amount; PN2 = 2nd Public Notice; Object = Objection Deadline; PH = Public Hearing Date, if necessary. If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

Stream Channel Alteration Permit (SCAP) Applications Bulletin

File ID	Applicant/Petitioner	Stream	Description	TMK	Accepted	90-day Deadline	Agenda	Final Action

No Stream Channel Alteration Permits Pending

File ID	Requestor	Stream	Description	TMK	Event Date	Completed	Project Impacts	Permit Requirement
Hawaii								
RFD.6328.8	BHE Renewables, LLC	Wailuku	BHE Renewables, Wailuku River Dredging Upstream of Power Plant	(3) 2-6-018:004	10/07/2024	11/20/2024	Stream; Repair	NO
1 records for the island of Hawaii								
Oahu								
RFD.6338.3	Aupuni Viela	Kaukonahua	Concrete Road Erosion Repair, Kaukonahua	(1) 6-7-000:000	10/24/2024	11/22/2024	Stream; Repair	NO
RFD.6330.3	Bills Engineering, Inc.	Kapālama Stream	City & County of Honolulu, Restoration of CRM Channel Walls, Kapalama	(1) 1-6-005:000	10/09/2024	11/20/2024	Stream; Repair	NO
RFD.6318.3	Jim Hayes (Planning Solutions, Inc.)	Kamiloiki	Anapalau Street Channel Erosion Control Improvements, Hawaii Kai	(1) 3-9-048:020 (1) 3-9-048:021 (1) 3-9-048:029 (1) 3-9-048:032 (1) 3-9-048:033 (1) 3-9-048:034	08/30/2024	11/25/2024	Repair	NO
RFD.6215.3	Yogi Kwong Engineers	Kaaawa	BWS Test Boring, Kaaawa	(1) 3-7-007:056	02/02/2024			
4 records for the island of Oahu								

Project Impacts: *Stream = Project area is considered a stream (perennial or intermittent); Channel = Project will impact the stream channel; Instream = May impact instream uses; Repair = Project is considered repair and maintenance; Complete = Project is completed.* ***Permit Requirements:*** *Yes = SCAP is required; No = SCAP is not required; Need Info = SCAP may be required, but more information is necessary; YES-ATF = Project is complete and an After-the-Fact SCAP is required*

File ID	Applicant/Petitioner	Stream	Description	TMK	Accepted	90-day Deadline	Agenda	Final Action
Maui								
SDWP.5722.6	Cynthia Driskill	Waipio Iki	Driskill, Application to Abandon, Waipio Iki, Paia	(2) 2-9-007:022	07/12/2021	10/10/2021		
SDWP.5691.6	Seth Marshall		Marshall, Application to Abandon, Unnamed Spring, Haiku	(2) 2-9-007:017 (2) 2-9-007:046	07/12/2021	10/10/2021		
SDWP.5508.6	Patrick and Naomi Guth (Guth Farms)	Kahoma	Guth Farms, 100,000 gpd for Commercial Diversified Agr and Kalo, After-The-Fact Application, Kahoma	(2) 4-5-016:888 (2) 4-5-017:005 (2) 4-5-017:007 (2) 4-5-017:888	03/25/2021	06/23/2021		
SDWP.5290.6	Fredrick Swaroop Honig (Spirit of Aloha)	Kealii	Spirit of Aloha Temple, 72,000 gpd for Kalo and Div. Ag, Kealii	(2) 2-8-004:032	06/24/2024	09/22/2024	09/17/2024	11/19/2024
4 records for the island of Maui								
Oahu								
SDWP.1610.3	Waimea Valley Adventure Park	Kamananui	ATF Diversion at Kamananui (OA-294). Waiting for SMA. Waimea	(1) 6-1-002:002	11/23/1999	02/21/2000		
1 records for the island of Oahu								

File ID	Applicant/Petitioner	Stream	Description	TMK	Accepted	180-day Deadline	Agenda	Final Action
Kauai								
PAIFS.5667.2	Commission on Water Resource Management, CWRM	North Fork Wailua River, Waikoko Stream	Waikoko Stream and North Fork Wailua River, Wailua, Kauai		06/01/2018	11/28/2018	8/21/2018	
1 records for the island of Kauai								
Maui								
PAIFS.5627.6	Commission on Water Resource Management, CWRM	Honokowai Stream	Commission-initiated PAIFS, Honokowai Stream, West Maui		08/08/2019	02/04/2020		
1 records for the island of Maui								
Molokai								
PAIFS.5153.4	Earthjustice	Kaunankakai Stream, Kawela Stream, Manawainui Stream, Waikolu Stream	Molokai No Ka Heke's Combined PAIIFS for Waikolu, Kawela, Manawainui, Kaunakakai Streams		07/01/2019	12/28/2019		
1 records for the island of Molokai								
Oahu								
PAIFS.5666.3	Commission on Water Resource Management, CWRM	He'eia Stream	Commission-initiated PAIFS, Heeia Stream, Heeia, Oahu		09/25/2020	03/24/2021		
PAIFS.3574.3	Bay View Golf Park, Inc.	Kawa	PAIFS, Kawa Stream, Well Impacts, Kaneohe, Oahu (OA-305)	(1) 4-5-030:001	03/09/2000	09/05/2000		
PAIFS.3573.3	Waimea Valley Adventure Park	Kamananui	PAIFS, Kamananui Stream, Diversion for Irrigation Use, Waimea, Oahu	(1) 6-1-002:002	11/23/1999	05/21/2000		
PAIFS.3570.3	Luana Hills Country Club	Ainoni	PAIFS, Ainoni Stream, Well Impacts, Kailua, Oahu (OA-218)	(1) 4-2-008:001 (1) 4-2-009:001	02/28/1997	08/27/1997	10/22/1997	
PAIFS.3569.3	Luana Hills Country Club	Maunawili	PAIFS, Maunawili Stream, Well Impacts, Kailua, Oahu (OA-218)	(1) 4-2-008:001 (1) 4-2-009:001	02/28/1997	08/27/1997	10/22/1997	
PAIFS.3568.3	Luana Hills Country Club	Omao	PAIFS, Omao Stream, Well Impacts, Kailua, Oahu (OA-218)	(1) 4-2-008:001 (1) 4-2-009:001	02/28/1997	08/27/1997	10/22/1997	
PAIFS.3567.3	Luana Hills Country Club	Makawao	PAIFS, Makawao Stream, Well Impacts, Kailua, Oahu (OA-218)	(1) 4-2-008:001 (1) 4-2-009:001	02/28/1997	08/27/1997	10/22/1997	
PAIFS.3560.3	Alan Brown	Kaalaea	PAIFS, Kaalaea Stream, Diversion for Irrigation Use, Kahaluu, Oahu	(1) 4-7-004:009	05/21/1985	11/17/1985		
8 records for the island of Oahu								

Surface Water Use Permit (SWUP) Applications Bulletin

Hydrologic Unit Codes for Designated Surface Water Management Areas

Maui: 6001 = Waikapu; 6022 Waihee; 6023 Waiehu; 6024 = Iao

Hydro Unit	Event ID	Applicant/Petitioner	Water Source	Water Use Category	Amount (mgd)	Accept Date	Public Notice #1	Public Notice #2	Objections Deadline	Public Hearing	90 day Deadline	Agenda	Final Action
Maui													
6022	5880	Na Mala o Waihee Private Water Co.	Spreckels Ditch Various TMKs	AGR	0.0550	04/24/2023	04/26/2023	05/03/2023	05/17/2023		07/23/2023		
6024	5904	Waikapu Gardens Homeowners Association	Iao-Waikapu Ditch Various TMKs	IRR	0.0440	04/24/2023	04/26/2023	05/03/2023	05/17/2023		07/23/2023		

