CHECKLIST

_ WELL CONSTRUCTION PERMIT __ PUMP INSTALLATION PERMIT

WELL NAME or LOCATION: Owa Well A

WELL NUMBER: 6049-05

OWNER or OPERATOR: Mauna Kea Properties, Inc.

ADDRESS: P.O. Box 218

Kamuela, Hawaii 96743

TELEPHONE (contact person): 808-882-7235 (William Mielcke)

Date application received: 12-6-89

Date acknowledged receipt/request more info: 12-14-89

Date application accepted: 12-14-89

Suspense date (90 days): 12-11-89

Suspense date (90 days): 12-11-89

Date filing fee deposited: 12-11-89

Application sent to following:

<table>
<thead>
<tr>
<th>Dept. of Health</th>
<th>Date sent</th>
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<td>12-21-89</td>
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<tr>
<td>County water board/dept</td>
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<td>12-22-89</td>
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<tr>
<th>Date agenda due</th>
<th>Date submittal due</th>
<th>Date submittal sent to applicant</th>
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<table>
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<th>Date application approved or disapproved</th>
<th>Date applicant notified of decision</th>
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</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

REMARKS:

1-5-89
To: ROY HARDY - CWRM  
From: Tom Nance  
Subject: SOUTH KOREA WATER WELD GROUP

(1) Copy of the signed Memorandum of Understanding (pp. 2-5)  
(2) Unsigned copy of Policies and Procedures (pp. 6-9)

---

680 Ala Moana Boulevard, Suite 405 • Honolulu, Hawaii 96813-5411 • Phone: (808) 537-1141 • Fax: (808) 538-7757

Ryan - Found this. Should put copies in relevant Big Island well folders.
MEMORANDUM OF UNDERSTANDING BETWEEN MAUNA
KEA PROPERTIES, INC., MAUNA LANI RESORT, INC.,
NANSAY HAWAII, INC. AND WAIKOLOA LAND COMPANY
ON COOPERATIVE REGIONAL WATER DEVELOPMENT

Mission Statement

To work jointly and cooperatively in developing and implementing a regional water plan which best serves the collective water needs of the parties and others within the region in a manner acceptable to relevant governmental authorities.

Objectives

The parties to this Memorandum of Understanding (collectively referred to as "South Kohala Water Study Group" or "Group") acknowledge and agree that it is in their long-term best interests to achieve the Mission set forth above in the following manner:

- Reach agreement on a regional plan for the development of sources and distribution systems for potable, non-potable water and effluent reuse;
- Form and establish, as equity participants, a private, regional water company or companies for the development, production, distribution and sale of potable, non-potable and effluent reuse resources serving the parties and others within the region;
- Reach bilateral and multilateral agreements achieving the staged implementation of the regional water plan;
- Publicly support and consider the commitment to the conditional, partial funding of the County of Hawaii Department of Water Supply's (DWS) development of its planned North Kohala Pipeline;
- Develop a Water Commitment Policy, which is incorporated herein by reference, containing guidelines and requirements for each Group Member securing a sufficient supply of water for actual use in accordance with a realistic timetable;
Coordinate the activities of the Water Study Group with all relevant State of Hawaii authorities, including but not limited to its Water Commission, in a manner which promotes and preserves the Group's ability to deal with regional water issues on a collective basis;

Communicate, where appropriate, with other interested parties within the region;

Enter into subsequent joint agreements intended to implement the objectives adopted herein.

Governance

The activities of the Group shall be governed and coordinated through an Executive Committee comprised of a designated representative of each signatory to this Memorandum of Understanding.

The Group Executive Committee shall:

- Approve all policies, agreements and expenditures made on behalf of the Group; provided, that if the representative of any Group member specifically disapproves of any such expenditure, that Group member shall be excused from its pro rata share of such expenditure;

- Approve the inclusion of additional members to and approve, except member in question, for the exclusion of existing members from the Water Study Group;

- Approve public statements and testimony regarding Water Study Group activities;

- Develop and approve an annual operating budget, project budgets and the individual party's obligations to fund the operations and the development of these planned projects;

- Be kept informed of all agreements entered into between Water Study Group members affecting the Group's Mission and Objectives;

- Coordinate all contact regarding the activities of the Water Study Group with governmental agencies;
Direct and approve the activities of all consultants retained by the Water Study Group relating to its stated Mission and Objectives.

All decisions of the Group shall be by the majority of the members of the Executive Committee except for "key decisions" which require unanimous approval. Key decisions include approval of the annual operating budget and individual members' obligation to fund operations or make contributions to the development of planned projects, expenditures which are outside of the approved budget in excess of $5,000 in any single case or $25,000 in the aggregate and the addition of any new member to the Executive Committee.

Dispute Resolution

It is acknowledged that from time to time, disputes and disagreements may arise between the parties to this Memorandum of Understanding regarding regional water issues and that it is in their long-term collective best interests that such disputes be resolved without resort to governmental or judicial involvement.

The parties agree that they shall use their individual and collective best efforts to resolve any and all outstanding issues covered by this Memorandum. The parties further agree that in the event negotiations fail to result in acceptable agreement or resolution, they may voluntarily submit outstanding issue(s) to binding or non-binding arbitration pursuant to terms agreed to by the parties.

