### SECTION 1: WELL LOCATION INFORMATION

- **Island**: OAHU
- **Aquifer System**: WAIANAE
- **Aquifer Sector**: 

### SECTION 2: WELL SECTION DATA

(enter data in grey cells only)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation at top of casing</td>
<td>1025 ft.</td>
</tr>
<tr>
<td>Ground Elevation</td>
<td>925 ft.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td></td>
</tr>
<tr>
<td>Rock Packing</td>
<td></td>
</tr>
<tr>
<td>Hole Diameter</td>
<td></td>
</tr>
<tr>
<td>Total Depth</td>
<td></td>
</tr>
<tr>
<td>Estimated Head</td>
<td>1025 ft.</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td></td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 3: CHECKLIST

(values to check are shaded)

#### Well Depth

- **Theoretical Thickness of Aquifer**: 1025 ft.
- **1/4 Aquifer Thickness**: 256.3 ft.
- **Depth of Well below Sea Level**: 25 ft. (okay, refer to HWCPIS Section 2.2)
- **Well Casing**
  - **Minimum Wall Thickness**
    - **Material**: PVC
    - **County or Non-County**: non-county
    - **Minimum Thickness per standards**: 0.237 in.
    - **Wall Thickness Provided**: 0.406 in. (okay, refer to HWCPIS Section 2.4 c)
    - **Minimum Length of Solid Casing**: 157.5 ft.
    - **Length of solid casing Provided**: 170 ft. (okay, refer to HWCPIS Section 2.4 d)
  - **Casing Material**: Sch 40
  - **Openings**: (refer to HWCPIS Section 2.4 e)

#### Annular Space

- **Depth of Grouting**
  - **Calculated Depth of Grouting**: 122.5 ft.
  - **Depth of Grouting provided**: 165 ft. (okay, refer to HWCPIS Section 2.6 c)
  - **Thickness of Annular Space**: 3 in. (okay, refer to HWCPIS Section 2.6 d)
December 8, 2004

Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857  

Dear Mr. Fukuda:

Well Completion Reports for Well Nos. 3113-02 to 06, 3213-08 to 11  

We received your Well Completion Reports Part I for the ERDC Monitor Wells (Well Nos. 3113-02 to 06, 3213-08 to 11) on December 2, 2004 and acknowledge that they are complete.

If you have any questions, please contact Lenore Y. Nakama of the Commission staff at 587-0218.

Sincerely,

[Signature]

YVONNE Y. IZU  
Deputy Director

LYN:ss

c: Floyd A. Quintana, Colonel, US Army, Director of Public Works, US Army Garrison  
Steve Turnbull, US Army Garrison
Directorate of Public Works

Ms. Lenore Nakama
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Dear Ms. Nakama:

Please find enclosed signed well construction permits and well completion reports for monitoring wells installed at the Makua Military Reservation as part of the Environmental Impact Statement (EIS) Process. We are planning to submit the EIS document for public review in the near future.

Please note that by submitting these well permits and well construction logs the Army is not waiving sovereign immunity; rather, that we are providing the completed application for informational purposes to the State of Hawaii Department of Land and Natural Resources.

If you have any questions, please contact Mr. Stephen Turnbull at 808-656-2878 ext. 1042.

Sincerely,

Floyd A. Quintana
Colonel, US Army
Director of Public Works

Enclosure(s)
1. State Well No.: 3113-02  
   Well Name: ERDC-MW-1  
   Island: Oahu

2. Address: Makua Military Reservation  
   Tax Map Key: 8-2-01:24

3. Drilling Company: Valley Well Drilling

4. Drilling method used during construction: 
   - Rotary  
   - Percussion  
   - Other (describe)

5. Date Well Construction (drilled,cased,grouted) completed: 9/24/2002 
   Attach Driller’s Log (7/26/99 DL Form)

   In addition to the driller’s log, if a geologic log was prepared, please submit with this form.

6. Was the subject well cored?  
   - Yes  
   - No

7. Initial water-level encountered 7.5 ft. below ground  
   Date and time of measurement: 9/14/02 10:15

8. Step-Drawdown Test completed?  
   - No  
   - Yes  
   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. Constant Rate Aquifer Test completed?  
   - No  
   - Yes  
   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:

10. Water-level: 4.35 ft. above msl  
    Date and time of measurement: 4/3/2003 8:50

11. Chloride: 188 ppm  
    Date and time of sampling: 12/18/02 11:55

12. Temperature: 79 °F  
    Date and time of measurement: 1/19/03 11:58

13. Fill in the as-built section on the other side of this sheet.

14. Attach plot plan and surveyor’s stamped elevation report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. Remarks: No pump installed. Well for sampling

---

Licensed Driller (print) Mike Sober  
C-57 Lic. No. 21358

Signature  
Date 11/16/04

Surveyor (print)  
L.P.L.S. Lic. No.

Signature  
Date

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI

Signature  
Date 10/7/04
13. AS-BUILT WELL SECTION

(Please attach as-built if different from diagram provided below)

Elevation at top of casing: 12.40 ft., msl*

Ground Elevation: 9.15 ft., msl

Minimum of 2' Radius & 4' Thick Concrete Pad

Solid Casing: (≥ 90% x (Ground Elev. - Water Level Elev.))
- Length: 6 ft.
- Nominal Diameter: 4 in.
- Well Thickness: 0.237 in.
- Bottom Elevation: 3.95 ft., msl

Open Casing: □ Perforated □ Screen
- Length: 29 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.237 in.
- Bottom Elevation: -25.06 ft., msl

Open Hole: □ Filled with Gravel
- Length: 1 ft.
- Diameter: 16 in.
- Bottom Elevation: -26.05 ft., msl

**msl = mean sea level**

---

Solid Casing Material:

- Carbon Steel: compliant with (check one or more): □ ANSI/WWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

- Carbon Steel: compliant with (check one or more): □ ANSI/WWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296
### DRILLER'S LOG

**Well Number:** 3113-02

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>Sand with basalt cobbles,</td>
<td>9/19/02</td>
</tr>
<tr>
<td>5 to 20</td>
<td>Silty sand with basalt cobbles, water level approx 7.5 ft</td>
<td>9/19/02</td>
</tr>
<tr>
<td>20 to 36</td>
<td>Sand with trace basalt fragments</td>
<td>9/19/02</td>
</tr>
</tbody>
</table>

**Remarks:**
HNu readings all background.

**For Official Use Only:**

04 DEC 2004 04:28
Monitoring Well Coordinates

Well MW-1 (3113-02)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 37”  Longitude (W) 158° 13’ 38”

Ground Elevation: 9.95 feet

Top of Casing Elevation: 12.90 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
**Drilling Log**

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Name of Driller:** John Sunagd

**Manufacturer's designation of drill:** Mobile B-90

**Total No. of overburden samples taken:** Disturbed 3

**GPS Coord. N21 deg. 31.814'W138 deg. 13.638' Undisturbed**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SAND (SP)</td>
<td>Black w/ basalt cobbles, very hard drilling - bit chattered on rocks. Small amt of limestone cobbles present @ 2-3.0 ft</td>
<td>0</td>
<td>HNU - 1.1 SC:LL - 0 counts (backs round)</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance. No detect - drilling ahead.</td>
<td>20</td>
<td>Note: Run 3 in PVC Pipe to 3.0 ft to clear. Run device inside PVC pipe to clear.</td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Rock drilled through - very slow drilling</td>
<td>30</td>
<td>FEREX 4.021 Sampled w/ 2&quot; sampler</td>
</tr>
<tr>
<td>-6</td>
<td>Silty sands (SP-SM), dark black w/ cobbles &amp; frags of basalt &amp; limestone (damp)</td>
<td>Second clearance. No detect - drilling ahead.</td>
<td>20</td>
<td>MW-1 5.0' - 6.0' Good recovery.</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>As above</td>
<td>0</td>
<td>7.5 ft Approx. water table</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Third clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts.</td>
<td>6</td>
<td>MW-2 Sample 10.0' - 11.5' Bottom part of sample is wet. Water table is approx. 7.5 ft.</td>
</tr>
<tr>
<td>-12</td>
<td>AA - wet</td>
<td>Fourth clearance. No detect - drilling ahead. Drilling smooth, below water table.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Fifth clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts</td>
<td>6</td>
<td>15.0' end of UXO clearance</td>
</tr>
</tbody>
</table>

**Vertical Hole No. ERDC MW-1**

**Size and Type of Bit:** 7" 3 way

**Datum for elevation shown:** MSL

**Date Started:** 9/19/02

**Completed:** 9/19/02

**Total Depth of Hole:** 35 ft

**Elevation ground water:** 7.5 ft
-16
Smooth drilling. No chattering. Sand (SP) w/ trace of basalt frags from cuttings rec. from auger.

-18

-20
Sand (SP) black w/ trace of basalt frags. (from auger), wet. Some clay (CL) present. Drilling smooth.

-22

-24
Sand (SP) from auger, wet w/ CL

-26
Drilling smooth

-28

-30
Sand (SP) from auger, wet, w/ CL

-32

-34
AA drilling smooth

Note: Smooth drilling from 15'-35' indicates sand with some CL present.
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Bentonite Pellet Seal (Minimum 2' Thick)

Bentonite Concrete Grout Backfill

Borehole Diameter (10'' Minimum)

#3 Sand

4'' Diameter PVC Schedule 40 Slotted Screen (0.020'' Slot Size)
WELL CONSTRUCTION PERMIT

ERDC-MW-1, Well No. 3113-02

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-1 (Well No. 3113-02) at Makua Military Reservation, Oahu, TMK 0-2-01-24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 821, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaiian Administrative Rules.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

5. The permittee, well operator, and/or well owner shall notify the State of Hawaii and the USGS of the commencement of any construction activities within the well site.

6. The permittee, well operator, and/or well owner shall comply with the standards for water well construction and testing as specified in the permit.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Photographs (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

8. The permittee, well operator, and/or well owner shall submit to the Chairperson a copy of the Department of Health's Safe Drinking Water Program's inspection report, if applicable.

9. The permittee, well operator, and/or well owner shall notify the State of Hawaii and the USGS of the date the well is ready for testing.

10. The permittee, well operator, and/or well owner shall submit to the Chairperson a copy of the Department of Health's Safe Drinking Water Program's inspection report, if applicable.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

12. The permittee, well operator, and/or well owner shall file with the Chairperson a copy of the Department of Health's Safe Drinking Water Program's inspection report, if applicable.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: 8/27/04
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: 11/14/2004
Printed Name: Mike Sibert Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
## WELL COMPLETION REPORT - PART I

**Well Construction**

*Instructions:* Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at [http://www.state.hi.us/dlnr/cwrm/](http://www.state.hi.us/dlnr/cwrm/).

### 1. State Well No.: 3113-03   Well Name: ERDC-MW-4A   Island: Oahu

### 2. Address: Makua Military Reservation   Tax Map Key: 8-2-01:24

### 3. Drilling Company: Valley Well Drilling

### 4. Drilling method used during construction:  
- [x] Rotary  
- [ ] Percussion  
- [ ] Other (describe)

### 5. Date Well Construction (drilled, cased, grouted) completed: 1/30/02  
*Fill out attached Driller's Log*

*In addition to the driller's log, if a geologic log was prepared, please submit with this form.*

### 6. Was the subject well cored?  
- [ ] Yes  
- [x] No

### 7. Initial water-level encountered ___ ft. below ground  
*Date and time of measurement:*

### 8. Step-Drawdown Test completed?  
- [ ] No  
- [x] Yes  
*Attach Step-Drawdown Test form (12/17/97 SDPTD Form)*

### 9. Constant Rate Aquifer Test completed?  
- [ ] No  
- [x] Yes  
*Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)*

### Parameters prior to pump test:

| 10. Water-level: 4.02 ft. above msl | Date and time of measurement: 4/3/2003 8:30 |
| 11. Chloride: 186 ppm | Date and time of sampling: 4/3/2003 12:00 |

### 13. Fill in the as-built section on the other side of this sheet.

### 14. Fill in attached surveyor’s report.

### 15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

### 16. The proposed manufacturer’s rated pump capacity is ___ gpm at a head of ___ ft.

### 17. Remarks: No pump installed. Well for sampling

---

**Licensed Driller (print)**  
Mike Sobz  
C-57 Lic. No. 21358

*Signature*  
[Signature]

*Date*  
11/3/04

**Permittee (print)**  
COL Floyd A. Quintana, DPW, USAG-HI

*Signature*  
[Signature]

*Date*  
9/7/04

[Form 9/12/01 Page 1 of 4]
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

Solid Casing Material:

- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200  □ API Spec. 5L  □ ASTM A53  □ ASTM A139
  - And compliant with (check one or more): □ ASTM A242  □ Type E  □ Type S  □ Grade B  □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells)  □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40  □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40  □ Schedule 80  □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200  □ API Spec. 5L  □ ASTM A53  □ ASTM A139
  - And compliant with (check one or more): □ ASTM A242  □ Type E  □ Type S  □ Grade B  □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells)  □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40  □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40  □ Schedule 80  □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296

*msl = mean sea level

HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.
<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Fine sand (SM) Brown fill?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance, no detect OA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>Sand (SP)</td>
<td>White, brown calcareous, well rounded, paleo-beach sand. Well sorted, coarse grained.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Second clearance</td>
<td>10</td>
<td>Sampled w/ 2&quot; sampler from 5.0' to 6.5' Sand (SP)</td>
</tr>
<tr>
<td>-8</td>
<td>A.A. (cuttings)</td>
<td></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Third clearance/NT/OA</td>
<td>7</td>
<td>Sampled w/ 2&quot; sampler from 10.0' to 11.5' Sand (SP) w/ sorted, white, coarse grained</td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Fourth clearance/NT/OA</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Sand (SP) A/A, white to brown (cuttings)</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fifth clearance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drilling Log**

**Makua Military Reservation**

Drilling agency: Valley Drilling

Name of Driller: John Surtigad

Manufacturer's designation of drill: Mobile B-90

Total No. of overburden samples taken: Disturbed 2

GPS Coord. N 21 deg 31.734", W 158 deg 13.570'

**Depth**

**Lithology**

**Description**

**Blow Counts**

**Comments**

**Vertical Hole No.** ERDC MW-4A

Size and Type of Bit: 7" 3 way

Datum for elevation shown: MSL

Date Started: 9/20/02

Completed: 9/20/02

Total Depth of Hole: 45 ft

Elevation ground water: 16.9'
-16 | SC: LL - 16-20 counts (only background)  
-18 | 16.9' Water Table  
-18 | Sand (SP) A/A  
-20 | Sand (SP) White to brown, well-sorted, coarse grained, wet (auger cutting)  
-22 | Sand (SP) AA (cuttings)  
-24 | Sand (SP) AA (cuttings)  
-26 | Sand (SP) AA (cuttings)  
-28 | Sand (SP) AA (cuttings)  
-30 | Sand (SP) AA (cuttings)  
-32 | Sand (SP) AA (cuttings)  
-34 | Sand (SP) AA (cuttings)  
-36 | Sand (SP) AA (cuttings)

Note: Drilling ahead to 20.0'- let hole set for 20 minutes to see if water comes back into hole. Measured 16.9' w/ electrical tape.

