**CHECKLIST**

**WELL CONSTRUCTION PERMIT**

**WELL NAME or LOCATION:** North Shore Wells, 182 ISLAND: Island

**WELL NUMBER:** 5651-02803  **Tax Map Key:** 3-2-01:4

**OWNER/OPERATOR:**
- Firm Name: 
- Contact Person: 
- Address: 
- Phone: 

**LANDOWNER:**
- Firm Name: 
- Contact Person: 
- Address: 
- Phone: 

Date application received: 9-21-92

Date acknowledged receipt/request more info: 

Date application accepted: 

Suspense date (90 days): 

Date filing fee deposited: 

**Application sent to following:**

<table>
<thead>
<tr>
<th>Dept. of Hawi Home Lands</th>
<th>Date sent</th>
<th>Comments received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept. of Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office of Hawi. Affairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Hist Pres Div</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dept/Bd of Water Supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sierra Club L. D. F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koolauloa NB #26 (Oahu)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dept Pub Wrks (Hawaii)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional List (Molokai)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eric Hino/Miyano</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date agenda due: 2 Dec 92

Date submittal due: 2 Dec 92

Date submittal sent to applicant: 

Date application approved or disapproved: 16 Dec 92

Date applicant notified of decision: 

**REMARKS:**

*also report: title (80c filing fee per well)*

[Redacted]
CLOSING AGREEMENT

By and Between
BOARD OF WATER SUPPLY and
WAILUKU AGRIBUSINESS CO., INC.
# TABLE OF CONTENTS

**RECITALS** .......................................................... 1

**AGREEMENT** .......................................................... 1

1. Definitions .......................................................... 1
2. Sale of Property .................................................. 2
3. Purchase Price ..................................................... 2
4. Closing Date .......................................................... 2
5. Conveyances at Closing ............................................. 2
   a. Sector A .......................................................... 2
   b. Sector B .......................................................... 4
   c. Sector C .......................................................... 4
   d. Personal Property ............................................... 4
   e. Tenancy in Common Agreement .................................. 4
6. Due Diligence .......................................................... 5
7. Closing Costs ............................................................ 6
8. Default/Remedies ..................................................... 6
9. Acceptance of Property As-Is ........................................ 7
10. Facsimiles ............................................................ 7
11. Counterparts ............................................................ 7
12. Notices ................................................................. 7
13. Consent/Approval of Agreement ..................................... 7
14. Survival of Warranties, Covenants and Representations ........... 8
15. Miscellaneous ............................................................ 8
16. Governing Law .......................................................... 8
17. Agreement Under Threat of Condemnation ......................... 8
TO: Commissioners
FROM: Rae M. Loui
SUBJECT: Inclusion of the North Waihee Wells in the Designated Area

At the meeting on Maui on January 24, 1996, you asked the staff to look into the best way to include the North Waihee wells in the proposed Iao Aquifer ground water designation. The two options are described below along with time estimates:

1. **DESIGNATE THE WAIHEE AQUIFER SYSTEM**

   **Process:**
   - Recommendation to initiate designation by the chairperson at a regular meeting.
   - Chair consults with Mayor and Board of Water Supply.
   - Decision to proceed within 60 days.
   - CWRM holds public hearing on Maui.
   - Staff prepares Findings of Fact Report.
   - Chair consults with Council and BWS.
   - CWRM designates.

   **Time:** 7 months plus

   **Analysis:**

   The criteria for ground water designation are listed in HRS §174C-44. The criterion that may be met is 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 percent of the sustainable yield of the proposed water management area.

   In the Windward Oahu designation, all areas of Oahu connected by water transmission infrastructure were included in the calculation of authorized planned use and sustainable yield. Similarly, the sustainable yields of both Iao and Waihee Aquifers should be included. The sustainable yield of Iao Aquifer is 20 mgd and for Waihee Aquifer it is 8 mgd, totalling 28 mgd.
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. There are two possible ways to calculate the authorized planned use for the Maui situation: 1) the Board's water commitments, and 2) projected water use from land use plans.

The Board has notified the Commission that they have about 8.4 mgd in water commitments, which would put the authorized planned use at 101% of the combined sustainable yields for Iao and Waihee Aquifers (28 mgd). The Maui Water Use and Development Plan projects a demand of 25 to 30 mgd by the year 2010 for the Wailuku System. This would calculate to 89% to 107% of the combined sustainable yields of the Iao and Waihee Aquifers (28 mgd).

2. AMEND THE BOUNDARY OF THE IAQ AQUIFER TO INCLUDE THE NORTH WAIHEE WELLS

Process:

- Hold a noticed public hearing to amend the Hawaii Water Plan (90 days notice required).
- Hold a decision-making meeting immediately after the hearing.

Time: 4 months

Analysis:

The reason to amend the boundary would have to be given. There appears to be no hydrologic reason why there should be separate Iao and Waihee aquifers. Although this method appears shorter, the CWRM may need to go through the entire Iao Aquifer designation process again because the boundaries are different.

I will appreciate your comments and thoughts on these options.
Ms. Marie Kimmey, Chairperson
Maui Board of Water Supply
P.O. Box 1109
Wailuku, Hawaii 96793-7109

Dear Ms. Kimmey:

Pump Installation Permit Transfer
North Waihee Wells 1 & 2
(Well Nos. 5631-02 & 03)

By your February 20, 1996 letter, the Commission on Water Resource Management acknowledges the transfer of the captioned permit from C. Brewer Properties, Inc. to the Maui Board of Water Supply.

Enclosed are copies of the permit and its extensions. Please be advised that the permit requires that work be started by May 14, 1996, and be completed by March 1, 1997. Should you be unable to meet those deadlines, please submit a request to extend them, showing cause why the permit should not be revoked.

Aloha,

Michael D. Wilson
Chairperson

Enclosures

c: C. Brewer Homes, Inc.
CLOSING AGREEMENT

By and Between
BOARD OF WATER SUPPLY and
WAILUKU AGribusiness Co., Inc.
# TABLE OF CONTENTS

## RECITALS

<table>
<thead>
<tr>
<th>AGREEMENT</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Definitions</td>
<td>1</td>
</tr>
<tr>
<td>2. Sale of Property</td>
<td>2</td>
</tr>
<tr>
<td>3. Purchase Price</td>
<td>2</td>
</tr>
<tr>
<td>4. Closing Date</td>
<td>2</td>
</tr>
<tr>
<td>5. Conveyances at Closing</td>
<td>2</td>
</tr>
<tr>
<td>a. Sector A</td>
<td>2</td>
</tr>
<tr>
<td>b. Sector B</td>
<td>4</td>
</tr>
<tr>
<td>c. Sector C</td>
<td>4</td>
</tr>
<tr>
<td>d. Personal Property</td>
<td>4</td>
</tr>
<tr>
<td>e. Tenancy in Common Agreement</td>
<td>4</td>
</tr>
<tr>
<td>6. Due Diligence</td>
<td>5</td>
</tr>
<tr>
<td>7. Closing Costs</td>
<td>6</td>
</tr>
<tr>
<td>8. Default/Remedies</td>
<td>6</td>
</tr>
<tr>
<td>9. Acceptance of Property As-Is</td>
<td>7</td>
</tr>
<tr>
<td>10. Facsimiles</td>
<td>7</td>
</tr>
<tr>
<td>11. Counterparts</td>
<td>7</td>
</tr>
<tr>
<td>12. Notices</td>
<td>7</td>
</tr>
<tr>
<td>13. Consent/Approval of Agreement</td>
<td>7</td>
</tr>
<tr>
<td>14. Survival of Warranties, Covenants and Representations</td>
<td>8</td>
</tr>
<tr>
<td>15. Miscellaneous</td>
<td>8</td>
</tr>
<tr>
<td>16. Governing Law</td>
<td>8</td>
</tr>
<tr>
<td>17. Agreement Under Threat of Condemnation</td>
<td>8</td>
</tr>
</tbody>
</table>
CLOSING AGREEMENT

This Agreement is made this 21st day of December, 1995, by and between the BOARD OF WATER SUPPLY of the County of Maui, 200 South High Street, Wailuku, Maui, Hawaii 96793 (the "BOARD") and WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, 90 Waiko Road, P.O. Box 520, Wailuku, Maui, Hawaii 96793 ("WAILUKU").

RECITALS: WAILUKU owns certain land in North Waihee Maui described in Exhibits "1" through "7" attached hereto and made a part hereof containing 2 improved wells and several well sites and easement areas, together with certain agreements, plans and specifications, and permits as further described in Exhibit "5" attached hereto. The purpose of this Agreement is to set forth the terms and conditions under which the parties shall close the transfer of certain real property title and other interests described in Section 5 below (collectively, the "Property") from WAILUKU to the BOARD for the consideration related below.

AGREEMENT: For valuable consideration WAILUKU and the BOARD mutually agree as follows:

1. Definitions. The following terms shall have the following means:

   a. "Sector A Property" shall mean that real property comprising approximately 5,306 acres, identified as TMK 3-2-14:01, more particularly reflected on Exhibit "1" and shown in yellow and purple on Exhibit "2".

   b. "Sector A-1 Property" shall mean that portion of Sector A Property comprising approximately 2,000 acres, being sometimes referred to as the North Waihee Aquifer Recharge Area and shown in yellow on Exhibit "2".

   c. "Sector A-2 Property" shall mean that portion of Sector A Property comprising approximately 3,000 acres, sometimes referred to as the Conservation Easement area and shown in purple on Exhibit "2".

   d. "Sector B Property" shall mean that real property comprising of approximately 380.318 acres, being that property sometimes referred to the Well Field/Easement area, more particularly described in Exhibit "3" and shown in pink on Exhibit "2".

   e. "Sector C Property" shall mean that real property referred to as the Pipeline Easement area, more particularly reflected in Exhibit "4" and shown in green on Exhibit "2".
f. "Personal Property" shall mean the two improved well sites on Sector B, the engineering studies, plans and specifications, permits, reports and other matters, all more particularly described and delineated on Exhibit "5".

g. "The Aquifer" or "The North Waihee Aquifer" shall mean the ground water resource(s) north of Waihee stream, including the recharge area of the North Waihee Aquifer as shown in yellow on Exhibit "2".

2. Sale of Property. WAILUKU agrees to sell and the BOARD agrees to purchase the Property on the terms and conditions set forth herein.

3. Purchase Price. The purchase price for the Property shall be approximately $3,820,000 (U.S. dollars)

4. Closing Date. For the purpose of this Agreement, closing shall be the date when all appropriate conveyance documents are recorded. WAILUKU and the BOARD agree to promptly execute appropriate and customary documents when requested by escrow to do so. The "scheduled closing date" shall be on or before February 15, 1996. There is no automatic right to extend. Time is of the essence and the "scheduled closing date" may not be extended unless both the BOARD and WAILUKU so agree in writing. This transaction shall be escrowed by Title Guaranty Escrow Services of Hawaii (Wailuku branch).

5. Conveyances at Closing. At closing, WAILUKU will convey the Property and the BOARD will pay to WAILUKU the total purchase price in cash, all as follows:

a. Sector A. WAILUKU shall convey to the BOARD an undivided approximate 40% interest in Sector A, such that WAILUKU and the BOARD shall hold Sector A as tenants in common subject to all encumbrances and covenants

The price has been allocated as follows: $2,500,000 for Sector A Property; $700,000 for the existing improvements, including the two existing wells; $350,000 for the easements on Sectors B and C to be conveyed at closing; $270,000 representing the estimate of expenses expended by WAILUKU (or affiliates) to be reimbursed by the BOARD for all engineering and entitlement costs (plans, studies, governmental processing costs) the final expense to be determined during the due diligence period.
concerning the same and further subject to the tenancy in common agreement, further described below.

1. **Covenants Concerning Sector A.** The deed to Sector A Property to be executed by the parties will be subject to existing encumbrances including, but not limited to, the Deed of Exchange between Hawaiian Commercial and Sugar Company and Wailuku Sugar Company dated June 23, 1924, as amended by Agreement dated March 24, 1937 and will have the following covenants (and other covenants which may be agreed to by the parties prior to closing).

   a. Within Sector A, there will be a covenant that neither party will take any action including the creation of improvements, which would result in any significant negative impact to the surface or ground water resources within or emanating from the area. The parties would agree that there would be no further surface or ground water development by either party within Sector A without the mutual consent of both parties. The consent of either party shall not be unreasonably withheld, provided, it is agreed that consent is not unreasonably withheld, if the reason for the withholding is that the proposed activity will either have a significant negative impact on (1) the aquifer, or (2) the rights emanating from the aquifer, or (3) the ground or surface water sources and rights related to the aquifer, or (4) that the requesting party is in breach of its covenants relating to Sectors A, B or C. ("Significant negative impacts" shall be defined in the closing documents).

   b. For water source development within Sector A, WAILUKU will be granted a right of first refusal to participate in the source development on a pro rata (cost of development) basis up to 50 percent (50%) of the resource. Any joint development would be implemented consistent with the Board of Water Supply rules concerning source development and source credits.

   c. WAILUKU will have the right and ability to satisfy any rights and obligations to maintain the stream and the existing surface water system improvements within the area, at its discretion and consistent with past practices. WAILUKU would provide to the Board of Water Supply a periodic plan of surface water system maintenance within the area.
d. The parties would provide notice to each other if they wish to undertake any type of activity within the area other than WAILUKU’s on-going maintenance of the surface water systems within the area.

b. **Sector B.** WAILUKU shall grant easements to the BOARD encumbering Sector B Property with the well site easements, access easements, tank site easements and pipeline easements, as more particularly defined in Exhibits "6" and "7".

At closing, WAILUKU and the BOARD will execute a declaration on Sector B Property reflecting that the BOARD, with the consent of WAILUKU, would have the ability to modify the location of the well site areas. WAILUKU’s consent would not unreasonably be withheld, and the obligation of the BOARD and WAILUKU would be to identify a needed relocated site which would have the least amount of impact on the utility of Sector B property. Within Sector B, WAILUKU would reserve and be granted the right of first refusal to participate in any ground water source development by the BOARD in excess of five million gallons per day from Sector B. The right of first refusal would be on a pro rata basis (cost of development) up to 50% of the resource, consistent with the BOARD’s rules and water source development and credits.

(The specifics of the right of first refusal for Sectors A and B, including the election period procedures, shall be provided in the closing documents).

c. **Sector C.** WAILUKU shall grant a pipeline easement to the BOARD encumbering Sector C Property with said pipeline easement as more particularly described in Exhibits "6" and "7".

At closing WAILUKU would create a declaration on Sector C Property covenanting that it would not create new improvements or other activity within Sector C which would have a negative impact on the volume of ground water developed by the BOARD within Sector B.

d. **Personal Property.** WAILUKU shall convey and assign to the BOARD all of that personal property identified in Exhibit "5".

e. **Tenancy in Common Agreement.** WAILUKU and the BOARD shall enter into a tenancy in common agreement concerning their joint interests in Sector A. The tenancy in common agreement will identify the rights and obligations of the parties concerning Sector A-1 and A-2, as well as providing for the subdivision of Sector A into Sectors A-1 and A-2 and the conveyance of A-1 Property from WAILUKU to the BOARD after the subdivision of Sector A-1 from
Sector A and the release by the BOARD to WAILUKU of its remaining undivided interest in Sector A-2. The tenancy in common agreement will provide for the grant of a conservation easement from WAILUKU to the BOARD concerning Sector A-2 Property after Sector A-2 is subdivided from Sector A. The agreement shall also authorize the BOARD to subdivide Sector A Property and will provide that the BOARD will perform all services and all acts and pay all costs necessary to create the referenced subdivision. The agreement will provide that the Property will remain in a tenancy in common status with the BOARD and WAILUKU maintaining their tenancy in common interests should the Property not be subdivided. The tenancy in common agreement will contain other covenants, as agreed upon between the BOARD and WAILUKU, concerning the respective rights, obligations and material declarations and covenants concerning Sector A.

6. *Due Diligence.* The BOARD shall have a "due diligence period" from the date of this Agreement to January 31, 1996, during which the BOARD may review all aspects of the Property, perform studies, tests, and generally to satisfy itself that the Property is acceptable to the BOARD in the BOARD’s discretion. During this period, the following will also occur:

a. Within five (5) days after the execution of this Agreement by both parties, WAILUKU will provide to the BOARD a copy of all WAILUKU’s studies, plans, surveys, environmental assessments, permits, approvals, and other reports relevant to the Property for the BOARD’s review.

b. The BOARD and its agents may enter the Property for the purpose of conducting surveys, tests and other work as the BOARD may deem appropriate, provided that if the ground is disturbed, the BOARD, at its expense, shall return the surface to the grade as existed prior to it being disturbed.

c. WAILUKU shall obtain and deliver to the BOARD a title report on the Property from Title Guaranty of Hawaii, Inc. (together with copies of all encumbrance documents).

d. Counsel for WAILUKU and the BOARD will prepare closing documents in the form satisfactory to each counsel, including the deed of the BOARD’s interest in Sector A from WAILUKU to BOARD; the deed shall convey title and warrant the same during the period WAILUKU has had title, subject to all encumbrances identified therein or shown on said title report or visible upon physical inspection of the Property. The closing documents shall also include the easements and the transfer of personal property as provided herein.

e. The BOARD and WAILUKU shall petition the Commission on Water Resource Management to transfer the pump installation permit from
WAILUKU to the BOARD such that, at closing, the BOARD shall obtain and hold said permit under terms satisfactory to the BOARD.

If the BOARD is not satisfied as to any matter referred to above or any other matter, whether related to the Property or not related to the Property, the BOARD may cancel this Agreement by written notice to WAILUKU no later than January 31, 1996, in which event this Agreement will terminate. If counsel for the BOARD and WAILUKU shall be unable to agree on the form and content of all closing documents, WAILUKU may cancel this Agreement by written notice to the BOARD no later than January 31, 1996. In each such instance, prior to February 1, 1996, the BOARD will return to WAILUKU all of WAILUKU’s studies, plans and other material in the BOARD’s possession and the parties shall be relieved from any liability hereunder.

7. Closing Costs.

a. WAILUKU will pay for the preliminary title report, cost of preparing the deed, Hawaii conveyance tax, one-half of the escrow fee and WAILUKU’s legal fees. BOARD will pay the cost of BOARD’s title insurance, recording fees for the deed, one-half of the escrow fee and BOARD’s legal fees.

b. Although BOARD agrees to pay the purchase price in cash at closing, WAILUKU may request that BOARD participate in a Section 1031 tax deferred exchange for the benefit of WAILUKU. In that event, WAILUKU may assign its interest in this Agreement to a "qualified intermediary" (as defined in the Internal Revenue Code or IRS regulations) as part of an exchange agreement and BOARD agrees to cooperate in said transaction and participate with WAILUKU in accepting the tax-deferred exchange, provided, however, that: (a) BOARD shall not be required to pay any additional costs or assume any exposure of liability with respect to the exchange; and (b) BOARD shall have no liability concerning the legal or tax effects of the exchange.

8. Default/Remedies.

a. In the event BOARD fails to perform BOARD’s obligations under this Agreement, (WAILUKU not being in default), WAILUKU may (a) bring an action for damages for breach of contract, and (b) BOARD shall be responsible for any costs incurred in accordance with this Agreement.

b. In the event WAILUKU fails to perform WAILUKU’s obligations under this Agreement (BOARD not being in default), BOARD may (a) bring an action for damages for breach of contract, (b) seek specific performance of this
Agreement, and (c) WAILUKU shall be responsible for any costs incurred in accordance with this Agreement.

c. The foregoing shall not exclude any other remedies available under this Agreement to either WAILUKU or BOARD on account of the other party’s default.

d. In the event of default by a party and/or a legal action, the prevailing party shall be entitled to recover all costs incurred, including reasonable attorney’s fees. All expenses incurred by escrow shall be deducted from any deposited funds prior to any disbursement to the prevailing party.

9. **Acceptance of Property As-Is.** BOARD accepts the Property in completely "as-is" condition without any representations or warranties whatsoever by WAILUKU, express or implied, except as otherwise expressly provided in this Agreement.

10. **Facsimiles.** Fax (facsimile) copies of the executed Agreement shall be fully binding and effective for all purposes whether or not originally executed documents are transmitted to escrow. Fax signatures on documents will be treated the same as original signatures. However, each party agrees that it will promptly forward originally executed documents to each other. The parties understand that they must physically execute and deliver original conveyance and other recordable documents prior to closing.

11. **Counterparts.** This Agreement may be executed in counterparts and all counterparts together shall constitute the agreement among all of the parties hereto, in the same way as if the parties physically signed the same document.

12. **Notices.** Any notice by one party to the other shall be deemed effective: (a) personally delivered; (b) 36 hours after mailing by first-class U.S. mail, postage prepaid, to the other party at its address stated at the beginning of this Agreement; (c) or at such other address as said other party shall have notified the party giving the notice as the address for receiving notices hereunder. Notices sent by telecopier (fax) shall be effective when transmitted to the current fax number of the receiving party at the said address provided that the sending party shall receive the electronic confirmation that the fax transmission was received at the said number, and the sending party mails a confirming copy on the same date to the receiving party at said address.

13. **Consent/Approval of Agreement.** Whenever a party is requested herein, to consent to, to agree to, or to provide any approval of the actions, plans, or requirements of the other party, the party being requested to "consent/approve,
agree to" shall consider the same in good faith and shall not unreasonably withhold or delay such consent, approval or agreement.

14. **Survival of Warranties, Covenants and Representations.** The warranties, covenants and representations of WAILUKU and the BOARD shall survive the closing of the transaction and shall not be binding to any person or entity not a party to this Agreement other than the successors and assigns of the parties.

15. **Miscellaneous.** Time is of the essence of this Agreement. WAILUKU and the BOARD will comply with all requirements of HRPTA and FRPTA (if applicable) and the other applicable laws.

16. **Governing Law.** This Agreement shall be governed by the laws of Hawaii.

17. **Agreement Under Threat of Condemnation.** The parties hereto agree that this Agreement is being executed by the parties under its right of condemnation by the BOARD and the Agreement is entered by into by WAILUKU in lieu of, and as a compromise alternative to, the condemnation proceedings threatened by the BOARD.

IN WITNESS WHEREOF, the parties have signed this Agreement on the date indicated above.

WAILUKU AGRIBUSINESS CO., INC.
a Hawaii corporation

By

[Signature]

Its: Chairperson  Vice president

By

[Signature]

Its: Vice president
BOARD OF WATER SUPPLY

By

Marie Kimmey

Its: Chairperson

By

Its:

APPROVED AS TO FORM AND LEGALITY:

GARY F. ZAKAR

Director, Operations and Planning
Courts of Hawaii

KAHULUI 1999

119325.1
PRM
On this 21st day of December, 1995, before me personally appeared Kent T. Lueren and W.K. Talbert, to me personally known, who, being by me duly sworn, did say that they are the Vice President and Vice President, respectively, of Wailuku Agribusiness Co., Inc., a Hawaii corporation, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

[Signature]

Notary Public, State of Hawaii.

My commission expires: 02/10/96
On this 26th day of December, 1995, before me appeared MARIE KIMMEY, to me personally known, being by me duly sworn, did say that she is the Chairperson of the BOARD OF WATER SUPPLY of the County of Maui, and that the seal affixed to the foregoing instrument is the lawful seal of the said BOARD OF WATER SUPPLY, and that the said instrument was signed and sealed on behalf of the said BOARD OF WATER SUPPLY, and the said MARIE KIMMEY acknowledged the said instrument to be the free act and deed of the said BOARD OF WATER SUPPLY.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

[Signature]
Notary Public, State of Hawaii
My commission expires: 4/19/98
On this ___ day of ________, 1995, before me personally appeared __________________________, to me personally known, who being by me duly sworn, did say that he is the Chairman of the Board of Water Supply of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed on behalf of said County of Maui, and the said officer acknowledged the said instrument to be the free act and deed of the said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

__________________________
Notary Public, State of Hawaii.

My commission expires: ___________
STATE OF HAWAII

COUNTY OF MAUI

On this ___ day of ____, 1995, before me personally appeared __________ and __________, to me personally known, who being by me duly sworn, did say that they are the Chairman and __________, respectively, of the Board of Water Supply of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed on behalf of said County of Maui, and the said officers acknowledged the said instrument to be the free act and deed of the said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

________________________________________
Notary Public, State of Hawaii.

My commission expires: __________
TO: Commissioners
FROM: Rae M. Loui
SUBJECT: Inclusion of the North Waihee Wells in the Designated Area

At the meeting on Maui on January 24, 1996, you asked the staff to look into the best way to include the North Waihee wells in the proposed Iao Aquifer ground water designation. The two options are described below along with time estimates:

1. DESIGNATE THE WAIHEE AQUIFER SYSTEM

Process:
- Recommendation to initiate designation by the chairperson at a regular meeting.
- Chair consults with Mayor and Board of Water Supply.
- Decision to proceed within 60 days.
- CWRM holds public hearing on Maui.
- Staff prepares Findings of Fact Report.
- Chair consults with Council and BWS.
- CWRM designates.

Time: 7 months plus

Analysis:

The criteria for ground water designation are listed in HRS §174C-44. The criterion that may be met is 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 percent of the sustainable yield of the proposed water management area.

In the Windward Oahu designation, all areas of Oahu connected by water transmission infrastructure were included in the calculation of authorized planned use and sustainable yield. Similarly, the sustainable yields of both Iao and Waihee Aquifers should be included. The sustainable yield of Iao Aquifer is 20 mgd and for Waihee Aquifer it is 8 mgd, totalling 28 mgd.
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. There are two possible ways to calculate the authorized planned use for the Maui situation: 1) the Board's water commitments, and 2) projected water use from land use plans.

The Board has notified the Commission that they have about 8.4 mgd in water commitments, which would put the authorized planned use at 101% of the combined sustainable yields for Iao and Waihee Aquifers (28 mgd). The Maui Water Use and Development Plan projects a demand of 25 to 30 mgd by the year 2010 for the Wailuku System. This would calculate to 89% to 107% of the combined sustainable yields of the Iao and Waihee Aquifers (28 mgd).

2. AMEND THE BOUNDARY OF THE IAO AQUIFER TO INCLUDE THE NORTH WAIHEE WELLS

Process:

- Hold a noticed public hearing to amend the Hawaii Water Plan (90 days notice required).
- Hold a decision-making meeting immediately after the hearing.

Time: 4 months

Analysis:

The reason to amend the boundary would have to be given. There appears to be no hydrologic reason why there should be separate Iao and Waihee aquifers. Although this method appears shorter, the CWRM may need to go through the entire Iao Aquifer designation process again because the boundaries are different.

2 I will appreciate your comments and thoughts on these options.
Ms. Marie Kimmey, Chairperson  
Maui Board of Water Supply  
P.O. Box 1109  
Wailuku, Hawaii 96793-7109  

Dear Ms. Kimmey:

Pump Installation Permit Transfer  
North Waihee Wells 1 & 2  
(Well Nos. 5631-02 & 03)  

By your February 20, 1996 letter, the Commission on Water Resource Management acknowledges the transfer of the captioned permit from C. Brewer Properties, Inc. to the Maui Board of Water Supply.

Enclosed are copies of the permit and its extensions. Please be advised that the permit requires work to be started by May 14, 1996, and be completed by March 1, 1997. Should you be unable to meet those deadlines, please submit a request to extend them, showing cause why the permit should not be revoked.

Aloha,

[Signature]

MICHAEL D. WILSON  
Chairperson  

Enclosures  
c: C. Brewer Homes, Inc.
DATE: 1/29/94

TO: Rae Loui

Fax No. 808. 587.0719

Subject: NTP N. Waihee Wells

No. of Pages (including this transmittal): 2

REMARKS:

Transmitter: Draddick

NOTE: If you have not received all of the pages, please call

Lee @ (808) 243-7816
February 29, 1996

Mr. Warren Unemori
Warren S. Unemori Engineering, Inc.
2145 Wells Street, Suite 403
Wailuku, Maui, Hawaii 96793

Dear Mr. Unemori:

Subject: Independent Professional Services for the Development of North Waihee Wells

This letter constitutes NOTICE TO PROCEED for all work under the subject project.

You are hereby notified that the official commencement date of this project shall be February 29, 1996. The time allowed to complete the required services is specified in the contract, exclusive of time required for governmental review.

Please acknowledge receipt of this notice in the space provided below on the original and two copies and return them to the Department of Water Supply. Please keep the third copy of this letter for your files.

A copy of the fully executed contract will be forwarded for your files.

Sincerely,

David R. Craddick
Director

cc: DWS Fiscal
DWS Contractor
DWS Engineer
Director

NOTICE TO PROCEED RECEIVED
THIS 29TH DAY OF February
1996.

Warren S. Unemori

"By Water All Things Find Life"
Selected critical path items for the four source alternatives are listed below:

**Waihee/Iao Ditch**
- Obtain membranes by March 1, 1996
- Reach land use agreement by April 1, 1996
- Complete design, EA and permits by Aug 1, 1996
- Bid line construction by Aug. 1, 1996
- Award line construction bid by Nov. 1, 1996
- Install membranes by Nov 1, 1996

**North Waihee**
- Execute purchase agreement by February 15, 1996
- Issue bid specs by July 1, 1996
- Award Bid by Sept 1, 1996
- Start pump installation by Nov. 1, 1996
- Complete pump installation by March 1, 1997
- Complete construction by Aug 1, 1997

**Wailuku Shaft**
- Extend use agreement by Aug 1, 1996
- Complete design by Feb 1, 1997
- Obtain pipe easements by May 1, 1997

**Waikapu Tank Well**
- Obtain well site agreement by June 1, 1996
- Complete design by June 1, 1996
- Complete EA by June 1, 1996
- Issue bids by Sept 1, 1996
- Award Bids by Nov 1, 1996
- Complete construction by May 1, 1997

**Status of C. Brewer agreement:** (1/31/96 telecon with Dave Craddick)
- Purchase includes 3000 acres of a conservation easement, 2000 acres in fee simple. C. Brewer would retain about 400 acres at the mauka end.
- Due diligence extended to Feb. 7 from Jan. 31.
- C. Brewer asking for things that MBWS cannot agree to:
  1) MBWS can't transfer land interest after acquisition
  2) MBWS must underground electric lines
  3) C. Brewer wants to be the arbitrator if existing uses (C. Brewer's ditches and tunnels) are impacted
- Dave says it doesn't look good, expects to negotiate over the weekend for a special Board meeting on *Tuesday, Feb. 6.*
February 20, 1996

Ms. Rae M. Loui  
Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809  

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2  
(Well Nos. 5631-02 & 03)

Dear Ms. Loui:

Pursuant to your letter dated February 1, 1996 relative to the subject permits, we are writing to inform you that the transaction between Wailuku Agribusiness Co., Inc. and the Maui Board of Water Supply, has closed as of this date. This transaction, pursuant to the parties' earlier agreement, will enable the installation of the pumps, and construction of other improvements, by the Board of Water Supply, to augment the water resources of Central Maui.

As a result, we hereby respectfully request that you, as previously authorized by the Commission, transfer the subject permits to the Board of Water Supply, according to the terms of the agreement.

Thank you for your assistance in this matter.

Sincerely,

C. BREWER HOMES, INC.  

[Signature]

Senior Vice President  

By [Signature]  

Vice-President
February 23, 1996

VIA FACSIMILE

Ms. Rae M. Loui
Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawaii 96809

Re: Pump Installation Permits for North Waihee Wells 1 and 2
(Well Nos. 5631-02 & 03)

Dear Ms. Loui:

Attached is a copy of the formal notification letter dated February 20, 1996 to the Commission on Water Resource Management confirming the closing of the County of Maui BWS/Wailuku Agribusiness North Waihee transaction. The letter is signed by C. Brewer Homes, Inc., Wailuku Agribusiness Company and the Maui Board of Water Supply.

The original of this letter will be forwarded to you for your files as soon as we receive it from escrow.

Yours truly,

Douglas W. MacDougal

DWM:me
Enclosure

cc: Mr. David Craddick (via facsimile)
Gary Zakian, Esq. (via facsimile)
C. Brewer Homes, Inc.

February 20, 1996

Ms. Rae M. Loui
Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
(Well Nos. 5631-02 & 03)

Dear Ms. Loui:

Pursuant to your letter dated February 1, 1996 relative to the subject permits, we are writing to inform you that the transaction between Wailuku Agribusiness Co., Inc. and the Maui Board of Water Supply, has closed as of this date. This transaction, pursuant to the parties' earlier agreement, will enable the installation of the pumps, and construction of other improvements, by the Board of Water Supply, to augment the water resources of Central Maui.

As a result, we hereby respectfully request that you, as previously authorized by the Commission, transfer the subject permits to the Board of Water Supply, according to the terms of the agreement.

Thank you for your assistance in this matter.

Sincerely,

C. BREWER HOMES, INC.

By

| [Signature] |
| Senior Vice President |

By

| [Signature] |
| Its Vice-President |

24 N. Church Street, Suite 205
P.O. Box 1437 / Wailuku, Maui, Hawaii 96793
| [Number] | FAX: (808) [Number] |
WAILUKU AGRIBUSINESS COMPANY

By

Kathleen J. Ahia

Secretary

BOARD OF WATER SUPPLY,
COUNTY OF MAUI

By

Roger Wetzler

Authorized Signatory

CHAIRMAN OF THE BOARD
STATE OF HAWAII

CITY & COUNTY OF HONOLULU

On this 21st day of FEBRUARY, 1996, before me personally appeared CRAIG CHAMPION and G. C. WENTWORTH, to me personally known, who, being by me duly sworn, did say that they are the Senior Vice President and Vice President, respectively, of C. BREWER HOMES, INC., a Delaware corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

[Signature]

Notary Public, State of Hawaii

My Commission Expires: 11/2/97
STATE OF HAWAII

CITY & COUNTY OF HONOLULU

On this 21st day of FEBRUARY, 1996, before me personally appeared J. ALAN KUGLE and KATHLEEN F. OSHIRO, to me personally known, who, being by me duly sworn, did say that they are the Chairman of the Board and Secretary, respectively, of WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

Notary Public, State of Hawaii

My Commission Expires: 11/2/97
STATE OF HAWAII  
COUNTY OF MAUI  

On this 20th day of February, 1996, before me appeared BYRON WALTERS, to me personally known, who, being by me duly sworn, did say that he is a Member of the Board of Water Supply of the County of Maui, and was authorized by the BOARD OF WATER SUPPLY on February 15, 1996 to execute any and all documents as set forth in the COUNTY OF MAUI BOARD OF WATER SUPPLY RESOLUTION RELATING TO THE PURCHASE OF THE WAIHEE VALLEY PROPERTY, and that the said instrument was signed on behalf of the said Board of Water Supply, and the said BYRON WALTERS acknowledged the said instrument to be the true act and deed of the said Board of Water Supply.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

[Signature]
Notary Public, State of Hawaii

My commission expires: 11/25/96
MANCINI, ROWLAND & WELCH

THE KAHULUI BUILDING
33 LONO AVENUE, SUITE 470
KAHULUI, MAUI, HAWAII 96732

TELEPHONE: (808) [redacted]
FAX: (808) [redacted]

FAX MEMORANDUM

DATE: February 22, 1996

TO: /Charley Ice, Water Commission
C. Brewer Homes: ATT: Val
Milton Arakawa

FROM: Paul R. Mancini

SUBJECT: North Waihee Wells

This communication contains confidential and privileged information. It is exempt from disclosure under applicable law. If you received it in error, please notify the sender immediately by telephone or fax and return the original by mail.

TRANSMITTING THE FOLLOWING:

Copy of letter dated February 20, 1996 to Department of Land and Natural Resources, Commission on Water Resource Management from C. Brewer Homes, Inc.

( ) FOR YOUR REVIEW AND COMMENT
( ) FOR APPROVAL AND RETURN
(x) FOR YOUR INFORMATION AND FILES
( ) AS WE DISCUSSED

REMARKS:
C. Brewer Homes, Inc.

