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

WUP 00999.sub.docx

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

September 16, 2015
Honolulu, Oahu

APPLICATION FOR A WATER USE PERMIT
APPLICATION FOR WELL CONSTRUCTION/PUMP INSTALLATION PERMITS
Chase Well (Well No. 3-3208-001), TMK (1) 6-7-002:034, WUP No. 00999
New Potable Ground Water Use for 0.127 mgd
Mokuleia Ground Water Management Area, Oahu

APPLICANT:

Candace Chase
99-1115 Aiea Heights Drive
Aiea, HI 96701

LANDOWNER:

Candace Chase
99-1115 Aiea Heights Drive
Aiea, HI 96701

SUMMARY OF REQUEST:

The applicant requests that the Commission on Water Resource Management (Commission) approve a water use permit for an allocation of **0.127** million gallons per day (mgd) of **potable basal** ground water from **a new** well to supply **3 dwelling units and 15 acres of cacao plant** irrigation. Therewith, the applicant requests approval of Well Construction/Pump Installation Permits for this well.

LOCATION MAP: See Exhibit 1

BACKGROUND:

May 8, 2015 — Applicant filed a new water use permit application (WUPA) for 3 dwelling units and 15 acres of cacao, as well as an application for well construction and pump installation for a new well. Clarifications on water use resulted in amending the water use permit application, deemed acceptable as of June 12, 2015.

August 5 & 12, 2015 — Public notice of the WUPA was published in the Honolulu Star-Advertiser.

August 26, 2015 Deadline for comments and objections. The WUPA and well applications were sent to divisions of the Departments of Health and Land Natural Resources, and to the Department of Hawaiian Home Lands, the Office of Hawaiian Affairs, and the Land Use Commission; the City and County Department of Planning and Permitting, Board of Water Supply and the Mayor. Responses included standard guidance without further comment or objection.

ANALYSIS/ISSUES:

Section 174C-49(a) of the State Water Code establishes seven (7) criteria that must be met to obtain a water use permit. An analysis of the proposed permit in relation to these criteria follows:

(1) Water availability

Through the Hawaii Water Plan, the Commission has adopted 8 mgd as the sustainable yield for the Mokuleia Aquifer System Area. Individual existing water use permits in this aquifer system area are shown in Exhibit 2. A summary of the current ground water conditions in the aquifer is provided in Table 1:

Table 1. Mokuleia **Aquifer System Area**

ITEM	Mokuleia Aquifer System Area (mgd)
Sustainable Yield	**8**
Less: Other Existing Water Use Permits (shown in Exhibit 2)	**7.073**
Reservation to DHHL	**0**
Subtotal (Current Available Allocation)	**0.927**
Less: Other Completed Applications (shown in Exhibit 3)	**0.156**
Less: This Application	0.127
Subtotal (Potential Available Allocation/Allocation Deficit)	**0.644**

Therefore, there is adequate water available to accommodate this application request.

(2) Reasonable-beneficial

Section 174C-3 HRS defines "reasonable-beneficial use" is

"*...the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest*".

I. Purpose of Use

The applicant is requesting the use of potable ground water to supply three dwellings and to irrigate 15 acres of cacao. These are considered residential or domestic use and irrigation uses of water. The Declaration of Policy section, §174C-2(c) HRS, states that the Water Code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for various purposes including residential and irrigation uses.

II. Quantity Justification

The applicant is requesting a total of **0.127** mgd, in two components: 1) 3 dwellings, each on 4 acres, at 1,500 gallons per day (gpd) each; the City & County of Honolulu Planning Department estimates 2,500 gallons per acre per day (gad) for rural residences.

The applicant has relied upon an agronomist to provide an estimate for irrigating cacao at 0.3 acre-inches per day, which translates to 8,146 gad. The plantation acreage (15 acres) is in the hills above the Mokuleia plain, primarily depositional material from the Waianae Range, in moderate slopes of silt, clay and loam, moderately drained. At first glance, this appears far higher than most typical crops grown in Hawaii; waiahole ditch contested case estimated diversified ag use with crop rotation at 2,500 gad while the Department of Agriculture's Agricultural Water Use and Development plan recognized 3,400 gad for diversified crops.
Staff uses an Irrigation Water Requirement Estimation Decision Support System (IWREDDS), produced under contract to the UH College of Tropical Agriculture and Human Resources (UH-CTAHR), to compare a composite of parcel-specific rainfall, ET, soil types, crop type, irrigation methods, etc. As recommended by UH-CTAHR, staff uses the one in five year drought estimate to estimate reasonable irrigation needs. IWREDDS does not list cacao among the crops it can estimate. Running this acreage for a variety of other crops (coffee, guava, etc.) over a range of scenarios yields the expectation that the irrigation requirement is on the order of 2,100-2,200 gad. But a quick Internet search revealed that cacao development and yields are sensitive to drought, including structural development from the very beginning of the growth cycle to optimize eventual yields; well-established plants are more capable of surviving drought; presumably the one in five year drought. Favoring the proposed irrigation rate as a trial can allow for verification under local conditions.

III. Efficiency of Use

The applicant states that its operations are as water efficient as possible through the use of mulching, wind breaks, and overnight irrigation. The applicant is also working with the Natural Resource Conservation Service (USDA/NRCS) preparing a conservation plan and developing growing strategy.

IV. Analysis of Practical Alternatives

The applicant has identified desalting as the sole alternative to the proposed use of potable basal water, which would be too expensive for this operation. No municipal water, wastewater, nor surface water are available. The ditch from the Wahiawa Reservoir runs just makai of the property, but is separated by other parcels and would require easements from three parties. The ditch is proprietary for seed corn, seems to run intermittently, and is not as secure as a private source on the property itself.

(3) Interference with other existing legal uses

There are four other small wells and one major battery from sugar plantation days within 1 mile of this source, none in current use. The smaller wells are for alternative agriculture irrigation and domestic use, with small amounts (1,000 & 2,000 gpd) anticipated but without pumps. The former sugar battery has no current pump but a water use permit for 0.406 mgd and is the full mile distant. Total use of three of the small wells, if producing, would be 4,000 ppd.