HNU - 0.9 ppm  
SC: LL 18-20 counts (only background)
## Well Number: 3113-03

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3.5</td>
<td>Fine brown sand</td>
<td>9/20/02</td>
</tr>
<tr>
<td>3.5 to 20</td>
<td>Sand, white with brown calcareous fragments, paleo beach sand.</td>
<td>9/20/02</td>
</tr>
<tr>
<td>20 to 45</td>
<td>Sand, white to brown, well-sorted</td>
<td>9/20/02</td>
</tr>
</tbody>
</table>

### Remarks:

- Remarks: **DL Form 06/24/2004**
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Elevation = 19.3 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Borehole Diameter (10" Minimum)

Water Level

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates

Well MW-4A (3113-03)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 44”  Longitude (W) 158° 13’ 34”

Ground Elevation: 19.25 feet

Top of Casing Elevation: 22.23 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-4A, Well No. 3113-03

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4A (Well No. 3113-03) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 11/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water: the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997: HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: _____________
Printed Name: ________ OL Floyd A. Quintana ________ Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: _____________
Printed Name: ________ Mike Solay ________ C-57 License #: 21358
Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
State of Hawaiʻi
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
WELL COMPLETION REPORT - PART I
Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. State Well No.: 3113-04 Well Name: ERDC-MW-4B Island: Oahu
2. Address: Makua Military Reservation Tax Map Key: 8-2-01:24
3. Drilling Company: Valley Well Drilling
4. Drilling method used during construction: Rotary
5. Date Well Construction (drilled,cased,grouted) completed: 9/21/02
6. Was the subject well cored? Yes
7. Initial water-level encountered Date and time of measurement: 9/21/02 9:50
8. Step-Drawdown Test completed? Yes
9. Constant Rate Aquifer Test completed? Yes
10. Water-level: 4.02 ft. above msl Date and time of measurement: 4/15/03 9:30
11. Chloride: 168 ppm Date and time of sampling: 4/15/03 16:00
12. Temperature: 78 °F Date and time of measurement: 4/15/03 16:10
13. Fill in the as-built section on the other side of this sheet.
14. Fill in attached surveyor's report.
15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)
16. The proposed manufacturer's rated pump capacity is gpm at a head of ft.
17. Remarks: No pump installed. Well for sampling

Licensed Driller (print) Mike Saber C-57 Lic. No. 21358
Signature Date 11/16/04

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI
Signature Date 10/31/04
13. **AS-BUILT WELL SECTION** (Please attach as-built if different from diagram provided below)

- **Elevation at top of casing**: ____ ft., msl* (to nearest 0.01 ft.)
- **Bench mark elevation**: ____ ft., msl* (Survey to nearest 0.01 ft.)
- **Cement Grout**: _____ ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)
- **Annular space between hole and casing (min.3")**: ____ in.
- **Rock or Gravel Packing**: _____ ft. Material:
  - Crushed Basalt
  - Rounded Gravel
- **Water Level Elevation**: _____ ft., msl*

---

**Solid Casing Material:**

- **Carbon Steel**: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - And compliant with (check one or more):
    - ASTM A242
    - Type E
    - Type S
    - Grade B
    - Other
- **Stainless Steel**: (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)
- **ABS Plastic** conforming to ASTM F480 and ASTM D1527: (check one):
  - Schedule 40
  - Schedule 80
- **PVC Plastic** conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- **Thermoset Plastic**: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

---

**Open Casing Material:**

- **Carbon Steel**: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - And compliant with (check one or more):
    - ASTM A242
    - Type E
    - Type S
    - Grade B
    - Other
- **Stainless Steel**: (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)
- **ABS Plastic** conforming to ASTM F480 and ASTM D1527: (check one):
  - Schedule 40
  - Schedule 80
- **PVC Plastic** conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- **Thermoset Plastic**: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

---

**Solid Casing:** (≥ 90% x (Ground Elev.-Water Level Elev))

- **Length**: 45 ft.
- **Nominal Diameter**: 4 in.
- **Wall Thickness**: 0.237 in.
- **Bottom Elevation**: -25.73 ft., msl*

**Open Casing**: □ Perforated □ Screen

- **Length**: 25 ft.
- **Nominal Diameter**: 4 in.
- **Wall Thickness**: 0.237 in.
- **Bottom Elevation**: -50.73 ft., msl*

**Open Hole**

- **Length**: 0 ft.
- **Diameter**: ________ in.
- **Bottom Elevation**: ________ ft., msl*

---

*msl = mean sea level

---

Please refer to the **HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS** to ensure that your as-built is in compliance with applicable standards.

---

WCR1 Form 9/12/01 Page 1 of 4
# DRILLER'S LOG

**Well Number:** 3113-04

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>Fine sand, brown</td>
<td>9/21/02</td>
</tr>
<tr>
<td>5 to 70</td>
<td>Sand, brown to white, well sorted</td>
<td>9/21/02</td>
</tr>
</tbody>
</table>

## Remarks:

---

**For Official Use Only:**

RECEIVED

04 DEC 2004

---

**DL Form 06/24/2004**
# Geologic Log
## Well No. 3113-04

### Drilling Log
- **Makua Military Reservation**
- **Drilling agency:** Valley Drilling
- **Name of Driller:** John Suriaad
- **Manufacturer's designation of drill:** Mobile B-90
- **GPS Coord.:** N 21 deg. 31.742' W 156 deg. 57.3' (Acc. 19')

### Vertical Hole No.
- **Vertical Hole No.:** ERDC MN-4B
- **Size and Type of Bit:** 7" 3 way
- **Datum for elevation shown:** MSL
- **Completed:** 9/20/02
- **Total Depth of Hole:** 70 ft
- **Elevation ground water:** 16.8'

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Fine sand (SM) brown. Fill?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance. ND/DA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>End of fill. Sand (SP) brown to white. Very well sorted.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Second clearance. ND/DA. Sand (SP) cuttings.</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Third clearance. HNU: 0 ppm SC: LL: 18-20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Fourth clearance. ND/DA. Sand (SP) Brown to white (cuttings).</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Fifth clearance. HNU: 0 ppm SC: LL: 18-20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Sand (SP) A/A. Water table at 16.8'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td></td>
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<tr>
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</tr>
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<td>-26</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table Notes:
- HNU: 0 ppm SC: LL: 18-20 counts (background)
- Sampled with 2" D.T.
- Sand (SP)
- Note: Drilled hole to 20', let set 20 min to check water level.
- HNU: 0 ppm SC: LL: 18-20 counts
- Sampled with 2" D.T.
- Sand (SP)
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-32</td>
<td>Sand (SP) (cuttings)</td>
</tr>
<tr>
<td>-34</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-36</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-38</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-40</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-42</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-44</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-46</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-48</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-50</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-52</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-54</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-56</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-58</td>
<td>Rock at 59 to 60°, then back into sand (SP) A/A</td>
</tr>
<tr>
<td>-60</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-62</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-64</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-66</td>
<td>Not as hard, last two feet.</td>
</tr>
</tbody>
</table>

Note: Removed hard black material from auger bit.
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Elevation = 19.3 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Borehole Diameter (10" Minimum)

Bentonite Concrete Grout Backfill

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates

Well MW-4B (3113-04)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31' 44"
Longitude (W) 158° 13' 34"

Ground Elevation: 19.27 feet
Top of Casing Elevation: 22.16 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4B (Well No. 3113-04) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pumping worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI
Date: 09/23/02

Driller's Signature: Mike Sober
C-57 License #: AR1358
Date: 11/16/04
Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.
1. State Well No.: 3113-05  
Well Name: ERDC-MW-4C  
Island: Oahu

2. Address: Makua Military Reservation  
Tax Map Key: 8-2-01:24

3. Drilling Company: Valley Well Drilling

4. Drilling method used during construction:  
   □ Rotary  □ Percussion  □ Other (describe)

5. Date Well Construction (drilled, cased, grouted) completed: 12/01/02  
   Fill out attached Driller's Log

6. Was the subject well cored?  
   □ Yes  □ No

7. Initial water-level encountered: 15 ft. below ground  
   Date and time of measurement: 12/03/02 16:30

8. Step-Drawdown Test completed?  
   □ Yes  □ No  
   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. Constant Rate Aquifer Test completed?  
   □ Yes  □ No  
   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:
10. Water-level: 4.05 ft. above msl  
    Date and time of measurement: 4/3/03 16:00

11. Chloride: 1800 ppm  
    Date and time of sampling: 4/3/03 15:00

12. Temperature: 75°F  
    Date and time of measurement: 4/4/03 15:30

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is ________ gpm at a head of ________ ft.

17. Remarks: No pump installed, well for sampling

Licensed Driller (print) Mike Salim  
C-57 Lic. No. 21358

Signature  
Date 1/6/04

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI

Signature  
Date 1/7/04
13. AS-BUILT WELL SECTION

(Please attach as-built if different from diagram provided below)

Bench mark elevation:
________ ft., msl*
(Survey to nearest 0.01 ft.)

Elevation:
Bench mark (Survey to nearest 0.01 ft.)

Cement Grout: 68 ft.
(min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min.3”):
3 in.

Rock or Gravel Packing:
32 ft.
Material:
☐ Crushed Basalt
☒ Round Gravel

Water Level Elevation:
4.05 ft., msl*

Total Depth: 100 ft.

Solid Casing Material:

Carbon Steel: compliant with (check one or more): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139
And compliant with (check one or more): ☐ ASTM A242 ☐ Type E ☐ Type S ☐ Grade B ☐ Other
Stainless Steel: (check one): ☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) ☒ Schedule 40 ☐ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 120
Thermoset Plastic: (check one)
☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

Carbon Steel: compliant with (check one or more): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139
And compliant with (check one or more): ☐ ASTM A242 ☐ Type E ☐ Type S ☐ Grade B ☐ Other
Stainless Steel: (check one): ☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) ☒ Schedule 40 ☐ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 120
Thermoset Plastic: (check one)
☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

Solid Casing:

Length: 70 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.337 in.
Bottom Elevation: -50.29 ft., msl

Open Casing: ☐ Perforated ☐ Screen
Length: 30 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.337 in.
Bottom Elevation: -90.49 ft., msl
**DRILLER'S LOG**

**Well Number:** 3113

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 55</td>
<td>Sand, brown clayey, silty, sand, loose from cutting. Smooth drilling</td>
<td>12/03/02</td>
</tr>
<tr>
<td>55 to 66</td>
<td>Dark brown sandy, silty clay and basaltic rock</td>
<td>12/03/02</td>
</tr>
<tr>
<td>66 to 92</td>
<td>Dark brown sandy few, silty clay, few basaltic fine to coarse gravel</td>
<td>12/04/02</td>
</tr>
<tr>
<td>92 to 105</td>
<td>Dark brown sandy, silty, clay, few basaltic fine to coarse gravel</td>
<td>12/04/02</td>
</tr>
</tbody>
</table>

**Remarks:**

**For Official Use Only:**

**Date:** 04 DEC 2 14:30

**COMMISSION ON WATER RESOURCE MANAGEMENT**

**Department of Land and Natural Resources**

**DL Form 06/24/2004**
### Drilling Log

**Makua Military Reservation**

**Date Started:** 12/04/02  
**Completed:**  
**Total Depth of Hole:** 105 ft  
**Elevation ground water:** 15' bgs

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 0     | (SC) Brown, clayey, silty, sand, loose, from cuttings. Smooth drilling. | Drilling performed initially using 6" diameter hollow stem auger to facilitate UXO clearance. UXO clearance conducted every 3' down to 21' bgs. HNU and scintillator readings taken on drill cuttings at the same time as UXO clearances (every 3 feet). HNU - 8.0  
| -2    |           | Approximate water table. |            |  
| -4    |           | End UXO clearance |            |  
| -6    | (SC) Brown, clayey, silty, sand w/ trace line to coarse basaltic gravel from drill cuttings. | 36' bgs encountered cavities or void, slow drilling due to borehole instability and drilling mud loss. |
(CL) Dark brown sandy, silty, clay and basaltic rock.

Basaltic rock layer, hard @ appx. 66' to 92' bgs.

(CL) Dark brown sandy, silty, clay, few basaltic fine to coarse gravel.

Overdrilled to 105' bgs. Bottom of well casing set at appx. 100' bgs.
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Borehole Diameter (10" Minimum)

Bentonite Concrete Grout Backfill

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Elevation = 19.7 ft.
Monitoring Well Coordinates

Well MW-4C (3113-A) 05

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 44”  Longitude (W) 158° 13’ 34”

Ground Elevation: 19.71 feet

Top of Casing Elevation: 22.67 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-4C, Well No. 3113-05

Note: This permit shall be prominently displayed at the site until the work is completed.

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4C (Well No. 3113-05) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPS). If the HWCPS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon request, showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ___________________________
Printed Name: Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: ___________________________
Printed Name: Mike Sobr Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C:

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
### State Well No.:

3113-06  

### Well Name:

ERDC-MW-5  

### Island:

Oahu  

### Address:

Makua Military Reservation  

### Tax Map Key:

8-2-01:20  

### Drilling Company:

Valley Well Drilling  

### Drilling method used during construction:

- Rotary  
- Percussion  
- Other (describe)  

### Date Well Construction (drilled, cased, grouted) completed:

1/1/02  

### Initial water-level encountered:

32 feet below ground  

### Date and time of measurement:

1/9/02, 8:00  

### Step-Drawdown Test completed?

No  

### Constant Rate Aquifer Test completed?

No  

### Parameters prior to pump test:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Date of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-level</td>
<td>15.35 feet above msl</td>
<td>4/3/2003, 10:30</td>
</tr>
<tr>
<td>Chloride</td>
<td>152 ppm</td>
<td>4/1/2003, 10:30</td>
</tr>
<tr>
<td>Temperature</td>
<td>79°F</td>
<td>4/1/2003, 14:00</td>
</tr>
</tbody>
</table>

### Fill in the as-built section on the other side of this sheet.

### Remarks:

No pump installed. Well for sampling.
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25</td>
<td>Dark brown clayey silt to silty clay. Few basaltic rocks</td>
<td>12/04/02</td>
</tr>
<tr>
<td>25 to 55</td>
<td>Basaltic rock layers mixed with dark brown clayey silt.</td>
<td>12/04/02</td>
</tr>
<tr>
<td>55 to 110</td>
<td>Dark brown clayey silt.</td>
<td>12/04/02</td>
</tr>
<tr>
<td>110 to 210</td>
<td>Brown clayey silt, void of boulders of basaltic rock pieces.</td>
<td>12/05/02</td>
</tr>
<tr>
<td>140 to 210</td>
<td>Light brown clayey silt</td>
<td>12/05/02</td>
</tr>
<tr>
<td>220 to 260</td>
<td>Fine grained silty sand. Very fine grained, poorly sorted.</td>
<td>12/05/02</td>
</tr>
<tr>
<td>260 to 303</td>
<td>Fine grained silty sand. Some clay lenses, very thin. Light brown</td>
<td>12/06/02</td>
</tr>
<tr>
<td>303 to 360</td>
<td>Clayey gravel. Loose gravel 2-5 cm in size. Well-rounded, poorly sorted</td>
<td>12/06/02</td>
</tr>
</tbody>
</table>

Remarks:
### Drilling Log

**Well No. 3113-06**

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Manufacturer's designation of drill:** Mobile B-90

**Name of Driller:** John Suriaad

**Total No. of overburden samples taken:** Disturbed 0, Undisturbed 0

**Vertical Hole No.:** ERDC MW-5

**Size and Type of Bit:** 10" Tri-cone, Mud rotary

**Datum for elevation shown:** MSL - 235.36'

**Date Started:** 12/04/02

**Completed:**

**Total Depth of Hole:** 360 ft

**Elevation ground water:** 15' bgs

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td></td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-40</td>
<td></td>
<td>Drilled through rock layers mixed with dk brown clayey silt (ML)., dry.</td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-50</td>
<td></td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-60</td>
<td></td>
<td>(ML) dk brown clayey silt, dry.</td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-70</td>
<td></td>
<td>Drilling smooth.</td>
<td>Air rotary drilling.</td>
<td></td>
</tr>
<tr>
<td>-80</td>
<td></td>
<td>(ML) Dk brown clayey silt, dry.</td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-90</td>
<td></td>
<td>Drilling smooth.</td>
<td>Air rotary drilling. Air volume 1,000</td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(ML) Brown clayey silt. Drilling smooth.