2 records for the island of Maui

Water Use Categories: AGR=Agriculture; DOM=Domestic; IND=Industrial; IRR=Irrigation; MIL=Military; MUN=Municipal

**If a public hearing is required, applications go before the CWRM within 180 days, otherwise within 90 days.

APPENDIX N

Summary of New Water Demands for the Mākena Mauka Project

Required Supply for the Mākena Mauka Project (Exclusive of Workforce Housing in M-2 and M-3 Lots) to be Supplied by Private Water System

Use	No. of Units	Potable GPD/Unit	Irrigation GPD/Unit	Potable GPD	Irrigation GPD
Single Family	180	300	500	54,000	90,000
Multi-Family	363	300	300	108,900	108,900
Golf Course Amenity Building	- -	- -	- -	42,900	31,400
Other Water Use	- -	- -	- -	19,000	- -
Park	6.7 (Acres)	- -	1,700 / Acre	- -	11,390
South Golf Course	65 (Acres)	- -	- -	- -	388,500
Total Average Demand				**224,800**	**630,190**
Total Maximum Demand (1.5x Average)				**337,200**	**945,285**

This table was modified from Table 2 Tom Nance's Water Resources Assessment for the Makena Mauka Project dated November 2025 to include the South Golf Course using data provided by SSFM.

Required Supply for Workforce Housing in Lots M-2 and M-3 at Mākena Mauka Project to be Supplied by MDWS

Use	No. of Units	Potable GPD/Unit	Potable GPD
Single Family	15	600	9,000
Multi-Family	94	560[1]	52,640
Total Average Demand			**61,640**
Total Maximum Demand (1.5x Average)			**92,460**

[1] Estimated consumption demand taken from table 100-18 of MDWS Standards.

Demand Summary for the Mākena Mauka Project without RO recovery

Item	Potable GPD	Irrigation GPD	Total GPD
Average Demand to MDWS	61,640	N/A	**61,640**
Maximum Demand to MDWS CMS	92,460	N/A	**92,460**
Average Demand for Private System	224,800	630,190	**854,990**
Maximum Demand for Private System	337,200	945,285	**1,282,485**
Total Average Demand	**286,440**	**630,190**	**916,630**
Total Maximum Demand	**429,660**	**945,285**	**1,374,945**

This table totals demands from the above two tables.

Demand Summary for the Mākena Mauka Project with RO Recovery by Category

Category	Total Average Demand GPD (with RO Recovery)	Total Maximum Demand GPD (with RO Recovery)
Potable (supplied by private water system)	**345,846**	**518,769**
Potable Affordable Housing (supplied by MDWS CMS)	**61,640**	**92,460**
Non-Potable Irrigation (supplied by private water system)	**630,190**	**945,285**
Total Demand	**1,037,676**	**1,556,514**

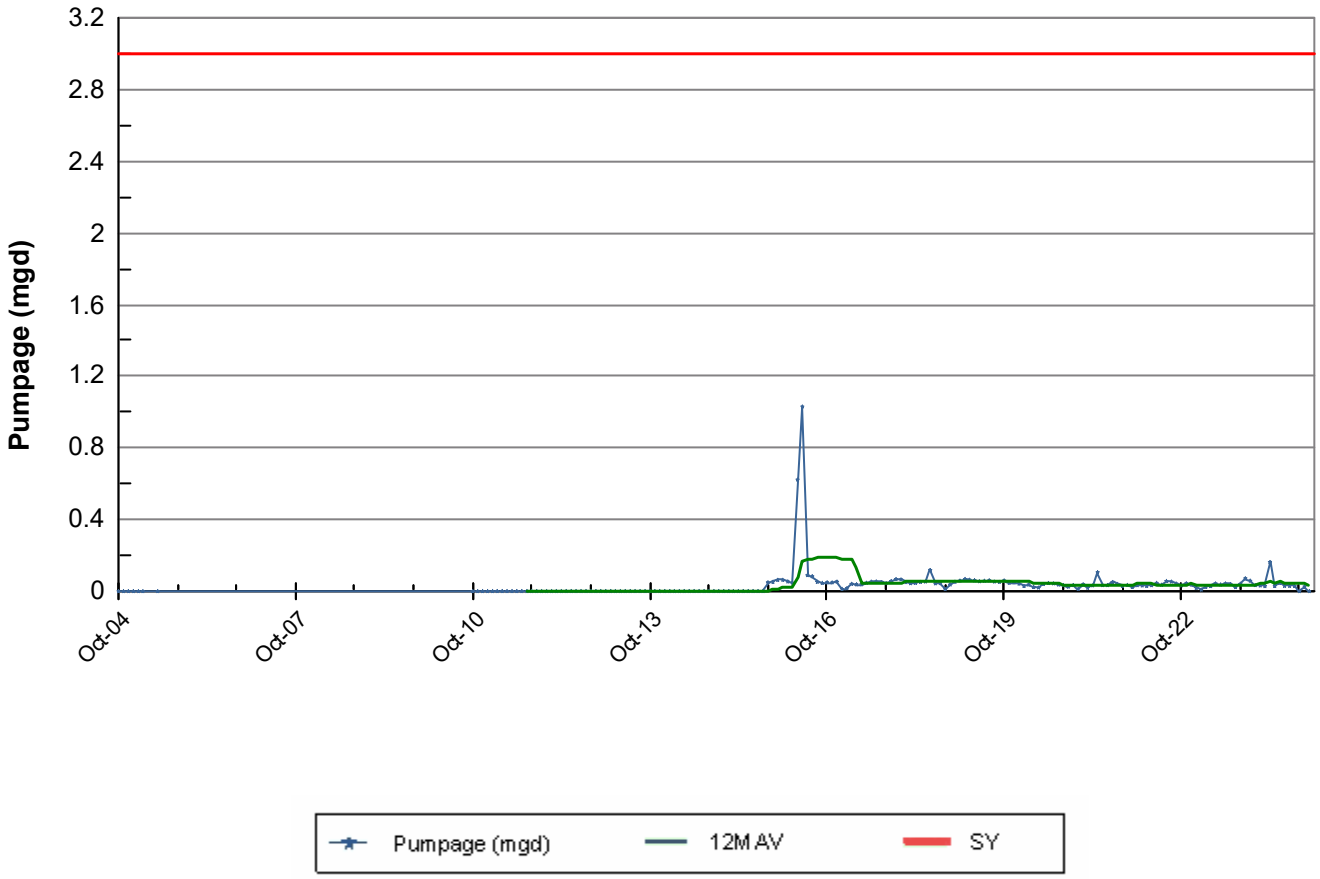
Total Required Supply Needed to be Pumped from Private Well with 65% RO Recovery

Item	Potable GPD	Irrigation GPD
Average Consumption Demand	224,800	630,190
Average Well Demand	345,846	630,190
	Total Average Well Demand	976,036
Maximum Consumption Demand	337,200	945,285
Maximum Well Demand	518,769 (RO Treatment Required with 65% Recovery)	945,285 (no RO treatment needed)
	Total Maximum Well Demand	**1,464,054**