February 20, 1996

Ms. Rae M. Loui
Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
(Well Nos. 5631-02 & 03)

Dear Ms. Loui:

Pursuant to your letter dated February 1, 1996 relative to the subject permits, we are writing to inform you that the transaction between Wailuku Agribusiness Co., Inc. and the Maui Board of Water Supply, has closed as of this date. This transaction, pursuant to the parties’ earlier agreement, will enable the installation of the pumps, and construction of other improvements, by the Board of Water Supply, to augment the water resources of Central Maui.

As a result, we hereby respectfully request that you, as previously authorized by the Commission, transfer the subject permits to the Board of Water Supply, according to the terms of the agreement.

Thank you for your assistance in this matter.

Sincerely,

C. BREWER HOMES, INC.

By [Signature]
Senior Vice President

By [Signature]
Vice-President
Ms. Rae M. Loui
February 20, 1996
Page 2

WAILUKU AGRIBUSINESS COMPANY

By

By J. Alan Knight
Its CHAIRMAN OF THE BOARD

BOARD OF WATER SUPPLY,
COUNTY OF MAUI

By

By Roger Walton
Its Authorized Signatory
STATE OF HAWAII
CITY & COUNTY OF HONOLULU

On this 21st day of February, 1996, before me personally appeared CRAIG CHAMPION and G. C. WENTWORTH, to me personally known, who, being by me duly sworn, did say that they are the Senior Vice President and Vice President, respectively, of C. BREWER HOMES, INC., a Delaware corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

[Signature]
Notary Public, State of Hawaii

My Commission Expires: 11/2/97
STATE OF HAWAI'I

CITY & COUNTY OF HONOLULU

On this 21st day of February, 1996, before me personally appeared J. ALAN KUGLE and KATHLEEN F. OSHIRO, to me personally known, who, being by me duly sworn, did say that they are the Chairman of the Board and Secretary, respectively, of WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

[Signature]

Notary Public, State of Hawaii

My Commission Expires: 11/2/97
STATE OF HAWAII  )
COUNTY OF MAUI  ) SS.

On this 20th day of February, 1996, before me appeared BYRON WALTERS, to me personally known, who, being by me duly sworn, did say that he is a Member of the Board of Water Supply of the County of Maui, and was authorized by the BOARD OF WATER SUPPLY on February 15, 1996 to execute any and all documents as set forth in the COUNTY OF MAUI BOARD OF WATER SUPPLY RESOLUTION RELATING TO THE PURCHASE OF THE WAIHEE VALLEY PROPERTY, and that the said instrument was signed on behalf of the said Board of Water Supply, and the said BYRON WALTERS acknowledged the said instrument to be the free act and deed of the said Board of Water Supply.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public, State of Hawaii

My commission expires: 11/25/96
WAILUKU AGRIBUSINESS COMPANY

By

By

Its CHAIRMAN OF THE BOARD

BOARD OF WATER SUPPLY, COUNTY OF MAUI

By

Its Authorized Signatory
STATE OF HAWAII

CITY & COUNTY OF HONOLULU

On this 21st day of February, 1996, before me personally appeared CRAIG CHAMPION and G. C. WENTWORTH, to me personally known, who, being by me duly sworn, did say that they are the Senior Vice President and Vice President, respectively, of C. BREWER HOMES, INC., a Delaware corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

[Signature]
Notary Public, State of Hawaii

My Commission Expires: 11/2/97
On this 21st day of February, 1996, before me personally appeared J. ALAN KUGLE and KATHLEEN F. OSHIRO, to me personally known, who, being by me duly sworn, did say that they are the Chairman of the Board and Secretary, respectively, of WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, that the foregoing instrument was signed on behalf of said corporation by authority of its Board of Directors, and the said officers acknowledged said instrument to be the free act and deed of said corporation.

Notary Public, State of Hawaii

My Commission Expires: 11/2/97
STATE OF HAWAII                      )  SS.
COUNTY OF MAUI                        )  SS.

On this 20th day of February, 1996, before me appeared BYRON WALTERS, to me personally known, who, being by me duly sworn, did say that he is a Member of the Board of Water Supply of the County of Maui, and was authorized by the BOARD OF WATER SUPPLY on February 15, 1996 to execute any and all documents as set forth in the COUNTY OF MAUI BOARD OF WATER SUPPLY RESOLUTION RELATING TO THE PURCHASE OF THE WAIHEE VALLEY PROPERTY, and that the said instrument was signed on behalf of the said Board of Water Supply, and the said BYRON WALTERS acknowledged the said instrument to be the free act and deed of the said Board of Water Supply.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

[Signature]

Notary Public, State of Hawaii

My commission expires: 11/25/96
NEWS RELEASE
February 15, 1996

Media Contact: David Craddick
Phone No. [redacted]

Waihee Watershed Purchase

Wailuku, Maui - on Thursday, February 15, 1996, the Maui Board of Water Supply approved the purchase of watershed land from Wailuku Agribusiness for 2000 acres north of Waihee Stream, and a conservation easement of 3000 acres south of the Waihee Stream in the Waihee watershed area.

In addition to the watershed purchase, the Board acquired two existing wells and easements for eight additional well sites, a reservoir site, and the transmission pipeline to develop water from the North Waihee Aquifer. The sustainable yield for North Waihee Aquifer is approximately 8 million gallons per day. The purchase price is $3.84 million.

The purchase represents long hours of work by Gary W. Zakian, Deputy Corporation Counsel, with the assistance of Douglas W. MacDougall and Jill M. Teutsch with the law firm of Ashford and Wriston, working for the Board, and local attorney Paul R. Mancini, representing Wailuku Agribusiness. The Board of Water Supply has held meetings over the past four years to conclude this agreement.

- end -

"By Water All Things Find Life"
Mr. James M. Murray  
C. Brewer Homes, Inc.  
24 North Church Street, Suite 205  
Wailuku, Hawaii 96793

Dear Mr. Murray:

Extension of Start Date for Pump Installation Permits  
North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

At its January 24, 1996 regular meeting, the Commission granted relief from its revocation of the captioned permits and approved a four-month extension of the start date to May 14, 1996, contingent upon receipt of written confirmation by February 25, 1996 that the Agreement between Wailuku Agribusiness Co., Inc. and the Maui Board of Water Supply has been closed.

If confirmation is not received by that date, the permit shall be immediately revoked.

The Chairperson is authorized to transfer the pump installation permits to the agreed party, according to the terms of the Agreement, upon receipt of a petition properly signed by the Board, Wailuku Agribusiness, and the permittee's successor in interest C. Brewer Homes, Inc.

If you have any questions, please contact Charley Ice at [redacted]

Sincerely,

RAE M. LOUI  
Deputy Director

Cl:ss
STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT
January 24, 1996
Wailuku, Maui

C. Brewer Properties, Inc.
Request for Extension of Start Date
North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03)
Request to Install 1400 gpm Pumps for Domestic Use
TMK 3-2-1:4 Waihee, Wailuku, Maui

APPLICANT:
C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, HI 96793

LANDOWNER:
Wailuku Agribusiness Company, Inc.
P.O. Box 520
Wailuku, HI 96793

ACTION REQUESTED:
Permission to extend start date four months, from January 14, 1996 to May 14, 1996, for installing a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.

WELL LOCATION/TAX MAP KEY:
The wells are located at Waihee Valley, Maui, at Tax Map Key: 3-2-1:4 (Exhibit 1).

BACKGROUND:
March 25, 1993
Pump Installation Permits for North Waihee Wells 1 & 2 were issued. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved.

March 1, 1995
Pump Installation Permits were extended, with a new expiration date of March 1, 1997. The start date was set to expire in two months, to require applicant to return to the Commission if delays continued. The permits were issued March 14, 1995.
May 5, 1995 to Nov. 14, 1995

The start date for work under the Pump Installation Permits was extended two months on three separate occasions. In September, Commissioners expressed the inclination to deny further extensions if the matters under consideration were not resolved. In November, the Commission denied further extension of the start date, allowing for revocation of the permit as of January 13, 1996, unless, by January 8, 1996:

1. C. Brewer Properties, Inc. and the Maui Department of Water Supply could document an agreement causing the initiation of the pump installation work; and

2. A schedule of actual installation work were provided by the permittee to the Commission.

January 5, 1996

The applicant filed a copy of a "Closing Agreement" between Wailuku Agribusiness Co., Inc. and the Maui Board of Water Supply, transferring real property title at Waihee, including the well properties, easements, and appurtenances. A Gantt chart schedule for 1996-97 was attached, indicating contract bids & awards in March and April 1996 and the pump installation beginning by May 1996 (Exhibit 3).

The Agreement includes a "due diligence" clause, extending through January 31, 1996, during which time the Board may review all aspects of the transfer, and by which deadline either party may cancel the Agreement. The agreed "closing date" is February 15, 1996. The document copy has notarized signatures of both parties.

During the "due diligence" period, the two parties are to submit to the Commission a petition to transfer the pump installation permit to the Board, such that, at closing, the Board will hold the permit under satisfactory terms.

WELL DESCRIPTION: (See Exhibit 2):

Ground elevation: 283 ft.
Casing diameter: 16 inches
Solid casing depth: 289 ft.
Screen casing depth: 309 ft.
Open hole: 79 ft.
Total depth: 363 ft.
Grouted annulus: 0 to 200 ft.
Proposed pump capacity: 1400 gpm (each)

WATER AVAILABILITY:

The wells are located in the Waihee System near the Waihee-Iao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of Iao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Total proposed use is 4 mgd; 2 mgd from
each well. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd by the Maui Water Use and Development Plan, although the Plan acknowledges that withdrawals above 4 mgd would require justification through field demonstration.

ANALYSIS:

The well will develop fresh, basal water for municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has observed that, because the stream channel in this vicinity is 200 feet above sea level, the wells should have no effect upon it. Further, John Mink's assessment of the Pump tests is that the drawdown from heavy pumping is relatively minor, with full recovery nearly instantaneous. Salinity is very low.

RECOMMENDATION:

A. That the Commission grant relief from its revocation of the pump installation permits for North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03) and approve a four-month extension of the start date of the pump installation permits for North Waihee Wells to May 14, 1996, contingent upon receipt of confirmation, by February 25, 1996, that the Agreement between the parties has closed. If confirmation is not received by that date, the permit shall be immediately revoked.

B. That the Commission authorize the Chairperson to transfer the pump installation permits to the agreed party upon receipt of a petition properly signed by the Board, Waihuku Agribusiness, and the permittee's successor in interest, C. Brewer Homes, Inc.

Respectfully submitted,

[Signature]

RAE M. LOUI
Deputy Director

Attachments

APPROVED FOR SUBMITTAL:

[Signature]

MICHAEL D. WILSON, Chairperson
Waihee 1 & 2
(Well No. 5631-02,03)
Mr. James M. Murray  
C. Brewer Homes, Inc.  
24 North Church St., Suite 205  
Wailuku, Hawaii 96793  

Dear Mr. Murray:  

Transfer of Pump Installation Permits  

We received your letter of January 9, 1996, requesting confirmation of the process for transferring the pump installation permits for North Waihee Wells 1 & 2 (Well Nos. 5631-01 & 02) from C. Brewer Properties, Inc. to the Maui Board of Water Supply (Board).  

You have indicated by phone that an escrow company will be handling the technical details of the "Closing Agreement" between the Board and Wailuku Agribusiness Co., Inc. upon conclusion of the due diligence period January 31, 1996, and wish to have confirmation from our office that the Commission on Water Resource Management (Commission) will officially transfer the pump installation permits to the Board upon fulfillment of procedural requirements.  

The "Closing Agreement" states (item 6e, page 5) that, during the due diligence period, the Board and Wailuku Agribusiness Co., Inc. shall petition the Commission to transfer the pump installation permit from Wailuku (sic) to the Board such that, at closing, the Board shall hold the permit under terms satisfactory to the Board. The petition can be in letter form addressed to the Chairperson, in simple language, and should be signed by both parties to the Agreement, as well as by the permittee's successor in interest, C. Brewer Homes, Inc. Staff is recommending that the Chairperson be authorized to respond by letter upon receipt of such petition.  

If you have any questions, please call Charley Ice at [redacted]  

Sincerely,  

[Signature]  
RAE M. LOUI  
Deputy Director
COMMISSION ON WATER RESOURCE MANAGEMENT

FROM: [Name]
TO: [Name]
DATE: [Date]
SUSPENSE DATE: [Date]

REGULATION BRANCH
R. LOUI
J. UWAIN
F. CHING
S. SUBIA
K. YODA

SURVEY BRANCH
E. HIRANO
G. BAUER
R. HARDY
N. FUJII
M. OHYE
I. KUNIMURA

PLANING BRANCH
S. EDMUNDS
L. MIZUNO

APPROVAL
SIGNATURE
INFORMATION

REVIEW & COMMENT
TAKE ACTION
TYPE DRAFT
TYPE FINAL
FILE
XEROX COPIES

Comment:

There is no permit until this is correct.

pump test results submitted prior to last meeting;
"Closing Agreement", when finalized, will be implemented schedule showing pump installation elements, etc. submitted in Agreement.
January 9, 1996

Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
(Well Nos. 5631-02 and 5631-03) Waihee, Maui, Hawaii

Dear Ms. Loui:

We have submitted to you a letter dated January 2, 1996 requesting that the subject pump installation permits be extended. As noted in the letter, the County of Maui Board of Water Supply and Wailuku Agribusiness Co. Inc. have executed a "Closing Agreement" which would allow the Board of Water Supply to be the responsible implementing entity for the project which includes the installation of pumps at North Waihee Wells 1 and 2. The "Closing Agreement" requires, in part, that the pump installation permits be transferred to the Board of Water Supply.

The applicant for the original pump installation permits was C. Brewer Properties, Inc. As discussed with the CWRM staff, we would like to confirm that, in order to transfer the permits, C. Brewer Homes, Inc. (the successor company to C. Brewer Properties, Inc.) and the County of Maui Board of Water Supply must write a letter requesting that the permits be transferred; and that, upon receiving the letter, CWRM staff will transfer the permits to the Board of Water Supply.
Please confirm your understanding of this process, and inform us in writing as soon as possible. The due diligence period for the "Closing Agreement" ends January 31, 1996. If you or your staff have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

C. BREWER HOMES, INC.

James M. Murray
Project Manager

JMM:vp

cc:  David Craddick, Director, Department of Water Supply
     Paul Mancini, Mancini, Rowland & Welch
     Milton Arakawa, Munekiyo & Arakawa, Inc.
To: Charley Ice  
Commission on Water Resource Management

From: Milton Arakawa

Subject: Pump Installation Permit for North Waihee Wells 1 and 2

Attached Is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/9/96</td>
<td>Letter to Rae Loui, Deputy Director from James Murray, C. Brewer Homes</td>
</tr>
</tbody>
</table>

Comments: Charley, attached is a copy of the letter from C. Brewer Homes requesting a response from the CWRM staff regarding the transfer of the subject permits. An expedited response would be appreciated. If you have any questions, please feel free to call me. Thank you.

(Initials) 

If you have any problems or do not receive the entire fax, kindly call me at 244-2015.

CONFIDENTIAL COMMUNICATION: This message is intended for the use of the designated recipient(s) named above. If you have received this message in error, kindly notify us immediately by telephone. Thank you.
January 9, 1996

Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
(Well Nos. 5631-02 and 5631-03) Waihee, Maui, Hawaii

Dear Ms. Loui:

We have submitted to you a letter dated January 2, 1996 requesting that the subject pump installation permits be extended. As noted in the letter, the County of Maui Board of Water Supply and Wailuku Agribusiness Co. Inc. have executed a "Closing Agreement" which would allow the Board of Water Supply to be the responsible implementing entity for the project which includes the installation of pumps at North Waihee Wells 1 and 2. The "Closing Agreement" requires, in part, that the pump installation permits be transferred to the Board of Water Supply.

The applicant for the original pump installation permits was C. Brewer Properties, Inc. As discussed with the CWRM staff, we would like to confirm that, in order to transfer the permits, C. Brewer Homes, Inc. (the successor company to C. Brewer Properties, Inc.) and the County of Maui Board of Water Supply must write a letter requesting that the permits be transferred; and that, upon receiving the letter, CWRM staff will transfer the permits to the Board of Water Supply.
Rae M. Loui, Deputy Director  
January 9, 1996  
Page 2

Please confirm your understanding of this process, and inform us in writing as soon as possible. The due diligence period for the "Closing Agreement" ends January 31, 1996. If you or your staff have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

C. BREWER HOMES, INC.

James M. Murray  
Project Manager

JMM:vp  
cc: David Craddick, Director, Department of Water Supply  
Paul Mancini, Mancini, Rowland & Welch  
Milton Arakawa, Munekiyo & Arakawa, Inc.
SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2 (Well Nos. 5631-02 and 5631-03) Waihee, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of November 8, 1995, the Commission on Water Resource Management (CWRM) considered the extension of the construction start date for the subject project. The CWRM determined that if two (2) conditions were met within 60 days, or by January 8, 1996, relief from revocation of the permit would be possible. The two (2) conditions imposed by the CWRM are:

1. C. Brewer Properties, Inc. and the Maui Department of Water Supply can document an agreement causing the initiation of the pump installation work and submit it to the CWRM; and

2. A schedule of actual installation work is provided by the permittee to the CWRM.

With regard to Condition No. 1, we have enclosed a copy of the "Closing Agreement" between the Board of Water Supply and Wailuku Agribusiness, Co. Inc. which sets forth the transfer of certain real property title and other interests from Wailuku Agribusiness to the Board of Water Supply. (For clarification purposes, Wailuku Agribusiness Co., Inc. is the landowner of the property and is a subsidiary of C. Brewer & Co., Ltd. At the time of application for the pump installation permit, C. Brewer Properties, Inc. was also a subsidiary of C. Brewer & Co., Ltd. Since then, C. Brewer Homes, Inc. was formed through a stock offering and is the successor company of C. Brewer Properties, Inc. However, C. Brewer Homes Inc. is not a subsidiary of C. Brewer and Company, Limited.)
The purpose of the transfer of property is to allow the Board of Water Supply to be the responsible implementing entity for the project which includes the use of Waihee Well Nos. 1 and 2, installation of production pumps (pursuant to the referenced permits), and appurtenant facilities, construction of a new 500,000 gallon water tank, and approximately 4.26 miles of underground waterline.

It should be noted that the "Closing Agreement" provides for a due diligence period which extends to January 31, 1996. Upon the subsequent closing of the transaction, the Agreement calls for the transfer of the pump installation permit to the Board of Water Supply. Refer to Item 6.e. of the Agreement.

With regard to Condition No. 2, we have attached a schedule of proposed construction for the project which includes the installation work for the pumps. The schedule has been developed by the Department of Water Supply. The schedule anticipates that pump installation for testing will be initiated by May 1, 1996. Thus, we request that construction start for the pump installation permits be extended to this date.

We respectfully request that the issue of extension of the permit be placed on the Commission's January 24, 1996 agenda. If you or your staff have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

James M. Murray
Project Manager

cc: David Craddick, Director, Department of Water Supply (with enclosures)
cbhnww.ext.le42
Mr. James Herberk  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, Hawaii 96793

Dear Mr. Herberk:

Revocation of Pump Installation Permits  
North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

At its regular meeting of November 8, 1995, at which a representative from C. Brewer Properties, Inc. was present, the Commission on Water Resource Management (CWRM) directed staff to notify the permittee that the permit shall be revoked on January 13, 1996. However, if two conditions were met within sixty (60) days, or by January 8, 1996, relief from revocation would be possible. The two conditions imposed by the CWRM are:

1. C. Brewer Properties, Inc. and the Maui Department of Water Supply can document an agreement causing the initiation of the pump installation work and submit it to the CWRM.

2. A schedule of actual installation work is provided by the permittee to the CWRM.

The next regularly scheduled CWRM meeting is January 24, 1996. The CWRM will reconsider this revocation matter on that date if conditions 1 and 2 are met by January 8, 1996.

Very truly yours,

MICHAEL D. WILSON
# Environmental Assessment
- 1995-12-18
- 1996-01-31

# Design/Study/Survey/Soils
- 1996-02-28
- 1996-04-30

# Renew Permits as needed
- 1996-05-15
- 1996-07-10

# Civil/Mech/Elec/P&ID/Struct
- 1996-06-15
- 1996-08-10

# Review & Approval
- 1996-09-20

# Bid & Award
- 1996-10-15

# Pump Installation for Testing
- 1996-11-15

# Water Quality Data
- 1996-12-15

# Preliminary Engineering Report
- 1997-01-15

# Construction
- 1997-02-28

# Environmental Assessment
- 1997-03-31

# Renew Permits as needed
- 1997-04-15

# Design/Study/Survey/Soils
- 1997-05-10

# Civil/Mech/Elec/P&ID/Struct
- 1997-06-15

# Review & Approval
- 1997-07-20

# Bid & Award
- 1997-08-15

# Pump Installation for Testing
- 1997-09-15

# Water Quality Data
- 1997-10-30

# Preliminary Engineering (DOH)
- 1997-11-15

# Preliminary Engineering Report submitted with 1 MGD Phase

# Construction
- 1997-12-31

# First 1 MGD On-Line
- 1998-01-15

# Pump Installed with 1 MGD Phase
- 1998-02-28

# WQ Data with 1 MGD Phase
- 1998-04-15

# Preliminary Engineering Report submitted with 1 MGD Phase
- 1998-05-30

# All 3 MGD On-Line
- 1998-06-30

---

**GANTT CHART REPORT**

**Current Date:** 12/18/95

**As of Date:** 01/01/96
C. Brewer Properties, Inc. Request for Extension of Start Date North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03) Request to Install 1400 gpm Pumps for Domestic Use TMK 3-2-1:4 Waihee, Wailuku, Maui

Applicant: C. Brewer Properties, Inc.
P.O. Box 1437 Wailuku, HI 96793

Landowner: Wailuku Agribusiness Company, Inc.
P.O. Box 520 Wailuku, HI 96793

Action Requested: Permission to extend start date two months, from November 14, 1995 to January 14, 1996, for installing a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.

Well Location/Tax Map Key: The wells are located at Waihee Valley, Maui at Tax Map Key: 3-2-1:4 (Attachment A).

Background:

March 25, 1993 Pump Installation Permits for North Waihee Wells 1 & 2 were issued. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved.

March 1, 1995 Pump Installation Permits were extended, with a new expiration date of March 1, 1997. The start date was set to expire in 2 months, to require applicant to return to the Commission if delays continued. The permits were issued March 14, 1995.

May 5, 1995 The start date for work under the Pump Installation Permits was extended two months, from May 14, 1995 to July 14, 1995, following the applicant's request for a four-month extension.

July 19, 1995 The start date for work under the Pump Installation Permits was extended two months, from July 14, 1995, to September 14, 1995, following the applicant's request for a six-month extension.
September 13, 1995  The start date for work under the Pump Installation Permits was extended two months, from September 14, 1995 to November 14, 1995, following the applicant's request for a six-month extension. The applicant and the Maui Department of Water Supply believed that the two parties were close to an agreement. The Commissioners expressed the inclination to deny further extensions if the matters under consideration were not resolved.

October 26, 1995  The applicant requested a two-month extension of the start date, from November 14, 1995 to January 14, 1995, stating that the parties had agreed "in principle" to purchase of land in fee, requisite easements, and reimbursements for certain development costs (See Attachment C). It was anticipated that a letter of intent by the Maui Board of Water Supply would be ready for action at a November 7, 1995 Board Meeting.

Well Description (See Attachment B):

- Ground elevation: 283 ft.
- Casing diameter: 16 inches
- Solid casing depth: 289 ft.
- Screen casing depth: 309 ft.
- Open hole: 79 ft.
- Total depth: 363 ft.
- Grouted annulus: 0 to 200 ft.
- Proposed pump capacity: 1400 gpm (each)

Water Availability: The wells are located in the Waihee System near the Waihee-Iao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of Iao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Total proposed use is 4 mgd; 2 mgd from each well. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd by the Maui Water Use and Development Plan, although the Plan acknowledges that withdrawals above 4 mgd would require justification through field demonstration.

Analysis: The well will develop fresh, basal water for municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has opined that pump tests from May 14 to 19, 1989 have demonstrated that the drawdown from heavy pumping is relatively minor, with full recovery nearly instantaneous, while salinity is very low during these tests. However, staff has only received pump test data from 1982.

According to §13-168-12(j), HAR:

Every Well construction and pump installation permit issued or caused to be issued by the commission shall be for a specified period not to exceed two years, unless otherwise specified in the permit and shall contain the commencement and completion dates for the permitted activity. In determining the commencement and completion dates of the activity, the commission shall take into consideration the:

1. Cost and magnitude of the project;
2. Engineering and physical features involved;
(3) Existing conditions; and
(4) Public interest affected.

The commission may extend the completion dates of the activity prescribed in any permit upon a showing of good cause and good-faith performance. If the commencement or completion date is not complied with, the commission shall cause the permittee to be notified by certified mail that the permit shall be revoked within sixty days unless the permittee can show good cause that it should not be revoked.

Staff believes this rule implies that the well construction and pump installation permits and timelines are specifically aimed at the actual well construction and pump installation activities rather than the planning or negotiation stages of a ground water development project. Since the history of this permit has been more in the arena of planning and negotiations, staff believes that the permittee should reapply when they are ready to actually install their pump. However, staff has, again, been informed by the permittee that the actual installation date is near.

RECOMMENDATION:

That the Commission approve the extension of the start date of the pump installation permits for North Waihee Wells to March 14, 1996 if:

1. By November 8, 1995, both C. Brewer Properties, Inc. and the Maui Department of Water Supply can show that an agreement which will cause initiation of the pump installation work has been reached;

2. A schedule of actual installation work is provided by the permittee to the Commission.

3. All past pump test data for both wells is provided by the permittee to the Commission.

If items 1, 2, and 3 are not met by the permittee by November 8, 1995, then staff recommends that the Commission direct staff to notify the permittee that the permit shall be revoked on January 13, 1996, in accordance with §13-168-12(j), HAR.

Respectfully submitted,

RAE M. LOUI
Deputy Director

Attachments

APPROVED FOR SUBMITTAL:

MICHAEL D. WILSON, Chairperson
Waihee 1 & 2
(Well No. 5631 - 02, 03)
PROPOSED SECTION OF WELL

Elevation at top of casing:
284 ft., msl.

Ground Elevation: 283 ft., msl

Cement Grout: 200 ft.

Hole Diameter: 20 in.

Total Depth: 363 ft.

Rock Packing: 108 ft.

Solid Casing: ASTM Designation A-242
USS Cor-ten, Kaiser
Material Steel Kaisaloy
Length 289 ft.
Diameter 16 in.
Wall thickness 0.3125 in.

Casing: □ Perforated □ Screen
USS Cor-ten, Kaiser
Material Steel Kaisaloy
Length 20 ft.
Diameter 16 in.
Wall thickness 0.25 in.
Openings 100 sq. in./L.F.

Open Hole:
Length 79
Diameter 15 in.

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
Ms. Rae M. Loui, Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe`e Wells 1 and 2 (Well Nos. 5631-02 and 5631-03)  
Waihe`e, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of September 13, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to November 14, 1995. We would like to respectfully request an extension of the start date to January 14, 1996.

We are pleased to note that after a number of discussions with the County of Maui Board and Department of Water Supply, we have reached an agreement “in principle” with the Board on October 24, 1995. After a Board of Water Supply proposal and C. Brewer Homes, Inc. counter proposal were discussed in September and October, the agreement “in principle” involves Board of Water Supply purchase of land in fee simple, a perpetual conservation easement and other necessary easements, and reimbursement for engineering and other development costs expended thus far by C. Brewer Homes, Inc.

At this point, we are anticipating that a letter of intent will be drafted by the Department of Water Supply for review by C. Brewer Homes, Inc. It is hoped that the letter of intent can be accepted by C. Brewer Homes, Inc. and the acceptance confirmed by the Board of Water Supply at its November 7, 1995 meeting.

For your information, we have attached an updated chronology of the major project tasks which have taken place since the project’s inception, and a status report on the various permits required for development.

Attachment C
We ask that our pump installation permit extension request be placed on the Commission’s November 8, 1995 agenda. If you have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

James M. Murray, Jr.
Project Manager

Attachments
cc: Milton Arakawa, Munekiyo and Arakawa, Inc.
NWW2
To: Charley Ice  
Commission of Water Resource Management  

From: Milton Arakawa  

Subject: North Waihee Wells 1 and 2  

Attached is/are:  

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Appendix C - Excerpts from Central Maui Water Source Development</td>
</tr>
</tbody>
</table>

Comments: Charley, attached for your information is a copy of Appendix C which was included in the Final Environmental Assessment for the project.

If you have any problems or do not receive the entire fax, kindly call me at [redacted].

CONFIDENTIAL COMMUNICATION: This message is intended for the use of the designated recipient(s) named above. If you have received this message in error, kindly notify us immediately by telephone. Thank you.
Appendix C

Excerpts from Central Maui Water Source Development, Norman Saito Engineering Consultants, Inc. and John F. Mink
Source Area 1: Waihee Aquifer System (Waihee to Kahakuloa)

The region between Waihee Valley and Kahakuloa Valley embraces about 12 square miles of humid, mountainous terrain where rainfall varies from an annual average of 40 inches at the coast to more that 300 inches at the headwaters of Waihee Stream. The combination of moderate to very high rainfall with geology featuring both poorly permeable and highly permeable rocks has created a complex suite of water resources. The major streams of Waihee, Makamakaole and Kahakuloa are perennial while lesser ones are not. Marshes form the headwaters of streams, and groundwater occurs in high level as well as basal aquifers.

Waihee Stream is one of the largest water courses in the State, discharging an average of 55 mgd and never experiencing a low of less than 14 mgd. The minimum flow of record (approximately 7 years) was 14.2 mgd in early 1985 following the most severe drought of the century. Below the USGS gaging station the river is diverted into the Waihee Ditch, and still further downstream into the Spreckels Ditch. The average combined flow of these ditches is 37 mgd on a 24 hour basis, placing Waihee among the most prolific sources of ditch water in the State.

The large base flow of Waihee is sustained principally by seepage from high level dike water and secondarily by headwater marshes. The low flow of Makamakaole, on the other hand, originates entirely in marshes and the perched aquifers that sustain them. Kahakuloa receives about equal volumes of low flow from perched water marshes and dike aquifers. Wailena is perennial at its origin where it is fed by perched water, but low flows are quickly lost by infiltration in the mid and lower reaches of the stream.

In contrast to the extraordinary discharges of Waihee Stream, those in Kahakuloa and Makamakaole are modest. The average flow at 330 feet elevation in Kahakuloa as measured at the USGS gage
station is 10 mgd, and the base flow, which is exceeded more than 90 percent of the time, is 3.5 mgd. For the Left Branch of Makamakaole at elevation 1500 feet the average is 1.9 mgd and the base flow is about 0.6 mgd. The large base flow of Waihee, about 20 to 25 mgd, and the smaller yet significant base flow of Kahakuloa are manifestation of the presence of voluminous dike impounded groundwater resources in the region. Nearer the coast basal aquifers occur.

Hydrogeology and Groundwater Occurrence

The primary geological formation underlying the entire region is basaltic lava of the Wailuku volcanic series. All major aquifers, both high level dike and basal, occur in this formation. The Wailuku series is analogous to the Honomanu series in East Maui and the Koolau series in Oahu, and like these formations it is extremely permeable. To the south the productive Iao aquifer consists of Wailuku basalt.

Over much of the region the Wailuku series is covered by the much paler Honolua formation. Composed of andesite and trachyte, the Honolua is normally dense, massive and light gray in contrast to the dark, more broken lavas of the Wailuku formation. Its permeability is significantly lower than that of the older basalt. It does not constitute major aquifers but carries the perched water that sustains marshes.

The Honolua formation forms a blanket, hundreds of feet thick at times, reaching from Eke to the coast. Its characteristics are most strikingly illustrated in the resistant trachyte dome of Puu Olai on the coast between Wailena and Waiolai Gulches. Other prominent trachyte domes are Eke, Puu Koae and Puu Olelo.

In the reach between Waihee and Makamakaole the Honolua may behave as a caprock on the Wailuku basalt aquifer, creating high heads a short distance inland. The head no more than 2000 feet
from the coast is 10 feet, which would be impossible in an unconfined basal aquifer. An alternative explanation for the high head is that groundwater flow is controlled by dikes.

Striking northerly from the original volcanic caldera in upper Iao Valley is a rift zone which passes through the Waihee Aquifer System, especially its northern part. The dikes trend from NNW to N to NNE but appear to favor the NNE strike. The rift formed during extrusion of the Wailuku formation, but dikes of the later Honolua series also follow the trend. The Wailuku dikes are normally one to two feet thick and black in fresh exposures. The Honolua dikes, which occur much less frequently, tend to be thicker and lighter in color.

The trachyte domes at Puu Koae and Puu Olai are contemporaneous with Puu Eke, which suggests that Honolua dikes cut through the region and may control groundwater movement even toward the coast. A large trachyte dike is exposed at the ditch intake on Waihee Stream, and its projected trace lies between Makamakaole and Waihee. Whether or not it affects groundwater behavior will be determined when a Makamakaole exploratory well is finally drilled.

As far as is known from experience elsewhere in West Maui, high level dike water is restricted to basalts of the Wailuku volcanic series and is far more voluminous than perched water in Honolua andesites. The seaward boundary of the high level aquifers by coincidence is about along the Forest Reserve line. In Kahakuloa a major spring (Kapuna Spring) overflows from a dike compartment where the stream leaves the Forest Reserve, and in Waihee the first visible dike spring cascades from the valley wall about two miles inland of the line. High level groundwater, however, seeps into the stream channel for a considerable distance downstream of this first dramatic canyon wall spring.
One or more basal aquifers exist seaward of the rift zone but are not hydraulically connected all the way from Waihee to Kahakuloa. These aquifers between Waihee and Makamakaole are probably confined at the coast, but beyond Makamakaole toward Wailena they are likely to be unconfined because the Honolua formation pinches out.

Groundwater Development

Aside from diversions to Waihee and Spreckels Ditches, only a small quantity of groundwater is being developed at this time, but not by wells, galleries or other common extraction techniques. Groundwater that collects as seepage in streams is withdrawn either at the source or, more often, downstream by users. The total volume taken is negligible, no more than thousands of gallons per day on the average.

Two successful wells were drilled on the north bank of Waihee in 1981 by C. Brewer Co. but have not yet been connected to a distribution system. These wells penetrated an aquifer of Wailuku basalt and produced low salinity (less than 50 mg/l chlorides) water at rates to 1700 gpm during the initial testing. In May of this year a more comprehensive test was conducted using one well for pumping while the other served as an observation well. Also used as an observation well was the monitor boring drilled at Kanoa during the field phase of the investigation. The recent test confirmed the earlier indications of the presence of a sizeable aquifer capable of being developed with high capacity pumps.

Pump Test Results

The test was conducted uninterruptedly between 12 noon May 15 and 12 noon May 19, a total of 96 hours. North Waihee Well 2 (makai well) was pumped at an average rate of 2450 gpm (3.5 mgd). North Waihee Well 1 (mauka well) and Kanoa served as principal observation wells. Each was equipped with a continuous water level recorder. A recorder was also placed on an unused well in Wailena.
Gulch, and tape measurements of water levels were made in boring A-1 in the Iao basal aquifer. Neither the Wailena well nor A-1 exhibited fluctuations induced by pumping. Both are too far away from the North Waihee wells, and in the case of A-1 an effective barrier consisting of the Waihee Valley fill and possibly dikes separate the Iao aquifer from North Waihee.

Maximum drawdown at the pumping well was 6.85 feet when the rate was temporarily at 2900 gpm; at the steady rate of 2450 gpm it was stable at 5.1 feet. These were expected values on the basis of the original step drawdown test in 1981. When the pump was turned off, recovery to within a few tenths of a foot of the original static level was instantaneous.

