## 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>

<table>
<thead>
<tr>
<th>Proposed Use</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Withdrawal</td>
<td>System Sustainable Yield</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>
</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>
</tbody>
</table>

| Estimated Head             | ft., m.s.l. |
| Calculated Aquifer Thickness | 1025 ft.    |
| County Water Supply (Y/N ?) | N/S         |

<table>
<thead>
<tr>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Designation</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Designation</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Wall Thickness</td>
</tr>
<tr>
<td>Openings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Open Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Diameter</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
  - County or Non-County: PVC
  - non-county
  - Minimum Thickness per standards: 0.237 in.
  - Wall Thickness Provided: 0.406 in.
  - Minimum Length of Solid Casing: 157.5 ft.
  - Length of solid casing Provided: 170 ft.
- Okay (refer to HWCPIS Section 2.4 c, d, e)

### Casing Material
- Sch 40

### Annular Space
- Depth of Grouting: 122.5 ft.
- Calculated Depth of Grouting: 165 ft.
- Thickness of Annular Space: 3 in.

- Okay (refer to HWCPIS Section 2.6 c, d)
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,

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)
### 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 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 Regulations Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.hawaii.gov/dlnrlcwrml.

| 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: 9/25/2002 |

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 (1217/97 SDPTD Form) |
| 9. Constant Rate Aquifer Test completed? ☐ No ☑ Yes Attach Constant Rate Aquifer Test form (1217/97 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: 12/14/02 11:55 |
| 12. Temperature: 79 °F Date and time of measurement: 12/14/00 11:58 |

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


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
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

---

**Details:**
- **Bench mark elevation:** ft., msl* (Survey to nearest 0.01 ft.)
- **Cement Grout:** Y 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:** 32 ft.  
  - **Material:** Crushed Basalt or Rounded Gravel
- **Water Level Elevation:** 4.35 ft. msl*
- **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.
  - **Well Thickness:** 0.237 in.
  - **Bottom Elevation:** 6.237 ft., msl
- **Open Hole:** Filled with gravel
  - **Length:** 1 ft.
  - **Diameter:** 10 ft.
  - **Bottom Elevation:** -26.05 ft., msl

*msl = mean sea level
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,</td>
<td>9/19/02</td>
</tr>
<tr>
<td></td>
<td>water level approx 7.5 ft</td>
<td></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.
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

**Well No. 3113-02**

<table>
<thead>
<tr>
<th>Drilling Agency</th>
<th>Valley Drilling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Driller</td>
<td>John Suri</td>
</tr>
<tr>
<td>Manufacturer's design of drill</td>
<td>Mobile B-90</td>
</tr>
<tr>
<td>Total No. of overburden samples taken</td>
<td>Disturbed 3</td>
</tr>
<tr>
<td>GPS Coord.</td>
<td>N 21 deg. 31.814' W 138 deg. 13.828'</td>
</tr>
<tr>
<td>Datum for elevation shown</td>
<td>MSL</td>
</tr>
<tr>
<td>Date Started</td>
<td>9/19/02</td>
</tr>
<tr>
<td>Completed</td>
<td>9/19/02</td>
</tr>
<tr>
<td>Total Depth of Hole</td>
<td>35 ft</td>
</tr>
<tr>
<td>Elevation ground water</td>
<td>7.5 ft</td>
</tr>
</tbody>
</table>

<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) Black w/ basalt cobbles. Very hard drilling - bit chattered on rocks. Small amt of limestone cobbles present @ 2-3.0 ft</td>
<td>HNU - 0.0 SC:LL - 0 counts</td>
<td>Note: Run 3 in PVC pipe to 3.0 ft to clear. Run device inside PVC pipe to clear.</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance. No detect - drilling ahead.</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Rock drilled through - very slow drilling</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Silty sands (SP-SM), dark black w/ cobbles &amp; frags of basalt &amp; limestone (damp)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Second clearance. No detect - drilling ahead. HNU - 0.0 SC:LL - 0 counts</td>
<td>7.5 ft Approx. water table</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>As above</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Third clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts</td>
<td>7.5 ft Approx. water table</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>AA - wet</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td>Fourth clearance. No detect - drilling ahead. Drilling smooth, below water table.</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td></td>
<td>Fifth clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts</td>
<td>15.0' end of UXO clearance</td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td>Smooth drilling. No chattering. Sand (SP) w/ trace of basalt frags from cuttings rec. from auger</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td>Sand (SP) black w/ trace of basalt frags. (from auger), wet. Some clay (CL) present. Drilling smooth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>Sand (SP) from auger, wet w/ CL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td>Drilling smooth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-24</td>
<td>Sand (SP) from auger, wet w/ CL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-26</td>
<td></td>
<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>
<tr>
<td>-32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-34</td>
<td>AA drilling smooth</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)
Title: Monitoring Well Locations

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

FIGURE NO: 2.16
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 3-2-01, 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, 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 Division 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: 1/23/04
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: ___________________________ Date: 11/14/04
Printed Name: Mike Suber 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
1. State Well No.: 3113-03  
2. Address: Makua Military Reservation  
3. Drilling Company: Valley Well Drilling  
4. Drilling method used during construction: Rotary  
5. Date Well Construction (drilled, cased, grouted) completed: 9/30/02  
6. Was the subject well cored? Yes/No  
7. Initial water-level encountered _____ ft. below ground  
8. Step-Drawdown Test completed? Yes/No  
9. Constant Rate Aquifer Test completed? Yes/No  
10. Water-level: 4.02 ft. above msl  
11. Chloride: 186 ppm  
12. Temperature: 79 °F  
13. Remarks: No pump installed. Well for sampling  
14. Licensed Driller (print) Mike Sopher  
15. Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI  

**Parameters prior to pump test:**

- Water-level: 4.02 ft. above msl  
- Chloride: 186 ppm  
- Temperature: 79 °F  

**Date and time of measurement:**

- Water-level: 4/3/2003 8:30  
- Chloride: 4/3/2003 12:00  

**License information:**

- C-57 Lic. No. 31358
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.)

Cement Grout: 13.5 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"):

Rock or Gravel Packing:

Material:
- Crushed Basalt
- Rounded Gravel

Water Level Elevation:

Total Depth

Solid Casing: (\geq 90\% x (Ground Elev.-Water Level Elev))

Length: 16.5 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: 3.25 ft., msl*

Open Casing:

Material:
- Perforated Screen

Open Hole:

Length: __ ft.
Diameter: ___ in.
Bottom Elevation: ______ ft., msl

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:

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

[Diagram with measurements and specifications]
## Drilling Log

**Well No. 3113-03**

**Makua Military Reservation**  
**Drilling agency**: Valley Drilling  
**Name of Driller**: John Surigao  
**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'

### Drill Log Data

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 0     | Fine sand (SM) Brown fill? | HNU - 0 ppm  
SC: LL - 18-20 counts (only background) |
| -2    | First clearance, no detect OA |  |
| -4    | Sand (SP) White, brown calcareous, well rounded, paleo-beach sand. Well sorted, coarse grained. | Blow counts  
10 | Sampled w/ 2" sampler from 5.0' to 6.5'. Sand (SP) |
| -6    | Second clearance  
HNU - 0 ppm  
SC: LL - 18 total counts (only background) |
| -8    | A.A. (cuttings)  
HNU - 0 ppm  
SC: LL - 0 counts (only background) |
| -10   | Third clearance/NT/OA  
HNU - 0 ppm  
SC: LL - 0 counts (only background) |
| -12   | Fourth clearance/NT/OA  
HNU - 0 ppm  
SC: LL - 0 counts (only background) |
| -14   | Sand (SP) A/A, white to brown (cuttings) |
|       | HNU - 0.0 ppm  
SC: LL - | |

**Vertical Hole No.**: ERDC MW-4A  
**Size and Type of Bit**: 7" 3 way  
**Datum for elevation shown**: MSL  
**Completed**: 9/20/02  
**Elevation ground water**: 16.9'  
**Total Depth of Hole**: 45 ft  
**Total No. of undisturbed samples taken**: Disturbed 2

### Vertical Hole Data

- **Vertical Hole No.**: ERDC MW-4A  
- **Size and Type of Bit**: 7" 3 way  
- **Datum for elevation shown**: MSL  
- **Completed**: 9/20/02  
- **Elevation ground water**: 16.9'  
- **Total Depth of Hole**: 45 ft  
- **Total No. of undisturbed samples taken**: Disturbed 2
SC: LL - 18-20 counts (only background)

16.9' Water Table

Sand (SP) A/A

Sand (SP) White to brown, well-sorted, coarse grained, wet (auger cutting)

Sand (SP) AA (cuttings)

Sand (SP) AA (cuttings)

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 - 0.0 ppm
SC: LL 18-20 counts (only background)
-38
-40
-42
-44

Sand (SP) AA (cuttings)
## DRILLER'S LOG

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

**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
Elevation = 19.3 ft.

- Steel, cement filled pickets (1 of 3)
- Concrete Surface Seal
- 4" Diameter PVC Schedule 40 Riser Pipe
- Borehole Diameter (10" Minimum)
- Water Level
- #3 Sand
- 4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

Depth Below Land Surface (ft.)