North Kohala Pipeline

The parties agree to support the concept of a North Kohala pipeline transporting potable water to South Kohala being pursued by the Department of Water Supply, County of Hawaii.

In the event that the parties are reasonably satisfied that the North Kohala pipeline will be built, but no later than the start of construction, individual signatories to this agreement shall commit, on a fair and equitable basis, to the partial funding of said pipeline under acceptable terms and conditions to be negotiated.
Termination/Withdrawal

A majority of the members of the Group may terminate the Group and joint obligations contained in this Memorandum of Understanding. Individual Group members may withdraw from the South Kohala Water Study Group upon written notice to other members; provided, that members shall remain liable for their or its pro-rata share of costs of operations per the approved budget or amendments thereto, incurred during their membership or prior to withdrawal, as the case may be.

This Memorandum of Understanding is entered into this 9th day of February, 1998.

MAUNA KEA PROPERTIES, INC. NANSAY HAWAI'I, INC.

By [Signature] By [Signature]

Its [Position] Its [Position]

MAUNA LANI RESORT, INC. WAIKOLOA LAND COMPANY

By [Signature] By [Signature]

Its [Position] Its [Position]
DRAFT
Water Commitment Policies and Procedures
of the
South Kohala Water Users' Group
Revised: [February 4, 1993]
March 9, 1993

The South Kohala Water Users Group ("Group") recognizes the need to develop a coherent set of policies and procedures for the development of groundwater to ensure maximum beneficial use of this limited resource, avoid conflicts among users, and facilitate the timely development of water tied to actual use. The parties to this document agree to abide by the policies and procedures it contains and encourage the State Commission on Water Resource Management ("Commission") to evaluate all drilling and pump installation permits received from other water users in the basin by the same criteria.

POLICIES

1. The group recognizes that all parties need assurance of the availability of water for their developments. The group further recognizes that such assurances can occur only if it is agreed to by all parties.

2. All drilling, well modification, and pump installation permits will be formulated to conform to the intent of the then current version of the Group's approved South Kohala Water [Master] Resource Plan.

3. To minimize excessive use of groundwater, all effluent from sewage treatment plants shall be reused for irrigation unless it can be conclusively demonstrated to be physically and/or economically impractical for the developer of the irrigation supply or the ultimate user of the water.
4. All new landscaping, including golf course turfgrass, will be designed and implemented to minimize irrigation use. Efforts toward this end shall include choosing appropriate plant materials, use of proper soil types and thickness, and avoiding excessive turfgrass areas. Any new 18-hole golf course shall not use more than 0.75 MGD on year-round average nor more than 1.00 MGD over any seven-day period.

5. All new hotel, residential, commercial, and industrial development shall be designed to minimize water use and shall include appropriate water saving devices.

6. Drilling permits should be supported if consistent with the Water Resource Plan, as they provide much needed information about this region's aquifer.

7. [Drilling and] Pump installation permits shall not be sought more than two years in advance of actual need [to avoid creating false shortages of supply and inappropriate positioning for the resource, potentially denying others their fair and equitable use].

8. Members of the Group agree to devise water use standards for consumption of potable and irrigation water use in order to implement these policies.

9. It is recognized that agreements between two or more parties may be necessary to facilitate respective water development. [Such agreements shall be consistent with these policies and procedures.]

PROCEDURES

1. All applications for drilling, well modification, and pump installation permits, including extensions of these permits, will be submitted for review and approval by the Group to ensure conformance with the Intent of the Group's policies and [master] water resource plan prior to submission to the Commission.

2. To initiate the Group's review, application will be submitted with the following supporting information:

   a. Quantity [and timing] of potable and/or non-potable supply requirements, including the basis for these projections (unit counts, acreage, etc.).
b. Measures taken to avoid excessive potable and/or non-potable water use.
c. Exact location of the water uses, including land use plans, TMKs, etc.
d. Approved State land use designation; County General Plan designation; County zoning; use permit for district use; and the prospective land use approvals, including subdivision, needed to achieve the desired land use.
e. The project's site specific water master plan for potable and not potable water shall be submitted.
f. Exact location, dimensions, and pump capacity of the well (or wells) to be developed to meet these supply requirements.

[g. A development schedule indicating the date of actual water use.]

3. The Group's review and response to the application shall be completed within 45 days. The response shall judge the application's conformance with these policies and with the South Kohala Water [Master] Resource Plan, [the appropriateness of the timing of the application,] and the [e.g.]

[Unless there are compelling reasons otherwise, the timing of an application shall be deemed inappropriate unless all land use approvals through and including County zoning have been received and the actual use of water, based on a firm schedule, is to begin within two years.]

Listed below are specific criteria of the Group's review of applications.

a. If conformance with these policies and procedures is demonstrated [and the timing of the application is appropriate.] the Group's approval shall not be unreasonably withheld.

b. If the application falls to meet the standards for acceptability set out herein, no submittal of the application to the Commission shall be made until revisions satisfactory to the Group are made.

c. The Group's approval for a pump installation permit shall be given only after tentative subdivision approval for the project to be served has been given.

d. If a proven water source is a condition of County zoning or use permit approvals, the Group's approval of a well construction permit shall be given only if evidence of the actual water use within two years is provided.]
These Water Commitment Policies and Procedures are entered into this day of _____________, 1993.