Same as above.

(ML) Light brown clayey silt.

(SM) Fine grained silty sand. Very fine grained, poorly sorted.
**Fine grained silty sand.** Some clay lenses, very thin. Light brown in color. Poorly sorted. Same as above.

**Silty gravels.** Gravel size 1-2 cm. Some silt matrix, appx. 25%. Poorly sorted. Same as above.

**Clayey gravel.** Loose gravel 2-5 cm in size. Well-rounded, poorly sorted. Some clay matrix, 10-15%. Same as above.

<table>
<thead>
<tr>
<th>Scintillator</th>
<th>HNU</th>
<th>Scintillator</th>
<th>HNU</th>
<th>Scintillator</th>
<th>HNU</th>
<th>Scintillator</th>
<th>HNU</th>
<th>Scintillator</th>
<th>HNU</th>
<th>Scintillator</th>
<th>HNU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scintillator</td>
<td>31.4</td>
<td>Scintillator</td>
<td>31.8</td>
<td>Scintillator</td>
<td>34.6</td>
<td>Scintillator</td>
<td>31.0</td>
<td>Scintillator</td>
<td>31.7</td>
<td>Scintillator</td>
<td>31.4</td>
</tr>
</tbody>
</table>
Monitoring Well Coordinates

Well MW-5 (3113-06)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on December 12, 2002

Latitude (N): 21° 31’ 42”   Longitude (W) 158° 12’ 43”

Ground Elevation: 235.40 feet

Top of Casing Elevation: 235.22 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation
Title: Monitoring Well Locations

ERDC-MW-2
ERDC-MW-3A, B, C
ERDC-MW-4A, B, C
ERDC-MW-1
Makua (Site)
WELL CONSTRUCTION PERMIT
ERDC-MW-5, Well No. 3113-06

Note: This permit shall be prominently displayed at the site until the work is completed.

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-5 (Well No. 3113-06) at Makua Military Reservation, Oahu, TMK 8-2-01:20, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: October 28, 2002
Expiration Date: October 28, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: [Signature]
Date: 10/28/02

Printed Name: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: [Signature]
Date: 11/14/04

Printed Name: Mike Saber
Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment:

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
State of Hawaii, Department of Land and Natural Resources
# State of Hawaii
## COMMISSION ON WATER RESOURCE MANAGEMENT
### Department of Land and Natural Resources

### WELL COMPLETION REPORT - PART I

#### WELL CONSTRUCTION

**Instructions:** Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission does not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at [http://www.state.hi.us/dlnr/cwrm/](http://www.state.hi.us/dlnr/cwrm/).

<table>
<thead>
<tr>
<th>1. State Well No.: 3213-08</th>
<th>Well Name: ERDC-MW-2</th>
<th>Island: Oahu</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Address: Makua Military Reservation</td>
<td>Tax Map Key: 8-1-01:2</td>
<td></td>
</tr>
<tr>
<td>3. Drilling Company: Valley Well Drilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Drilling method used during construction:</td>
<td>Rotary</td>
<td>Percussion</td>
</tr>
<tr>
<td>5. Date Well Construction (drilled, cased, grouted) completed: 10/10/02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_In addition to the driller's log, if a geologic log was prepared, please submit with this form._

| 6. Was the subject well cored? | Yes | No |
| 7. Initial water-level encountered: 11.7 ft. below ground | Date and time of measurement: 10/10/02 9:45 |
| 8. Step-Drawdown Test completed? | No | Yes |
| 9. Constant Rate Aquifer Test completed? | No | Yes |

Parameters prior to pump test:

| 10. Water-level: 4.99 ft. above msl | Date and time of measurement: 10/11/02 10:15 |
| 11. Chloride: 231 ppm | Date and time of sampling: 11/10/02 11:19 |
| 12. Temperature: 80°F | Date and time of measurement: 11/10/02 11:19 |

13. **Fill in the as-built section on the other side of this sheet.**

14. **Fill in attached surveyor's report.**

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is __________ gpm at a head of _______ ft.

17. Remarks: **No pump installed. Well is for sampling only.**

---

**Licensed Driller (print):** Mike Sober  
**C-57 Lic. No.:** 21358  
**Signature:**  
**Date:** 11/16/04

**Permittee (print):** COL Floyd A. Quintana, DPW, USAG-HI  
**Signature:**  
**Date:** 01/06/04

---

_WCR1 Form 9/12/01 Page 1 of 4_
13. AS-BUILT WELL SECTION

(Please attach as-built if different from diagram provided below)

Bench mark elevation:
____ ft., msl*
(Survey to nearest 0.01 ft.)

Cement Grout: __________ ft.
(min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min.3"):
3 in.

Rock or Gravel Packing:
31.5 ft.
Material:
□ Crushed Basalt
□ Rounded Gravel

Water Level Elevation:
4.19 ft., msl*

Solid Casing: (≥ 90% x [Ground Elev.-Water Level Elev.])
Length:
6 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: 4.81 ft., msl

Open Casing:
□ Perforated
□ Screen
Length:
29 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: -24.11 ft., msl

Open Hole: Filled with gravel
Length:
1 ft.
Diameter: 10 in.
Bottom Elevation: -25.9 ft., msl

*msl = mean sea level

Solid Casing Material:
Carbon Steel: compliant with (check one or more):
□ ANSI/AWWA C200
□ API Spec. 5L
□ ASTM A53
□ ASTM A139
And compliant with (check one or more):
□ ASTM A242
□ Type E
□ Type S
□ Grade B
□ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells)
□ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one):
□ Schedule 40
□ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one):
□ Schedule 40
□ Schedule 80
□ Schedule 12
Thermoset Plastic: (check one):
□ Filament Wound Resin Pipe conforming to ASTM D2996
□ Centrifugally Cast Resin Pipe conforming to ASTM D2997
□ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
Carbon Steel: compliant with (check one or more):
□ ANSI/AWWA C200
□ API Spec. 5L
□ ASTM A53
□ ASTM A139
And compliant with (check one or more):
□ ASTM A242
□ Type E
□ Type S
□ Grade B
□ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells)
□ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one):
□ Schedule 40
□ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one):
□ Schedule 40
□ Schedule 80
□ Schedule 12
Thermoset Plastic: (check one):
□ Filament Wound Resin Pipe conforming to ASTM D2996
□ Centrifugally Cast Resin Pipe conforming to ASTM D2997
□ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

[Diagram showing well section details]
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1.5</td>
<td>Silty sand, with basalt fragments</td>
<td>10/09/02</td>
</tr>
<tr>
<td>1.5 to 25</td>
<td>Clay, black, slight sand, basalt frags</td>
<td>10/09/02</td>
</tr>
<tr>
<td>25 to 30.5</td>
<td>Clay, slightly sandy, basalt frags</td>
<td>10/09/02</td>
</tr>
<tr>
<td>30.5 to 35</td>
<td>Lean clay, some sand.</td>
<td>10/09/02</td>
</tr>
</tbody>
</table>

Remarks:
## Drilling Log

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Name of Driller:** John Surfaced

**Manufacturer's designation of drill:** Mobile B-90

**Total No. of overburden samples taken:** Disturbed 3

**GPS Coord., N 21 deg. 32.063' W 158 deg. 13.13.694'**

**Vertical Hole No.** ERDC MW-2

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Silty sand (SM), black, slightly sandy w/ basalt frags.</td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>background counts 18-20 ppm</td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td>Clay (CL) Black, sl. sandy, basalt frags.</td>
<td>10</td>
<td>Lean clay (CL) dark gray w/ silt</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance. No detect - drilling ahead.</td>
<td>20</td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
</tr>
<tr>
<td>-3</td>
<td></td>
<td>Second clearance. No detect - drilling ahead.</td>
<td>10</td>
<td>Lean clay (CL) dark gray w/ silt</td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Third clearance. No detect - drilling ahead.</td>
<td>20</td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
</tr>
<tr>
<td>-5</td>
<td></td>
<td>Fourth clearance. No detect - drilling ahead.</td>
<td>10</td>
<td>Lean clay (CL) dark gray w/ sand/silts. Inclusions and lenses.</td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Fifth clearance. No detect - drilling ahead.</td>
<td>20</td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
</tr>
<tr>
<td>-7</td>
<td></td>
<td>11.7' (Approx. water table)</td>
<td>6</td>
<td>11.7' (Approx. water table)</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-9</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-11</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-13</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
<tr>
<td>-15</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18-20 counts</td>
<td>6</td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Tareas as basalt frag.</td>
</tr>
</tbody>
</table>
Sixth clearance. No detect - drilling ahead.

Seventh clearance (final). No detect - drilling ahead.

Lean clay, slightly sandy. Dark gray, trace basalt frags. (auger cuttings).

Rock and rock frags (recovered basalt frags).

Lean clay (CL) A/A more sandy (auger cuttings).

HNU - 0 ppm  SC:LL - 15-20 counts

HNU - 0 ppm  SC:LL - 18-20 counts
Monitoring Well Coordinates

Well MW-2 (3213-08)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 32' 04"
Longitude (W) 158° 13' 42"

Ground Elevation: 10.81 feet
Top of Casing Elevation: 13.59 feet

Coordinates are referred to the North American Datum of 1983 (NAD83) /
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT

ERDC-MW-2, Well No. 3213-08

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-2 (Well No. 3213-08) at Makaua Military Reservation, Cahu, TMK 8-1-012, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: [Signature]
Date: [Date]

Printed Name: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: [Signature]
C-57 License #: [License #] Date: [Date]

Printed Name: Mike Sober
Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
1. State Well No.: **3213-09**  
   Well Name: **ERDC-MW-3A**  
   Island: **Oahu**

2. Address: **Makua Military Reservation**  
   Tax Map Key: **8-1-01-3**

3. Drilling Company: **Valley Well Drilling**

4. Drilling method used during construction:  
   - ☐ Rotary  
   - ☐ Percussion  
   - ☐ Other (describe)

5. Date Well Construction (drilled, cased, grouted) completed: **10/14/2002**  
   Fill out attached Driller's Log

   In addition to the driller's log, if a geologic log was prepared, please submit with this form.

6. Was the subject well cored?  
   - ☐ Yes  
   - ☐ No

7. Initial water-level encountered:  
   - 17 ft. below ground  
   Date and time of measurement: **10/14/2002 10:00**

8. Step-Drawdown Test completed?  
   - ☐ Yes  
   - ☐ No  
   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. Constant Rate Aquifer Test completed?  
   - ☐ Yes  
   - ☐ No  
   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:

10. Water-level:  
    - 3.81 ft. above msl  
    Date and time of measurement: **4/1/2003 11:00**

11. Chloride:  
    - 55 ppm  
    Date and time of sampling: **4/1/2003 11:30**

12. Temperature:  
    - 80°F  
    Date and time of measurement: **4/1/2003 11:30**

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is _______ gpm at a head of _______ ft.

17. Remarks: **No pump installed. Well is for sampling**

---

**Licensed Driller (print):** **Mike Sober**  
C-57 Lic. No.: **21358**

**Signature:**  
**Date:** **11/16/04**

**Permittee (print):** **COL Floyd A. Quintana, DPW, USAG-HI**

**Signature:**  
**Date:** **08/27/04**
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

Elevation at top of casing ______ ft., msl*
(Hole Diameter: 10 in.)

Bench mark elevation: ______ ft., msl*
(Survey to nearest 0.01 ft.)

Cement Grout: ______ ft. (min. 70% of distance from
ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min.3"): _____ in.

Rock or Gravel Packing: ______ ft.
Material: 
- Crushed Basalt
- Rounded Gravel

Water Level Elevation: ______ ft., msl*

Total Depth ______ ft.

Minimum of 2' Radius & 4' Thick Concrete Pad

Ground Elevation: ______ ft., msl

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev))
- Length: ______ ft.
- Nominal Diameter: ______ in.
- Wall Thickness: ______ in.
- Bottom Elevation: ______ ft., msl

Open Casing: Perforated ______ Screen
- Length: ______ ft.
- Nominal Diameter: ______ in.
- Wall Thickness: ______ in.
- Bottom Elevation: ______ ft., msl

Open Hole: ______
- Length: ______ ft.
- Diameter: ______ in.
- Bottom Elevation: ______ ft., msl

*msl = mean sea level

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  - And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  - And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296
Well Number: 3213-09

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20</td>
<td>Dark brown sandy clayey silt few basaltic fragments</td>
<td>10/14/2002</td>
</tr>
<tr>
<td>20 to 45</td>
<td>Brown clayey silty sand, trace basaltic fine pebbles</td>
<td>10/14/2002</td>
</tr>
</tbody>
</table>

Remarks:
Geologic Log
Well No. 3213-09

Drilling Log

Makua Military Reservation
Drilling agency: Valley Drilling
Name of Driller: John Suriaad
Manufacturer's designation of drill: Mobile B-90
Date Started: 10/14/02
Completed: 10/14/02

Total No. of overburden samples taken: Disturbed 3

Undisturbed

Vertical Hole No. ERDC MW-3A
Size and Type of Bit: 10'-dia Hollow Stem Auger
Datum for elevation shown: MSL (approx. 20')

Total Depth of Hole: 45 ft
Elevation ground water: 17' bgs

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML Dark brown clayey silt with few basaltic gravel fragments (dry) (loose)</td>
<td>#1</td>
<td>HNU - 0 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>SC: LL - 17-20, background</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td>UXO clearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td>Sample w/ 2&quot; dia split spoon sampler. 140 lb. hammer. Sample ID: MMRSSNW-3A-5.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>HNU - 0 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td>SC: LL - 20-30, background</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td>2nd UXO clearance at 6' bgs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>#2</td>
<td>3rd UXO clearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>Sample w/ 2&quot; dia split spoon sampler. 140 lb. hammer. Sample ID: MMRSSNW-3A-10.0' Sampler refusal 41'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>4th UXO clearance. HNU - 0 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>SC: LL 20-35, background</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>Sample w/ 2&quot; dia split spoon sampler. 140 lb. hammer. Rock in sample shoe. Low recovery</td>
</tr>
</tbody>
</table>
Approx. depth to water table: 17 ft bgs

SC-SM Brown clayey silty sand, trace basaltic fine pebbles (wet) (soft)

SC-SM Brown clayey silty sand w/ trace fine pebbles

Drilling smooth

SC Brown clayey silty sand, trace fine pebbles

HNU - 0 ppm
SC-LL - 17-30, background.