Title: Well Construction
Log ERDC-MW-4A

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-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 instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of existence 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 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: 6/23/04
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ____________________________ Date: 11/16/04
Printed Name: Mike S memories C-57 License #: 21356
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/ Safe Drinking Water, Wastewater, and Clean Water Branches Honolulu Board of Water Supply
## WELL COMPLETION REPORT - PART I

### Well Construction

**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 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 808-587-0225. 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/)

### General Information

1. **State Well No.:** 3113-04
2. **Well Name:** ERDC-MW-4B
3. **Address:** Makua Military Reservation
4. **Island:** Oahu
5. **Drilling Company:** Valley Well Drilling
6. **Drilling method used during construction:**
   - [ ] Rotary
   - [x] Percussion
   - [ ] Other (describe)
7. **Date Well Construction (drilled, cased, grouted) completed:** 9/21/02

### Additional Details

- **Driller's Log:** Fill out attached Driller's Log
- **Geologic Log:** In addition to the driller's log, if a geologic log was prepared, please submit with this form.

### Technical Data

1. **Was the subject well cored?**
   - [ ] Yes
   - [x] No

2. **Initial water-level encountered:**
   - 16.5 ft. below ground
   - Date and time of measurement: 9/21/02 9:50

3. **Step-Drawdown Test completed?**
   - [ ] Yes
   - [ ] No

4. **Constant Rate Aquifer Test completed?**
   - [ ] Yes
   - [ ] No

### Water Levels

5. **Water-level:**
   - 4.02 ft. above msl
   - Date and time of measurement: 4/15/03 9:30

6. **Chloride:**
   - 168 ppm
   - Date and time of sampling: 4/16/03 6:00

7. **Temperature:**
   - 70 °F
   - Date and time of measurement: 4/16/03 16:10

### Remarks

- **Remarks:** No pump installed. Well for sampling

### License Information

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

- **Permittee (print):** COL Floyd A. Quintana, DPW, USAG-HI
  - Signature: [Signature]
  - Date: 10/30/04

---

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

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

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.

Ground Elevation: __ ft., msl

Minimum of 2' Radius & 4" Thick Concrete Pad

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

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): 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
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*msl = mean sea level

WCR1 Form 9/12/01 Page 2 of 4
# State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
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:

04 DEC 2  P4:00

COMMISION ON WATER
RESOURCES MANAGEMENT

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

<table>
<thead>
<tr>
<th>Drilling Log</th>
<th>Vertical Hole No.</th>
<th>ERDC MN-4B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Makua Military Reservation</strong></td>
<td><strong>Size and Type of Bit:</strong> 7&quot; 3 way</td>
<td></td>
</tr>
<tr>
<td><strong>Drilling agency:</strong> Valley Drilling</td>
<td><strong>Datum for elevation shown:</strong> MSL</td>
<td></td>
</tr>
<tr>
<td><strong>Name of Driller:</strong> John Suriaad</td>
<td><strong>Date Started:</strong> 9/20/02</td>
<td></td>
</tr>
<tr>
<td><strong>Manufacturer's designation of drill:</strong> Mobile E-90</td>
<td><strong>Completed:</strong> 9/20/02</td>
<td></td>
</tr>
<tr>
<td><strong>Total No. of overburden samples taken:</strong> Disturbed 2</td>
<td><strong>Total Depth of Hole:</strong> 70 ft</td>
<td></td>
</tr>
<tr>
<td><strong>GPS Coord. N 21 deg 31.742'W 156 deg 57.3' (Acc. 1')</strong> Undisturbed</td>
<td><strong>Elevation ground water:</strong> 16.8'</td>
<td></td>
</tr>
</tbody>
</table>

<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>20</td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts (background)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First clearance. ND/DA.</td>
<td>30</td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts (background)</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>End of fill. Sand (SP) brown to white. Very well sorted.</td>
<td></td>
<td>Sampled with 2&quot; D.T. Sands (SP)</td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Second clearance. ND/DA.</td>
<td>15</td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Sand (SP) cuttings.</td>
<td>20</td>
<td>Sampled with 2&quot; D.T. Sand (SP)</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Third clearance.</td>
<td>30</td>
<td>Note: Drilled hole to 20', let set 20 min to check water level.</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Fourth clearance. ND/DA. Sand (SP) Brown to white (cuttings).</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Fifth clearance.</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td></td>
<td>Sand (SP) A/A. Water table at 16.8'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td></td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td></td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-24</td>
<td></td>
<td></td>
<td>20</td>
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<tr>
<td>-26</td>
<td></td>
<td>Sand (SP) A/A (cuttings)</td>
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<tr>
<td>-28</td>
<td></td>
<td></td>
<td>20</td>
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</tr>
<tr>
<td>-30</td>
<td></td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
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</tr>
<tr>
<td>Layer</td>
<td>Description</td>
<td></td>
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<td>-------</td>
<td>-------------</td>
<td></td>
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</tr>
<tr>
<td>-32</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-34</td>
<td>Sand (SP) A/A</td>
<td></td>
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</tr>
<tr>
<td>-36</td>
<td>Sand (SP) A/A</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-38</td>
<td>Sand (SP) A/A</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-40</td>
<td>Sand (SP) A/A</td>
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</tr>
<tr>
<td>-42</td>
<td>Sand (SP) A/A</td>
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<td>-44</td>
<td>Sand (SP) A/A</td>
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<td>-46</td>
<td>Sand (SP) A/A</td>
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<td>-52</td>
<td>Sand (SP) A/A</td>
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<td></td>
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<tr>
<td>-54</td>
<td>Sand (SP) A/A</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-56</td>
<td>Sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-58</td>
<td>Sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-60</td>
<td>Rock at 59 to 60°, then back into sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-62</td>
<td>Sand (SP) A/A</td>
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<tr>
<td>-64</td>
<td>Sand (SP) A/A</td>
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<td></td>
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<tr>
<td>-66</td>
<td>Sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-68</td>
<td>Sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-70</td>
<td>Not as hard, last two feet.</td>
<td></td>
<td></td>
<td></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.
US Army Corps of Engineers

Title: Monitoring Well Locations

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

DR BY: RSS 3-17-03
CHK BY: SJT 3-17-03

FIGURE NO: 2.16

Ref: 1995 Korea 7.5 Quad
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 (123/97) 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 pumping test 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, [m]) 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]
Printed Name: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: [Signature]
C-57 License #: 21358
Date: 11/16/94
Printed Name: Mike Soben
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
## WELL COMPLETION REPORT - PART I
### Well Construction

**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 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/ldlnr/cwrm/

---

<table>
<thead>
<tr>
<th>1. State Well No.:</th>
<th>3113-05</th>
<th>Well Name:</th>
<th>ERDC-MW-4C</th>
<th>Island:</th>
<th>Oahu</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Address:</td>
<td>Makua Military Reservation</td>
<td>Tax Map Key:</td>
<td>8-2-01:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Drilling Company:</td>
<td>Valley Well Drilling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Drilling method used during construction:</td>
<td>Rotary</td>
<td>Percussion</td>
<td>Other (describe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Date Well Construction (drilled, cased, grouted) completed:</td>
<td>12/01/02</td>
<td>Fill out attached Driller's Log</td>
<td></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 | 15 ft. below ground | Date and time of measurement: 12/01/02 16:30 |
| 8. Step-Drawdown Test completed? | ☐ No | ☑ Yes |
| 9. Constant Rate Aquifer Test completed? | ☐ No | ☑ Yes |

*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: | 0 ppm | Date and time of sampling: 4/3/03 15:00 |
| 12. Temperature: | 75 °F | Date and time of measurement: 4/3/03 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 Salas
C-57 Lic. No. 21358

[Signature]

Date 1/4/03

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

[Signature]

Date 7/21/03

---

WCRI 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:**
- ft., msl

**Minimum of 2' Radius & 4' Thick Concrete Pad**
- ft., msl

**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/WWA C200
  □ API Spec. 5L
  □ ASTM A53
  □ ASTM A139

- Stainless Steel: 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
  □ Schedule 120

- Thermoset Plastic: (check one)
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D2996
  □ 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: 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
  □ Schedule 120

- Thermoset Plastic: (check one)
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D2996
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