APPENDIX O

Monthly Pumpage Chart

12 Month Moving Average



Report Parameters

Date:	10/1/2004 - 01/13/2025
Island:	Maui
Well Owner:	All
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	Wailuku
Aquifer:	60101 Waikapu
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
October 2004	0.000		3.000
November 2004	0.000		3.000
December 2004	0.000		3.000
January 2005	0.000		3.000
February 2005	0.000		3.000
March 2005	0.000		3.000
April 2005			3.000
May 2005			3.000
June 2005	0.000		3.000
July 2005			3.000
August 2005			3.000
September 2005			3.000
October 2005			3.000
November 2005			3.000
December 2005			3.000
January 2006			3.000
February 2006			3.000
March 2006			3.000
April 2006			3.000
May 2006			3.000
June 2006			3.000
July 2006			3.000
August 2006			3.000
September 2006			3.000
October 2006			3.000
November 2006			3.000
December 2006			3.000
January 2007			3.000
February 2007			3.000
March 2007			3.000
April 2007			3.000
May 2007			3.000
June 2007			3.000
July 2007			3.000
August 2007			3.000
September 2007			3.000
October 2007			3.000
November 2007			3.000
December 2007			3.000
January 2008			3.000
February 2008			3.000
March 2008			3.000
April 2008			3.000
May 2008			3.000
June 2008			3.000
July 2008			3.000
August 2008			3.000
September 2008			3.000
October 2008			3.000
November 2008			3.000
December 2008			3.000
January 2009			3.000
February 2009			3.000
March 2009			3.000
April 2009			3.000
May 2009			3.000
June 2009			3.000
July 2009			3.000
August 2009			3.000
September 2009			3.000
October 2009			3.000
November 2009			3.000
December 2009			3.000
January 2010			3.000
February 2010			3.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
March 2010			3.000
April 2010			3.000
May 2010			3.000
June 2010			3.000
July 2010			3.000
August 2010			3.000
September 2010			3.000
October 2010	0.000		3.000
November 2010	0.000		3.000
December 2010	0.001		3.000
January 2011	0.001		3.000
February 2011	0.001		3.000
March 2011	0.001		3.000
April 2011	0.001		3.000
May 2011	0.001		3.000
June 2011	0.001		3.000
July 2011	0.001		3.000
August 2011	0.001		3.000
September 2011	0.001	0.000	3.000
October 2011	0.001	0.001	3.000
November 2011	0.001	0.001	3.000
December 2011	0.001	0.001	3.000
January 2012	0.001	0.001	3.000
February 2012	0.001	0.001	3.000
March 2012	0.001	0.001	3.000
April 2012	0.001	0.001	3.000
May 2012	0.001	0.001	3.000
June 2012	0.001	0.001	3.000
July 2012	0.001	0.001	3.000
August 2012	0.001	0.001	3.000
September 2012	0.001	0.001	3.000
October 2012	0.001	0.001	3.000
November 2012	0.001	0.001	3.000
December 2012	0.001	0.001	3.000
January 2013	0.001	0.001	3.000
February 2013	0.001	0.001	3.000
March 2013	0.001	0.001	3.000
April 2013	0.001	0.001	3.000
May 2013	0.001	0.001	3.000
June 2013	0.001	0.001	3.000
July 2013	0.001	0.001	3.000
August 2013	0.001	0.001	3.000
September 2013	0.001	0.001	3.000
October 2013	0.001	0.001	3.000
November 2013	0.001	0.001	3.000
December 2013	0.001	0.001	3.000
January 2014	0.001	0.001	3.000
February 2014	0.001	0.001	3.000
March 2014	0.001	0.001	3.000
April 2014	0.001	0.001	3.000
May 2014	0.001	0.001	3.000
June 2014	0.001	0.001	3.000
July 2014	0.001	0.001	3.000
August 2014	0.001	0.001	3.000
September 2014	0.001	0.001	3.000
October 2014	0.001	0.001	3.000
November 2014	0.001	0.001	3.000
December 2014	0.001	0.001	3.000
January 2015	0.001	0.001	3.000
February 2015	0.001	0.001	3.000
March 2015	0.001	0.001	3.000
April 2015	0.001	0.001	3.000
May 2015	0.001	0.001	3.000
June 2015	0.001	0.001	3.000
July 2015	0.001	0.001	3.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
August 2015	0.001	0.001	3.000
September 2015	0.001	0.001	3.000
October 2015	0.050	0.005	3.000
November 2015	0.052	0.009	3.000
December 2015	0.063	0.014	3.000
January 2016	0.064	0.019	3.000
February 2016	0.054	0.024	3.000
March 2016	0.048	0.028	3.000
April 2016	0.623	0.080	3.000
May 2016	1.031	0.166	3.000
June 2016	0.089	0.173	3.000
July 2016	0.083	0.180	3.000
August 2016	0.052	0.184	3.000
September 2016	0.047	0.188	3.000
October 2016	0.050	0.188	3.000
November 2016	0.049	0.188	3.000
December 2016	0.053	0.187	3.000
January 2017	0.013	0.183	3.000
February 2017	0.017	0.180	3.000
March 2017	0.041	0.179	3.000
April 2017	0.038	0.130	3.000
May 2017	0.039	0.048	3.000
June 2017	0.047	0.044	3.000
July 2017	0.053	0.042	3.000
August 2017	0.054	0.042	3.000
September 2017	0.051	0.042	3.000
October 2017	0.045	0.042	3.000
November 2017	0.056	0.042	3.000
December 2017	0.068	0.043	3.000
January 2018	0.066	0.048	3.000
February 2018	0.050	0.051	3.000
March 2018	0.044	0.051	3.000
April 2018	0.047	0.052	3.000
May 2018	0.052	0.053	3.000
June 2018	0.054	0.053	3.000
July 2018	0.118	0.059	3.000
August 2018	0.043	0.058	3.000
September 2018	0.045	0.057	3.000
October 2018	0.012	0.055	3.000
November 2018	0.037	0.053	3.000
December 2018	0.053	0.052	3.000
January 2019	0.059	0.051	3.000
February 2019	0.069	0.053	3.000
March 2019	0.064	0.054	3.000
April 2019	0.061	0.056	3.000
May 2019	0.055	0.056	3.000
June 2019	0.059	0.056	3.000
July 2019	0.061	0.052	3.000
August 2019	0.054	0.052	3.000
September 2019	0.052	0.053	3.000
October 2019	0.060	0.057	3.000
November 2019	0.047	0.058	3.000
December 2019	0.049	0.058	3.000
January 2020	0.042	0.056	3.000
February 2020	0.029	0.053	3.000
March 2020	0.037	0.051	3.000
April 2020	0.023	0.047	3.000
May 2020	0.021	0.044	3.000
June 2020	0.040	0.043	3.000
July 2020	0.046	0.042	3.000
August 2020	0.044	0.041	3.000
September 2020	0.037	0.040	3.000
October 2020	0.034	0.037	3.000
November 2020	0.025	0.036	3.000
December 2020	0.034	0.034	3.000