Mauna Kea Properties, Inc.
By: ____________________________
   Its

Mauna Lani Resort, Inc.
By: ____________________________
   Its

Nansay Hawaii, Inc.
By: ____________________________
   Its

Waikoloa Land Company
By: ____________________________
   Its
PUMP INSTALLATION PERMIT

for

Ouli Well A
Well No. 6049-05
Ouli, South Kohala, Hawaii

TO: Mauna Kea Properties, Inc.
P.O. Box 218
Kamuela, Hawaii 96743

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 300 gallons per minute pump into Ouli Well A (Well No. 6049-05) within Tax Map Key: 6-2-01:19 for dust control is approved, subject to the following conditions:

1. The Division of Water and Land Development (DOWALD), Geology-Hydrology Section, shall be notified at 548-7543, before any work covered by this permit commences.

2. The proposed use shall not adversely affect existing legal uses in the area.

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

4. 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 shall be completed within two years of the date of issuance.

Date of Issuance  FEB 14 1990

cc: USGS
Department of Health
Drinking Water Branch
Ground Water Protection Program
Hawaii Department of Water Supply
Belt Collins and Associates
The Honorable William W. Paty, Chairperson  
Commission on Water Resource Management  
Department of Land and Natural Resources  
State of Hawaii  
P.O. Box 621  
Honolulu, Hawaii 96809  

Dear Mr. Paty:  

SUBJECT: PUMP INSTALLATION PERMIT APPLICATION  
OLI WELL A  
STATE WELL NO. 6049-05  
KAWAIHE, HAWAII  

Thank you for the opportunity to comment on the pump installation permit for Ouli Well A. We offer the following comments:  

1. Because the well will not be supplying potable water, it will not be subject to the Department's Administrative Rules, Title 11, Chapter 20, "Potable Water Systems".  

2. The well lies above the UIC line. Land areas above the UIC line are considered to contain underground sources of drinking water. Thus, it is essential that the well be maintained and operated to prevent the possibility of groundwater contamination. For example, seepage or floodwaters should not be allowed to migrate down the well shaft.  

Should you have any questions, please contact the Safe Drinking Water Branch at 543-8258.  

Very truly yours,  


cc: William Mielcke  
Mauna Kea Properties, Inc.  
P.O. Box 218  
Kamuela, Hawaii 96743
December 27, 1989

MR. MANABU TAGOMORI
DEPUTY DIRECTOR
DEPT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P O BOX 621
HONOLULU HI 96809

SUBJECT: WELL CONSTRUCTION PERMIT APPLICATION
✓ Ouli Well A (Well No. 6049-05) Pump Installation Permit
   Kukuiopai Well (Well No. 1852-01) Well Construction Permit

We have reviewed the subject permit application and have no objections to the proposed well construction.

ROBERT K. YANABU
Division Chief
Engineering Division

STT: cds
Honorable John C. Lewin, MD
Director of Health
Department of Health
State of Hawaii
1250 Punchbowl Street
Honolulu, Hawaii 96813

Attn: Mr. Thomas Arizumi, Drinking Water Branch

Dear Dr. Lewin:

Well Construction and Pump Installation Permit Applications

In accordance with Hawaii Administrative Rules Section 13-168-12(e), we are requesting that your office review the following permit applications for compliance with your agency's rules and standards:

- Ouli Well A (Well No. 6049-05) Pump Installation Permit
- Kukulipae Well (Well No. 1852-01) Well Construction Permit

We'd appreciate receiving your comments, orally or in writing, within three weeks from the date of this letter.

If you have any questions regarding these applications, please contact Manabu Tagomori at 548-7533.

Very truly yours,

WILLIAM W. PATY

Enc.
December 20, 1989

Mr. Manabu Tagomori, Deputy Director
State Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, HI 96809

OULI WELL A (WELL NO. 6049-05) PUMP INSTALLATION PERMIT
KUKUIOPAE WELL (WELL NO. 1852-01) WELL CONSTRUCTION PERMIT

We have no objections to the subject permit applications.

[Signature]
Manager

GK

...Water brings progress...
December 14, 1989

Mr. William Sewake, Manager  
Department of Water Supply  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Sewake:

Well Construction Permit Applications

We are sending you a copy of the following permit applications for your review and comments:

✓ Ouli Well A (Well No. 3049-05) Pump Installation Permit  
  Kukulopae Well (Well No. 1852-01) Well Construction Permit

Please submit your comments to us, orally or in writing, within three weeks from the date of this letter.

If you have any questions, please contact Ed Sakoda at 548-7543.

Sincerely,

MANABU TAGOMORI  
Deputy Director

E3:bn  
Enc.
December 14, 1989

Mr. Hugh Y. Ono
Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Ono:

Well Construction Permit Applications

We are sending you a copy of the following permit applications for your review and comments:

✓ Ouli Well A (Well No. 6049-05) Pump Installation Permit
   Kukulopae Well (Well No. 1852-01) Well Construction Permit

Please submit your comments to us, orally or in writing, within three weeks from the date of this letter.