---

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


---

*msl = mean sea level

**3-31-2005 ERDC-MJ-4C**

---

**WCR1 Form 9/12/01 Page 3 of 4**
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, silt, sand,</td>
<td>12/03/02</td>
</tr>
<tr>
<td></td>
<td>loose from cutting. Smooth drilling</td>
<td></td>
</tr>
<tr>
<td>55 to 66</td>
<td>Dark brown sandy, silt, clay and</td>
<td>12/03/02</td>
</tr>
<tr>
<td></td>
<td>basaltic rock</td>
<td></td>
</tr>
<tr>
<td>66 to 92</td>
<td>Dark brown sandy few, silt clay,</td>
<td>12/04/02</td>
</tr>
<tr>
<td></td>
<td>few basaltic fine to coarse gravel</td>
<td></td>
</tr>
<tr>
<td>92 to 105</td>
<td>Dark brown sandy, silt, clay, few</td>
<td>12/04/02</td>
</tr>
<tr>
<td></td>
<td>basaltic fine to coarse gravel</td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
**Geologic Log**  
*Well No. 3113-06*

<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>-4</td>
<td></td>
<td>Approximate water table.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>End UXO clearance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| -8    | (SC) Brown, clayey, silty, sand w/ trace line to coarse basaltic gravel from drill cuttings. |             | HNU - 8.0  
| -10   |            |             |             |          |
| -12   |            |             |             |          |
| -14   |            |             |             |          |
| -16   |            |             |             |          |
| -18   |            |             |             |          |
| -20   |            |             |             |          |
| -22   |            |             |             |          |
| -24   |            |             |             |          |
| -26   |            |             |             |          |
| -28   |            |             |             |          |
| -30   |            |             |             |          |
| -32   |            |             |             |          |
| -34   |            |             |             |          |
| -36   |            |             |             |          |
| -38   |            |             |             |          |
| -40   |            |             |             |          |
| -42   |            |             |             |          |
| -44   |            |             |             |          |
| -46   |            |             |             |          |

**Drilling Log**  
*C Draft*

**Makua Military Reservation**  
*Drilling agency: Valley Drilling*

<table>
<thead>
<tr>
<th>Driller's Name</th>
<th>John Surigad</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Total No. of overburden samples taken:</th>
<th>Disturbed 0</th>
<th>Undisturbed 0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Datum for elevation shown:</th>
<th>MSL - 235.36'</th>
</tr>
</thead>
</table>

**Total Depth of Hole:** 105 ft

**Depth**

**Lithology**

**Description**

**Blow Counts**

**Comments**

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).

*35' 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.
Monitoring Well Coordinates

Well MW-4C (3113-00) 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.
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. All work shall be performed 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 basalt 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: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: ____________
Printed Name: Mike Sobr C-57 License #: 21356 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 Safe Drinking Water, Wastewater, and Clean Water Branches Honolulu Board of Water Supply
WELL COMPLETION REPORT - PART I

**State: Hawaii**
**Commission on Water Resource Management**
**Department of Land and Natural Resources**

**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/

<table>
<thead>
<tr>
<th>1. State Well No.:</th>
<th>3113-06</th>
<th>Well Name:</th>
<th>ERDC-MW-5</th>
<th>Island:</th>
<th>Oahu</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Address:</td>
<td>Makua Military Reservation</td>
<td>Tax Map Key:</td>
<td>8-2-01:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Drilling Company:</td>
<td>Valley Well Drilling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Drilling method used during construction:</td>
<td>Rotary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Date Well Construction (drilled,cased,grouted) completed:</td>
<td>12/11/02</td>
<td>Fill out attached Driller's Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Was the subject well cored?</td>
<td>☑ Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Initial water-level encountered:</td>
<td>323 ft. below ground</td>
<td>Date and time of measurement:</td>
<td>12/09/2002 8:00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Step-Drawdown Test completed?</td>
<td>☑ Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Constant Rate Aquifer Test completed?</td>
<td>☑ Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Water-level:</td>
<td>15.35 ft. above msl</td>
<td>Date and time of measurement:</td>
<td>4/3/2003 10:30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Temperature:</td>
<td>79 °F</td>
<td>Date and time of measurement:</td>
<td>4/1/2003 14:00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Parameters prior to pump test:**

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. (Attach pump specifications and rating curve)

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

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

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

**Signature:**

**Date:** 11/16/04

**Signature:**

**Date:** 12/07/04
### Well Number: 3113-06

<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:**

For Official Use Only:

RECEIVED

04 DEC 2 P4:31
Drilling Log
Well No. 3113-06

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:

<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>(ML) dk brown clayey silt to silty clay, moist. Few basaltic rocks.</td>
<td>From drill cuttings HNU - 0 SC LL - BG</td>
<td></td>
</tr>
<tr>
<td>-20</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>-30</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>-40</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>-50</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>-60</td>
<td></td>
<td>Drilling smooth.</td>
<td>Air rotary drilling, Air volume 1,000</td>
<td></td>
</tr>
<tr>
<td>-70</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>-80</td>
<td></td>
<td>Drilling smooth.</td>
<td>Air rotary drilling, Air volume 1,000</td>
<td></td>
</tr>
<tr>
<td>-90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
Total Depth of Hole: 360 ft
Elevation ground water: 15' bgs
Completed.


ML) Light brown clayey silt.

(M) Fine grained silty sand. Very fine grained. Poorly sorted.
Fine grained silty sand. Some clay lenses, very thin. Light brown in color. Poorly sorted.

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

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

Scintillometer - 38.7
Scintillometer - 31.0
Scintillometer - 34.6
Scintillometer - 31.8
Scintillometer - 32.9
Scintillometer - 33.3
Scintillometer - 31.4
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.
Title: Monitoring Well Locations

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

DR BY: RSS 3-17-03
CHK BY: SJT 3-17-03
FIGURE NO: 2.16
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: ____________________________ Date: ____________________________
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ____________________________ Date: ____________________________
Printed Name: Mike Sobier 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
1. State Well No.: 3213-08  
2. Address: Makua Military Reservation  
3. Drilling Company: Valley Well Drilling  
4. Drilling method used during construction:  
   [ ] Rotary [ ] Percussion [ ] Other (describe)  
5. Date Well Construction (drilled, cased, grouted) completed: 1/10/02  
6. Was the subject well cored?  
   [ ] Yes [x] No  
7. Initial water-level encountered: 11.7 ft. below ground  
   Date and time of measurement: 1/10/02 9:45  
8. Step-Drawdown Test completed?  
   [ ] Yes [x] No  
   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)  
9. Constant Rate Aquifer Test completed?  
   [ ] Yes [x] No  
   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)  
10. Water-level: 4.99 ft. above msl  
    Date and time of measurement: 11/11/02 10:15  
11. Chloride: 231 ppm  
    Date and time of sampling: 11/11/02 11:19  
12. Temperature: 80°F  
    Date and time of measurement: 11/11/02 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.
Solid Casing Material:
- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - Other
- 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: (check one or more):
  - ASTM F480
  - ASME A537
  - Schedule 80
  - Schedule 12
  - Other
- Thermoset Plastic: (check one or more):
  - ASTM F480
  - Schedule 40
  - Schedule 80
  - Schedule 12
  - Other

Open Casing Material:
- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - Other
- 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: (check one or more):
  - ASTM F480
  - Schedule 40
  - Schedule 80
  - Schedule 12
  - Other
- Thermoset Plastic: (check one or more):
  - ASTM F480
  - Schedule 40
  - Schedule 80
  - Schedule 12
  - Other

Water Level Elevation: 4.19 ft. msl

*msl = mean sea level
<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:

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Geologic Log**
**Well No. 3213-08**

<table>
<thead>
<tr>
<th>Drilling Log</th>
<th>DRAFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makua Military Reservation</td>
<td>Size and Type of Bit: 7&quot; 3 way</td>
</tr>
<tr>
<td>Drilling agency: Valley Drilling</td>
<td>Datum for elevation shown: MSL</td>
</tr>
<tr>
<td>Name of Driller: John Suriqad</td>
<td>Date Started: 10/09/02</td>
</tr>
<tr>
<td>Manufacturer's designation of drill: Mobile B-90</td>
<td>Completed: 10/09/02</td>
</tr>
<tr>
<td>Total No. of overburden samples taken: Disturbed 3</td>
<td>Total Depth of Hole: 35 ft</td>
</tr>
<tr>
<td>GPS Coord. N 21 deg. 32.063' W 158 deg. 13.13.694'</td>
<td>Undisturbed</td>
</tr>
<tr>
<td></td>
<td>Elevation ground water: 11.7 ft</td>
</tr>
</tbody>
</table>

<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>Silty sand (SM), black, slightly sandy w/ basalt frags.</td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>Clay (CL) Black, sl. sandy, basalt frags.</td>
<td>Background counts</td>
<td>18-20 ppm</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>First clearance. No detect - drilling ahead.</td>
<td>Blow Counts</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td>Second clearance. No detect - drilling ahead.</td>
<td>Lean clay (CL) dark gray w/ silt</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>Third clearance. No detect - drilling ahead.</td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td></td>
<td>Lean clay (CL) dark gray w/ sand/silts. Inclusions and lenses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>Fourth clearance. No detect - drilling ahead.</td>
<td>Blow Counts</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td></td>
<td>11.7' (Approx. water table)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td></td>
<td>Blow Counts</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>Fifth clearance. No detect - drilling ahead.</td>
<td>Lean clay (CL) dl. sandy, dark gray to black. Trace basalt frags.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>-11</td>
<td></td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Lean clay (CL) dl. sandy, dark gray to black. Trace basalt frags.</td>
<td></td>
<td></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 - 10-20 counts