Month Year	Pumpage (Mgd)	12MAV (Mgd)	SY (Mgd)
January 2021	0.013	0.032	3.000
February 2021	0.039	0.033	3.000
March 2021	0.019	0.031	3.000
April 2021	0.032	0.032	3.000
May 2021	0.106	0.039	3.000
June 2021	0.034	0.039	3.000
July 2021	0.034	0.038	3.000
August 2021	0.051	0.038	3.000
September 2021	0.041	0.039	3.000
October 2021	0.029	0.038	3.000
November 2021	0.035	0.039	3.000
December 2021	0.023	0.038	3.000
January 2022	0.033	0.040	3.000
February 2022	0.032	0.039	3.000
March 2022	0.029	0.040	3.000
April 2022	0.033	0.040	3.000
May 2022	0.047	0.035	3.000
June 2022	0.036	0.035	3.000
July 2022	0.057	0.037	3.000
August 2022	0.054	0.037	3.000
September 2022	0.042	0.038	3.000
October 2022	0.032	0.038	3.000
November 2022	0.044	0.039	3.000
December 2022	0.037	0.040	3.000
January 2023	0.018	0.039	3.000
February 2023	0.009	0.037	3.000
March 2023	0.024	0.036	3.000
April 2023	0.029	0.036	3.000
May 2023	0.044	0.035	3.000
June 2023	0.037	0.036	3.000
July 2023	0.043	0.034	3.000
August 2023	0.040	0.033	3.000
September 2023	0.023	0.032	3.000
October 2023	0.042	0.032	3.000
November 2023	0.072	0.035	3.000
December 2023	0.059	0.037	3.000
January 2024	0.034	0.038	3.000
February 2024	0.031	0.040	3.000
March 2024	0.028	0.040	3.000
April 2024	0.162	0.051	3.000
May 2024	0.029	0.050	3.000
June 2024	0.047	0.051	3.000
July 2024	0.030	0.050	3.000
August 2024	0.030	0.049	3.000
September 2024	0.029	0.049	3.000
October 2024	0.000	0.046	3.000
November 2024	0.027	0.042	3.000
December 2024	0.000	0.037	3.000
January 2025			3.000

APPENDIX P

15.6.6 Irrigation Demand Projections

Reported irrigation use of 3.68 mgd within the aquifer sector includes brackish water used for golf course, resort and landscaping irrigation purposes. Over 75 percent of irrigation withdrawals are from the Kamaʻole Aquifer but the data is likely under-reported. This is in addition to irrigation uses served by the MDWS Central and Upcountry Systems. Although irrigation needs may not correspond directly to population growth, it's prudent to project an increase in demand based on population growth, which is at a higher rate than the de facto population growth ("de facto" includes visitors). Demand would increase from 3.68 mgd to 5.59 mgd over the planning period.

In addition to groundwater withdrawals for irrigation, recycled water from the Kīhei Wastewater Reclamation Facility provides up to 1.75 mgd during peak summer months. Reclaimed water is distributed to 24 commercial properties in South Maui for landscape and agricultural irrigation, cooling, fire control, erosion and dust control, drinking water for cattle and other uses.[63] The volume of R-1 water reused varies seasonally. It is estimated that about 1 mgd is reused on average for irrigation purposes. An additional 0.08 mgd of reclaimed water is generated and used at the Mākena Resort, primarily for golf course irrigation. The reclamation facility is undergoing an upgrade to further integrate on-site reclaimed water generation and use.

Table 14-30 Planned Growth Wailuku ASEA and MDWS Central Maui System Service Area

Planned Growth Area	# Units	# Acres	Projected Demand (mgd)
Waiʻale	300+2,254	50+495	1.40 – 1.52
Puʻunani	450/TBD	209	0.75
Kāhili Rural Residential	TBD	218	0.65
Waikapū Tropical Plantation Town	1433	502	0.86 – 1.51
North Kīhei Residential	600	95	0.29 - 0.36
Kīhei Mauka, , and Pulehunui	1,500	583	0.90 – 1.75
Maui Research and Technology Park	1,250	437	0.98 – 1.03
Pulehunui	N/A	639	3.83
TOTAL		**3,228**	**9.6 – 11.04**

Table 14-33 Projected Consumption by CWRM Category, MDWS Central System to 2035

CWRM CATEGORY	2014	2015	2020	2025	2030	2035
Domestic Residential	12,700,856	13,917,175	15,503,723	17,137,436	19,042,779	20,817,699
Domestic Non-Residential	6,284,171	6,885,985	7,670,983	8,479,317	9,422,048	10,300,249
Industrial	611,938	670,541	746,982	825,696	917,497	1,003,014
Municipal	1,228,621	1,346,282	1,499,757	1,657,794	1,842,108	2,013,806
Agriculture	24,130	26,440	29,454	32,558	36,178	39,550
Irrigated	256,824	281,420	313,501	346,537	385,065	420,955
Military	17,232	18,882	21,034	23,251	25,836	28,244
Unknown	30,216	33,110	36,885	40,771	45,304	49,527
TOTAL GPD	21,153,987	23,179,835	25,822,320	28,543,360	31,716,815	34,673,044
TOTAL MGD	**21.154**	**23.180**	**25.822**	**28.543**	**31.717**	**34.673**

Figure 14-28 Projected Consumption by CWRM Category, MDWS Central System to 2035 (GPD)

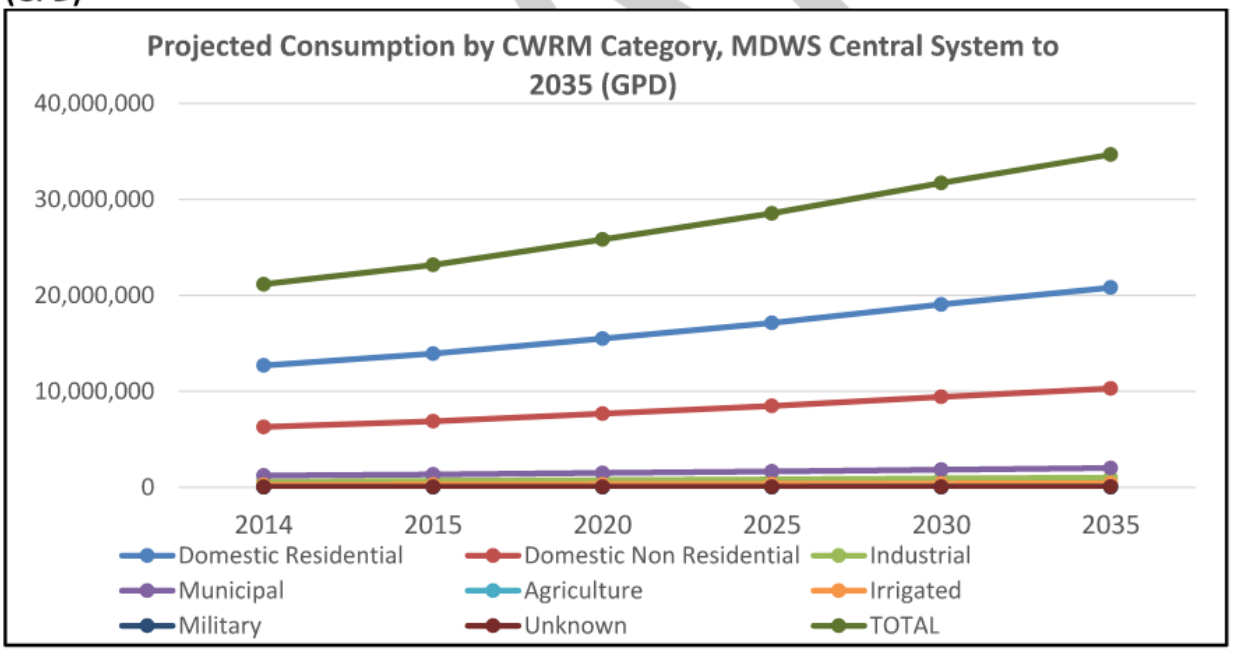


Table 16-31 Projected MDWS Consumption by CWRM Category, Koʻolau ASEA to 2035 (gpd)*