The curve of drawdown at observation wells as a function of time at constant pumping rate yields fundamental information about aquifer characteristics. Data from observation wells are uncluttered by perturbations except for the harmonic tidal swing. Analyses of drawdown at both observation wells give an aquifer transmissivity of 320,000 sq.ft./day and storativity in the range of .05 to .30. Transmissivity is the measure of how easily water moves through an aquifer; the results indicate a highly permeable aquifer comparable in properties to the Iao and Lahaina aquifers. A further calculation gives hydraulic conductivity of approximately 2000 ft./day, which is capable of handling high capacity pumps. Storativity is equivalent to effective porosity, or the pore volume which gives up water to pumping. The high value is typical of unconfined conditions. The aquifer sector between the North Waihee wells and the Kanoa boring is not confined, but near the coast the cap of Honolua trachyte covering the Wailuku formation may be a confining stratum.

If aquifer barriers are encountered during a pump test, the drawdown curve will deflect so that the rate of drawdown will increase. No such deflections occur in the data from either North
Waihee 1 or Kanoa. Evidently potential impediments to groundwater flow, such as dikes, do not behave as barriers but are subsumed in the aquifer's global characteristics. This means that groundwater moves freely in the reach between North Waihee and Kanoa and for a considerable distance beyond. Application of groundwater hydraulics equations to the data suggest that the minimum distance to an effective barrier is more than a mile away.

Salinity of the pumped water was very low, less than 30 mg/l chloride, and did not vary over the period of the test. The low and invariant salinity in view of the high pump rate suggests that the fresh water portion of the aquifer is poorly connected to sea water.

The test was highly successful in providing fundamental information about aquifer characteristics as well as extent and exploitability.

Potential Development and Sustainable Yield

The North Waihee aquifer is highly permeable, enjoys a high static water level, and is extensive. It has never been forcibly drafted for municipal or irrigation needs. It presents an opportunity to add a significant increment of new water to the Central Maui Water System.

The recommended first phase in development of the aquifer is to drill two new wells to add to the already existing two North Waihee wells. The new wells will be in the reach between North Waihee and Kupaa Gulch. Access is easy and pipeline layout and construction should not pose unusual problems. Each well can be equipped with a 2 mgd (1400 gpm) pump, providing a total installed capacity of 8 mgd. However, average output of the aquifer on an annual basis must not exceed 4 mgd. The full capacity of the wells could be used temporarily during high demand periods as long as the annual average is held.
Another increment of several mgd is likely to be developable between Kupaa and Makamakaole, and several more beyond. Beyond Kupaa the cost of development and transmission construction will increase sharply because of the inhospitable terrain. The expectable sustainable yield in the 3.5 mile distance from Waihee to Kahakuloa is at least 10 mgd and may be 12 to 15 mgd. Not all of it may be feasibly developable, but in the next few years it should not be difficult to add an average of 4 mgd to the Central Maui network.
FACSIMILE COVER SHEET

November 2, 1995

To: Charley Ice
    Commission on Water Resource Management

From: Milton Arakawa

Fax No.: (808) [redacted]

No. of Pages Including Cover Letter: 6

Subject: North Waihee Wells 1 and 2

Attached is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
</table>

Comments: Charley, attached is a copy of the summary report of the North Waihee Wells Pump Test, as you requested.

cc: Jim Murray (Fax no. [redacted])

(Initials) [redacted]

If you have any problems or do not receive the entire fax, kindly call me at [redacted]

CONFIDENTIAL COMMUNICATION: This message is intended for the use of the designated recipient(s) named above. If you have received this message in error, kindly notify us immediately by telephone. Thank you.
NORTH WAIHEE WELLS PUMP TEST
May 15 - 19, 1989

Summary Report

John F. Mink and Norman Saito Engineering Inc.
June 3, 1989

In 1981 two deep wells were drilled for C. Brewer on the north bank of Waihee Stream from an elevation of 282 feet, about 2300 feet upstream of Kahekili Highway. They were tested and proved capable of yielding more than 2 mgd per well but were never fitted with pumps and have remained idle since then. The aquifer which they penetrate appears to be so poorly connected to the main Iao-Waiehu aquifer as to be virtually independent of it. The northward extent toward Kahakuloa is uncertain but likely reaches to beyond Makamakaole. One of the objectives of the recent pump test was to determine whether low permeability boundaries constrain the size of the aquifer; no boundaries could be detected by analysis of the test results.

In 1987 a reconnaissance hydrological survey of the region from Waihee to Kahakuloa was made as part of an effort to identify additional water sources for Central Maui. A test boring was drilled at the nose of Kanoa Ridge about 2000 feet north of the North Waihee wells to measure fresh water head, and another was planned for a site where Makamakaole Stream crosses the highway. The Makamakaole boring has not been drilled because the State Department of Water Resources Management plans eventually to drill an exploratory well
there, one large enough to be pumped. The water table in the
Kanoa boring is about the same as at North Waihee, suggesting
aquifer continuity between the two sites. The Kanoa boring
was carefully monitored during the recent test and clearly
established that continuity does indeed exist in the region.

The delay by the State in drilling the Makamakaole
exploratory well denied the opportunity to ascertain whether
the aquifer continued to and beyond Makamakaole Valley.
Drilling a small diameter boring, which was originally
planned by the Joint Venture, was raised again, but the cost
seemed excessive for the type of data obtainable (water level
and salinity). The alternative of a long term pump test, the
results of which could be analyzed to give aquifer parameters
and an estimate of extent, was selected instead.

Pump Test and Results

The test was conducted uninterruptedly between 12 noon
May 15 and 12 noon May 19, a total of 96 hours. North Waihee
Well 2 (makai well) was pumped at a rate of 2400 gpm (3.43
mgd) except for a period of 9 to 10 hours on May 18 when the
rate was raised to 2900 gpm (4.1 mgd) in response to an
incorrect belief that the steady rate had decreased. The
average rate for the 96 hour period was 2450 gpm (3.5 mgd).

North Waihee Well 1 (mauka well) and Kanoa served as
principal observation wells. Each was equipped with a
continuous water level recorder. A recorder was also placed
on the Wailena well, and tape measurements of water levels
were made in boring A-1 in the Waiehu-Iao aquifer. Neither
the Wailena well nor A-1 exhibited fluctuations induced by
pumping. Both are too far away, and in the case of A-1 an
effective barrier consisting of Waihee Valley fill and
perhaps dikes separates Waiehu-Iao from North Waihee.

Maximum drawdown at the pumping well was 6.85 feet when
the rate was 2900 gpm; at the steady rate of 2400 gpm
drawdown was stable at 5.1 feet. These were expected values
on the basis of the original step drawdown tests in 1981.
When the pump was turned off, recovery to within a few tenths
of a foot of the original static level was instantaneous.

At North Waihee 1 the static head before the start of
pumping was 11.45 feet. At the end of the test maximum
drawdown was 0.70 feet. North Waihee 1 is just 178 feet from
North Waihee 2. Water levels respond to sea tides, displaying
a tidal efficiency of about 4 percent (range of 0.07 feet).
Distance from the sea is 4000 feet.

The pre-test static water level at Kanoa was 12.42 feet.
Maximum drawdown at the end of the test was 0.44 feet (tape
measurement). The distance between North Waihee 2 and Kanoa
is 2000 feet. Tidal efficiency is about 6 percent (range 0.11
feet), which is greater than at North Waihee 1 because Kanoa
is only 2000 feet from the coast. Tidal efficiencies are
interesting because they suggest the ease with which water
moves through an aquifer. Manifestly the North Waihee aquifer
is very permeable.
The curve of drawdown as a function of time at constant pumping rate yields fundamental information about aquifer characteristics. Data from observation wells are uncluttered by perturbations except for the harmonic tidal swing. Preliminary analyses of drawdown at both observation wells give an aquifer transmissivity of 320,000 sq.ft./day and storativity in the range .05 to .30. Transmissivity is the measure of how easily water moves through an aquifer; the results indicate a highly permeable aquifer comparable in properties to the Waiehu-Iao and Lahaina aquifers. A further calculation gives hydraulic conductivity of about 2000 ft./day, which is capable of handling high capacity pumps. Storativity is equivalent to effective porosity, or the pore volume which gives up water to pumping. The high value is typical of unconfined conditions. The aquifer sector between North Waihee 1 and Kanoa is not confined, but near the coast the cap of Honolua trachyte covering the Wailuku formation may be a confining stratum.

If aquifer barriers are encountered during a pump test, the drawdown curve will deflect so that the rate of drawdown will increase. No such deflections occur in the data from either North Waihee 1 or Kanoa. Evidently potential impediments to groundwater flow, such as dikes, do not behave as barriers but are subsumed in the aquifer's global characteristics. This means that groundwater moves freely in the reach between North Waihee and Kanoa and for a considerable distance beyond. Application of groundwater
hydraulics equations to the data suggest that the minimum distance to a an effective barrier is more than a mile away.

The salinity of the pumped water was very low, less than 30 mg/l chloride as determined from Hach kit analyses, and did not vary over the period of the test. The low and invariant salinity in view of the high pump rate suggests that the fresh water portion of the aquifer is poorly connected with sea water.

In summary, the test was very successful in providing fundamental information about aquifer characteristics as well as extent and exploitability. The final report will include technical appendices dealing with the test protocol, data, analysis of results, and determination of aquifer properties and groundwater flow behavior.

**Preliminary Conclusions and Recommendations**

The North Waihee aquifer is highly permeable, enjoys a high static water level, and is extensive. This combination of features will allow it to be developed with moderately large wells yielding a total average of 4 mgd in the region between Waihee Valley and the land boundary just north of Kupaa Gulch. Four wells can be located in this region, two of which (North Waihee) already exist. Each well can be equipped with a 2 mgd (1400 gpm) pump. Average output of the aquifer on an annual basis must not exceed 4 mgd. The full capacity of the wells (8 mgd) can be used temporarily in high demand periods, however, so long as the annual average is held.
Ms. Rae M. Loui, Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe`e Wells 1 and 2 (Well Nos. 5631-02 and 5631-03)  
Waihe`e, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of September 13, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to November 14, 1995. We would like to respectfully request an extension of the start date to January 14, 1996.

We are pleased to note that after a number of discussions with the County of Maui Board and Department of Water Supply, we have reached an agreement "in principle" with the Board on October 24, 1995. After a Board of Water Supply proposal and C. Brewer Homes, Inc. counter proposal were discussed in September and October, the agreement "in principle" involves Board of Water Supply purchase of land in fee simple, a perpetual conservation easement and other necessary easements, and reimbursement for engineering and other development costs expended thus far by C. Brewer Homes, Inc.

At this point, we are anticipating that a letter of intent will be drafted by the Department of Water Supply for review by C. Brewer Homes, Inc. It is hoped that the letter of intent can be accepted by C. Brewer Homes, Inc. and the acceptance confirmed by the Board of Water Supply at its November 7, 1995 meeting.

For your information, we have attached an updated chronology of the major project tasks which have taken place since the project’s inception, and a status report on the various permits required for development.
Ms. Rae M. Loui, Deputy Director  
October 26, 1995  

Page 2

We ask that our pump installation permit extension request be placed on the Commission’s November 8, 1995 agenda. If you have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

James M. Murray, Jr.  
Project Manager

Attachments  
cc: Milton Arakawa, Munekiyo and Arakawa, Inc.  
NWW2
### NORTH WAIHEE SOURCE/TRANSMISSION PROJECT

**Chronology of Source Development Program**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>North Waihee Wells (2) are drilled and pump tested by C. Brewer, proving water availability and quality</td>
</tr>
<tr>
<td>1985-1990</td>
<td>Various discussions with DWS Directors regarding the development attractiveness of the Waihee source</td>
</tr>
<tr>
<td>May 1989</td>
<td>Wells are pump tested again, confirming earlier results. 4 mgd initial development program recommended</td>
</tr>
<tr>
<td>November 1989</td>
<td>Central Maui Water Study Part II estimates aquifer capacity (to Kahakuloa) at 10 mgd, up to 12 or 15 mgd</td>
</tr>
<tr>
<td>November 1990</td>
<td>Joint venture discussions initiated with DWS</td>
</tr>
<tr>
<td>January 1991</td>
<td>First letter to DWS with draft business points</td>
</tr>
<tr>
<td>September 1991</td>
<td>First substantive meeting towards joint venture</td>
</tr>
<tr>
<td>June 1992</td>
<td>C. Brewer approached for private party joint venture</td>
</tr>
<tr>
<td>October 1992</td>
<td>BWS Technical &amp; Planning committee approves draft joint venture business points; forwards to full board</td>
</tr>
<tr>
<td>March 1993</td>
<td>BWS approves business points; directs CBHI to work with staff to finalize details</td>
</tr>
<tr>
<td>March 1993</td>
<td>Pump Installation Permit request approved by CWRM</td>
</tr>
<tr>
<td>April 1993</td>
<td>BWS approves new source/transmission/storage fees</td>
</tr>
<tr>
<td>August 1993</td>
<td>CBHI initiates engineering for transmission line</td>
</tr>
<tr>
<td>January 1994</td>
<td>Draft agreement by Paul Mancini based on discussions</td>
</tr>
<tr>
<td>April 1994</td>
<td>Project Environmental Assessment approved</td>
</tr>
<tr>
<td>November 1994</td>
<td>Department of the Army Permit approved</td>
</tr>
<tr>
<td>March 1993 to November 1994</td>
<td>Discussions and negotiations with DWS staff: Ed Kagehiro, Gary Ishikawa, Kim Nuyen, Dave Craddick</td>
</tr>
<tr>
<td>November 1994</td>
<td>CB initiates engineering for pump installation</td>
</tr>
<tr>
<td>December 1994</td>
<td>Basic agreement on detail points (Dave Craddick/JMM)</td>
</tr>
</tbody>
</table>
January 1995  Paul Mancini provides revised draft with all new points
February 1995  BWS Technical & Planning Committee directs further work on draft agreement (2/17)
March 1995  CWRM extends pump installation permit (3/1)
March 1995  Stream Channel Alteration Permit approved (3/1)
March 1995  BWS special meeting (3/7) declines to pursue agreement
March 1995  BWS forms two committees to assess alternatives
March 1995  Well development plans submitted to DWS for review and approval (3/10)
April 1995  BWS/CBHI agree to attempt to negotiate for CB rights
June 1995  BWS/CBHI select Judge Fong to mediate settlement
July 1995  First meeting with all parties and Judge Fong (7/19)
July 1995  CWRM extends pump installation permit (7/19)
August 1995  BWS/CBHI meet w/Judge Fong (8/10) to hear his review of both parties' presentations; agreement to continue the discussions is reached
August 1995  BWS special meeting (8/24) to discuss settlement position/options for acquisition of the project
September 1995  BWS presents offer to purchase land and repay development costs to CBHI
September 1995  CWRM extends pump installation permit (9/13)
October 1995  CBHI presents counter offer of proposal involving BWS purchase of land and perpetual conservation easement
October 1995  OSP approves CZM Consistency permit (10/19)
October 1995  BWS agrees in principle to acquire rights to land, repay development costs to CBHI
North Waihee Wells, Storage & Transmission System
Permit Status

<table>
<thead>
<tr>
<th>Permit or other requirement</th>
<th>Date Submitted</th>
<th>Current Status</th>
<th>Date Approved</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Installation Permit</td>
<td>9/17/92</td>
<td>approved</td>
<td>3/25/93</td>
<td>requesting 2 month extension</td>
</tr>
<tr>
<td>Environmental Assessment</td>
<td>n/a</td>
<td>completed</td>
<td>Apr-94</td>
<td></td>
</tr>
<tr>
<td>Department of the Army Permit</td>
<td>7/6/94</td>
<td>approved</td>
<td>11/30/94</td>
<td>ties to CZM, 401 permits</td>
</tr>
<tr>
<td>Section 401 Water Quality Certification</td>
<td>7/6/94</td>
<td>pending</td>
<td>n/a</td>
<td>application to be revised</td>
</tr>
<tr>
<td>Coastal Zone Management Program</td>
<td>7/6/94</td>
<td>approved</td>
<td>10/19/95</td>
<td></td>
</tr>
<tr>
<td>Consistency Assessment (CZM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream Channel Alteration Permit</td>
<td>7/20/94</td>
<td>approved</td>
<td>3/1/95</td>
<td></td>
</tr>
<tr>
<td>Easement over State Property</td>
<td>n/a</td>
<td>none</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>(old road ROW at Waihee Stream)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
October 26, 1995

Ms. Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe`e Wells 1 and 2 (Well Nos. 5631-02 and 5631-03) Waihe`e, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of September 13, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to November 14, 1995. We would like to respectfully request an extension of the start date to January 14, 1996.

We are pleased to note that after a number of discussions with the County of Maui Board and Department of Water Supply, we have reached an agreement “in principle” with the Board on October 24, 1995. After a Board of Water Supply proposal and C. Brewer Homes, Inc. counter proposal were discussed in September and October, the agreement “in principle” involves Board of Water Supply purchase of land in fee simple, a perpetual conservation easement and other necessary easements, and reimbursement for engineering and other development costs expended thus far by C. Brewer Homes, Inc.

At this point, we are anticipating that a letter of intent will be drafted by the Department of Water Supply for review by C. Brewer Homes, Inc. It is hoped that the letter of intent can be accepted by C. Brewer Homes, Inc. and the acceptance confirmed by the Board of Water Supply at its November 7, 1995 meeting.

For your information, we have attached an updated chronology of the major project tasks which have taken place since the project’s inception, and a status report on the various permits required for development.
We ask that our pump installation permit extension request be placed on the Commission's November 8, 1995 agenda. If you have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

James M. Murray, Jr.
Project Manager

Attachments
cc: Milton Arakawa, Munekiyo and Arakawa, Inc.
WWW2
NORTH WAIHEE SOURCE/TRANSMISSION PROJECT
Chronology of Source Development Program

1981
North Waihee Wells (2) are drilled and pump tested by C. Brewer, proving water availability and quality

1985-1990
Various discussions with DWS Directors regarding the development attractiveness of the Waihee source

May 1989
Wells are pump tested again, confirming earlier results. 4 mgd initial development program recommended

November 1989
Central Maui Water Study Part II estimates aquifer capacity (to Kahakuloa) at 10 mgd, up to 12 or 15 mgd

November 1990
Joint venture discussions initiated with DWS

January 1991
First letter to DWS with draft business points

September 1991
First substantive meeting towards joint venture

June 1992
C. Brewer approached for private party joint venture

October 1992
BWS Technical & Planning Committee approves draft joint venture business points; forwards to full board

March 1993
BWS approves business points; directs CBHI to work with staff to finalize details

March 1993
Pump Installation Permit request approved by CWRM

April 1993
BWS approves new source/transmission/storage fees

August 1993
CBHI initiates engineering for transmission line

January 1994
Draft agreement by Paul Mancini based on discussions

April 1994
Project Environmental Assessment approved

November 1994
Department of the Army Permit approved

March 1993 to November 1994
Discussions and negotiations with DWS staff: Ed Kagehiro, Gary Ishikawa, Kim Nuyen, Dave Craddick

November 1994
CB initiates engineering for pump installation

December 1994
Basic agreement on detail points (Dave Craddick/JMM)
January 1995  Paul Mancini provides revised draft with all new points
February 1995  BWS Technical & Planning Committee directs further work on draft agreement (2/17)
March 1995  CWRM extends pump installation permit (3/1)
March 1995  Stream Channel Alteration Permit approved (3/1)
March 1995  BWS special meeting (3/7) declines to pursue agreement
March 1995  BWS forms two committees to assess alternatives
March 1995  Well development plans submitted to DWS for review and approval (3/10)
April 1995  BWS/CBHI agree to attempt to negotiate for CB rights
June 1995  BWS/CBHI select Judge Fong to mediate settlement
July 1995  First meeting with all parties and Judge Fong (7/19)
July 1995  CWRM extends pump installation permit (7/19)
August 1995  BWS/CBHI meet w/Judge Fong (8/10) to hear his review of both parties' presentations; agreement to continue the discussions is reached
August 1995  BWS special meeting (8/24) to discuss settlement position/options for acquisition of the project
September 1995  BWS presents offer to purchase land and repay development costs to CBHI
September 1995  CWRM extends pump installation permit (9/13)
October 1995  CBHI presents counter offer of proposal involving BWS purchase of land and perpetual conservation easement
October 1995  OSP approves CZM Consistency permit (10/19)
October 1995  BWS agrees in principle to acquire rights to land, repay development costs to CBHI
## North Waihee Wells, Storage & Transmission System
### Permit Status

<table>
<thead>
<tr>
<th>Permit or other requirement</th>
<th>Date Submitted</th>
<th>Current Status</th>
<th>Date Approved</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Installation Permit</td>
<td>9/17/92</td>
<td>approved</td>
<td>3/25/93</td>
<td>requesting 2 month extension</td>
</tr>
<tr>
<td>Environmental Assessment</td>
<td>n/a</td>
<td>completed</td>
<td>Apr-94</td>
<td></td>
</tr>
<tr>
<td>Department of the Army Permit</td>
<td>7/6/94</td>
<td>approved</td>
<td>11/30/94</td>
<td>ties to CZM, 401 permits</td>
</tr>
<tr>
<td>Section 401 Water Quality Certification</td>
<td>7/6/94</td>
<td>pending</td>
<td>n/a</td>
<td>application to be revised</td>
</tr>
<tr>
<td>Coastal Zone Management Program Consistency Assessment (CZM)</td>
<td>7/6/94</td>
<td>approved</td>
<td>10/19/95</td>
<td></td>
</tr>
<tr>
<td>Stream Channel Alteration Permit</td>
<td>7/20/94</td>
<td>approved</td>
<td>3/1/95</td>
<td></td>
</tr>
<tr>
<td>Easement over State Property</td>
<td>n/a</td>
<td>none</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

*old road ROW at Waihee Stream*
BOARD OF WATER SUPPLY, COUNTY OF MAUI
SPECIAL MEETING

DATE: Tuesday, October 17, 1995
TIME: 9:00 a.m.
PLACE: Board of Water Supply Conference Room
County Building, Fifth Floor
200 South High Street
Wailuku, Maui, Hawaii

AGENDA

I. CALL TO ORDER

II. ATTENDANCE

III. DISCUSSION AND POSSIBLE ACTION ON C. BREWER’S RESPONSE TO THE OFFER MADE BY THE BOARD REGARDING THE NORTH WAIHEE AQUIFER.

For this matter, the board may convene in executive session pursuant to HRS 92-5(3) in order to deliberate concerning the authority of persons designated by the board to conduct labor negotiations or to negotiate the acquisition of public property, or during the conduct of such negotiations; and pursuant to HRS 92-5(4) in order to consult with its attorney on questions and issues pertaining to the board’s powers, duties, privileges, immunities, and liabilities.

IV. ADJOURNMENT

If you have special needs or require an accommodation that will assist in your successful participation in the meeting (i.e. large print, taped materials, Sign Language interpreter, accessible parking, etc.), please call Jerry Wells at [redacted] on or before October 12, 1995.
STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

September 13, 1995
Honolulu, Hawaii

C. Brewer Properties, Inc.
Request for Extension of Start Date
North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03)
Request to Install 1400 gpm Pumps for Domestic Use

TMK 3-2-1:4 Waihee, Wailuku, Maui

Applicant: C. Brewer Properties, Inc.
Landowner: Wailuku Agribusiness Company, Inc.
P.O. Box 1437 P.O. Box 520
Wailuku, HI 96793 Wailuku, HI 96793

Action Requested: Permission to extend start date six months, from July 14, 1995 to January 14, 1996, for installing a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.

Well Location/Tax Map Key: The wells are located at Waihee Valley, Maui at Tax Map Key: 3-2-1:4 (Attachment A).

Background:

March 25, 1993
Pump Installation Permits for North Waihee Wells 1 & 2 were issued. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved.
March 1, 1995

Pump Installation Permits were extended, with a new expiration date of March 1, 1997. The start date was set to expire in two (2) months, to require applicant to return to the Commission if delays continued. The permits were issued March 14, 1995.

May 5, 1995

The start date for work under the Pump Installation Permits was extended two (2) months, from May 14, 1995 to July 14, 1995, following the applicant’s request for a four-month extension.

July 19, 1995

The start date for work under the Pump Installation Permits was extended two months, from July 14, 1995, to September 14, 1995, following the applicant’s request for a six-month extension.

August 24, 1995

The applicant requested a six-month extension of the start date, to March 14, 1996, due to continuing discussions with the Maui Department of Water Supply. In response to Commission comments at the July 19, 1995 meeting, the applicant attached a chronology of the source development program and a table showing the status of various relevant permits (see Attachments C & D). Under separate cover, the applicant also sent construction drawings for the pump assembly (Attachment E). The chronology indicates that the parties have agreed, before Judge Fong in August 1995, to continue discussions, and that the BWS was meeting August 24, 1995 to discuss settlement options. The letter also emphasizes that plans and specifications for well improvements and related facilities were transmitted to the Department of Water Supply on March 10, 1995.

Well Description: (See Attachment B)

<table>
<thead>
<tr>
<th>Element</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground elevation:</td>
<td>283 ft.</td>
</tr>
<tr>
<td>Casing diameter:</td>
<td>16 inches</td>
</tr>
<tr>
<td>Solid casing depth:</td>
<td>289 ft.</td>
</tr>
<tr>
<td>Screen casing depth:</td>
<td>309 ft.</td>
</tr>
<tr>
<td>Open hole:</td>
<td>79 ft.</td>
</tr>
<tr>
<td>Total depth:</td>
<td>363 ft.</td>
</tr>
<tr>
<td>Grouted annulus:</td>
<td>0 to 200 ft.</td>
</tr>
<tr>
<td>Proposed pump capacity:</td>
<td>1400 gpm (each)</td>
</tr>
</tbody>
</table>
Water Availability: The wells are located in the Waihee Aquifer System near the Waihee-Iao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of Iao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Total proposed use is 4 mgd; 2 mgd from each well. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd by the Maui Water Use and Development Plan, although the Plan acknowledges that withdrawals above 4 mgd would require justification through field demonstration.

Hydrologic Analysis: The well will develop fresh, basal water for municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has observed that, because the stream channel in this vicinity is 200 feet above sea level, the wells should have no effect upon it. Pump tests have demonstrated that the drawdown from heavy pumping is relatively minor, with full recovery nearly instantaneous. Salinity is very low.

RECOMMENDATION:

Not having heard any contrary indications

That the Commission approve the extension of the start date of the pump installation permits for North Waihee Wells to March 14, 1996. The conditions of the permit issued March 14, 1995 remain in effect except for the start date. Discussions and reviews described by the applicant may be reasonably expected to require six months for completion, prior to pump installation.

Respectfully submitted,

RAE M. LOUI
Deputy Director

Attachments

APPROVED FOR SUBMITTAL:

MICHAEL D. WILSON, Chairperson
Waihee 1&2
(Well No. 5631-02,03)
Briefly describe the proposed work:

Subject wells were drilled and tested between March and August 1981.

---

PROPOSED SECTION OF WELL

Elevation at top of casing:
284 ft., msl.

Ground Elevation: 283 ft., msl

Cement Grout: 200 ft.

Solid Casing: ASTM Designation A-242
USS Cor-ten, Kaiser
Material: Steel Kaiserloy
Length: 289 ft.
Diameter: 16 in.
Wall thickness: 0.1125 in.

Hole Diameter: 20 in.

Casing: □ Perforated □ Screen
USS Cor-ten, Kaiser
Material: Steel Kaiserloy
Length: 20 ft.
Diameter: 16 in.
Wall thickness: 0.25 in.
Openings: 100 sq.in./L.F.

Total Depth: 363 ft.

Rock Packing: 108 ft.

Open Hole:
Length: 79
Diameter: 15 in.

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
NORTH WAIHEE SOURCE/TRANSMISSION PROJECT
Chronology of Source Development Program

1981  North Waihee Wells (2) are drilled and pump tested by C. Brewer, proving water availability and quality

1985-1990 Various discussions with DWS Directors regarding the development attractiveness of the Waihee source

May 1989 Wells are pump tested again, confirming earlier results. 4 mgd initial development program recommended.

November 1989 Central Maui Water Study Part II estimates aquifer capacity (to Kahakuloa) at 10 mgd, up to 12 or 15 mgd.

November 1990 Joint venture discussions initiated with DWS.

January 1991 First letter to DWS with draft business points.

September 1991 First substantive meeting towards joint venture.

June 1992 C Brewer approached for private party joint venture.

October 1992 BWS Technical & Planning committee approves draft joint venture business points; forwards to full board.

March 1993 BWS approves business points; directs CBHI to work with staff to finalize details

March 1993 Pump Installation Permit request approved by CWRM

April 1993 BWS approves new source/transmission/storage fees

August 1993 CBHI initiates engineering for transmission line

January 1994 Draft agreement by Paul Mancini based on discussions

April 1994 Project Environmental Assessment approved

November 1994 Department of the Army Permit approved

March 1993 to November 1994 Discussions and negotiations with DWS staff: Ed Kagehiro, Gary Ishikawa, Kim Nuyen, Dave Craddick

November 1994 CB initiates engineering for pump installation

December 1994 Basic agreement on detail points (Dave Craddick/JMM)
January 1995  Paul Mancini provides revised draft with all new points

February 1995  BWS Technical & Planning Committee directs further work on draft agreement (2/17)

March 1995  CWRM extends pump installation permit (3/1)

March 1995  Stream Channel Alteration Permit approved (3/1)

March 1995  BWS special meeting (3/7) declines to pursue agreement

March 1995  BWS forms two committees to assess alternatives

March 1995  Well development plans submitted to DWS for review and approval (3/10)

April 1995  BWS/CBHI agree to attempt to negotiate for CB rights

June 1995  BWS/CBHI select Judge Fong to mediate settlement

July 1995  First meeting with all parties and Judge Fong (7/19)

July 1995  CWRM extends pump installation permit (7/19)

August 1995  BWS/CBHI meet w/Judge Fong (8/10) to hear his review of both parties' presentations; agreement to continue the discussions is reached

August 1995  BWS special meeting (8/24) to discuss settlement position/options for acquisition of the project
# North Waihee Wells, Storage & Transmission System

## Permit Status

<table>
<thead>
<tr>
<th>Permit or other requirement</th>
<th>Date Submitted</th>
<th>Current Status</th>
<th>Date Approved</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Installation Permit</td>
<td>9/17/92</td>
<td>approved</td>
<td>3/25/93</td>
<td>requesting 6 month extension</td>
</tr>
<tr>
<td>Environmental Assessment</td>
<td>n/a</td>
<td>completed</td>
<td>Apr-94</td>
<td></td>
</tr>
<tr>
<td>Department of the Army Permit</td>
<td>7/6/94</td>
<td>approved</td>
<td>11/30/94</td>
<td>ties to CZM, 401 permits</td>
</tr>
<tr>
<td>Section 401 Water Quality Certification</td>
<td>7/6/94</td>
<td>pending</td>
<td>n/a</td>
<td>application to be revised (standards changed)</td>
</tr>
<tr>
<td>Coastal Zone Management Program Consistency Assessment (CZM)</td>
<td>7/6/94</td>
<td>pending</td>
<td>n/a</td>
<td>OSP still reviewing</td>
</tr>
<tr>
<td>Stream Channel Alteration Permit</td>
<td>7/20/94</td>
<td>approved</td>
<td>3/1/95</td>
<td></td>
</tr>
<tr>
<td>Easement over State Property (old road ROW at Waihee Stream)</td>
<td>n/a</td>
<td>none</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>
Mr. James Herberg, Manager
Maui Operations
C. Brewer Properties
P.O. Box 1437
Wailuku, Hawaii 96793

Dear Mr. Herberg:

Request for Extension of Start Date of Pump Installation
North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

At its regular meeting of September 13, 1995, the Commission on Water Resource Management (Commission) approved the extension of the start date for work on the pump installation permit issued March 14, 1995.

By this letter, the start date is extended two months, from September 14, 1995 to November 14, 1995. The completion date remains March 14, 1997.

Any requests for additional extensions must be submitted for consideration by the Commission prior to November 14, 1995.

Aloha,

MICHAEL D. WILSON
BOARD OF WATER SUPPLY, COUNTY OF MAUI
RULES COMMITTEE MEETING

DATE: Thursday, September 14, 1995
TIME: 11:00 a.m.
PLACE: Board of Water Supply Conference Room
County Building, Fifth Floor
200 South High Street
Wailuku, Maui, Hawaii

AGENDA

I. CALL TO ORDER

II. ATTENDANCE

III. APPROVAL OF MINUTES

IV. COMMITTEE DISCUSSION/ACTION

A. Com. 95-22. Request from Wayne Arakaki for a waiver of the subdivision requirements for water, Paehau Subdivision, TMK 2-1-08:3, SD 91-54.

B. Com. 95-28. Request from Greg Davidge for a waiver to install a domestic water storage tank and buy water to fill the tank, TMK 2-2-06:109, SD 95-21.

C. Com. 95-29. Request from Wayne Arakaki for a 50% reimbursement after the installation of the waterline for the Garrison Subdivision, TMK 2-4-5:73.

D. Com. 95-30. Request from Cindy Moelter for approval of a non-conforming private water system to satisfy the subdivision requirements for domestic use and fire protection, Pali Uli Subdivision, TMK 2-2-004:088, SD 95-2.

E. Com. 95-31. Request from Valerie Harte for a waiver of the shortage declaration, Virginia Caires Subdivision, TMK 2-7-014:062.

V. ADJOURNMENT

If you have special needs or require an accommodation that will assist in your successful participation in the meeting (i.e. large print, taped materials, Sign Language interpreter, accessible parking, etc.), please call Jerry Wells at [redacted] on or before September 12, 1995.
BOARD OF WATER SUPPLY, COUNTY OF MAUI
FINANCE COMMITTEE MEETING

DATE: Thursday, September 14, 1995
TIME: 1:00 p.m.
PLACE: Board of Water Supply Conference Room
        County Building, Fifth Floor
        200 South High Street
        Wailuku, Maui, Hawaii

AGENDA

I. CALL TO ORDER

II. ATTENDANCE

III. APPROVAL OF MINUTES

IV. COMMITTEE DISCUSSION/ACTION
   A. Discussion/possible action on proposed new rates.
   B. Discussion/possible action on C. Brewer's response to the offer made by the Board regarding the North Waihee Aquifer.

For this matter, the board may convene in executive session pursuant to HRS 92-5(3) in order to deliberate concerning the authority of persons designated by the board to conduct labor negotiations or to negotiate the acquisition of public property, or during the conduct of such negotiations; and HRS 92-5(4) in order to consult with its attorney on questions and issues pertaining to the board's powers, duties, privileges, immunities, and liabilities.

V. ADJOURNMENT

If you have special needs or require an accommodation that will assist in your successful participation in the meeting (i.e. large print, taped materials, Sign Language interpreter, accessible parking, etc.), please call Jerry Wells at [REDACTED] on or before September 12, 1995.
Rae M. Loui, Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission of Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihē`e Wells 1 and 2  
Well Nos. 5631-02 and 5631-03  
Waihe`e, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of July 19, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to September 14, 1995. We would like to respectfully request a six (6) month extension of the start date to March 14, 1996.

There has been a significant amount of work done on the project to date in securing permits and in engineering. For your consideration and review, we have included a chronology of the major project tasks which have taken place since the project’s inception, and a status report on the various permits required for development. We should also emphasize that the plans and specifications for the well improvements and related facilities were transmitted to the Department of Water Supply on March 10 of this year. These were prepared by Warren S. Unemori Engineering, Inc.

We are continuing to discuss our involvement in this project with the Department of Water Supply, and progress is being made in these discussions. Our intent is to continue working with the Department of Water Supply to bring this project to fruition. We ask that we be allowed to continue pursuing the implementation of this project through a further extension of the pump installation permits.
If you have any questions, please feel free to call me. Thank you for your consideration.

Sincerely,

James M. Murray, Jr.
Project Manager

Attachments
cc: Milton Arakawa, Munekiyo & Arakawa, Inc.
Attached is material I sent to Rae Loui yesterday on this subject; this fax copy is provided for your immediate use as required. Milton Arakawa had indicated that today is the deadline for submittals for the September 13 meeting.

If you have any questions, don’t hesitate to call me. Thanks for your help.
C. Brewer Homes, Inc.