The fourth well has resumed reporting after a 12-year hiatus. During the earlier phase, the pumpage never exceeded a 12-MAV of 20,000 gpd, far below its allocated 0.056 mgd. The majority of that allocation was intended for pasture irrigation. Current 12-MAV is 11,000 gpd. That well is a little down-gradient and cross-gradient at a distance of about 2,000 ft, and would not be expected to affect this proposed well even at full pumpage.

Also, given the apparent non-use of other existing allocations (Exhibit 2a) and other pending but incomplete WUPAs (Exhibit 3) and , staff has initiated outreach to get 100% compliance on water use reporting and revocations for non-use of existing allocations. This effort has been ongoing for the past year.

(4) Public interest

Public interest is defined under §174C-2 - Declaration of policy, as follows:

"*(c) The state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation. Such objectives are declared to be in the public interest."*

There are no significant aquatic resources nor native terrestrial species noted in this agriculture and long-time pasture area. For traditional and customary rights, the kipuka database identifies no sites on this parcel; the adjoining parcel contains Kalakiki Heiau. There are no comments from SHPD or other historic properties noted. This WUPA is simply an attempt to expand the diversified agricultural base in cacao. Therefore, this application meets the public interest.

(5) State & county general plans and land use designations

The proposed uses are in the State **Agriculture** District, and the county zoning is **Ag-2**. Therefore, the proposed use is consistent with these land use designations.

Normal agency review includes:

1) the State's Department of Land and Natural Resources (DLNR) and its State Parks, Aquatic Resources, Historic Preservation, and Land Divisions; the Department of Health (DOH) with its Clean Water, Safe Drinking Water, and Wastewater Branches; the Department of Hawaiian Home Lands (DDHL), and Land Use Commission (LUC); and the Office of Hawaiian Affairs (OHA).

2) the Office of the Mayor, Department of Planning and Permitting, and Board of Water Supply;

No comments or objections regarding this project have been made through this review. These proposed uses are consistent with the state and county general plans and land use designations. (if for BWS, "BWS provides water on a first-come-first-serve basis at the building permit phase, which must follow State and County General Plans and land use designations.")

Therefore, this application meets the state & county general plans and land use designations.

6) County land use plans and policies

Again normal County review includes Office of the Mayor, Department of Planning and Permitting, and the Honolulu Board of Water Supply. No comments or objections have been made.

Therefore, this application meets the county land use plans and policies.

(7) Interference with Hawaiian home lands rights

All permits are subject to the prior rights of Hawaiian home lands. The Department of Hawaiian Home Lands (DHHL) and the Office of Hawaiian Affairs have reviewed this application and made no comments or objections regarding the project. Further, standard water use permit conditions 3.g., 6., and 9.f. notify all water use permittees that their permits are subject to and cannot interfere with Hawaiian home land rights.

However, the Department of Hawaiian Home Lands opined that the application did not identify DHHL needs. Staff notes that the State Water Projects Plan identifies DHHL needs, but for North Shore Aquifer System Areas the needs are listed as "0". There are no water reservations for this area.

Standard water use permit conditions 3g, 6, and 9f notify all water use permittees that their permits are subject to and cannot interfere with Hawaiian home land rights.

Therefore, this application will not interfere with Hawaiian home lands rights.

(8) Other issues

I. Chapter 343 – Environmental Assessment (EA) Compliance

EA Triggers
In accordance with §HRS 343-5(a), the applicant's proposed action does not trigger the need for an EA. It is a private project on private land, not interefering with any special design district or conservation land or burials.

RECOMMENDATION:

Staff Recommends that:

A. The Commission approve the issuance of water use permit no. 00999 to Candace Chase for the reasonable and beneficial use of 0.127 million gallons per day of ~~f~~Fresh water from the Chase Well (Well No. 3-3208-001), subject to the standard water use permit conditions listed in Attachment B and the following special conditions:

1. Should an alternate permanent source of water be found for this use, then the Commission reserves the right to revoke this permit, after a hearing.

2. In the event that the tax map key at the location of the water use is changed, the permittee shall notify the Commission in writing of the tax map key change within thirty (30) days after the permittee receives notice of the tax map key change.

B. The Commission approve Well Construction/Pump Installation permits for the Chase Well (Well No. 3-3208-001), subject to the standard conditions in Attachments C and D, and the following special conditions:

1. None

Respectfully submitted,

JEFFREY T. PEARSON, P.E.
Deputy Director

Attachment(s): A (Water Use Permit Detailed Information)
B (Water Use Permit Standard Conditions)
C (Well Construction Permit Standard Conditions)
D (Pump Installation Permit Standard Conditions)

Exhibit(s): 1 (Location Map)
2 (Existing Water Use Permits and 12-Month Moving Average Withdrawal)
3 (Pending Water Use Permit Applications)
4 (IWREDSS Print-out)

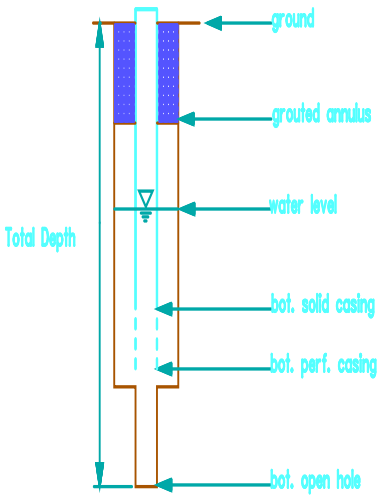
APPROVED FOR SUBMITTAL:

for SUZANNE D. CASE
Chairperson

WATER USE PERMIT DETAILED INFORMATION

Source Information

AQUIFER:	Mokuleia System, North Sector, Oahu
Sustainable Yield:	8 mgd
Existing Water Use Permits:	7.073mgd
Available Allocation:	0.927 mgd
Total other pending applications:	0.156 mgd
This application:	0.127 mgd
WELL:	Chase (Well No. 3-3208-001)
Location:	Mokuleia, Oahu, TMK: (1) 6-7-002:034
Year Drilled:	
Casing Diameter:	8 in.
Elevations (msl= 0 ft.)	
Water Level:	20 ft.
Ground:	558 ft.
Bottom of Solid Casing:	-42 ft.
Bottom of Perforated:	-92 ft.
Bottom of Open Hole:	(none) -92 ft.
Total Depth:	650 ft.
Grouted Annulus Depth:	380 ft.
Pump Capacity	150 gpm



