



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

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

November 21, 2012
Honolulu, Oahu

Hydraflx Systems, LLC
APPLICATION FOR A WATER USE PERMIT
Hydraflx Well (Well No. 2057-005), TMK (1) 9-9-001: 013, WUP No. 959
Future (Military) Use for 450 gallons per day
Waimalu Ground Water Management Area, Oahu

APPLICANT:

Hydraflx Systems, LLC
135A St. Building 2003
JBPHH, HI 96853

LANDOWNER:

U.S. Air Force
15 CES/DEV
Hickam AFB, HI 96853

SUMMARY OF REQUEST:

The applicant is requesting approval of a ground water use permit for an allocation of 450 gallons per day (gpd) of ground water from a proposed well to develop hydrogen-to-fuel conversion.

LOCATION MAP: See Exhibit 1

BACKGROUND:

On September 13, 2012, the Commission on Water Resource Management (Commission) received a completed water use permit application from Hydraflx Systems, LLC. Additional information regarding the source, use, notification, objections, and field investigation(s) is provided in Attachment A.

ANALYSIS/ISSUES:

The State Water Code, Haw. Rev. Stat. § 174C-49(a), establishes seven (7) criteria that must be met to obtain a water use permit. We analyze the 7 criteria in order:

(1) Water availability

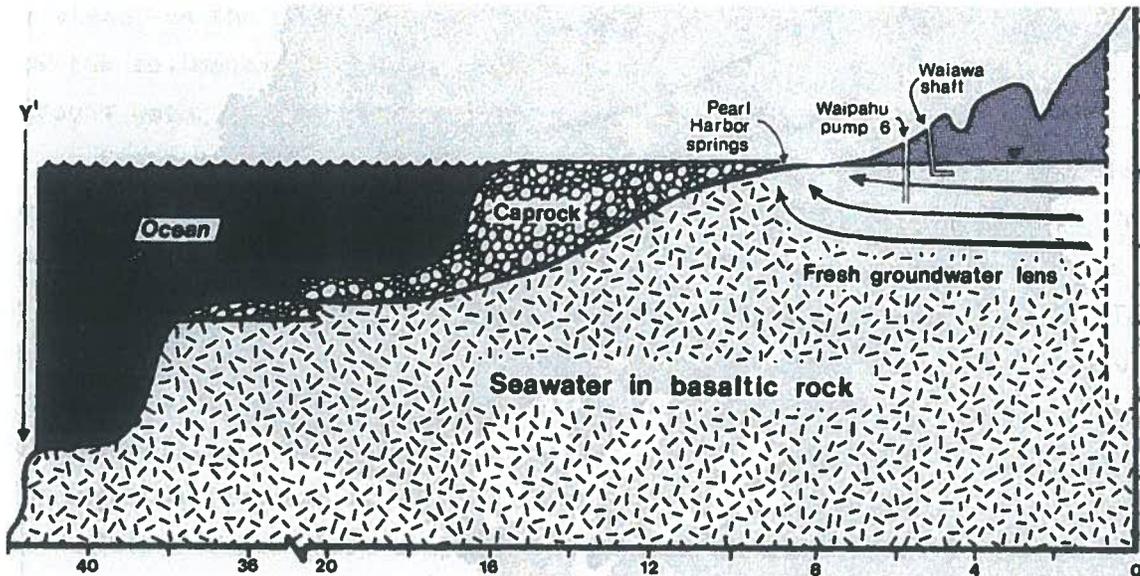
Through the Hawaii Water Plan, the Commission has adopted 45 mgd as the sustainable yield for the Waimalu Aquifer System Area. Individual existing water use permits in this aquifer system area are shown in Exhibit 2. A summary of the current ground water conditions in the aquifer is provided in Table 1:

Table 1. Waimalu Aquifer System Area

<u>ITEM</u>	Waimalu Aquifer System Area (mgd)
Sustainable Yield	45
Less: Other Existing Water Use Permits (shown in Exhibit 2)	46.951
Reservation to DHHL	none
Subtotal (Current Available Allocation)	-1.951
Less: Other Completed Applications	none
Less: This Application (450 gpd)	0.000
Subtotal (Potential Available Allocation/Allocation Deficit)	-1.951

Based on the figures summarized in Table 1, there is not sufficient *basal ground* water to accommodate the requested quantity of 450 gallons per day (0.000 mgd).