5th UXO clearance 18' bgs
End UXO clearance

From drill cutting

From drill cutting

From drill cutting
Steel, cement filled pickets (1 of 3)  

Concrete Surface Seal

Elevation = 19.1 ft.

Borehole Diameter (10" Minimum)

Water Level

Bentonite Pellet Seal (Minimum 2' Thick)

Bentonite Concrete Grout Backfill

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

Title: Well Construction Log ERDC-MW-3A

US Army Corps of Engineers

For: U.S. Army Garrison Hawaii Proj: Makua Military Reservation

DR BY: RSS 01-30-04

CHK BY: SJT 01-30-04
Monitoring Well Coordinates

Well MW-3A (3213-09)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki (Surveyors Lic. #10059)

Surveyed on June 30, 2003

Latitude (N): 21° 31' 52"
Longitude (W) 158° 13' 36"

Ground Elevation: 19.11 feet

Top of Casing Elevation: 22.02 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
Title: Monitoring Well Locations

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

FIGURE NO: 2.16
WELL CONSTRUCTION PERMIT

ERDC-MW-3A, Well No. 3213-09

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-3A (Well No. 3213-09) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 ¼-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiry Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: 10/7/02

Printed Name: SOL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ C-57 License #: 31538 Date: 11/14/04

Printed Name: Mike Robor Firm or Title: Valley Well Driling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

C: USGS

Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches

Honolulu Board of Water Supply
# WELL COMPLETION REPORT - PART I
## Well Construction

**Instructions:** Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at [http://www.state.hi.us/dlnr/cwrm/](http://www.state.hi.us/dlnr/cwrm/).

### 1. State Well No.: 3213-10  
**Well Name:** ERDC-MW-3B  
**Island:** Oahu

### 2. Address: Makua Military Reservation  
**Tax Map Key:** 8-1-01:1

### 3. Drilling Company: Valley Well Drilling

### 4. Drilling method used during construction:  
- [x] Rotary  
- [ ] Percussion  
- [ ] Other (describe)

### 5. Date Well Construction (drilled, cased, grouted) completed:  
*10/14/02*  
Fill out attached Driller's Log

In addition to the driller's log, if a geologic log was prepared, please submit with this form.

### 6. Was the subject well cored?  
- [ ] Yes  
- [x] No

### 7. Initial water-level encountered  
15 ft. below ground  
**Date and time of measurement:**  
*4/3/2003 9:20  
month/day/year time*

### 8. Step-Drawdown Test completed?  
- [ ] No  
- [x] Yes  
Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

### 9. Constant Rate Aquifer Test completed?  
- [ ] No  
- [x] Yes  
Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

### Parameters prior to pump test:

#### 10. Water-level:  
3.78 ft. above msl  
**Date and time of measurement:**  
*4/3/2003 13:30  
month/day/year time*

#### 11. Chloride:  
39 ppm  
**Date and time of sampling:**  
*4/3/2003 13:50  
month/day/year time*

#### 12. Temperature:  
75 °F  
**Date and time of measurement:**  
*4/3/2003 14:00  
month/day/year time*

### 13. Fill in the as-built section on the other side of this sheet.

### 14. Fill in attached surveyor's report.

### 15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

### 16. The proposed manufacturer's rated pump capacity is _____ gpm at a head of _____ ft.

### 17. Remarks:  
No pump installed, well for sampling

---

**Licensed Driller (print):** Mike Sobre  
**C-57 Lic. No.:** 21358

**Signature**  
**Date:** 11/16/04

**Permittee (print):** COL Floyd A. Quintera, DPW, USAG-HI

**Signature**  
**Date:** 12/12/04

---

For Official Use Only:

**WCR1 Form 9/12/01 Page 1 of 4**
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

- Elevation at top of casing (to nearest 0.01 ft.)
- Hole Diameter: 10 in.
- Minimum of 2' Radius & 4" Thick Concrete Pad
- Ground Elevation: ______ ft., msl*

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one) □ Filament Wound Resin Pipe conforming to ASTM D2996
- Centrally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one) □ Filament Wound Resin Pipe conforming to ASTM D2996
- Centrally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

*msl = mean sea level

WCR1 Form 9/12/01 Page : of 4
### DRILLER'S LOG

**Well Number:** 3213-10

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 16</td>
<td>Dark brown sandy clayey silt</td>
<td>10/16/02</td>
</tr>
<tr>
<td>16 to 60</td>
<td>Brown clayey silty sand</td>
<td>10/16/02</td>
</tr>
<tr>
<td>60 to 62</td>
<td>Black silty sandy clay with trace basaltic pebbles</td>
<td>10/16/02</td>
</tr>
<tr>
<td>62 to 70</td>
<td>Basaltic boulders. Slow drilling</td>
<td>10/18/02</td>
</tr>
</tbody>
</table>

**Remarks:**

**For Official Use Only:**

DL Form 06/24/2004
Drilling Log
Well 3213-10

Makua Military Reservation

Drilling agency: Valley Drilling
Name of Driller: John Suriaad
Manufacturer's designation of drill: Mobile B-90

Total No. of overburden samples taken: Disturbed 3
Total Depth of Hole: 70 ft
Elevation ground water: 4' (16' bgs)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel (dry) (loose) (ill)</td>
<td>12 26 30</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-2</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense)</td>
<td>25 40</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-4</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel fragments (dry) (medium dense to dense)</td>
<td>20</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-6</td>
<td>ML-SC</td>
<td>Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense)</td>
<td>15 25</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Approx. water table at 16' bgs</td>
<td>75</td>
<td>End UXO clearance</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Drilling smooth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-12</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td></td>
<td>Drilling smooth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HNU - 0
SC:LL - 19 to 31, BG

Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
Sample ID: MMRSSMW-3B-5.0
HNU - 0
SC:LL - 20 to 30, BG
UXO clearance

Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
Sample ID: MMRSSMW-3B-10.0'
HNU - 0
SC:LL - 15 to 35, BG
UXO clearance

Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
Sample ID: MMRSSMW-3B-15.0'
HNU - 0, SC:LL - 15 to 33 BG, UXO clearance
End UXO clearance

HNU - 0 End HNU monitoring
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>-24</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-26</td>
<td>Drilling smooth</td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-32</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-36</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-44</td>
<td>Drilling smooth</td>
<td></td>
</tr>
<tr>
<td>-46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-50</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Drilling smooth
- SC Brown clayey silty sand
- CL Black silty sandy clay with trace basaltic pebbles (wet) (soft)
- Drilling hard, lots of drill bit chatter. Basaltic rock stratum.
- Drilling hard to TD of borehole.

Approx. depth from drill cuttings

TD 63' bgs with 10" auger

Charcoal odor, black silty clay with basalt rock fragments
Steel, cement filled pickets (1 of 3)

Concrete
Surface Seal

Elevation = 18.3 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Bentonite Concrete Grout Backfill

Borehole Diameter (10" Minimum)

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

Well Construction Log ERDC-MW-3B

US Army Corps of Engineers

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

DR BY: RSS 01-30-04
CHK BY: SJT 01-30-04
Monitoring Well Coordinates

Well MW-3B (3213-10)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 52”  Longitude (W) 158° 13’ 36”

Ground Elevation: 18.34 feet

Top of Casing Elevation: 21.25 feet

Coordinates are referred to the North American Datum of 1983 (NAD83) Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-3B, Well No. 3213-10

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-3B (Well No. 3213-10) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules.
2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdrawal for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.
3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.
4. The permittee, well operator, and/or well owner shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.
5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.
6. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of conclusive water rights.
7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.
8. The permittee, well operator, and/or well owner shall comply with all applicable laws, rules, and ordinances; non-compliance may be grounds for revocation of this permit.
9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997, HWCRIS). If the HWCRIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.
10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires.
11. If the permittee or well owner notice of the proposed action and an opportunity to be heard.
12. If the well is not to be used it must be properly capped. If the well is to be abandoned the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.
13. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ___________________________
Printed Name: Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: ___________________________ Date: ___________________________
Printed Name: Mike Salum C-57 License #: 21358

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c USGS
Department of Healthy Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
State of Hawai'i
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT - PART I

Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. State Well No.: 3213-11
   Well Name: ERDC-MW-3C
   Island: Oahu

2. Address: Makua Military Reservation
   Tax Map Key: 8-1-01:1

3. Drilling Company: Valley Well Drilling

4. Drilling method used during construction: ☑ Rotary ☐ Percussion ☐ Other (describe)

5. Date Well Construction (drilled,cased,grouted) completed: 4/21/02

   In addition to the driller's log, if a geologic log was prepared, please submit with this form.

6. Was the subject well cored? ☑ Yes ☐ No

7. Initial water-level encountered 16 ft. below ground

   Date and time of measurement: 4/20/02 13:00

8. Step-Drawdown Test completed? ☐ No ☑ Yes

   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. Constant Rate Aquifer Test completed? ☐ No ☑ Yes

   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:

10. Water-level: 3.82 ft. above msl

    Date and time of measurement: 4/21/02 15:00

11. Chloride: 57 ppm

    Date and time of sampling: 4/21/02 15:30

12. Temperature: 75 °F

    Date and time of measurement: 4/21/02 15:45

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is _______ gpm at a head of _______ ft.

17. Remarks: No pump installed. Well for Sampling

Licensed Driller (print) Mike Siler C-57 Lic. No. 21358

Signature

Date 11/16/04

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI

Signature

Date 12/20/04
**DRILLER'S LOG**

**State of Hawaii**
**COMMISSION ON WATER RESOURCE MANAGEMENT**
**Department of Land and Natural Resources**

**For Official Use Only:**

04 DEC 2  P4:29

**Well Number:** 3213-11

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 26</td>
<td>Dark brown clayed silt, Some fragments of basalt</td>
<td>11/20/2002</td>
</tr>
<tr>
<td>26 to 45</td>
<td>Basaltic rock boulder layer</td>
<td>11/21/2002</td>
</tr>
<tr>
<td>45 to 60</td>
<td>Black silty clay with trace of basalt fragments</td>
<td></td>
</tr>
<tr>
<td>60 to 85</td>
<td>Basaltic rock layer, boulders</td>
<td></td>
</tr>
<tr>
<td>85 to 106</td>
<td>Black silty clay, soft, trace basaltic fragments</td>
<td></td>
</tr>
</tbody>
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**Remarks:**

**DL Form 06/24/2004**
<table>
<thead>
<tr>
<th>Depth</th>
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<th>Description</th>
<th>Blow Counts</th>
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<td>-12</td>
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<td>SPT 8/13/02</td>
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</tr>
<tr>
<td>-14</td>
<td></td>
<td>(ML) Dark brown clayey silt, dry, loose, few to coarse sub-angular basaltic gravel, rare frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td>(CL) Dark brown (10YR3/3) clayey silt, medium plasticity, dry, loose from drill cuttings</td>
<td></td>
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</tr>
<tr>
<td>-18</td>
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<td>SPT 4/12/16</td>
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<td></td>
</tr>
<tr>
<td>-20</td>
<td></td>
<td>(CH) Olive gray (5Y4/1) sandy clay with silt, stiff, moist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td></td>
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<td></td>
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<tr>
<td>-26</td>
<td></td>
<td>Basaltic rock layer at appx. 26' bgs to appx. 45' bgs</td>
<td></td>
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<tr>
<td>-28</td>
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<td></td>
</tr>
<tr>
<td>-46</td>
<td></td>
<td>(CL) Black silt clay with trace of basaltic frag from drill cuttings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drilling performed using 5" diameter hollow stem auger to facilitate UXO clearance. UXO clearance conducted every 3" down to 21' bgs. HNU scintillometer readings taken on drill cuttings at the same time as UXO clearance. HNU - B SC-LL - 15 to 15 (background) levels.

Appx. water table.
MEMORANDUM FOR THE RECORD

FROM: Lenore Nakama
SUBJECT: Well Completion Reports for 3113-02 to 06 & 3213-08 to 11

8/11/04 called Traci Sober of Valley Well Drilling to check on the status of the well construction permits for the subject Army wells. She said they needed an extension. I asked Traci who she was communicating with at the Army, because to extend the permits, I need a brief explanation of why the wells couldn't be completed in the 1st two years. She gave me a name of the person in the field, Steve Turnbull (cell phone 295-4998).

8/12/04 called Steve Turnbull. He said the wells were actually completed, but they weren't sure if they were permanent because they might be sealed instead. He said he was waiting to file the Completion Reports until it was determined if the wells would be kept or not. I informed Steve that he should file the WCR 1 because the wells were completed under the permit. If the wells are to be sealed later, well abandonment permits should be obtained first. He said he had misunderstood and that he will work on getting the WCR1s in for all 9 wells. He said it will take about a month before he will be able to get the military commander's signature. I told him that he could send in partially executed WCR1s and let us know that fully executed WCR1s would be forthcoming. He said that he would prefer to wait until he can get the signatures. I told him that would be fine.

10-8-04 Left msg for Steve to call me re: status of WCR1.
10-8-04 Steve called back, will submit for signature ASAP.
Talk him we could wait another 3 weeks or so before notice of violation send.
November 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-5 (Well No. 3113-06)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for your permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures

c: State of Hawaii, Department of Land and Natural Resources
WELL CONSTRUCTION PERMIT
ERDC-MW-5, Well No. 3113-06

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management’s Administrative Rules, Section 13-168, entitled “Water Use, Wells, and Stream Diversion Works”, this document permits the construction and testing of ERDC-MW-5 (Well No. 3113-06) at Makua Military Reservation, Oahu, TMK 8-2-01:20, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department’s Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, MSL) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: October 28, 2002
Expiration Date: October 28, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ________________

Printed Name: ___________________________ Firm or Title: ___________________________

Driller's Signature: ___________________________ C-57 License #: _______ Date: ________________

Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health, Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Supply
State of Hawaii, Department of Land and Natural Resources
**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>Aquifer System</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>Aquifer Sector</td>
</tr>
</tbody>
</table>

**Proposed Use**

- Proposed Withdrawal
- System Sustainable Yield

**SECTION 2: WELL SECTION DATA**

(enter data in grey cells only)

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>Material</td>
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<tr>
<td>Cement Grout</td>
<td>Designation</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>Length</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>Diameter</td>
</tr>
<tr>
<td>Total Depth</td>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

- Estimated Head
- Calculated Aquifer Thickness
- County Water Supply (Y/N ?)