Use Information

Quantity Requested:	0.127 gallons per day.
New Type of Water Use:	
Place of Water Use:	TMK:(1) 6-7-002:034
Reported Water Usage:	0.011 gpd
Nearby Similar Water Usage:	0.011 gpd
Mokuleia Aquifer System	
Current 12-Month Moving Average Withdrawal (See Exhibit 2a):	0.497 mgd

Public Notice

In accordance with HAR §13-171-17, a public notice was published in the Honolulu Advertiser on 08/05/2015 and 08/05/2015 and a copy of the notice was sent to the Office of the Mayor. Copies of the completed application were sent to the Honolulu/Board of Water Supply, Department of Planning and Permitting, Department of Health, Department of Hawaiian Home Lands, Office of Hawaiian Affairs, the various divisions within the Department of Land and Natural Resources, and other interested parties for comments. Written comments and objections to the proposed permit were to be submitted to the Commission by August 26, 2015**.**

Objections

The public notice specifies that an objector meet the following requirements: (1) state property or other interest in the matter; (2) set forth questions of procedure, fact, law, or policy, to which objections are taken; (3) state all grounds for objections to the proposed permits, (4) provide a copy of the objection letter(s) to the applicant, and (5) submit objections meeting the previous requirements to the Commission by August 26, 2015.

To the best of staff's knowledge there are no objectors who have property interest within the Mokuleia Aquifer System or who will be directly and immediately affected by the proposed water use.

Briefs in Support

Responses to objections, or briefs in support, regarding the application are required to be filed with the Commission ten (10) days after an objection is filed and, presumably, copies are served to the applicant. No briefs in support were filed with the Commission.

STANDARD WATER USE PERMIT CONDITIONS

1. The water described in this water use permit may only be taken from the location described and used for the reasonable beneficial use described at the location described above. Reasonable beneficial uses means "the use of water in such a quantity as is necessary for economic and efficient utilization which is both reasonable and consistent with State and County land use plans and the public interest." (HRS § 174C-3)

2. The right to use ground water is a shared use right.

3. The water use must at all times meet the requirements set forth in HRS § 174C-49(a), which means that it:

   a. Can be accommodated with the available water source;
   b. Is a reasonable-beneficial use as defined in HRS § 174C-3;
   c. Will not interfere with any existing legal use of water;
   d. Is consistent with the public interest;
   e. Is consistent with State and County general plans and land use designations;
   f. Is consistent with County land use plans and policies; and
   g. Will not interfere with the rights of the Department of Hawaiian Home Lands as provided in section 221 of the Hawaiian Homes Commission Act and HRS § 174C-101(a).

4. The ground water use here must not interfere with surface or other ground water rights or reservations.

5. The ground water use here must not interfere with interim or permanent instream flow standards. If it does, then:

   a. A separate water use permit for surface water must be obtained in the case an area is also designated as a surface water management area;
   b. The interim or permanent instream flow standard, as applicable, must be amended.

6. The water use authorized here is subject to the requirements of the Hawaiian Homes Commission Act, as amended, if applicable.

7. The water use permit application and submittal, as amended, approved by the Commission at its September 16, 2015 meeting are incorporated into this permit by reference.

8. Any modification of the permit terms, conditions, or uses may only be made with the express written consent of the Commission.

9. This permit may be modified by the Commission and the amount of water initially granted to the permittee may be reduced if the Commission determines it is necessary to:

   a. protect the water sources (quantity or quality);

b. meet other legal obligations including other correlative rights;
c. insure adequate conservation measures;
d. require efficiency of water uses;
e. reserve water for future uses, provided that all legal existing uses of water as of June, 1987 shall be protected;
f. meet legal obligations to the Department of Hawaiian Home Lands, if applicable; or
g. carry out such other necessary and proper exercise of the State's and the Commission's police powers under law as may be required.

Prior to any reduction, the Commission shall give notice of its proposed action to the permittee and provide the permittee an opportunity to be heard.

10. An approved flowmeter(s) **must** be installed to measure monthly withdrawals and a monthly record of withdrawals, salinity, temperature, and pumping times must be kept and reported to the Commission on Water Resource Management on forms provided by the Commission on a **monthly** basis.

11. This permit shall be subject to the Commission's periodic review of the Mokuleia Aquifer System Area's sustainable yield. The amount of water authorized by this permit may be reduced by the Commission if the sustainable yield of the Mokuleia Aquifer System Area, or relevant modified aquifer(s), is reduced.

12. A permit may be transferred, in whole or in part, from the permittee to another, if:

a. The conditions of use of the permit, including, but not limited to, place, quantity, and purpose of the use, remain the same; and
b. The Commission is informed of the transfer within ninety days.

Failure to inform the department of the transfer invalidates the transfer and constitutes a ground for revocation of the permit. A transfer which involves a change in any condition of the permit, including a change in use covered in HRS § 174C-57, is also invalid and constitutes a ground for revocation.

13. The use(s) authorized by law and by this permit do not constitute ownership rights.

14. The permittee shall request modification of the permit as necessary to comply with all applicable laws, rules, and ordinances which will affect the permittee's water use.