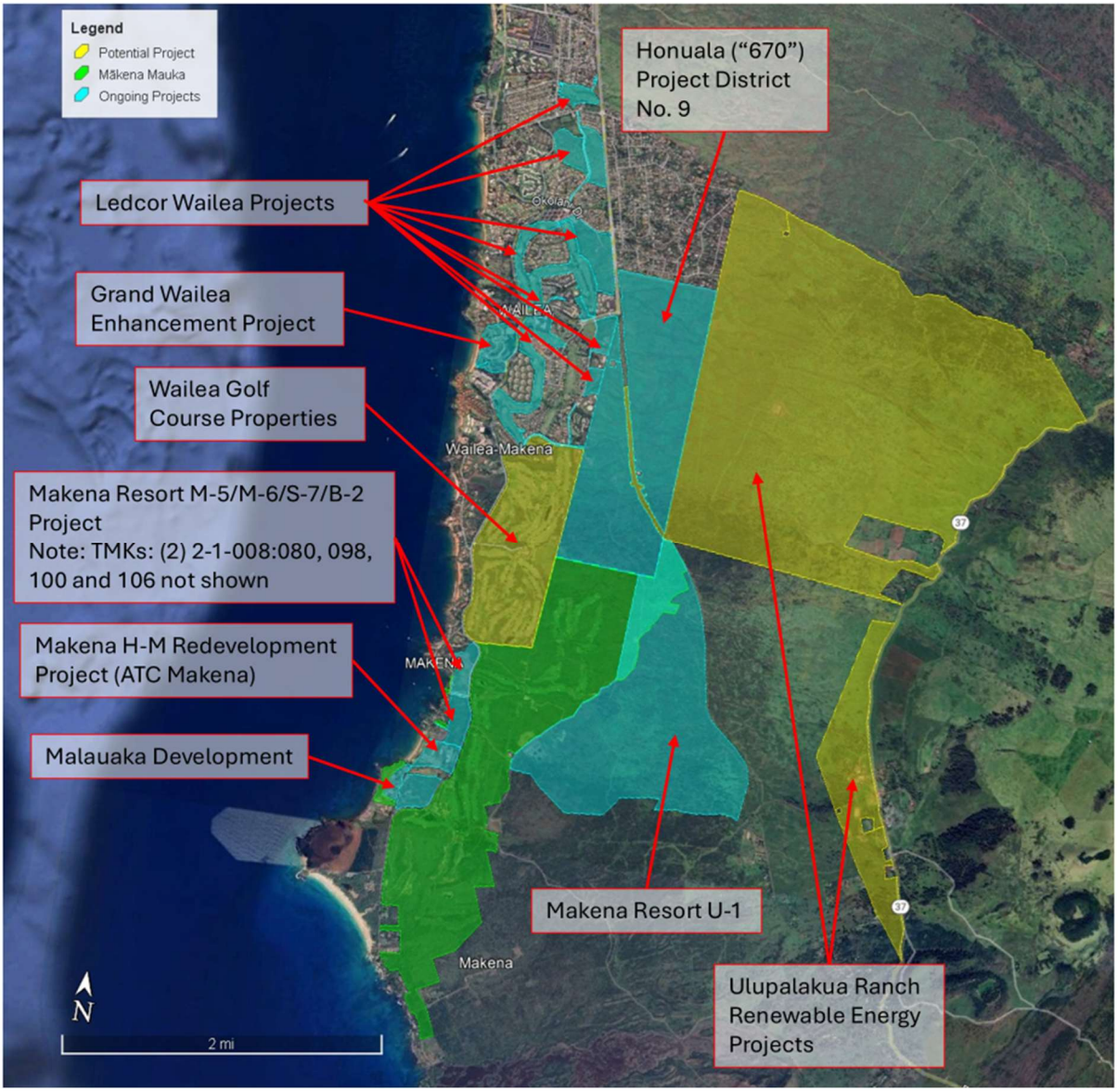
CWRM Categories	2014	2015	2020	2025	2030	2035
Domestic	955,189	964,930	978,693	987,487	996,275	999,729
Industrial	0	0	0	0	0	0
Municipal	11,016	11,128	11,287	11,388	11,490	11,530
Agriculture	1507	1,522	1,544	1,558	1,572	1,577
Irrigated	0	0	0	0	0	0
Military	0	0	0	0	0	0
Unknown	12,159	12,283	12,458	12,570	12,682	12,726
Total	**979,871**	**989,863**	**1,003,982**	**1,013,003**	**1,022,018**	**1,025,562**

Source: MDWS. Based on Calendar Year 2014 consumption billing data within the Koʻolau ASEA for MDWS Water Use Zone (WUZ) Subdistricts: Kokomo-Kaupakalua (311), Kuiaha (312), Haʻikū-Paʻuwela (313), Pukalani (316), Upper Kula (331), Lower Kula (333), Nahikū (913), Keʻanae (915).

*Includes water exported to Central ASEA and then supplied to MDWS Upcountry System customers located within Koʻolau ASEA.

APPENDIX Q

Summary of Proposed New Water Demands in the Makena Area



Ongoing and Potential Impact Projects Map

MALUAKA DEVELOPMENT

Estimated Supply for Maluaka Development

Use	No. of Units	Potable GPD/Unit	Potable GPD
Single-family	13	600	7,800
Multi-Family	6	560	3,360
Total Average Demand			**11,160**
Total Maximum Demand (1.5x Average)			**16,740**

Number of single and multi family units provided by MMP.

Estimated consumption demand taken from table 100-18 of MDWS Standards.

All demands assumed to be supplied by MDWS.

MAKENA REDEVELOPMENT PROJECT

Based on information provided to us by MMP, this redevelopment plans to convert a former hotel 310-room hotel at the Makena Beach & Golf Club Resort into a combination of hotel, condominium, beach cottage units, together with a spa hale. A total of 65 units are proposed.

Since this project is a conversion, we will assume that there will be no additional water demands that comes with this redevelopment.

MAKENA RESORT

Estimated Required Supply for Makena Resort

Use	No. of Units	Potable GPD/Unit	Potable GPD
Multi-family	30	560	16,800
Single-family cottages	18	600	10,800
Single-family Custom Lot	32	600	19,200
Transient Vacation Rental (TVR) Units	9	600	5,400
Condos	14	560	7,840
Commercial Space	0.627 acres	600 gal/acre	376.2
Total Average Demand			**60,416**
Total Maximum Demand (1.5x Average)			**90,624**

Number of units and planned use provided by MMP.

Supplied by MDWS CMS

[1] Assume same demands as Single Family

[2] Assume same demands as Multi-Family

WAILEA 670/ Honua'ula

In the Honua'ula FEIS, they state that they will not rely upon on MDWS, and instead will develop their own private water system. Their EIS estimates that a total average of 1.7 Mgd will be withdrawn from brackish wells in the Kama'ole ASA.

LEDCOR

Estimated Supply for Ledcor Wailea Projects

Average Demand (gpd)	Maximum Demand (gpd)
558,000	837,000

Demands taken from the Ledcor South Maui Properties and Improvements EIS.
To be supplied by MDWS per the Ledcor South Maui Properties and Improvements EIS.