August 24, 1995

Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission of Water Resource Management
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe`e Wells 1 and 2
Well Nos. 5631-02 and 5631-03
Waihe`e, Maui, Hawaii

Dear Ms. Loui:

At its regular meeting of July 19, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to September 14, 1995. We would like to respectfully request a six (6) month extension of the start date to March 14, 1996.

There has been a significant amount of work done on the project to date in securing permits and in engineering. For your consideration and review, we have included a chronology of the major project tasks which have taken place since the project’s inception, and a status report on the various permits required for development. We should also emphasize that the plans and specifications for the well improvements and related facilities were transmitted to the Department of Water Supply on March 10 of this year. These were prepared by Warren S. Unemori Engineering, Inc.

We are continuing to discuss our involvement in this project with the Department of Water Supply, and progress is being made in these discussions. Our intent is to continue working with the Department of Water Supply to bring this project to fruition. We ask that we be allowed to continue pursuing the implementation of this project through a further extension of the pump installation permits.
If you have any questions, please feel free to call me. Thank you for your consideration.

Sincerely,

James M. Murray, Jr.
Project Manager

Attachments
cc: Milton Arakawa, Munekiyo & Arakawa, Inc.
NORTH WAIHEE SOURCE/TRANSMISSION PROJECT
Chronology of Source Development Program

1981
North Waihee Wells (2) are drilled and pump tested by C. Brewer, proving water availability and quality

1985-1990
Various discussions with DWS Directors regarding the development attractiveness of the Waihee source

May 1989
Wells are pump tested again, confirming earlier results. 4 mgd initial development program recommended.

November 1989
Central Maui Water Study Part II estimates aquifer capacity (to Kahakuloa) at 10 mgd, up to 12 or 15 mgd.

November 1990
Joint venture discussions initiated with DWS.

January 1991
First letter to DWS with draft business points.

September 1991
First substantive meeting towards joint venture.

June 1992
C Brewer approached for private party joint venture.

October 1992
BWS Technical & Planning committee approves draft joint venture business points; forwards to full board.

March 1993
BWS approves business points; directs CBHI to work with staff to finalize details

March 1993
Pump Installation Permit request approved by CWRM

April 1993
BWS approves new source/transmission/storage fees

August 1993
CBHI initiates engineering for transmission line

January 1994
Draft agreement by Paul Mancini based on discussions

April 1994
Project Environmental Assessment approved

November 1994
Department of the Army Permit approved

March 1993 to November 1994
Discussions and negotiations with DWS staff: Ed Kagehiro, Gary Ishikawa, Kim Nuyen, Dave Craddick

November 1994
CB initiates engineering for pump installation

December 1994
Basic agreement on detail points (Dave Craddick/JMM)
<table>
<thead>
<tr>
<th>Month</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1995</td>
<td>Paul Mancini provides revised draft with all new points</td>
</tr>
<tr>
<td>February 1995</td>
<td>BWS Technical &amp; Planning Committee directs further work on draft agreement (2/17)</td>
</tr>
<tr>
<td>March 1995</td>
<td>CWRM extends pump installation permit (3/1)</td>
</tr>
<tr>
<td>March 1995</td>
<td>Stream Channel Alteration Permit approved (3/1)</td>
</tr>
<tr>
<td>March 1995</td>
<td>BWS special meeting (3/7) declines to pursue agreement</td>
</tr>
<tr>
<td>March 1995</td>
<td>BWS forms two committees to assess alternatives</td>
</tr>
<tr>
<td>March 1995</td>
<td>Well development plans submitted to DWS for review and approval (3/10)</td>
</tr>
<tr>
<td>April 1995</td>
<td>BWS/CBHI agree to attempt to negotiate for CB rights</td>
</tr>
<tr>
<td>June 1995</td>
<td>BWS/CBHI select Judge Fong to mediate settlement</td>
</tr>
<tr>
<td>July 1995</td>
<td>First meeting with all parties and Judge Fong (7/19)</td>
</tr>
<tr>
<td>July 1995</td>
<td>CWRM extends pump installation permit (7/19)</td>
</tr>
<tr>
<td>August 1995</td>
<td>BWS/CBHI meet w/Judge Fong (8/10) to hear his review of both parties' presentations; agreement to continue the discussions is reached</td>
</tr>
<tr>
<td>August 1995</td>
<td>BWS special meeting (8/24) to discuss settlement position/options for acquisition of the project</td>
</tr>
</tbody>
</table>
# North Waihee Wells, Storage & Transmission System

## Permit Status

<table>
<thead>
<tr>
<th>Permit or other requirement</th>
<th>Date Submitted</th>
<th>Current Status</th>
<th>Date Approved</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Installation Permit</td>
<td>9/17/92</td>
<td>approved</td>
<td>3/25/93</td>
<td>requesting 6 month extension</td>
</tr>
<tr>
<td>Environmental Assessment</td>
<td>n/a</td>
<td>completed</td>
<td>Apr-94</td>
<td></td>
</tr>
<tr>
<td>Department of the Army Permit</td>
<td>7/6/94</td>
<td>approved</td>
<td>11/30/94</td>
<td>ties to CZM, 401 permits</td>
</tr>
</tbody>
</table>
| Section 401 Water Quality Certification       | 7/6/94         | pending        | n/a           | application to be revised
stands changed                                  |
| Coastal Zone Management Program               | 7/6/94         | pending        | n/a           | OSP still reviewing                           |
| Consistency Assessment (CZM)                  |                |                |               |                                               |
| Stream Channel Alteration Permit              | 7/20/94        | approved       | 3/1/95        |                                               |
| Easement over State Property                  | n/a            | none           | n/a           |                                               |

(fold road ROW at Waihee Stream)
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>North Waihee Wells (2) are drilled and pump tested by C. Brewer, proving water availability and quality</td>
</tr>
<tr>
<td>1985-1990</td>
<td>Various discussions with DWS Directors regarding the development attractiveness of the Waihee source</td>
</tr>
<tr>
<td>May 1989</td>
<td>Wells are pump tested again, confirming earlier results. 4 mgd initial development program recommended.</td>
</tr>
<tr>
<td>November 1989</td>
<td>Central Maui Water Study Part II estimates aquifer capacity (to Kahakuloa) at 10 mgd, up to 12 or 15 mgd.</td>
</tr>
<tr>
<td>November 1990</td>
<td>Joint venture discussions initiated with DWS.</td>
</tr>
<tr>
<td>January 1991</td>
<td>First letter to DWS with draft business points.</td>
</tr>
<tr>
<td>September 1991</td>
<td>First substantive meeting towards joint venture.</td>
</tr>
<tr>
<td>June 1992</td>
<td>C Brewer approached for private party joint venture.</td>
</tr>
<tr>
<td>October 1992</td>
<td>BWS Technical &amp; Planning committee approves draft joint venture business points; forwards to full board.</td>
</tr>
<tr>
<td>March 1993</td>
<td>BWS approves business points; directs CBHI to work with staff to finalize details</td>
</tr>
<tr>
<td>March 1993</td>
<td>Pump Installation Permit request approved by CWRM</td>
</tr>
<tr>
<td>April 1993</td>
<td>BWS approves new source/transmission/storage fees</td>
</tr>
<tr>
<td>August 1993</td>
<td>CBHI initiates engineering for transmission line</td>
</tr>
<tr>
<td>January 1994</td>
<td>Draft agreement by Paul Mancini based on discussions</td>
</tr>
<tr>
<td>April 1994</td>
<td>Project Environmental Assessment approved</td>
</tr>
<tr>
<td>November 1994</td>
<td>Department of the Army Permit approved</td>
</tr>
<tr>
<td>March 1993 to November 1994</td>
<td>Discussions and negotiations with DWS staff: Ed Kagehiro, Gary Ishikawa, Kim Nuyen, Dave Craddick</td>
</tr>
<tr>
<td>November 1994</td>
<td>CB initiates engineering for pump installation</td>
</tr>
<tr>
<td>December 1994</td>
<td>Basic agreement on detail points (Dave Craddick/JMM)</td>
</tr>
</tbody>
</table>
January 1995  Paul Mancini provides revised draft with all new points

February 1995  BWS Technical & Planning Committee directs further work on draft agreement (2/17)

March 1995  CWRM extends pump installation permit (3/1)

March 1995  Stream Channel Alteration Permit approved (3/1)

March 1995  BWS special meeting (3/7) declines to pursue agreement

March 1995  BWS forms two committees to assess alternatives

March 1995  Well development plans submitted to DWS for review and approval (3/10)

April 1995  BWS/CBHI agree to attempt to negotiate for CB rights

June 1995  BWS/CBHI select Judge Fang to mediate settlement

July 1995  First meeting with all parties and Judge Fang (7/19)

July 1995  CWRM extends pump installation permit (7/19)

August 1995  BWS/CBHI meet w/Judge Fang (8/10) to hear his review of both parties’ presentations; agreement to continue the discussions is reached

August 1995  BWS special meeting (8/24) to discuss settlement position/options for acquisition of the project
## North Waihee Wells, Storage & Transmission System Permit Status

**Date**

Permit or other requirement | Date Submitted | Current Status | Date Approved | Comments |
--- | --- | --- | --- | --- |
Pump Installation Permit | 9/17/92 | approved | 3/25/93 | requesting 6 month extension |
Environmental Assessment | n/a | completed | Apr-94 | |
Department of the Army Permit | 7/6/94 | approved | 11/30/94 | ties to CZM, 401 permits |
Section 401 Water Quality Certification | 7/6/94 | pending | n/a | application to be revised (standards changed) |
Coastal Zone Management Program Consistency Assessment (CZM) | 7/6/94 | pending | n/a | OSP still reviewing |
Stream Channel Alteration Permit | 7/20/94 | approved | 3/1/95 | |
Easement over State Property (old road ROW at Waihee Stream) | n/a | none | n/a | |
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

July 19, 1995
Honolulu, Hawaii

C. Brewer Properties, Inc.
Request for Extension of Start Date
North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03)
Request to Install 1400 gpm Pumps for Domestic Use

Applicant: C. Brewer Properties, Inc.
Landowner: Wailuku Agribusiness Company, Inc.
P.O. Box 1437
P.O. Box 520
Wailuku, HI 96793
Wailuku, HI 96793

Action Requested: Permission to extend start date six months, from July 14, 1995 to January 14, 1996, for installing a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.

Well Location/Tax Map Key: The wells are located at Waihee Valley, Maui at Tax Map Key: 3-2-1:4 (Attachment A).

Background:

March 25, 1993  Pump Installation Permits for North Waihee Wells 1 & 2 were issued. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved.

March 1, 1995  Pump Installation Permits were extended, with a new completion date of March 1, 1997. The start date was set to expire in 2 months, to require applicant to return to the Commission if delays continued. The permits were issued March 14, 1995.
May 5, 1995

The start date for work under the Pump Installation Permits was extended two months, from May 14, 1995 to July 14, 1995, following the applicant's request for a four-month extension.

June 30, 1995

The applicant requested a six-month extension of the start date, to January 14, 1995, due to other ongoing, related regulation requirements. Preparation of a response to the Department of Health comments concerning a Section 401 Water Quality Certification and a still-pending application for a Coastal Zone Management Program Consistency Assessment are required before work can begin. A Department of the Army Permit and a Stream Channel Alteration Permit have been conditionally approved. Work on pump improvement design is nearing completion.

Well Description:

- Ground elevation: 283 ft.
- Casing diameter: 16 inches
- Solid casing depth: 289 ft.
- Screen casing depth: 309 ft.
- Open hole: 79 ft.
- Total depth: 363 ft.
- Grouted annulus: 0 to 200 ft.
- Proposed pump capacity: 1400 gpm (each)

Water Availability: The wells are located on the Waihee side of the Waihee-lao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of lao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Proposed use is 2 mgd from both wells together. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd by the Maui Water Use and Development Plan.

Hydrologic Analysis: The well will develop fresh, basal water for municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has observed that, because the stream channel in this vicinity is 200 feet above sea level, the wells should have no effect upon it.
RECOMMENDATION:

That the Commission approve the extension of the start date of the pump installation permits for North Waihee Wells to January 14, 1996. The conditions of the permit issued March 14, 1995 remain in effect except for the start date. Pending work described by the applicant may be reasonably expected to require six months for completion, prior to pump installation.

Respectfully submitted,

[Signature]

RAE M. LOUI
Deputy Director

Attachment

APPROVED FOR SUBMITTAL:

[Signature]

MICHAEL D. WILSON, Chairperson
Waihee 1&2
(Well No. 5631-02,03)

Attachment A
TO: Charley Ice  
Commission on Water Resource Management  
1151 Punchbowl, Room 227  
Honolulu, Hawaii 96813

DATE: September 5, 1995

SUBJECT: Pump Installation Permit  
Extension for North Waihee Wells 1 & 2

Enclosed is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>---</td>
<td>Pump Unit and Piping Plan</td>
</tr>
</tbody>
</table>

( ) For approval  
( ) For your use  
(x) As requested  
( ) Returned for corrections  
( ) For your files  
( ) For necessary action  
( ) For review and comment  
( ) For your signature  
( ) Returning

REMARKS: Attached is the Pump Unit and Piping Plan, as you requested. Please call me if you have any questions.

Signed: 

Milton Arakawa
**SECTION 1**

**SECTION 2**

**SECTION 3**

**MATERIALS LIST**

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>QUAN.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>12&quot; Flange Coupling Adapter W/1/2&quot; 3/8&quot; TE Rods Flange To Flange</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>12&quot; F. E. P. PIPE, 12&quot; WM. LENGTH</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>12&quot; X 8&quot; Flange Reducer</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>8&quot; Metal Seated Butterfly Valve W/Diaphragm Operator</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>12&quot; F. E. Flanged Center Guided Check Valve</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 6&quot; P. W. WM. LENGTH</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>12&quot; F. E. Universal Venturi Tube</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 4&quot; P. W. LENGTH</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 3&quot; P. W. LENGTH</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 2&quot; P. W. LENGTH</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>12&quot; F. E. Rubber Seated Butterfly Valve</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 1/8&quot; P. W. LENGTH</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>12&quot; F. E. Pipe, 1/8&quot; P. W. LENGTH</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
<td>6&quot; X 8&quot; F. E. TEE</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>6&quot; F. E. Pump Vacuum Release Check Valve</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>6&quot; Screw &amp; Fitting, Detail Sheet M-2</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>6&quot; F. E. Pump Control Valve</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>6&quot; F. E. Center Guided Check Valve</td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>6&quot; F. E. Pipe, 24&quot; LONG</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>6&quot; F. E. 90° Bend</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>8&quot; F. E. Pipe, 24&quot; LONG</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>8&quot; F. E. Pump Pipe, 1/2&quot; P. W. COVER, Pressure Standard Rein. Cond. Jacket</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>Flow Switch</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>3/4&quot; Air Relief Valve</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>Stopcock</td>
</tr>
</tbody>
</table>

**NOTE (FLANGED PIPING):**

Flanged pipe and fittings shall conform to all requirements of project specifications.

**NOTES (Pipping smaller than 6):**

1. All pipes, fittings, valves and strainers shall be brass unless otherwise noted.
2. Fittings and valves shall be Crane or approved equal.
3. Strainers shall be ASCO or approved equal.
4. Pressure reducing valves shall be Wiegman or approved equal.
5. Flow control valves shall be ASCO or approved equal.
6. Pressure gages shall be Aushi or approved equal.
7. Pressure gauges shall be monitor or approved equal.
8. Copper pipe shall be Type K.
9. Solder joint fittings shall be Mueller or approved equal.
10. Minimum ground cover for all copper & PVC piping shall be 12 inches.
DEVELOPMENT OF NEW WATER SOURCE
AT NORTH WAIHEE

Wells 1 & 2

Owner: Wailuku Agribusiness Co., Inc.

- Well No. 1
- Well No. 2

- 24" x 32" (Concrete Slab) O.D., 10 ft.

- Drainage Area

- Paving Materials:
  - 1-1/8" x 2-1/2" Road
  - 1-1/8" x 1-1/4" Block
  - 2-1/2" Gate Valve w/ SVB
  - 2-1/2" Nipples

- Manholes

- Scale: Not to Scale

- Site Plan for Wells 1 & 2

Note: All dimensions are approximate and should be verified with the site plan.
TO:  Mr. Charley Ice  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809

DATE:  August 28, 1995

SUBJECT:  Waihee Wells Pump Installation Permit Extension

Enclosed is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>---</td>
<td>Site Plan for Wells 1 and 2</td>
</tr>
</tbody>
</table>

( ) For approval  
(x) For your use  
(x) As requested  
( ) Returned for corrections  
( ) For your files  
( ) For necessary action  
( ) For review and comment  
( ) For your signature  
( ) Returning

REMARKS:  The attached site plan is submitted pursuant to your request.

Signed:  
Milton Arakawa

Copy to:  Jim Murray (w/ enclosure)
<table>
<thead>
<tr>
<th>FROM: E. Hirano</th>
<th>DATE: 7/6/85</th>
<th>SUSPENSE DATE:</th>
<th>PLEASE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO:</td>
<td>INIT:</td>
<td>TO:</td>
<td>INIT:</td>
</tr>
<tr>
<td>R. LOUI</td>
<td>J. UWAIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. CHING</td>
<td>S. SUBIA</td>
<td>K. YODA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURVEY BRANCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. HIRANO</td>
<td>G. BAUER</td>
<td>R. HARDY</td>
<td></td>
</tr>
<tr>
<td>N. FUJI</td>
<td>M. OHYE</td>
<td>I. KUNIMURA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REGULATION BRANCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLANING BRANCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPROVAL SIGNATURE INFORMATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See Me</td>
<td>Review &amp; Comment</td>
<td>Take Action</td>
<td>Type Draft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

02/95
Rae M. Loui, Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe’e Wells 1 and 2  
Wells Nos. 5631-02 and 5631-03  
Waihe’e, Maui Hawaii

Dear Ms. Loui:

At its regular meeting of May 5, 1995, the Commission on Water Resource Management approved the extension of the start date for work on the pump installation permits for the subject wells to July 14, 1995. We would like to respectfully request an extension of the start date to January 14, 1996.

We are continuing to discuss our involvement in this project with the Department of Water Supply, but have not reached agreement regarding implementation of the project.

We have recently received comments from the State Department of Health regarding the Section 401 Water Quality Certification application on the project and will provide a response in order to seek final approval. The Coastal Zone Management Program Consistency Assessment application is still pending. Other permits, such as the Department of the Army Permit and the Stream Channel Alteration Permit have been conditionally approved.

We continue to pursue the engineering of the project, which has been contracted to Warren S. Unemori Engineering, Inc. Design of the pump improvements, and related facilities, is nearing completion.
We feel that implementation of this project is important to provide supplies of water needed to meet the near-term needs of Central and South Maui. We ask that we be allowed to continue pursuing the implementation of this project.

If you have any questions, please feel free to call me. Thank you for your kind consideration.

Very truly yours,

James M. Murray, Jr.
Project Manager

JMM:jh
cc: Milton Arakawa, Munekiy & Arakawa, Inc.
M-Water
Dear Mr. Blane:

Request for Extension of Start Date of Pump Installation
North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

At its regular meeting of July 19, 1995, the Commission on Water Resource Management approved the extension of the start date for work on pump installation for the permit issued March 14, 1995.

By this letter, the start date is extended two months, from July 14, 1995, to September 14, 1995. The completion date remains March 14, 1997.

Should delays prevent work from starting by September 14, 1995, additional extension must be approved by the Commission prior to that date. The Commission requires that such a request be accompanied by a written report of the status of the pump installation project, including a sketch of the pump improvement design.

Aloha,

Michael D. Wilson
ITEM 1  MINUTES OF THE JULY 5, 1995 MEETING

UNANIMOUSLY APPROVED. (NOBRIGA/GIRALD)

ITEM 2  OLD BUSINESS/ANNOUNCEMENTS

NONE.

ITEM 3  C.BREWER PROPERTIES, INC. REQUEST FOR EXTENSION OF START DATE, NORTH WAIHEE WELLS 1 & 2, (WELL NOS. 5631-02 & 03), REQUEST TO INSTALL 1400 GPM PUMPS FOR DOMESTIC USE, WAIHEE, WAILUKU, MAUI (TMK 3-2-1:4)

STAFF PRESENTATION: Mr. Charley Ice

STAFF RECOMMENDATION:

Staff recommended that the Commission approve the extension of the start date of the pump installation permits for North Waihee Wells to January 14, 1996. The conditions of the permit extensions issued March 14, 1995 remain in effect except for the start date. Pending work described by the applicant may be reasonably expected to require six months for completion, prior to pump installation.

TESTIMONIES:

Mr. David Craddick of the Maui Department of Water Supply stated that he would prefer a two month extension. Future requests for extension should include a status report, including construction drawings for the well and pump assembly.

AMENDMENT: Commissioner Nobriga moved to amend the staff's recommendation for an extension of the start date from six months to two months, and to require a status report, including construction plans.
UNANIMOUSLY APPROVED AS AMENDED.  (NOBRIGA/GIRALD)

ITEM 4  WAIALUA SUGAR COMPANY VOLUNTARY REDUCTION OF PERMITTED WATER USE, PUMPS 25 & 26 (WELL NOS. 3203-01 & 02), WAHIAWA GROUNDWATER MANAGEMENT AREA, OAHU (TMK 6-4-03:1)

PRESENTATION OF SUBMITTAL:  Ms. Lenore Nakama

STAFF RECOMMENDATION:

Staff recommended that the Commission:

1. Revoke the water use permit, permanently and in whole, for Pump 25 (Well No. 3203-01).

2. Require the owner or former operator of Pump 25 (Well No. 3203-01) to properly secure the well, in accordance with the requirements of Chapter 13-168, Water Use, Wells and Stream Diversion Works, Hawaii Administrative Rules, to prevent contamination of the groundwater aquifer.

3. Accept Waialua Sugar Company's voluntary permanent reduction in the allocation to Pump 26 (Well No. 3203-02) from 2.76 mgd to 1.72 mgd.

AMENDMENT:  Staff requested to amend the staff recommendation by removing the word "permanently" and "permanent" in #1 and #3 to read as follows:

1. Revoke the water use permit, in whole, for Pump 25 (Well No. 3203-01).

2. Require the owner or former operator of Pump 25 (Well No. 3203-01) to properly secure the well, in accordance with the requirements of Chapter 13-168, Water Use, Wells and Stream Diversion Works, Hawaii Administrative Rules, to prevent contamination of the groundwater aquifer.

3. Accept Waialua Sugar Company's voluntary reduction in the allocation to Pump 26 (Well No. 3203-02) from 2.76 mgd to 1.72 mgd.
C. Brewer Properties, Inc.
Request for Extension of Start Date
North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03)
Request to Install 1400 gpm Pumps for Domestic Use

TMK 3-2-1:4 Waihee, Wailuku, Maui

Applicant: C. Brewer Properties, Inc.
Landowner: Wailuku Agribusiness Company, Inc.
P.O. Box 1437
P.O. Box 520
Wailuku, HI 96793
Wailuku, HI 96793

Action Requested: Permission to extend start date six months, from July 14, 1995 to January 14, 1996, for installing a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.

Well Location/Tax Map Key: The wells are located at Waihee Valley, Maui at Tax Map Key: 3-2-1:4 (Attachment A).

Background:

March 25, 1993
Pump Installation Permits for North Waihee Wells 1 & 2 were issued. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved.

March 1, 1995
Pump Installation Permits were extended, with a new completion date of March 1, 1997. The start date was set to expire in 2 months, to require applicant to return to the Commission if delays continued. The permits were issued March 14, 1995.
May 5, 1995

The start date for work under the Pump Installation Permits was extended two months, from May 14, 1995 to July 14, 1995, following the applicant's request for a four-month extension.

June 30, 1995

The applicant requested a six-month extension of the start date, to January 14, 1995, due to other ongoing, related regulation requirements. Preparation of a response to the Department of Health comments concerning a Section 401 Water Quality Certification and a still-pending application for a Coastal Zone Management Program Consistency Assessment are required before work can begin. A Department of the Army Permit and a Stream Channel Alteration Permit have been conditionally approved. Work on pump improvement design is nearing completion.

Well Description:

Ground elevation: 283 ft.
Casing diameter: 16 inches
Solid casing depth: 289 ft.
Screen casing depth: 309 ft.
Open hole: 79 ft.
Total depth: 363 ft.
Grouted annulus: 0 to 200 ft.
Proposed pump capacity: 1400 gpm (each)

Water Availability: The wells are located on the Waihee side of the Waihee-lao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of lao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Proposed use is 2 mgd from both wells together. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd by the Maui Water Use and Development Plan.

Hydrologic Analysis: The well will develop fresh, basal water for municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has observed that, because the stream channel in this vicinity is 200 feet above sea level, the wells should have no effect upon it.
RECOMMENDATION:

That the Commission approve the extension of the start date of the pump installation permits for North Waihee Wells to January 14, 1996. The conditions of the permit issued March 14, 1995 remain in effect except for the start date. Pending work described by the applicant may be reasonably expected to require six months for completion, prior to pump installation.

Respectfully submitted,

[Signature]

RAE M. LOUI
Deputy Director

Attachment

APPROVED FOR SUBMITTAL:

[Signature]

MICHAEL D. WILSON, Chairperson
Waihee 1&2
(Well No. 5631-02,03)
Mr. David W. Blane  
C. Brewer Properties  
P.O. Box 1437  
Wailuku, Hawaii 96793

Dear Mr. Blane:

Request for Extension of  
Start Date of Pump Installation  
North Waihee Wells 1 & 2  
(Well Nos. 5631-02 & 03)

At its regular meeting of May 5, 1995, the Commission on Water Resource Management approved the extension of the start date for work on pump installation for the permit issued March 14, 1995.

By this letter, the start date is extended two months, from May 14, 1995 to July 14, 1995. The completion date remains March 14, 1997.

Should delays prevent work from starting by July 14, 1995, additional extension must be approved by the Commission prior to that date.

Sincerely,

[Signature]

RAE M. LOUI
Deputy Director

CI:ss
COMMISSION ON WATER RESOURCE MANAGEMENT

FROM: [Signature]
TO: [Signature]

DATE: 4/19
SUSPENSE DATE: ____________

TO: [Signature]
INIT: [Signature]
TO: [Signature]
INIT: [Signature]
FOR: [Signature]

PLEASE:
See Me
Review & Comment
Take Action
Type Draft
Type Final
File
Xerox ___ copies

REGULATION BRANCH
R. LOUI
J. UWAKINE
F. CHING
S. SUBIA
K. YODA

APPROVAL
SIGNATURE
INFORMATION
E. SAKODA
D. HIGA
L. NAKAMA
C. ICE
R. JINNAI
S. SWANSON

PLANING BRANCH
E. HIRANO
G. BAUER
R. HARDY
N. FUJII
M. OHYE
I. KUNIMURA

S. EDMUNDS
L. MIZUNO

1) Extend 2 mo. in keeping w/ Cur. Rodriguez's amendment?
2) Comment on "resource valuation"?

Please check - shall you draft a submittal for May 5 to provide start date by 3/14/95.
[We see two options (1) or (2) for submitting]
(1) approval (2) denial unot prejudice
Rae M. Loui, Deputy Director  
Commission on Water Resource Management  
Department of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe'e Wells 1 and 2  
Well Nos. 5631-02 and 5631-03  
Waihe'e, Maui, Hawaii

Dear Ms. Loui:

Pump installation permits for the subject wells were extended by the Commission on Water Resource Management on March 1, 1995. We have enclosed a signed copy of the extension for your files.

Condition No. 6 of the extension notes in part that the "permit may be revoked if work is not started within two (2) months after the date of issuance or if work is suspended or abandoned for two (2) months, unless otherwise specified."

Since the Commission action on March 1, 1995, we have met a number of times with the Board of Water Supply (BWS) regarding the implementation of this project. As you know, the project involves Waihe'e Well Nos. 1 and 2 as well as construction of a new 500,000 gallon water tank and approximately 4.26 miles of transmission lines to link with the existing County water system.

Although a joint venture with the BWS has been discussed over the past several years, an agreement has not been reached. The current approach favored by the BWS involves purchase of the wells and implementation of the entire project by the BWS. We are currently working with the BWS on the valuation of the well resource as well as the value of work done on the project thus far by C. Brewer Homes, Inc. and our consultants.
In the interim, construction plans for installation of the pumps have been submitted to the Department of Water Supply for approval.

We would like to request that the construction start date for Waihe`e Well Nos. 1 and 2 be extended to September 14, 1995 which is six (6) months after the issuance for the extension. We believe that progress is being made toward the implementation of this important project and we will continue to work with the BWS in coming up with a mutually agreeable solution.

If you have any questions, please feel free to call me. Thank you for your consideration of our request.

Very truly yours,

[Signature]

David W. Blane
Senior Vice President

Attachment - Pump Installation Permit Extension

cc: David Craddick, Department of Water Supply (w/attachment)
Milton Arakawa, Munekiyo & Arakawa, Inc. (w/attachment)
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 21
HONOLULU, HAWAII 96809
MAR 14 1995
EXTENSION
PUMP INSTALLATION PERMIT
for
North Waihee Wells 1 & 2
Well Nos. 5631-02 & 03
Waihee, Maui

TO: C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, HI 96793

In accordance with the Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your request to extend the permit to install pumps in North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03), is approved subject to the following conditions:

STANDARD PUMP INSTALLATION PERMIT CONDITIONS

1. The Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, before any work covered by this permit commences.

2. The pump installation permits shall be for installation of a 1400 gpm capacity, or less, pump in each well. A means to accurately measure water levels, acceptable to the Commission, shall be provided.

3. The proposed use 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 pump water from a well shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

4. The applicant shall comply with all applicable laws, rules, and ordinances.

5. An approved flowmeter(s) must be installed to measure withdrawals and a monthly record of withdrawals, water-levels, salinity, and temperature must be kept and reported to the Commission on a monthly basis, which conforms with the Commission's September 16, 1992 direction on reporting requirements.
6. The permit may be revoked if work is not started within two (2) months after the date of issuance or if work is suspended or abandoned for two (2) months, unless otherwise specified. 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 Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

7. An as-built sectional drawing of the pump installation shall be submitted to the Commission within thirty (30) days after completion of work.

8. The pump installation permit application and staff submittals, approved by the Commission at its March 3, 1993 and March 1, 1995 meetings, are incorporated into the permit by reference.

MICHAEL D. WILSON, Chairperson
Commission on Water Resource Management
MAR 14 1995
Date of Issuance

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant's Signature: [Signature]
Date: April 15/95

Printed Name: DAVID W. BLAKE

Firm or Title: S.R. D.P. C. BREWER HOMES, INC.

Please sign and return one copy of this permit to the Commission and retain a copy for your record.

cc: USGS
Department of Health
Safe Drinking Water Branch
Ground Water Protection Program
Wastewater Branch
Maui Department of Water Supply
EXTENSION
PUMP INSTALLATION PERMIT

for

North Waihee Wells 1 & 2
Well Nos. 5631-02 & 03
Waihee, Maui

TO: C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, HI 96793

In accordance with the Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your request to extend the permit to install pumps in North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03), is approved subject to the following conditions:

STANDARD PUMP INSTALLATION PERMIT CONDITIONS

1. The Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, before any work covered by this permit commences.

2. The pump installation permits shall be for installation of a 1400 gpm capacity, or less, pump in each well. A means to accurately measure water levels, acceptable to the Commission, shall be provided.

3. The proposed use 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 pump water from a well shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

4. The applicant shall comply with all applicable laws, rules, and ordinances.

5. An approved flowmeter(s) must be installed to measure withdrawals and a monthly record of withdrawals, water-levels, salinity, and temperature must be kept and reported to the Commission on a monthly basis, which conforms with the Commission's September 16, 1992 direction on reporting requirements.
State of Hawaii  
Department of Land and Natural Resources  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Honolulu, Hawaii  

March 1, 1995  

Chairperson and Members  
Commission on Water Resource Management  
State of Hawaii  

Gentlemen:

Request for Extension  
C. Brewer Properties, Inc.  
Request to Install 1400 gpm Pumps in  
North Waihee Wells 1 & 2, (Well Nos. 5631-02 & 03)  
TMK 3-2-1:4 Waihee, Maui  

Applicant:  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, HI 96793  

Landowner:  
Wailuku Agribusiness Company, Inc.  
P.O. Box 520  
Wailuku, HI 96793  

Action Requested: Permission to extend permit to install a 1400 gpm (gallons per minute) pump in each of two North Waihee Wells for private municipal use.  

Well Location/Tax Map Key: The wells are located at Waihee Valley, Maui at Tax Map Key: 3-2-1:4 (see attached map).  

Well Description:  
Ground elevation: 283 ft.  
Casing diameter: 16 inches  
Solid casing depth: 289 ft.  
Screen casing depth: 363 ft.  
Open hole: 79 ft.  
Total depth: 309 ft.  
Grouted annulus: 0 to 200 ft.  
Proposed pump capacity: 1400 gpm (each)  

Background: Pump Installation Permits for North Waihee Wells 1 & 2 were issued on March 25, 1993. Due to delays in other aspects of the residential development project, action on the permits was also delayed. Several requests for extension of the start date were made and administratively approved. In December, the applicant inquired as to a preferred approach to the coming March permit expiration date, and consequently submitted this request to extend the permit.  

Water Availability: The wells are located on the Waihee side of the Waihee-Iao Aquifer System boundary of the Wailuku Sector of Maui. Sustainable yield for the Waihee Aquifer System is estimated at 8 mgd, while that of Iao is 20 mgd. There are no existing ground water uses from the Waihee Aquifer System at present. Proposed use is 2 mgd from both wells together. Potential water use from the Waihee System by the year 2010 is estimated to be up to 8 mgd.  

Analysis: The well will develop fresh, basal water for private municipal use; the applicant is negotiating dedication of the wells to the County. The wells tap an aquifer with a static head standing about 10 feet above sea level. John Mink has observed that, because the stream channel in this vicinity is 200 feet above sea level, the wells should have no effect upon it. Further, Mr. Mink states that pump tests have demonstrated that the drawdown from heavy pumping is relatively minor, with full recovery nearly instantaneous; salinity is very low.
RECOMMENDATION:

That the Commission approve the extension of the pump installation permits for North Waihee Wells, subject to the same following original conditions:

STANDARD PUMP INSTALLATION PERMIT CONDITIONS

1. The Commission shall be notified before work commences.

2. The pump installation permits shall be for installation of a 1400 gpm capacity, or less, pump in each well. A means to accurately measure water levels, acceptable to the Commission, shall be provided.

3. The proposed use 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 pump water from a well shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

4. The applicant shall comply with all applicable laws, rules, and ordinances.

5. An approved flowmeter(s) must be installed to measure withdrawals and a monthly record of withdrawals, water-levels, salinity, and temperature must be kept and reported to the Commission on a monthly basis, which conforms with the Commission’s September 16, 1992 direction on reporting requirements.

6. The permit may be revoked if work is not started within six (6) months after the date of issuance or if work is suspended or abandoned for six (6) months, unless otherwise specified. 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 Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

7. An as-built sectional drawing of the pump installation shall be submitted to the Commission within thirty (30) days after completion of work.

8. The pump installation permit application and staff submittal approved by the Commission at its March 3, 1993 and March 1, 1995 meetings are incorporated into the permit by reference.

Respectfully submitted,

RAE M. LOUI
Deputy Director

Attachment

APPROVED FOR SUBMITTAL:

MICHAEL D. WILSON, Chairperson
UNANIMOUSLY APPROVED AS AMENDED. (NOBRIGA/GIRALD)

ITEM 14
REQUEST FOR EXTENSION, C. BREWER PROPERTIES, INC., REQUEST TO INSTALL 1400 GPM PUMPS IN NORTH WAIHEE WELLS 1 & 2 (WELL NOS. 5631-02 & 03), TMK 3-2-1-4, WAIHEE, MAUI

PRESENTATION OF SUBMITTAL: Edwin Sakoda

AMENDMENT: Staff recommended approval with an amendment to delete the word “original” from the Recommendation, so as to read:

“That the Commission approve the extension of the pump installation permits for North Waihee Wells, subject to the same following conditions.”