15. The permittee understands that under HRS § 174C-58(4), that partial or total nonuse, for reasons other than conservation, of the water allowed by this permit for a period of four (4) continuous years or more may result in a permanent revocation as to the amount of water not in use. The Commission and the permittee may enter into a written agreement that, for reasons satisfactory to the Commission, any period of nonuse may not apply towards the four-year period. Any period of nonuse which is caused by a declaration of water shortage pursuant to section HRS § 174C-62 shall not apply towards the four-year period of forfeiture.

16. The permittee shall prepare and submit a water shortage plan within 30 days of the issuance of this permit as required by HAR § 13-171-42(c). The permittee's water shortage plan shall identify what the permittee is willing to do should the Commission declare a water shortage in the Mokuleia Ground Water Management Area.

17. The water use permit shall be subject to the Commission's establishment of instream standards and policies relating to the Stream Protection and Management (SPAM) program, as well as legislative mandates to protect stream resources.

18. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

19. The permittee understands that any willful violation of any of the above conditions or any provisions of HRS § 174C or HAR § 13-171 may result in the suspension or revocation of this permit.

STANDARD WELL CONSTRUCTION PERMIT CONDITIONS

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).

2. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.

3. The well construction permit shall be for construction and testing of the well only. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the HWCPIS (the latest pump test worksheet can be obtained by contacting Commission staff or at http://files.hawaii.gov/dlnr/cwrm/forms/APTR.pdf). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson. No withdrawal of water shall be made for purposes other than testing without a Certificate of Pump Installation Completion. The permitted pump capacity described on the pump installation permit **may be reduced** in the event that the pump test does not support the capacity.

4. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson. If it can be shown that the well does not tap basal ground water then this condition may be waived after consultation with and acceptance by Commission staff. However, in no instance can the well be drilled deeper than one-half (1/2) of the theoretical thickness without Commission approval.

5. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.

6. In the event that historically significant remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and immediately contact the Department of Land and Natural Resources' State Historic Preservation Division. Work may recommence only after written concurrence by the State Historic Preservation Division.

7. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.

8. The Well Completion Report Part I shall be submitted to the Chairperson within sixty (60) days after completion of work (please contact staff or visit http://files.hawaii.gov/dlnr/cwrm/forms/WCR1.pdf for current form).

9. The permittee shall comply with all applicable laws, rules, and ordinances; non-compliance may be grounds for revocation of this permit.

10. The well construction permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.

11. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

12. Any variances from the HWCPIS shall be approved by the Chairperson prior to invoking the variance.

13. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.

14. If the well is not to be used it must be properly capped. If the well is to be abandoned during the course of the project then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f), HAR, prior to any well sealing or plugging work.

15. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

16. This permit shall apply to the location shown on the application only. If the well is to be relocated, the permittee shall apply for a new well construction/pump installation permit in accordance with §13-168-12(f), HAR.

17. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

STANDARD PUMP INSTALLATION PERMIT CONDITIONS

1. The Chairperson to the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work covered by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).

2. No withdrawal of water shall be made other than for testing until a Certificate of Pump Installation Completion has been issued by the Commission.

3. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.

4. The pump installation permit shall be for installation of a 150 gpm rated capacity, or less, pump in the well. This permanent capacity may be reduced in the event that the pump test data does not support the capacity.

5. A water-level measurement access shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels.

6. The permittee shall install an approved meter or other appropriate means for measuring and reporting withdrawals and appropriate devices or means for measuring chlorides and temperature at the well head.

7. Well Completion Report Part II shall be submitted to the Chairperson within sixty (60) days after completion of work (please contact staff or visit **http://files.hawaii.gov/dlnr/cwrm/forms/WCR2.pdf** for current form).

8. The permittee, well operator, and/or well owner shall comply with all applicable laws, rules, and ordinances, and non-compliance may be grounds for revocation of this permit.

9. The pump installation permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.

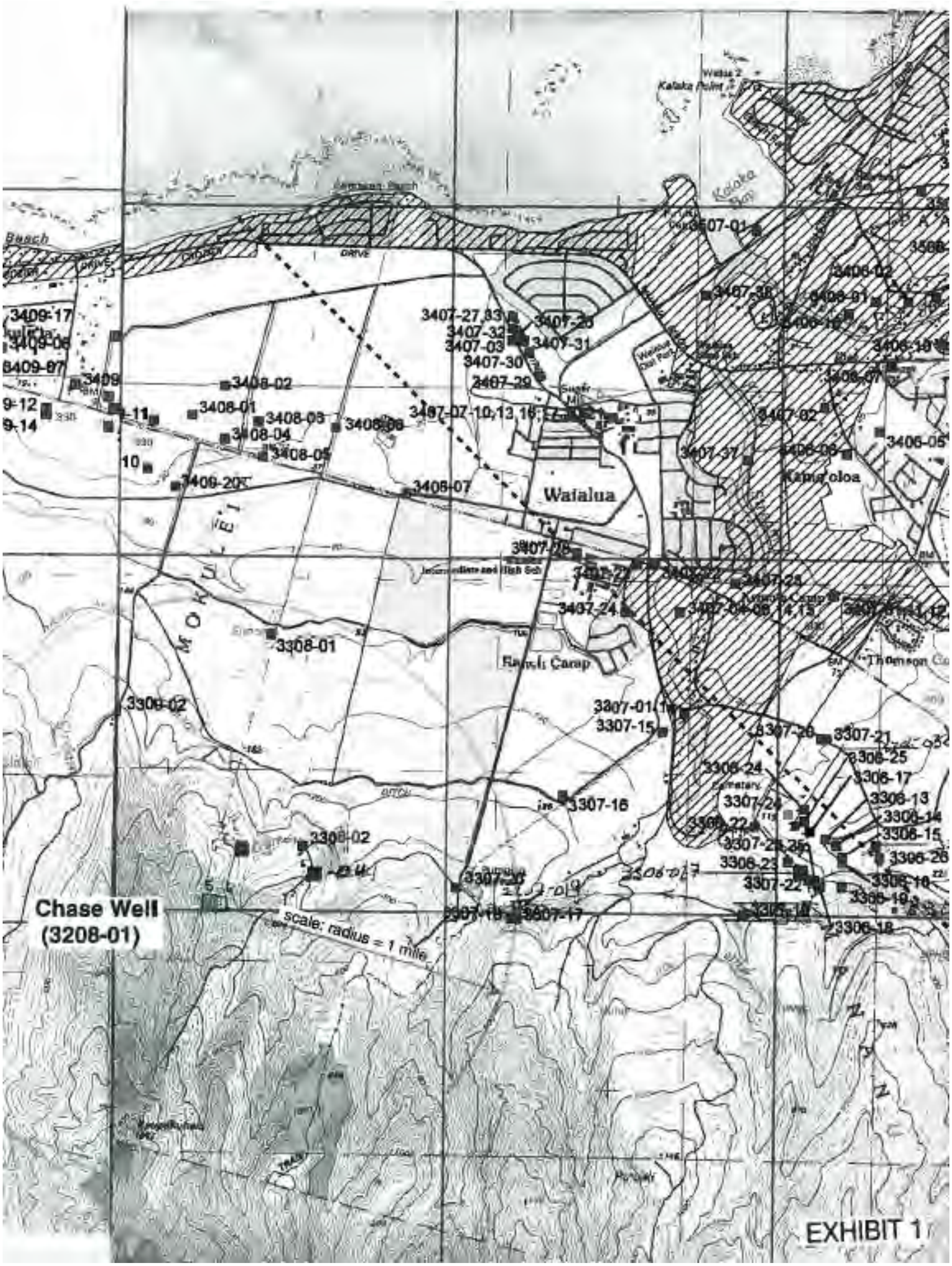
10. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