However, the applicant anticipates tapping the *caprock* formation that overlies the basal portions of the aquifer system area (See diagram below). Withdrawal from caprock does not count against the estimated sustainable yield of 45 mgd for basal groundwater forth in the Commission’s 2008 Water Resource Protection Plan. Caprock wells are managed and administered in other ground water management areas (other than the Ewa Caprock Ground Water Management Area which is the only separately managed caprock aquifer area to date).



The proposed well location and depth to other nearby and adjacent wells indicate s that the proposed well will withdraw caprock ground water. Two older but nearby wells tap the caprock formation at similar depths (see Exhibit 1). State well number 2057-001 is a mile mauka and northeast of the proposed subject well and taps caprock to a depth of 938 feet below mean sea level (msl). State well number 2057-004 is about 1/3 of a mile mauka and north east from the proposed well> It taps caprock water at 55 feet below msl. Therefore, it appears the proposed well will extract water from the caprock formation at a depth of 180 feet below msl.

The relatively small proposed use (450 gal./day), the anticipated tapping of caprock ground water, and the well’s proximity to the ocean should not cause any adverse impacts to the basal aquifer’s sustainable yield. Therefore, based on information available, there should be adequate water to accommodate the requested amount from the caprock portions of the aquifer area. If the well happens to penetrate into basaltic formations, then the well should be backfilled to remain within the target caprock aquifer. The permit should include a condition to this effect. The Hawaii Well Construction and Pump Installation Standards, sections 2.4(c) specifies that solid casing lengths to prevent cross connections between and the tapping of multiple aquifers in one well.

(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 requests ground water to develop a process to extract hydrogen from the requested water by electrolysis. This is an industrial use of water. The Water Code's Declaration of Policy Haw. Rev. Stat. §174C-2(c) states that the Water Code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for various purposes. This industrial use meets that standard..

II. Quantity Justification

The applicant requests 450 gallons per day of water for the hydrogen extraction processes. This volume of water is less than the duty of water used by one single family residence. A research and development project using this daily quantity of water appears to be reasonable.

III. Efficiency of Use

By its nature, the electrolysis production is efficient because the applicant is maximizing the hydrogen yield from the water that is extracted. The process is also in a closed loop system. There are no evaporative losses.

IV. Analysis of Practical Alternatives

The applicant is conducting the research based on raw ground water from a relatively shallow well that can be replicated in other parts of the world. Therefore, no alternatives are available. The applicant notes that 450 gallons per day can and has been used from the base municipal system. However, the purpose of this study is to simulate direct ground water.

(3) Interference with other existing legal uses

There is one other well (2057-004) within 1 mile of the proposed well. Well 2057-004 is not currently used, but it is shallow enough to be retained within the caprock. It is also owned by the U.S. Air Force. Any interference (not anticipated) will be from their source as well. Staff inquired if this well could substitute for the new well. The applicant responded the existing well is too far away. . The well and infrastructure need to be located in one place. e.

(4) Public interest

The Water Code, Haw. Rev. Stat. §174C-2 - Declaration of Policy, defines the public interest:

“(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.”

The use of water is an industrial use. This application meets the criteria and comes within the public interest.

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

The proposed uses are in the State Urban District. The county zoning is F-1 (Federal and Military Preservation District). The proposed use is consistent with these land use designations.

Normal agency review includes the:

- 1) State’s Department of Land and Natural Resources (DLNR) and its State Parks, Aquatic Resources, Historic Preservation, and Land Divisions;
- 2) the Department of Health (DOH) with its Clean Water, Safe Drinking Water, and Wastewater Branches;
- 3) the Department of Hawaiian Home Lands (DHHL);
- 4) Land Use Commission (LUC);
- 5) the Office of Hawaiian Affairs (OHA).
- 6) the Office of the Mayor, Department of Planning and Permitting, and the Board of Water Supply.

No comments or objections have been made through this review. These proposed uses are consistent with the state and county general plans and land use designations.

Therefore, this application is consistent with state & county general plans and land use designations.