PRESENTATION BY APPLICANT: None; however, Mr. Jim Murray of C. Brewer Homes was present and available for questioning.

TESTIMONIES:

Mr. David Craddick of the Maui Board of Water Supply asked to have an amendment to the staff recommendation (#6) so that the applicant must face the Commission again for review if work is not started within six months.

QUESTIONS/CLARIFICATIONS:

Comissioner Nobriga wondered whether six months was too long.

Mr. Murray responded that, in regards to time table, they are in the "engineering" process for this project. They are also in the final stages of discussing, with the Board of Water Supply, the manner in which this will be developed. Also, C. Brewer anticipates that this will become the Board of Water Supply's project. He is very confident that the project will be started within the six months; less than that will be too "tight".

Commissioner Nobriga asked if the Board of Water Supply is ready to take over the project, once it's developed. He also asked why C. Brewer is taking so long to complete the project and turn it over to the Board of Water Supply.

Mr. Craddick replied that is what they are negotiating for. The Board meeting will be held on March 7, 1995 and the terms of the agreement will be discussed at that time. After the meeting, they will know whether they will be able to start the project within six months.

AMENDMENT: Page Two, Condition # 6 was amended from six (6) months to two (2) months.

UNANIMOUSLY APPROVED AS AMENDED. (NOBRIGA/NAKATA)

ITEM #4
ACCEPTANCE OF THE PRE-FINAL DRAFT NONPOTABLE WATER MASTER PLAN AND APPROVAL OF A PUBLIC REVIEW PROCESS

PRESENTATION OF SUBMITTAL: Rae Loui

UNANIMOUSLY APPROVED. (NOBRIGA/MIIKE)
6. The permit may be revoked if work is not started within two (2) months after the date of issuance or if work is suspended or abandoned for two (2) months, unless otherwise specified. 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 Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

7. An as-built sectional drawing of the pump installation shall be submitted to the Commission within thirty (30) days after completion of work.

8. The pump installation permit application and staff submittals, approved by the Commission at its March 3, 1993 and March 1, 1995 meetings, are incorporated into the permit by reference.

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant’s Signature: __________________________ Date: ______________

Printed Name: ______________________________________________________

Firm or Title: _______________________________________________________

Please sign and return one copy of this permit to the Commission and retain a copy for your record.

cc: USGS
Department of Health
Safe Drinking Water Branch
Ground Water Protection Program
Wastewater Branch
Maui Department of Water Supply
Briefly describe the proposed work:

Subject wells were drilled and tested between March and August 1981.

PROPOSED SECTION OF WELL

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation at top of casing</td>
<td>284 ft., msl.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>200 ft.</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>20 in.</td>
</tr>
<tr>
<td>Total Depth</td>
<td>363 ft.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>108 ft.</td>
</tr>
<tr>
<td>Ground Elevation</td>
<td>283 ft., msl*</td>
</tr>
<tr>
<td>Solid Casing</td>
<td>ASTM Designation A-242</td>
</tr>
<tr>
<td>Material</td>
<td>Steel Kaiser</td>
</tr>
<tr>
<td>Length</td>
<td>289 ft.</td>
</tr>
<tr>
<td>Diameter</td>
<td>16 in.</td>
</tr>
<tr>
<td>Wall thickness</td>
<td>0.3125 in.</td>
</tr>
<tr>
<td>Casing</td>
<td>Perforated</td>
</tr>
<tr>
<td>Material</td>
<td>Steel Kaiser</td>
</tr>
<tr>
<td>Length</td>
<td>20 ft.</td>
</tr>
<tr>
<td>Diameter</td>
<td>16 in.</td>
</tr>
<tr>
<td>Wall thickness</td>
<td>0.25 in.</td>
</tr>
<tr>
<td>Openings</td>
<td>100 sq. in./F.</td>
</tr>
<tr>
<td>Open Hole</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>79</td>
</tr>
<tr>
<td>Diameter</td>
<td>15 in.</td>
</tr>
</tbody>
</table>

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
Waihee 1&2
(Well No. 5631-02,03)
Mr. David W. Blane  
C. Brewer Homes  
24 N. Church Street, #205  
Wailuku, HI 96793-1437

Dear Mr. Blane:

We have received your request for an eighteen (18) month extension of the pump installation permit approved by the Commission on Water Resource Management on March 25, 1993.

Please be advised that we intend to submit this request to the Commission at its regular meeting on March 1, 1995, in Honolulu. Please call Ed Sakoda at [redacted] if you have any questions.

Sincerely,

[Signature]

RAE M. LOUI  
Deputy Director

cc: Mr. Milton Arakawa, Munekiyo & Arakawa
TO: Rae M. Loui  
Deputy Director  
Commission of Water Resource Management  
Department of Land & Natural Resources  
State of Hawaii  
P. O. Box 621  
Honolulu, Hawaii 96809  

DATE: December 21, 1994  

SUBJECT: Waihe'e Wells and Transmission System  

Enclosed is/are:  

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orig.</td>
<td>12/20/94</td>
<td>Letter from David W. Blane to Commission of Water Resource Management</td>
</tr>
</tbody>
</table>

( ) For approval  
( ) For your use  
( ) As requested  
( ) Returned  
( ) For your files  
(X) For necessary action  
( ) For review and comment  
( ) For your signature  
( ) Returning  

REMARKS: Please refer to the attached letter.  

Signed:  
Milton Arakawa  

Copy to: David W. Blane, C. Brewer Homes, Inc. (w/enclosure, via fax)  
Warren Unemori, Warren S. Unemori Engineering, Inc. (w/enclosures, via fax)  
David Craddick, Department of Water Supply (w/enclosure, via fax)
December 20, 1994

Rae M. Loui, Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Pump Installation Permits for North Waihe'e Wells 1 and 2
Well Nos. 5631-02 and 5631-03
Waihe'e, Maui, Hawaii

Dear Ms. Loui:

Pump installation permits for the subject wells were issued with conditions by the Commission on Water Resource Management on March 25, 1993. Condition No. 8 of both permits note in part that the work must be started within six (6) months of the date of permit issuance. Moreover, construction must be completed within two (2) years of the date of permit issuance, or by March 25, 1995.

Extensions on the construction start date have been granted administratively, to January 25, 1995.

We would like to request a six (6) month extension of the construction start date to July 25, 1995 and an eighteen (18) month extension of the construction completion date to September 25, 1996.

As you recall, we are working with the County of Maui, Department of Water Supply (DWS), on improvements to the water system including two (2) additional wells to be drilled and equipped by the DWS, a water storage tank, and approximately 4.26 miles of waterline. Before we proceed with installation of the pumps, we would like to be reasonably certain that a connection to the County water system can be made and that applicable governmental approvals can be obtained in a timely manner. We have been working on securing the necessary permits to implement the entire project.

The Final Environmental Assessment for the project was filed in April 1994 and this process is completed.
Since the proposed waterline crosses five (5) streams or gulches, other permit requirements apply to the subject project. These include the U.S. Department of the Army permit, Section 401 Water Quality Certification, Coastal Zone Management (CZM) Consistency, and Stream Alteration Permit. The Army, Section 401, CZM and Stream Alteration Permit applications were submitted to the appropriate agencies in July 1994. A Department of the Army Provisional Nationwide Permit was issued on November 30, 1994. Action on the Section 401, CZM and Stream Alteration Permit applications are still pending.

In this regard, our requests for time extensions will allow us to continue working with the State Department of Health, the Office of State Planning and the Commission on Water Resource Management to secure the respective permit approvals for project implementation. If you or your staff have any questions, please feel free to call me. Thank you for your consideration.

Very truly yours,

C. BREWER HOMES, INC.

[Signature]

David W. Blane
Senior Vice-President

cc: David Craddick, Department of Water Supply
    Milton Arakawa, Munekiyo & Arakawa, Inc.
researched and addressed. The negative declaration was published in the Office of Environmental Quality Control Bulletin of April 8, 1994.

Work is also ongoing for several permits required for waterline crossings of five streams and gulches. These include the Corps of Engineers Permit, Section 401 Water Quality Certification, Coastal Zone Management Consistency, and Stream Channel Alteration Permit. Filing of these permits is anticipated in mid-1994.

If you or your staff have any questions, please feel free to call me.

Very truly yours,

David W. Blane
Senior Vice-President
C. Brewer Homes, Inc.

DWB:It
cc: Pete C. Moynahan, C. Brewer Properties, Inc.
    David Craddick, Department of Water Supply
    Milton Arakawa, Munekiyo & Arakawa, Inc.
Mr. David W. Blane, Senior Vice-President  
C. Brewer Homes, Inc.  
P.O. Box 1437  
Wailuku, HI 96793-1437

Dear Mr. Blane:

Request for Second Extension of Start of Construction Date for  
North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

We acknowledge receipt of your letter requesting a ten-month extension of the start of construction date. By this letter we are extending your start date an additional ten months to January 25, 1995. Please note that the well should be completed by March 25, 1995, two years from the date the permit was issued.

Please notify the Commission on Water Resource Management, in writing, before any work covered by the permit begins, or if work cannot begin by January 25, 1995.

Sincerely,

RAE M. LOUI  
Deputy Director

cc: Pete C. Moynahan, C. Brewer Properties, Inc.  
David Craddick, Maui Department of Water Supply  
Milton Arakawa, Munekiyo & Arakawa, Inc.
SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
Well Nos. 5631-02 and 5631-03
Waihee, Maui, Hawaii

Dear Ms. Loui:

We would like to request a ten (10) month extension (to January 25, 1995) on the start date for the above pump installation permits.

Permits for the subject wells were issued with conditions by the Commission on Water Resource Management on March 25, 1993. Condition No. 8 of both permits state in part that the "permit may be revoked if work is not started within six months of the date of issuance or if work is suspended or abandoned for six months." Accordingly, a six month extension on the start date was granted to March 25, 1994.

Our intent is to install the pumps in accordance with the other conditions of the permits, including the condition that construction be completed by March 25, 1995. Should difficulties arise regarding construction start and completion dates, we will notify the Commission in January 1995.

Before we proceed with installing the pumps, we would like some assurance that a connection to the existing County water system can be made and that applicable governmental approvals can be obtained in a timely manner. The pump installation permits are envisioned to be part of a larger project jointly undertaken by C. Brewer Homes, Inc. and the County of Maui, Department of Water Supply (DWS). This includes two additional wells to be drilled and equipped by the DWS, a water storage tank, and approximately 4.26 miles of waterline.

We have been working on filing the Final Environmental Assessment (EA) for the project. Public comments raised during the 30-day comment period of the Draft EA were
Mr. David W. Blane  
Senior Vice President  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, HI 96793-1437

Dear Mr. Blane:

Request for Extension of Start of Construction Date  
for North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03)

We acknowledge receipt of your letter requesting a six-month extension of the start of construction date. By this letter we are extending your start date an additional six months to March 25, 1994. Please note that the well should be completed by March 25, 1995, two years from the date the permit was issued.

Please notify the Commission on Water Resource Management, in writing, before any work covered by the permit begins, or if work cannot begin by March 25, 1994.

Sincerely,

RAE M. LOUI
Deputy Director

ES:fc

c. Michael T. Munekiyo Consulting, Inc.
David Craddick, Maui Department of Water Supply
September 8, 1993

Rae M. Loui
Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Loui:

SUBJECT: Pump Installation Permits for North Waihee Wells 1 and 2
Well Nos. 5631-02 and 5631-03
Waihee, Maui, Hawaii

Pump installation permits for the subject wells were issued with conditions by the Commission on Water Resource Management on March 25, 1993. Condition No. 8 of both permits state in part that the "permit may be revoked if work is not started within six (6) months of the date of issuance or if work is suspended or abandoned for six months."

We would like to request a six (6) month extension to the start date for the work on the subject wells. Our request would extend the start date for work on the wells to March 25, 1994. Our intent is to install the pumps in accordance with the other conditions of the permits. However, before we proceed with installing the pumps, we would like some assurance that a connection to the existing County water system can be made. The County is also interested in drilling additional wells in the area to the north of Well Nos. 5631-02 and 5631-03.

We are working with the County of Maui, Department of Water Supply (DWS), on improvements to the water system including two additional wells to be drilled and equipped by the DWS, a water storage tank, and approximately 4.36 miles of waterline. A Draft Environmental Assessment has been filed with the Office of Environmental Quality Control. The 30-day review period for the Draft EA started on August 23, 1993. Should there be no significant environmental impacts as a result of the project, then the EA process should be completed prior to March 1994. Our intent is to start work covered by the subject pump installation permits upon completion of the environmental review process.
If you or your staff have any questions, please feel free to call me. Thank you for your consideration.

Very truly yours,

David W. Blane
Senior Vice President
C. Brewer Properties, Inc.

cc: Pete Moynahan, C. Brewer Properties, Inc.
    Michael T. Munekiyo, Michael T. Munekiyo Consulting, Inc.
    David Craddick, Department of Water Supply
5. The permit application and staff submittal approved by the Commission at its meeting on March 3, 1993 shall be incorporated herein by reference.

6. The following shall be submitted to the Commission staff within 30 days after completion of the work:
   a. Well Completion Report.
   b. As-built sectional drawing of the installed pump.

7. The applicant shall comply with all applicable laws, rules, and ordinances.

8. This permit may be revoked if work is not started within six months of the date of issuance or if work is suspended or abandoned for six months. The work proposed in the permit application shall be completed within two years from the date of permit issuance.

KEITH W. AHUE, Chairperson
Commission on Water Resource Management

MAR 25 1993
Date of Issuance
I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant’s Signature:  
Printed Name:  
Firm or Title:  

Please sign and return one copy of this permit to the Commission and retain a copy for your record.

Enc. (Well Completion Report form)

c:  
USGS
Department of Health
Safe Drinking Water Branch
Ground Water Protection Program
Maui Department of Water Supply
Michael T. Munekiyo Consulting, Inc.
Mink & Yuen, Inc.
TO: C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, HI 96793

In accordance with the Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your application to install a pump in Waihee Well 2 for private/municipal use is approved, subject to the following conditions:

1. The Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified in writing before any work covered by this permit commences.

2. The permit shall be for installation of up to a 1400 gpm capacity pump in the well. The total pumpage from North Waihee Wells 1 & 2 shall average 2 mgd or less.

3. The proposed use 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 pump water from the well shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

4. The applicant shall provide and maintain an approved meter or other appropriate device or means for measuring and reporting total water usage. Water usage shall be measured on a monthly basis and reported to the Commission.
TO: C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, HI 96793

In accordance with the Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your application to install a pump in Waihee Well 1 for private/municipal use is approved, subject to the following conditions:

1. The Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified in writing before any work covered by this permit commences.

2. The permit shall be for installation of up to a 1400 gpm capacity pump in the well. The total pumpage from North Waihee Wells 1 & 2 shall average 2 mgd or less.

3. The proposed use 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 pump water from the well shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

4. The applicant shall provide and maintain an approved meter or other appropriate device or means for measuring and reporting total water usage. Water usage shall be measured on a monthly basis and reported to the Commission.
5. The permit application and staff submittal approved by the Commission at its meeting on March 3, 1993 shall be incorporated herein by reference.

6. The following shall be submitted to the Commission staff within 30 days after completion of the work:
   a. Well Completion Report.
   b. As-built sectional drawing of the installed pump.

7. The applicant shall comply with all applicable laws, rules, and ordinances.

8. This permit may be revoked if work is not started within six months of the date of issuance or if work is suspended or abandoned for six months. The work proposed in the permit application shall be completed within two years from the date of permit issuance.

KEITH W. AHUE, Chairperson
Commission on Water Resource Management
MAR 25 1993
Date of Issuance
I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant’s Signature: [Signature] Date: 3/29/93

Printed Name: DAVID W. BLAKE

Firm or Title: SR. V.P., C. BREWER PROPERTIES

Please sign and return one copy of this permit to the Commission and retain a copy for your record.

Enc. (Well Completion Report form)

c: USGS
Department of Health
Safe Drinking Water Branch
Ground Water Protection Program
Maui Department of Water Supply
Michael T. Munekiyo Consulting, Inc.
Mink & Yuen, Inc.
Water Availability: The wells are located in the Wailuku Sector, Waihee System of Maui. Sustainable yield of the Waihee System is estimated at 8 mgd. There is no pumpage from the aquifer. Ground water use from the aquifer system is expected to be about 4.2 mgd by the year 2010. The wells are listed for potential development in the Maui County Water Use and Development Plan.

RECOMMENDATION:

That the Commission approve the issuance of pump installation permits for North Waihee Wells 1 & 2, subject to the following conditions:

1. The Commission on Water Resource Management (Commission) shall be notified before work commences.
2. The permits shall be for installation of 1400 gpm capacity pumps in the wells. The total pumpage from both wells shall average 2 mgd.
3. The proposed uses shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. These permits or the authorization to pump water from the wells shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from each well could be reduced by the Commission in the future. These permits are not a commitment that the pump capacities permitted here or even some lesser amount are guaranteed in the future.
4. The applicant shall provide and maintain an approved meter or other appropriate device or means for measuring and reporting total water usage. Water usage shall be measured on a monthly basis and reported to the Commission.
5. The following shall be submitted to the Commission within 30 days after completion of the work:
   a. Well Completion Reports.
   b. As-built sectional drawings of the pump installations.
6. The applicant shall comply with all applicable laws, rules, and ordinances.
7. These permits may be revoked if work is not started within six months of the dates of issuance or if work is suspended or abandoned for six months. The work proposed in these permit applications shall be completed within two years from the dates of permit issuance.

Respectfully submitted,

Edwin T. Sakoda
Deputy Director

Attachment.

APPROVED FOR SUBMITTAL:

John P. Keppler II, Acting Chairperson
Chairperson and Members  
Commission on Water Resource Management  
State of Hawaii  
Honolulu, Hawaii  

March 3, 1993  

Gentlemen:  

C. Brewer Properties, Inc.  
Application for Pump Installation Permits  
North Waihee Wells 1 & 2, Waihee, Maui  

Applicant:  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, HI 96793  

Landowner:  
Wailuku Agribusiness Company, Inc.  
P.O. Box 520  
Wailuku, HI 96793  

Action Requested: Permission to install 1400 gallons per minute (gpm) pumps in North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03) for private/municipal use. The proposed total amount of use from both wells is 2,000,000 gallons per day (2 mgd).  

Well Location/Tax Map Key: The wells are located at Tax Map Key: 3-2-01:4 (see attached map).  

Well Description (typical):  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground elevation</td>
<td>283 ft.</td>
</tr>
<tr>
<td>Casing diameter</td>
<td>16 inches</td>
</tr>
<tr>
<td>Solid casing depth</td>
<td>289 ft.</td>
</tr>
<tr>
<td>Screen casing depth</td>
<td>309 ft.</td>
</tr>
<tr>
<td>Open hole</td>
<td>79 ft.</td>
</tr>
<tr>
<td>Total depth</td>
<td>388 ft.</td>
</tr>
<tr>
<td>Proposed pump capacity</td>
<td>1400 gpm per well</td>
</tr>
</tbody>
</table>

Agency Review: The application has been sent to the Maui Department of Water Supply, the State Historic Preservation Division, the Office of Hawaiian Affairs, and to the State Departments of Health and Hawaiian Home Lands for review. There have been no objections to the project.  

Analysis: The well will develop fresh, basal water, for private/municipal use. The wells tap a basal aquifer with a static head standing about 10 ft. above mean sea level. John Mink, in a letter to C. Brewer Properties, Inc. states, "The water table in the North Waihee wells lies 10 to 11 feet above sea level while the channel of the stream opposite the wells is 200 feet above sea level. A small depression in the water table caused by pumping will not influence Waihee upstream of the wells. Nor is it likely that the stream will suffer in the downstream direction because of the high invert of the channel compared to the position of the water table". The wells were drilled and tested in 1981 and tested again in 1989. A pumping test conducted between May 15 and May 19, 1989, using Well 2 as the pumping well and Well 1 along with a specially drilled boring at Kanoa as observation wells, showed that the aquifer is extensive and potentially very productive. Well 2 was pumped at 2480 gpm (3.57 mgd) and experienced drawdown of just 5 feet. Recovery was virtually instantaneous following 96 hours of continuous pumping. The salinity of the water was constant at less than 20 mg/l chloride. No adverse impacts are expected.
Mr. Nakata asked for the location of the wells in relation to the stream. Mr. Sakoda said the wells were about 400-500 feet from the stream but were on a slope. Discussion followed regarding the any relationship between the stream and the surrounding wetlands. Mr. Nakata was concerned about where the water for the wetlands was coming from and whether or not there was a relationship between the basal and the wetland. Mr. Sakoda explained that the water would come from the overflow of the dikes plus whatever recharge. In regards to the relationship, Mr. Sakoda said there must be a relationship but was not sure what it was. Mr. Bauer pointed out that the heads on the south side of the stream (the basal portion) was higher than the north side. Therefore, there are wetlands on the south side but not on the north.

Mr. Jim Murray of C. Brewer summarized the project and answered questions of the Commission. He stated that the water distribution system would be dedicated to the County Department of Water Supply and the final terms of the joint development agreement are being worked out. A meeting was scheduled for Friday, March 5th. Mr. Murray said the DWS had encouraged them to submit this application.

Mr. Ing asked Mr. Murray if he had seen Mr. Craddick's letter of March 3 indicating that negotiations have not yet resulted in an agreement with C. Brewer and also commented that he would not want to see any action taken by the Commission that would infringe on the need to supply water to the area. Mr. Ing asked for the status of the negotiations. Mr. Murray had not seen the letter, but explained that a meeting was held last week and that there was a conceptual agreement on how to proceed on the development of the source. This conceptual agreement would be presented to the DWS Technical Committee.

Mr. Craddick explained that he was not asking that the application be deferred but that it be approved. Negotiations have been ongoing since 1986, although it has not resulted in any agreements. He hoped the agreement would be resolved this month then DWS may not need to drill their well and could look at other areas where a well would be more beneficial.

Discussion followed regarding locations of proposed DWS wells in the area, spacing, which aquifer systems they would impact. The applicant’s well would be located in Waihee aquifer while the proposed DWS well would be in the Iao aquifer with the Waihee Stream as the dividing point between the two aquifers (if streams can be that definitive). Mr. Craddick said it is known that the head on one side of the stream is 10 feet while the other side has a 14 foot head.

Ms. Loui added that the USGS model for Pearl Harbor showed that cones of depression can cross non-conformities so even if there is a difference in heads there could still be some effects. Mr. Craddick said that was the reason for his letter but he did not intend to stop the permit. He felt staff’s recommendations were sufficient to handle the situation mentioned by Ms. Loui.

Mr. Nakata asked if there would be any impact on the stream or wetlands from the proposed DWS well and if USGS had been asked to look at it. Mr. Sakoda did not think it would affect the stream but effects on the wetlands needs to be looked at more closely. The USGS were given copies of John Mink’s letter and they have not stated any objections. Ms. Loui added that not enough is known on whether or not the stream is gaining and where it’s gaining, therefore Mr. Meyer from USGS could not make any recommendations and deferred to Mr. Mink’s statement.

Mr. Martin provided testimony expressing concern about the reservation of water for Hawaiian Home Lands. Since the well is being dedicated to DWS, Ms. Brown asked if under the terms of agreement exclusive rights are being reserved for C. Brewer and how extensive they would be. Mr. Murray said the agreement is not in place but they would be developing the water source and investing a
Mr. Nakata asked for the location of the wells in relation to the stream. Mr. Sakoda said the wells were about 400-500 feet from the stream but were on a slope. Discussion followed regarding the any relationship between the stream and the surrounding wetlands. Mr. Nakata was concerned about where the water for the wetlands was coming from and whether or not there was a relationship between the basal and the wetland. Mr. Sakoda explained that the water would come from the overflow of the dikes plus whatever recharge. In regards to the relationship, Mr. Sakoda said there must be a relationship but was not sure what it was. Mr. Bauer pointed out that the heads on the south side of the stream (the basal portion) was higher than the north side. Therefore, there are wetlands on the south side but not on the north.

Mr. Jim Murray of C. Brewer summarized the project and answered questions of the Commission. He stated that the water distribution system would be dedicated to the County Department of Water Supply and the final terms of the joint development agreement are being worked out. A meeting was scheduled for Friday, March 5th. Mr. Murray said the DWS had encouraged them to submit this application.

Mr. Ing asked Mr. Murray if he had seen Mr. Craddick's letter of March 3 indicating that negotiations have not yet resulted in an agreement with C. Brewer and also commented that he would not want to see any action taken by the Commission that would infringe on the need to supply water to the area. Mr. Ing asked for the status of the negotiations. Mr. Murray had not seen the letter, but explained that a meeting was held last week and that there was a conceptual agreement on how to proceed on the development of the source. This conceptual agreement would be presented to the DWS Technical Committee.

Mr. Craddick explained that he was not asking that the application be deferred but that it be approved. Negotiations have been ongoing since 1986, although it has not resulted in any agreements. He hoped the agreement would be resolved this month then DWS may not need to drill their well and could look at other areas where a well would be more beneficial.

Discussion followed regarding locations of proposed DWS wells in the area, spacing, which aquifer systems they would impact. The applicant's well would be located in Waaihe aquifer while the proposed DWS well would be in the lao aquifer with the Waaihe Stream as the dividing point between the two aquifers (if streams can be that definitive). Mr. Craddick said it is known that the head on one side of the stream is 10 feet while the other side has a 14 foot head.

Ms. Loui added that the USGS model for Pearl Harbor showed that cones of depression can cross non-conformities so even if there is a difference in heads there could still be some effects. Mr. Craddick said that was the reason for his letter but he did not intend to stop the permit. He felt staff's recommendations were sufficient to handle the situation mentioned by Ms. Loui.

Mr. Nakata asked if there would be any impact on the stream or wetlands from the proposed DWS well and if USGS had been asked to look at it. Mr. Sakoda did not think it would affect the stream but effects on the wetlands needs to be looked at more closely. The USGS were given copies of John Mink's letter and they have not stated any objections. Ms. Loui added that not enough is known on whether or not the stream is gaining and where it's gaining, therefore Mr. Meyer from USGS could not make any recommendations and deferred to Mr. Mink's statement.

Mr. Martin provided testimony expressing concern about the reservation of water for Hawaiian Home Lands. Since the well is being dedicated to DWS, Ms. Brown asked if under the terms of agreement exclusive rights are being reserved for C. Brewer and how extensive they would be. Mr. Murray said the agreement is not in place but they would be developing the water source and investing a
significant amount with the intent of having some reserved right to use the water. The nature of that right has not been determined but it would be a sharing of the source.

Mr. Craddick added that when an agreement is reached, DHHL would have water made available to them.

Staff recommendation unanimously approved (Fujimura/Lewin).

**ITEM 5**
EXTENSION: HUEHU RANCH ASSOCIATES, L.P., PUMP INSTALLATION PERMITS, KUKIO IRRIGATION (K) WELLS 1 TO 3, KUKIO, NORTH KONA, HAWAII

Mr. Dustin Crimmins, representing the applicant, stated approval had been received for the Water Quality Monitoring and Management Plan from the Department of Health. A copy of the approved permit would be sent to the Commission's staff.

Staff recommendation unanimously approved (Fujimura/Ing).

**ITEM 6**
JOHN D. MOOD JR., APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, A STREAM DIVERSION WORKS PERMIT, AND AN AMENDMENT TO THE INTERIM INSTREAM FLOW STANDARD FOR HUALOLO STREAM, NINOLE, HAWAII

Mr. Martin questioned whether or not the approval of all landowners adjacent to the streams was needed before the stream was restored. Ms. Loui said several letters were received from landowners who were in favor of restoring the stream. The first step would be to determine who built the diversion, then work with the landowners.

Staff recommendation unanimously approved (Nakata/Lewin).

**ITEM 7**
BOUNDARY RECLASSIFICATIONS WITHIN THE HONOLULU, PEARL HARBOR, AND WAILUA GROUND WATER MANAGEMENT AREAS INCLUDING THE PEARL HARBOR CAPROCK AREA, OAHU

Mr. Hardy explained the boundaries and sectors being presented to the Commission.

Mr. Martin stated (testimony in Commission file) that in future refinement of the aquifer system and sector boundaries, the Commission should “utilize readily available additional output from USGS modelling that was not mentioned nor presented at the public information meeting”.

Mr. Bowles cautioned that if boundaries and definition of rules and regulations become too rigid, the real purpose will be lost. Ground water modeling is helpful as a tool but field knowledge is equally, if not more important and that if modeling is not working it should be modified.

Since at the informational meeting the Windward area was numbers were left blank, Mr. Gary Lee asked if the information included on the map presented by Mr. Hardy was for information only or would the Commission be acting on that also. Mr. Hardy said it was just general information which was attached at the request of the Commission. The Windward area numbers were approved at an earlier meeting.

Mr. Charley Ice of Hawaiian Home Lands asked if the Central Sector is a high level aquifer does it suggest that there is an overlap of the North and Pearl Harbor Aquifer. Mr. Hardy said that it is recognized and that was the reason staff is proposing to set the sustainable yield at a status quo.
significant amount with the intent of having some reserved right to use the water. The nature of that right has not been determined but it would be a sharing of the source.

Mr. Craddick added that when an agreement is reached, DHHL would have water made available to them.

Staff recommendation unanimously approved (Fujimura/Lewin).

ITEM 5

EXTENSION: HUEHUE RANCH ASSOCIATES, L.P., PUMP INSTALLATION PERMITS, KUKIO IRRIGATION (K) WELLS 1 TO 3, KUKIO, NORTH KONA, HAWAII

Mr. Dustin Crimmins, representing the applicant, stated approval had been received for the Water Quality Monitoring and Management Plan from the Department of Health. A copy of the approved permit would be sent to the Commission's staff.

Staff recommendation unanimously approved (Fujimura/Ing).

ITEM 6

JOHN D. MOOD JR., APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, A STREAM DIVERSION WORKS PERMIT, AND AN AMENDMENT TO THE INTERIM INSTREAM FLOW STANDARD FOR HUALOLO STREAM, NINOLE, HAWAII

Mr. Martin questioned whether or not the approval of all landowners adjacent to the streams was needed before the stream was restored. Ms. Loui said several letters were received from landowners who were in favor of restoring the stream. The first step would be to determine who built the diversion, then work with the landowners.

Staff recommendation unanimously approved (Nakata/Lewin).

ITEM 7

BOUNDARY RECLASSIFICATIONS WITHIN THE HONOLULU, PEARL HARBOR, AND WAIALUA GROUND WATER MANAGEMENT AREAS INCLUDING THE PEARL HARBOR CAPROCK AREA, OAHU

Mr. Hardy explained the boundaries and sectors being presented to the Commission.

Mr. Martin stated (testimony in Commission file) that in future refinement of the aquifer system and sector boundaries, the Commission should "utilize readily available additional output from USGS modelling that was not mentioned nor presented at the public information meeting".

Mr. Bowles cautioned that if boundaries and definition of rules and regulations become too rigid, the real purpose will be lost. Ground water modeling is helpful as a tool but field knowledge is equally, if not more important and that if modeling is not working it should be modified.

Since at the informational meeting the Windward area was numbers were left blank, Mr. Gary Lee asked if the information included on the map presented by Mr. Hardy was for information only or would the Commission be acting on that also. Mr. Hardy said it was just general information which was attached at the request of the Commission. The Windward area numbers were approved at an earlier meeting.

Mr. Charley Ice of Hawaiian Home Lands asked if the Central Sector is a high level aquifer does it suggest that there is an overlap of the North and Pearl Harbor Aquifer. Mr. Hardy said that it is recognized and that was the reason staff is proposing to set the sustainable yield at a status quo.
Chairperson and Members  
Commission on Water Resource Management  
State of Hawaii  
Honolulu, Hawaii  

March 3, 1993  

Gentlemen:

C. Brewer Properties, Inc.  
Application for Pump Installation Permits  
North Waihee Wells 1 & 2, Waihee, Maui

Applicant:  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, HI 96793  

Landowner:  
Wailuku Agribusiness Company, Inc.  
P.O. Box 520  
Wailuku, HI 96793

Action Requested: Permission to install 1400 gallons per minute (gpm) pumps in North Waihee Wells 1 & 2 (Well Nos. 5631-02 & 03) for private/municipal use. The proposed total amount of use from both wells is 2,000,000 gallons per day (2 mgd).

Well Location/Tax Map Key: The wells are located at Tax Map Key: 3-2-01:4 (see attached map).

Well Description (typical):

- Ground elevation: 283 ft.
- Casing diameter: 16 inches
- Solid casing depth: 289 ft.
- Screen casing depth: 309 ft.
- Open hole: 79 ft.
- Total depth: 388 ft.
- Proposed pump capacity: 1400 gpm per well

Agency Review: The application has been sent to the Maui Department of Water Supply, the State Historic Preservation Division, the Office of Hawaiian Affairs, and to the State Departments of Health and Hawaiian Home Lands for review. There have been no objections to the project.

Analysis: The well will develop fresh, basal water, for private/municipal use. The wells tap a basal aquifer with a static head standing about 10 ft. above mean sea level. John Mink, in a letter to C. Brewer Properties, Inc. states, "The water table in the North Waihee wells lies 10 to 11 feet above sea level while the channel of the stream opposite the wells is 200 feet above sea level. A small depression in the water table caused by pumping will not influence Waihee upstream of the wells. Nor is it likely that the stream will suffer in the downstream direction because of the high invert of the channel compared to the position of the water table". The wells were drilled and tested in 1981 and tested again in 1989. A pumping test conducted between May 15 and May 19, 1989, using Well 2 as the pumping well and Well 1 along with a specially drilled boring at Kanoa as observation wells, showed that the aquifer is extensive and potentially very productive. Well 2 was pumped at 2480 gpm (3.57 mgd) and experienced drawdown of just 5 feet. Recovery was virtually instantaneous following 96 hours of continuous pumping. The salinity of the water was constant at less than 20 mg/l chloride. No adverse impacts are expected.
Water Availability: The wells are located in the Wailuku Sector, Waihee System of Maui. Sustainable yield of the Waihee System is estimated at 8 mgd. There is no pumpage from the aquifer. Ground water use from the aquifer system is expected to be about 4.2 mgd by the year 2010. The wells are listed for potential development in the Maui County Water Use and Development Plan.

RECOMMENDATION:

That the Commission approve the issuance of pump installation permits for North Waihee Wells 1 & 2, subject to the following conditions:

1. The Commission on Water Resource Management (Commission) shall be notified before work commences.

2. The permits shall be for installation of 1400 gpm capacity pumps in the wells. The total pumpage from both wells shall average 2 mgd.

3. The proposed uses shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. These permits or the authorization to pump water from the wells shall not constitute a determination of correlative water rights. The permittee is notified and by this provision understands that the quantity of water taken from each well could be reduced by the Commission in the future. These permits are not a commitment that the pump capacities permitted here or even some lesser amount are guaranteed in the future.

4. The applicant shall provide and maintain an approved meter or other appropriate device or means for measuring and reporting total water usage. Water usage shall be measured on a monthly basis and reported to the Commission.

5. The following shall be submitted to the Commission within 30 days after completion of the work:
   a. Well Completion Reports.
   b. As-built sectional drawings of the pump installations.

6. The applicant shall comply with all applicable laws, rules, and ordinances.

7. These permits may be revoked if work is not started within six months of the dates of issuance or if work is suspended or abandoned for six months. The work proposed in these permit applications shall be completed within two years from the dates of permit issuance.

Respectfully submitted,

RAE M. LODI
Deputy Director

Attach.

APPROVED FOR SUBMITTAL:

JOHN P. KEPPELER II, Acting Chairperson

-2-
average will be 2 mgd. Eventually additional wells may be drilled in the aquifer about half a mile north of the existing wells to allow total average pumpage of 4 mgd.

Sincerely,

John F. Mink
March 3, 1993

Mr. John Keppeler, II  
Acting Director  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Keppeler:

We are planning on constructing a well along the south side of N. Waihee stream at about the 200 foot elevation. The purpose of the well is to spread the pumping of Iao aquifer and to supply the new Department of Hawaiian Homes subdivision of Waiehu Kou and other Hawaiian Homes areas in Waiehu. Withdrawal would be in the amount of 1 MGD

The County of Maui Board of Water Supply has been negotiating with Brewer on joint development of water in this area. These negotiations have not resulted in agreement at this time. We would not want any action taken here to infringe on our need to supply water to the areas listed above.