HNU - 0 ppm
SC: LL - 10-20 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 (Surveyor Lic. #10059)

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 Makua 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 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 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: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: ___________________________ C-57 License #: 21358 Date: 11/16/04
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
C. 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: 8-1-01-1

3. Drilling Company: Valley Well Drilling

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

5. Date Well Construction (drilled, cased, grouted) completed: 10/15/2002  
   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: 9/1/2003 11:00

11. Chloride: 55 ppm  
    Date and time of sampling: 9/1/2003 11:30

12. Temperature: 80 °F  
    Date and time of measurement: 9/1/2003 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 Sobor  
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

- **Ground Elevation:** ______ ft., msl*
- **Minimum of 2' Radius & 4' Thick Concrete Pad**
- **Elevation at top of casing:** ______ ft., msl*
- **Total Depth:** ______ 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 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

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

*msl = mean sea level
**Well Number:** 3213-09

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description</th>
<th>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></td>
<td>10/14/2002</td>
</tr>
<tr>
<td>20 to 45</td>
<td>Brown clayey silty sand, trace basaltic fine pebbles</td>
<td></td>
<td>10/14/2002</td>
</tr>
</tbody>
</table>

**Remarks:**

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**For Official Use Only:**

[Stamp]

DL Form 06/24/2004
Geologic Log
Well No. 3213-09

<table>
<thead>
<tr>
<th>Drilling Log</th>
<th>DRAFT</th>
<th>Vertical Hole No.</th>
<th>ERDC MW-3A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makua Military Reservation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling agency:</td>
<td>Valley Drilling</td>
<td>Date Started: 10/14/02</td>
<td></td>
</tr>
<tr>
<td>Name of Driller:</td>
<td>John Suriaad</td>
<td>Completed: 10/14/02</td>
<td></td>
</tr>
<tr>
<td>Manufacturer’s designation of drill:</td>
<td>Mobile B-90</td>
<td>Total Depth of Hole: 45 ft</td>
<td></td>
</tr>
</tbody>
</table>

| Total No. of overburden samples taken: | Disturbed 3 | Elevation groundwater: 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 sandy clayey silt with few basaltic gravel fragments (dry) (loose)</td>
<td>HNU - 0 ppm SC: LL - 17-25 background</td>
<td></td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-2</td>
<td>ML Dark brown sandy clayey silt, few basaltic gravel fragments (dry) (loose)</td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-6'</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>ML Dark brown sandy clayey silt, few basaltic fine gravel (dry) (dense to very dense)</td>
<td>21</td>
<td>25% recovery</td>
<td>HNU - 0 ppm SC: LL - 20-30, background</td>
</tr>
<tr>
<td>-6</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>27</td>
<td>33% recovery</td>
<td>2nd UXO clearance at 6' bgs</td>
</tr>
<tr>
<td>-8</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>30</td>
<td>33% recovery</td>
<td>3rd UXO clearance</td>
</tr>
<tr>
<td>-10</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>40</td>
<td>33% recovery</td>
<td>4th UXO clearance. HNU - 0 ppm SC: LL 20-35, background.</td>
</tr>
<tr>
<td>-12</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>50</td>
<td>33% recovery</td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Rock in sample shoe. Low recovery</td>
</tr>
<tr>
<td>-14</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>20</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-10.0' Sampler refusal1'</td>
</tr>
<tr>
<td>-16</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>20</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-10.0' Sampler refusal1'</td>
</tr>
<tr>
<td>-18</td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>20</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-10.0' Sampler refusal1'</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

30
5% recovery
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.

Depth Below Land Surface (ft.)

Bentonite Pellet Seal (Minimum 2' Thick)

Water Level

Bentonite Concrete Grout Backfill

#3 Sand

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

4" Diameter PVC Schedule 40 Riser Pipe

Borehole Diameter (10" Minimum)

US Army Corps of Engineers

Title: Well Construction
Log ERDC-MW-3A

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 (Surveyor's 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.
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 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 Unit 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 corelative 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 $100 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: 10/07/04
Printed Name: Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: 11/16/04
Printed Name: Mike Sabo 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 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 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/

For Official Use Only:

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: □ Rotary □ Percussion □ Other (describe)
5. Date Well Construction (drilled,cased,grouted) completed: 10/14/02 Fill out attached Driller's Log
6. Was the subject well cored? □ Yes □ No
7. Initial water-level encountered ___ ft. below ground Date and time of measurement: 4/3/2003 9:20
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:
12. Temperature: 75°F Date and time of measurement: 4/3/2003 14:00
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 Sober C-57 Lic. No. 21358

Signature Date 11/16/04

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

Signature Date 7/8/04
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.)

Cement Grout: 4 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:
29 ft.
Material:
□ Crushed Basalt
□ Round Gravel

Water Level Elevation:
3.78 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
□ 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 120
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 Hole: □ Perforated □ Screen
Length: 25 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: -51.66 ft., msl

Open Hole: □ Filled with gravel pack
Length: a ft.
Diameter: 10 in.
Bottom Elevation: -51.66 ft., msl

*msl = mean sea level
**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 silt 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:**
**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

**Datum for elevation shown:** MSL (apprx. 20)

**Date Started:** 10/16/02

**Date Completed:**

**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 Dark brown sandy clayey silt, few basaltic fine gravel (dry) (loose) (fill)</td>
<td>HNU - 0</td>
<td>SC:LL - 19 to 31, BG</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>ML Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense)</td>
<td>26</td>
<td>UXO clearance</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>Drilling smooth</td>
<td>30</td>
<td>UXO clearance</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>ML Dark brown sandy clayey silt, few basaltic fine gravel fragments (dry) (medium dense to dense)</td>
<td>20%</td>
<td>UXO clearance</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>Drilling smooth</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>ML Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense)</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>Approx. water table at 16' bgs</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>ML-SC Dark brown sandy clayey silt,</td>
<td>20%</td>
<td>UXO clearance</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td>Drilling smooth</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
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<td>75%</td>
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<td>UXO clearance</td>
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<td></td>
</tr>
<tr>
<td>-22</td>
<td>Drilling smooth</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample w/ 2 in diameter split spoon sampler, 140 lb hammer**

**Sample ID:** MMRSSWMW-3B-6.0

**HNU - 0**

**SC:LL - 20 to 30, BG**

**UXO clearance**

**Sample w/ 2 in diameter split spoon sampler, 140 lb hammer**

**Sample ID:** MMRSSWMW-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:** MMRSSWMW-3B-15.0'

**HNU - 0, SC:LL - 15 to 35 BG, UXO clearance**

**HNU - 0 End HNU monitoring**
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-66</td>
<td>Drilling smooth</td>
</tr>
<tr>
<td>-68</td>
<td>SC Brown clayey silty sand</td>
</tr>
<tr>
<td>-70</td>
<td>CL Black silty sandy clay with trace basaltic pebbles (wet) (soft)</td>
</tr>
<tr>
<td>-74</td>
<td>Drilling hard, lots of drill bit chatter. Basaltic rock stratum.</td>
</tr>
<tr>
<td>-76</td>
<td>Drilling hard to TD of borehole.</td>
</tr>
</tbody>
</table>

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)
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 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 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, HWCRS). If the HWCRS 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 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: ___________________________  
Firm or Title: Director of Public Works, USAG-HI

Printed Name: 60L Floyd A. Quintana  
Driller's Signature: ___________________________  
C-57 License #: 21358  
Firm or Title: Valley Well Drilling

Printed Name: ___________________________  
Date: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.
1. State Well No.: 3213-11  
2. Address: Makua Military Reservation  
3. Drilling Company: Valley Well Drilling  
4. Drilling method used during construction: X Rotary  
5. Date Well Construction (drilled, cased, grouted) completed: 4/23/02  
6. Was the subject well cored? X Yes  
7. Initial water-level encountered 16 ft. below ground  
8. Step-Drawdown Test completed? X Yes  
9. Constant Rate Aquifer Test completed? X Yes  
10. Water-level: 3.82 ft. above msl  
11. Chloride: 57 ppm  
12. Temperature: 75 °F  
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 Rohrer  
C-57 Lic. No. 21358  
Signature  
Date 11/16/04  
Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI  
Signature  
Date 12/8/04
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>
</table>

Remarks:

DL Form 06/24/2004
## Geologic Log
### Well 3213-11

<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>-2</td>
<td></td>
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</tr>
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<td>-4</td>
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</tr>
<tr>
<td>-10</td>
<td></td>
<td>SPT 8/13/02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Dark brown clayey silt, dry, loose, few fine to coarse sub-angular basaltic gravel fragments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Dark brown (10YR3/3) clayey silt, medium plasticity, dry, loose from drill cuttings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td>SPT 4/12/16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td></td>
<td>Olive gray (6Y4/0) sandy clay with silt, stiff, moist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
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<td>-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-26</td>
<td></td>
<td>Basaltic rock layer at approx. 26' bgs to approx. 45' bgs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td></td>
<td></td>
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<td>-44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-46</td>
<td></td>
<td>(CL) Black silty clay with trace of basaltic fragments from drill cuttings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drilling Log**

**Makua Military Reservation**

**Drilling Agency:** Valley Drilling

**Name of Driller:** John Surfiaad

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

**Total No. of overburden samples taken:** Disturbed 2

**Datum for elevation shown:** MSL

**Vertical Hole No.:** ERDC MW-3C

**Size and Type of Bit:** 10" tri-cone

**Date Started:** 11/20/02

**Completed:** 11/27/02

**Total Depth of Hole:** 106 ft

**Elevation ground water:** 15.5' bgs

---

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.
Title: Monitoring Well Locations

US Army Corps of Engineers

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

FIGURE NO: 2.16

ERDC-MW-2
ERDC-MW-4A, B, C
ERDC-MW-1

Makua

Kahanawa

Valley

Gulch

Scale (ft)
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.
   Talked him we could wait another 3 weeks or so before notice of viol 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 1/4-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 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 the 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. 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. 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.