GRAND WAILEA ENHANCEMENT PROJECT

Estimated Required Supply for Grand Wailea Enhancement Project

Use	No. of Units	Potable GPD/Unit	Potable GPD
Resort	151	350	52,850
		Total Average Demand	**52,850**
		Total Maximum Demand (1.5x Average)	**79,275**

Number of resort units provided by MMP.
Assumed to be supplied by MDWS.
Estimated consumption demand taken from table 100-18 of MDWS Standards.

PROPOSED H-2 RESIDENTIAL PROJECT

Estimated Required Supply for Proposed H-2 Residential Project

Use	Average Demand (gpd)	Maximum Demand (1.5x average) (gpd)
Domestic (potable)	47,700	71,550
Irrigation (non-potable)	66,400	99,600

Domestic demands to be supplied by MDWS per the Proposed H-2 Residential Project EA.
Non-potable water demands to be supplied by Makena Golf Course System per the Proposed H-2 Residential Project EA.
Estimated demands per the Proposed H-2 Residential Project EA .

MAKENA RESORT U-1 PROJECT

Estimated Required Supply for Makena Resort U-1 Project

Use	No. of Units	Potable GPD/Acre	Irrigation GPD/Unit	Potable GPD	Irrigation GPD
Main residences	36	1,000	4,000	36,000	144,000
Accessory Dwelling Unit (ADU)	36	600	600	21,600	21,600
Cattle Troughs	- -	15,000	- -	15,000	- -
Total Average Demand				**72,600**	**165,600**
Total Maximum Demand (1.5x Average)				**108,900**	**248,700**
Total average demand required to be pumped and treated with RO				**277,292**	
Total maximum demand required to be pumped and treated with RO				**415,938**	

Demands taken from TNWRE Water Resources Assessment for the MMP.
Assumed to be supplied from private wells.

WAILEA GOLF COURSE PROPERTIES

Based on information provided to us by MMP, Wailea Golf LLC proposes a planned, mix-use development among 214 acres, to include a resort hotel and between 856 and 1,070 housing units. This proposal has been included for possible land use designations in the South Maui Community Plan, awaiting review and approval by the Maui County Council in 2025. However, this information is too preliminary, and the demands are not taken into the total demands on Kama'ole Aquifer.

Ulupalakua Ranch Renewable Energy Projects

Based on information provided to us by MMP, the Paeahu Solar Project, a 15 MW solar array with 60 MWh battery storage, was proposed for Ulupalakua Ranch land. However, it is not currently proceeding. The Hawaii State Energy Office has announced plans for conducting a geothermal survey, so the potential exists for renewable energy projects at Ulupalakua Ranch.

DHHL Reservations

CWRM has established water reservations for DHHL of 2.547 Mgd in the Kama'ole ASA .

Demands to MDWS CMS		
Development	Total Average Demands to MDWS	Maximum Demands to MDWS
MMP Workforce Housing	61,640	92,460
Maluaka Development	11,160	16,740
Makena Resort	60,416	90,624
Ledcor	558,000	837,000
Grand Wailea Enhancement Project	52,850	79,725
H-2 Domestic Potable	47,700	71,550
Total	791,766	1,187,649

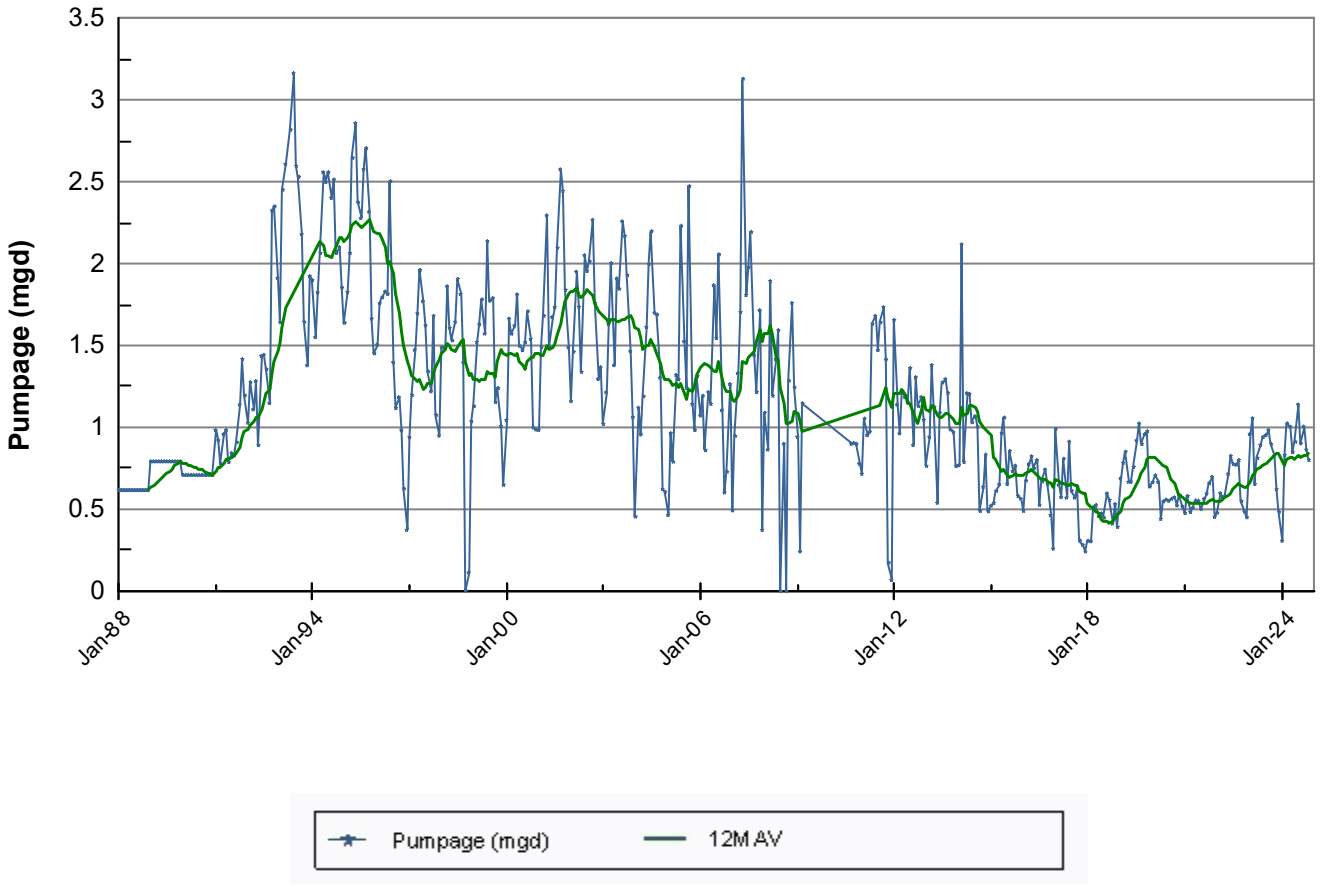
Total Demands on Kama'ole Aquifer		
Development	Total Average Demands on Aquifer	Maximum Average Demands on Aquifer
Current 12-MAV Use	3,660,000	3,660,000
MMP	976,036	1,464,054
U-1 Makena Ranch	277,292	415,938
Wailea 670/Honua'ula	1,700,000	2,550,000
H-2 Irrigation Non-Potable	66,400	99,600
Total Additional Pumpage (Excluding 12-MAV)	3,019,728	4,529,593
Total Pumpage (Including 12-MAV)	6,679,728	8,189,593
DHHL Reservations	2,547,000	2,547,000
Total Including DHHL Reservations	9,226,728	10,736,593