Thank you for your consideration in this matter.

Sincerely,

David Craddick, Director

DRC/ao/N Waihee wells

cc: Charles Ice, Dept of Hawaiian Home Lands  
David Blane, C. Brewer Properties

"By Water All Things Find Life"
Waihee 1&2
(Well No. 5631-02,03)
February 12, 1993

David Blane
C. Brewer Properties, Inc.
PO Box 1437
Wailuku, HI 96793

Dear David:

Subject: Effect of North Waihee Wells 1 and 2 pumpage on Waihee Stream flow.

I understand that C. Brewer Properties, Inc. application for pump installation permits to install a 1400 gpm pump in each of the North Waihee wells (nos. 1 and 2) was delayed because a point was raised concerning the possible effect pumping the wells might have on Waihee stream flow. This is an exaggerated concern in view of the position of the water level in the aquifer with respect to the channel invert of Waihee Stream.

The water table in the North Waihee wells lies at 10 to 11 feet above sea level while the channel of the stream opposite the wells is 200 feet above sea level (see attached location map). A small depression in the water table caused by pumping will not influence Waihee upstream of the wells. Nor is it likely that the stream will suffer in the downstream direction because of the high invert of the channel compared to the position of the water table.

A pump test conducted between May 15 and May 19, 1989, using Well 2 as the pumping well and Well 1 along with a specially drilled boring at Kanoa (see map) as observation wells, showed that the aquifer is extensive and potentially very productive. Well 2 was pumped at 2480 gpm (3.57 mgd) and experienced drawdown of just 5 feet. Recovery was virtually instantaneous following 96 hours of continuous pumping. The salinity of the water was constant at less than 20 mg/l chloride.

Although each well will be fitted with a 1400 gpm pump (2 mgd) to give a total capacity of 4 mgd, during normal operations only 2 mgd will be pumped, and annually the
Date: February 16, 1993

To: Ed Sakoda
Dept. of Land and Natural Resources

From: Michael T. Munekiyo

Fax No.: 587-0219
Telephone No.: 

No. of Pages including Cover Letter: 4

Subject: C. Brewer Properties, Inc., North Waihee Wells No. 1 and 2

Comments: Ed, per our telephone conversation this morning, attached is John Mink's letter response regarding the effects of the North Waihee Wells on Waihee Stream flows. Please call me after you have had a chance to review to discuss placing this matter back on the Commission's agenda. Thank you.

cc: David W. Blane (242-7068)

(Initials) [Signature]

If you have any problems or do not receive the entire fax, kindly call me at 244-2015.
Please deliver the following pages to:

Name: Bill Meyer
Company: USGS
From: Ed Sakoda
Date: 2/22/93
Time: 12:13 pm

Message: For your information, Pump installation permits for Wahee Wells 1 & 2 tentatively scheduled for March 17, 1993. Commissioner meeting.

Total number of pages (including Transmittal Page): 4

If you do not receive all of the pages legibly, please call back: (808) 587-0225

Sending Facsimile Number: (808) 541-3611
Receiving Facsimile Number: (____) 541-3611

TRANSMISSION REPORT

THIS DOCUMENT (REDUCED SAMPLE ABOVE) WAS SENT

** COUNT **
# 4

*** SEND ***

<table>
<thead>
<tr>
<th>NO</th>
<th>REMOTE STATION I.D.</th>
<th>START TIME</th>
<th>DURATION</th>
<th>#PAGES</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>808 541 3611</td>
<td>2-22-93</td>
<td>12:58PM</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL 0:03'35" 4

XEROX TELECOPIER 7020
TO: Mr. Ed Sakoda  
Department of Land and Natural Resources  
Water Resources Management  
P. O. Box 621  
Honolulu, HI 96809

Enclosed is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2/4/93</td>
<td>Check #2221 in the amount of $25.00 for permit fee</td>
</tr>
</tbody>
</table>

() For approval  
() For your use  
() As requested  
() Returned for corrections  
() For your files  
(x) For necessary action  
() For review and comment  
() For your signature  
() Returning

REMARKS: Ed, as we discussed we are enclosing the permit fee to cover the second well.

Signed: Michael T. Munekiyo, A.I.C.P.

Copy to:
PAY TO THE ORDER OF: Department of Land and Natural Resources

Twent five and no/100 DOLLARS

First Hawaiian Bank
Wailuku Branch
WAILUKU, HI 96793

Well No. 5631-02,03

M. T. Munekiyo
TO: Ed

DATE: 2/7

TIME: 10:08 a.m.

WHILE YOU WERE OUT

Mr. Mike Shuneyo
of Maui

Phone: 244-2015

<table>
<thead>
<tr>
<th>TELEPHONED</th>
<th>PLEASE CALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALLED TO SEE YOU</td>
<td>WILL CALL AGAIN</td>
</tr>
<tr>
<td>WANTS TO SEE YOU</td>
<td>URGENT</td>
</tr>
</tbody>
</table>

RETURNED YOUR CALL

Message: Spoke w/ Mike on 2/2/93. He will check on status & get back to me.

Operator: Minke

Stream reflects
Ms. Rae Loui, Deputy Director  
Commission on Water Resource Management  
Department of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, Hawaii  96809

Dear Ms. Loui:

SUBJECT:  PUMP INSTALLATION PERMIT APPLICATION  
WAIHEE WELLS 1 AND 2  
STATE WELL NOS. 5631-02 AND -03  
WAIHEE, MAUI

Thank you for the opportunity to review and comment on the subject document. We have examined the application and have the following comments to offer:

1. The application indicates that the subject wells will be for domestic use. If the wells will serve 25 or more individuals at least 60 days per year or will have a minimum of 15 service connections, the applicant will be required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, Rules Relating to Potable Water Systems.

2. Section 11-20-29 of Chapter 20 requires that a new source of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

3. The proposed wells are situated above the Underground Injection Control (UIC) line. Land areas above the UIC line are considered to contain underground sources of drinking water. Thus, it is essential that the wells be designed and constructed to prevent the possibility of groundwater contamination. For example, each well should have a concrete well pad and full grouting to prevent seepage or floodwaters from migrating down the well shaft.

4. If the wells are also used for irrigation purposes, adequate measures must be taken to eliminate cross-connections and backflow conditions. The potable and irrigation water systems should be clearly labeled and
physically separated by an air gap or an approved backflow preventer to avoid contaminating the potable water supply.

If you should have any questions, please contact Stuart Yamada of the Safe Drinking Water Branch at [Redacted]

Sincerely,

THOMAS E. ARIZUMI, P.E., Chief
Environmental Management Division

SY:la

c: David Blane
C. Brewer Properties, Inc.
P.O. Box 1437
Wailuku, Maui, HI 96793
Mr. David Blane  
C. Brewer Properties, Inc.  
P.O. Box 1437  
Wailuku, HI 96793  

Dear Mr. Blane:

We have received your application and filing fee for a permit to install pumps in two wells (Well Nos. 5631-02,03) at Waihee, Maui, (TMK: 3-2-01:4). We are reviewing the application for completeness.

Should you have questions, please call the Commission on Water Resource Management staff at [redacted].

Sincerely,

RAE M. LOUI  
Deputy Director
Honorable Hoaliku Drake  
Director  
Department of Hawaiian Home Lands  
State of Hawaii  
P.O. Box 1879  
Honolulu, Hawaii 96805

Dear Ms. Drake:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact Rae M. Loui, Deputy Director, at 587-0214.

Very truly yours,

[Signature]

WILLIAM W. PATY

JZ:ky
Enc.
Mr. Clayton H.W. Hee  
Chairman & Trustee At Large  
Office of Hawaiian Affairs  
711 Kapiolani Blvd., Suite 500  
Honolulu, Hawaii 96813-5249

Attn: Ms. Linda Delaney, Land & Natural Resources Division

Dear Mr. Hee:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1 &amp; 2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact Rae M. Loui, Deputy Director, at [Contact Information]

Very truly yours,

WILLIAM W. PATY

JZ:ky
Enc.
Mr. Thomas Arizumi, Chief  
Environmental Management Division  
State Department of Health  
Five Waterfront Plaza  
500 Ala Moana Blvd., Suite 250  
Honolulu, Hawaii 96813

Attn: Mr. William Wong

Dear Mr. Arizumi:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02, 03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact the Commission on Water Resource Management staff at

Sincerely,

 Rae M. Loui  
Deputy Director

Enc.
Ms. Marjorie Ziegler  
Sierra Club Legal Defense Fund, Inc.  
212 Merchant Street, Room 202  
Honolulu, Hawaii 96813  

Dear Ms. Ziegler:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact the Commission on Water Resource Management staff at

Sincerely,

RAE M. LOUI  
Deputy Director

JZ:ky  
Enc.
MEMORANDUM

TO: Don Hibbard, Director
   Historic Preservation Program

FROM: Rae M. Loui, Deputy Director
       Commission on Water Resource Management

SUBJECT: Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact the Commission on Water Resource Management staff at [Contact Information]

JZ:ky
Enc.
Mr. Dave Craddick, Director  
Department of Water Supply  
County of Maui  
200 South High Street  
Wailuku, Maui, Hawaii 96793

Dear Mr. Craddick:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact the Commission on Water Resource Management staff at [number]

Sincerely,

[Signature]

RAE M. LOUI  
Deputy Director

JZ:ky  
Enc.
Mr. Kazu Hayashida  
Manager and Chief Engineer  
Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Well Construction and Pump Installation Permit Applications

Transmitted for your review and comment are copies of the following permit applications:

<table>
<thead>
<tr>
<th>Island</th>
<th>Well Name</th>
<th>Well No.</th>
<th>Applicant Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maui</td>
<td>Wahikuli-MAU</td>
<td>5441-01</td>
<td>Well and Pump</td>
</tr>
<tr>
<td>Maui</td>
<td>Waihee 1&amp;2</td>
<td>5631-02,03</td>
<td>Pump Installation</td>
</tr>
</tbody>
</table>

Please review the applications pursuant to your area of concern and submit your comments to us, orally or in writing, ten (10) working days from date of this letter.

Should you have any questions, please contact the Commission on Water Resource Management staff at [number redacted].

Sincerely,

RAE M. LOUI  
Deputy Director

JZ:ky  
Enc.
MEMORANDUM

TO:    Rae M. Loui, Deputy Director  
     Commission on Water Resource Management 

FROM: Don Hibbard, Administrator

SUBJECT: Historic Preservation Review of Well Construction and Pump Installation Permit Applications
         Waihee, Wailuku & Wahikuli, Lahaina, Maui
         TMK 3-2-1: 4 & 4-5-14: 14

We believe that both applications will have "no effect" on significant historic sites. The wells in Waihee already exist in farmed land and the proposed well in Wahikuli will be located along the highway, an area that has been previously disturbed. Both areas are not likely to contain historic sites.

Please call Annie Griffin at extension 7-0013 if you have any questions.

AG:aal
TO:        Ed Sakoda  
           DLNR  
           Div. of Water Resources  
           Management  
           P. O. Box 621  
           Honolulu, HI 96809

SUBJECT:  Pump Installation Permit for North Waihee Wells

Enclosed is/are:

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>---</td>
<td>Application for Pump Installation Permit with attachments</td>
</tr>
<tr>
<td>1</td>
<td>---</td>
<td>$25.00 Filing Fee</td>
</tr>
</tbody>
</table>

( ) For approval  (x) For necessary action  
( ) For your use  ( ) For review and comment  
( ) As requested  ( ) For your signature  
( ) Returned for corrections  ( )  
( ) For your files

REMARKS: The attached materials are submitted for processing. If there are any questions or if additional information is needed, please call me at [redacted] Thank you.

Signed: Michael T. Munekiyo, A.I.C.P.

Copy to: [blank]
MICHAEL T. MUNEKIYO CONSULTING, INC.
2035 MAIN ST.
WAILUKU, HI 96793

September 17, 92

PAY TO THE ORDER OF: Department of Land and Natural Resources

$25.00

***Twenty five and no/100***

DOLLARS

WAILUKU BRANCH
First Hawaiian Bank
P.O. BOX 310
WAILUKU, HAWAII, 96793

CBP-N. Waihee Wells

Årei T. Munekiyo

27W04652511
APPLICATION FOR: □ Well Construction or □ Pump Installation PERMIT

Instructions: Please print or type and send completed application with attachments to the Div. of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. (Filing fee waived for government agencies.) If necessary, phone Hydrology/Geology Section for assistance.

1. WELL LOCATION/NAME: State Well Nos. 5631-02 and 5631-03 Island Maui
   Address Waihee, Maui, Hawaii
   Tax Map Key 3-2-01:4
   (Attach a USGS map, scale 1":2000", and a property tax map showing well location referenced to established property boundaries.)

2. (a) WELL OWNER:
   Firm Name C. Brewer Properties, Inc.
   Contact Person David Blane
   Address P.O. Box 1437
   Wailuku, HI 96793 Ph. __________
   (b) LANDOWNER:
   Firm Name Wailuku Agribusiness Company, Inc.
   Contact Person Stephen W. Knox
   Address P.O. Box 520
   Wailuku, HI 96793 Ph. __________

3. PROPOSED CONTRACTOR:
   Not available. Project to be bid following receipt of permit. Contractor's License No. __________ Ph. __________

4. PROPOSED WORK: □ Drill New Well □ Deepen □ Redrill
   □ Alter □ Seal □ Abandon
   □ Install New Pump □ Replace Pump □ Modify Pump
   (Briefly describe the proposed work and fill in the diagram on the back of this form.)

5. PROPOSED USE: □ Municipal (including hotels, stores, etc.) □ Military
   □ Domestic (individual, noncommercial water sys.) □ Industrial
   □ Irrigation (specify) □ Other (specify)

6. PROPOSED AMOUNT OF WITHDRAWAL: 6.0 Million gallons per day Total
   (2.0 MGD per well)

7. PROPOSED PUMP INFORMATION:
   Pump Type:
   □ Vertical Turbine □ Submersible □ Centrifugal
   Motor:
   □ Diesel □ Gas □ Electric, at a rated horsepower of ___
   Rated Pump Capacity: Gallons per minute 1400

Well Owner (print) C. Brewer Properties, Inc. Landowner (print) Wailuku Agribusiness Co., Inc.
Signature ___________________________ Signature ___________________________
Date September 16, 1992 Date September 16, 1992

For Official Use Only:
Field Checked By ___________________________
Date ___________________________
Latitude ___________________________
Longitude ___________________________
Hydrologic Unit __________ State Well No. __________
Briefly describe the proposed work:

Subject wells were drilled and tested between March and August 1981.

PROPOSED SECTION OF WELL

Elevation at top of casing: 284 ft., msl.

Cement Grout: 200 ft.

Hole Diameter: 20 in.

Total Depth: 363 ft.

Rock Packing: 108 ft.

Ground Elevation: 283 ft., msl*

Solid Casing: ASTM Designation A-242

USS Cor-ten, Kaiser

Material Steel Kaisaloy

Length 289 ft.

Diameter 16 in.

Wall thickness 0.3125 in.

Casing: ☐ Perforated ☐ Screen

USS Cor-ten, Kaiser

Material Steel Kaisaloy

Length 20 ft.

Diameter 16 in.

Wall thickness 0.25 in.

Openings 100 sq. in./L.F.

Open Hole:

Length 79

Diameter 15 in.

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
APPLICATION FOR: ☐ Well Construction or ☐ Pump Installation PERMIT

Instructions: Please print or type and send completed application with attachments to the Dir. of Water Resource Management, Room Box 333, Honolulu, Hawaii 96859. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. (Filing fee waived for government agencies.) If necessary, phone Hydrology/Geology Section for assistance.

1. WELL LOCATION/NAME: North Waihee Wells 1 and 2
   State Well Nos. 5631-02 and 5631-03
   Island Maui
   Address Waihee, Maui, Hawaii
   Tax Map Key 3-2-D14
   (Attach a USGS map, scale 1:2000, and a property tax map showing well location referenced to established property boundaries.)

2. (a) WELL OWNER:
   Firm Name C. Brewer Properties, Inc.
   Contact Person David Blane
   Address P. O. Box 1437
   Wailuku, HI 96793
   Ph.
   (b) LANDOWNER:
   Firm Name Wailuku Agribusiness Company, Inc.
   Contact Person Stephen W. Knox
   Address P. O. Box 520
   Wailuku, HI 96793
   Ph.

3. PROPOSED CONTRACTOR: Not available. Project to be bid following receipt of permit.
   Contractor's License No.
   Ph.

4. PROPOSED WORK:
   ☐ Drill New Well ☐ Deepen ☐ Redrill
   ☐ Alter ☐ Seal ☐ Abandon
   ☐ Install New Pump ☐ Replace Pump ☐ Modify Pump
   (Briefly describe the proposed work and fill in the diagram on the back of this form.)

5. PROPOSED USE:
   ☐ Municipal (including hotels, stores, etc.) ☐ Military
   ☐ Domestic (individual, noncommercial water sys.) ☐ Industrial
   ☐ Irrigation (specify) ☐ Other (specify)

6. PROPOSED AMOUNT OF WITHDRAWAL:
   ☐ 4.0 Million gallons per day Total (2.0 MGD per well)

7. PROPOSED PUMP INFORMATION:
   Pump Type:
   ☐ Vertical Turbine ☐ Submersible ☐ Centrifugal
   Motor:
   ☐ Diesel ☐ Gas ☐ Electric, at a rated horsepower of 150
   Rated Pump Capacity:
   Gallons per minute 1600

Well Owner (print) C. Brewer Properties, Inc.
Signature __________________________
Date September 10, 1992

Landowner (print) Wailuku Agribusiness Co., Inc.
Signature __________________________
Date September 15, 1992

For Official Use Only:
Field Checked By __________________________
Date __________________________
Latitude __________________________
Longitude __________________________
Hydrologic Unit __________________________
State Well No. __________________________
Briefly describe the proposed work:

Subject wells were drilled and tested between March and August 1981.

---

**PROPOSED SECTION OF WELL**

Elevation at top of casing: 284 ft., msl.

Ground Elevation: 283 ft., msl*

Cement Grout: 200 ft.

Solid Casing: ASTM Designation A-242
USS Cor-ten, Kaiser
Material: Steel Kaiser
Length: 289 ft.
Diameter: 16 in.
Wall thickness: 0.3125 in.

Hole Diameter: 20 in.

Casing: Perforated Screen
USS Cor-ten, Kaiser
Material: Steel Kaiser
Length: 20 ft.
Diameter: 16 in.
Wall thickness: 0.25 in.
Openings: 100 sq. in./L.F.

Total Depth: 363 ft.

Rock Packing: 108 ft.

Open Hole:
Length: 79 ft.
Diameter: 15 in.

---

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
Dr. David Henderson Brown, M.D.
RR#1 Box 138
Wailuku, HI 96793

Dear Dr. Brown:

Waihee Valley Wells 1 & 2 (Well Nos. 5631-02 & 03)

Your letter indicates that you are looking for a way to require Wailuku Agribusiness to do an environmental assessment and an environmental impact statement before they draw any water from the Waihee Valley Wells.

The administrative rules of the State Water Code require only that a water user obtain a pump installation permit from the Commission on Water Resource Management prior to installing a pump in a well. In designated water management areas, an additional water use permit is required. Presently, there are no water management areas on Maui.

The State Water Code also provides for dispute resolution and citizen complaints for water-related matters whether or not they are in a water management area.

An environmental assessment and environmental impact statement are not required by the Commission on Water Resource Management prior to the owner or applicant using water from the Waihee Valley Wells. However, they must obtain a pump installation permit from the Commission. If there are any disputes or complaints about the issuance of such a permit, the Commission will hear them and act accordingly.

Call Ed Sakoda at [number] if you have any questions.

Sincerely,

[Signature]

MANABU TAGOMORI
Deputy Director

ES:dk
Briefly describe the proposed work:

Subject wells were drilled and tested between March and August 1981.

**PROPOSED SECTION OF WELL**

- **Elevation at top of casing:** 284 ft., msl.
- **Cement Grout:** 200 ft.
- **Hole Diameter:** 20 in.
- **Total Depth:** 363 ft.
- **Rock Packing:** 108 ft.
- **Ground Elevation:** 283 ft., msl

**Solid Casing:**
- **Material:** ASTM Designation A-242
- **USS Cor-ten, Kaiser Steel Kaisaloy**
- **Length:** 289 ft.
- **Diameter:** 16 in.
- **Wall thickness:** 0.3125 in.

**Casing:**
- **Perforated Screen**
- **Material:** USS Cor-ten, Kaiser Steel Kaisaloy
- **Length:** 20 ft.
- **Diameter:** 16 in.
- **Wall thickness:** 0.25 in.
- **Openings:** 100 sq. in./L.F.

**Open Hole:**
- **Length:** 79
- **Diameter:** 15 in.

---

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.*
June 13, 1990

Department of Land & Natural Resources
Commission on Water Resource Management
State of Hawaii
P. O. Box 621
Honolulu, Hawaii  96809

Gentlemen:

Re:  PUMP INSTALLATION PERMITS

Pursuant to your letter of May 30, 1990, we are submitting applications for pump installation permits for the following projects:

1.  Honokahua Well A, Repair of Controls.  Permit not necessary
3.  Waiehu Heights Pump #2, Pump Replacement.    5930-02
4.  Hamoa Well, Pump Installation.    3000-02
5.  Kopenhagen Well, Pump Installation.    0801-03

Additional information requested are as follows:

1.  Wakiu Wells "A" and "B" both have 40 horsepower motors and have capacities of 350 gpm.

2.  Waihee Wells #1, #2, and #3 all flow through the same meter.

If any additional information is required, please contact us.

Sincerely,

Vince G. Bagoyo, Jr.
Director

ab
Enclosures
The pump rate will be held constant at 2000 gpm over a continuous period of 96 hours. The continuous rate may be prolonged another 24 hours at the discretion of the test supervisor.

In the Waihee-Kahakuloa sector water level measurements will be taken in the pumping well, the other North Waihee well, the Kanoa boring and the Wailena well. In the Waihee-Waiehu sector, measurements will be taken in Test Hole A-1. The unpumped North Waihee well is outfitted with a continuous water level recorder and in the Kanoa boring a bubbler will be installed. The Wailena well and A-1 are open. Manual measurements will be made with an insulated copper wire equipped with an electrode, or a steel tape.

Static water level measurements by steel tape or wire will be taken as follows.

1. Both North Waihee wells and the Kanoa boring.
   a. Three days before the start of the test in the A.M.
   b. One day before the start, also A.M.
   c. 30 minutes before the start.

2. Wailena well.
   a. Within five days of the start of the test.
   b. The day of the start of the test.

3. Test Hole A-1.
   a. Within five days of the start of the test.
   b. The day of the start of the test.

After the test is started, water level measurements will be taken as follows.

1. Pumping North Waihee well (manual measurements preferred; airline if manual not possible).
   a. 1 reading per minute for 5 minutes.
   b. 1 reading per 5 minutes for 25 minutes.
   c. 1 reading per 10 minutes for 60 minutes.
   d. 1 reading every hour thereafter.
2. Unpumped North Waihee well. Drawdowns will be traced on the continuous recorder, but manual measurements should be made as follows to check the reliability of the recorder.
   a. At 10 minutes
   b. At 30 minutes.
   c. Every hour thereafter.

3. Kanoa boring. Drawdowns will be determined by the bubbler arrangement but need to be checked manually. Recognizable drawdown of about 0.1 feet will not occur until 48 hours after the start of the test if the aquifer is unconfined and not narrowly bounded. If the aquifer is confined, drawdown will be measurable sooner. The sequence of readings should be:
   a. At 10 minutes.
   b. At 30 minutes.
   c. Every hour thereafter.

4. Wailena well. The Wailena well is so distant from North Waihee that drawdown of 0.1 feet and more isn’t likely to occur unless the aquifer is confined. Nevertheless, manual measurements should be made as follows.
   a. At 6 hours.
   b. At 24 hours.
   c. At 30 hours.
   d. At 48 hours.
   e. At 54 hours.
   f. At 72 hours.
   g. At 78 hours.
   h. At 96 hours.

   If a response is noted, the frequency of measurements will be increased as practicable.

5. Test Hole A-1. Same schedule as the Wailena well.

   Recoveries will be measured after the pump is turned off. Recovery measurements at the pumped well, the unpumped North Waihee well and the Kanoa boring will follow the same schedule as the drawdown measurements over a period of 12 hours. Thereafter single measurements will be made in the A.M. for the following 5 days. Recovery measurements will be made at Wailena and A-1 only if these wells experienced measurable drawdown. The schedule for such measurements will be drawn up before the end of the test.
North Waihee, Maui, Hawaii

Memo To: Joint Venture
From: John F. Mink and Norman Saito Engineering
Re: Location of new well sites in aquifer north of Waihee Valley
Date: July 17, 1989

The aquifer starting at Waihee Valley and extending northward toward Makamakaole is capable of providing approximately 4 mgd on a sustained basis. To meet maximum demands pumpage can be greater temporarily, but over the long term the average draft should be restricted to 4 mgd. This is the sustainable yield that has been estimated from analysis of the successful pumping test conducted recently on one of the North Waihee wells.

The high groundwater head in the aquifer will allow withdrawal of potable water employing relatively high capacity pumps. Drawdowns during the test were modest and recovery was rapid. Pumps having a capacity of 2 mgd (1400 gpm) each are recommended for the existing two North Waihee wells and the proposed two new wells between Waihee and Kupaa Gulch.

Sites for the new wells are plotted on the accompanying map. Three sites have been selected, but only two new wells are recommended at this time. The remaining site should be reserved for a future well in the event the sustainable yield of the aquifer proves to be greater than the estimate of 4 mgd. The first new well should be drilled at Site 2, and the next at Site 3. Site 1 is the reserve location.
Site 2 is close by the Kanoa test boring where an unnamed gulch becomes too narrow to allow uncomplicated land development. The new well can be drilled within 150 feet of the test boring at an elevation of about 300 feet. The boring will be an important monitor to track behavior of the aquifer. The site is 2000 feet north of the North Waihee wells. An access road already exists.

Site 3, where the second new well should be drilled, is on the south bank of Kupaa Gulch where it is crossed by Kahekili Highway. The usable space is small but adequate for drilling operations and construction of a pumping station. Clearing and leveling will be required. Otherwise, north of Site 2 the terrain is difficult and elevation quickly rises above 400 feet. Elevation at the site is about 350 feet; distance north of Site 2 is 1000 feet.

The reserve location, Site 1, is 500 feet south of Site 2 and 1500 feet northeast of the North Waihee wells at elevation 300 to 350 feet. The site is on the slope forming the head of an attractive small valley.

Although four wells, each fitted with a 2 mgd pump, are proposed for the reach between Waihee valley and Kupaa Gulch, on the average only 4 mgd will be pumped. The total capacity of 8 mgd can be exercised during periods of unusual demand, but on an annual basis pumpage should be equivalent to 4 mgd.

The average of 4 mgd should not be taken from the two North Waihee wells alone. One of these wells should act as a standby except during the highest demand periods.
WAILENA WELL
ELEVATION = 608.23
(At top of pipe)

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOP WATER ELEVATION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/17/89</td>
<td>x</td>
<td>Poor reading - chloride content 87.5 mg/l</td>
</tr>
<tr>
<td>03/01/89</td>
<td>6.63</td>
<td>Good results; 3:00 p.m. - NaCl 87.5 mg/l</td>
</tr>
<tr>
<td>03/08/89</td>
<td>6.67</td>
<td>4:30 p.m.; river nearby flowing</td>
</tr>
<tr>
<td>03/15/89</td>
<td>6.44</td>
<td>4:00 p.m.; river not flowing</td>
</tr>
<tr>
<td>03/22/89</td>
<td>6.16</td>
<td>4:00 p.m.; river not flowing</td>
</tr>
<tr>
<td>04/03/89</td>
<td>6.61</td>
<td>10:15 a.m.; no water in river</td>
</tr>
<tr>
<td>04/11/89</td>
<td>6.54</td>
<td>1:30 a.m.; 150 mg/l - river running strong</td>
</tr>
<tr>
<td>04/17/89</td>
<td>6.20</td>
<td>9:00 a.m.; from chart</td>
</tr>
</tbody>
</table>
# Pump Test at Well A-1

**Elevation:** 248.11

(Water Level In Feet)

<table>
<thead>
<tr>
<th>TIME</th>
<th>5/15/89</th>
<th>5/16/89</th>
<th>5/17/89</th>
<th>5/18/89</th>
<th>5/19/89</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18.17</td>
<td>18.01</td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>18.17</td>
<td>18.01</td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>8:10 a.m.</td>
<td></td>
<td>18.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:20 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>8:40 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>8:50 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:10 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:20 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:40 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>9:50 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>10:20 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td></td>
<td></td>
<td></td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>10:40 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:50 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:20 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:40 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:50 a.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 noon</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:10 p.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:20 p.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30 p.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:40 p.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:50 p.m.</td>
<td></td>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>1:10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>1:20 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>1:40 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>1:50 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:20 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>2:50 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:20 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:40 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>3:50 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:10 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:20 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:40 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>4:50 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.09</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>18.05</td>
<td>17.99</td>
<td>18.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WELL A-1

Elevation: 248.11 feet
(Water Level in Feet)

<table>
<thead>
<tr>
<th></th>
<th>5/15/89</th>
<th>5/16/89</th>
<th>5/17/89</th>
<th>5/18/89</th>
<th>5/19/89</th>
<th>5/20/89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8:00 am</td>
<td>8:00 am</td>
<td>8:30 am</td>
<td>8:00 am</td>
<td>8:00 am</td>
<td>8:40 am</td>
</tr>
<tr>
<td></td>
<td>18.17</td>
<td>18.01</td>
<td>17.96</td>
<td>17.88</td>
<td>18.08</td>
<td></td>
</tr>
<tr>
<td>10:40 am</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(noon-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>begin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>test)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:30 pm</td>
<td>5:10 pm</td>
<td>5:00 pm</td>
<td>5:00 pm</td>
<td>5:10 pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.06</td>
<td>18.05</td>
<td>17.99</td>
<td>18.09</td>
<td>18.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All measurements taken by steel tape.

The A-1 well is located far enough away from the test well, North Waihee #2, that any effect on A-1 would be doubtful.

A final reading of Well A-1 was taken on Monday, May 22, 1989 at 8:00 a.m. with a water level elevation of 18.08 feet above sea level.
TEST WELL DATA
NORTH WAIHEE WELL #2

Test well elevation at top of casing                          281.98
Measure point at base of gearing                             282.73
Pump location (-300 feet from M.P.)                          -17.27
Air line location (top of bowl assembly)                    - 6.27
Pressure gauge reading at beginning of test (to 1/10)        17.5

Distance from North Waihee Well #1 to North Waihee Well #2   176 feet

Chloride readings were taken twice daily. All were between 37.5 mg/l and 50 mg/l. NaCl measured with the HACH chloride test kit, Model 7-P, using low range measure 0-250 mg/l.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>PUMPING RATES X 100</th>
<th>RATE (GPM)</th>
<th>WATER LEVEL (FT.) AT GAUGE</th>
<th>WATER LEVEL (FT.) ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon. 5/15</td>
<td>Noon</td>
<td>Begin Pump Test</td>
<td></td>
<td>17.10</td>
<td>11.2</td>
</tr>
<tr>
<td>Mon. 5/15</td>
<td>2:15 p.m.</td>
<td>409651</td>
<td>2527</td>
<td>14.00</td>
<td>7.7</td>
</tr>
<tr>
<td>Tue. 5/16</td>
<td>8:25 a.m.</td>
<td>436445</td>
<td>2483</td>
<td>13.50</td>
<td>7.2</td>
</tr>
<tr>
<td>Tue. 5/16</td>
<td>2:05 p.m.</td>
<td>444808</td>
<td>2479</td>
<td>12.60</td>
<td>6.3</td>
</tr>
<tr>
<td>Tue. 5/16</td>
<td>5:20 p.m.</td>
<td>449715</td>
<td>2451</td>
<td>12.50</td>
<td>6.2</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>8:30 a.m.</td>
<td>472020</td>
<td>2506</td>
<td>12.20</td>
<td>5.9</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>12:00 noon</td>
<td>477233</td>
<td>2450</td>
<td>12.50</td>
<td>6.2</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>3:00 p.m.</td>
<td>481695</td>
<td>2471</td>
<td>12.50</td>
<td>6.2</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>5:30 p.m.</td>
<td>485400</td>
<td></td>
<td>12.50</td>
<td>6.2</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:00 a.m.</td>
<td>Increased Pump Rotation</td>
<td>1700 rpm - 1900 rpm</td>
<td>12.20</td>
<td>5.9</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:05 a.m.</td>
<td></td>
<td></td>
<td>12.20</td>
<td>5.9</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:10 a.m.</td>
<td></td>
<td></td>
<td>10.60</td>
<td>4.3</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>5:30 p.m.</td>
<td></td>
<td></td>
<td>10.10</td>
<td>3.8</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>6:00 p.m.</td>
<td>Reduced Pump Rotation</td>
<td>1900 rpm - 1700 rpm</td>
<td>12.00</td>
<td>5.7</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>8:00 a.m.</td>
<td></td>
<td></td>
<td>12.00</td>
<td>5.7</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>10:30 a.m.</td>
<td></td>
<td></td>
<td>12.00</td>
<td>5.7</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>12:00 noon</td>
<td>Stopped Pump Test</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>2:20 p.m.</td>
<td></td>
<td></td>
<td>17.20</td>
<td>10.9</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>5:50 p.m.</td>
<td></td>
<td></td>
<td>17.50</td>
<td>11.2</td>
</tr>
<tr>
<td>Fri. 5/19</td>
<td>7:50 p.m.</td>
<td></td>
<td></td>
<td>17.50</td>
<td>11.2</td>
</tr>
<tr>
<td>Date</td>
<td>Time</td>
<td>Totalizer (x's 100)</td>
<td>Pump Rate</td>
<td>Recorder Level</td>
<td>Elevation</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>---------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>5/15/89</td>
<td>12:00 noon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 p.m.</td>
<td>2450</td>
<td>14.10</td>
<td>Began</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(2:15 p.m.)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 p.m.</td>
<td>2400</td>
<td>14.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 p.m.</td>
<td>2400</td>
<td>14.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 p.m.</td>
<td>2400</td>
<td>14.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 p.m.</td>
<td>2450</td>
<td>13.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 p.m.</td>
<td>2450</td>
<td>13.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 p.m.</td>
<td>2450</td>
<td>13.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 p.m.</td>
<td>2450</td>
<td>13.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 p.m.</td>
<td>2450</td>
<td>13.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 p.m.</td>
<td>2450</td>
<td>13.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/16/89</td>
<td>12:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 a.m.</td>
<td>2450</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 a.m.</td>
<td>436645</td>
<td>13.50</td>
<td><em>(8:30 a.m.)</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(0.25 a.m.)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(0.25 a.m.)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 a.m.</td>
<td>2450</td>
<td>12.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 a.m.</td>
<td>2450</td>
<td>12.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 a.m.</td>
<td>2450</td>
<td>12.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 noon</td>
<td>2450</td>
<td>12.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 p.m.</td>
<td>2450</td>
<td>12.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 p.m.</td>
<td><em>444888</em></td>
<td>12.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 p.m.</td>
<td>2460</td>
<td>12.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 p.m.</td>
<td>2460</td>
<td>12.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 p.m.</td>
<td>2460</td>
<td>12.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 p.m.</td>
<td>2460</td>
<td>12.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/17/89</td>
<td>12:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 a.m.</td>
<td>2460</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## NORTH WAIHEE WELL NO. 2
### PUMP TEST FIELD DATA
5/15/89 TO 5/19/89

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>WATER METER TOTALIZER (X'S 100)</th>
<th>PUMP RATE</th>
<th>RECORDER LEVEL</th>
<th>NaCl ELEVATION (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/15/89</td>
<td>6:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 a.m.</td>
<td><em>(8.20 a.m.)</em></td>
<td></td>
<td>12.20</td>
<td>37.5-50 mg/l</td>
</tr>
<tr>
<td></td>
<td>10:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 noon</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td>50 mg/l</td>
</tr>
<tr>
<td></td>
<td>5:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 p.m.</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 p.m.</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 p.m.</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 p.m.</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 p.m.</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/16/89</td>
<td>12:00 a.m.</td>
<td>2480</td>
<td>12.30</td>
<td></td>
<td>50 mg/l</td>
</tr>
<tr>
<td></td>
<td>1:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 a.m.</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 a.m.</td>
<td><em>(totalizer not working)</em></td>
<td>1840</td>
<td>10.60</td>
<td>37.5-50 mg/l</td>
</tr>
<tr>
<td></td>
<td>9:00 a.m.</td>
<td><em>(totalizer not working)</em></td>
<td>1840</td>
<td>10.60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 a.m.</td>
<td>1860</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 a.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 noon</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 p.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 p.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 p.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 p.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 p.m.</td>
<td>1850</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td>37.5-50 mg/l</td>
</tr>
<tr>
<td></td>
<td>7:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 p.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/17/89</td>
<td>12:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>WATER METER TOTALIZER (x's 100)</td>
<td>PUMP RATE</td>
<td>RECORDER LEVEL</td>
<td>ELEVATION</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>5/15</td>
<td>2:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8:00 a.m.</td>
<td>2450</td>
<td>12.00</td>
<td></td>
<td>50 mg/l</td>
</tr>
<tr>
<td></td>
<td>9:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12:00 noon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PUMP TEST AT
NORTH WAIHEE WELL NO. 2

MP Elevation = 282.73 (Bottom of Housing)

<table>
<thead>
<tr>
<th>DATE</th>
<th>PUMP TIME</th>
<th>RATES X 100 READING</th>
<th>RATE (GPM)</th>
<th>WATER LEVEL (FT.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon. 5/15</td>
<td>2:15 p.m.</td>
<td>409651</td>
<td>&gt; 2527</td>
<td>14.00</td>
</tr>
<tr>
<td>Tues. 5/16</td>
<td>8:25 a.m.</td>
<td>436445</td>
<td>&gt; 2483</td>
<td>13.50</td>
</tr>
<tr>
<td>Tues. 5/16</td>
<td>2:05 p.m.</td>
<td>444888</td>
<td>&gt; 2475</td>
<td>12.60</td>
</tr>
<tr>
<td>Tues. 5/16</td>
<td>5:20 p.m.</td>
<td>449715</td>
<td>&gt; 2451</td>
<td>12.50</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>8:30 a.m.</td>
<td>472020</td>
<td>&gt; 2506</td>
<td>12.20</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>12:00 noon</td>
<td>477283</td>
<td>&gt; 2450</td>
<td>12.50</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>3:00 p.m.</td>
<td>481693</td>
<td>&gt; 2471</td>
<td>12.50</td>
</tr>
<tr>
<td>Wed. 5/17</td>
<td>5:30 p.m.</td>
<td>485400</td>
<td>&gt; 1812 +</td>
<td>12.50</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:00 a.m.</td>
<td>502255</td>
<td></td>
<td>12.20</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:05 a.m.</td>
<td>-</td>
<td>1500</td>
<td>12.20</td>
</tr>
<tr>
<td>Thur. 5/18</td>
<td>9:10 a.m.</td>
<td>-</td>
<td>1840 +</td>
<td>10.60</td>
</tr>
</tbody>
</table>

(Increased Pump Rotation
1700 rpm - 1900 rpm)

Flow meter malfunction.