**SECTION 3: CHECKLIST**

(values to check are shaded)

**Well Depth**

- Theoretical Thickness of Aquifer
- 1/4 Aquifer Thickness
- Depth of Well below Sea Level

<table>
<thead>
<tr>
<th>Well Casing</th>
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<tbody>
<tr>
<td>Minimum Wall Thickness</td>
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<tr>
<td>Material</td>
</tr>
<tr>
<td>PVC</td>
</tr>
<tr>
<td>County or Non-County</td>
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<tr>
<td>non-county</td>
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<td>Minimum Thickness per standards</td>
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<td>Wall Thickness Provided</td>
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<td>157.5 ft.</td>
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<td>Casing Material</td>
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<td>Annular Space</td>
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<td>If the cell above reads #N/A, reference HWCPIS</td>
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</tbody>
</table>

- Depth of Grouting
- Calculated Depth of Grouting
- Depth of Grouting provided
- Thickness of Annular Space

**Reviewer**

- RRI
MEMORANDUM

TO:        Linnel T. Nishioka, Deputy Director
            Commission on Water Resource Management

FROM:       Dierdre S. Mamiya, Administrator

SUBJECT:    Application for Permit – Well Construction; State Well No. 3113-06, Well Name
            ERDC-MW-5, Makua, Waianae, Oahu, Tax Map Key: 8-2-001:Por 20

This is a follow-up to your memorandum dated July 26, 2002, requesting for
confirmation of State ownership; obtain the Chairperson's signature on the attached Application
for Permit and confirmation if Chapter 343 have been met.

Please find enclosed the permit with the Chairperson's signature.

In regards to the confirmation on whether Chapter 343 have been met, please refer to the
Department of Army's letter dated October 21, 2002, stating that they are not required to obtain a
CDUA permit under the doctrine of sovereign immunity.

Should you have any questions, please feel free to call Patti Miyashiro of my staff at
587-0410.

Enclosure

c: Central Files
   District Files
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (x) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APVG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. (x) LAND OWNER: (Name of unanimous)
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: Valley Well Drilling
   Fax: 682-1768
   E-mail: vwdhi@lava.net

3. (x) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Ohana St., Kapolei, HI 96707
   Fax: 682-1768
   E-mail: vwdhi@lava.net
   Lic #: 21358
   (circle one C-57a, C-57b, or C-57c)

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-5
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8-2-01-00
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)
   (X) Construct New Well
   (X) Install New Pump*
   (X) Modify Existing Well*
   (X) Modify Pump*
   (X) Abandon/Seal*
   *State Well No.:
   If unknown, please call Commission at 587-0225

4. CONSTRUCTION: (check all that apply)
   Drilled
   Dug
   Shaft
   Tunnel
   Is this well part of a battery of wells? □ Yes □ No (Please describe)

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (not applicable) gallons per minute
   Pump Type (Check one):
   □ Deep Well Turbine
   □ Rotary
   □ Submersible
   □ Rotary-Displacement
   □ Centrifugal
   □ Reciprocating
   □ Impulse
   □ Propeller
   □ Other (explain):

6. PROPOSED USE: (check all that apply)
   □ Domestic (including hotels, stores, etc.)
   □ Industrial
   □ Municipal (including hotels, stores, etc.)
   □ Other (explain): Monitoring Well
   □ Irrigation (crop)
   □ Offshore
   □ Military
   □ No. of Acres:
   □ No.
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? □ Yes □ No
   □ No. of Connections:
   □ No. of Services:

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT: □ Flowmeter □ Orifice □ Open-pipe □ Weir □ Other (explain)

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: □ CDUP □ SMAP □ EIS □ EA □ None □ Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: LTC Floyd A. Quintan
Signature: ________________________________ Date: 10/10/02

Landowner: Eric L. Higino
Signature: ________________________________ Date: 10/10/02

Contractor: Valley Well Drilling
Signature: ________________________________ Date: 10/10/02

For official use only
Latitude: _____________________________
Longitude: _____________________________
Acquifer System No.: _____________________________
State Well No.: _____________________________

WCPIPA Form 10/25/00
<table>
<thead>
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<th>Details</th>
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</table>
| **TMK:** 8-2-001:020  
Historical TMK Sequence:  
Area (sq ft): 40536239  
Area (acres): 930  
Lot Number: Ohana: |

**LAND CONTROL CODES**

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<th>Code Description</th>
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<td>FIRM ZONE D</td>
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<tr>
<td>HEIGHT LIMIT</td>
<td>STATE LAND USE STANDARDS</td>
</tr>
<tr>
<td>HISTORIC SITE REGISTER</td>
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<tr>
<td>LOT RESTRICTIONS</td>
<td>NONE</td>
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<td>SMA/SHORELINE</td>
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<tr>
<td>SPECIAL DISTRICT</td>
<td>NOT IN SPECIAL DISTRICT</td>
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<tr>
<td>STATE LAND USE</td>
<td>CONSERVATION DISTRICT</td>
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<tr>
<td>STREET SETBACK</td>
<td>NONE</td>
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<td>ZONING (LUO)</td>
<td>P-1 RESTRICTED PRESERVATION</td>
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**FACILITIES**

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<th>Total Floor Area</th>
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**TMK SEPARATIONS**

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<th>Census Block</th>
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<tbody>
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<td>098.00</td>
<td>902</td>
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<tr>
<td>62 · MILITARY (INCLUDING RECRUITING STATION)</td>
<td>098.00</td>
<td>902</td>
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</tbody>
</table>

Close
Ms. Dierdrei Mamiya, Administrator  
Department of Land and Natural Resources  
Land Division, State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Ms. Mamiya & Planners

Subject: Conservation District Use Application for Drilling and Installation of Monitoring Well  
ERDC-MW-5 at Makua Military Reservation, Oahu.

I am replying to a 3 October 2002 request by Ms. Patty Miyashiro of the Department of Land and Natural Resources (DLNR) for the Army to submit a Conservation District Use Application (CDUA) as part of drilling and installation of the above reference monitoring well at Makua Military Reservation (MMR). The Army submitted a monitoring well permit application on 24 September 2002. The matter was referred to my office for legal review after DLNR requested that the Army also file a CDUA. The Army respectfully declines DLNR’s request because we are not required to obtain a CDUA permit under the doctrine of sovereign immunity. In fact, the Army is not required to submit a monitoring well permit but has done so for informational purposes as a courtesy to the State.

Federal activities and installations are subject to state regulation only if Congress relinquishes federal supremacy by clearly and specifically waiving the federal government’s immunity from that state regulation. Three Supreme Court cases, Hancock v. Train, 426 U.S. 167 (1976); Department of Energy v. Ohio, 503 US 607 (1992) and United States v. Idaho, 508 U.S. 1 (1993), confirm that such waivers must be unequivocally and strictly construed. There has not been any Congressional waiver of sovereign immunity with regards to the CDUA permits at issue. The Army’s position on this issue is supported by a decision from the United States District Court for the District of Hawaii and is consistent with the approach taken by other military services in Hawaii.

The Army appreciates DLNR’s timely processing for permit ERDC-MW-5 in addition to the processing of eight other well permits for MMR last month (to include well numbers - 3113-2, 3213-08,3213-09,3213-10,3113-03,3113-04,3213-11,3113-05). We look forward to continued spirit of cooperation between our agencies. The Army’s technical point of contact on this matter is Steve Turnbull at 696-2878 x 1050. If you wish to discuss the legal issues further, please feel free to call me at 438-6724.

Very Respectfully,

Jeanne Prussman Ockerman  
Attorney Advisor  
25th Infantry Division (L) & U.S. Army, Hawaii
Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857  

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-1 (Well No. 3113-02)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

**Special Conditions**

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. To prevent surface contamination, the annular space of all cased non-artesian wells (except monitor wells designed for immediate and short-term monitoring purposes and subsequent abandonment) must be sealed with grout from the ground surface to a minimum depth of 500 feet or 70% of the vertical distance between the ground surface and the top of the aquifer selected for exploration, long-term monitoring, or development, whichever depth is less.

3. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

**IMPORTANT** - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-1, Well No. 3113-02
Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-1 (Well No. 3113-02) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1x-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pumping testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

13. Special conditions in the attached cover transmitteLetter are incorporated herein by reference.

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ___________________________ 

Printed Name: ___________________________ Firm or Title: ___________________________

Driller's Signature: ___________________________ C-57 License #: ___________________________ Date: ___________________________

Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857  

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-4A (Well No. 3113-03)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

**Special Conditions**

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit **does not** authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

**IMPORTANT** - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

Gilbert S. Coloma-Agaran  
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-4A, Well No. 3113-03

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4A (Well No. 3113-03) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

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

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ________________
Printed Name: ___________________________ Firm or Title: ___________________________
Driller's Signature: ___________________________ C-57 License #: ________________ Date: ________________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C. USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857  

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-4B (Well No. 3113-04)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-4B, Well No. 3113-04

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4B (Well No. 3113-04) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-166-15, Hawaii Administrative Rules.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1¼-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: __________

Printed Name: ___________________________ Firm or Title:

Driller's Signature: ___________________________ C-57 License #: __________ Date: __________

Printed Name: ___________________________ Firm or Title:

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

c: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-4C (Well No. 3113-05)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-4C, Well No. 3113-05

Note: This permit shall be prominently displayed at the site until the work is completed.

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4C (Well No. 3113-05) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referred to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Final construction plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: _________________
Printed Name: _______________________________ Firm or Title: _______________

Driller's Signature: ____________________________ C-57 License #: ____________ Date: _______________
Printed Name: _______________________________ Firm or Title: _______________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.
September 26, 2002

TO: Ms. Dede Mamiya, Administrator
    Land Division

FROM: Linnel T. Nishioka, Deputy Director
      Commission on Water Resource Management

SUBJECT: Request for Chairperson's Signature as Landowner

The attached permit application entails the use of State-owned land and, accordingly, requires the signature of the Chairperson as the landowner. Here, we are requesting your help in affirming the State's ownership of the property and, thereafter, routing the application to the Chairperson for his signature. (We have enclosed the appropriate transmittal memo that contains the affirmation statement.)

Please note that the Chairperson's signature on the permit application completes the application and allows it to be accepted for processing by the Commission. The signature neither represents an endorsement of the applicant's proposal nor an approval for the use of State land; both approvals would be sought by the applicant under separate actions later.

Please inform us if the proposed project is in the Conservation District and, if so, whether the requirements of Chapter 343 have been met.

Lastly, please inform us of the contact person at Land Division who is responsible for transmitting the attached original applications to the Chairperson's office.

LN:ss
Attach.
September 26, 2002

Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-2 (Well No. 3213-08)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. To prevent surface contamination, the annular space of all cased non-artesian wells (except monitor wells designed for immediate and short-term monitoring purposes and subsequent abandonment) must be sealed with grout from the ground surface to a minimum depth of 500 feet or 70% of the vertical distance between the ground surface and the top of the aquifer selected for exploration, long-term monitoring, or development, whichever depth is less.

3. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

[Signature]
GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-2 (Well No. 3213-08) at Makua Military Reservation, Oahu, TMK 8-1-01:2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise approved by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, nsl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be made in writing, at least two (2) years from the date of permit approval, or if work is suspended or abandoned; the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ____________
Printed Name: ___________________________ Firm or Title: ______________

Driller's Signature: ___________________________ C-57 License #: ____________ Date: ____________
Printed Name: ___________________________ Firm or Title: ______________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C: USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-3A (Well No. 3213-09)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT

ERDC-MW-3A, Well No. 3213-09

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-3A (Well No. 3213-09) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ________________

Printed Name: ___________________________ Firm or Title: ___________________________

Driller's Signature: ___________________________ C-57 License #: ___________________________ Date: ________________

Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-3B (Well No. 3213-10)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-3B, Well No. 3213-10

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-3B (Well No. 3213-10) at Makua Military Reservation, Cahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1¼-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: _______________________________ Date: _______________________________
Printed Name: _______________________________ Firm or Title: _______________________________

Driller's Signature: _______________________________ C-57 License #: __________________ Date: _______________________________
Printed Name: _______________________________ Firm or Title: _______________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c: USGS
   Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
   Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-3C (Well No. 3213-11)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-3C (Well No. 3213-11) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson.

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson.

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

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval 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 Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

11. If the well is not to be used it must be properly capped. If the well is to be abandoned then the permittee, well operator, and/or well owner must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: __________________________ Date: ____________
Printed Name: _______________________________ Firm or Title: _______________________________

Driller's Signature: ___________________________ C-57 License #: __________ Date: ____________
Printed Name: _______________________________ Firm or Title: _______________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
### SECTION 1: WELL LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Well No.</th>
<th>3113-02 3213-029</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>ERDC-MW-1</td>
</tr>
<tr>
<td>Applicant</td>
<td>US ARMY</td>
</tr>
<tr>
<td>Date of Review</td>
<td></td>
</tr>
<tr>
<td>Reviewer</td>
<td></td>
</tr>
<tr>
<td>Proposed Use</td>
<td></td>
</tr>
<tr>
<td>Proposed Withdrawal</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>54000</td>
</tr>
<tr>
<td>System Sustainable Yield</td>
<td>4</td>
</tr>
</tbody>
</table>

### SECTION 2: WELL SECTION DATA

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>ft., m.s.l.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>ft.</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>in.</td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
</tr>
<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>90.2 ft.</td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 3: CHECKLIST

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>(values to check are shaded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Thickness of Aquifer</td>
<td>90.2 ft.</td>
</tr>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
</tr>
<tr>
<td>Depth of Well below Sea Level</td>
<td>20 ft. okay (refer to HWCPIS Section 2.2)</td>
</tr>
<tr>
<td>Well Casing</td>
<td>(disregard if the well is not basal)</td>
</tr>
<tr>
<td>Minimum Wall Thickness Material</td>
<td>PVC non-county</td>
</tr>
<tr>
<td>County or Non-County</td>
<td>non-county</td>
</tr>
<tr>
<td>Minimum Thickness per standards</td>
<td>0.237 in. okay (refer to HWCPIS Section 2.4 c)</td>
</tr>
<tr>
<td>Wall Thickness Provided</td>
<td>0.406 in. okay (refer to HWCPIS Section 2.4 c)</td>
</tr>
<tr>
<td>Minimum Length of Solid Casing</td>
<td>(disregard this if this is a non-county well)</td>
</tr>
<tr>
<td>90% of ground to top of aquifer</td>
<td>11.52 ft.</td>
</tr>
<tr>
<td>Length of solid casing Provided</td>
<td>10 ft. too shallow (refer to HWCPIS Section 2.4 d)</td>
</tr>
<tr>
<td>Casing Material</td>
<td>Sch 40 okay (refer to HWCPIS Section 2.4 e)</td>
</tr>
<tr>
<td>Annular Space</td>
<td>If the cell above reads #N/A, referencing HWCPIS)</td>
</tr>
<tr>
<td>Depth of Grouting</td>
<td>8.96 ft.</td>
</tr>
<tr>
<td>Calculated Depth of Grouting</td>
<td>8 ft. not enough (refer to HWCPIS Section 2.6 c)</td>
</tr>
<tr>
<td>Depth of Grouting provided</td>
<td>3 in. okay (refer to HWCPIS Section 2.6 d)</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
<td></td>
</tr>
</tbody>
</table>
### SECTION 1: WELL LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIANAE</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>####</td>
</tr>
</tbody>
</table>

