### SECTION 1: WELL LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Island</th>
<th>Aquifer System</th>
<th>Aquifer Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAHU</td>
<td>WAIANAE</td>
<td>4</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>0</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Ground Elevation</th>
<th>Rock Packing</th>
<th>Hole Diameter</th>
<th>Total Depth</th>
<th>Estimated Head</th>
<th>Calculated Aquifer Thickness</th>
<th>County Water Supply (Y/N ?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ft., m.s.l.</td>
<td>ft.</td>
<td>in.</td>
<td>ft.</td>
<td>ft., m.s.l.</td>
<td>1025 ft.</td>
<td>Y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Wall Thickness</td>
</tr>
<tr>
<td>PVC</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Openings</th>
<th>Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
</tr>
</tbody>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

#### Well Depth

<table>
<thead>
<tr>
<th>Theoretical Thickness of Aquifer</th>
<th>1025 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>256.3 ft.</td>
</tr>
<tr>
<td>Depth of Well below Sea Level</td>
<td>25 ft.</td>
</tr>
<tr>
<td>Minimum Wall Thickness</td>
<td>okay (refer to HWCPIS Section 2.2)</td>
</tr>
</tbody>
</table>

#### Well Casing

<table>
<thead>
<tr>
<th>Minimum Wall Thickness Provided</th>
<th>0.406 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Length of Solid Casing</td>
<td>157.5 ft.</td>
</tr>
<tr>
<td>Length of solid casing Provided</td>
<td>170 ft.</td>
</tr>
<tr>
<td>Casing Material</td>
<td>Sch 40</td>
</tr>
<tr>
<td>Annular Space</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annular Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth of Grouting</th>
<th>Calculated Depth of Grouting</th>
<th>Depth of Grouting provided</th>
<th>Thickness of Annular Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>122.5 ft.</td>
<td>165 ft.</td>
<td>3 in.</td>
</tr>
<tr>
<td></td>
<td>okay (refer to HWCPIS Section 2.6 c)</td>
<td>okay (refer to HWCPIS Section 2.6 d)</td>
<td>okay (refer to HWCPIS Section 2.6 d)</td>
</tr>
</tbody>
</table>
December 8, 2004

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

Dear Mr. Fukuda:

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

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

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

Sincerely,

[Signature]

YVONNE Y. IZU  
Deputy Director

LYN:ss

c: Floyd A. Quintana, Colonel, US Army, Director of Public Works, US Army Garrison  
Steve Turnbull, US Army Garrison
December 2, 2004

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 Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.hawaii.gov/dlnr/cwm/wcr/wcr.html.

<table>
<thead>
<tr>
<th>1. State Well No.:</th>
<th>3113-02</th>
<th>Well Name:</th>
<th>ERDC-MW-1</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 ☐ Percussion ☐ Other (describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Date Well Construction (drilled,cased,grouted) completed:</td>
<td>9/24/2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Was the subject well cored?</td>
<td>☐ Yes ☑ No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Initial water-level encountered</td>
<td>7.5 ft. below ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Step-Drawdown Test completed?</td>
<td>☐ No ☑ Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Constant Rate Aquifer Test completed?</td>
<td>☐ No ☑ Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Water-level:</td>
<td>4.35 ft. above msl</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Chloride:</td>
<td>188 ppm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Temperature:</td>
<td>79 °F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 10/27/04
13. AS-BUILT WELL SECTION
(Please attach as-built if different from diagram provided below)

Elevation at top of casing: 12.40 ft., msl*
Bench mark elevation: __ ft., msl* (Survey to nearest 0.01 ft.)

Cement Grout: 7 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: 3 3/8 ft.
Material: □ Crushed Basalt □ Rounded Gravel
Water Level Elevation: 4.35 ft., msl*

Solid Casing: (> 90% x (Ground Elev.-Water Level Elev))
Length: __ ft.
Nominal Diameter: __ in.
Well Thickness: __ O.237 __ in.
Bottom Elevation: __ 3.95 __ ft., msl

Open Casing: □ Perforated □ Screen
Length: __ 29 __ ft.
Nominal Diameter: __ __ in.
Wall Thickness: __ __ in.
Bottom Elevation: __ __ ft., msl

Open Hole: Filled with gravel
Length: __ __ ft.
Diameter: __ __ in.
Bottom 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: (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/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 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
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
DRILLER’S LOG

Well Number: 3113-02

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

Remarks:
HNu readings all background.

For Official Use Only:
RECEIVED
04 DEC 2004 7:28 AM

DL Form 06/24/2004
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.
# Geologic Log

## Well No. 3113-02

<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</td>
<td>(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 - 1.1</td>
<td>SC: LL - 0 counts (backs round)</td>
</tr>
<tr>
<td>-2</td>
<td>Rock</td>
<td>drilled through - very slow drilling</td>
<td>HNU - 0.0 SC: LL - 0 counts</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>Silty</td>
<td>sands (SP-SM), dark black w/ cobbles &amp; frags of basalt &amp; limestone (damp)</td>
<td>Rock - 2</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Second clearance. No detect - drilling ahead.</td>
<td>HNU - 0.0 SC: LL - 0 counts</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>As above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Third clearance. No detect - drilling ahead. HNU - 0.0 ppm SC: LL - 0 counts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Fifth clearance. No detect - drilling ahead. HNU - 0.0 ppm SC: LL - 0 counts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Run 3 in PVC Pipe to 3.0 ft to clear. Run device inside PVC pipe to clear.

**Blow Counts**
- #1: FEREX 4.021
- #2: Sampled w/ 2" sampler
- MW-1: 5.0' - 6.0' Good recovery.
- MW-2: Sampled 10.0' - 11.5' Bottom part of sample is wet. Water table is approx. 7.5 ft.

**Elevation ground water:** 7.5 ft

**Total Depth of Hole:** 35 ft

**Drilling Log**
- **Makua Military Reservation**
- **Drilling agency:** Valley Drilling
- **Name of Driller:** John Sunada
- **Manufacturer's designation of drill:** Mobile B-90
- **Total No. of overburden samples taken:** Disturbed 3
- **GPS Coord.**
  - Total No. of overburden samples taken: Undisturbed

**DRAFT**
- **Vertical Hole No.:** ERDC MW-1
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-16</td>
<td>Smooth drilling. No chattering. Sand (SP) w/ trace of basalt frags from cuttings rec. from auger</td>
</tr>
<tr>
<td>-18</td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>Sand (SP) black w/ trace of basalt frags. (from auger), wet. Some clay (CL) present. Drilling smooth.</td>
</tr>
<tr>
<td>-22</td>
<td></td>
</tr>
<tr>
<td>-24</td>
<td>Sand (SP) from auger, wet w/ CL</td>
</tr>
<tr>
<td>-26</td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td>Drilling smooth</td>
</tr>
<tr>
<td>-30</td>
<td>Sand (SP) from auger, wet, w/ CL</td>
</tr>
<tr>
<td>-32</td>
<td></td>
</tr>
<tr>
<td>-34</td>
<td>AA drilling smooth</td>
</tr>
</tbody>
</table>

Note: Smooth drilling from 15' - 35' indicates sand with some CL present.
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 9-2-01-24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and submit 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; 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: 8/27/04
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 Siver C-57 License #: 21358 Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.
State of Hawai‘i
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
WELL COMPLETION REPORT - PART I
Well Construction

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

1. State Well No.: 3113-03  Well Name: ERDC-MW-4A  Island: Oahu
2. Address: Makua Military Reservation  Tax Map Key: 8-2-01:24
3. Drilling Company: Valley Well Drilling
4. Drilling method used during construction: ☑ Rotary ☐ Percussion ☐ Other (describe)
5. Date Well Construction (drilled, cased, grouted) completed: 9/30/02  Fill out attached Driller's Log

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

6. Was the subject well cored? ☑ Yes ☐ No
7. Initial water-level encountered ______ ft. below ground  Date and time of measurement: ____________
8. Step-Drawdown Test completed? ☐ No ☑ Yes  Attach Step-Drawdown Test form (12/17/97 SDPTD Form)
9. Constant Rate Aquifer Test completed? ☐ No ☑ Yes  Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:
10. Water-level: 4.02 ft. above msl  Date and time of measurement: 4/3/2003 8:30
11. Chloride: 186 ppm  Date and time of sampling: 4/3/2003 12:00
12. Temperature: 79 °F  Date and time of measurement: 4/2/2003 12:15

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 Sohn  C-57 Lic. No. 21358

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

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: 10 ft., msl*

Minimum of 2' Radius & 4" Thick Concrete Pad

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: (≤ 90% x (Ground Elev.-Water Level Elev))
Length: 18.5 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: 3.25 ft., msl

Open Casing:
□ Perforated X Screen
Length: 30 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.337 in.
Bottom Elevation: 26.75 ft., msl

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

Solid Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM 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
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□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

*msl = mean sea level
## Drilling Log

**Well No.:** 3113-03

### Makua Military Reservation

- **Drilling agency:** Valley Drilling
- **Name of Driller:** John Surgad
- **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'