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>OAHU</th>
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</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIANAE</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>#</td>
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<thead>
<tr>
<th>Proposed Use</th>
<th>Proposed Withdrawal</th>
<th>Other</th>
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<table>
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<tr>
<th>System Sustainable Yield</th>
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**SECTION 2: WELL SECTION DATA** *(enter data in grey cells only)*

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<th>Elevation at top of casing</th>
<th>Solid Casing</th>
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</tr>
<tr>
<td></td>
<td>Diameter</td>
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<tr>
<td></td>
<td>Wall Thickness</td>
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<table>
<thead>
<tr>
<th>Ground Elevation</th>
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<tr>
<td></td>
<td>M, S.L</td>
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<th>Cement Grout</th>
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<tr>
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<td>ft.</td>
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<table>
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</thead>
<tbody>
<tr>
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<td>ft.</td>
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<table>
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<th>Hole Diameter</th>
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<tbody>
<tr>
<td></td>
<td>in.</td>
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<thead>
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<th>Total Depth</th>
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<td>ft.</td>
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<table>
<thead>
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<th>Estimated Head</th>
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<tr>
<td></td>
<td>ft. m.s.l.</td>
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</table>

<table>
<thead>
<tr>
<th>Calculated Aquifer Thickness</th>
<th>1025 ft.</th>
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</thead>
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| County Water Supply (Y/N ?) |  |  |

**SECTION 3: CHECKLIST** *(values to check are shaded)*

| Well Depth                                      |  |
|------------------------------------------------|-
| Theoretical Thickness of Aquifer               | 1025 ft. |
| 1/4 Aquifer Thickness                          | 256.3 ft. |

<table>
<thead>
<tr>
<th>Depth of Well below Sea Level</th>
<th>25 ft.</th>
</tr>
</thead>
</table>

| 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. |
| Minimum Length of Solid Casing | 157.5 ft. |
| 90% of ground to top of aquifer| 170 ft. |

| Annular Space                  |  |
|--------------------------------|-
| Depth of Grouting              |  |
| Calculated Depth of Grouting   | 122.5 ft. |
| Depth of Grouting provided     | 165 ft. |
| Thickness of Annular Space     | 3 in. |

Note: Disregard if the well is not basal.

If the cell above reads #N/A, reference HWCPIS Section 2.6 c).

Okay (refer to HWCPIS Section 2.4 c).

Okay (refer to HWCPIS Section 2.4 d).

Okay (refer to HWCPIS Section 2.4 e).

Okay (refer to HWCPIS Section 2.4).
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

October 25, 2002

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
APPLICATION FOR PERMIT

APPLICANT INFORMATION:

For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

WELL & PUMP INFORMATION:

PROPOSED WORK: (check all that apply)
- Construct New Well
- Modify Existing Well
- Abandon/Seal

PROPOSED USE: (check all that apply)
- Municipal (including hotels, stores, etc.)
- Domestic (individual, noncommercial water system)
- Irrigation (crop)
- Military

PROPERTY REQUIREMENTS:
- Address: Makua Military Reservation
- Tax Map Key: 3126-0201-20
- Island: Oahu
- Plat Parcel: 21358

AUTHORIZED SIGNATURE:

For Official Use Only:

For official use only
Latitude: Aquifer System No.
Longitude: State Well No.
### Details

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#### LAND CONTROL CODES

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#### TMK SEPARATIONS

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October 21, 2002

Ms. Dierdre 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
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-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 1x4-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 re-vegetate 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 at his or her discretion to avoid periods of high rainfall, 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 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 the date the permit expires. If the well is not to be used it must be properly capped.

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
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 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 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 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, masl) 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-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.

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-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 14-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 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 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 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 #: ___________
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

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.
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,

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 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 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, 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

GILBERT S. COLOMA-AGARAN, Chairperson
Commission on Water Resource Management

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: UGS
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
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 permitted 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

GILBERT S. COLOMA-AGARAN, Chairperson
Commission on Water Resource Management

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
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,

[Signature]

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 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 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 results, 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
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,

Chairperson

Enclosures
WELL CONSTRUCTION PERMIT

ERDC-MW-3C, Well No. 3213-11

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-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 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 basalt 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>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>

<table>
<thead>
<tr>
<th>Proposed Use</th>
<th>Proposed Withdrawal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>54000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</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>
</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  
(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: 20 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.
  - Minimum Length of Solid Casing: 11.52 ft.
  - 90% of ground to top of aquifer: 8.96 ft.
  - Length of solid casing Provided: 10 ft.
  - Casing Material: Sch 40
  - okay (refer to HWCPIS Section 2.4 c)
  
- too shallow (refer to HWCPIS Section 2.4 d)

**Annular Space**
- Depth of Grouting
  - Calculated Depth of Grouting: 8.96 ft.
  - Depth of Grouting provided: 8 ft.
  - not enough (refer to HWCPIS Section 2.6 c)
  
- Thickness of Annular Space: 3 in.
  - okay (refer to HWCPIS Section 2.6 d)
  
**Depth of Grouting**
- Calculated Depth of Grouting: 8.96 ft.
- Depth of Grouting provided: 8 ft.
- not enough (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>#4#4#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Use</td>
<td>Proposed Withdrawal</td>
<td>System Sustainable Yield</td>
<td>54000</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
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<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>ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td>Rock Packing</td>
<td>in.</td>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>in.</td>
<td>Diameter</td>
<td></td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
<td>Wall Thickness</td>
<td></td>
</tr>
<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
<td>Casing</td>
<td></td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>90.2 ft.</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td>NO</td>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Length</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diameter</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Thickness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Openings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Openings</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sq.in./l.f.</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>Depth of Well below Sea Level</th>
<th>25 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical Thickness of Aquifer</td>
<td>90.2 ft.</td>
<td>too deep</td>
<td>(refer to HWCPIS Section 2.2)</td>
</tr>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
<td>(disregard if the well is not basal)</td>
<td></td>
</tr>
<tr>
<td>Depth of Well below Sea Level</td>
<td>25 ft.</td>
<td>too deep</td>
<td>(refer to HWCPIS Section 2.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Casing</th>
<th>PVC</th>
<th>Minimum Wall Thickness Provided</th>
<th>0.406 in.</th>
<th>okay</th>
<th>(refer to HWCPIS Section 2.4 c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Wall Thickness</td>
<td>non-county</td>
<td>Minimum Thickness per standards</td>
<td>0.237 in.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.4 c)</td>
</tr>
<tr>
<td>Material</td>
<td>County or Non-County</td>
<td>Wall Thickness Provided</td>
<td>0.406 in.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.4 c)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimum Length of Solid Casing</td>
<td>16.02 ft.</td>
<td>too shallow</td>
<td>(refer to HWCPIS Section 2.4 d)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90% of ground to top of aquifer</td>
<td>16.02 ft.</td>
<td>too shallow</td>
<td>(refer to HWCPIS Section 2.4 d)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Length of solid casing Provided</td>
<td>15 ft.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.4 e)</td>
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<tr>
<td></td>
<td></td>
<td>Casing Material</td>
<td>Sch 40</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.4 e)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Annular Space</td>
<td>if the cell above reads N/A, reference HWCPIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depth of Grouting</td>
<td>12.46 ft.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.6 c)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calculated Depth of Grouting</td>
<td>12.46 ft.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.6 c)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depth of Grouting provided</td>
<td>13 ft.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.6 c)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thickness of Annular Space</td>
<td>3 in.</td>
<td>okay</td>
<td>(refer to HWCPIS Section 2.6 c)</td>
</tr>
</tbody>
</table>
**SECTION 1: WELL LOCATION INFORMATION**