### Proposed Use
- Proposed Withdrawal: System Sustainable Yield 54000
- Other: 4

### SECTION 2: WELL SECTION DATA (enter data in grey cells only)

| Elevation at top of casing | ft., m.s.l. |
| Ground Elevation | ft., m.s.l. |
| Cement Grout | ft. |
| Rock Packing | ft. |
| Hole Diameter | in. |
| Total Depth | ft. |
| Estimated Head | ft., m.s.l. |
| Calculated Aquifer Thickness | 90.2 ft. |
| County Water Supply (Y/N ?) | NO |

| Solid Casing | Material | ft. |
| Designation | Length | in. |
| Diameter | Wall Thickness | in. |

| Casing | Material | ft. |
| Designation | Length | in. |
| Diameter | Wall Thickness | in. |
| Openings | sq.in./l.f. |
| Open Hole | Length | ft. |
| Diameter | in. |

### SECTION 3: CHECKLIST (values to check are shaded)

#### Well Depth
- Theoretical Thickness of Aquifer: 90.2 ft.
- 1/4 Aquifer Thickness: 22.55 ft.
- Depth of Well below Sea Level: 25 ft.
- Too deep (refer to HWCPIS Section 2.2) (disregard if the well is not basal)

#### Well Casing
- Minimum Wall Thickness
  - Material: PVC
  - County or Non-County: non-county
  - Minimum Thickness per standards: 0.237 in.
  - Wall Thickness Provided: 0.406 in. okay (refer to HWCPIS Section 2.4 c) (disregard this if this is a non-county well)
- Minimum Length of Solid Casing: 16.02 ft.
- 90% of ground to top of aquifer: 15 ft. too shallow (refer to HWCPIS Section 2.4 d)
- Casing Material: Sch 40 okay (refer to HWCPIS Section 2.4 e)
- Too shallow (refer to HWCPIS Section 2.4 d)

#### Annular Space
- Depth of Grouting
  - Calculated Depth of Grouting: 12.46 ft.
  - Depth of Grouting provided: 13 ft. okay (refer to HWCPIS Section 2.6 c)
  - Thickness of Annular Space: 3 in. okay (refer to HWCPIS Section 2.6 d)
### SECTION 1: WELL LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
<th>Aquifer System</th>
<th>WAIANAE</th>
<th>Aquifer Sector</th>
<th>##</th>
<th>Proposed Use</th>
<th>Proposed Withdrawal</th>
<th>System Sustainable Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Review</td>
<td>Reviewer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 2: WELL SECTION DATA

(enter data in grey cells only)

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>ft., m.s.l.</th>
<th>Solid Casing</th>
<th>Material</th>
<th>ft.</th>
<th>Designation</th>
<th>Length</th>
<th>ft.</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
<td>Designation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
<td>Diameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Packing</td>
<td>ft.</td>
<td>Wall Thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>in.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
<td>Casing</td>
<td>Material</td>
<td>ft.</td>
<td>Designation</td>
<td>Length</td>
<td>ft.</td>
<td>in.</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>90.2 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 3: CHECKLIST

(values to check are shaded)

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>90.2 ft.</th>
<th>Theoretical Thickness of Aquifer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
<td>1/4 Aquifer Thickness</td>
</tr>
<tr>
<td>Depth of Well below Sea Level</td>
<td>50 ft.</td>
<td>Depth of Well below Sea Level</td>
</tr>
<tr>
<td>Well Casing</td>
<td>16.02 ft.</td>
<td>90% of ground to top of aquifer</td>
</tr>
<tr>
<td>PVC</td>
<td>Too deep</td>
<td>Depth of Grouting</td>
</tr>
<tr>
<td>Sch 40</td>
<td>Okay</td>
<td>Annular Space</td>
</tr>
</tbody>
</table>

If the cell above reads #N/A, reference HWCPIS Section 2.6 c)
Okay (refer to HWCPIS Section 2.6 e)
**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
<th>Proposed Use</th>
<th>Proposed Withdrawal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIANAE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>#</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 2: WELL SECTION DATA**  (enter data in grey cells only)

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>Material</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>Designation</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>Length</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>Diameter</td>
</tr>
<tr>
<td>Total Depth</td>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Head</th>
<th>Calculated Aquifer Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90.2 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>County Water Supply (Y/N ?)</th>
<th>90.2 ft.</th>
</tr>
</thead>
</table>

**SECTION 3: CHECKLIST**  (values to check are shaded)

Well Depth
- Theoretical Thickness of Aquifer: 90.2 ft.
- 1/4 Aquifer Thickness: 22.55 ft.
- Depth of Well below Sea Level: 60 ft.  (too deep, refer to HWCPIS Section 2.2)

Well Casing
- Minimum Wall Thickness
  - Material: PVC (non-county)
  - County or Non-County: non-county
  - Minimum Thickness per standards: 0.237 in.
  - Wall Thickness Provided: 0.406 in.  (okay, refer to HWCPIS Section 2.4 a)
  - Minimum Length of Solid Casing: 16.02 ft.
  - 90% of ground to top of aquifer: 70 ft.  (okay, refer to HWCPIS Section 2.4 d)
  - Length of solid casing Provided: 16.02 ft.  (okay, refer to HWCPIS Section 2.4 e)
  - Casing Material: Sch 40
- Annular Space
  - Depth of Grouting
    - Calculated Depth of Grouting: 12.46 ft.
    - Depth of Grouting provided: 68 ft.  (okay, refer to HWCPIS Section 2.6 c)
    - Thickness of Annular Space: 3 in.  (okay, refer to HWCPIS Section 2.6 d)
<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/Condo</th>
<th>Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-2-1-20</td>
<td>G</td>
<td>FARRINGTON HWY</td>
<td>STATE OF HAWAII</td>
<td></td>
<td></td>
<td></td>
<td>930.58 ac</td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/Condo</th>
<th>Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-1-1-1</td>
<td>G</td>
<td>FARRINGTON HWY UNITED STATES OF AMERICA</td>
<td>13.39 ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/Condo Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-1-1-2</td>
<td>G FARRINGTON HWY</td>
<td>UNITED STATES OF AMERICA</td>
<td>25.72 ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.

PUBLIC RECORD DATA

<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/CondoTnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-2-1-24</td>
<td>G</td>
<td>82-180 FARRINGTON HWY</td>
<td>STATE OF HAWAII UNITED STATES OF AMERICA</td>
<td></td>
<td></td>
<td>260.47 ac</td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
LICENSE SCREEN

[ Look up License Type Codes-> ]
Please click a link listed below to display the other screen.

***** GENERAL LICENSEE *****

LIC ID: CT-21358                  Active/Inactive: ACTIVE
NAME: VALLEY WELL DRILLING
TRADE NAME:
STATUS: VALID THRU EXPIRATION DATE, RENEWAL NOTICE SENT
ENTITY: PARTNERSHIP              BUSINESS CODE:
ORIG LIC DATE: 3/16/98            EXPIRE DATE: 9/30/02
CLASS PREFIX: C                   SPECIAL PRIVILEGE:
RESTRICTION:
EDUCATION CODE:
BUSINESS ADDR: 91-235 OIHANA ST #A KAPOLEI HI 96707
MAILING ADDR:

Click here to enter search criteria for prior complaints history ->
For prior complaints and disciplinary history, contact licensing and business information center at (808)587-3295.

<-Back       New Search->

EMPLOYEES LIST || EMPLOYERS LIST || INSURANCE/BOND || LICENSE CLASS
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Well Construction and/or Pump Installation

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

FOR APPLICANT:

Applications for permits in support of non-emergency work shall be accompanied by the following:

1. (a) Well Owner: Full legal name, mailing address, fax, phone number, e-mail, and signature.
   (b) Land Owner: Full legal name, mailing address, fax, phone number, e-mail, and signature.
   (c) Contractor: Full legal name, mailing address, fax, phone number, e-mail, and signature.

FOR LEGAL REQUIREMENTS:

2. Well NAME: Well name, location referenced to established property boundaries.

3. PROPOSED WORK:
   (check all that apply)
   □ Construct New Well
   □ Modify Existing Well
   □ Abandon/Seal

4. CONSTRUCTION:
   □ Drilled
   □ Dug
   □ Shaft
   □ Tunnel
   Is this well part of a battery of wells? □ Yes □ No (Please describe)

5. PROPOSED PUMP INFORMATION:
   □ Rated Pump Capacity: Not applicable gallons per minute
   □ Pump Type (Check one):
     □ Deep Well Turbine
     □ Submersible
     □ Centrifugal
     □ Rotary
     □ Rotary-Displacement
     □ Rotary-Gear
     □ Propeller
     □ Reciprocating
     □ Impulse
   □ Domestic (individual, noncommercial water system)
   □ Municipal (including hotels, stores, etc.)
   □ Industrial
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? □ Yes □ No
   □ Irrigation (crop)
   □ No. of Acres:
   □ No. of Acres: □ Other (explain): Monitoring well

6. PROPOSED USE:
   (check all that apply)
   □ Municipal (including hotels, stores, etc.)
   □ Domestic (individual, noncommercial water system)
   □ Industrial
   □ Irrigation (crop)
   □ No. of Acres:
   □ No. of Acres: □ Other (explain): Monitoring well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   □ Not Applicable gallons per day
   □ Method of Flow Measurement:
     □ Flowmeter
     □ Open-pipe
     □ Weir
     □ Orifice
     □ Other (explain):

8. OTHER IMPORTANT INFORMATION:

REMINDERS EXPLANATIONS:

This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

For Official Use Only

Applicant:

For Official Use Only

Well Owner

Contractor

Landowner

Valley Well Drilling

Signature

Signature

Date

Date

AQUIFER SYSTEM NO.

State Well No.

Latitude

Longitude

WCP/01 Form 10/25/00
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

For non-salt water Basalt Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = \( \left( \frac{4 x \text{Water Level Elev.}}{21} \right) - 18.5 \text{ ft.} \)

Example: Estimated + 2 ft. Water Level Elev. = Bottom Elevation of Well Limit = \( \left( 2 \times \frac{41 \times 21}{4} \right) - 18.5 \text{ ft.} \)

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
  And compliant with (check one or more): ASTM A242, Type E, Type S, Grade B, Other
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527. (check one): Schedule 40, Schedule 80, Schedule 120
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): X Schedule 40, Schedule 80, Schedule 120
- Thermoset Plastic: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
  And compliant with (check one or more): ASTM A242, Type E, Type S, Grade B, Other
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527. (check one): Schedule 40, Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): X Schedule 40, Schedule 80, Schedule 120
- Thermoset Plastic: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulatory Branch at 587-0225.

For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APVO-GMV, U.S. Army Garrison-Hawaii, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. (b) LAND OWNER: (same as well owner)
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APVO-GMV, U.S. Army Garrison-Hawaii, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

3. (c) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Scher
   Phone: 682-1767
   Mailing Address: 91-235A Oihana St., Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wwdhi@lava.net
   Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERD-0W-2 2313-08
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8-1-01-2
   State Well No.: _________

   (a) Describe Well Location: _________
   (b) (circle one) D Landowner D Contractor
   (c) (circle one) D Landowner D Contractor

   Is this well part of a battery of wells? D Yes D No (Please describe)

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: Not applicable gallons per minute
   Pump Type: (Check one)
   D Deep Well Turbine D Rotary
   D Submersible D Rotary-Displacement
   D Centrifugal D Reciprocating
   D Propeller D Other
   D Impulse

6. PROPOSED USE: D Municipal (including hotels, stores, etc.)
   (Check all that apply)
   D Industrial
   D Domestic (individual, noncommercial water system)
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? D Yes D No
   D Irrigation (crop) D Other (explain): Monitoring well
   D No. of Acres: _________
   D No. of Service Connections: _________
   D Other (explain): _________

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT: D Flowmeter D Open-pipe
   D Weir D Office D Other (explain)
   D None

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: D DUP D SMAP D EIS D EA D None D Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (If more space is needed, please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: LTC Floyd A. Quintana
(Official Use Only)
Signature: ____________________________ Date: 10/25/00

Landowner: ____________________________ Signature: ____________________________ Date: __________

Contractor: Valley Well Drilling
(Official Use Only)
Signature: ____________________________ Date: 9/18/02

Latitude: ____________________________ Aquifer System No.: _________
Longitude: ____________________________ State Well No.: _________
10. PROPOSED WELL SECTION

(Hole Diameter: _______ in.)

Elevation at top of casing: ______ ft., msl

Minimum of 2" Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: ______ ft., msl

- Cement Grout: ______ ft. (max. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less)
- Annular space between hole and casing (min. 3") ______ in.
- Rock or Gravel Packing: ______ ft.
  - Material:
    - Crushed Basalt
    - Rounded Gravel

Estimated Water Level Elevation: ______ ft., msl

Total Depth: ______ ft.

Solid Casing: (≥ 90% x (Ground Elev. - Water Level Elev.))
- Total Length: ______ ft.
- Nominal Diameter: ______ in.
- Wall Thickness: ______ in.
- Bottom Elevation: ______ ft., msl

Open Casing: (check one)
- Perforated
- Screen
- Total Length: ______ ft.
- Nominal Diameter: ______ in.
- Wall Thickness: ______ in.
- Bottom Elevation: ______ ft., msl

Open Hole:
- Length: ______ ft.
- Diameter: ______ in.
- Bottom Elevation: ______ ft., msl

**The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.**

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = \( \left( \frac{\text{Water Elevation} - \text{Ground Elev.}}{4} \right) \)

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = \( \left( \frac{2.2 - 15}{4} \right) = -5.35 \) ft.