### Vertical Hole No.: ERDC MW-4A

- **Size and Type of Bit:** 7" 3 way
- **Datum for elevation shown:** MSL
- **Date Started:** 9/20/02
- **Completed:** 9/20/02
- **Total Depth of Hole:** 45 ft
- **Elevation ground water:** 16.9'

### Depth | Lithology | Description | Blow Counts | Comments |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>Fine sand (SM) Brown fill?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance, no detect OA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Sand (SP) White, brown calcareous, well rounded, paleo-beach sand. Well sorted, coarse grained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Second clearance</td>
<td>Blow counts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HNU - 0.0 ppm</td>
<td>Sampled w/ 2&quot; sampler from 5.0' to 6.5'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC: LL = 18 total counts (only background)</td>
<td>Sand (SP)</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>A.A. (cuttings)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>Third clearance/NT/OA</td>
<td>Blow counts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HNU - 0.0 ppm</td>
<td>Sampled w/ 2&quot; sampler from 10.0' to 11.5'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC: LL = 0 counts (only background)</td>
<td>Sand (SP) w/ sorted, white, coarse grained</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Fourth clearance/NT/OA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HNU - 0.0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC: LL = 0 counts (only background)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>Fifth clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand (SP) A/A, white to brown (cuttings)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HNU - 0.0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (ft)</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>SC: LL - 18-20 counts (only background)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td>16.9' Water Table</td>
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<td></td>
</tr>
<tr>
<td>-18</td>
<td>Sand (SP) A/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>Sand (SP) White to brown, well-sorted, coarse grained, wet (auger cutting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-24</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
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<tr>
<td>-26</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-28</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-32</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-34</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-36</td>
<td>Sand (SP) AA (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3.5</td>
<td>Fine brown sand</td>
<td>9/20/02</td>
</tr>
<tr>
<td>3.5 to 20</td>
<td>Sand, white with brown calcarous 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:
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.
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 1.25-inch diameter monitor tube shall be permanently installed, in 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 related 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. Pit 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: Lt Col Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: ________

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

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

Attachment
USGS
Department of Health/Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
1. State Well No.: 3113-04  
2. Well Name: ERDC-MW-4B  
3. Island: Oahu  
4. Address: Makua Military Reservation  
5. Tax Map Key: 8-2-01:24  
6. Drilling Company: Valley Well Drilling  
7. Drilling method used during construction: ___ Rotary ___ Percussion ___ Other (describe)  
8. Date Well Construction (drilled, cased, grouted) completed: 11/21/02  
9. Fill out attached Driller's Log  
10. Was the subject well cored? ___ Yes ___ No  
11. Initial water-level encountered: ___ ft. below ground  
12. Date and time of measurement: 11/21/02 9:50  
13. Step-Drawdown Test completed? ___ No ___ Yes  
14. Attach Step-Drawdown Test form (12/17/97 SDPTD Form)  
15. Constant Rate Aquifer Test completed? ___ No ___ Yes  
16. Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)  
17. Date and time of measurement: 11/21/02 9:50  
18. Water-level: ___ ft. above msl  
19. Date and time of measurement: 4/15/03 9:30  
20. Chloride: ___ ppm  
21. Date and time of measurement: 4/15/03 9:00  
22. Temperature: ___ °F  
23. Date and time of measurement: 4/15/03 16:10  
24. Fill in the as-built section on the other side of this sheet.  
25. Fill in attached surveyor's report.  
26. 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.)  
27. The proposed manufacturer's rated pump capacity is ___ gpm at a head of ___ ft.  
28. Remarks: No pump installed. Well for sampling  

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

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI  
Signature  
Date 1/3/05  

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

---

**Solid Casing Material:**

- [ ] Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200 [ ] API Spec. 5L [ ] ASTM A53 [ ] ASTM A139
  - And compliant with (check one or more):
    - ASTM A242 [ ] Type E [ ] Type S [ ] Grade B [ ] Other
- [ ] Stainless Steel: (check one):
  - [ ] ASTM A409 (production wells)
  - [ ] ASTM A312 (monitor wells)
- [ ] ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): [X] 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
- [ ] Stainless Steel: (check one):
  - [ ] ASTM A409 (production wells)
  - [ ] ASTM A312 (monitor wells)
- [ ] ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): [X] 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

---

*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 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:
# Geologic Log

**Well No. 3113-04**

## Drilling Log

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Name of Driller:** John Suriaad

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

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

**GPS Coord.** N 21 deg 31.742' W 156 deg 57.3' (Acc. 0.9')

---

### Vertical Hole No. ERDC MW-4B

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

**Datum for elevation shown:** MSL

**Date Started:** 9/20/02

**Completed:** 9/20/02

**Total Depth of Hole:** 70 ft

**Elevation ground water:** 16.8'

---

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Fine sand (SM) brown,</td>
<td>Fill?</td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 18 - 20 counts (background)</td>
</tr>
<tr>
<td></td>
<td>First clearance. ND/DA.</td>
<td></td>
<td>20</td>
<td>Sampled with 2&quot; D.T. Sand (SP)</td>
</tr>
<tr>
<td>-2</td>
<td>End of fill.</td>
<td></td>
<td>20</td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
</tr>
<tr>
<td>-4</td>
<td>Sand (SP) brown to white. Very well sorted.</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>Second clearance. ND/DA.</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>Sand (SP) cuttings.</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>Third clearance.</td>
<td>HNU - 0 ppm SC:LL - 16 - 20 counts</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>Fourth clearance. ND/DA.</td>
<td>Sand (SP) Brown to white (cuttings).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>Fifth clearance.</td>
<td>HNU - 0 ppm SC:LL - 18 - 20 counts</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td>Sand (SP) A/A.</td>
<td>Water table at 16.8'</td>
<td>HNU - 0 ppm</td>
<td>SC:LL - 16 - 20 counts</td>
</tr>
<tr>
<td>-18</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>Sand (SP) A/A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-22</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-24</td>
<td>Sand (SP) A/A (cuttings)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>-26</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td>Sand (SP) A/A (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Drilled hole to 20', let set 20 min to check water level.
Sand (SP) A/A
(cuttings)

Sand (SP) A/A

Sand (SP) A/A

Sand (SP) A/A

Rock at 59 to 60', then back into sand (SP) A/A

Sand (SP) A/A

Not as hard, last two feet.

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

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

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a 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 conserved water rights.

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

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

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

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

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

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: [Signature] Date: [Signature Date]
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: [Signature] C-57 License #: [C-57 License] Date: [Date]
Printed Name: Mike Sison Firm or Title: Valley Well Drilling

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

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

3. Drilling Company: Valley Well Drilling

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

5. Date Well Construction (drilled, cased, grouted) completed: 1/10/02  
   Fill out attached Driller's Log

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

7. Initial water-level encountered: 15 ft. below ground  
   Date and time of measurement: 12/3/02 14:30

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

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

Parameters prior to pump test:

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

11. Chloride: 180 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 Salon  
C-57 Lic. No. 21358

Signature  
[Signature]  
Date 1/6/04

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

Signature  
[Signature]  
Date 7/2/04
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

Ground Elevation: ft., msl

Bench mark elevation:

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

Length: ft.

Nominal Diameter: in.

Wall Thickness: in.

Bottom Elevation: ft., msl

Open Casing: □ Perforated □ Screen

Length: ft.

Nominal Diameter: in.

Wall Thickness: in.

Bottom Elevation: ft., msl

Open Hole:

Length: ft.

Diameter: in.

Bottom Elevation: ft., msl

*msl = mean sea level

Solid Casing Material:

- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
  - Other

- Stainless Steel: (check one):
  - ASTM A242
  - Type E
  - Type S
  - Grade B
  - Schedule 40
  - Schedule 80

- 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):
  - Epoxy 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
  - Other

- Stainless Steel: (check one):
  - ASTM A242
  - Type E
  - Type S
  - Grade B
  - Schedule 40
  - Schedule 80

- 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):
  - Epoxy 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

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

---

WCR1 Form 9/12/01 Page 1 of 4
### Well Number: 3113

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

#### Remarks:

**For Official Use Only:**

RECEIVED

04 DEC 2 14:30

COMMISSION ON WATER RESOURCE MANAGEMEN

DL Form 06/24/2004
**Drilling Log**  
**Makua Military Reservation**  
**Date:** 12/04/02  
**Size and Type of Bit:** 10" Tri-cone, Mud rotary  
**Datum for elevation shown:** MSL-235.36'  
**Date Started:** 12/04/02  
**Completed:**  
**Total No. of overburden samples taken:** Disturbed 0  
**Total Depth of Hole:** 105 ft  
**Undisturbed 0**  
**Elevation ground water:** 15' bgs

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>(SC) Brown, clayey, silty, sand, loose, from cuttings. Smooth drilling.</td>
<td></td>
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<tr>
<td>-2</td>
<td>-2</td>
<td>Approximate water table.</td>
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<td>-4</td>
<td>-4</td>
<td>End UXO clearance</td>
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<tr>
<td>-6</td>
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<td>(SC) Brown, clayey, silty, sand w/ trace line to coarse basaltic gravel from drill cuttings.</td>
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<td>-8</td>
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<td>38' bgs encountered cavities or void, slow drilling due to borehole instability and drilling mud loss.</td>
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<td>-46</td>
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</tbody>
</table>
(CL) Dark brown sandy, silty, clay and basaltic rock.