11. Any variances from the HWCPIS shall be approved by the Chairperson **prior** to invoking the variance.

12. The work proposed in the pump installation permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.

13. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

14. Special conditions in the attached cover transmittal letter are incorporated herein by reference.


Waialua
Chase Well
(3208-01)
scale: radius = 1 mile
3308-01
3308-02
3307-16
3307-15
3307-24
3407-26
3407-37
3407-02
3408-07
3408-02
3408-01
3408-03
3408-04
3408-05
3409-17
3409-20
3507-01
Ranch Camp
Kaiaka Bay
EXHIBIT 1

Commission on Water Resource Management

Water Use Permit

Report Parameters:

Island	Oahu
Applicant	All
Well # Prefix	All
Date	All
Aquifer	30401 Mokuleia
TMK	All
Aquifer Type	All
Water Quality	All
Non	None
Proposed Use	All

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

Island of Oahu

Aquifer System Ground Water Management Area: **30401 Mokuleia**

Sustainable Yield (mgd): **8**

WUP No	Approved	Permittee	Well No	Well Name	WUP (mgd)
38	09/11/1981	United States Air Force	3-3314-003	USAF Kaena Point	0.018
49	06/02/1993	Waialua Sugar Company, Inc.	3-3409-013	Pump 11	0.530
52	06/02/1993	Waialua Sugar Company, Inc.	3-3411-004	Pump 5	2.550
			3-3411-006	Pump 5	
			3-3411-007	Pump 5	
			3-3411-008	Pump 5	
			3-3411-009	Pump 5	
			3-3411-010	Pump 5	
			3-3411-011	Pump 5	
			3-3411-013	Pump 5	
53	09/11/1981	Directorate of Public Works, Environmental Div., DPW, U.S. Army Garrison	3-3412-002	Dillingham Airfield	0.055
446	10/23/1996	Mokuleia Aquafarm	3-3409-024	MAF 1	0.250
606	01/30/2002	C&C DOE	3-3407-025	Waialua HS	0.039
669	02/18/2004	Hawaii Fish Company Inc	3-3412-004	Hawaii Fish Co. 1	0.576
679	01/13/2004	KAALA RANCH	3-3309-002	Mokuleia	0.127
766	07/12/2006	Mark Hamamoto (Mohala Farms)	3-3306-016	Hamamoto 2006	0.013
777	12/14/1988	Dillingham Ranch Aina LLC	3-3310-002	Mokuleia 2	0.850
779	09/11/1981	Dillingham Ranch Aina LLC	3-3410-003	Shop Well	1.500
813	09/11/1981	North Shore Water Company, LLC	3-3410-001	Crowbar Ranch	0.500
941	09/17/2003	Stanhope Farms	3-3308-002	Stanhope Farms	0.056
984	08/11/2015	Kealia Farms	3-3412-006	Kealia Farms	0.000
Summary for Mokuleia (21 detail records)				**Total:**	7.073
				SY Available:	0.927