If you have any questions, please contact Ed Sakoda at 548-7543.

Sincerely,

MANABU TAGOMORI
Deputy Director

ES:bm
Enc.
Mauna Kea Properties, Inc.  
P.O. Box 218  
Kamuela, Hawaii  96743

Gentlemen:

We are acknowledging the receipt and acceptance of your application and $25.00 filing fee for the installation of a pump in the existing Ouli Well A (Well No. 6049-05) in South Kohala. We understand the pumped water will be used for temporary dust control during the construction of the proposed golf holes and related infrastructure mauka of Queen Kaahumanu Highway.

We have begun processing your application and will contact you if we need more information.

Sincerely,

[Signature]

MANABU TAGOMORI  
Deputy Director

ES:bm  
cc: Belt Collins & Assoc.
D. Lum  
G. Matsumoto  
G. Akita  
L. Chang  
Y. Shiroma  
E. Sakoda  
D. Nakano  
W. Rozeboom  
P. Haraguchi  
S. Samuels  
R. Chung  
T. Kam  
A. Monden  
H. Young  
R. Suzuki  
N. Kaneshiro  
T. Nakama  
S. Kokubun  
D. Hamada  
L. Nanbu  
F. Ching
Mr. William Paty, Chairman
Commission on Water Resource Management
Department of Land & Natural Resources
P. O. Box 373
Honolulu, Hawaii 96809

Dear Mr. Paty:

Pump Installation Permit Application for
South Kohala Resort, Hawaii

On behalf of Mauna Kea Properties, Inc., I am pleased to submit the attached pump installation permit application along with the $25.00 filing fee. The water will be used for temporary dust control during construction of the proposed golf holes and related infrastructure situated mauka of Queen Kaahumanu Highway.

If you need additional information or clarification, please do not hesitate to call us.

Very truly yours,

Paul P. Wallrabenstein, Jr., P.E.

cc: William Mielcke
APPLICATION FOR

WELL CONSTRUCTION PERMIT

X PUMP INSTALLATION PERMIT

INSTRUCTIONS: Please print or type and send completed application with attachments to the Division of Water and Land Development, P.O. Box 373, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Department of Land and Natural Resources. (Filing fee waived for government agencies.) If necessary, phone 548-1543, Hydrology/Geology Section for assistance.

1. WELL LOCATION

Island [Hawaii] Tax Map Key G-2-01:19

Address EXISTING WELL "A"

(Attach a USGS map (scale 1"=2000") and property tax map showing well location referenced to established property boundaries.)

2. WELL OWNER

Firm Name MAUNA KEA PROPERTIES, INC.
Contact Person WILLIAM MIELECKE
Address P.O. BOX 218
KAMUELA, HAWAII 96743
Phone 1-800-952-7235

LANDOWNER

Firm Name MAUNA KEA PROPERTIES, INC.
Contact Person WILLIAM MIELECKE
Address P.O. BOX 218
KAMUELA, HAWAII 96743
Phone 1-800-952-7235

3. PROPOSED CONTRACTOR FOR:

Name GOODFELLOW BROTHERS, INC. Phone 879-5205
Address PO BOX 220
KIHEI, MAUI, HAWAII 96753
Contractor's License No. A-07046

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 systems) ☐ Industrial
☐ Irrigation (specify) ☐ Other (specify) JUST CONTROL

6. PROPOSED AMOUNT OF WITHDRAWAL 200,000 gallons per day

7. PROPOSED PUMP INFORMATION

Pump Type: ☐ Vertical Turbine ☐ Submersible ☐ Centrifugal
Motor: ☐ Diesel ☐ Gas ☐ Electric: 50 Rated Horsepower
Rated Pump Capacity 300 gallons per minute (gpm)

Well Owner (print) MAUNA KEA PROPERTIES
Signature ____________________________
Date ________________________________

Landowner (print) MAUNA KEA PROPERTIES
Signature ____________________________
Date ________________________________

For Official Use Only:

Latitude ____________________________ Hydrologic Unit ____________________________
Longitude ____________________________ State Well No. 6049-05

Field Checked By ____________________________ Date ____________________

Official Use Only: ____________________________
Briefly describe the proposed work:

OUTFIT EXISTING QULL WELL A FOR TEMPORARY USE OF
DUST CONTROL DURING CONSTRUCTION.

PROPOSED SECTION OF WELL

Elevation at top of casing

300 ft., msl.

Ground Elev. 299.5 ft., msl*

Cement
Grout 30 ft.

Solid Casing:
Material STEEL
Length 302 ft.
Diameter 14 in.
Wall thickness 0.312 in.

Hole
Dia. 18 in.

Casing: /X/Perforated / /Screen
Material STEEL
Length 20 ft.
Diameter 14 in.
Wall thickness 0.312 in.
Openings NOT KNOWN sq. in./L.F.

Total Depth 340 ft.

Open Hole:
Length 18
Diameter 12 in.

Rock
Packing 260 ft.