At 6 p.m. 5/18 lowered rpm’s to 1700. Water level went up to 12.0

Calcite Content: 3.75% - sample contains

Testing 2 hr test in Set 5th 500 = 2800 yd 0=6

Field Work
5/15/89 Due to Hg = 0.4 miles.  (A (N2y1 = N2y2) = 1% Fr. Removal)
MP (hp actual recovery at test) 282.78; + 1.56 = 284.34 ft.
Start with: 466419
Pumping (300 (-17.27) DTW = 272 (8.10+73)
Start TEST @ 1200 = 6184  ∆= 660 2400 rpm

inlet at 17.19'f (below wat).  ∆(12.20) = 2.8  ∆(12.40) = 3.0  ∆(12.60) = 3.1
Pumping 5/16/89 1200 A = 5.2  c = 3.3  b = 0.24  2.46 = 5.28 ∆' = 3.1 1.44 = 1.20
\[ A \]
\[ b \]
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>WATER METER</th>
<th>TOTALIZER (x100)</th>
<th>PUMP RATE</th>
<th>RECORDER LEVEL</th>
<th>WATER LEVEL ELEV.</th>
<th>NaCl</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/15/29</td>
<td>Noon</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.10</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>14.00</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td>5/16/29</td>
<td>12 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 AM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 PM</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>13.50</td>
<td>2450</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>WATER METER TOTALIZER</td>
<td>PUMP RATE</td>
<td>RECORDER LEVEL</td>
<td>WATER LEVEL ELEV.</td>
<td>NaCl</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>------------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>--------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>5-16-89</td>
<td>10 P.M</td>
<td>2480</td>
<td>12.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 P.M</td>
<td>2480</td>
<td>12.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-17-89</td>
<td>12 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 P.M</td>
<td>2480</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 P.M</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 P.M</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 P.M</td>
<td>2480</td>
<td>12.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-18-89</td>
<td>12 A.M</td>
<td>2480</td>
<td>12.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 A.M</td>
<td>2480</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>WATER METER TOTALIZER</td>
<td>PUMP RATE</td>
<td>RECORDER LEVEL</td>
<td>WATER LEVEL ELEV.</td>
<td>NaCl</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>------------------------</td>
<td>-----------</td>
<td>----------------</td>
<td>-------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>5/18/89</td>
<td>8 A.M</td>
<td>507170</td>
<td>24.80</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/19/89</td>
<td>6 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 A.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 P.M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NORTH WAIHEE WELLS 1 AND 2
STEP DRAWDOWN PUMP TEST
APRIL 15, 1981 (WELL NO. 1)
AUGUST 3, 1981 (WELL NO. 2)

DRAWDOWN IN FEET

PUMPING RATE IN GPM
5/18/84 17:10

Call from El Remmel -

Ron Moen, meter not reading correctly,

@ 1700 RPM, Q = 2400 gpm
@ 1900 RPM (to which change was made at 5/18/84) Q = 2400 gpm

Advised to return to 1700 RPM. Will calibrate from other means.

5/19/84 07:30 Call from El Remmel.

Bill Moore calculated rate at 2900 gpm when RPM = 2000.

From 5/18 at 5/18 1800 (?) at this rate. Cut back to 2400 gpm (1700 RPM). New pump sounds, i.e. pump should be operating properly. Confusion caused by malfunction of meter reading.
The pump test at North Waihee Well #2 began on Monday, May 14, at noon.

Pumping was to be at a constant rate of 2,400-2,500 gpm for 5 days.

Between 6:00 p.m. on Wednesday, May 17 and 9:00 a.m. on Thursday, May 18 the in-line flow meter malfunctioned. Not knowing this, we increased the pump's rpm to keep up the 2,450 gpm rate.

The pumping was at this increased rate (1,900 rpm) from 9:00 a.m. on Thursday, May 17 to 6:00 p.m. on Thursday, May 17. At that time the pumping was reduced to approximately 2,450 gpm by reducing the pump rotation to the original 1,700 rpm. The remainder of the test was run at this rate.

Pumping at the test well was stopped at 12:00 p.m. (noon) on Friday, May 18, 1989.

Recovery was almost immediate and by 2:00 p.m. the pressure gauge at the test well read 17.2 feet. By 5:00 p.m., Friday it was back to the original 17.5 feet on the gauge.

On Saturday at 8:00 a.m. the water level at the test well was measured by tape to be 11.25 feet above sea level. At this time the gauge was at 17.5 feet.

With the air line at -6.27 feet and water level at 11.25 feet, the gauge reading should be at 17.52 feet. The gauge reading correlates well with these results.
# Kanoa Well

**Well Elevation**: 305.94 ft. at 2 1/2 IN. CASING

<table>
<thead>
<tr>
<th>DATE</th>
<th>ELEVATION</th>
<th>TIME</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/09/89</td>
<td>11.74</td>
<td>2:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>12/20/89</td>
<td>10.54</td>
<td>11:00 a.m.</td>
<td>NaCl content 50 mg/1</td>
</tr>
<tr>
<td>12/29/89</td>
<td>11.90</td>
<td>9:00 a.m.</td>
<td>NaCl content 38 mg/1</td>
</tr>
<tr>
<td>01/05/89</td>
<td>11.96</td>
<td>11:00 a.m.</td>
<td></td>
</tr>
<tr>
<td>01/10/89</td>
<td>11.09</td>
<td>10:00 a.m.</td>
<td></td>
</tr>
<tr>
<td>01/20/89</td>
<td>11.59</td>
<td>4:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>01/27/89</td>
<td>11.55</td>
<td>5:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>02/03/89</td>
<td>11.59</td>
<td>2:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>02/10/89</td>
<td>11.59</td>
<td>4:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>02/17/89</td>
<td>11.57</td>
<td>3:00 p.m.</td>
<td>NaCl content 38 mg/1</td>
</tr>
<tr>
<td>02/24/89</td>
<td>11.50</td>
<td>4:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>03/01/89</td>
<td>11.52</td>
<td>4:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>03/08/89</td>
<td>11.66</td>
<td>3:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>03/15/89</td>
<td>11.60</td>
<td>5:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>03/22/89</td>
<td>11.60</td>
<td>4:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>04/07/89</td>
<td>11.48</td>
<td>2:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>04/10/89</td>
<td>11.54</td>
<td>1:30 p.m.</td>
<td></td>
</tr>
<tr>
<td>05/13/89</td>
<td>12.34</td>
<td>11:30 a.m.</td>
<td></td>
</tr>
<tr>
<td>05/15/89</td>
<td>12.42</td>
<td>9:30 a.m.</td>
<td>Pump Test Today - Noon</td>
</tr>
<tr>
<td>05/15/89</td>
<td>12.31</td>
<td>8:30 p.m.</td>
<td></td>
</tr>
<tr>
<td>05/16/89</td>
<td>12.14</td>
<td>9:00 a.m.</td>
<td>(chart reading)</td>
</tr>
<tr>
<td>05/17/89</td>
<td>12.05</td>
<td>9:00 a.m.</td>
<td>(tape)</td>
</tr>
<tr>
<td>05/19/89</td>
<td>11.98</td>
<td>11:15 a.m.</td>
<td>(tape)</td>
</tr>
<tr>
<td>05/19/89</td>
<td>12.14</td>
<td>2:00 p.m.</td>
<td>(tape)</td>
</tr>
<tr>
<td>05/19/89</td>
<td>12.20</td>
<td>5:30 p.m.</td>
<td>(tape)</td>
</tr>
<tr>
<td>05/20/89</td>
<td>12.20</td>
<td>6:20 a.m.</td>
<td></td>
</tr>
<tr>
<td>05/22/89</td>
<td>12.20</td>
<td>8:50 a.m.</td>
<td></td>
</tr>
</tbody>
</table>
**KANOA WELL**

*Elevation: 305.94 feet (Bubbler System)*

<table>
<thead>
<tr>
<th>5/15/89</th>
<th>5/16/89</th>
<th>5/17/89</th>
<th>5/18/89</th>
<th>5/19/89</th>
<th>5/20/89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Tuesday</td>
<td>Wednesday</td>
<td>Thursday</td>
<td>Friday</td>
<td>Saturday</td>
</tr>
<tr>
<td>9:30 am</td>
<td>9:00 am</td>
<td>9:00 am</td>
<td>9:00 am</td>
<td>9:00 am</td>
<td>9:00 am</td>
</tr>
<tr>
<td>12.42</td>
<td>12.14</td>
<td>12.05</td>
<td>12.05</td>
<td>12.05</td>
<td>12.05</td>
</tr>
</tbody>
</table>

(noon-begin test)

5:00 am 12.10 8:20 am 12.24*

11:15 am 11.98*

(noon-stop test)

2:00 pm 12.14*

3:00 pm 12.15

5:00 pm 12.10

6:00 pm 12.10 5:30 pm 12.20*

6:00 pm 12.10

8:30 pm 12:00 am 12:00 am 12:00 am

12.10 12.10 12.10

*Measured by steel tape.

On Monday, May 22, 1989, at 8:30 a.m. a final measure was taken by tape to read 12.35 feet.
**KANOA WELL**

**Elevation = 305.94**
*(Bubbler System)*

<table>
<thead>
<tr>
<th>TIME</th>
<th>5/15/89 Monday</th>
<th>5/16/89 Tuesday</th>
<th>5/17/89 Wednesday</th>
<th>5/18/89 Thursday</th>
<th>5/19/89 Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Before Test</td>
<td>12.14 (tape)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td></td>
<td>12.05 (tape)</td>
<td></td>
<td></td>
<td>12.05</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>Begin Bubbler System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 noon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td></td>
<td></td>
<td>12.10</td>
<td></td>
<td>12.10</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td></td>
<td></td>
<td>12.10</td>
<td>12.10</td>
<td></td>
</tr>
<tr>
<td>8:00 p.m.</td>
<td>12.31 (8:30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 p.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 a.m.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

5/15/89  $h_0 = 12.42 + 0.03 = 12.45$  

5/16/89  $h = 11.98$  (tape)  

From chart $h = 12.10$

11:10  $h' = 12.10$  

---

**Field Notes (Kanoe)**  

5/15/89  $h_0 = 12.42 + 0.03 = 12.45$  

5/16/89  $h = 11.98$  (tape)  

$\Delta = 12.42 - 11.98 = 0.44$

From chart $h = 12.10$

11:10  $h' = 12.10$  

---

**Summary:**

- **Kanoe Well**
  - Elevation: 305.94
  - Bubbler System

**Notes:**
- Field notes indicate specific measurements and calculations related to well operations.
- Date and time stamps are present throughout the document for tracking.
- Additional comments and calculations are handwritten in the margins.
<table>
<thead>
<tr>
<th>DATE</th>
<th>Elevation</th>
<th>time</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/19/89</td>
<td>11.74</td>
<td>2 pm</td>
</tr>
<tr>
<td>12/20/89</td>
<td>10.54</td>
<td>11 am</td>
</tr>
<tr>
<td>12/29/89</td>
<td>11.90</td>
<td>9 am</td>
</tr>
<tr>
<td>11/5/89</td>
<td>11.96</td>
<td>11 am</td>
</tr>
<tr>
<td>11/13/89</td>
<td>11.09</td>
<td>10 am</td>
</tr>
<tr>
<td>11/20/89</td>
<td>11.59</td>
<td>4 pm</td>
</tr>
<tr>
<td>11/27/89</td>
<td>11.55</td>
<td>5 pm</td>
</tr>
<tr>
<td>2/13/89</td>
<td>11.59</td>
<td>2 pm</td>
</tr>
<tr>
<td>2/19/89</td>
<td>11.59</td>
<td>4 pm</td>
</tr>
<tr>
<td>2/27/89</td>
<td>11.57</td>
<td>3 pm</td>
</tr>
<tr>
<td>3/1/89</td>
<td>11.50</td>
<td>4 pm</td>
</tr>
<tr>
<td>3/8/89</td>
<td>11.66</td>
<td>3 pm</td>
</tr>
<tr>
<td>3/15/89</td>
<td>11.60</td>
<td>5 pm</td>
</tr>
<tr>
<td>3/22/89</td>
<td>11.60</td>
<td>4 pm</td>
</tr>
<tr>
<td>4/1/89</td>
<td>11.48</td>
<td>2 pm</td>
</tr>
<tr>
<td>4/10-89</td>
<td>11.54</td>
<td>1.30 pm</td>
</tr>
<tr>
<td>5/13-89</td>
<td>12.34</td>
<td>11.30 am</td>
</tr>
<tr>
<td>5/19-89</td>
<td>12.08</td>
<td>9.30 am</td>
</tr>
<tr>
<td>5-25-89</td>
<td>12.31</td>
<td>8-30 pm</td>
</tr>
<tr>
<td>5-26-89</td>
<td>12.04</td>
<td>9.30 am</td>
</tr>
<tr>
<td>5-17-89</td>
<td>12.05</td>
<td>9 am</td>
</tr>
</tbody>
</table>

Elevation at pipe 305.94.
NORTH WAIHEE WELLS
Site Description
Pump Test Results

JOHN F. MINK

Submitted to:
Hawaiiana Investment Co., Inc.
October 20, 1981

Original
Pump Test 1981
NORTH WAIHEE WELLS

Summary

The basal aquifer extending southward from Waihee Stream to Waikapu Stream, which is now referred to as the Waiehu aquifer, is being exploited nearly to the limit of its sustainable yield, and an additional significant contribution from it to Central Maui's water supply is not reasonable to expect. To develop more water different sources must be explored, and to this purpose an exploration-production well field was proposed in the region north of Waihee Stream where the aquifer was thought to be either separate or only poorly connected to the aquifer south of the valley. A separate aquifer would provide a new exploitable source of water supply, while proof of connection with the Waiehu aquifer would extend the limits of that aquifer and increase the overall allowable sustainable yield.

Two wells have now been drilled on the north side of Waihee Valley by Roscoe Moss Co. for Hawaiiana Investment Co., Inc. (See Figure 1 for location). Both have been successfully tested and have proved that a substantial, highly transmissive aquifer extends toward Kohakuloa from Waihee. A sustained rate of about 1,700 gpm over 48 hours was pumped from each well with very small drawdown and with no change in
the low initial salinity (15 mg/l chloride). Interpretation of the initial conditions and the pump test results indicate that the aquifer, to be referred to as the North Waihee aquifer, is essentially independent of the Waiehu basal aquifer. If a hydraulic connection exists, it is very weak.

The two wells can be safely fitted with 1,750 gpm pumps. The North Waihee aquifer is large enough to support more production than can be provided by the completed well field. The site of the next well is proposed in the small valley about 1,600 feet northward at a ground elevation of 400 to 500 feet.

North Waihee Aquifer

The region north of Waihee Stream toward Kohakuloa over a width of about two miles is probably underlain by a basal aquifer, perhaps modified by stray dikes, in the Wailuku volcanic series, a highly permeable basaltic formation. Dense trachytic flows of the Honolua series overlie the Wailuku series except in the deeper valleys where erosion has exposed the basaltic rocks. The trachytes do not constitute a principal aquifer and should be avoided if possible because they are difficult to drill through.

The North Waihee wells were located to avoid the trachyte but as a result had to penetrate about 100 feet of
talus and alluvium before striking the basalt. Drilling logs indicate that bedrocks of the Wailuku series was encountered 70 to 100 feet below ground surface. The deep alluvial fill of Waihee Valley was successfully avoided. Dikes were not observed in the vicinity of the well field but are known to occur about 3,500 feet upstream, approximately coincident with the forest reserve line. The rift zone is close enough to the wells that local geohydrologic conditions may be dike-basal rather than strictly basal.

The Wells

The North Waihee wells lie 2,150 feet inland of Kahekili Highway about 250 feet from the stream channel. Ground elevation is 280 to 283 feet. The wells are fitted with 16 inch casing and were drilled to a depth of 105 feet below sea level. The casing is perforated from five to 25 feet below sea level, and the remainder of the bore is open (uncased). The wells are on a line parallel to the stream, 178½ feet apart. The most inland well is called North Waihee 1, the other is called North Waihee 2. They are identical in design and nearly so in performance. The first well was completed in March of 1981 and tested in April and June. The second well was completed in July and tested in August.
Pump Tests

Step Drawdown

Step drawdown tests were conducted on North Waihee 1 on April 15 and June 3 and on North Waihee 2 on August 3. Initial head was nine to ten feet at each well and initial chloride about 15 mg/l. Behavior of the wells was similar during pumping; in each drawdown was small even at high rates of draft and recovery was instantaneous. The specific capacity of Well 1 was 450 gpm/ft. drawdown at 1,765 gpm, and of Well 2 550 gpm/ft. drawdown at 1,715 gpm. Tables 1 and 2 list the step drawdown results and Figure 2 shows a plot of $s = f(Q)$ for each.
TABLE 1
NORTH WAIHEE WELL 1
Step Drawdown Pump Test
April 15, 1981

Ground elev. 283 ft.; Bowls set 309.5 ft.; Airline at 310 ft.; uncased.

<table>
<thead>
<tr>
<th>Time</th>
<th>Min.</th>
<th>P.S.I.</th>
<th>D.D. Ft.</th>
<th>Rate GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:14</td>
<td>0</td>
<td>17.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>08:16</td>
<td>2</td>
<td>17.1</td>
<td>.92</td>
<td>577</td>
</tr>
<tr>
<td>08:19</td>
<td>5</td>
<td>17.0</td>
<td>1.16</td>
<td>588</td>
</tr>
<tr>
<td>08:26</td>
<td>12</td>
<td>17.0</td>
<td>1.16</td>
<td>732</td>
</tr>
<tr>
<td>08:38</td>
<td>24</td>
<td>17.0</td>
<td>1.16</td>
<td>750</td>
</tr>
<tr>
<td>08:43</td>
<td>29</td>
<td>17.0</td>
<td>1.16</td>
<td>769</td>
</tr>
<tr>
<td>08:48</td>
<td>34</td>
<td>17.0</td>
<td>1.16</td>
<td>769</td>
</tr>
<tr>
<td>08:50</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08:52</td>
<td>38</td>
<td>16.75</td>
<td>1.73</td>
<td>1071</td>
</tr>
<tr>
<td>09:00</td>
<td>46</td>
<td>16.75</td>
<td>1.73</td>
<td>1071</td>
</tr>
<tr>
<td>09:43</td>
<td>89</td>
<td>16.75</td>
<td>1.73</td>
<td>1071</td>
</tr>
<tr>
<td>09:44</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09:45</td>
<td>91</td>
<td>16.5</td>
<td>2.31</td>
<td>1364</td>
</tr>
<tr>
<td>09:48</td>
<td>94</td>
<td>16.5</td>
<td>2.31</td>
<td>1333</td>
</tr>
<tr>
<td>10:13</td>
<td>119</td>
<td>16.4</td>
<td>2.54</td>
<td>1333</td>
</tr>
<tr>
<td>10:38</td>
<td>144</td>
<td>16.5</td>
<td>2.31</td>
<td>1333</td>
</tr>
<tr>
<td>10:39</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:43</td>
<td>149</td>
<td>15.8</td>
<td>3.93</td>
<td>1765</td>
</tr>
<tr>
<td>10:51</td>
<td>157</td>
<td>15.8</td>
<td>3.93</td>
<td>1765</td>
</tr>
<tr>
<td>11:12</td>
<td>178</td>
<td>15.8</td>
<td>3.93</td>
<td>1765</td>
</tr>
<tr>
<td>11:17</td>
<td>183</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:18</td>
<td>184</td>
<td>17.5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Start pump
Increase Rate
Increase Rate
Shut Down
Instant Recovery
TABLE 2
NORTH WAIHEE WELL 2
Step Drawdown Test
August 3, 1981

Ground elevation 282.21 feet; airline set 304 feet; cased.

<table>
<thead>
<tr>
<th>Time</th>
<th>Min.</th>
<th>P.S.I.</th>
<th>D.D. Ft.</th>
<th>Rate GPM</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:15</td>
<td>0</td>
<td>13.75</td>
<td>0</td>
<td>0</td>
<td>Start pump</td>
</tr>
<tr>
<td>08:20</td>
<td>5</td>
<td>13.25</td>
<td>1.16</td>
<td>375</td>
<td></td>
</tr>
<tr>
<td>08:23</td>
<td>8</td>
<td>13.25</td>
<td>1.16</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td>08:35</td>
<td>20</td>
<td>13.50</td>
<td>0.58</td>
<td>346</td>
<td></td>
</tr>
<tr>
<td>08:38</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>Increase rate</td>
</tr>
<tr>
<td>08:39</td>
<td>24</td>
<td>13.0</td>
<td>1.73</td>
<td>1,111</td>
<td></td>
</tr>
<tr>
<td>08:41</td>
<td>26</td>
<td></td>
<td></td>
<td>1,071</td>
<td></td>
</tr>
<tr>
<td>08:47</td>
<td>32</td>
<td>13.0</td>
<td>1.73</td>
<td>1,111</td>
<td></td>
</tr>
<tr>
<td>09:00</td>
<td>45</td>
<td>13.0</td>
<td>1.73</td>
<td>1,071</td>
<td></td>
</tr>
<tr>
<td>09:13</td>
<td>58</td>
<td>13.0</td>
<td>1.73</td>
<td>1,132</td>
<td></td>
</tr>
<tr>
<td>09:39</td>
<td>84</td>
<td>13.0</td>
<td>1.73</td>
<td>1,111</td>
<td></td>
</tr>
<tr>
<td>09:40</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
<td>Increase rate</td>
</tr>
<tr>
<td>09:48</td>
<td>93</td>
<td></td>
<td></td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>09:57</td>
<td>102</td>
<td>12.6</td>
<td>2.66</td>
<td>1,539</td>
<td></td>
</tr>
<tr>
<td>10:10</td>
<td>115</td>
<td>12.6</td>
<td>2.66</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>10:15</td>
<td>120</td>
<td>12.5</td>
<td>2.89</td>
<td>1,715</td>
<td>Increase rate</td>
</tr>
<tr>
<td>10:38</td>
<td>143</td>
<td>12.4</td>
<td>3.12</td>
<td>1,715</td>
<td></td>
</tr>
<tr>
<td>10:43</td>
<td>148</td>
<td></td>
<td></td>
<td></td>
<td>Stop. Instant recovery.</td>
</tr>
</tbody>
</table>
Sustained Pump Test

Both wells were subjected to 48 hours of continuous pumping at a constant rate. The first well was tested before the second was drilled so that drawdown measurements were restricted to the pumping well. While Well 2 was being pumped, Well 1 was available for use as an observation well. Sustained pumping at Well 1 at 1,715 gpm for 48 hours was successful on the first try and the results indicated the aquifer to be highly transmissive. At Well 2, two attempts to sustain a constant rate for 48 hours failed, the first after 30 hours and the other after 26 hours, but the third attempt succeeded at a rate of 1,680 gpm. During all three attempts, drawdown measurements were taken at Well 1, a distance of 178\(\frac{3}{4}\) feet away. With these drawdown observation it was possible to compute the transmissivity and specific yield of the aquifer. Drawdown at Well 1 caused by draft at Well 2 and a summary of aquifer characteristics is given in Figure 3. The aquifer was proved to be extensive and highly transmissive, conditions needed for successful exploitation.

Drawdown at pumping wells during sustained tests give well efficiency but generally are not adaptable for calculating aquifer characteristics. The North Waihee wells are very efficient, having specific capacities in excess of
500 gpm/ft. drawdown. During the sustained test at Well 1 drawdown stabilized at 2.54 feet at 1,715 gpm and at Well 2 it stabilized at 3.0 feet at 1,680 gpm.

The drawdowns induced at Well 1 by constant pumping at Well 2 were carefully analyzed to determine, in addition to the aquifer constants, the following:

1. whether the aquifer is effectively closed by impermeable boundaries at short to moderate distances from the well field
2. whether the aquifer has unimpeded hydraulic connection with the Waiehu aquifer
3. whether the aquifer is extensive and effectively unconnected, or poorly connected, with the Waiehu aquifer.

The values for transmissivity and specific yield (effective porosity) were computed by employing the short form (Jacob's method) of the non-equilibrium well hydraulic formula. The short form is permissible because the drawdown data at Well 1 for sustained Test 1 at Well 2 includes early and late measurements that fall on a continuous curve expressed by:

\[ s = \frac{Q}{4\pi T} W(u) \]

in which \( s \) is drawdown, \( Q \) is constant pumping rate, \( T \) is transmissivity, and \( W(u) \) is the solution for the series
that expands the variable, \( u = \frac{r^2S}{4\pi t} \), in which

\( r \) is distance between the pumping and observation wells, \( S \) is specific yield, and \( t \) is time. Units are in feet and days. Proof that the \( s = f(u) \) curve is continuous was demonstrated by assuming that the straight line portion of the plot (after about three hours) fit the Jacob criteria, then employing the computed \( S \) and \( T \) values in calculating the ratio, \( s/W(u) \), for the early part of the curve to check its values against the fixed value of \( Q/4\pi T \). The accord is good and thus it is permissible to conclude that all of the drawdowns fall along a continuous curve. Table 3 below summarizes the computations.

**TABLE 3**

Aquifer Characteristics by Jacob Method
Continuity of \( s = f(u) \)

\((T = 320,000 \text{ ft}^2/\text{d}; S = .284; r = 178 \text{ ft.}; Q/4\pi T = .0737)\)

<table>
<thead>
<tr>
<th>Time Days</th>
<th>( u )</th>
<th>( W(u) )</th>
<th>( s(\text{ft.}) )</th>
<th>( s/W(u) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>.0417</td>
<td>.1686</td>
<td>1.3648</td>
<td>.11</td>
<td>.0805</td>
</tr>
<tr>
<td>.0625</td>
<td>.1125</td>
<td>1.7172</td>
<td>.12</td>
<td>.0699</td>
</tr>
<tr>
<td>.0833</td>
<td>.0844</td>
<td>1.9777</td>
<td>.14</td>
<td>.0698</td>
</tr>
<tr>
<td>.1042</td>
<td>.0675</td>
<td>2.1853</td>
<td>.16</td>
<td>.0709</td>
</tr>
<tr>
<td>.1250</td>
<td>.0562</td>
<td>2.3564</td>
<td>.17</td>
<td>.0717</td>
</tr>
<tr>
<td>.50</td>
<td>.0141</td>
<td>3.7012</td>
<td>.26</td>
<td>.0702</td>
</tr>
<tr>
<td>1.0</td>
<td>.0070</td>
<td>4.3874</td>
<td>.32</td>
<td>.0738</td>
</tr>
<tr>
<td>2.0</td>
<td>.0035</td>
<td>5.0770</td>
<td>.38</td>
<td>.0739</td>
</tr>
</tbody>
</table>
The aquifer parameters are comparable to those of the best aquifers in Hawaii. The transmissivity is about 320,000 ft$^2$/day, which implies a hydraulic conductivity of 2,000 to 3,000 ft./day, based on partial penetration of 100 feet in the saturated aquifer, and an average specific yield of at least .20.

Continuity of the early and later drawdown data implies that the aquifer is extensive. On the other hand, hydraulic connection between it and the Waiehu aquifer is, at best, very weak. The nearest test hole in the Waiehu aquifer is A-1, which lies 5,100 feet south of the North Waihee wells. Head in this test hole quickly responds to pumping by the Mokuhau and Waiehu wells in the Waiehu aquifer, and the speed of the response indicates that head changes are transmitted under confined aquifer conditions. No such response showed up on the recorder chart at A-1 as a result of the pumping at North Waihee. If continuous confined conditions existed between North Waiheec and A-1, a drawdown of 0.1 feet would have been recorded at A-1 within 70 minutes of the start of each pump test.

For unconfined conditions between the two sites almost ten days would be required for transmittal of 0.1 feet of drawdown. The record at A-1 is too responsive to pumping starts and stops at the Mokuhau and Waiehu wells to unambiguously display any long term effects from North Waihee
if they occurred. Following is a summary of behavior at A-1 during the North Waihee tests.

**TEST 4**

**Head Changes at A-1**

**Pump Tests at North Waihee**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time of Test</th>
<th>Type of Test</th>
<th>Rate (GPM)</th>
<th>Head-changes at A-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/15/81</td>
<td>08:14 - 11:18</td>
<td>Step</td>
<td>1765</td>
<td>No change.</td>
</tr>
<tr>
<td>6/3 - 5/81</td>
<td>07:30 - 07:30</td>
<td>Sustained</td>
<td>1715</td>
<td>No significant change during test; slight gain in head 6/3-6/10; abrupt drawdown of 0.1 ft. on 6/12, probably caused by Mokuhau-Waiehu pump start up. Gradual increase of .15 ft. by 6/18. Head at A-1 20.5 to 21.0 ft.</td>
</tr>
<tr>
<td>8/3/81</td>
<td>08:15 - 10:43</td>
<td>Step</td>
<td>1715</td>
<td>No change.</td>
</tr>
<tr>
<td>8/3 - 4/81</td>
<td>13:00 - 19:00</td>
<td>Sustained</td>
<td>1540</td>
<td>Head at A-1 about 15.5 ft. Variable</td>
</tr>
<tr>
<td>8/10 - 11/81</td>
<td>09:00 - 11:00</td>
<td>Sustained</td>
<td>1580</td>
<td>Small head changes, up and down.</td>
</tr>
<tr>
<td>8/12 - 14/81</td>
<td>15:00 - 15:00</td>
<td>Sustained</td>
<td>1680</td>
<td>Same head at end of period as at start.</td>
</tr>
</tbody>
</table>

A more telling argument against free hydraulic connection between North Waihee and Waiehu is the large difference in head between A-1 and the new wells. At A-1 the head is about 20 feet when Mokuhau and Waiehu are not pumping,
or 15 to 16 feet when they are, while at North Waihee the head
is nine to ten feet. The hydraulic gradient in the Waiehu
aquifer is 1 ft./mile, but between A-1 and North Waihee it
is five to ten feet per mile, an impossible gradient if free
connection prevailed. Whatever connection exists is highly
damped by the alluvial fill and weathered rock in Waihee
Valley. For planning purposes it is reasonable to consider the
North Waihee aquifer to be effectively separate from the Waiehu
aquifer.

**Water Quality**

Analyses by Brewer Analytical Laboratories of water
collected in April during the pump test at Well 1 and in
August at Well 2 showed no change in chloride from 15 mg/l.
A more complete analysis for Well 1 is given below.

**TABLE 5**

North Waihee Water Quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.58</td>
</tr>
<tr>
<td>Conductance</td>
<td>272 micromhos</td>
</tr>
<tr>
<td>Alkalinity as CaCO₃</td>
<td>108 mg/l</td>
</tr>
<tr>
<td>Sodium</td>
<td>9.43 mg/l</td>
</tr>
<tr>
<td>Chloride</td>
<td>14.0 mg/l</td>
</tr>
<tr>
<td>Nitrate-Nitrogen</td>
<td>2.03 mg/l</td>
</tr>
<tr>
<td>Calcium</td>
<td>10.7 mg/l</td>
</tr>
<tr>
<td>Magnesium</td>
<td>8.94 mg/l</td>
</tr>
</tbody>
</table>
The quality of the water is excellent for any purpose. Chloride content did not increase during the tests.

Conclusions and Recommendations

The North Waihee aquifer is extensive and potentially very productive. The aquifer consists of Wailuku basalt with hydraulic conductivity of 2,000 to 3,000 ft./day and specific yield of .20. The aquifer is basal, possibly affected by widespread dikes, with a static head of about ten feet. The two wells drilled to date are very efficient, displaying specific capacities in excess of 500 gpm/ft. drawdown at high pumping rates. Water quality is excellent.

The two wells at North Waihee could safely be outfitted with 1,750 gpm pumps to provide a potential field output of five mgd. Northward toward Kohakuloa more water could be developed from the aquifer. When an additional water supply is planned, a well field could be located in the next valley about 0.3 miles north of Waihee Stream at an elevation of 400 to 500 feet (See Figure 1).

JOHN F. MINK
SUSTAINED PUMP TEST
NORTH WAIHEE WELL FIELD, MAUI
WELL 2 PUMPING: WELL 1 OBSERVATION
NORTH WAIHEE WELLS 1 AND 2
STEP DRAWDOWN PUMP TEST
APRIL 15, 1981 (WELL NO. 1)
AUGUST 3, 1981 (WELL NO. 2)

DRAWDOWN IN FEET

10 100
9 10
8 10
7 10
6 10
5 10
4 10
3 10
2 10
1 10
0 10

PUMPING RATE IN GPM

100 1,000 10,000
100 1,000 10,000

No. 1

No. 2
TO
STATE OF HAWAI'I
DEPT. LAND & NAT'L RESOURCES
Attn: Ed Sakodo
DIV OF WATER & LAND DEVELOPMENT

1-18-82
No. Waihee Wells -
Sustained Pump-Test Results.