<table>
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<tr>
<th>Island</th>
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<th>Proposed Use</th>
<th>Proposed Withdrawal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIAANAE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>#4</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>
<tr>
<td>Estimated Head</td>
<td>Casing</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>Material</td>
</tr>
<tr>
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</tr>
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<tbody>
<tr>
<td>Theoretical Thickness of Aquifer</td>
<td></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>50 ft. too deep (refer to HWCPIS Section 2.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Wall Thickness</td>
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</tr>
<tr>
<td>Minimum Thickness per standards</td>
</tr>
<tr>
<td>Wall Thickness Provided</td>
</tr>
<tr>
<td>Minimum Length of Solid Casing</td>
</tr>
<tr>
<td>90% of ground to top of aquifer</td>
</tr>
<tr>
<td>Length of solid casing Provided</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing Material</th>
<th>Sch 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annular Space</td>
<td>If the cell above reads #N/A, reference HWCPIS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth of Grouting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Depth of Grouting</td>
</tr>
<tr>
<td>Depth of Grouting provided</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
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<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</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>
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</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>
</tbody>
</table>

| Estimated Head             | 2 ft. m.s.l. |
| Calculated Aquifer Thickness | 90.2 ft. |

| County Water Supply (Y/N ?) | N |

**SECTION 3: CHECKLIST**

<table>
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<th>Well Depth</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Wall Thickness Provided</td>
</tr>
<tr>
<td>Minimum Length of Solid Casing 90% of ground to top of aquifer</td>
</tr>
<tr>
<td>Length of solid casing Provided</td>
</tr>
<tr>
<td>Casing Material</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annular Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Grouting</td>
</tr>
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</tr>
<tr>
<td>Depth of Grouting provided</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
</tr>
</tbody>
</table>
### PUBLIC RECORD DATA

<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdv/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>930.58 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.

http://webre2.hawaiiinformation.com/REsearch/Asp/Functions/Property/Search.asp  
9/25/2002
<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>1-8-1-1-1</td>
<td>G FARRINGTON HWY</td>
<td>UNITED STATES OF AMERICA</td>
<td>13.39 ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<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 UNITED STATES OF AMERICA</td>
<td>25.72 ac</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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<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>1-8-2-1-24</td>
<td>G</td>
<td>82-180 FARRINGTON HWY</td>
<td>STATE OF HAWAI</td>
<td>260.47 ac</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**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: 

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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 821, 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
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APWG-GW, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. LAND OWNER: (same as well owner)
   Mailing Address: Fax: E-mail:

3. CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: Fax: 682-1768
   E-mail: wvdw@lava.net

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

2. WELL NAME: ERDC-MW-1
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 2 01 24
   Is this well part of a battery of wells? Yes No (Please describe)

3. PROPOSED WORK: (check all that apply)
   - Construct New Well
   - Install New Pump
   - Modify Existing Well
   - Modify Pump
   - Abandon/Seal

4. CONSTRUCTION: Drilled Dug Shaft Tunnel
   Is this well of 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)
   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): Monitoring well

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. (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 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
Landowner: Signature: Date: 2-3-02
Contractor: Valley Well Drilling
Signature: Date: 1-18-02

For official use only
Aquifer System No. State Well No. 313-02

WCPIPA Form 10/25/00
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*

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

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.

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*

* 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 = \( \text{Water Elevation} - \frac{41 \times \text{Water Level Elev.}}{4} \)

Example: Estimated + 2 ft. Water Level Elev. -- Bottom Elevation of Well Limit = \( \left( 2 - \frac{41 \times (2)}{4} \right) = -18.5 \) ft.

**Solid Casing Material:**

Carbon Steel: compliant with (check one or more): \( \square \) ANSI/AWWA C200 \( \square \) API Spec. 5L \( \square \) ASTM A53 \( \square \) ASTM A139
And compliant with (check one or more): \( \square \) ASTM A242 \( \square \) Type E \( \square \) Type S \( \square \) Grade B \( \square \) Other

Stainless Steel: (check one):

- \( \square \) ASTM A409 (production wells)
- \( \square \) ASTM A312 (monitor wells)
- \( \square \) Schedule 40
- \( \square \) Schedule 80

PVC Plastic conforming to ASTM F490 and ASTM D1527: (check one):

- \( \square \) Schedule 40
- \( \square \) Schedule 80

Thermoset Plastic: (check one):

- \( \square \) Filament Wound Resin Pipe conforming to ASTM D3296
- \( \square \) Centrifugally Cast Resin Pipe conforming to ASTM D2997
- \( \square \) Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- \( \square \) Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C650
- \( \square \) PTFE Fluorocarbon Tubing conforming to ASTM D3296
- \( \square \) FEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**

Carbon Steel: compliant with (check one or more): \( \square \) ANSI/AWWA C200 \( \square \) API Spec. 5L \( \square \) ASTM A53 \( \square \) ASTM A139
And compliant with (check one or more): \( \square \) ASTM A242 \( \square \) Type E \( \square \) Type S \( \square \) Grade B \( \square \) Other

Stainless Steel: (check one):

- \( \square \) ASTM A409 (production wells)
- \( \square \) ASTM A312 (monitor wells)
- \( \square \) Schedule 40
- \( \square \) Schedule 80

PVC Plastic conforming to ASTM F490 and ASTM D1527: (check one):

- \( \square \) Schedule 40
- \( \square \) Schedule 80

Thermoset Plastic: (check one):

- \( \square \) Filament Wound Resin Pipe conforming to ASTM D3296
- \( \square \) Centrifugally Cast Resin Pipe conforming to ASTM D2997
- \( \square \) Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- \( \square \) Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C650
- \( \square \) PTFE Fluorocarbon Tubing conforming to ASTM D3296
- \( \square \) 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 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: APVG-CN, U.S. Army Garrison-Hawaii, Schofield Barracks, HI
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil
   State Well No.: 96857

(b) □ LAND OWNER: (same as well owner)
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APVG-CN, U.S. Army Garrison-Hawaii, Schofield Barracks, HI
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil
   State Well No.: 96857

(c) □ CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Oihana St., Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wwd18 lava.net
   Lic #: 21358

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

2. WELL NAME: ERDC-MW-2 3213-08
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 1 01 2
   Zone: Sec: Plat: Parcel
   Attach the relevant portion of 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)
   (Please describe)
   □ Construct New Well
   □ Install New Pump
   □ Modify Existing Well
   □ Modify Pump
   □ Abandon/Seal
   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)

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, noncommercial water system)
   □ Irrigation (crop)
   □ Industrial
   □ No. of Acres:
   □ No
   □ 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)

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.
   (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
(firmly legible)

Landowner
(firmly legible)

Contractor
(firmly legible)

Signature

Signature

Signature

Date

Date

Date

For official use only
Latitud

Aquifer System No.

Longitude

State Well No.

3213-08
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

Hole Diameter: \( \text{10 in.} \)

Elevation at top of casing: \( 17 \text{ ft., msl}^* \)

Minimum of 2' Radius & 3' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: \( 15 \text{ ft., msl}^* \)

**Solid Casing:**
- Total Length: \( 10 \text{ ft.} \)
- Nominal Diameter: \( 4 \text{ in.} \)
- Wall Thickness: \( 0.406 \text{ in.} \)
- Bottom Elevation: \( 5 \text{ ft., msl}^* \)

**Open Casing:**
- Total Length: \( 25 \text{ ft.} \)
- Nominal Diameter: \( 4 \text{ in.} \)
- Wall Thickness: \( 0.406 \text{ in.} \)
- Bottom Elevation: \( -20 \text{ ft., msl}^* \)

Note: Neither bentonite nor mud should be used in saturated zone during drilling.

**Estimated Water Level:**
- Elevation: \( 2.2 \text{ ft., msl}^* \)

**Total Depth:**
- \( 35 \text{ ft.} \)

**Rock or Gravel Packing:**
- \( 27 \text{ ft.} \)
- Material:
  - Crushed Basalt
  - Rounded Gravel

**Annular space between hole and casing (min 3"):**
- \( 3 \text{ in.} \)

**Cement Grout:**
- \( 0 \text{ ft.} \)
- (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less)

**Solid Casing:**
- \( \geq 90\% \text{ (Ground Elev.-Water Level Elev.)} \)

**Open Casing:**
- Perforated Screen

**Material:**
- Crushed Basalt
- Rounded Gravel

**Estimated Water Level Elevation:**
- \( 2.2 \text{ ft., msl}^* \)

**Solid Casing:**
- Total Length: \( 10 \text{ ft.} \)
- Nominal Diameter: \( 4 \text{ in.} \)
- Wall Thickness: \( 0.406 \text{ in.} \)
- Bottom Elevation: \( 5 \text{ ft., msl}^* \)

**Open Casing:**
- Total Length: \( 25 \text{ ft.} \)
- Nominal Diameter: \( 4 \text{ in.} \)
- Wall Thickness: \( 0.406 \text{ in.} \)
- Bottom Elevation: \( -20 \text{ ft., msl}^* \)

**Open Casing:**
- Length: \( __ \text{ ft.} \)
- Diameter: \( __ \text{ in.} \)
- Bottom Elevation: \( __ \text{ ft., msl}^* \)

* 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 shall not be deeper than 1/4 of aquifer thickness or,

\[
\text{Bottom Elevation of Well Limit} = \left( \frac{\text{Water Elevation} - \text{41 x Water Level Elev.}}{4} \right)
\]

Example: Estimated + 2 ft. Water Level Elev. \( \rightarrow \) Bottom Elevation of Well Limit = \( \left( \frac{5 - 41 \times 2}{4} \right) = -18.5 \text{ ft.} \)

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more): [ ] ANSI/AWWA C200 [ ] API Spec. 5L [ ] ASTM A53 [ ] ASTM A139
- 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
- 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

* Water Elevation

- Ground elevation to top of hole and casing (min 3"): Nominal Diameter: ____ in.