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

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

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

Concrete Surface Seal

Elevation = 19.7 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Borehole Diameter (10" Minimum)

Bentonite Concrete Grout Backfill

Bentonite Pellet Seal (Minimum 2' Thick)

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

#3 Sand

Title: Well Construction
Log ERDC-MW-4C

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-4C (3113-24) OS

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

Surveyed on June 30, 2003

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

Ground Elevation: 19.71 feet
Top of Casing Elevation: 22.67 feet

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

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

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of ERDC-MW-4C (Well No. 3113-05) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/87) 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. An 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 not 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: 10/22/02

Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works

Driller's Signature: ___________________________ Date: 11/16/02

Printed Name: Mike Sobin 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: Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches

Honolulu Board of Water Supply
1. State Well No.: **3113-06**  
2. Well Name: **ERDC-MW-5**  
3. Island: **Oahu**

4. Drilling Company: **Valley Well Drilling**

5. Drilling method used during construction: ** Rotary**

6. Date Well Construction (drilled, cased, grouted) completed: **12/11/02**

7. Initial water-level encountered: **323 ft.** below ground  
   Date and time of measurement: **12/09/2002 8:00**

8. Step-Drawdown Test completed? **No**

9. Constant Rate Aquifer Test completed? **Yes**

Parameters prior to pump test:

10. Water-level: **15.35 ft.** above msl  
     Date and time of measurement: **4/3/2003 10:30**

11. Chloride: **152 ppm**  
     Date and time of sampling: **4/1/2003 13:30**

12. Temperature: **79°F**  
     Date and time of measurement: **4/1/2003 14:03**

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 Sola**  
**C-57 Lic. No.:** **27358**

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

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

**Signature**  
**Date: 12/5/04**
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:

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

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

<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>(ML) dk brown clayey silt to silty clay, moist. Few basaltic rocks.</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drilled through rock layers mixed with dk brown clayey silt (ML), dry.</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-40</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-50</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-60</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-70</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-80</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-90</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td></td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
</tbody>
</table>

Drilling Log

Makua Military Reservation

Drilling agency: Valley Drilling

Name of Driller: John Suriad

Manufacturer's designation of drill: Mobile B-90

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

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

Datum for elevation shown: MSL - 235.36'

Date Started: 12/04/02

Completed:

Total Depth of Hole: 360 ft

Elevation ground water: 15' bgs

Vertical Hole No. ERDC MW-5

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

Blow Counts

From drill cuttings HNU - 0 SC:LL - BG

HNU - 0 SC:LL - BG

HNU - 0 SC:LL - BG

Air rotary drilling, Air volume 1,000
(ML) Brown clayey silt. Drilling smooth.


Same as above.

(ML) Light brown clayey silt.

(SM) Fine grained silty sand. Very fine grained, poorly sorted.

MLJ

HNU 33.5
Scintillometer

HNU - 0
Scintillometer - 32.5

HNU - 0
Scintillometer - 33.4

HNU - 0
Scintillometer - 31.7

HNU - 0
Scintillometer - 33.6

HNU - 0
Scintillometer - 39.0

HNU - 0
<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(SM)</td>
<td>Same as above.</td>
</tr>
<tr>
<td>(GM)</td>
<td>Silty gravels. Gravel size 1-2 cm. Some silt matrix, appx. 25%. Poorly sorted.</td>
</tr>
<tr>
<td>(GM)</td>
<td>Same as above.</td>
</tr>
<tr>
<td>(GC)</td>
<td>Clayey gravel. Loose gravel 2-5 cm in size. Well-rounded, poorly sorted. Some clay matrix, 10-15%.</td>
</tr>
<tr>
<td>(GC)</td>
<td>Same as above.</td>
</tr>
</tbody>
</table>

*Scintillometer values:*
- 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 Waiahamilo 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.
WELL CONSTRUCTION PERMIT
ERDC-MW-5, Well No. 3113-06

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

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

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

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

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

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

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

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

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

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

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

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

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

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ____________________________ Date: ____________________________

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

Driller's Signature: ____________________________ Date: ____________________________

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

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

Attachment

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

### WELL COMPLETION REPORT - PART I

**Well Construction**

**Instructions:** Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission will 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>3213-08</th>
<th>Well Name:</th>
<th>ERDC-MW-2</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>8-1-01:2</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>10/16/02</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 | 11.7 ft. below ground | Date and time of measurement: 10/16/02 9:45 |
| 8. Step-Drawdown Test completed? | ☑ Yes | ☐ No | ☐ | Date and time of measurement: 10/16/02 9:45 |
| 9. Constant Rate Aquifer Test completed? | ☑ Yes | ☐ No | ☐ | Date and time of measurement: 10/16/02 9:45 |

**Parameters prior to pump test:**

| 11. Chloride: | 231 ppm | Date and time of sampling: 4/11/03 1:17 |
| 12. Temperature: | 80 °F | Date and time of measurement: 4/11/03 1:17 |

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

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

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

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

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

---

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

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date: 11/16/04</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date: 12/20/04</th>
</tr>
</thead>
</table>
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: 4.5 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"): 3 in.

Rock or Gravel Packing:
31.5 ft.
□ Crushed Basalt
□ Round Gravel

Water Level Elevation:
4.19 ft., msl*

Total Depth 35 ft.

Hole Diameter: 10 in.

Minimum of 2' Radius & 4" Thick Concrete Pad

Ground Elevation: 10.81 ft., msl

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev.))
Length: 6 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: -24.19 ft., msl

Open Casing: □ Perforated □ Screen
Length: 29 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.237 in.
Bottom Elevation: -24.19 ft., msl

Open Hole: □ Filled with gravel
Length: 1 in.
Diameter: 10 in.
Bottom Elevation: -25.7 in.

Elevation at top of casing
(to nearest 0.01 ft.)

Minimum of 2' Radius & 4" Thick Concrete Pad

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): □ FEP Fluorocarbon Tubing conforming to ASTM D3296
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
□ TFE 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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□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ TFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

HAWAII WELL CONSTRUCTION STANDARDS

Please refer to the
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)
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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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□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ TFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296
Well Number: 3213-08

<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:
## Geologic Log
**Well No. 3213-08**

<table>
<thead>
<tr>
<th>Drilling Log</th>
<th>DRAFT</th>
<th>Vertical Hole No. ERDC MW-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makua Military Reservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling agency: Valley Drilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of Driller: John Suriqad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturer's designation of drill: Mobile B-90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total No. of overburden samples taken: Disturbed 3</td>
<td>Total Depth of Hole: 35 ft</td>
<td></td>
</tr>
<tr>
<td>GPS Coord.</td>
<td>N 21 deg. 32.838' W 158 deg. 13.130'</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></td>
<td>HNU - 0 ppm</td>
<td>SC: LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>Third clearance. No detect - drilling ahead.</td>
<td>Lean clay (CL) dark gray w/ silt and/or sand/silts. Inclusions and lenses.</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>HNU - 0 ppm</td>
<td>SC: LL - 18-20 counts</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td>Fourth clearance. No detect - drilling ahead.</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Lean clay (CL) sl. sandy, dark gray to black. Trace basalt frags.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td>Fifth clearance. No detect - drilling ahead.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-11</td>
<td></td>
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</tr>
<tr>
<td>-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-15</td>
<td></td>
<td></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 - 18-20 counts

HNU - 0 ppm
SC/LL - 18-20 counts
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 Riser Pipe

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

Well MW-2 (3213-08)

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

Surveyed on June 30, 2003

Latitude (N): 21° 32’ 04”  Longitude (W) 158° 13’ 42”

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

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-2, Well No. 3213-08

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

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management’s Administrative Rules, Section 13-168, entitled “Water Use, Wells, and Stream Diversion Works”, this document permits the construction and testing of ERDC-MW-2 (Well No. 3213-08) at Makua Military Reservation, Oahu, TMK 8-1-01T, subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997) 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 cumulative 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: [Signature]
Date: [Date]

Printed Name: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAC-HI
Driller's Signature: [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'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/](http://www.state.hi.us/dlnr/cwrm/)

---

1. **State Well No.:** 3213-09  
   **Well Name:** ERDC-MW-3A  
   **Island:** Oahu

2. **Address:** Makua Military Reservation  
   **Drilling Company:** Valley Well Drilling

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

4. **Date Well Construction (drilled,cased,grouted) completed:** 10/1/2002

5. **Fill out attached Driller's Log**

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

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

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

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

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

10. **Parameters prior to pump test:**

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

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

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

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

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

13. **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.)**

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

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

---

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

**Signature:**

**Date:** 11/16/04

---

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

**Signature:**

**Date:** 8/27/04
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

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

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

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

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

Remarks:

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

<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>ML Dark brown sandy clayey silt with few basaltic gravel fragments (dry) (loose) (fill)</td>
<td></td>
<td>HNU - 0 ppm &lt;br&gt; SC: LL - 17-25 background</td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>ML Dark brown sandy clayey silt, few basaltic gravel fragments (dry) (loose)</td>
<td>7&lt;br&gt;21&lt;br&gt;27</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-5.0'</td>
<td>25% recovery</td>
<td>2nd UXO clearance at 6' bgs</td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-5.0'</td>
<td>30&lt;br&gt;50&lt;br&gt;60</td>
<td>3rd UXO clearance</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-5.0'</td>
<td>33% recovery</td>
<td>4th UXO clearance. HNU - 0 ppm &lt;br&gt; SC: LL 20-35, background.</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>ML Dark brown sandy clayey silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td>20&lt;br&gt;20</td>
<td>Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Rock in sample shoe. Low recovery.</td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-14</td>
<td></td>
<td></td>
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</tbody>
</table>

**Drilling Log**
- **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, Undisturbed 2

**Drilling Log**
- **Vertical Hole No.:** ERDC MW-3A
- **Size and Type of Bit:** 10'-dia Hollow Bm. Auger
- **Datum for elevation shown:** MSL (approx. 20)
- **Date Started:** 10/14/02
- **Date Completed:** 10/14/02
- **Total Depth of Hole:** 45 ft
- **Elevation ground water:** 17' bgs
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

5% recovery

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

5th UXO clearance 18' bgs
End UXO clearance

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

Concrete Surface Seal

Elevation = 19.1 ft.

4\" Diameter PVC Schedule 40 Riser Pipe

Borehole Diameter (10\" Minimum)

Water Level

Bentonite Pellet Seal (Minimum 2\' Thick)

Bentonite Concrete Grout Backfill

#3 Sand

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

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

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

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

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

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

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

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

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

Driller's Signature: ___________________________ C-57 License #: 31358 Date: 11/16/04
Printed Name: Mike Stover 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
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: 

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</tbody>
</table>

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: 10/4/02 Fill out attached Driller's Log
6. Was the subject well cored? ☐ Yes ☑ No
7. Initial water-level encountered 15 ft. below ground Date and time of measurement: 4/3/2003 9:20
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:
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 12/19/04
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

**Solid Casing Material:** 3 - 3213 - 10 ERDC-MW-3B

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

<table>
<thead>
<tr>
<th>Material</th>
<th>Options</th>
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<tbody>
<tr>
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<td>□ ASTM A53 □ ASTM A139</td>
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<tr>
<td>And compliant</td>
<td>□ ASTM A242 □ Type E □ Type S</td>
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<td></td>
</tr>
<tr>
<td>Thermoset Plastic: (check one)</td>
<td>□ Filament Wound Resin Pipe conforming to ASTM D2996</td>
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<td></td>
<td>□ PTFE Fluorocarbon Tubing conforming to ASTM D3296</td>
</tr>
<tr>
<td></td>
<td>□ FEP Fluorocarbon Tubing conforming to ASTM D3296</td>
</tr>
</tbody>
</table>

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*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 16</td>
<td>Dark brown sandy clayey silt</td>
<td>10/16/02</td>
</tr>
<tr>
<td>16 to 60</td>
<td>Brown clayey silty sand</td>
<td>10/16/02</td>
</tr>
<tr>
<td>60 to 62</td>
<td>Black silty sandy clay with trace</td>
<td>10/16/02</td>
</tr>
<tr>
<td></td>
<td>basaltic pebbles</td>
<td></td>
</tr>
<tr>
<td>62 to 70</td>
<td>Basaltic boulders. Slow drilling</td>
<td>10/18/02</td>
</tr>
</tbody>
</table>

Remarks:

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**Drilling Log**

**Well 3213-10**

**Makua Military Reservation**  
**Drilling agency:** Valley Drilling  
**Name of Driller:** John Surtigad  
**Manufacturer's designation of drill:** Mobile B-90  
**Total No. of overburden samples taken:** Disturbed: 3  
**Total Depth of Hole:** 70 ft  
**Elevation ground water:** 4' (16' bgs)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel (dry) (loose) (fill)</td>
<td>26 20%</td>
<td>UXO clearance</td>
</tr>
</tbody>
</table>
| -2    | ML        | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense) | 30 | SC:LL - 20 to 30, BG  
|       |           | Drilling smooth | 20% | UXO clearance |
| -4    | ML        | Dark brown sandy clayey silt, few basaltic fine gravel fragments (dry) (medium dense to dense) | 40 20% | UXO clearance |
|       |           | Drilling smooth | 30 | UXO clearance |
| -6    | ML-SC     | Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense) | 15 | Sample w/ 2 in diameter split spoon sampler, 140 lb hammer  
|       |           | Approx. water table at 16' bgs | 25 20% | HNU - 0, SC:LL - 15 to 33 BGS, UXO clearance  
|       |           | End UXO clearance | 75% | End UXO clearance |
| -8    | ML        | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense) | 25 | HNU - 0  
|       |           | Drilling smooth | 30 | End HNU monitoring |
| -10   | ML        | Dark brown sandy clayey silt, few basaltic fine gravel fragments (dry) (medium dense to dense) | 15 | HNU - 0  
|       |           | Drilling smooth | 20 | HNU - 0  
| -12   | ML-SC     | Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense) | 15 | HNU - 0  
|       |           | Approx. water table at 16' bgs | 25 20% | HNU - 0, SC:LL - 15 to 33 BGS, UXO clearance  
| -14   | ML        | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense) | 25 | HNU - 0  
|       |           | Drilling smooth | 30 | End UXO clearance |
| -16   | ML-SC     | Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense) | 15 | HNU - 0  
|       |           | Approx. water table at 16' bgs | 25 20% | HNU - 0, SC:LL - 15 to 33 BGS, UXO clearance  
| -18   | ML        | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense) | 25 | HNU - 0  
|       |           | Drilling smooth | 30 | End UXO clearance |
| -20   | ML-SC     | Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense) | 15 | HNU - 0  
|       |           | Approx. water table at 16' bgs | 25 20% | HNU - 0, SC:LL - 15 to 33 BGS, UXO clearance  
| -22   | ML        | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense) | 25 | HNU - 0  
|       |           | Drilling smooth | 30 | End UXO clearance |

**Vertical Hole No.:** ERDC MW-3B  
**Size and Type of Bit:**  
**Datum for elevation shown:** MSL (appr. 20)  
**Date Started:** 10/16/02  
**Date Completed:**  

---

**Sample 10:** MMRSSMW-38-5.0'  
**Sample 10:** MMRSSMW-38-10.0'  
**Sample 10:** MMRSSMW-38-15.0'
-66
-68
-70

Unfilling smooth

SC Brown clayey silty sand

CL Black silty sandy clay with trace basaltic pebbles (soft)


Drilling hard, lots of drill bit chatter. Basaltic rock stratum.

Drilling hard to TD of borehole.

Approx. depth from drill cuttings

TD 63' bgs with 10" auger

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

Concrete Surface Seal

Elevation = 18.3 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Bentonite Concrete Grout Backfill

Borehole Diameter (10" Minimum)

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
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.
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 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: FLOYD A. QUINTANA Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________  Date: ___________________________
Printed Name: MIKE SABIAN  C-57 License #: 21358  Date: 11/16/94
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
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/

1. State Well No.: 3213-11  Well Name: ERDC-MW-3C  Island: Oahu
2. Address: Makua Military Reservation  Tax Map Key: 8-1-01:1
3. Drilling Company: Valley Well Drilling
4. Drilling method used during construction: X Rotary  □ Percussion  □ Other (describe)
5. Date Well Construction (drilled,cased,grouted) completed: 4/23/02  Fill out attached Driller's Log
6. Was the subject well cored?  □ Yes  X No
7. Initial water-level encountered _16_ ft. below ground  Date and time of measurement: 4/20/02  13:00
8. Step-Drawdown Test completed?  □ No  □ Yes  Attach Step-Drawdown Test form (12/17/97 SDPTD Form)
9. Constant Rate Aquifer Test completed?  □ No  □ Yes  Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:
10. Water-level: 3.82 ft. above msl  Date and time of measurement: 4/2/2002  15:00
11. Chloride: 57 ppm  Date and time of sampling: 4/2/2002  15:30
12. Temperature: 75°F  Date and time of measurement: 4/2/2002  15:45

13. Fill in the as-built section on the other side of this sheet.
14. Fill in attached surveyor's report.
15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)
16. The proposed manufacturer's rated pump capacity is _______ gpm at a head of _______ ft.
17. Remarks: No pump installed. Well for Sampling

Licensed Driller (print) Mike Solomon  C-57 Lic. No. 21358
Signature ______________________ Date 1/16/04

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HI
Signature ______________________ Date 1/15/04
**State of Hawaii**  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
Department of Land and Natural Resources  
**DRILLER’S LOG**

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:
# Drilling Log

## Makua Military Reservation

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

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

**Drilling agency:** Valley Drilling

**Datum for elevation shown:** MSL

**Name of Driller:** John Surigad

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

**Completed:** 11/27/02

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

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

**Elevation ground water:** 15.5' bgs

**Total Depth of Hole:** 106 ft

<table>
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<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
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<th>Comments</th>
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<tr>
<td>-46</td>
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</table>

- **SPT 8/13/20 (ML)** Dark brown clayey silt, dry, loose, few fine to coarse sub-angular basaltic fragments.
- **SPT 4/12/16 (CH)** Olive gray (5Y4/1) sandy clay with silt, stiff, moist.