APPENDIX R

Monthly Pumpage Chart

12 Month Moving Average

ATC Makena Wells



Report Parameters

Date:	01/01/1988 - 01/07/2025
Island:	All
Well Owner:	ATC Makena Holdings, LLC
Well Reporter:	All
Well # Prefix:	All
Aquifer Sector:	All
Aquifer:	All
Water Quality:	Fresh (0-250 ppm), Brackish (251-16,999 ppm), Not Specified
Potable/Non-Potable:	All
TMK:	All
PWS:	All
Aquifer Type:	Alluvial, Basal, Caprock, Deep Fresh Water, Dike, Perched, Not
Pump Capacity:	Specified
Well Use:	All

Month Year	Pumpage (Mgd)	12MAV (Mgd)
January 1988	0.617	
February 1988	0.617	
March 1988	0.617	
April 1988	0.617	
May 1988	0.617	
June 1988	0.617	
July 1988	0.617	
August 1988	0.617	
September 1988	0.617	
October 1988	0.617	
November 1988	0.617	
December 1988	0.617	0.617
January 1989	0.792	0.632
February 1989	0.792	0.647
March 1989	0.792	0.661
April 1989	0.792	0.676
May 1989	0.792	0.690
June 1989	0.792	0.705
July 1989	0.792	0.719
August 1989	0.792	0.734
September 1989	0.792	0.749
October 1989	0.792	0.763
November 1989	0.792	0.778
December 1989	0.792	0.792
January 1990	0.711	0.786
February 1990	0.711	0.779
March 1990	0.711	0.772
April 1990	0.711	0.765
May 1990	0.711	0.758
June 1990	0.711	0.752
July 1990	0.711	0.745
August 1990	0.711	0.738
September 1990	0.711	0.731
October 1990	0.711	0.724
November 1990	0.711	0.718
December 1990	0.711	0.711
January 1991	0.984	0.734
February 1991	0.921	0.751
March 1991	0.780	0.757
April 1991	0.958	0.777
May 1991	0.983	0.800
June 1991	0.789	0.807
July 1991	0.844	0.818
August 1991	0.827	0.828
September 1991	0.909	0.844
October 1991	1.139	0.880
November 1991	1.417	0.939
December 1991	1.194	0.979
January 1992	1.028	0.983
February 1992	1.275	1.012
March 1992	1.109	1.039
April 1992	1.282	1.066
May 1992	0.892	1.059
June 1992	1.436	1.113
July 1992	1.443	1.163
August 1992	1.355	1.207
September 1992	1.148	1.227
October 1992	2.323	1.325
November 1992	2.348	1.403
December 1992	1.912	1.463
January 1993	1.641	1.514
February 1993	2.451	1.612
March 1993	2.608	1.737
April 1993		
May 1993	2.817	

Month Year	Pumpage (Mgd)	12MAV (Mgd)
June 1993	3.164	
July 1993	2.596	
August 1993	2.530	
September 1993	2.180	
October 1993	1.645	
November 1993	1.378	
December 1993	1.923	
January 1994	1.899	
February 1994	1.551	
March 1994	1.824	
April 1994	2.064	2.131
May 1994	2.558	2.109
June 1994	2.498	2.054
July 1994	2.557	2.050
August 1994	2.401	2.040
September 1994	2.513	2.068
October 1994	2.065	2.103
November 1994	2.102	2.163
December 1994	1.854	2.157
January 1995	1.639	2.135
February 1995	1.827	2.158
March 1995	2.063	2.178
April 1995	2.646	2.227
May 1995	2.857	2.252
June 1995	2.374	2.241
July 1995	2.277	2.218
August 1995	2.576	2.233
September 1995	2.705	2.249
October 1995	2.316	2.270
November 1995	1.664	2.233
December 1995	1.452	2.200
January 1996	1.505	2.189
February 1996	1.758	2.183
March 1996	1.794	2.160
April 1996	1.830	2.092
May 1996	1.814	2.005
June 1996	2.503	2.016
July 1996	1.396	1.943
August 1996	1.117	1.821
September 1996	1.186	1.695
October 1996	0.982	1.583
November 1996	0.627	1.497
December 1996	0.375	1.407
January 1997	0.940	1.360
February 1997	1.198	1.313
March 1997	1.474	1.287
April 1997	1.696	1.276
May 1997	1.961	1.288
June 1997	1.770	1.227
July 1997	1.623	1.246
August 1997	1.341	1.264
September 1997	1.220	1.267
October 1997	1.681	1.325
November 1997	1.076	1.363
December 1997	0.950	1.411
January 1998	1.488	1.456
February 1998	1.488	1.481
March 1998	1.860	1.513
April 1998	1.608	1.505
May 1998	1.531	1.470
June 1998	1.644	1.459
July 1998	1.907	1.483
August 1998	1.815	1.522
September 1998	1.395	1.537
October 1998	0.004	1.397

Month Year	Pumpage (Mgd)	12MAV (Mgd)
November 1998	0.115	1.317
December 1998	1.038	1.324
January 1999	1.129	1.294
February 1999	1.522	1.297
March 1999	1.629	1.278
April 1999	1.781	1.292
May 1999	1.573	1.296
June 1999	2.137	1.337
July 1999	1.774	1.326
August 1999	1.789	1.324
September 1999	1.155	1.304
October 1999	1.241	1.407
November 1999	1.008	1.481
December 1999	0.649	1.449
January 2000	1.045	1.442
February 2000	1.664	1.454
March 2000	1.572	1.449
April 2000	1.621	1.436
May 2000	1.811	1.455
June 2000	1.498	1.402
July 2000	1.470	1.377
August 2000	1.520	1.354
September 2000	1.708	1.401
October 2000	1.540	1.426
November 2000	0.999	1.425
December 2000	0.986	1.453
January 2001	0.984	1.448
February 2001	1.490	1.433
March 2001	1.682	1.442
April 2001	2.294	1.499
May 2001	1.494	1.472
June 2001	1.673	1.487
July 2001	1.733	1.509
August 2001	2.097	1.557
September 2001	2.574	1.629
October 2001	2.444	1.704
November 2001	1.840	1.774
December 2001	1.487	1.816
January 2002	1.160	1.831
February 2002	1.462	1.828
March 2002	1.951	1.851
April 2002	1.736	1.804
May 2002	1.340	1.791
June 2002	2.051	1.823
July 2002	1.955	1.841
August 2002	2.013	1.834
September 2002	2.268	1.809
October 2002	1.759	1.752
November 2002	1.295	1.706
December 2002	1.367	1.696
January 2003	1.021	1.685
February 2003	1.213	1.664
March 2003	1.629	1.637
April 2003	2.003	1.660
May 2003	1.379	1.663
June 2003	1.909	1.651
July 2003	1.847	1.642
August 2003	2.258	1.662
September 2003	2.168	1.654
October 2003	1.929	1.668
November 2003	1.465	1.682
December 2003	1.062	1.657
January 2004	0.456	1.610
February 2004	1.121	1.602
March 2004	0.957	1.546