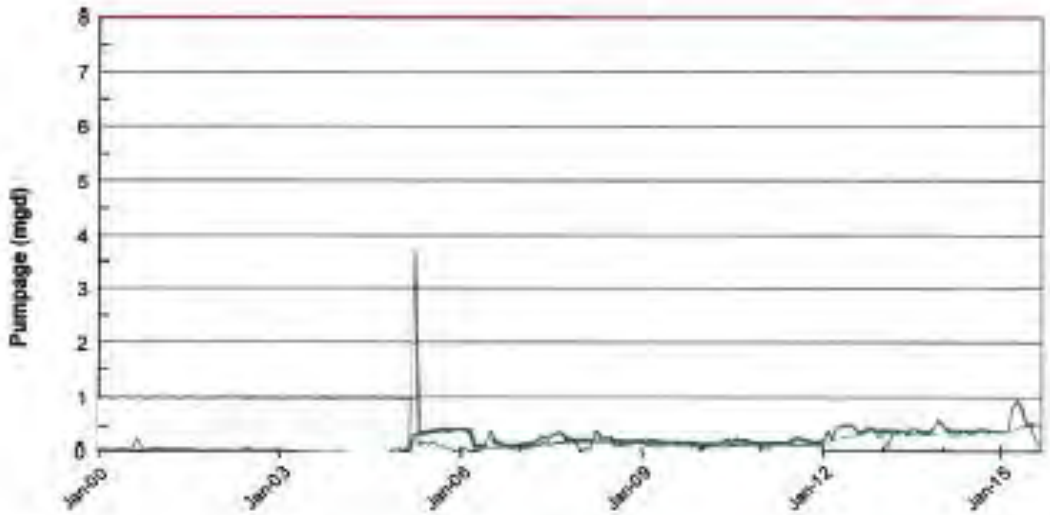
9/1/2015 12:48 pm

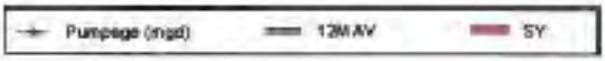
EXHIBIT 2

Commission on Water Resource Management

Monthly Pumpage Chart

12 Month Moving Average





Report Parameters

Date	01/01/2000 - 08/03/2015
Island	Oahu
Well Owner	All
Well Reporter	All
Well # Prefix	All
Aquifer	[illegible] Municipal
Pumpage/Non-Potable	All
TMK	All
Aquifer Type	All
Well Use	All

EXHIBIT 2a

Month Year	Purpose (mgd)	12MAV	FT
January 2000	0.058	0.061	8.000
February 2000	0.075	0.063	8.000
March 2000	0.076	0.063	8.000
April 2000	0.059	0.063	8.000
May 2000	0.064	0.065	8.000
June 2000	0.067	0.067	8.000
July 2000	0.069	0.069	8.000
August 2000	0.085	0.073	8.000
September 2000	0.069	0.087	8.000
October 2000	0.113	0.091	8.000
November 2000	0.042	0.090	8.000
December 2000	0.047	0.090	8.000
January 2001	0.045	0.089	8.000
February 2001	0.047	0.087	8.000
March 2001	0.056	0.085	8.000
April 2001	0.050	0.084	8.000
May 2001	0.049	0.082	8.000
June 2001	0.052	0.079	8.000
July 2001	0.053	0.076	8.000
August 2001	0.053	0.073	8.000
September 2001	0.052	0.055	8.000
October 2001	0.052	0.050	8.000
November 2001	0.047	0.050	8.000
December 2001	0.029	0.049	8.000
January 2002	0.035	0.048	8.000
February 2002	0.037	0.047	8.000
March 2002	0.031	0.045	8.000
April 2002	0.044	0.045	8.000
May 2002	0.046	0.044	8.000
June 2002	0.045	0.044	8.000
July 2002	0.122	0.049	8.000
August 2002	0.056	0.050	8.000
September 2002	0.060	0.050	8.000
October 2002	0.050	0.050	8.000
November 2002	0.040	0.050	8.000
December 2002	0.045	0.051	8.000
January 2003			8.000
February 2003			8.000
March 2003			8.000
April 2003			8.000
May 2003			8.000
June 2003	0.000		8.000
July 2003	0.000		8.000
August 2003	0.000		8.000
September 2003	0.000		8.000
October 2003	0.000		8.000
November 2003	0.000		8.000
December 2003	0.000		8.000
January 2004	0.000		8.000
February 2004	0.000		8.000
March 2004	0.000		8.000
April 2004	0.000		8.000
May 2004	0.000	0.000	8.000
June 2004	0.000	0.000	8.000
July 2004	0.000	0.000	8.000
August 2004	0.000	0.000	8.000
September 2004	0.000	0.000	8.000
October 2004	0.000	0.000	8.000
November 2004	0.000	0.000	8.000
December 2004	0.075	0.006	8.000
January 2005	0.062	0.011	8.000
February 2005	0.077	0.018	8.000
March 2005	0.101	0.028	8.000
April 2005	3.746	0.338	8.000
May 2005	0.165	0.352	8.000

Month Year	Purpose (mgd)	12MAV	SY
June 2005	0.205	0.368	6.000
July 2005	0.171	0.364	6.000
August 2005	0.233	0.403	6.000
September 2005	0.121	0.413	6.000
October 2005	0.126	0.424	6.000
November 2005	0.103	0.432	6.000
December 2005	0.045	0.430	6.000
January 2006	0.000	0.424	6.000
February 2006	0.117	0.428	6.000
March 2006	0.017	0.421	6.000
April 2006	0.047	0.412	6.000
May 2006	0.050	0.103	6.000
June 2006	0.153	0.099	6.000
July 2006	0.393	0.117	6.000
August 2006	0.204	0.115	6.000
September 2006	0.160	0.120	6.000
October 2006	0.115	0.119	6.000
November 2006	0.062	0.116	6.000
December 2006	0.103	0.123	6.000
January 2007	0.127	0.133	6.000
February 2007	0.093	0.131	6.000
March 2007	0.120	0.140	6.000
April 2007	0.203	0.153	6.000
May 2007	0.291	0.173	6.000
June 2007	0.290	0.184	6.000
July 2007	0.258	0.174	6.000
August 2007	0.333	0.185	6.000
September 2007	0.363	0.200	6.000
October 2007	0.268	0.213	6.000
November 2007	0.209	0.222	6.000
December 2007	0.218	0.232	6.000
January 2008	0.059	0.226	6.000
February 2008	0.087	0.226	6.000
March 2008	0.070	0.221	6.000
April 2008	0.383	0.236	6.000
May 2008	0.274	0.235	6.000
June 2008	0.284	0.234	6.000
July 2008	0.284	0.234	6.000
August 2008	0.132	0.218	6.000
September 2008	0.155	0.202	6.000
October 2008	0.120	0.188	6.000
November 2008	0.191	0.188	6.000
December 2008	0.222	0.188	6.000
January 2009	0.224	0.202	6.000
February 2009	0.160	0.208	6.000
March 2009	0.143	0.214	6.000
April 2009	0.141	0.194	6.000
May 2009	0.126	0.182	6.000
June 2009	0.174	0.173	6.000
July 2009	0.179	0.164	6.000
August 2009	0.148	0.165	6.000
September 2009	0.149	0.165	6.000
October 2009	0.176	0.169	6.000
November 2009	0.127	0.164	6.000
December 2009	0.150	0.156	6.000
January 2010	0.094	0.145	6.000
February 2010	0.122	0.142	6.000
March 2010	0.132	0.141	6.000
April 2010	0.150	0.142	6.000
May 2010	0.183	0.147	6.000
June 2010	0.235	0.152	6.000
July 2010	0.190	0.153	6.000
August 2010	0.250	0.161	6.000
September 2010	0.227	0.167	6.000
October 2010	0.222	0.172	6.000