- Cement Grout: ____ in.

- Rock or Gravel Packing: ____ ft.

- Material:
  - Crushed Basalt
  - Rounded Gravel

- Minimum of 2' Radius & 3' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

- Ground Elevation: ____ ft., msl*
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
For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

1. [ ] WELL OWNER: U.S. Army
   Phone: 656-2878
   Mailing Address: DPW, Attn: APWG-GW, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. [ ] LAND OWNER: (same as well owner)
   Phone: 682-1767
   Mailing Address:
   Fax: 682-1768
   E-mail: v4chi@lava.net

3. PROPOSED WORK:
   (check all that apply)
   [ ] Construct New Well
   [ ] Modify Existing Well
   [ ] Abandon/Seal
   *State Well No.:

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

6. PROPOSED USE:
   (check all that apply)
   [ ] Municipal (including hotels, stores, etc.)
   [ ] Domestic (individual, noncommercial water system)
   [ ] Industrial
   [ ] Military
   [ ] Irrigation (crop)
   [ ] No. of Acres:
   [ ] Other (explain): Monitoring Well

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
LTC Floyd A. Quintana
Signature
Date 10/25/00

Landowner
Signature
Date 10/25/00

Contractor
Valley Well Drilling
Signature
Date 10/25/00

WCPIPA Form 10/25/00
**10. PROPOSED WELL SECTION** (Please attach schematic if different from diagram provided below)

<table>
<thead>
<tr>
<th>Hole Diameter: 10 in.</th>
</tr>
</thead>
</table>

Elevation at top of casing 22 ft., msl

- **Cement Grout:** 13 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:** 3 in.
- **Rock or Gravel Packing:** 32 ft. Material: □ Crushed Basalt □ Rounded Gravel
- **Total Depth:** 45 ft.
- **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

- **Solid Casing:** (min. 90% x (Ground Elev. - Water Level Elev.))
  - **Total Length:** 15 ft
  - **Nominal Diameter:** 4 in.
  - **Wall Thickness:** 0.406 in.
  - **Bottom Elevation:** 5 ft., msl

- **Open Casing:** □ Perforated □ Screen
  - **Total Length:** 30 ft
  - **Nominal Diameter:** 4 in.
  - **Wall Thickness:** 0.406 in.
  - **Bottom Elevation:** -25 ft., msl

*Note: Neither bentonite nor mud should be used in saturated zone during drilling.*

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 - 41 x Water Level Elev.) / 4**

Example: Estimated + 2 ft. Water Level Elev. = Bottom Elevation of Well Limit = (2 - 41 x 0.25) x 4 = -18.5 ft.

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more): □ ANSI/WWA 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 □ 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
  - 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 A512 (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):
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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
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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.*

*Note: Neither bentonite nor mud should be used in saturated zone during drilling.*

---

![Annotation: 9/25/82](signature.png)

- **mm: ttewmm to Steve Turnbull.**
WELL NAME: ERDC-MW-3B Island: Oahu
Address: Makua Military Reservation Tax Map Key: 8 Sec 1-01 1 Parcel

PROPOSED WORK:
- [x] Construct New Well
- [ ] Install New Pump
- [ ] Modify Existing Well
- [ ] Modify Pump
- [ ] Abandon/Seal

PROPOSED USE:
- [ ] Municipal (including hotels, stores, etc.)
- [ ] Industrial
- [ ] Domestic (individual, noncommercial water system)
- [ ] Irrigation (crop)
- [ ] Military
- [ ] Other (explain): Monitoring Well

PROPOSED PUMP INFORMATION:
- [ ] Not Applicable
- [ ] Rated Pump Capacity
  - [ ] gallons per minute
  - [ ] gallons per day

METHOD OF FLOW MEASUREMENT:
- [ ] Flowmeter
- [ ] Open-pipe
- [ ] Weir
- [ ] Orifice
- [ ] Other (explain)

OTHER IMPORTANT INFORMATION:

LEGAL REQUIREMENTS:
- [ ] COUP
- [ ] SMAP
- [ ] EIS
- [ ] EA
- [ ] None
- [ ] Other (explain)

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 90 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 __________________________
Address: __________________________

Landowner
Signature __________________________
Date __________________________
Address: __________________________

Contractor
Signature __________________________
Date __________________________
Address: __________________________

For official use only
Latitude ____________________________
Longitude __________________________
Aqurifer System No. __________________________
State Well No. __________________________
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' Radius & 4' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 ft., msl*

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

Solid Casing Material:
- (≥ 90% x (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*

Note: Neither bentonite nor mud should be used in saturated zone during drilling.

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 = \( \text{Water Elevation} + \frac{4}{3} \times \text{Aquifer Thickness} \)

Example: Estimated + 2 ft. Water Level Elev. \( \Rightarrow \) Bottom Elevation of Well Limit = \( (2 - \frac{18.5}{4}) = 16.5 \) ft.

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: (check one)
  - Schedule 40
  - Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1765 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

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: (check one)
  - Schedule 40
  - Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1765 or ASTM D2241): (check one)
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- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296
Instructions: Please 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-GW, U.S. Army Garrison, Schofield Barracks HI 96857
   
   Fax: 656-1039

(b) **LANDOWNER:** (same as well owner)

(c) **CONTRACTOR:** Valley Well Drilling

Mailing Address: 91-235A Ohana St. Kapolei, HI 96707

Fax: 682-1768

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPLICANT INFORMATION:</strong></td>
<td>Fill out all three, if applicable, and place a check next to the primary contact</td>
</tr>
<tr>
<td><strong>1. (a) WELL OWNER:</strong></td>
<td>U.S. Army</td>
</tr>
<tr>
<td><strong>Mailing Address:</strong></td>
<td>DPW, Attn: APVC-GW, U.S. Army Garrison, Schofield Barracks HI 96857</td>
</tr>
<tr>
<td><strong>Fax:</strong></td>
<td>656-1039</td>
</tr>
<tr>
<td><strong>LANDOWNER:</strong></td>
<td>(same as well owner)</td>
</tr>
<tr>
<td><strong>Mailing Address:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Fax:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CONTRACTOR:</strong></td>
<td>Valley Well Drilling</td>
</tr>
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<td>682-1768</td>
</tr>
</tbody>
</table>

**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:** 8
   **Sec:** 1
   **Sec:** 01
   **Plan:** 1
   **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
   - Install New Pump*
   - Modify Existing Well*
   - Modify Pump*
   - Abandon/Seal*
   - Is this well part of a battery of wells? **Yes** No (Please describe)

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
   - Rotary
   - Propeller
   - Submersible
   - Rotary-Displacement
   - Reciprocating
   - Centrifugal
   - Rotary-Gear
   - Impulse

6. **PROPOSED USE:**

   (check all that apply)

   - Municipal (including hotels, stores, etc.)
   - Domestic (individual, noncommercial water system)
   - Industrial
   - Military
   - Irrigation (crop)
   - Other (explain)

7. **(a) PROPOSED AMOUNT OF WITHDRAWAL:**

   **Not Applicable**

   **gallons per day**

   **METHOD OF FLOW MEASUREMENT:**

   - Flowmeter
   - Open-pipe
   - Weir
   - Orifice
   - 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.

   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:**
   **Signature:**
   **Date:**

   **Landowner:**
   **Signature:**
   **Date:**

   **Contractor:** Valley Well Drilling
   **Signature:**
   **Date:**

   **For official use only:**
   **Latitude:**
   **Longitude:**
   **Aquifer System No.:**
   **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' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 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 + 1/4 Water Level Elev.)

Example: Estimated + 2 ft. Water Level Elev. → bottom Elevation of Well Limit = (2 + 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 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

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• FEP Fluorocarbon Tubing conforming to ASTM D3296
APPLICATION FOR PERMIT

Commission may not accept on Water Resource Management,

APPLICANT

Instructions: Please

1. WELL NAME: ERDC-MW-4A Island: Oahu

Address Makua Military Reservation Tax Map Key: Zone: 8 Sec: 200 - 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

☐ Modify Existing Well

☐ Abandon/Seal

☐ Install New Pump

☐ Modify Pump

☐ State Well No.: (if unknown, please call Commission at 587-0225)

☐ 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 pairs 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

6. PROPOSED USE: (check all that apply)

☐ Municipal (including hotels, stores, etc.) ☐ No.