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
PAY

TO THE ORDER OF

DEPARTMENT OF LAND AND NATURAL RESOURCES

DATE

November 30, 1989

AMOUNT

$25.00

IMPREST ACCOUNT

DETACH AND RETAIN THIS STATEMENT
THE ATTACHED CHECK IS IN PAYMENT OF ITEMS DESCRIBED BELOW.
IF NOT CORRECT PLEASE NOTIFY US PROMPTLY. NO RECEIPT DESIRED.

DELUXE FORM TWC-3 SPL N-1811

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<td>Dust Control</td>
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<td>OULI WELL A (WELL No. 6049-05)</td>
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<tr>
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<td>MKP Account No. 233801.800LNR</td>
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N-1811
**DESCRIPTION**

| Date of report | 3/24/80 | Person filling report | I. H. Runnels |

| A. OWNER | Olohana Corp. |
| B. GENERAL LOCATION | Kane |
| C. DRILLING COMPANY | Roscoe Moss Company |
| D. TYPE OF RIG | 28L Cable tool DRILLING COMPLETED: 7/79 | DRILLER: G. Leslie |

| E. ELEVATION, msl: Top of drilling platform | 299.53 | ft. | Bench mark and method used to determine Height of drilling platform above ground surface | 0 | ft. |
| F. HOLE SIZE | 18 | in. | dia. to | 322 | ft. below drilling platform. | 12 | in. | dia. to | 340 | ft. below drilling platform. |
| G. CASING INSTALLED: | 14 | in. | I.D. x 312 | in. wall solid section to | 302 | ft. below drilling platform. | 14 | in. | I.D. x 312 | in. wall perforated section to | 322 | ft. below drilling platform. |
| H. ANNULUS: | Grouted | 0 | ft. to | 30 | ft. below drilling platform. | Gravel packed | 30 | ft. to | 290 | ft. below drilling platform. |

**HYDROLOGY**

| J. INITIAL WATER LEVEL | 296.30 | ft. below drilling platform. | Date of measurement: | June 1, 1979 |
| K. INITIAL CHLORIDE | ppm, total depth of well | below drilling platform |

**PUMPING TESTS**

| L. PUMPING TESTS | Reference point (R.P.) used: | which elevation is | ft. |
| Date | July 9, 1979 | ft. |
| Start water level | ft. below R. P. | Start water level | ft. below R. P. |
| End water level | ft. below R. P. | End water level | ft. below R. P. |
| Depth of well | 340 | ft. below R. P. | Depth of well | ft. below R. P. |
| Time (hours) | Elapsed | Rate (ppm) | Draw-down (ft.) | Cl- (ppm) | Temp. (°F) |
| | to | 9:00 A.M. | 8:00 P.M. | 300 | 575 | 1:10 to 9:35 A.M. | 300 | 573 | 1:10 to 9:35 A.M. | 300 | 573 |
| | to | July 10, 1980 | 9:00 A.M. to 12:00 midnight | 570 | 570 | 1:10 to 9:35 A.M. | 300 | 573 | 1:10 to 9:35 A.M. | 300 | 573 |

**SUBSURFACE FORMATION**

| M. DRILLER'S LOG | Water Level | Water Level |
| Depth, ft. | Rock Description & Remarks | Water Level | Depth, ft. | Rock Description & Remarks |
| 0. to | 3 | Soil | 154. to | 193. | Hard rock |
| 3. to | 24 | Med. hard rock | 193. to | 231. | Red rock cinders |
| 24. to | 36 | Hard rock | 231. to | 242. | Hard rock |
| 36. to | 41 | Cinders | 242. to | 266. | Red rock |
| 41. to | 67 | Hard rock gray | 266. to | 300. | Porous gray rock |
| 67. to | 80 | Red rock | 300. to | 324. | Med. hard rock |
| 80. to | 105 | Hard. grey rock | 324. to | 335. | Hard rock |
| 105. to | 107 | Red rock | 335. to | 339. | Med. hard rock |
| 129. to | 315 | Hard rock | 340. to | 340. | Hard rock |
| 135. to | 154 | Red rock | 340. to | 340 | Hard rock |

**N. REMARKS**

**FOR DRILLER'S USE**

**INSTRUCTIONS:** Send three (3) copies to: Manager-Chief Engineer, Division of Water and Land Development, P. O. Box 373, Honolulu, Hawaii 96809.

**REFERENCES:** Chapter 178 entitled "Atypical Well Records." Time

**FOR OFFICIAL USE**

| Latitude | 20 00 03 |
| Longitude | 155 49 02 |
| Well No. | 6049-05 |
OUU WELL A
OLDHAM CORP.

TEST RESULTS OF 7/4/79

PUMP IMMERSE 310.17'

ELEV. 321.58'

AIRLINE 2.33'

HOURS OPERATE 31

CHLOR. TEST 575 mg/l (15 cent. per)

WATER LEVEL +2.5' (m 1)

\[ \text{Diagram showing the relationship between flow rate (Q in GPM) and depth in feet.} \]
To: DONALD  
Attention: Ed Sekaha  
From: Tom Nance  
Subject: Onli 6 8 8  

Fax No. 546-6052  
Date: Nov. 21  
No. of Pages: 8  
(Including Header)

If you do not receive all pages, please telephone immediately.