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - Other
- Stainless Steel: (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)

**ABS Plastic conforming to ASTM F480 and ASTM D1527:** (check one)
- Schedule 40
- Schedule 80

**PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241):** (check one)
- Schedule 40
- Schedule 80
- Schedule 120

**Thermoset Plastic:** (check one)
- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrífugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**
- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - Other
- Stainless Steel: (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)

**ABS Plastic conforming to ASTM F480 and ASTM D1527:** (check one)
- Schedule 40
- Schedule 80

**PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241):** (check one)
- Schedule 40
- Schedule 80
- Schedule 120

**Thermoset Plastic:** (check one)
- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrífugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296
State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources  
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICATION INFORMATION:  
(Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army  
Mailing Address: DPW, Attn: APVG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857  
Phone: 656-2878  
Fax: 656-1039  
E-mail: fukudaj@schofield.army.mil

(b) LAND OWNER: (same as well owner)  
Mailing Address:  
Phone:  
Fax:  
E-mail:

(c) CONTRACTOR: Valley Well Drilling  
Mailing Address: 91-235A Oihana St, Kapolei, HI 96707  
Phone: 682-1767  
Fax: 682-1768  
E-mail: vwdhi@lava.net

WELL & PUMP INFORMATION:  
(please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-3A 3213-09  
Island: Oahu  
Address: Makua Military Reservation  
Tax Map Key: 8 1 01 1 1

ATTACH the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK:  
(check all that apply)  
☐ Construct New Well  
☐ Modify Existing Well*  
☐ Abandon/Seal*  
☐ Install New Pump*  
☐ Modify Pump*  
*State Well No. ____________________________  
(if unknown, please call Commission at 587-0225)

4. CONSTRUCTION:  
☐ Drilled  
☐ Dug  
☐ Shaft  
☐ Tunnel  
☐ Is this well part of a battery of wells? ☑Yes ☐No (Please describe)  
(This well is one of three in nested pair at different depths MW-3A, 3B, 3C)

5. PROPOSED PUMP INFORMATION:  
Rated Pump Capacity: Not Applicable gallons per minute  
Pump Type (check one):  
☐ Deep Well Turbine  
☐ Submersible  
☐ Centrifugal  
☐ Rotary  
☐ Rotary-Displacement  
☐ Rotary-Gear  
☐ Propeller  
☐ Reciprocating  
☐ Impulse  
☐ Other (explain): Monitoring Well

6. PROPOSED USE:  
(check all that apply)  
☐ Municipal (including hotels, stores, etc.)  
☐ Domestic (individual, noncommercial water system)  
☐ Industrial  
☐ Domestic (including hotels, stores, etc.)  
☐ Military  
☐ Other (explain):  
☐ Irrigation (crop)  
☐ No. of Acres: ____________________

☐ No. of Acres: ____________________  
☐ Other (explain):  
☐ Flowmeter  
☐ Open-pipe  
☐ Weir  
☐ Orifice  
☐ Other (explain):  

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable gallons per day  
(b) METHOD OF FLOW MEASUREMENT:

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:  
☐ CDUP  
☐ SMAP  
☐ EIS  
☐ EA  
☐ None  
☐ Other (explain):  

9. REMARKS, EXPLANATIONS:  
This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity of future use up to the permitted pump capacity.

Well Owner  
LTC Floyd A. Quintana  
Signature:  
Date: 10/25/00

Landowner  
Signature:  
Date:  

Contractor Valley Well Drilling  
Signature:  
Date: 4/18/02

For official use only  
Latitude:  
Longitude:  
Aquifer System No:  
State Well No: 3213-09

WCIPA Form 10/25/00
**10. PROPOSED WELL SECTION** (Please attach schematic if different from diagram provided below)

**Hole Diameter:** 10 in.

**Elevation at top of casing:** 22 ft., msl*

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock or Gravel Packing:</td>
<td>Total Depth 45 ft.</td>
</tr>
</tbody>
</table>

**Cement Grout:** 13 ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

**Annual space between hole and casing (min.3):** 3 in.

**Estimated Water Level Elevation:** 2.2 ft., msl*

**Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)**

**Ground Elevation:** 20 ft., msl

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Casing:</td>
<td>Total Length: 15 ft.</td>
</tr>
<tr>
<td></td>
<td>Nominal Diameter: 4 in.</td>
</tr>
<tr>
<td></td>
<td>Wall Thickness: 0.406 in.</td>
</tr>
<tr>
<td></td>
<td>Bottom Elevation: 5 ft., msl*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Casing:</td>
<td>Total Length: 30 ft.</td>
</tr>
<tr>
<td></td>
<td>Nominal Diameter: 4 in.</td>
</tr>
<tr>
<td></td>
<td>Wall Thickness: 0.406 in.</td>
</tr>
<tr>
<td></td>
<td>Bottom Elevation: 5 ft., msl*</td>
</tr>
</tbody>
</table>

Note: Neither bentonite nor mud should be used in saturated zone during drilling.

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation - 0.1 x Water Level Elev.) / 4

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 - 0.1 x 2) / 4 = 1.5 ft.

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more):  ❑ ANSI/AWWA C200  ❑ API Spec. 5L  ❑ ASTM A53  ❑ ASTM A139
  And compliant with (check one or more):  ❑ ASTM A242  ❑ Type E  ❑ Type S  ❑ Grade B  ❑ Other
- ABS Plastic: compliant with (check one):  ❑ ASTM D3296: (check one):  ❑ Schedule 40  ❑ Schedule 80

**Thermoset Plastic:**
- Centrifugally Cast Resin Pipe conforming to ASTM D2996
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- EPT Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**
- Carbon Steel: compliant with (check one or more):  ❑ ANSI/AWWA C200  ❑ API Spec. 5L  ❑ ASTM A53  ❑ ASTM A139
  And compliant with (check one or more):  ❑ ASTM A242  ❑ Type E  ❑ Type S  ❑ Grade B  ❑ Other

**Thermoset Plastic:**
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- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- EPT Fluorocarbon Tubing conforming to ASTM D3296

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For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation - 0.1 x Water Level Elev.) / 4

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 - 0.1 x 2) / 4 = 1.5 ft.
APPLICATION FOR PERMIT

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DIV, Attn: APVG-CGW, U.S. Army Garrison-HI, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@ Schofield.army.mil

2. LAND OWNER: 
   (same as well owner)
   Contact Person: 
   Phone: 
   Mailing Address: 
   Fax: 
   E-mail: 

3. CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Oihi St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wvdhi@lava.net
   Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MK-3B 52 3-1D
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 1 35 1
   Zone: Sec: 10 1
   Parcel: (if unknown, please call Commission at 587-0225)

3. PROPOSED WORK: (check all that apply)
   □ Construct New Well
   □ Install New Pump*
   □ Modify Existing Well
   □ Modify Pump*
   □ Abandon/Seal*
   □ (State Well No.: )
   (explain): Monitoring Well

4. CONSTRUCTION: □ Drilled
   □ Dig
   □ Shaft
   □ Tunnel
   □ Is this well part of a battery of wells? □ Yes □ No (Please describe)

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (Not Applicable) gallons per minute

   Pump Type (Check one)
   □ Deep Well Turbine
   □ Rotary
   □ Propeller
   □ Submersible
   □ Rotary-Displacement
   □ Reciprocating
   □ Centrifugal
   □ Rotary-Gear
   □ Impulse

6. PROPOSED USE: (check all that apply)
   □ Municipal (including hotels, stores, etc.)
   □ Industrial
   □ Domestic (individual, noncommercial water system)
   □ Irrigation (crop)
   □ No. of Acres: 
   □ Military
   □ Other (explain): Monitoring Well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable 
   (b) METHOD OF FLOW MEASUREMENT: 

   Other (explain):

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: □ COUP □ SMAP □ EIS □ EA □ None □ Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (If more space is needed, please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: LTC Floyd A. Quinlan
Signature: Date: 10/25/00

Landowner: 
Signature: Date: 

Contractor: Valley Well Drilling
Signature: Date: 9/15/00

For official use only
Latitude: Aquifer System No.: 3 213-1D
Longitude: State Well No.:
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

- Hole Diameter: ___________ in.
- Elevation at top of casing: ___________ ft., msl*

- Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)
- Ground Elevation: ___________ ft., msl*

- Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

- Solid Casing Material:
  - Total Length: ___________ ft.
  - Nominal Diameter: ___________ in.
  - Wall Thickness: ___________ in.
  - Bottom Elevation: ___________ ft., msl*

- Open Casing:
  - Total Length: ___________ ft.
  - Nominal Diameter: ___________ in.
  - Wall Thickness: ___________ in.
  - Bottom Elevation: ___________ ft., msl*

- Open Hole:
  - Length: ___________ ft.
  - Diameter: ___________ in.
  - Bottom Elevation: ___________ ft., msl*

- The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = (Water Elevation - (Water Level Elev. + Ground Elevation to Top of Casing))

Example: Estimated + 2 ft. Water Level Elev. = Bottom Elevation of Well Limit = (2 - (41 x 1/4)) = 18.5 ft.

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic: compliant with (check one or more): □ Schedule 40 □ Schedule 80 □ Schedule 120
- PVC Plastic: compliant with (check one or more): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one): □ Filament Wound Resin Pipe conforming to ASTM D2996 □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
- □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517 □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950, □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
- □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic: compliant with (check one or more): □ Schedule 40 □ Schedule 80 □ Schedule 120
- PVC Plastic: compliant with (check one or more): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one): □ Filament Wound Resin Pipe conforming to ASTM D2996 □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
- □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517 □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950, □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
- □ FEP Fluorocarbon Tubing conforming to ASTM D3296

- Rock or Gravel Packing:
  - Material: □ Crushed Basalt □ Rounded Gravel

- Annular space between hole and casing (min. 3")
  - 3 in.

- Total Depth: ___________ ft.

- Estimated Water Level Elevation: ___________ ft., msl*
Figure 3.13

Monitoring Well Locations

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

Scale (ft.)
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) □ WELL OWNER: U.S. Army
Mailing Address: DPW, Attn: APVC-GWV, U.S. Army Garrison, Schofield Barracks HI 96857
Fax: 656-1039
E-mail: fukuda@scnfield.army.mil
Contact Person: Jon Fukuda
Phone: 656-2878
(b) □ LAND OWNER: (same as well owner)
Contact Person: __________________________
Fax: __________________
(c) □ CONTRACTOR: Valley Well Drilling
Mailing Address: 91-235A Iwihana St. Kapolei, HI 96707
Fax: 682-1768
E-mail: vwdhi@lava.net
Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form)

2. WELL NAME: ERDC-MW-3C Island: Oahu
Address: Makua Military Reservation
Tax Map Key: Zone __________ Sec __________ Plan __________ parcel __________
Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)
□ Construct New Well
□ Modify Existing Well*
□ Abandon/Seal*
□ Install New Pump*
□ Modify Pump*
□ *State Well No: __________________________ (If unknown, please call Commission at 587-0225)

4. CONSTRUCTION: □ Drilled □ Dug □ Shaft □ Tunnel
Is this well part of a battery of wells? □ Yes □ No (Please describe)
(This well is one of three in nested pair at different depths MW-3A,3B,3C

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (not applicable) gallons per minute
Pump Type (Check one):
□ Deep Well Turbine □ Rotary □ Propeller
□ Submersible □ Rotary-Displacement □ Reciprocating
□ Centrifugal □ Rotary-Gear □ Impulse

6. PROPOSED USE: (check all that apply)
□ Municipal (including hotels, stores, etc.) □ Industrial
□ Domestic (individual, noncommercial water system)
□ Other (explain): Monitoring Well
Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? □ Yes □ No
□ Irrigation (crop) □ No. of Acres:
□ Military □ Other (explain): _______

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable gallons per day
(b) METHOD OF FLOW MEASUREMENT: □ Flowmeter □ Open-pipe □ Weir □ Orifice □ Other(explain) _______

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: □ CDUP □ SMAP □ EIS □ EA □ None □ Other (explain) _______

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS. _______

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner _____________________________ Landowner _____________________________ Contractor _____________________________
(print legibly) (print legibly) (print legibly)
Signature _____________________________ Signature _____________________________ Signature _____________________________
Date 2/3/00 Date _____________________________ Date 1/8/00

For official use only
Latitude _____________________________ Aquifer System No. _____________________________
Longitude _____________________________ State Well No. 5213-11

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft., msl*

Minimum of 2\(^\circ\) Radius & 4\(^\circ\) Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 ft., msl*

Cement Grout: 68 ft (min. 70% of distance from ground elevation to top of water surface or 500 ft, whichever is less.)

Annular space between hole and casing (min.3"): 3 in.

Rock or Gravel Packing: 32 ft.

Material:
- Crushed Basalt
- Rounded Gravel

Total Depth: 100 ft.

Solid Casing: (90\% x (Ground Elev.-Water Level Elev))
- Total Length: 70 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -80 ft., msl*

Open Casing: (check one or more): Open Hole
- Total Length: 30 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -80 ft., msl*

note: Neither bentonite nor mud should be used in saturated zone during drilling.

Estimate Water Level Elevation: 2.2 ft. msl*

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = (Water Elevation - (1/4 x Aquifer Thickness))

Example: Estimated + 2 ft. Water Level Elev. —> bottom Elevation of well limit = (2 - (1/4 x (2 ft.))) = 1.5 ft.

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A65 □ ASTM A139
- Stainless Steel: (check one):
  □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2966
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A65 □ ASTM A139
- Stainless Steel: (check one):
  □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
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  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296
APPLICATION FOR PERMIT

WELL & PUMP INFORMATION:

1. WELL NAME: ERDC-MW-4A  2312 - 05  
2. Address: Makua Military Reservation  
3. Island: Oahu  
4. Map Tax Key: 8 2 01 24  
5. Zone:  
6. Sec:  
7. Parcel:  
8. Is this well part of a battery of wells? (c)  
9. Yes  (a)  
10. No  (b)  
11. (Please describe)  
12. Other (explain):  
13. This well is one of three in nested pairs at different depths MW-4A,4B,4C  
14. PROPOSED PUMP INFORMATION: Rated Pump Capacity: Not applicable gallons per minute  
15. Pump Type (Check one):  
16. Deep Well Turbine  
17. Rotary  
18. Propeller  
19. Submersible  
20. Rotary-Displacement  
21. Reciprocating  
22. Centrifugal  
23. Rotary-Gear  
24. Impulse  
25. CONSTRUCTION:  
26. Drilled  
27. Dug  
28. Shaft  
29. Tunnel  
30. (This well is part of a battery of wells?)  
31. Yes  
32. No  
33. (Please describe)  
34. Other (explain):  
35. PROPOSED USE: Municipal (including hotels, stores, etc.)  
36. No  
37. Industrial  
38. Domestic (individual, noncommercial water system)  
39. Yes  
40. No  
41. Irrigation (crop)  
42. No  
43. No. of Acres:  
44. Military  
45. Yes  
46. No  
47. Other (explain):  
48. Monitoring Well  
49. PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day  
50. FLOW MEASUREMENT:  
51. Flowmeter  
52. Open-pipe  
53. Weir  
54. Orifice  
55. Other (explain):  
56. OTHER IMPORTANT INFORMATION:  
57. LEGAL REQUIREMENTS:  
58. CDUP  
59. SMAP  
60. EIS  
61. EA  
62. None  
63. Other (explain):  
64. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS. (if more space is needed, please attach additional sheet)  
65. I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date, 2) the contractor shall submit to the Commission a well abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft., msl

Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: ___________ ft., msl*

---

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev))
Total Length: ___________ ft.
Nominal Diameter: _______ in.
Wall Thickness: _______ in.
Bottom Elevation: ________ ft., msl*

Open Casing: □ Perforated □ Screen
Total Length: ___________ ft.
Nominal Diameter: _______ in.
Wall Thickness: _______ in.
Bottom Elevation: ________ ft., msl*

Open Hole:
Length: ________ ft.
Diameter: ________ in.
Bottom Elevation: _________ ft., msl*

---

Solid Casing Material:
Carbon Steel: compliant with (check one or more):
□ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more):
□ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one)
□ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one)
□ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one)
□ Filament Wound Resin Pipe conforming to ASTM D2996
□ Centrifugally Cast Resin Pipe conforming to ASTM D3517
□ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C960
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
Carbon Steel: compliant with (check one or more):
□ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more):
□ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
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* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation - (1/4 x Water Level Elev.))