Drilling performed using 8" diameter hollow stem auger to facilitate UXO clearance. UXO clearance conducted every 3' down to 21' bgs. HNU scintillometer readings taken on drill cuttings at the same time as UXO clearance. HNU - B SC-LL - 15 to 15 (background) levels.

Appx. water table.
MEMORANDUM FOR THE RECORD

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

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

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

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

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

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

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

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

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

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

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence 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 by 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: ___________________________ Firm or Title: ___________________________

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

Printed Name: ___________________________ Firm or Title: ___________________________

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

Attachment

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

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIAANE</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>######</td>
</tr>
<tr>
<td>Proposed Use</td>
<td>Proposed Withdrawal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>OAHU</th>
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<td>######</td>
</tr>
<tr>
<td>Proposed Use</td>
<td>Proposed Withdrawal</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>
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<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>
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<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
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<tr>
<td>Calculated Aquifer Thickness</td>
<td>1025 ft.</td>
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<tr>
<td>County Water Supply (Y/N ?)</td>
<td>-----------</td>
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<tr>
<td>Solid Casing</td>
<td>Material</td>
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<tr>
<td></td>
<td>Designation</td>
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<tr>
<td></td>
<td>Length</td>
</tr>
<tr>
<td></td>
<td>Diameter</td>
</tr>
<tr>
<td></td>
<td>Wall Thickness</td>
</tr>
<tr>
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<td>ft.</td>
</tr>
<tr>
<td></td>
<td>in.</td>
</tr>
<tr>
<td>Casing</td>
<td>Material</td>
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<td>Wall Thickness</td>
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<td></td>
<td>sq.in./l.f.</td>
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<tr>
<td></td>
<td>ft.</td>
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<td>in.</td>
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<td>Open Hole</td>
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<td>Diameter</td>
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SECTION 3: CHECKLIST (values to check are shaded)

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<th>Well Depth</th>
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<tr>
<td>Theoretical Thickness of Aquifer</td>
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<tr>
<td>1/4 Aquifer Thickness</td>
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<td>Depth of Well below Sea Level</td>
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<table>
<thead>
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<th>Well Casing</th>
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<td>Minimum Wall Thickness</td>
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<tr>
<td>Material</td>
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<tr>
<td>County or Non-County</td>
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<tr>
<td>non-county</td>
</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>
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<tr>
<td>Length of solid casing Provided</td>
</tr>
<tr>
<td>Casing Material</td>
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<tr>
<td>okay (refer to HWCPIS Section 2.4 e)</td>
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</table>

<table>
<thead>
<tr>
<th>Annular Space</th>
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<tbody>
<tr>
<td>Depth of Grouting</td>
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<tr>
<td>Calculated Depth of Grouting</td>
</tr>
<tr>
<td>Depth of Grouting provided</td>
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<tr>
<td>Thickness of Annular Space</td>
</tr>
</tbody>
</table>
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
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 52, 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:

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

Well Owner

1. The approval date; 2) the contractor water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Name: ERDC-MW-5

Well & Pump Information:

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

2. WELL NAME: ERDC-MW-5 Island: Oahu

Address: Makua Military Reservation

Tax Map Key: 8-2-01-20

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 property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK:

☐ Construct New Well

☐ Modify Existing Well

☐ Abandon/Seal

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

4. CONSTRUCTION:

☐ Drilled ☐ Dug ☐ Shaft ☐ Tunnel

Is this well part of a battery of wells? ☐ Yes ☐ No (Please describe)

5. PROPOSED PUMP INFORMATION:

Rated Pump Capacity: (not applicable) gallons per minute

Pump Type (Check one):

☐ Deep Well Turbine ☐ Rotary Pump

☐ Submersible ☐ Propeller Pump

☐ Centrifugal ☐ Reciprocating Pump

☐ Rotary-Displacement Pump

6. PROPOSED USE:

☐ Domestic (including hotels, stores, etc.) ☐ Industrial

☐ Municipal (including hotels, stores, etc.)

☐ Other (explain): Monitoring Well

☐ Non-commercial water system

Does this well serve 25 or more people at least 60 days per year or have 16 or more service connections? ☐ Yes ☐ No

☐ Irrigation (crop)

☐ Military

☐ No. of Acres:

☐ Other (explain): Monitoring Well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:

☐ Not applicable ☐ Flowmeter ☐ Flowmeter

☐ Open-pipe ☐ Weir ☐ Orifice ☐ Other (explain)

(b) METHOD OF FLOW MEASUREMENT:

☐ None ☐ Other (explain): Monitoring Well

Other Important Information:

8. LEGAL REQUIREMENTS:

☐ COUP ☐ SMAP ☐ EIS ☐ EA ☐ None ☐ Other (explain)

9. REMARKS, EXPLANATIONS:

This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

If more space is needed, please attach additional sheet.

I understand that approval of this application attaches the following 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. Quintin

Landowner: Eric T. Hiura

Contractor: Valley Well Drilling

Signature: ____________________________ Signature: ____________________________ Signature: ____________________________

Date: 10/10/02 Date: 10/10/02 Date: 10/10/02

For official use only

Latitude: 21° 14' 50" Aquifer System No. State Well No.: 3113-046

Longitude: ____________________________

WCPIPA Form 10/25/00

For Official Use Only:
Details

<table>
<thead>
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<tr>
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<td>Lot Number:</td>
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**LAND CONTROL CODES**

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<td>HEIGHT LIMIT</td>
<td>STATE LAND USE STANDARDS</td>
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<td>P-1 RESTRICTED PRESERVATION</td>
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**FACILITIES**

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<thead>
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**TMK SEPARATIONS**

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

© 2000 City and County of Honolulu. All Rights Reserved.
Ms. Dierdre Mamiya, Administrator  
Department of Land and Natural Resources  
Land Division, State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

October 21, 2002

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

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

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

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

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

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

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

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

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval or if work is suspended or abandoned 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 properly damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

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

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

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

Attachment

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

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

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-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
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 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 basalt 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-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
WELL CONSTRUCTION PERMIT
ERDC-MW-4B, Well No. 3113-04

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

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

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

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

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

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

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

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

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

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

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

10. The permit may be revoked by the Commission if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

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

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

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

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

Attachment

USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
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 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
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
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, Oahu, TMK 8-1-01:2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following conditions:

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

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

3. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise 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. Pilot 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 permitee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

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

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

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

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

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

Attachment

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

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

Dear Mr. Fukuda:

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

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

Special Conditions

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

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

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

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

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

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

Aloha,

[Signature]
GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-3A, Well No. 3213-09

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

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

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

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 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 rules, laws, 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(0) 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-3B (Well No. 3213-10)

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

**Special Conditions**

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

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

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

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

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

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-3B, Well No. 3213-10
Note: This permit shall be prominently displayed at the site until the work is completed

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

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

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

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

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

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

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test 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 c:
USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

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

Dear Mr. Fukuda:

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

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

Special Conditions

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

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

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

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

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

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

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

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

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

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

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawings 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 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

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

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

Attachment c

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
Well No. 3113-02
Well Name ERDC-MW-1
Applicant US ARMY

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>
</tbody>
</table>

| System Sustainable Yield | 4 |

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>

<table>
<thead>
<tr>
<th>Estimated Head</th>
<th>ft., m.s.l.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>90.2 ft.</td>
</tr>
</tbody>
</table>

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

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

SECTION 3: CHECKLIST

(values to check are shaded)

Well Depth

<table>
<thead>
<tr>
<th>Theoretical Thickness of Aquifer</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
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<tr>
<td>Depth of Well below Sea Level</td>
<td>20 ft.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>okay (refer to HWCPIS Section 2.2)</th>
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</table>

Well Casing

<table>
<thead>
<tr>
<th>Minimum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC PVC</td>
</tr>
<tr>
<td>County or Non-County</td>
</tr>
<tr>
<td>Minimum Thickness per standards</td>
</tr>
<tr>
<td>Wall Thickness Provided</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>okay (refer to HWCPIS Section 2.4 c)</th>
</tr>
</thead>
</table>

| Minimum Length of Solid Casing     | 11.52 ft. |
| 90% of ground to top of aquifer    |          |
| Length of solid casing Provided    | 10 ft.   |