(6) County land use plans and policies

Normal County review includes Office of the Mayor, Department of Planning and Permitting, and the Board of Water Supply. No comments or objections were received.

This application is consistent with 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. They made no comments or objections. 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.

This application will not interfere with Hawaiian home lands rights.

(8) Other issues

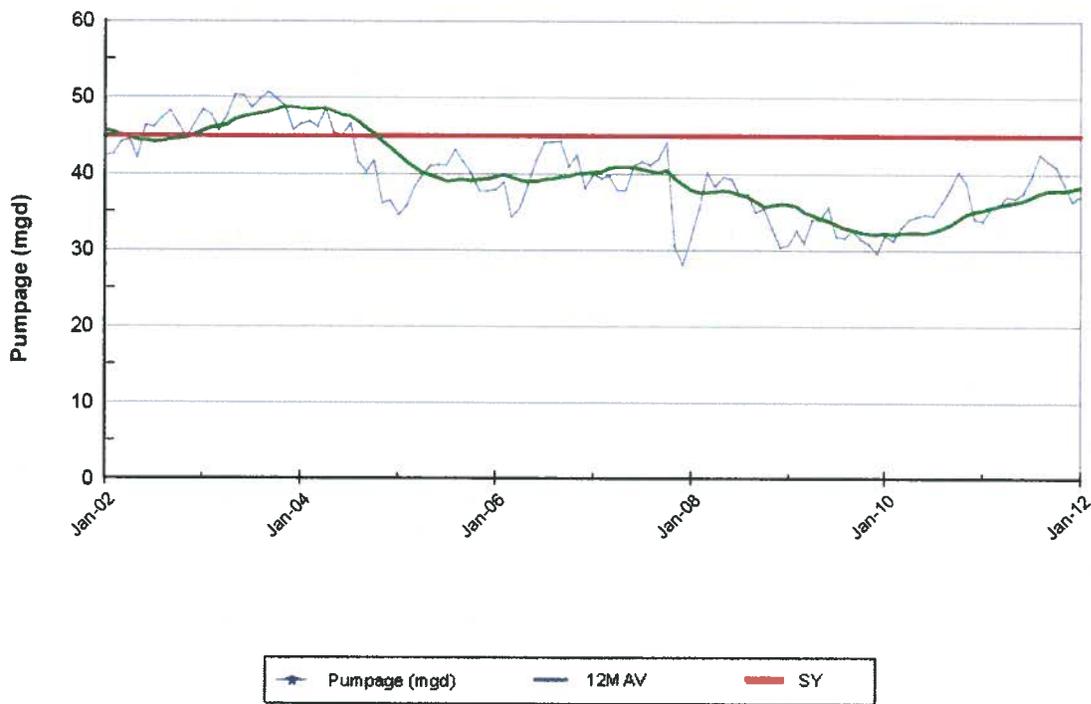
I. Chapter 343 – Environmental Assessment (EA) Compliance

EA Triggers

In accordance with §HRS 343-5(a), the applicant’s proposed action does not trigger the need for an EA. A categorical exemption was issued by NAVFAC for the larger extent of this project on September 26, 2011.

II. Over Allocation of Waimalu Aquifer System Area

Actual use of all groundwater within the Waimalu Aquifer System exceeded sustainable yield roughly between December of 2002 and September of 2004. Uses then dropped below the sustainable yield and are currently less than sustainable yield (refer to the chart below).



The Board of Water Supply has not yet started work on the County Water Use and Development Plan for the Primary Urban Center. Work on this plan will include the Waimalu Aquifer System. It will not be completed until approximately 2018. The over allocation issue will be addressed in the future or should actual pumping (primarily by the Honolulu Board of Water Supply) approach the sustainable yield.

III. Study Period Duration – Limited Permit Duration

The applicant has stated that the project will be ongoing, but may end sometime in 2015 or 2016. Staff recommends that the permit be conditioned such that it be automatically revoked after the completion of the project.