Month Year	Pumpage (mgd)	12MAV	SY
November 2010	0.167	0.175	6.000
December 2010	0.134	0.176	6.000
January 2011	0.104	0.176	6.000
February 2011	0.110	0.175	6.000
March 2011	0.160	0.177	6.000
April 2011	0.157	0.177	6.000
May 2011	0.152	0.175	6.000
June 2011	0.170	0.169	6.000
July 2011	0.212	0.171	6.000
August 2011	0.273	0.173	6.000
September 2011	0.244	0.175	6.000
October 2011	0.226	0.175	6.000
November 2011	0.163	0.176	6.000
December 2011	0.148	0.176	6.000
January 2012	0.159	0.182	6.000
February 2012	0.389	0.205	6.000
March 2012	0.264	0.215	6.000
April 2012	0.458	0.240	6.000
May 2012	0.499	0.268	6.000
June 2012	0.488	0.296	6.000
July 2012	0.504	0.320	6.000
August 2012	0.398	0.330	6.000
September 2012	0.367	0.340	6.000
October 2012	0.423	0.357	6.000
November 2012	0.493	0.380	6.000
December 2012	0.287	0.392	6.000
January 2013	0.358	0.409	6.000
February 2013	0.093	0.383	6.000
March 2013	0.326	0.388	6.000
April 2013	0.325	0.377	6.000
May 2013	0.364	0.386	6.000
June 2013	0.317	0.352	6.000
July 2013	0.450	0.349	6.000
August 2013	0.406	0.349	6.000
September 2013	0.353	0.347	6.000
October 2013	0.359	0.342	6.000
November 2013	0.430	0.339	6.000
December 2013	0.564	0.364	6.000
January 2014	0.500	0.376	6.000
February 2014	0.431	0.404	6.000
March 2014	0.292	0.401	6.000
April 2014	0.295	0.399	6.000
May 2014	0.362	0.399	6.000
June 2014	0.354	0.402	6.000
July 2014	0.345	0.392	6.000
August 2014	0.357	0.389	6.000
September 2014	0.435	0.395	6.000
October 2014	0.338	0.393	6.000
November 2014	0.377	0.389	6.000
December 2014	0.365	0.371	6.000
January 2015	0.360	0.359	6.000
February 2015	0.358	0.354	6.000
March 2015	0.518	0.396	6.000
April 2015	0.957	0.463	6.000
May 2015	0.849	0.493	6.000
June 2015	0.498	0.505	6.000
July 2015	0.470	0.515	6.000
August 2015	0.136	0.457	6.000
September 2015			6.000

Commission on Water Resource Management

Pending Water Use Applications

WUPA No	Well No.	Applicant	Well Name	mgd	Received	Accept
Aquifer System: **30401 Mokuleia**						
1,003	3-3410-001	North Shore Water Company, LLC	Crowbar Ranch	1.709	07/02/2015	
1,003	3-3410-003	North Shore Water Company, LLC	Shop Well		07/02/2015	
1,004		North Shore Water Company, LLC	Well 1	1.300	07/02/2015	
1,004		North Shore Water Company, LLC	Well 2		07/02/2015	
1,007		G Tree Ranch LLC	TBD	0.183	08/15/2015	
1,007	3-3307-019	G Tree Ranch LLC	Waialua-Mauka		08/15/2015	
1,007	3-3307-026	G Tree Ranch LLC	Paty		08/15/2015	
999	3-3208-001	Candace Chase	Chase	0.127	05/06/2015	06/12/2015
1,002	3-3308-003	Kalea Properties LLC	Kalea 2012	0.029	06/15/2015	06/15/2015
				5 WUPAs totalling 3.348		

Number of Wells: 9

Commission on Water Resource Management

Incomplete Ground Water Use Permit Applications

WUPA No	Well No.	Applicant	Well Name	mgd	Received	Void
Aquifer System: **Mokuleia 30401**						
1,003	3-3410-001	North Shore Water Company, LLC	Crowbar Ranch	1.709	07/02/2015	No
1,003	3-3410-003	North Shore Water Company, LLC	Shop Well		07/02/2015	No
1,004		North Shore Water Company, LLC	Well 1	1.300	07/02/2015	No
1,004		North Shore Water Company, LLC	Well 2		07/02/2015	No
1,007		G Tree Ranch LLC	TBD	0.183	08/15/2015	No
1,007	3-3307-019	G Tree Ranch LLC	Waialua-Mauka		08/15/2015	No
1,007	3-3307-026	G Tree Ranch LLC	Paty		08/15/2015	No
				7 WUPAs totalling 3.192		

Number of Wells: 7

3.348
3.192
0.156

Tuesday, September 1, 2015 12:51 pm

EXHIBIT 3

imansys_out.txt

52 0.2 0.0 1.71 1.4 0.0 0.00 0.53 0.4 0.6 0.7 0.8

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*********************************************************
*                      SUMMARY                          *
*********************************************************
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TMK : 67002034

SOILS: Ewa(0.014), Halawa(0.453), Kemoo(0.015), Kemoo(0.405), Stony steep land(0.113)

ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETO	ET	DR
24.5	28.8	781.7	47.2	34.0	23.7	27.8	6.9	6.3	48.2	48.3	10.3

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	28.788	27.806	47.224	16.368	29.066	33.937	36.250	38.049
	Thou. gpd/acre	2.142	2.069	3.513	1.218	2.162	2.525	2.697	2.831
50.41	Total thou. gpd	53.977	52.135	88.544	30.689	54.497	63.631	67.967	71.340