Copy of Bowle' report.
March 28, 1980

Mr. Bill Mielke
Mauna Kea Land Corp.
P.O. Box 218
Kamuela, Hawaii 96743

Dear Bill:

Enclosed is my final report on the drilling program, as well as my final bill. In the event that you need more information or explanation, please feel free to call on me. Each well has been capped awaiting further use. The performance of each well was disappointing, but adequate.

Since I am frequently in your area, I will make a point of stopping by in the near future.

Sincerely,

Stephen P. Bowles

STEPHEN P. BOWLES
CONSULTING HYDROLOGIST – GEOLOGIST

4988 MAUNALANI CIRCLE
HONOLULU, HAWAII 96816

Telephone
TELEPHONE
737-2001

Mr. Bill Mielke
Mauna Kea Land Corp.
P.O. Box 218
Kamuela, Hawaii 96743

Dear Bill:

Enclosed is my final report on the drilling program, as well as my final bill. In the event that you need more information or explanation, please feel free to call on me. Each well has been capped awaiting further use. The performance of each well was disappointing, but adequate.

Since I am frequently in your area, I will make a point of stopping by in the near future.

Sincerely,

Stephen P. Bowles
As originally intended, these wells were to serve a new golf course to be constructed by the Olomana Corporation mauka of the Kona Drive Highway. Estimated daily demand was approximately 800,000 gallons. In order to minimize the interference between the existing (M.K.H.) wells and Ouli "A" and "B", the new sites were selected as far apart as practicable. Plans called for pumping each well to a reservoir and thence to use. It was intended that each well be equipped with a 500 gpm (gallons per minute) pump to be operated on 12 hour schedules.

Drilling of Ouli "A" commenced on December 27, 1978 and Ouli "B" was completed February 20, 1980. Difficulties in maintaining straight holes complicated by exceptionally hard rock caused the construction to take eight months longer than intended. Attached are the Driller's logs showing the as built dimensions.

In both wells, very dense lavas were encountered between sea level and elevation -40', causing relatively poor yields. Ouli "A" was tested at elevations -20', -30', and -40'. Ouli "B" was tested at elevation -33'. The relatively high salinity (727 mg/l chlorides) in Ouli "B" precluded deepening to improve its yield. Based on the high drawdowns, as summarized in figures 1 and 2, it will be impossible to pump the wells as originally planned. Under no circumstances can either well be pumped in excess of 300 gpm. In order to obtain the desired 800,000 gallons per day, each well would have to be pumped a minimum of 22 hours to meet the demand.

In the event that plans are rejuvenated to build the golf course, the following recommendations should be considered:

1) Pumping rates in Ouli "A" and "B" should not exceed 300 gpm.
2) Pump bowls should extend no deeper than elevation -20' (the bottom of the well screens).
3) An intake tail piece should be used to extend the pump intake to elevation -27' in both wells.

4) Based on the above, only vertical turbine or line shaft type pumps can be used.

5) In order to ensure an adequate supply for the golf course, the State well mauka of Ouli "B" should be leased or otherwise made available to integrate with the irrigation system.
To: DONALD

Attention: Ed Sekake

From: Tom Nance

Subject: Ouli A & B

Fax No. 546-6052

Date: Nov. 21, 1989

No. of Pages: 8

(Indluding Header)

If you do not receive all pages, please telephone immediately.

Copy of Hard's report:
DESCRIPTION

Date of report: 3/24/80

Person filing report: L.H. Ruanella

A. OWNER: Olohana Corp.
NAME: Quixx Rxx, Ouli A.
ISLAND: Hawaii

B. GENERAL LOCATION: Kahe

C. DRILLING COMPANY: Roscoe Moss Company

D. TYPE OF RIG: 28 ft. cable tool. DRILLING COMPLETED: 7/79

E. ELEVATION, msl: Top of drilling platform: 299.53 ft. Bench mark and method used to determine

Height of drilling platform above ground surface: 0 ft. elevation:

F. HOLE SIZE: 18 in. dia. to 322 ft. below drilling platform.

30 in. dia. to 340 ft. below drilling platform.

G. CASING INSTALLED: 14 in. I.D. x .312 in. wall solid section to 322 ft. below drilling platform.

32 in. I.D. x .312 in. wall perforated section to 322 ft. below drilling platform.

Type of perforation: Louver

H. ANNULUS: Grouted 30 ft. to 300 ft. below drilling platform.

Gravel packed 30 ft. to 290 ft. below drilling platform.

I. 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: 296.30 ft. below drilling platform. Date of measurement: June 1, 1979

K. INITIAL CHLORIDE: ppm, total depth of well: ft. below drilling platform

Sampling Date: 7/79

L. PUMPING TESTS:

Reference point (R.P.) used: which elevation is ft.

Date: July 9, 1979

Start water level: ft. below R.P. Start water level: ft. below R.P.

End water level: ft. below R.P. End water level: ft. below R.P.

Depth of well: 340 ft. below R.P. Depth of well: 302 ft. below R.P.