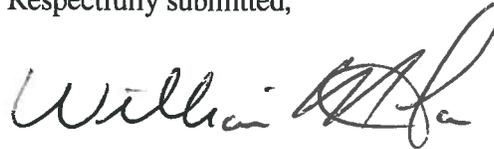
RECOMMENDATION:

Staff recommends that the Commission approve the issuance of Water Use Permit No. 959 to Hydraflx Systems, LLC for the reasonable and beneficial use of 0.000 mgd (450 gpd) million gallons per day of caprock potable water for military use from the proposed Hydraflx Well (Well No. 2057-005). The permit is subject to the standard water use permit conditions listed in Attachment B and the following special conditions:

1. Well 2057-005 shall only be allowed to tap the caprock formation within the Waimalu Ground Water Management Area. Should the well encounter basaltic geology; hence basal conditions, the well shall be backfilled to remain within the caprock formation and prevent the leakage or use of basal ground water.
2. 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.
3. 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.
4. Standard Condition 16 for a water shortage plan requirement is waived.

5. Upon completion of the project, the applicant shall notify the Commission and its commitment to voluntarily revoke the water use permit in full. Upon notification, the water use permit will be fully revoked without a hearing. At that time, if the well is to be also abandoned, then an application to seal the well shall be part of the notification. Otherwise, the well may continue to serve as a monitor well that will be reported to the Commission in accordance with its water use reporting requirements.

Respectfully submitted,



WILLIAM M. TAM
Deputy Director

Attachment(s): A (Water Use Permit Detailed Information)
 B (Water Use Permit Standard Conditions)

Exhibits: 1 (Location Map)
 2 (Existing Water Use Permits and 12-Month Moving Average Withdrawal)

APPROVED FOR SUBMITTAL:



WILLIAM J. AILA, JR.
Chairperson

WATER USE PERMIT DETAILED INFORMATION

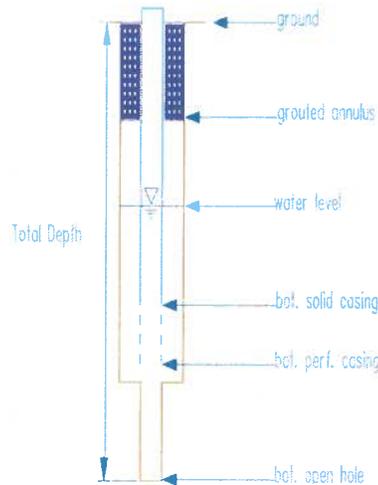
Source Information

AQUIFER: **Waimalu System, Pearl Harbor Sector, Oahu**
 Sustainable Yield: 45 mgd
 Existing Water Use Permits: 46.951 mgd
 Available Allocation: -1.951 mgd
 Total other pending applications: 0 mgd
 This application: 0.000 mgd (450 gpd)

WELL: **Hydraflx Well (Well No. 2057-005)**
 Location: **Hickam AFB, Oahu, TMK: (1) 9-9-001: 013**
 Year Drilled: n/a
 Casing Diameter: 4 in.
Elevations (msl= 0 ft.)
 Water Level: 0 ft.
 Ground: 10 ft.
 Bottom of Solid Casing: -150 ft.
 Bottom of Perforated: -170 ft.

Total Depth: 180 ft.
 Grouted Annulus Depth: 150 ft.

Pump Capacity 20 gpm



Use Information

Quantity Requested:	0.000 mgd (450 gpd)
Future Type of Water Use:	Military
Place of Water Use:	TMK: (1) 9-9-001: 013

Nearby Surrounding Wells and Other Registered Ground Water Use

There is one other well within a mile of the well (see Exhibit 1). This well is currently unused.

Public Notice

In accordance with HAR §13-171-17, a public notice was published in the Honolulu Advertiser on October 5, 2012 and October 12, 2012, and a copy of the notice was sent to the Office of the Mayor. Copies of the completed application were sent to the 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 October 26, 2012.

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 October 26, 2012.

There are no objectors who have property interest within the Waimalu 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 November 21, 2012 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 (attached).
- 11. This permit shall be subject to the Commission's periodic review of the **Waimalu** Aquifer System's sustainable yield. The amount of water authorized by this permit may be reduced by the Commission if the sustainable yield of the **Waimalu** Aquifer System, 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 **Waimalu** 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.