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	24.470	23.635	40.141	13.913	24.706	28.847	30.812	32.342
	Thou. gpd/acre	1.820	1.758	2.986	1.035	1.838	2.146	2.292	2.406
50.41	Total thou. gpd	45.880	44.315	75.263	26.086	46.322	54.087	57.772	60.639

Note:- Irrigated area for the selected TRICKLE, DRIP irrigation system is 0.5 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.4	0.5	13.4	8.4	6.1	2.9	4.5	1.6	0.7	3.0	3.0	3.2
2	0.5	0.6	15.9	5.8	4.2	2.5	3.2	0.9	0.6	3.1	3.1	1.8
3	1.0	1.2	31.8	5.2	4.0	2.5	3.1	0.7	0.6	4.0	4.0	1.4
4	1.4	1.6	44.4	3.6	2.7	2.1	2.4	0.3	0.6	4.3	4.3	0.5
5	2.5	3.0	80.2	2.1	1.4	1.4	1.5	0.2	0.5	4.8	4.8	0.1
6	3.4	4.0	109.0	1.2	0.8	0.8	0.8	0.0	0.3	4.8	4.8	0.0
7	3.7	4.4	119.0	1.6	1.1	1.1	1.2	0.1	0.5	5.0	5.0	0.0
8	3.8	4.4	120.2	1.6	1.1	1.1	1.1	0.1	0.4	4.9	4.9	0.0
9	3.4	4.0	109.1	1.6	1.2	1.1	1.1	0.1	0.4	4.5	4.5	0.0
10	2.6	3.0	82.4	3.8	2.6	2.3	2.2	0.8	0.5	3.9	3.9	0.2
11	1.2	1.4	37.5	5.4	3.9	3.0	3.1	0.9	0.6	3.0	3.0	0.9
12	0.6	0.7	19.0	6.9	5.1	3.0	3.7	1.1	0.7	2.8	2.8	2.1

EXHIBIT 4

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.5	0.0	3.2	0.0	0.4	1.2	1.8	2.4
2	0.6	0.1	3.9	0.0	0.5	1.2	1.8	2.4
3	1.2	1.1	5.5	0.0	1.1	2.0	2.7	3.3
4	1.6	1.6	4.0	0.0	1.6	2.6	3.2	3.7
5	3.0	3.2	5.4	0.0	2.9	4.2	4.9	5.4
6	4.0	3.9	6.1	1.1	4.0	5.1	5.6	5.7
7	4.4	4.8	6.3	2.1	4.4	5.3	5.8	5.9
8	4.4	4.9	6.6	1.0	4.4	5.6	5.8	5.8
9	4.0	3.9	5.7	0.5	4.1	5.0	5.3	5.3
10	3.0	3.2	5.1	0.1	3.0	4.1	4.6	4.6
11	1.4	1.1	3.8	0.0	1.3	2.2	2.8	3.2
12	0.7	0.1	2.7	0.0	0.8	1.5	2.0	2.5

****
* Commission on Water Resources Management IWREDSS Summary *
****

IWREDSS estimates that irrigation needs for the application is:

UNIT	*DROUGHT FREQUENCY 1 in 2 year	1 in 5 year	1 in 10 year	1 in 20 year	OTHER STATISTICS Mean	Median	Max	Min
inch/acre	29.066	33.937	36.250	38.049	28.788	27.806	47.224	16.368
Thou. gpd/acre	2.162	2.525	2.697	2.831	2.142	2.069	3.513	1.218
Total thou. gpd	54.497	63.631	67.967	71.340	53.977	52.135	88.544	30.689

*Drought frequency of 2, 5, 10 and 20 year return periods are GIR values of 50%, 80%, 90% and 95% probabilities, respectively.
*GIR of 1 in 5 year return period is recommended by CTAHR for design or water use allocation purposes.

where:
Irrigation season = 1-1 TO 12-31
Irrigation total days = 365 days

Irrigation system:
TYPE = TRICKLE, DRIP
Design Application Efficiency = 85 %
Fraction of Soil Surface Irrigated = 50 %
Fraction extracted from irigated zone = 40 %

Climate Data Base:
Location = WAIALUA 847 UNITED Latitude 21.5667

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.5	0.0	3.2	0.0	0.4	1.2	1.8	2.4
2	0.6	0.1	3.9	0.0	0.5	1.2	1.8	2.4
3	1.2	1.1	5.5	0.0	1.1	2.0	2.7	3.3
4	1.6	1.6	4.0	0.0	1.6	2.6	3.2	3.7
5	3.0	3.2	5.4	0.0	2.9	4.2	4.9	5.4
6	4.0	3.9	6.1	1.1	4.0	5.1	5.6	5.7
7	4.4	4.8	6.3	2.1	4.4	5.3	5.8	5.9
8	4.4	4.9	6.6	1.0	4.4	5.6	5.8	5.8
9	4.0	3.9	5.7	0.5	4.1	5.0	5.3	5.3
10	3.0	3.2	5.1	0.1	3.0	4.1	4.6	4.6
11	1.4	1.1	3.8	0.0	1.3	2.2	2.8	3.2
12	0.7	0.1	2.7	0.0	0.8	1.5	2.0	2.5

****
* Commission on Water Resources Management IWREDSS Summary *
****

IWREDSS estimates that irrigation needs for the application is:

UNIT	*DROUGHT FREQUENCY				OTHER STATISTICS			
	1 in 2 year	1 in 5 year	1 in 10 year	1 in 20 year	Mean	Median	Max	Min
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Irrigation total days = 365 days

Irrigation system:
TYPE = TRICKLE, DRIP
Design Application Efficiency = 85 %
Fraction of Soil Surface Irrigated = 50 %
Fraction extracted from irigated zone = 40 %

Climate Data Base:
Location = WAIALUA 847 UNITED Latitude 21.5667