Attached are copies of the sustained pump test results, wells No. 1 & 2, North Waihee, Maui.

[Signature]
<table>
<thead>
<tr>
<th>Time</th>
<th>EVERY HR</th>
<th>GPM</th>
<th>Airline</th>
<th>Water Level (Direct)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 7:40</td>
<td>8:15</td>
<td>600</td>
<td>17.5</td>
<td>271</td>
</tr>
<tr>
<td>8:30</td>
<td>10:00</td>
<td>1700</td>
<td>16.5</td>
<td>273</td>
</tr>
<tr>
<td>9:00</td>
<td>10:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>10:15</td>
<td>11:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>11:00</td>
<td>12:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>1:00</td>
<td>13:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>2:00</td>
<td>14:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>3:00</td>
<td>15:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>4:00</td>
<td>16:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>5:00</td>
<td>17:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>6:00</td>
<td>18:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>7:00</td>
<td>19:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>8:00</td>
<td>20:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>9:00</td>
<td>21:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>10:00</td>
<td>22:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>11:00</td>
<td>23:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>12:00</td>
<td>1:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>1:00</td>
<td>2:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>2:00</td>
<td>3:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>3:00</td>
<td>4:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>4:00</td>
<td>5:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>5:00</td>
<td>6:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>6:00</td>
<td>7:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>7:00</td>
<td>8:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>8:00</td>
<td>9:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>9:00</td>
<td>10:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>10:00</td>
<td>11:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>11:00</td>
<td>12:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>12:00</td>
<td>1:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>1:00</td>
<td>2:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>2:00</td>
<td>3:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>3:00</td>
<td>4:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>4:00</td>
<td>5:00</td>
<td>1700</td>
<td>16.5</td>
<td>275</td>
</tr>
<tr>
<td>Time</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Date</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
</tr>
<tr>
<td>Read</td>
<td>16.5</td>
<td>16.75</td>
<td>16.5</td>
<td>16.5</td>
</tr>
<tr>
<td>Scrab</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
</tr>
</tbody>
</table>
November 4, 1981

Mr. Warren A. Suzuki  
Warren S. Unemori Engineering, Inc.  
Wells Street Professional Center  
2145 Wells Street, Suite 403  
Wailuku, Maui, Hawaii 96793

Dear Mr. Suzuki:

Thank you for sending the location maps for Waihee Valley Wells 1 & 2, State Well Numbers 5631-02 and 5631-03.

We appreciate your cooperation very much.

Very truly yours,

ROBERT T. CHUCK  
Manager-Chief Engineer
October 19, 1981

Mr. Robert T. Chuck
Manager - Chief Engineer
State of Hawaii
Dept. of Land and Natural Resources
Division of Water and Land Development
P. O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Chuck,

Subject: Request for Location of Waihee Valley Wells 1 & 2

As per your request, we are transmitting herewith:

1. Two (2) copies of map showing location of subject wells.
2) One (1) print location map.

If you need any additional information, please feel free to call me.

Mahalo,

Warren A. Suzuki

cc: Dave Wissmar
October 2, 1981

Mr. Warren S. Unemori  
2145 Wells St., Suite 403  
Wailuku, Maui, Hawaii 96793  

Dear Mr. Unemori:

Request for Location of Waihee Valley  
Wells 1 & 2

Enclosed herewith is a map of the two Waihee Valley wells project. Please send us a surveyed plot plan of the wells, if available; or accurately mark the location of the wells on the enclosed map and return to our office. Thank you very much for your cooperation.

Very truly yours,

ROBERT T. CHUCK  
Manager-Chief Engineer

RTC:MO:ko  
Encl.
DESCRIPTION

Date of report Sept. 3, 1981 Person filing report Loran H. Runnells

A. OWNER Hawaiian Invest. WELL NAME Waihe Valley # 1 ISLAND Maui

B. GENERAL LOCATION Waihe

C. DRILLING COMPANY Roscoe Moss Company

D. TYPE OF RIG 28L DRILLING COMPLETED 6-81 DRILLER R. Bourne

E. ELEVATION, msl: Top of drilling platform 281.35 ft. Bench mark and method used to determine Height of drilling platform above ground surface 0 ft. elevation:

F. HOLES: 20 inch dia. to 320 ft. below drilling platform.

G. CASING INSTALLED: 16 in. I.D. x 312 in. wall solid section to 290 ft. below drilling platform, 16 in. I.D. x 312 in. wall perforated section to 310 ft. below drilling platform.

H. ANNULUS: Grouted 0 ft. to 160 ft. below drilling platform, Gravel packed 0 ft. to 20 ft. below drilling platform.

I. PERMANENT PUMP INSTALLATION:
- Pump type, make, serial no. Capacity g.p.m
- Motor type, H.P., voltagp., r.p.m.
- Depth of pump intake setting ft. below which elevation is ft.
- Depth of bottom of airline ft. below which elevation is ft.

HYDROLOGY

J. INITIAL WATER LEVEL 271 ft. below drilling platform. Date of measurement.

K. INITIAL CHLORIDE: 25 ppm, total depth of well 387 ft. below drilling platform. 6-3-81 Sampling Date

L. PUMPING TESTS: Reference point (R.P.) used: which elevation is ft.

M. DRILLER'S LOG:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level (ft)</th>
<th>Depth (ft)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>hard</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>4-15</td>
<td>loose rock, clay</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>15-52</td>
<td>Mud rock</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>52-92</td>
<td>Puka rock</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>92-112</td>
<td>Puka hard streak</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>112-116</td>
<td>Blue rock</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>116-372</td>
<td>Puka hard streak</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>372-380</td>
<td>Blue rock</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>380-387</td>
<td>Puka, Red</td>
<td>to</td>
<td></td>
<td>to</td>
<td>to</td>
</tr>
</tbody>
</table>

N. REMARKS:

FOR DRILLER’S USE

Job Name

Job No.

INSTRUCTIONS: Send three (3) copies to: Manager-Chief Engineer, Division of Water and Land Development, P.O. Box 233, Honolulu, Hawaii 96809.


FOR OFFICIAL USE

Latitude 20° 56.51

Longitude 156° 31.32

Well No. 5631-02
TO

Department of Land &
Natural Resources
Division of Water and Land Development
P.O. Box 373
Honolulu, Hawaii 96809

GENTLEMEN:

WE ARE SENDING YOU □ Attached □ Under separate cover via __________ the following items:

- □ Shop drawings
- □ Prints
- □ Plans
- □ Samples
- □ Specifications
- □ Copy of letter
- □ Change order
- □ __________________________

<table>
<thead>
<tr>
<th>COPIES</th>
<th>DATE</th>
<th>NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Drillers Reports for Waihee VALley # 1 and 2</td>
</tr>
</tbody>
</table>

THESE ARE TRANSMITTED as checked below:

- □ For approval
- □ Approved as submitted
- □ Resubmit____ copies for approval
- □ For your use
- □ Approved as noted
- □ Submit____ copies for distribution
- □ As requested
- □ Returned for corrections
- □ Return____ corrected prints
- □ For review and comment
- □ __________________________
- □ FOR BIDS DUE ______ 19 __ □ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO __________________________________________

SIGNED: __________________________________________

FORM 240-2 - Available from Townsend, Mass. 01469

If enclosures are not as noted, kindly notify us at once.
<table>
<thead>
<tr>
<th>To</th>
<th>Initial</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert T. Chuck</td>
<td></td>
<td></td>
<td>See Me</td>
</tr>
<tr>
<td>Takeo Fujii</td>
<td></td>
<td></td>
<td>Take action by</td>
</tr>
<tr>
<td>James Yoshimoto</td>
<td></td>
<td></td>
<td>Route to your branch</td>
</tr>
<tr>
<td>Manabu Tagomori</td>
<td>✔️</td>
<td></td>
<td>Review &amp; comment</td>
</tr>
<tr>
<td>George Morimoto</td>
<td></td>
<td></td>
<td>Draft reply by</td>
</tr>
<tr>
<td>Hong Fong Chang</td>
<td></td>
<td></td>
<td>For information</td>
</tr>
<tr>
<td>Herbert Morimatsu</td>
<td></td>
<td></td>
<td>Xerox distributed</td>
</tr>
<tr>
<td>George Miyashiro</td>
<td></td>
<td></td>
<td>Acknowledge receipt</td>
</tr>
<tr>
<td>Harold Sakai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leslie Asari</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albert Ching</td>
<td></td>
<td></td>
<td>Jane Sakai</td>
</tr>
<tr>
<td>George Matsumoto</td>
<td></td>
<td></td>
<td>Doris Hamada</td>
</tr>
<tr>
<td>Daniel Lum</td>
<td>✔️</td>
<td></td>
<td>Lorraine Nanbu</td>
</tr>
<tr>
<td>Paul Matsuo</td>
<td></td>
<td></td>
<td>Jean Starot</td>
</tr>
<tr>
<td>Noboru Kaneshiro</td>
<td>✔️</td>
<td></td>
<td>Elsie Yonamine</td>
</tr>
<tr>
<td>Edwin Sakoda</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Handwritten notes:
- 1/22/81 requested ED draft 1/22/82
- "none we'd yet"
- 1/16/92 contacted Dr. Suzuki - to will contact Hawaiian investor and send request data.
December 15, 1980

Mr. Robert Chuck
State of Hawaii
Dept. of Water & Land Development
P. O. Box 373
Honolulu, HI  96809

Dear Mr. Chuck,

Subject: Well, Waihee, Maui, within Tax Map Key 3-2-01

The Department of Water Supply is requesting a copy of an "as-built" sectional drawing of the well, and a copy of the pumping test records.

Your assistance and response would be appreciated concerning this matter.

Sincerely,

William S. Haines, Director

CK/tm

cc: Engr. File
    Waihee Well

Enclosure
WELL DRILLING PERMIT

TO: Wailuku Sugar Company and its subsidiary, Hawaiiana Investment Co., Inc.
2180 Main Street, Suite 417
Wailuku, Maui 96793

Your application, received on October 14, 1980, for a permit to drill two wells within Tax Map Key 3-2-01:1 at Waihee, Maui, is approved subject to the following conditions:

1. That within 30 days after completion of the well, the applicant shall submit a completed Driller's Report, a copy of the Driller's logs, an "as-built" sectional drawing of the well, and a copy of the pumping test records.

2. That the user of the wells shall submit a monthly record of water pumpage and use.

3. That this well drilling permit does not confer or imply any rights regarding the use of water from the wells.

November 26, 1980
Date of issuance

Susumu Ono, Chairman, Board of Land and Natural Resources

cc: Maui Dept of Water Supply
TO: Wailuku Sugar Company and its subsidiary, Hawaiiana Investment Co., Inc.
2180 Main Street, Suite 417
Wailuku, Maui 96793

Your application, received on October 14, 1980, for a permit to drill two wells within Tax Map Key 3-2-01:1 at Waihee, Maui, is approved subject to the following conditions:

1. That within 30 days after completion of the well, the applicant shall submit a completed Driller's Report, a copy of the Driller's logs, an "as-built" sectional drawing of the well, and a copy of the pumping test records.

2. That the user of the wells shall submit a monthly record of water pumpage and use.

3. That this well drilling permit does not confer or imply any rights regarding the use of water from the wells.

Susumu Ono, Chairman, Board of Land and Natural Resources

November 26, 1980
Date of issuance

cc: Maui Dept of Water Supply
November 17, 1980

Mr. Robert T. Chuck
Manager-Chief Engineer
Division of Water & Land Development
Department of Land & Natural Resources
State of Hawaii
P. O. Box 373
Honolulu, Hawaii 96809

Dear Bob:

Subject: Application for Well Drilling Permit by Wailuku Sugar Company, TMK 3-2-01:1

In response to your letter of November 3, 1980, the subject application is being coordinated with our office. We have been informed by Hawaiiana Investment Company that if the tests successfully show that the safe yield of the proposed wells is sufficient, the two completed wells will be dedicated to the Department of Water Supply, County of Maui, via a second Central Maui Joint Venture to which Hawaiiana Investment Company will be a party.

Hawaiiana Investment Company is anxious to proceed with the test drilling at the site as soon as possible in order to verify the quantity of water available prior to formulization of the Joint Venture. We are in agreement with this approach.

Sincerely,

William S. Haines, Director
Department of Water Supply
November 3, 1980

Mr. William Haines
Director
Department of Water Supply
County of Maui
P.O. Box 1109
Wailuku, Maui 96793

Dear Bill:

For your information, transmitted is a copy of the Application for Well Drilling Permit submitted to us by Warren S. Unemori Engineering, Incorporated on behalf of Wailuku Sugar Company and its subsidiary, Hawaiiana Investment Company.

We intend to issue them a permit under the provisions of Regulation 9. of the Department of Land and Natural Resources. Before we issue this permit will you please let us know if this proposal is being coordinated with your office.

Very truly yours,

ROBERT T. CHUCK
Manager-Chief Engineer

Encl.
ES:ai
State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
APPLICATION FOR (check one)
☐ WELL DRILLING PERMIT ☐ WELL MODIFICATION PERMIT

Instructions: Send completed application and attachments to Department of Land and Natural Resources, P.O. Box 373, Honolulu, Hawaii 96809.

Reference: Regulation 9, Dept. of Land & Natural Resources.

Is the well located in a Designated Ground Water Control Area? ☐ Yes ☒ No

If "yes", application must be accompanied by a Water Use and/or Water Supply Permit and a non-refundable filing fee of $100 payable to the Department of Land & Natural Resources. However, if application is for minor modification of well, filing fee may be waived. If "no", no filing fee is required. Filing fee is waived for federal, state, and county government agencies.

1. WELL LOCATION: Island __ Maui __ Tax Map Key 3-2-01:1. Attach a plot plan showing well location referenced to established property boundaries.

2. WATER USER: __ subsidiary, Hawaii Investment Co., Inc. __ Telephone __ Address Suite 417, 2180 Main Street, Wailuku, Maui, HI. __ Zip Code 96793

3. PROPOSED DRILLING COMPANY: __ Water Resources International or Roscoe Moss Company __

4. PROPOSED WORK: ☐ Drill new well ☐ Deepen ☐ Redrill ☐ Alter ☐ Seal ☐ Abandon ☐ Install new pump ☐ Replace pump ☐ Modify pump

Fill in the diagram and briefly describe the proposed work (use back of form if necessary):

PROPOSED SECTION OF WELL

Elevation at top of casing 321 ft. msl.

Ground Elev. 320 ft. msl.

Steel

Cement, Grout 100 ft.

Casing Perforated

Total Depth 420 ft.

Rock Packing 125 ft.

Hole 20 in.

Material Structural Carbon

Depth 16 in.

Wall thickness 0.250 in.

Openings 85 ft. in. L F

Length 75 ft.

Diameter 16 in.

Approximate elev. at filing. Final elev. (msl) by a surveyor licensed by the State must be submitted at start of construction.

5. PROPOSED USE: ☐ Municipal ☐ Military ☐ Agriculture ☐ Industrial

☐ Domestic ☐ Disposal ☐ Other (specify)

6. PROPOSED AMOUNT OF WITHDRAWAL: Check most appropriate box and fill in amount.

☐ Daily 4 million gallons total ☐ Monthly __________ gallons ☐ Yearly __________ gallons

(2 M.G. or more per well)

7. PROPOSED PUMP OR FLOW CAPACITY: 1500 gpm per well for total of __________ gallons per minute

3,000

Signature: ____________________________

Water User __ Date: ________________

Signature: ____________________________

Landowner of Well Site __ Date: ________________

For Official Use:

State Well No. __________

DLNR Permit No. __________

DLNR Application No. __________
October 9, 1980

Department of Land and Natural Resources
P. O. Box 373
Honolulu, Hawaii 96809

Gentlemen:

Re: Regulation 9, Dept. of Land and Natural Resources
Application for Well Drilling Permit

We are submitting herewith a well drilling permit application for our client, Wailuku Sugar Company and its subsidiary, Hawaiiana Investment Co., Inc., in accordance with Regulation 9. Also enclosed for your use are the following:

1. 2000 scale U.S.G.S. map which shows the approximate elevation of the proposed well site.
2. Two copies of tax maps.
3. One print of 100 scale survey map which shows the relative locations of the proposed well site to a known boundary corner.

We believe all the information needed for evaluation have been provided. If not, please call us. We will be working with Hydrologist, John Mink, on this project.

Very truly yours,

[Signature]
Warren S. Unemori

cc: Charles G. Street, Jr.
John Mink
Don Cataluna
APPLICATION FOR (check one)
[☐] WELL DRILLING PERMIT [☐] WELL MODIFICATION PERMIT

Instructions: Send completed application and attachments to Department of Land and Natural Resources, P.O. Box 373, Honolulu, Hawaii 96809. Reference: Regulation 9, Dept. of Land & Natural Resources.

Is the well located in a Designated Ground Water Control Area? [☐] Yes [☐] No
If "yes", application must be accompanied by a Water Use and/or Water Supply Permit and a non-refundable filing fee of $100 payable to the Department of Land & Natural Resources. However, if application is for minor modification of well, filing fee may be waived. If "no", no filing fee is required. Filing fee is waived for federal, state, and county government agencies.

1. WELL LOCATION: Island Maui Tax Map Key 3-2-01:1. Attach a plot plan showing well location referenced to established property boundaries.

2. WATER USER subsidiary, Hawaiiaina Investment Co., Inc.
   Address Suite 417, 2180 Main Street, Wailuku, Maui, HI. Zip Code 96793

3. PROPOSED DRILLING COMPANY: Water Resources International or Roscoe Moss Company

4. PROPOSED WORK: [☐] Drill new well [☐] Deepen [☐] Redrill [☐] Alter [☐] Seal [☐] Abandon [☐] Install new pump [☐] Replace pump [☐] Modify pump

Fill in the diagram and briefly describe the proposed work (use back of form if necessary):

PROPOSED SECTION OF WELL

<table>
<thead>
<tr>
<th>Material</th>
<th>Length</th>
<th>Diameter</th>
<th>Wall thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Carbon</td>
<td>326 ft</td>
<td>16 in</td>
<td>0.3125 in</td>
</tr>
<tr>
<td>Steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter</td>
<td>125 in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock</td>
<td>75 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packer</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PROPOSED USE: [☐] Municipal [☐] Military [☐] Agriculture [☐] Industrial [☐] Domestic [☐] Disposal [☐] Other (specify)

PROPOSED AMOUNT OF WITHDRAWAL: Check most appropriate box and fill in amount.

[☐] Daily 4 million gallons total [☐] Monthly gallons [☐] Yearly gallons
(2 M.G. or more per well)

PROPOSED PUMP OR FLOW CAPACITY: 1500 gpm per well for total 3,000 gallons per minute

Signature: [ signature] Date: 10/9/80

For Official Use:
State Well No. [ ] DLNR Permit No. [ ]
DLNR Application No. [ ]
Revised Measuring-Point Elevations for Selected Wells in the Waihee and Iao Aquifer Areas on the Island of Maui

The USGS has been working with the National Geodetic Survey (NGS) to update benchmark and well measuring-point elevations in central Maui as part of a ground-water availability study with the Maui Department of Water Supply. The purpose of this effort is to ensure that water-level monitoring wells used in this study are tied to a common and accurate vertical datum.

Benchmark and reference-mark elevations were determined by the NGS using differential GPS (Global Positioning System) methods during September 2-4, and November 18-20, 2003.

Well measuring-point elevations were determined by the USGS using vertical leveling surveys from NGS benchmarks and USGS reference marks during September 22-26, and December 15-19, 2003.

Measuring-point elevations for selected wells in the Waihee and Iao aquifer areas are provided below. The difference between the previously reported and the revised measuring-point elevation for each well is also provided. Leveling notes and photographs of the measuring points are available in well folders maintained by the USGS Water Resources office in Honolulu.

It is important to recognize that the revised well measuring-point elevations will result in a modification of the absolute water levels (referenced to mean sea level), but not the relative change in water levels measured over time (trend).

Historical water levels measured in these wells may be revised pending further research into possible causes for the differences between the previously reported and the revised well measuring-point elevations. Future water-level measurements will be based on the revised well measuring-point elevations.

Related links:

Ground-Water Availability in Central Maui - Project description
Recent Hydrologic Conditions, Iao Aquifer area, Maui - Updated every three months

<table>
<thead>
<tr>
<th>Well name</th>
<th>Well no.</th>
<th>Revised</th>
<th>Previous</th>
<th>Difference</th>
<th>Notes regarding previous well measuring-point elevations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kupaa 1</td>
<td>5731-03</td>
<td>638.77</td>
<td>639.37</td>
<td>-0.60</td>
<td>C. Takumi Engineering report (1/31/00) provides MP elevation of 639.37 ft for top of casing, based on leveling from a benchmark elevation of 631.87 ft located about 200 ft from well (Exhibit A-1, Mink &amp; Yuen, 6/21/99). Driller's well-completion report provides MP elevation of 638.10 ft for top of casing (5/20/99). No record of MP survey notes and initial benchmark. Wallani Drilling and Ed Vaiera (surveyor) combined trigonometric leveling (using a total station and vertical angles) from Tanaka's work and a carpenter's level to get the initial height of casing.</td>
</tr>
<tr>
<td></td>
<td>RM</td>
<td>Elev.</td>
<td>New Elev.</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------</td>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td><strong>Kanoa TH</strong></td>
<td>5731-05</td>
<td>303.56</td>
<td>305.22</td>
<td>-1.66</td>
<td></td>
</tr>
<tr>
<td><strong>Kanoa 1</strong></td>
<td>5731-02</td>
<td>308.14</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><strong>Kanoa 2</strong></td>
<td>5731-04</td>
<td>280.48</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><strong>North Waihee 1</strong></td>
<td>5631-02</td>
<td>283.76</td>
<td>285.23</td>
<td>-1.47</td>
<td></td>
</tr>
<tr>
<td><strong>North Waihee 2</strong></td>
<td>5631-03</td>
<td>283.62</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

USGS reports MP elevation of 305.22 ft for top of casing, based on leveling from nearby RM - 1-inch pipe (1/22/03). RM elevation of 304.50 ft provided by C. Takumi Engineering. No record of RM survey notes and initial benchmark. K. Tanaka set the 1/2-in. pipe using trigonometric leveling (using a total station and vertical angles).

Driller's well-completion report has elevation of 309.15 ft for top of pump base plate (5/29/99). No record of MP survey or initial benchmark.

Driller's well-completion report has MP elevation 281.83 ft for top of sounding tube (6/7/00). C. Takumi Engineering report (Aug. 2000) has 281.38 ft for top of sounding tube (Exhibit A, Mink & Yuen, 7/12/00).

USGS reports MP elevation of 285.23 ft for top of measuring tube, based on leveling from nearby RM - 3/4 inch pipe (6/12/97). RM elevation of 266.63 ft given by W.S. Unemori Engineering. No record of RM survey notes and initial benchmark in well folder, however, Unemori confirms this elevation from their notes. From information provided by Reed Ariyoshi of W.S. Unemori, and Wendy Taomoto, MDWS, the best estimate of the difference between the top of the casing prior to pump installation and the measuring tube after installation is 1.01 ft (old casing higher in elevation). As a result, the old MP for data prior to August 1997, 284.78 ft, is very close to the new measuring tube elevation plus 1.01 ft (284.77 ft).

Height of measuring point modified after pump installation. Measuring tube modified twice since pump installation in 1997 and leveling on 8/12/97. USGS reports MP elevation of 284.39 ft for top of measuring tube on 8/12/97. USGS reports MP elevation of 284.33 ft for top of measuring tube on 3/30/99 after first modification, based on measuring up from base plate elevation of 284.11 ft. Previous leveling on 8/12/97 and 3/30/99 are based on RM (3/4-inch pipe) elevation of 266.63 ft provided by W.S. Unemori Engineering. No record of RM survey notes and initial benchmark in well folder, however, Unemori confirms this elevation.
<table>
<thead>
<tr>
<th>Location</th>
<th>DRILLER'S REPORT</th>
<th>USGS REPORT</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiehu TH A1</td>
<td>5631-01</td>
<td>248.05</td>
<td>-1.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiehu TH D</td>
<td>5430-04</td>
<td>380.66</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiehu Deep</td>
<td>5430-05</td>
<td>380.84</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiehu TH B</td>
<td>5431-01</td>
<td>492.51</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiehu Heights 2</td>
<td>5430-02</td>
<td>338.05</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiehu TH E</td>
<td>5430-03</td>
<td>416.75</td>
<td>-1.10</td>
</tr>
</tbody>
</table>


USGS reports MP elevation of 380.66 ft for top of 1.75-inch PVC casing, based on leveling from nearby RM - "X" chiseled in concrete at entrance to TH D shelter (8/23/85). RM elevation of 380.01 ft was provided by Dan Lum, DOWALD (8/29/83). No record of RM survey notes and initial benchmark.

USGS reports MP elevation of 380.84 ft for top of 10-inch casing, based on leveling from RM - "X" chiseled in concrete at entrance to TH D shelter (8/23/85). RM elevation of 380.01 ft was provided by Dan Lum, DOWALD (8/29/83). No record of RM survey notes and initial benchmark.

USGS reports MP elevation of 492.51 ft for top of 1.5-inch PVC casing (9/24/75). However, later field notes show top of casing as 491.79, and top of surrounding wooden box as 492.51. No record of MP survey notes and initial benchmark. Probably surveyed from State of Hawaii benchmark U-6: 250.37 ft (1974). Driller's report provides elevation of 493.97 ft for top of drilling platform. Well has been measured from top of wooden box since USGS started measuring well in July, 1982. Well modified 3/31/04 by USGS, adding 0.74 ft to top of PVC casing. Revised MP (top of PVC casing) combines changes due to recent surveying and modification. Elevation of top of box was lowered by 0.42 ft from results of 2003/2004 surveying.

Notes in well folder show pump refurbishment in 1998. Measurement tube likely installed at that time. No prior leveling notes or references in USGS well folder.

<table>
<thead>
<tr>
<th>Location</th>
<th>MP Elevation</th>
<th>Survey Method</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mokuahau 1 (Pump 2) 4</td>
<td>5330-09</td>
<td>353.37, 353.79, -0.42</td>
<td>USGS reports MP elevation of 353.79 ft (12/1/99). No record of MP survey and initial benchmark. Dan Lum (DOWALD) provides MP elevation of 353.57 ft for access port at base of pump (1/17/72). H.A.R. Austin Engineering provides elevation of 353.17 ft for top of casing (6/4/53).</td>
</tr>
<tr>
<td>Wailuku Shaft 33</td>
<td>5330-05</td>
<td>32.33, 32.17, 0.16</td>
<td>USGS reports MP elevation of 32.17 ft for top of casing, based on leveling from Wailuku Courthouse NGS benchmark elevation of 331.06 ft (4/17/97).</td>
</tr>
<tr>
<td>Waikapu 1</td>
<td>5130-01</td>
<td>551.04, 551.33, -0.29</td>
<td>USGS reports MP elevation of 551.33 ft for top of 6-inch coupling, based on leveling from RM - 0.5 inch pipe located on the east side of the concrete foundation (4/11/75). RM elevation of 550.61 ft provided by Norman Saito Engineering, based on leveling from Wailuku Courthouse NGS benchmark (12/74). Dan Lum (DOWALD) provides elevation of 552.08 ft for top of 8-inch casing, and 551.15 ft for top of conductor pipe (5/14/74).</td>
</tr>
<tr>
<td>Waikapu 2</td>
<td>5130-02</td>
<td>518.96, 518.33, -0.37</td>
<td>USGS reports MP elevation of 519.33 ft for top of casing, based on leveling from Waikapu 1 well MP elevation of 551.33 ft (6/21/83). DOWALD as-built drawing provides elevation of 519.47 ft for top of 20-inch casing.</td>
</tr>
<tr>
<td>DWS Waikapu Mauka</td>
<td>5131-01</td>
<td>764.87, --, --</td>
<td>USGS surveying on 12/29/03 to top of 6-inch threaded coupling welded to plate that is welded to the top of the 18-inch casing (highest point after removing plug). CWEM well completion report and Water Resources International as-built drawing provides elevation of 764.7 ft for top plate welded to 18-inch casing.</td>
</tr>
</tbody>
</table>

1 Revised well measuring-point elevations were determined by the USGS using vertical leveling from National Geodetic Survey benchmarks and reference marks in December 2003. NGS benchmark and reference mark elevations provided by NGS on 1/20/04. Leveling notes and photographs of the measuring points are available in well folders maintained by the USGS Hawaii District Office.

2 Difference calculated by subtracting the previous from the revised well measuring-point elevation.

3 All information contained in USGS well folder.

4 Maui Department of Water Supply refers to this well as Mokuahau Pump 2 (Well 502) whereas Commission on Water Resource Management well index refers to this well as Mokuahau 1.
Dr. David Henderson Brown, M.D.
RR#1 Box 138
Wailuku, HI 96793

Dear Dr. Brown:

**Waihee Valley Wells 1 & 2 (Well Nos. 5631-02 & 03)**

Your letter indicates that you are looking for a way to require Wailuku Agribusiness to do an environmental assessment and an environmental impact statement before they draw any water from the Waihee Valley Wells.

The administrative rules of the State Water Code require only that a water user obtain a pump installation permit from the Commission on Water Resource Management prior to installing a pump in a well. In designated water management areas, an additional water use permit is required. Presently, there are no water management areas on Maui.

The State Water Code also provides for dispute resolution and citizen complaints for water-related matters whether or not they are in a water management area.

An environmental assessment and environmental impact statement are not required by the Commission on Water Resource Management prior to the owner or applicant using water from the Waihee Valley Wells. However, they must obtain a pump installation permit from the Commission. If there are any disputes or complaints about the issuance of such a permit, the Commission will hear them and act accordingly.

Call Ed Sakoda at [redacted] if you have any questions.

Sincerely,

[Signature]

MANABU TAGOMORI
Deputy Director

ES:dk
State of Hawaii
MENT OF LAND & NATURAL RES
ON OF WATER AND LAND DEVELO.
DRILLER'S REPORT

DESCRIPTION

Date of report: Sept. 3, 1981
Person filing report: Loran H. Runnells

A. OWNER: Hawaiian Invest. NAME: Waiea Valley # 2
B. GENERAL LOCATION: Waiea
C. DRILLING COMPANY: Roscoe Moss Company
D. TYPE OF RIG: 281. DRILLING COMPLETED: 8/31/81 DRILLER: Bourn
E. ELEVATION, msl: Top of drilling platform 281.35 ft. Bench mark and method used to determine
Height of drilling platform above ground surface: ... ft. elevation:
F. HOLE SIZE: 20 in. dia. to 325 ft. below drilling platform.
G. CASING INSTALLED: 16 in. I.D. x 312 in. wall solid section to 300 ft. below drilling platform.
Type of perforation: Louver
H. ANNULUS: Grouted 0 ft. to 175 ft. below drilling platform.

1. PERMANENT PUMP INSTALLATION:
   - Pump type, make, serial no.: 
   - Motor type, H.P., voltage, r.p.m.
   - Depth of pump intake setting: ft. below which elevation is ft.
   - Depth of bottom of airline: ft. below which elevation is ft.

HYDROLOGY

J. INITIAL WATER LEVEL: 272 ft. below drilling platform. Date of measurement.
K. INITIAL CHLORIDE: ppm, total depth of well: ft. below drilling platform

L. PUMPING TESTS:
   Reference point (R.P.) used: which elevation is ft.
   Sampling Date: Aug. 12, 1981
   Start water level: 272 ft. below R. P.
   Depth of well: ft. below R. P.
   Draw down (ft.): 
   Rate Draw-down (ppm): 

   Time (hours)      Rate Draw-down (ft.)      Rate Draw-down (ppm)
   3:00 to 4:00       1690 ft.            5 ppm

24 hour test

SUBSURFACE FORMATION

M. DRILLER'S LOG:
   Depth: ft.    Rock Description & Remarks
   Water Level: ft.

   0 to 31. Clay loose rock
   31 to 52. Clay - med. rock
   52 to 70. Puka rock
   70 to 130. Puka - clinkers
   130 to 145. Puka - hard streak
   145 to 165. Puka - clinkers
   165 to 221. Puka - streak blue rock
   221 to 227. Blue rock
   227 to 233. Puka - hard streak
   233 to 240. Blue rock
   240 to 270. Puka - hard streak

N. REMARKS:

INSTRUCTIONS: Send three copies to: Manager-Chief Engineer, Division of Water and Land Development, P. O. Box 373, Honolulu, Hawaii 96803.


FOR OFFICIAL USE
Latitude 21°56'51"
Longitude 156°31'30"
Well No. 5631-03
TO: John Mink

DATE: 8-17-81

SUBJECT: WAIHEE WELL No. 2 — 3rd PUMP TEST

A SUCCESSFUL PUMP TEST WAS CONDUCTED BETWEEN AUG. 12 (BEGINNING @ 3 pm) AND AUG. 14 (ENDING @ 3 pm). ATTACHED IS A COPY OF THE PUMP TEST RESULTS OR DATA.

cc/ Unemori Roscoe — Moss

SIGNED

[Signature]

(Handwritten)
<table>
<thead>
<tr>
<th>Time</th>
<th>Every 2 Hour Airline</th>
<th>Every 2 Hour Airline</th>
<th>Every 6 Hour Sample</th>
<th>Every 4 Hour Well D. Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 PM</td>
<td>1660</td>
<td>282</td>
<td>1-3:00 PM</td>
<td>2 9:00 PM</td>
</tr>
<tr>
<td>5:00 PM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>23/4&quot;</td>
</tr>
<tr>
<td>7:00 PM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>3 1/4&quot;</td>
</tr>
<tr>
<td>9:00 PM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>4 1/4&quot;</td>
</tr>
<tr>
<td>11:00 PM</td>
<td>1660</td>
<td>285</td>
<td></td>
<td>4 3/4&quot;</td>
</tr>
<tr>
<td>8/13/81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 AM</td>
<td>1670</td>
<td>285</td>
<td>3-3:00 AM</td>
<td>3 3/4&quot;</td>
</tr>
<tr>
<td>3:00 AM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>4 1/4&quot;</td>
</tr>
<tr>
<td>5:00 AM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>4&quot;</td>
</tr>
<tr>
<td>7:00 AM</td>
<td>1670</td>
<td>285</td>
<td></td>
<td>4&quot;</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>1680</td>
<td>285</td>
<td></td>
<td>4 1/4&quot;</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>1680</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/14/81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 AM</td>
<td>1680</td>
<td>285</td>
<td>7-3:00 AM</td>
<td>4 3/4&quot;</td>
</tr>
<tr>
<td>3:00 AM</td>
<td>1680</td>
<td>285</td>
<td></td>
<td>5&quot;</td>
</tr>
<tr>
<td>5:00 AM</td>
<td>1680</td>
<td>285</td>
<td></td>
<td>5&quot;</td>
</tr>
<tr>
<td>7:00 AM</td>
<td>1680</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00 AM</td>
<td>1690</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM</td>
<td>1690</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 PM</td>
<td>1690</td>
<td>285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 PM</td>
<td>1690</td>
<td>285</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WELL DRILLING PERMIT

TO: Wailuku Sugar Company and its subsidiary,
Hawaiiana Investment Co., Inc.
2180 Main Street, Suite 417
Wailuku, Maui 96793

Your application, received on October 14, 1980, for a permit to drill two wells within Tax Map Key 3-2-01:1 at Waihee, Maui, is approved subject to the following conditions:

1. That within 30 days after completion of the well, the applicant shall submit a completed Driller's Report, a copy of the Driller's logs, an "as-built" sectional drawing of the well, and a copy of the pumping test records.

2. That the user of the wells shall submit a monthly record of water pumpage and use.

3. That this well drilling permit does not confer or imply any rights regarding the use of water from the wells.

Susumu Ono, Chairman, Board of Land and Natural Resources

December 26, 1980
Date of issuance

cc: Maui Dept of Water Supply