Month Year	Pumpage (Mgd)	12MAV (Mgd)
April 2004	1.189	1.478
May 2004	1.612	1.498
June 2004	1.998	1.505
July 2004	2.197	1.534
August 2004	1.701	1.488
September 2004	1.689	1.448
October 2004	1.303	1.396
November 2004	0.624	1.326
December 2004	0.607	1.288
January 2005	0.465	1.289
February 2005	0.965	1.276
March 2005	0.791	1.262
April 2005	1.320	1.273
May 2005	1.293	1.246
June 2005	2.231	1.265
July 2005	1.524	1.209
August 2005	1.240	1.171
September 2005	2.473	1.236
October 2005	1.143	1.223
November 2005	0.983	1.253
December 2005	1.314	1.312
January 2006	1.072	1.362
February 2006	1.193	1.381
March 2006	0.860	1.387
April 2006	1.215	1.378
May 2006	1.144	1.366
June 2006	1.867	1.336
July 2006	1.545	1.337
August 2006	2.056	1.405
September 2006	1.104	1.291
October 2006	0.603	1.246
November 2006	0.730	1.225
December 2006	1.264	1.221
January 2007	0.493	1.173
February 2007	0.948	1.152
March 2007	1.331	1.192
April 2007	1.704	1.232
May 2007	3.128	1.398
June 2007	1.809	1.393
July 2007	1.977	1.429
August 2007	2.194	1.440
September 2007	1.440	1.468
October 2007	1.215	1.520
November 2007	1.714	1.602
December 2007	0.374	1.527
January 2008	1.090	1.577
February 2008	0.864	1.570
March 2008	1.893	1.617
April 2008	1.193	1.574
May 2008	1.416	1.432
June 2008	1.594	1.414
July 2008	0.000	1.249
August 2008	0.900	1.141
September 2008	0.000	1.021
October 2008	1.285	1.027
November 2008	1.759	1.031
December 2008	1.244	1.103
January 2009	0.942	1.091
February 2009	0.243	1.039
March 2009	1.147	0.977
April 2009		
May 2009		
June 2009		
July 2009		
August 2009		

Month Year	Pumpage (Mgd)	12MAV (Mgd)
September 2009		
October 2009		
November 2009		
December 2009		
January 2010		
February 2010		
March 2010		
April 2010		
May 2010		
June 2010		
July 2010		
August 2010		
September 2010	0.900	
October 2010	0.906	
November 2010	0.900	
December 2010	0.779	
January 2011	0.717	
February 2011	1.054	
March 2011	0.952	
April 2011	0.975	
May 2011	1.633	
June 2011	1.681	
July 2011	1.471	
August 2011	1.641	1.134
September 2011	1.734	1.204
October 2011	1.415	1.246
November 2011	0.175	1.186
December 2011	0.068	1.126
January 2012	1.656	1.205
February 2012	1.139	1.212
March 2012	0.963	1.213
April 2012	1.223	1.233
May 2012	1.184	1.196
June 2012	1.155	1.152
July 2012	1.363	1.143
August 2012	0.893	1.081
September 2012	1.306	1.045
October 2012	1.131	1.021
November 2012	1.184	1.105
December 2012	1.047	1.187
January 2013	0.766	1.113
February 2013	0.941	1.096
March 2013	1.381	1.131
April 2013	1.126	1.123
May 2013	0.540	1.069
June 2013	1.090	1.064
July 2013	1.274	1.057
August 2013	1.294	1.090
September 2013	1.211	1.082
October 2013	0.987	1.070
November 2013	0.970	1.052
December 2013	0.763	1.029
January 2014	0.769	1.029
February 2014	2.117	1.127
March 2014	0.789	1.078
April 2014	1.209	1.084
May 2014	1.205	1.140
June 2014	1.031	1.135
July 2014	1.067	1.118
August 2014	1.006	1.094
September 2014	0.490	1.034
October 2014	0.636	1.004
November 2014	0.834	0.993
December 2014	0.488	0.970
January 2015	0.522	0.950

Month Year	Pumpage (Mgd)	12MAV (Mgd)
February 2015	0.539	0.818
March 2015	0.613	0.803
April 2015	0.652	0.757
May 2015	0.964	0.737
June 2015	1.060	0.739
July 2015	0.654	0.705
August 2015	0.856	0.692
September 2015	0.733	0.713
October 2015	0.767	0.724
November 2015	0.582	0.703
December 2015	0.565	0.709
January 2016	0.491	0.706
February 2016	0.676	0.718
March 2016	0.776	0.731
April 2016	0.823	0.746
May 2016	0.751	0.728
June 2016	0.799	0.706
July 2016	0.527	0.695
August 2016	0.670	0.680
September 2016	0.743	0.681
October 2016	0.656	0.672
November 2016	0.465	0.662
December 2016	0.260	0.636
January 2017	0.990	0.678
February 2017	0.651	0.676
March 2017	0.574	0.659
April 2017	0.809	0.658
May 2017	0.571	0.643
June 2017	0.913	0.652
July 2017	0.613	0.660
August 2017	0.571	0.651
September 2017	0.637	0.643
October 2017	0.310	0.614
November 2017	0.283	0.599
December 2017	0.243	0.597
January 2018	0.308	0.540
February 2018	0.304	0.511
March 2018	0.512	0.506
April 2018	0.527	0.483
May 2018	0.458	0.473
June 2018	0.475	0.437
July 2018	0.449	0.423
August 2018	0.597	0.425
September 2018	0.557	0.419
October 2018	0.413	0.427
November 2018	0.531	0.448
December 2018	0.393	0.460
January 2019	0.689	0.492
February 2019	0.784	0.532
March 2019	0.852	0.560
April 2019	0.668	0.572
May 2019	0.668	0.590
June 2019	0.759	0.613
July 2019	0.920	0.653
August 2019	1.024	0.688
September 2019	0.899	0.717
October 2019	0.959	0.762
November 2019	0.977	0.799
December 2019	0.639	0.820
January 2020	0.665	0.818
February 2020	0.707	0.811
March 2020	0.666	0.796
April 2020	0.442	0.777
May 2020	0.548	0.767
June 2020	0.559	0.750

Month Year	Pumpage (Mgd)	12MAV (Mgd)
July 2020	0.552	0.720
August 2020	0.564	0.681
September 2020	0.573	0.654
October 2020	0.523	0.618
November 2020	0.588	0.586
December 2020	0.518	0.576
January 2021	0.476	0.560
February 2021	0.581	0.549
March 2021	0.484	0.534
April 2021	0.510	0.540
May 2021	0.554	0.540
June 2021	0.553	0.540
July 2021	0.503	0.536
August 2021	0.564	0.536
September 2021	0.596	0.538
October 2021	0.660	0.549
November 2021	0.698	0.558
December 2021	0.454	0.553
January 2022	0.480	0.553
February 2022	0.598	0.555
March 2022	0.567	0.562
April 2022	0.580	0.567
May 2022	0.715	0.581
June 2022	0.827	0.604
July 2022	0.776	0.626
August 2022	0.773	0.644
September 2022	0.801	0.661
October 2022	0.550	0.652
November 2022	0.486	0.634
December 2022	0.451	0.634
January 2023	0.959	0.674
February 2023	1.055	0.712
March 2023	0.654	0.719
April 2023	0.814	0.738
May 2023	0.893	0.753
June 2023	0.941	0.763
July 2023	0.953	0.777
August 2023	0.985	0.795
September 2023	0.899	0.803
October 2023	0.828	0.826
November 2023	0.625	0.838
December 2023	0.485	0.841
January 2024	0.308	0.787
February 2024	0.832	0.768
March 2024	1.025	0.799
April 2024	1.005	0.815
May 2024	0.849	0.811
June 2024	0.913	0.809
July 2024	1.140	0.824
August 2024	0.902	0.817
September 2024	1.006	0.826
October 2024	0.864	0.829
November 2024	0.801	0.844
December 2024		
January 2025		