Elapsed Time (hours) Rate Draw- CL- Temp.

9:00 AM to 11:00 AM 300 575

12:00 PM to 2:30 PM 300 575

3:30 PM to 6:00 PM 300 575

Subsurface Formation

M. DRILLER'S LOG:

Depth, ft. Rock Description & Remarks Water Level Depth, ft. Rock Description & Remarks Water Level

0. to 3 Soil 154 to 193 Hard rock

3. to 24 Med. hard rock 193 to 231 Red rock cinder

24. to 36 Hard rock 231 to 242 Hard rock

36. to 41 Cinder 242 to 266 Red rock

41. to 67 Hard rock grey 266 to 300 Porous grey rock

67. to 80 Red rock 300 to 324 Med. hard rock

80. to 105 Hard grey rock 324 to 355 Hard rock

105. to 107 Red rock 355 to 393 Med. hard rock

107. to 129 Med. hard rock 393 to 400 Hard rock

129. to 135 Hard rock 400 to 410 Hard rock

135. to 154 Red rock

N. REMARKS:

INSTRUCTIONS: Send three (3) copies to Manager-Chief Engineer, Division of Water and Land Development, P. O. Box 373, Honolulu, Hawaii 96809.

FOR DRILLER'S USE

FOR OFFICIAL USE

Latitude: 21.30 N
Date of report: March 24, 1980  
Person filing report: L.H. Runnells

A. OWNER: Olahana Corp.  
NAME: Ouli B.  
ISLAND: Hawaii

B. GENERAL LOCATION: Kehe

C. DRILLING COMPANY: Roscoe Moss Company

D. TYPE OF RIG: Cable tool

E. ELEVATION, msl: Top of drilling platform: 314.90 ft.  
Height of drilling platform above ground surface: 0 ft. elevation:

F. HOLE SIZE: 14 in. dia. to 338 ft. below drilling platform.  
12 in. dia. to 347 ft. below drilling platform.

G. CASING INSTALLED: 14 in. I.D. x 312 ft. wall solid section to 317 ft. below drilling platform.  
14 in. I.D. x 316 ft. perforated section to 317 ft. below drilling platform.

H. ANNULUS: Grouted to 30 ft. below drilling platform.  
Gravel packed: 30 ft. to 295 ft. below drilling platform.

I. PERMANENT PUMP INSTALLATION:

- Pump type, make, serial no.  
- Capacity g.p.m.  
- Motor type, H.P., voltage, r.p.m.  
- Depth of pump intake setting ft. below  
- Depth of bottom of airline ft. below

J. INITIAL WATER LEVEL: 312 ft. below drilling platform.  
Date of measurement: Feb. 8, 1980

K. INITIAL CHLORIDE: ppm, total depth of well ft. below drilling platform

L. PUMPING TEST:

Date: Feb. 12, 1980  
Reference point (R.P.) used:  
which elevation is ft.

- Start water level ft. below R.P.  
- Start water level ft. below R.P.  
- End water level ft. below R.P.  
- End water level ft. below R.P.  
- Depth of well ft. below R.P.  
- Depth of well ft. below R.P.

- Time (hours)  
- Rate (gpm)  
- Draw-down (ft.) (ppm)

- Temperature

- Time (hours)  
- Rate (gpm)  
- Draw-down (ft.) (ppm)

- Temperature

M. DRILLER'S LOG:

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Rock Description &amp; Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Soil</td>
</tr>
<tr>
<td>148</td>
<td>172</td>
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<tr>
<td>172</td>
<td>182</td>
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<tr>
<td>255</td>
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<td>262</td>
<td>288</td>
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<td>288</td>
<td>297</td>
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<td>297</td>
<td>306</td>
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<td>317</td>
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<td>317</td>
<td>321</td>
</tr>
<tr>
<td>321</td>
<td>345</td>
</tr>
<tr>
<td>345</td>
<td>347</td>
</tr>
</tbody>
</table>

N. REMARKS:
Quli Well B
MAUNAKA LAND CO.

TEST RESULTS OF 2/12/80

Temp (F)       @ 343° (-22.5°F)
Gr. Elevation:  914.90'
Airline:        @ 240.95'

Abrasions: 5%

Chlorine: 727.4 mg/L (6 samples)
Wate Level: +2.5' (msl)
OUILI WELLA*

OLDHAM CORP

TEST RESULTS OF 7/4/79
PUMP INTAKE 3,017'
ELEV. 297.58'
AIRLINE 2 306.92'
HOURS PRODUCT 81
CHLORIDES 575 mg/L (15 c.p.m. level)
WATER LEVEL +2.5' (+12)

*O U L I  W E L L A
3) An intake tail piece should be used to extend the pump intake to elevation -27' in both walls.

4) Based on the above, only vertical turbine or line shaft type pumps can be used.

5) In order to ensure an adequate supply for the golf course, the State well mauka of Ouli "E" should be leased or otherwise made available to integrate with the irrigation system.
As originally intended, these wells were to serve a new golf course to be constructed by the Olohana Corporation mauka of the Highway. Estimated daily demand was approximately 800,000 gallons. In order to minimize the interference between the existing (M.K.B.H.) wells and Ouli "A" and "B", the new sites were selected as far apart as practicable. Plans called for pumping each well to a reservoir and thence to use. It was intended that each well be equipped with a 300 gpm (gallons per minute) pump to be operated on 12 hour schedules.