Example: Estimated 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 ft. - (1/4 x 2 ft.)) = .5 ft.
Title: Monitoring Well Locations

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

FIGURE NO: 3.13

Scale (ft)

References: USGS Hawaii Elevation Grid

Legend:
- ERDC-MW-2
- ERDC-MW-3A, B
- ERDC-MW-4A, B
- ERDC-MW-1

Note:
- Points of interest are marked on the map.
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Well Construction and/or Pump Installation

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 521, Honolulu, Hawaii 96814. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 808-852-0225. For further information and updates to this application form, visit: http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army
   Mailing Address: DWP, Attn: APWG-GWY, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   Contact Person: Jon Fukuda
   Phone: 656-2878
   E-mail: fukuda@schofield.army.mil

2. (b) LAND OWNER: (same as well owner)
   Mailing Address: 
   Fax: 
   Contact Person: 
   Phone: 
   E-mail: 

3. (c) CONTRACTOR: Valley Well Drilling
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Fax: 682-1768
   Contact Person: Mike Sober
   Phone: 682-1767
   E-mail: vdhi@lava.net
   Lic#: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-4B
   Address: Makua Military Reservation
   Tax Map Key: 8 2 01 24
   Island: Oahu
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK:
   (check all that apply)
   - Construct New Well*
   - Install New Pump*
   - Modify Existing Well*
   - Modify Pump*
   - Abandon/Seal*
   *State Well No.: __________________ (if unknown, please call Commission at 808-825-2225)

4. CONSTRUCTION:
   - Drilled
   - Dug
   - Shaft
   - Tunnel
   Is this well part of a battery of wells? Yes ☐ No ☐ (Please describe) This well is one of three in nested pair at different depths MW-4A, 4B, 4C

5. PROPOSED PUMP INFORMATION:
   Rated Pump Capacity: Not Applicable gallons per minute
   Pump Type (Check one):
   - Deep Well Turbine
   - Rotary
   - Propeller
   - Submersible
   - Rotary-Displacement
   - Reciprocating
   - Centrifugal
   - Rotary-Gear
   - Impulse
   - Other (explain):

6. PROPOSED USE:
   (check all that apply)
   - Municipal (including hotels, stores, etc.)
   - Industrial
   - Domestic (individual, non-commercial water system)
   - No
   - Other (explain):

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   - Not Applicable gallons per day
   - Monitoring Well

   (b) METHOD OF FLOW MEASUREMENT:
   - Flowmeter
   - Open- Pipe
   - Weir
   - Orifice
   - Other (explain):

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:
   - CDUP
   - SNAP
   - EIS
   - EA
   - None
   - Other (explain):

9. REMARKS, EXPLANATIONS:
   This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

I understand that approval of this application attaches the following standard conditions: 1) The proposed work is to be completed within two (2) years from the approval date; 2) The contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) Monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: ________________________
Signature: ________________________
Date: 2-3-00

Landowner: ________________________
Signature: ________________________
Date: ________________________

Contractor: ________________________
Signature: ________________________
Date: 4-8-00

For official use only
Latitude: ________________________
Longitude: ________________________
Aquifer System No: ________________________
State Well No: ________________________

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft., msl

Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 ft., msl

Solid Casing: (≥ 90%) (Ground Elev.-Water Level Elev.)

Total Length: 45 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -25 ft., msl

Open Casing: ☑ Perforated ☑ Screen

Total Length: 25 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft., msl

Solid Casing Material:

- Carbon Steel: compliant with (check one or more) ☑ ANSI/AWWA C200 ☑ API Spec. 5L ☑ ASTM A53 ☑ ASTM A139
- Stainless Steel: (check one): ☑ ASTM A409 (production wells) ☑ ASTM A139 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527 (check one): ☑ Schedule 40 ☑ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241); (check one): ☑ Schedule 40 ☑ Schedule 80 ☑ Schedule 120
- Thermoset Plastic: (check one) ☑ Filament Wound Resin Pipe conforming to ASTM D2996

Open Casing Material:

- Carbon Steel: compliant with (check one or more) ☑ ANSI/AWWA C200 ☑ API Spec. 5L ☑ ASTM A53 ☑ ASTM A139
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- Thermoset Plastic: (check one) ☑ Filament Wound Resin Pipe conforming to ASTM D2996

---

For non-salt water Basal Wells: bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation, ft. - Water Level Elev., ft.)/4 (may be negative)

Example: Estimated + 2 ft. Water Level Elev. = Bottom Elevation of Well Limit = (2 + 41)/4 = 10.5 ft.

---

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

WELL CONSTRUCTION and/or PUMP INSTALLATION

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

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For Official Use Only:

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3. PROPOSED WORK:

- Construct New Well
- Modify Existing Well
- Abandon/Seal

4. CONSTRUCTION:

- Drilled
- Dug
- Shaft
- Tunnel

5. PROPOSED PUMP INFORMATION:

- Rated Pump Capacity: (Not applicable) gallons per minute
- Pump Type (Check one):
  - Deep Well Turbine
  - Submersible
  - Centrifugal

- Pump Type (Check one):
  - Rotary
  - Rotary-Displacement
  - Centrifugal

- Rated Pump Capacity: (Not applicable) gallons per minute

6. PROPOSED USE:

- Municipal (including hotels, stores, etc.)
- Industrial
- Domestic (individual, noncommercial water system)
- Irrigation (crop)
- Military

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:

- Not Applicable gallons per day

8. LEGAL REQUIREMENTS:

- CDP 
- SMAP 
- EIS 
- EA 
- None 
- Other (explain)

9. REMARKS, EXPLANATIONS:

- This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
- (If more space is needed, please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: Lt. Floyd A. Quintana  
Signature:  
Date: 23 SEP 02

Landowner:  
Signature:  
Date:  

Contractor: Valley Well Drilling  
Signature:  
Date:  

For official use only:

Latitude:  
Longitude:  
Aquifer System No: 311-03

State Well No: 21358

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

WELL CONSTRUCTION and/or PUMP INSTALLATION

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3. PROPOSED WORK:

- Construct New Well
- Modify Existing Well
- Abandon/Seal

4. CONSTRUCTION:

- Drilled
- Dug
- Shaft
- Tunnel

5. PROPOSED PUMP INFORMATION:

- Rated Pump Capacity: (Not applicable) gallons per minute
- Pump Type (Check one):
  - Deep Well Turbine
  - Submersible
  - Centrifugal

- Pump Type (Check one):
  - Rotary
  - Rotary-Displacement
  - Centrifugal

- Rated Pump Capacity: (Not applicable) gallons per minute

6. PROPOSED USE:

- Municipal (including hotels, stores, etc.)
- Industrial
- Domestic (individual, noncommercial water system)
- Irrigation (crop)
- Military

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:

- Not Applicable gallons per day

8. LEGAL REQUIREMENTS:

- CDP 
- SMAP 
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- None 
- Other (explain)

9. REMARKS, EXPLANATIONS:

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Well Owner: Lt. Floyd A. Quintana  
Signature:  
Date: 23 SEP 02

Landowner:  
Signature:  
Date:  

Contractor: Valley Well Drilling  
Signature:  
Date:  

For official use only:

Latitude:  
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Aquifer System No: 311-03

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State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
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3. PROPOSED WORK:

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- Abandon/Seal

4. CONSTRUCTION:

- Drilled
- Dug
- Shaft
- Tunnel

5. PROPOSED PUMP INFORMATION:

- Rated Pump Capacity: (Not applicable) gallons per minute
- Pump Type (Check one):
  - Deep Well Turbine
  - Submersible
  - Centrifugal

- Pump Type (Check one):
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8. LEGAL REQUIREMENTS:

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- None 
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Well Owner: Lt. Floyd A. Quintana  
Signature:  
Date: 23 SEP 02

Landowner:  
Signature:  
Date:  

Contractor: Valley Well Drilling  
Signature:  
Date:  

For official use only:

Latitude:  
Longitude:  
Aquifer System No: 311-03

State Well No: 21358
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: __ in.

Elevation at top of casing: 22 ft., msl

Minimum of 2' x 4' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 ft., msl

Cement Grout: 68 ft

(min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min. 3")

3 in.

Rock or Gravel Packing:

32 ft.

Material:

- Crushed Basalt
- Rounded Gravel

Total Depth: 100 ft.

2.00 x (Ground Elev. - Water Level Elev.)

Solid Casing: (check one or more):

- Q 90% x (Ground Elev. - Water Level Elev.)

Total Length: 70 ft.

Nominal Diameter: 4 in.

Wall Thickness: 0.406 in.

Bottom Elevation: -50 ft., msl

Open Casing:

- Q Perforated
- Q Screen

Total Length: 30 ft.

Nominal Diameter: 4 in.

Wall Thickness: 0.406 in.

Bottom Elevation: -50 ft., msl

Open Hole:

Length: __________ ft.

Diameter: __________ in.

Bottom Elevation: __________ ft., msl

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation - 0.25 x Water Level Elev.)

Example: Estimated Water Level Elev. = 2.2 ft., msl

Bottom Elevation of Well Limit = (2 - 0.25 x 2.2) = -1.85 ft.

Solid Casing Material:

Carbon Steel: compliant with (check one or more):

- ANSI/AWWA C200
- API Spec. 5L
- ASTM A53
- ASTM A139

And compliant with (check one or more):

- ASTM A242
- Type E
- Type S
- Grade B
- Other

Stainless Steel: (check one)

- ASTM A409 (production wells)
- ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one)

- Schedule 40
- Schedule 80

PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one)

- Schedule 40
- Schedule 80
- Schedule 120

Thermoset Plastic: (check one)

- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material Schedule 80:

Carbon Steel: compliant with (check one or more):

- ANSI/AWWA C200
- API Spec. 5L
- ASTM A53
- ASTM A139

And compliant with (check one or more):

- ASTM A242
- Type E
- Type S
- Grade B
- Other

Stainless Steel: (check one)

- ASTM A409 (production wells)
- ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one)

- Schedule 40
- Schedule 80

PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one)

- Schedule 40
- Schedule 80
- Schedule 120

Thermoset Plastic: (check one)

- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

APPLICANT INFORMATION:
(Fill out all three, if applicable, and place a check next to the primary contact)
1. (a) ☑ WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Mailing Address: DFW, Attn: APVO-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Phone: 656-2878
   Fax: 656-1039
   E-mail: fukuda@schofield.army.mil
2. ☐ LAND OWNER: (STATE OF HAWAII)
3. ☐ CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Mailing Address: 91-235A Ohana St., Kapolei, HI 96707
   Phone: 682-1767
   Fax: 682-1768
   E-mail: vywdhi@lava.net
   Lic #: 21358
   (circle one 25-57A, or A)

WELL & PUMP INFORMATION:
(please fill in the diagram on the back of this form.)
2. WELL NAME: ERDC-MW-5 31° 31' 06"
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8: 2: 01: 20

3. PROPOSED WORK:
   (check all that apply)
   ☑ Construct New Well
   ☑ Modify Existing Well
   ☑ Abandon/Seal

   "State Well No.__________________ 
   (If unknown, please call Commission at 587-0225)

4. CONSTRUCTION:
   ☑ Drilled
   ☑ Dug
   ☑ Shaft
   ☑ Tunnel

5. PROPOSED PUMP INFORMATION
   Rated Pump Capacity: (not applicable) gallons per minute
   Pump Type (check one):
   ☑ Deep Well Turbine
   ☑ Submersible
   ☑ Centrifugal
   ☑ Rotary
   ☑ Rotary-Displacement
   ☑ Rotary-Gear
   ☑ Propeller
   ☑ Reciprocating
   ☑ Impulse

6. PROPOSED USE
   (check all that apply)
   ☑ Municipal (including hotels, stores, etc.)
   ☑ Domestic (individual or noncommercial water system)
   ☑ Industrial
   ☑ Irrigation (crop)
   ☑ Military
   ☑ Other (explain): Monitoring Well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day
    (b) METHOD OF FLOW MEASUREMENT:
       Flowmeter
       Open-pipe
       Weir
       Office
       Other (explain)

8. LEGAL REQUIREMENTS:
   ☑ CDUP ☑ SMAP ☑ EIS ☑ EA ☑ None ☑ Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

   (If more space is needed, please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner:
Landowner:
Contractor:

Signature:
Signature:
Signature:

Date: 9/15/02

For official use only
Latitude: ____________
Longitude: ____________
Aquifer System No.: ____________
State Well No.: ____________

WCPIPA Form 10/25/00
# PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

**Hole Diameter:** _____________ in.

**Estimated Water Level Elevation:** _____________ ft., msl

**Minimum of 2" Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)**

**Ground Elevation:** _____________ ft., msl

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**Solid Casing:** (a 90% x (Ground Elev.-Water Elev.)

- **Total Length:** _____________ ft.
- **Nominal Diameter:** _____________ in.
- **Wall Thickness:** _____________ in.
- **Bottom Elevation:** _____________ ft., msl

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**Open Casing:**

- **Total Length:** _____________ ft.
- **Nominal Diameter:** _____________ in.
- **Wall Thickness:** _____________ in.
- **Bottom Elevation:** _____________ ft., msl

*Note: Neither bentonite nor mud should be used in saturated zone during drilling.*

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**Solid Casing Material:**

Carbon Steel: compliant with (check one or more): ANSI/AWWA C200  API Spec. 5L  ASTM A53  ASTM A139  
And compliant with (check one or more): ASTM A242  Type E  Type S  Grade B  Other

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one)  Schedule 40  Schedule 80

PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one)  Schedule 40  Schedule 80

Thermoset Plastic: (check one)

- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

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**Open Casing Material:**

Carbon Steel: compliant with (check one or more): ANSI/AWWA C200  API Spec. 5L  ASTM A53  ASTM A139  
And compliant with (check one or more): ASTM A242  Type E  Type S  Grade B  Other

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one)  Schedule 40  Schedule 80

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- FEP Fluorocarbon Tubing conforming to ASTM D3296

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*The approximate elevation must be referenced to mean sea level (msl) at the time of installation filing. Final elevations of well components shall be adjusted to the Well Completion/Well Abandonment reports and surveyed as a benchmark which has been established by a surveyor.*

For non-casing Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, (Bottom Elevation of Well Limit = (Water Elevation + 1/4 Water Level Elevation)

Example: Estimated + 2 ft. Water Level Elevation → Bottom Elevation of Well Limit = (2 - (1/4 x 2)) = -18.5 ft.

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*Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.*