<table>
<thead>
<tr>
<th>too shallow (refer to HWCPIS Section 2.4 d)</th>
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</table>

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

<table>
<thead>
<tr>
<th>okay (refer to HWCPIS Section 2.4 e)</th>
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</thead>
</table>

Depth of Grouting

| Calculated Depth of Grouting | 8.96 ft. |
| Depth of Grouting provided   | 8 ft.    |
| Thickness of Annular Space   | 3 in.    |

<table>
<thead>
<tr>
<th>not enough (refer to HWCPIS Section 2.6 c)</th>
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<tr>
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<tr>
<td>Aquifer System</td>
<td>WAIANAE</td>
</tr>
<tr>
<td>Aquifer Sector</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>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>Diameter</td>
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</table>

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

**Well Depth**
- Theoretical Thickness of Aquifer: 90.2 ft.
- Depth of Well below Sea Level: 25 ft.
- Too deep (refer to HWCPIS Section 2.2)

**Well Casing**
- Minimum Wall Thickness
  - Material: PVC
  - Non-county
  - Minimum Thickness per standards: 0.237 in.
  - Wall Thickness Provided: 0.406 in.
  - Minimum Length of Solid Casing: 16.02 ft.
  - Length of solid casing Provided: 15 ft.

**Annular Space**
- Depth of Grouting
  - Calculated Depth of Grouting: 12.46 ft.
  - Depth of Grouting provided: 13 ft.
  - Thickness of Annular Space: 3 in.
**SECTION 1: WELL LOCATION INFORMATION**

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**Proposed Use**

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**SECTION 2: WELL SECTION DATA** (enter data in grey cells only)

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<thead>
<tr>
<th>County Water Supply (Y/N ?)</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

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

**Well Depth**

<table>
<thead>
<tr>
<th>Theoretical Thickness of Aquifer</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
</tr>
</tbody>
</table>

**Depth of Well below Sea Level**

<table>
<thead>
<tr>
<th>50 ft. too deep</th>
<th>(refer to HWCPIS Section 2.2)</th>
</tr>
</thead>
</table>

**Well Casing**

<table>
<thead>
<tr>
<th>Minimum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>County or Non-County</td>
</tr>
<tr>
<td>PVC non-county</td>
</tr>
<tr>
<td>Minimum Thickness per standards</td>
</tr>
</tbody>
</table>

| Wall Thickness Provided | 0.406 in. | okay (refer to HWCPIS Section 2.4 c) |
|                        | (disregard this if this is a non-county well) |

<table>
<thead>
<tr>
<th>Minimum Length of Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% of ground to top of aquifer</td>
</tr>
</tbody>
</table>

| Length of solid casing Provided | 45 ft. | okay (refer to HWCPIS Section 2.4 d) |
|                                | (disregard this if this is a non-county well) |

**Casing Material**

<table>
<thead>
<tr>
<th>Sch 40</th>
</tr>
</thead>
</table>

**Annular Space**

<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>
</tr>
</tbody>
</table>

Page 1
**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
<th>Aquifer System</th>
<th>WAIAEA</th>
<th>Aquifer Sector</th>
<th>#4444</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Use</td>
<td></td>
<td>Proposed Withdrawal</td>
<td></td>
<td>System Sustainable Yield</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td>0</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>
<th>Solid Casing Material</th>
<th>ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
<td>Length</td>
<td>in.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>in.</td>
<td>Diameter</td>
<td>in.</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>ft.</td>
<td>Wall Thickness</td>
<td></td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Head (ft., m.s.l.)</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Aquifer Thickness</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>Theoretical Thickness of Aquifer</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
<td></td>
</tr>
<tr>
<td>Depth of Well below Sea Level</td>
<td>80 ft.</td>
<td>too deep</td>
</tr>
</tbody>
</table>

**Well Casing**

<table>
<thead>
<tr>
<th>Minimum Wall Thickness</th>
<th>PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>non-county</td>
</tr>
<tr>
<td>County or Non-County</td>
<td></td>
</tr>
<tr>
<td>Minimum Thickness per standards</td>
<td>0.237 in.</td>
</tr>
<tr>
<td>Wall Thickness Provided</td>
<td>0.406 in.</td>
</tr>
<tr>
<td>Minimum Length of Solid Casing</td>
<td>16.02 ft.</td>
</tr>
<tr>
<td>90% of ground to top of aquifer</td>
<td>70 ft.</td>
</tr>
<tr>
<td>Length of solid casing Provided</td>
<td>Sch 40</td>
</tr>
</tbody>
</table>

**Annular Space**

<table>
<thead>
<tr>
<th>Depth of Grouting Calculated Depth of Grouting</th>
<th>12.46 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Grouting provided</td>
<td>68 ft.</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
<td>3 in.</td>
</tr>
<tr>
<td>Taxkey</td>
<td>Subdiv/Condo</td>
</tr>
<tr>
<td>--------</td>
<td>--------------</td>
</tr>
<tr>
<td>1-8-2-1-20</td>
<td>G</td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
### PUBLIC RECORD DATA

<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/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></td>
<td></td>
<td></td>
<td>13.39 ac</td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/Condo</th>
<th>Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-1-1-2</td>
<td>G</td>
<td>FARRINGTON HWY</td>
<td>UNITED STATES OF AMERICA</td>
<td>25.72 ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/CondoTnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-2-1-24</td>
<td>G 82-180</td>
<td>FARRINGTON HWY</td>
<td>STATE OF HAWAII</td>
<td></td>
<td></td>
<td>260.47 ac</td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
LICENSE SCREEN

[ Look up License Type Codes-> ]
Please click a link listed below to display the other screen.

***** GENERAL LICENSEE *****

LIC ID: CT-21358       Active/Inactive: ACTIVE
NAME: VALLEY WELL DRILLING
TRADE NAME:  
STATUS: VALID THRU EXPIRATION DATE, RENEWAL NOTICE SENT
ENTITY: PARTNERSHIP       BUSINESS CODE:  
ORIG LIC DATE: 3/16/98       EXPIRE DATE: 9/30/02
CLASS PREFIX: C  
SPECIAL PRIVILEGE:  
RESTRICTION:  
EDUCATION CODE:  
BUSINESS ADDR: 91-235 OIHANA ST #A   KAPOLEI HI 96707
MAILING ADDR:  

Click here to enter search criteria for prior complaints history ->
For prior complaints and disciplinary history, contact licensing and business information center at (808)587-3295.

<-Back   New Search->

EMPLOYEES LIST || EMPLOYERS LIST || INSURANCE/BOND || LICENSE CLASS
**State of Hawaii**
**COMMISSION ON WATER RESOURCE MANAGEMENT**
Department of Land and Natural Resources
APPLICATION FOR PERMIT

**Well Construction** and/or **Pump Installation**

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 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 further information and updates to this application form, visit [http://www.state.hi.us/dlnr/cwrm](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: 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)  
   Contact Person:  
   Phone:  
   Mailing Address:  
   Fax:  
   E-mail:  

3. **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: wdh@lava.net  
   Lic #: 21358

**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

   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quadrangle map, and (b) a property tax map, showing well location referenced to established property boundaries.

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

   *State Well No: (if unknown, please call Commission at 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  
   - [ ] 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:  
   - [ ] Other:  

   If unknown, please call Commission at 587-0225

7. **PROPOSED AMOUNT OF WITHDRAWAL:**  
   - Not Applicable  
   - gallons per day

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

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**:  
**Contractor**: Valley Well Drilling

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

**For official use only**

**Latitude**:  
**Longitude**:  
**Aquifer System No**: 243-02  
**State Well No**: 243-02  

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: **17** ft., msl*  
Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)  
Ground Elevation: **15** ft., msl*

Cement Grout: **8** 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

Total Depth: **35** ft.

Estimated Water Level Elevation: **2.2** ft., msl*

Solid Casing: (check one or more):  
- Stainless Steel: compliant with ASTM A53 or ASTM A139  
- Thermoset Plastic: compliant with (check one):  
  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other
- ABS Plastic: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- PVC Plastic: compliant with (check one):  
  - ASTM D1785 or ASTM D2241 (check one):  
  - Schedule 40  
  - Schedule 80  
  - Schedule 120

Open Casing: (check one):  
- Perforated  
- Screen

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

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,  
Bottom Elevation of Well Limit = \( \frac{\text{Water Elevation} - 41 \times \text{Water Level Elev.}}{4} \)  
Example: \( 0.5 \times \text{Water Level Elev.} = -18.5 \) ft.

Solid Casing Material:  
- Carbon Steel: compliant with (check one or more):  
  - ANSI/WWA 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: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- ABS Plastic: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- PVC Plastic: compliant with (check one):  
  - ASTM D1785 or ASTM D2241 (check one):  
  - Schedule 40  
  - Schedule 80  
  - Schedule 120
- Thermoset Plastic: compliant with (check one):  
  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other

Open Casing Material:  
- Carbon Steel: compliant with (check one or more):  
  - ANSI/WWA 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
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  - ASTM A512 (monitor wells)
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  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- PVC Plastic: compliant with (check one):  
  - ASTM D1785 or ASTM D2241 (check one):  
  - Schedule 40  
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  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other

* 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.