Drilling of Ouli "A" commenced on December 27, 1978 and Ouli "B" was completed February 20, 1980. Difficulties in maintaining straight holes complicated by exceptionally hard rock caused the construction to take eight months longer than intended. Attached are the Driller's logs showing the as built dimensions.

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In the event that plans are rejuvenated to build the golf course, the following recommendations should be considered:

1) Pumping rates in Ouli "A" and "B" should not exceed 300 gpm.

2) Pump bowls should extend no deeper than elevation -20' (the bottom of the well screens).
March 28, 1980

Mr. Bill Mielke
Mauna Kea Land Corp.
P.O. Box 218
Kamuela, Hawaii  96743

Dear Bill:

Enclosed is my final report on the drilling program, as well as my final bill. In the event that you need more information or explanation, please feel free to call on me. Each well has been capped awaiting further use. The performance of each well was disappointing, but adequate.

Since I am frequently in your area, I will make a point of stopping by in the near future.

Sincerely,

[Signature]

Stephen P. Bowles

SPB:th
Date of report: 3/24/80  Person filing report: I.H. Runnells

WELL
A. OWNER: Olohan Corp.  NAME: Quixx Corp.  ISLAND: Hawaii

B. GENERAL LOCATION: Kahe

C. DRILLING COMPANY: Roscoe Moss Company

Q. TYPE OF RIG: 28L. Cable tool DRILLING COMPLETED: 7/79  DRILLER: S. Leslie

E. ELEVATION, msl: Top of drilling platform: 299.53 ft.  Bench mark and method used to determine height of drilling platform above ground surface: 0 ft. elevation:

F. HOLE SIZE: 12 inch dia. to 322 ft. below drilling platform.

G. CASING INSTALLED: 14 in. I.D. x 312 in. wall solid section to 302 ft. below drilling platform.

H. ANNULLUS: Grouted: 0 ft. to 30 ft. below drilling platform.

I. PERMANENT PUMP INSTALLATION:

- Pump type, make, serial no.: Capacity: gpm
- Motor type, H.P., voltage, r.p.m.
- Depth of pump intake setting: ft. below:
- Depth of bottom of airline: ft. which elevation is: ft.
- Depth of bottom of airline: ft. which elevation is: ft.

HYDROLOGY

J. INITIAL WATER LEVEL: 296.30 ft. below drilling platform. Date of measurement: June 1, 1979

K. INITIAL CHLORIDE: ppm, total depth of well: ft. below drilling platform

L. PUMPING TESTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Reference point (R.P.) used:</th>
<th>which elevation is: ft.</th>
<th>Date</th>
<th>Start water level: ft. below R. P.</th>
<th>Start water level: ft. below R. P.</th>
<th>End water level: ft. below R. P.</th>
<th>End water level: ft. below R. P.</th>
<th>Depth of well: ft. below R. P.</th>
<th>Depth of well: ft. below R. P.</th>
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</thead>
<tbody>
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<td>July 9, 1979</td>
<td>8:12AM to 9:00PM</td>
<td>300</td>
<td>12:00 PM to 9:35 AM</td>
<td>300</td>
<td>575</td>
<td>12:00 PM to 9:35 AM</td>
<td>300</td>
<td>575</td>
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</tr>
<tr>
<td>July 10, 1980</td>
<td>9:00AM to 12:00 Midnight</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td>300</td>
<td>970</td>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SUBSURFACE FORMATION

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>3 to 3</td>
<td>Soil</td>
<td>154 to 193</td>
<td>Hard rock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 to 24</td>
<td>Med. hard rock</td>
<td>192 to 231</td>
<td>Red rock cinders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 to 36</td>
<td>Hard rock</td>
<td>231 to 242</td>
<td>Hard rock</td>
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<tr>
<td>36 to 41</td>
<td>Cinders</td>
<td>242 to 266</td>
<td>Red rock</td>
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<td>41 to 67</td>
<td>Hard rock grey</td>
<td>266 to 300</td>
<td>Porous grey rock</td>
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<td>67 to 80</td>
<td>Red rock</td>
<td>300 to 324</td>
<td>Med hard rock</td>
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<tr>
<td>80 to 105</td>
<td>Hard grey rock</td>
<td>324 to 335</td>
<td>Hard rock</td>
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<td>105 to 107</td>
<td>Red rock</td>
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<td>Med hard rock</td>
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<td>107 to 129</td>
<td>Med. hard rock</td>
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<td>135 to 154</td>
<td>Red rock</td>
<td>343 to 346</td>
<td>Hard rock</td>
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</tr>
</tbody>
</table>

N. REMARKS:

FOR DRILLER'S USE

INSTRUCTIONS: Send three (3) copies to Manager-Chief Engineer, Division of Water and Land Development, P.O. Box 373, Honolulu, Hawaii 96809. FOR OFFICIAL USE

Latitude: 20° 00' 03" Long: 158° 44' 02"