☐ Domestic (individual, noncommercial water system)

☐ 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:

☐ Military

☐ Other (explain): Monitoring Well

☐ Other (explain)

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day

☐ Flowmeter

☐ Open-pipe

☐ Weir

☐ Orifice

☐ Other (explain)

(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.

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 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 Landowner: National Guard

Signature: ___________________________ Signature: ___________________________

Date: ___________________________ Date: ___________________________

Contractor: Valley Well Drilling Contractor: ___________________________

Signature: ___________________________ Signature: ___________________________

Date: 9/17/02 Date: ________________

For official use only: Latitude: ___________________________ Aquifer System No. ___________________________

Longitude: ___________________________ State Well No. ___________________________

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

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.)

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

Total Length: 15 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: 25 ft, msl

Open Casing: [ ] Perforated [ ] Screen

Total Length: 30 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: 25 ft, msl

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

Cement Grout: 13 ft.
(min. 70% of distance from ground elevation to top of water surface or 200 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: 45 ft.

Ground Elevation: ______ ft, msl

Estimated Water Level Elevation: 2.2 ft, msl*

Solid Casings 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 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
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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
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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 = \( \frac{\text{Water Elevation} - \text{Estimated Water Level Elevation}}{4} \)

Example: Estimated + 2 ft. Water Level Elev. 4 Bottom Elevation of Well Limit = \( \frac{2.41 x 2}{4} \) = -16.5 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
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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
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State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources  
APPLICATION FOR PERMIT

[Form Image]

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 96802. 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 887-0225.

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  
Fax: 656-1039  
E-mail: fukuda@shofield.army.mil

(b) LAND OWNER: (same as well owner)  
Contact Person:  
Phone:  
Fax:  
E-mail:  

(c) CONTRACTOR: Valley Well Drilling  
Contact Person: Mike Sober  
Phone: 682-1767  
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-4B  
Well Address: Makua Military Reservation  
Well Map Key: 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  
Modify Existing Well  
Abandon/Seal

*State Well No.: 
(if unknown, please call Commission at 887-0225)

4. CONSTRUCTION:  
Drilled  
Dug  
Shaft  
Tunnel

This well part of a battery of wells?  
Yes  
No  
(If applicable, 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

6. PROPOSED USE:  
(check all that apply)  
Municipal (including hotels, stores, etc.)  
Industrial

Domestic (individual, non-commercial water system)  
No. of Acres: 

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)  
Orifice

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  
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.

For official use only

Latitude  
Longitude  
Aquifer System No.  
State Well No.  

For Official Use Only:

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

Cement Grout: 63 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:

27 ft.

Material:

- Crushed Basalt
- Rounded Gravel

Estimated Water Level Elevation:

2.2 ft, msl

Solid Casing: (≥ 90% x (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

note: Neither bentonite nor mud should be used in saturated zone during drilling

Open Hole:

Length:

in.

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 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)

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- Filament Wound Resin Pipe conforming to ASTM D2996
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- 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 D3298

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
- Schedule 120

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 C960
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3298

* 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 - Ground Elevation) x (0.25 x Aquifer Thickness or, water surface or whichever is less.)

Example: Estimated = 2 ft. Water Level Elev. Bottom Elevation of Well Limit = (-2.2 ft. - 2 ft. x 0.25 ft.) = -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

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  - 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)
  - 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 C960
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3298

* 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
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  - Type S
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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 - Ground Elevation) x (0.25 x Aquifer Thickness or, water surface or whichever is less.)

Example: Estimated = 2 ft. Water Level Elev. Bottom Elevation of Well Limit = (-2.2 ft. - 2 ft. x 0.25 ft.) = -18.5 ft.

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- 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
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- ABS Plastic conforming to ASTM F480 and ASTM D1527 (check one)
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- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241) (check one)
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- 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 C960
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3298

* 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
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- Stainless Steel: (check one)
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  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3298
APPLICATION FOR PERMIT

1. WELL Construction and/or Pump Installation

APPLICANT INFORMATION:

1. (a) OBJECT OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APWG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@ Schofield.army.mil

   (b) LAND OWNER: (same as object owner)
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: Valley Well Drilling
   Fax: 682-1768
   E-mail: wldhi@lava.net

   (c) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wldhi@lava.net

WELL & PUMP INFORMATION:

2. WELL NAME: ERDC-MW-4C
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 512-05
   Is this well part of a battery of wells? Yes
   (Please describe)
   (This well is one of three in nested pair at different depths 44-4A, 4B, 4C)
   Island: Oahu
   Map Key: 512-05
   Proposed Work: 
   ① Construct New Well
   ② Install New Pump
   ③ Modify Existing Well
   ④ Abandon/Seal
   ⑤ Modify Pump
   (State Well No.: (if unknown, please call Commission at 587-0225)

   4. CONSTRUCTION: Drilled
   ① Dug
   ② Shaft
   ③ Tunnel
   (If yes, explain):
   (This well is one of three in nested pair at different depths 44-4A, 4B, 4C)

   5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (Not applicable) gallons per minute
      Pump Type (check one):
      ① Deep Well Turbine
      ② Rotary-Displacement
      ③ Reciprocating
      ④ Propeller
      ⑤ Rotary-Gear
      ⑥ Impulse
      ⑦ Centrifugal

   6. PROPOSED USE: Municipal (including hotels, storos, etc.)
      ① Industrial
      ② Domestic (including noncommercial water system)
      ③ Irrigation (crop)
      ④ Military
      ⑤ Other (explain)
      (Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections?)
      (Yes or No)
      (No. of Acres: )

   7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable
      (b) METHOD OF FLOW MEASUREMENT:
      ① Flowmeter
      ② Open-pipe
      ③ Weir
      ④ Orifice
      ⑤ Other (explain)

   OTHER IMPORTANT INFORMATION:

   8. LEGAL REQUIREMENTS:
      ① CDP
      ② SMAP
      ③ EIS
      ④ 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 shall 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 to the permitted pump capacity.

Well Owner: Lt. Floyd A. Quintana
Signature: [Signature]
Date: 23 SEP 07

Landowner: [Signature]
Date: [Date]

Contractor: Valley Well Drilling
Signature: [Signature]
Date: [Date]

Latitude: [Latitude]
Longitude: [Longitude]
State Well No.: [State Well No.]
Aquifer System No.: [Aquifer System No.]

WCPA Form 10/25/06
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

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% x (Ground Elev. - Water Level Elev.))

Total Length: 70 ft.
Nominal Diameter: 6 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft., msl

Open Casing: ○ Perforated ○ Screen

Total Length: 30 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft., msl

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 - 4 x Water Level Elev.)/(100)

Example: Estimated = 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 - 4 x 2)/(100) = -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 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 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 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
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 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. (☐) WELL OWNER: U.S. Army Contact Person: Jon Fukuda Phone: 656-2878
   Mailing Address: DF, Attn: APVG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@saosfield.army.mil

2. (☐) LAND OWNER: State of Hawaii Contact Person: Phone:
   Mailing Address: Fax:

3. (☐) CONTRACTOR: Valley Well Drilling Contact Person: Mike Sober Phone: 682-1768
   Mailing Address: 91-235A Olaha St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: buttonlava.net Lic #: 21358

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

2. WELL NAME: ERDC-MW-5 31°41.06' Island: Oahu
   Address Makua Military Reservation Tax Map Key: 820.00
   Zone: Sec: Plat: 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 proper 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
   □ Uug
   □ 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
   □ Centrifugal
   □ Rotary
   □ Reciprocating
   □ Propeller
   □ Impulse

6. PROPOSED USE: (check all that apply)
   □ Municipal (including hotels, stores etc.)
   □ 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? □ Yes □ No

   □ Irrigation (crop)
   □ Military

   □ No. of Acres:

   □ Other (explain): Monitoring Well

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 of future use up to the permitted pump capacity.

Well Owner (print legibly) ____________________________ Landowner (print legibly) ____________________________ Contractor ____________________________
Signature ____________________________ Signature ____________________________ Signature ____________________________
Date 2/25/07 Date ____________________________ Date 9/16/02

For official use only:
Latitude ____________________________ Aquifer System No. ____________________________
Longitude ____________________________ State Well No. ____________________________
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: ___________ in.

Minimum of 2' Radius & 4' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: ___________ ft., msl*

*The approved elevation must be referenced to mean sea level (msl) at the time of construction filing. Final elevations of well components shall be adjusted as noted in Well Completion/Well Abandonment reports and verified by a benchmark which has been established by a surveyor.

For non-self water Basel Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Level + 1/4 Aquifer Thickness )

Example: Estimated + 2 ft. Water Level: 25 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
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 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
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