Solid Casing: (check one or more):  
- Stainless Steel: compliant with ASTM A53 or ASTM A139  
- Thermoset Plastic: compliant with (check one):  
  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other
- ABS Plastic: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- PVC Plastic: compliant with (check one):  
  - ASTM D1785 or ASTM D2241 (check one):  
  - Schedule 40  
  - Schedule 80  
  - Schedule 120
- Thermoset Plastic: compliant with (check one):  
  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other

Open Casing Material:  
- Carbon Steel: compliant with (check one or more):  
  - ANSI/WWA 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: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- ABS Plastic: compliant with (check one):  
  - ASTM A409 (production wells)  
  - ASTM A512 (monitor wells)
- PVC Plastic: compliant with (check one):  
  - ASTM D1785 or ASTM D2241 (check one):  
  - Schedule 40  
  - Schedule 80  
  - Schedule 120
- Thermoset Plastic: compliant with (check one):  
  - ASTM A242  
  - Type E  
  - Type S  
  - Grade B  
  - Other

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

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

WELL NAME: ERDC-MW-2
Island: Oahu

Address Makua Military Reservation

Tax Map Key: 8-1-01-2

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.

PROPOSED WORK: (check all that apply)
X Construct New Well
□ Install New Pump*
□ Modify Existing Well*
□ Abandon/Seal*
□ Modify Pump*
□

(State Well No.: 

CONSTRUCTION: Drilled 
Dug
Shaft 
Tunnel

Is this well part of a battery of wells? Yes fNo (Please describe)

PROPOSED PUMP INFORMATION:

Rated Pump Capacity: Not applicable gallons per minute

Pump Type (Check one):
□ Deep Well Turbine
□ Rotary
□ Submersible
□ Rotary-Displacement
□ Centrifugal
□ Rotary-Gear
□ Propeller
□ Reciprocating
□ Impulse

PROPOSED USE: (check all that apply)
□ Municipal (including hotels, stores, etc.)
□ Domestic (individual, noncommercial water system)
□ Industrial
□ Other (explain): Monitoring well

Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? Yes No

Irrigation (crop)

No. of Acres:

MILITARY
□ Other (explain): 

OTHER IMPORTANT INFORMATION:

METHOD OF FLOW MEASUREMENT:
□ Flowmeter
□ Open-pipe
□ Weir
□ Office
□ Other (explain): 

OTHER LEGAL REQUIREMENTS:
□ CDP
□ 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 80 days after the completion date of the permitted work, 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner
Landowner
Contractor
LTC Floyd A. Quinlan
(legible)
(legible)
Valley Well Drilling
(legible)

Signature
Signature
Signature

Date
Date
Date
10. PROPOSED WELL SECTION  

(Please attach schematic if different from diagram provided below)

Hole Diameter: ______ in.

Elevation at top of casing: 17 ft., msl*

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

Ground Elevation: 15 ft., msl*

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

Total Length: __________ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

Open Casing: □ Perforated □ Screen

Total Length: __________ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

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 = \( \left( \frac{Elevation \times \frac{1}{4} \times \text{Water Level Elev.}}{4} \right) \)

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = \( \frac{10 \times \frac{1}{4} \times 8}{4} \) = -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

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
Title: Monitoring Well Locations

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

FIGURE NO: 3.13
APPLICATION FOR PERMIT

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

2. WELL NAME: ERDC-MW-3A Island: Oahu
Address Makua Military Reservation Tax Map Key: 8 1 01 1
Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

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

*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 (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

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
Landowner
Contractor Valley Well Drilling

For official use only
Latitude Aquifer System No. 3213-09
Longitude State Well No.
10. PROPOSED WELL SECTION

(please attach schematic if different from diagram provided below)

Hole Diameter: 10_______ in.

Elevation at top of casing 22____ ft., msl*

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

Ground Elevation: 20____ ft., msl

Solid Casing: (2 x 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: (check one)

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.

Open Hole:
Length: __________________ ft.
Diameter: __________________ ft.
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 Basalt Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = (Water Elevation - 0.25 x Water Level Elev.)

Example: Estimated + 2 ft. Water Level Elev. = Bottom Elevation of Well Limit = (2 - 0.25 x 2) = -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
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 D3266
□ FEP Fluorocarbon Tubing conforming to ASTM D3266

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
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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 D3266
□ FEP Fluorocarbon Tubing conforming to ASTM D3266

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

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

Bottom Elevation of Well Limit = (Water Elevation - 0.25 x Water Level Elev.)

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

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

FIGURE NO: 3.13

US Army Corps of Engineers,
**APPLICANT INFORMATION:**

Fill out all three, if applicable, and place a check next to the primary contact.

1. (a) **WELL OWNER:** U.S. Army
   - Mailing Address: DPW, Attn: APVG-GWV, U.S. Army Garrison HI, Schofield Barracks, HI 96857
   - Phone: 656-2878
   - Email: fukudaj@schofield.army.mil

2. (b) **LAND OWNER:** (same as well owner)
   - Mailing Address: 91-235A Ohana St., Kapolei, HI 96707
   - Phone: 682-1767
   - Email: ywahi@lava.net

3. (c) **CONTRACTOR:** Valley Well Drilling
   - Mailing Address: 91-235A Ohana St., Kapolei, HI 96707
   - Phone: 682-1767
   - Email: ywahi@lava.net

**WELL & PUMP INFORMATION:**

- **WELL NAME:** ERDC-MW-3B
- **Island:** Oahu
- **Address:** Makua Military Reservation
- **Tax Map Key:** 8 1 01 1

Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

**PROPOSED WORK:**

- Construct New Well
- Modify Existing Well*
- Abandon/Seal* (if unknown, please call Commission at 587-0225)

**CONSTRUCTION:**

- Drilled
- Dig
- Shaft
- Tunnel

- Is this well part of a battery of wells? Yes No

**PROPOSED PUMP INFORMATION:**

- Rated Pump Capacity: Not Applicable
- Other (explain): Monitoring Well

**METHOD OF FLOW MEASUREMENT:**

- Flowmeter
- Open-pipe
- Weir
- Orifice

**OTHER IMPORTANT INFORMATION:**

8. **LEGAL REQUIREMENTS:**
   - **COUP**
   - **SMAP**
   - **EIS**
   - **EA**
   - None

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/seabondment 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.

**OTHER INFORMATION:**

- **Latitude:**
- **Longitude:**
- **Aquifer System No.:**
- **State Well No.:**
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing 22 ft., msl

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

Ground Elevation: 20 ft., msl

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

- Total Length: 45 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -23 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.

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
- ABS Plastic: (check one):
  - ASTM A126
- Thermoset Plastic: (check one)
  - 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
- ABS Plastic: (check one):
  - ASTM A126
- Thermoset Plastic: (check one)
  - 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

* 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 = \( \text{Water Elevation} - \left( \frac{1}{4} \times \text{Aquifer Thickness} \right) \)

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = \( (2 - \frac{1}{4} \times 70) = -18.5 \) ft.
For Official Use Only:

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 Regulations Branch at 587-0225.

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

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

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

   (b) ☐ LAND OWNER: (same as well owner)
   Mailing Address: DPW, Attn: APVC-CWV, U.S. Army Garrison, Schofield Barracks HI 96857
   Fax: 656-1039
   Phone: 656-2878
   Contact Person: Jon Fukuda
   E-mail: fukudaj@schofield.army.mil

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

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

2. WELL NAME: ERDC-MW-3C
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key:
   (check all that apply)
   Island:
   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
   ☐ (if unknown, please call Commission at 587-0225)

4. CONSTRUCTION:
   ☐ Drilled
   ☐ Dug
   ☐ Shaft
   ☐ Tunnel
   ☐ Other (explain): Monitoring Well

   (This well is one of three in nested pair at different depths MW-3A,3B,3C)

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

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

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   ☐ Not Applicable
   ☐ Flowmeter
   ☐ Open-pipe
   ☐ Well
   ☐ Office
   ☐ Other (explain): Monitoring Well
   gallons per day

   (b) METHOD OF FLOW MEASUREMENT:
   ☐ Flowmeter
   ☐ Open-pipe
   ☐ Well
   ☐ Office
   ☐ Other (explain): Monitoring Well

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. Crittenden
Landowner: 
Contractor: Valley Well Drilling
Signature: 
Signature: 
Date: 10/25/00
Date: 10/25/00

For official use only:

Latitude: 
Aquifer System No. 521-3-11
Longitude: 
State Well No. 