Report Parameters

Island: Oahu
 Applicant: All
 Well # Prefix: All
 Date: All
 Aquifer: 30201 Waimalu
 TMK: All
 Aquifer Type: 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: 30201 Waimalu
Sustainable Yield (mgd): 45

WUP No	Approved	Permittee	Well No	Well Name	WUP (mgd)	12-MAV (mgd)	Diff (mgd)	Date Last Reported
65	08/22/1986	Lau Taro Farm	3-2356-070	Lau Farm	0.100	0.040	0.060	07/31/1999
71	03/27/1987	Board of Water Supply, BWS	3-2456-001	Newtown 1	1.500	1.184	0.316	06/30/2012
			3-2456-002	Newtown 2				
			3-2456-003	Newtown 3				
72	03/27/1987	Board of Water Supply, BWS	3-2457-013	Waiau 2	1.890	1.622	0.268	06/30/2012
			3-2457-014	Waiau 1				
			3-2457-015	Waiau 3				
86	05/17/1989	Navy Public Works Center 3	3-2255-032	Aiea Halawa Shft	0.697	0.006	0.691	12/31/2010
94	05/17/1989	Board of Water Supply, BWS	3-2354-001	Halawa Shaft	11.320	10.155	1.165	06/30/2012
97	05/17/1989	Board of Water Supply, BWS	3-2355-009	Kalauao P1	11.750	9.125	2.625	06/30/2012
			3-2355-010	Kalauao P4				
			3-2355-011	Kalauao P2				
			3-2355-012	Kalauao P3				
			3-2355-013	Kalauao P5				
			3-2355-014	Kalauao P6				
98	05/17/1989	Board of Water Supply, BWS	3-2356-049	Waimalu I-1	0.080	0.000	0.080	05/31/1999
			3-2356-050	Waimalu I-2		0.000	0.080	06/30/2012
102	05/17/1989	Board of Water Supply, BWS	3-2357-023	Kaahumanu I-2	1.110	0.973	0.137	06/30/2012
			3-2357-024	Kaahumanu I-1				
104	05/17/1989	Board of Water Supply, BWS	3-2457-005	Punanani 6	11.970	10.911	1.059	06/30/2012
			3-2457-006	Punanani 1				
			3-2457-009	Punanani 2				
			3-2457-010	Punanani 4				
			3-2457-011	Punanani 3				
			3-2457-012	Punanani 5				
110	05/17/1989	Waimano Home & Training School	3-2557-001	Waimano Trng Sch 1	0.136	0.103	0.033	09/30/2009
			3-2557-002	Waimano Traing Sch 2				04/30/1998
180	12/16/1992	Board of Water Supply, BWS	3-2357-011	Waiau HECO 2	0.000	0.671	-0.671	06/30/2012
			3-2357-012	Waiau 3				04/30/1992
466	07/15/1998	Howard Hamada (Pearl Country Club)	3-2356-054	Pearl C C Golf	0.330	0.322	0.008	06/30/2008
477	10/22/1997	Board of Water Supply, BWS	3-2255-037	Halawa 2	1.080	1.476	-0.396	06/30/2012
			3-2255-038	Halawa 3				
			3-2255-039	Halawa 1				
478	10/22/1997	Board of Water Supply, BWS	3-2355-006	Aiea 1	1.300	0.630	0.670	06/30/2012
			3-2355-007	Aiea 2				
479	10/22/1997	Board of Water Supply, BWS	3-2355-003	Aiea Gulch 1	0.980	0.670	0.310	06/30/2012



WUP No	Approved	Permittee	Well No	Well Name	WUP (mgd)	12-MAV (mgd)	Diff (mgd)	Date Last Reported
			3-2355-005	Aiea Gulch 2				
480	10/22/1997	Board of Water Supply, BWS	3-2356-055	Kaonohi I-2	1.350	0.875	0.475	06/30/2012
			3-2356-056	Kaonohi I-1				
481	10/22/1997	Board of Water Supply, BWS	3-2356-058	Kaamilo 1	1.200	1.220	-0.020	06/30/2012
			3-2356-059	Kaamilo 2				
656	04/11/1980	MINAMI FARM	3-2455-002	Waimalu	0.158	0.004	0.154	12/31/2010
<i>Summary for Waimalu (42 detail records)</i>					Total:	46.951	39.987	6.964
					Available:	-1.951		