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>
<tbody>
<tr>
<td>Elevation at top of casing: 22 ft, msl*</td>
</tr>
<tr>
<td>Minimum of 2 ft. &amp; 4 ft. Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)</td>
</tr>
<tr>
<td>Ground Elevation: 20 ft, msl*</td>
</tr>
</tbody>
</table>

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

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

Rock or Gravel Packing: 32 ft.

Material: Crushed Basalt

Estimated Water Level Elevation: 2.2 ft. msl*

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

| Total Length: | 70 ft. |
| Nominal Diameter: | 4 in. |
| Wall Thickness: | 0.406 in. |
| Bottom Elevation: | -80 ft, msl* |

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

| Total Length: | 30 ft. |
| Nominal Diameter: | 4 in. |
| Wall Thickness: | 0.406 in. |
| Bottom Elevation: | -80 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 = \( \frac{4}{1} \times \text{Water Elevation} \)

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = \( 2 + \frac{4}{1} \times 2 = 18.5 \) 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 A42 | [ ] 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): | [ ] Centrifugal Cast Resin Pipe conforming to ASTM D2996 |
| [ ] Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517 |
| [ ] Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950 |
| [ ] PTFE Fluorocarbon Tubing conforming to ASTM D3296 |
| [ ] 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 A42 | [ ] 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): | [ ] Centrifugal Cast Resin Pipe conforming to ASTM D2996 |
| [ ] Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517 |
| [ ] Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950 |
| [ ] PTFE Fluorocarbon Tubing conforming to ASTM D3296 |
| [ ] 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.

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 A42, Type E, Type S, Grade B, Other
- ABS Plastic conforming to ASTM F480 and ASTM D1527: Schedule 40, Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): Schedule 40, Schedule 80, Schedule 120
- Thermoset Plastic: (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A42, Type E, Type S, Grade B, Other
- ABS Plastic conforming to ASTM F480 and ASTM D1527: Schedule 40, Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): Schedule 40, Schedule 80, Schedule 120
- Thermoset Plastic: (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296
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 887-0225.

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

1. ☑ WELL OWNER: U.S. Army
   Mailing Address: DPY, Attn: APWC-GW, U.S. Army Garrison Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@schofield.army.mil
   Phone: 656-2878
   Contact Person: Jon Fukuda

2. ☑ LAND OWNER: (same as well owner)
   Mailing Address: 91-235A O'ahu St., Kapolei, HI 96707
   Fax: 682-1768
   E-mail: vdhhi@lava.net
   Phone: 682-1767
   Contact Person: Mike Sober
   License #: 21358

3. Proposed Work:
   (check all that apply)
   ☑ Construct New Well
   ☑ Install New Pump*
   ☑ Modify Existing Well*
   ☑ Modify Pump*
   ☑ Abandon/Seal*

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

4. CONSTRUCTION:
   ☑ Dug
   ☑ Shaft
   ☑ Tunnel
   ☑ Drilled
   ☑ Shaft
   ☑ Tunnel
   ☑ Is this well part of a battery of wells? ☑ Yes ☐ No
   ☑ Please describe:

5. Proposed Pump Information:
   Pump Type (check one):
   ☑ Deep Well Turbine
   ☑ Rotary
   ☑ Submersible
   ☑ Rotary-Displacement
   ☑ Centrifugal
   ☑ Rotary-Gear
   ☑ Propeller
   ☑ Reciprocating
   ☑ Impulse
   ☑ Not applicable
   Rated Pump Capacity: Not applicable gallons per minute

6. Proposed Use:
   (check all that apply)
   ☑ Municipal (including hotels, stores, etc.)
   ☑ Domestic (individual, noncommercial water system)
   ☑ Industrial
   ☑ No Irrigation (crop)
   ☑ No. of Acres:
   ☑ No. of Acres:
   ☑ Military
   ☑ Other (explain):

7. Proposed Amount of Withdrawal:
   ☑ Not applicable gallons per day
   ☑ Monitoring Well
   ☑ 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.
   (If more space is needed, please attach additional sheet)

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

Well Owner: LTC Floyd A. Quintana
Landowner: Mark Y. Fukuda
Contractor: Valley Well Drilling
Signature: 23 Sep 00
Date: 23 Sep 00
Signature: 9/17/02
Date: 9/17/02

For official use only

Latitude
Longitude
Aquifer System No.
State Well No.
3113-03

WCIPPA 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*

Open Casing: □ Perforated □ Screen
Total Length: ________ ft.
Nominal Diameter: ________ in.
Wall Thickness: ________ in.
Bottom Elevation: ________ ft., msl*

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

---

Solid Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
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) □ Centrifugally Cast Resin Pipe conforming to ASTM D2997

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) □ Centrifugally Cast Resin Pipe conforming to ASTM D2997

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* The approximate elevation must be referenced to mean sea level (msl) at the time of application filling. 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 = \( \frac{1}{4} \times \text{Aquifer Thickness} \)

Example: Estimated + 2 ft., Water Level Elev. → Bottom Elevation of Well Limit = \( \left( \frac{1}{4} \times 2 \right) \) = -0.5 ft.

---

Ground Elevation: ________ ft.
Water Level Elev.: ________ ft.
Rock or Gravel Packing: ________ ft.
Material: □ Crushed Basalt □ Rounded Gravel
Cement Grout: ________ 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") ________ in.
Total Depth: ________ ft.
Estimated Water Level 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.
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

[X] Well Construction and/or [ ] Pump Installation

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 521, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $250.00 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
   Mailing Address: DPW, Attn: APVC-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   Phone: 656-2878
   E-mail: fukuda@shoefield.army.mil

2. (b) [ ] LAND OWNER (same as well owner)
   Contact Person:
   Mailing Address:
   Fax:
   Phone:
   E-mail:

3. (c) [ ] CONTRACTOR Valley Well Drilling
   Contact Person: Mike Sober
   Mailing Address: 91-235A Oihana St. Kapaolei, HI 96707
   Fax: 682-1768
   Phone: 682-1767
   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
   Address: Makua Military Reservation
   Tax Map Key:
   Island:
   Landowner:
   Mailing Address:
   Fax:
   Phone:
   E-mail:

3. PROPOSED WORK: (check all that apply)
   [ ] Construct New Well
   [ ] Modify Existing Well
   [ ] Abandon/Seal
   [ ] Install New Pump
   [ ] Modify Pump
   [ ] Other (explain)
   [ ] State Well No.: (if unknown, please call Commission at 887-0225)

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
   Pump Type (check one):
   [ ] Deep Well Turbine
   [ ] Rotary
   [ ] Propeller
   [ ] Submersible
   [ ] Rotary-Displacement
   [ ] Reciprocating
   [ ] Centrifugal
   [ ] Rotary-Gear
   [ ] Impulse
   [ ] Other (explain):

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

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable
   [ ] Flowmeter
   [ ] Open-pipe
   [ ] Weir
   [ ] Orifice
   [ ] Other (explain):
   [ ] Monitoring Well:
   gallons per day

(b) METHOD OF FLOW MEASUREMENT:

OTHER IMPORTANT INFORMATION:

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

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

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

Well Owner [ ] LANDOWNER [ ] CONTRACTOR
(print legibly)
Signature
Date

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

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

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft. msl

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

Ground Elevation: 20 ft. msl

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

Total Depth: 70 ft

Solid Casing Material:
- Stainless Steel: compliant with (check one or more)
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
- PVC Plastic conforming to ASTM F480 and ASTM D1527 (check one)
  - Schedule 40
  - Schedule 80

Open Casing Material:
- Carbon Steel: compliant with (check one or more)
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
- 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 D3298

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

Bottom Elevation of Well Limit = \( \frac{1}{4} \) * Aquifer Thickness

Example: Estimated + 2 ft. Water Level Elev. \( \rightarrow \) Bottom Elevation of Well Limit = \( \frac{1}{4} \) * Aquifer Thickness - 2 ft.

Solid Casing: \( \geq 90\% \) 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

* 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.
APPLICATION FOR PERMIT

1. WELL CONSTRUCTION and/or □ Pump Installation

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

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

(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: vwdhi@lava.net
   Lic #: 21358
   (circle one D/5-57a, or A)

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

2. WELL NAME: ERDC-MW-4C 31° 36' 05.7" Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 2 01 24
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

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

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

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

(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, noncommercial water system)
   □ Other (explain): Monitoring Well
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? X__ 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 □ Well □ Orifice □ Other (explain)

OTHER IMPORTANT INFORMATION:

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

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (if more space is needed, please attach additional sheet)

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

Well Owner: LT Floyd A. Quintana
Landowner: 
Contractor: Valley Well Drilling

Signature: ____________________________ Signature: ____________________________
Date: 23-SEP-02 Date: ____________________________

For official use only
Latitude: Aquifer System No: 
Longitude: State Well No: 31° 36' 05.7"

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

**HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS**

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

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

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

- 3 in.

Rock or Gravel Packing:

- 32 ft.

Material:

- Crushed Basalt
- Rounded Gravel

Estimated Water Level Elevation:

- 2.2 ft. msl*

Open Casing:

- Perforated
- Screen

Total Length: 70 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft. msl*

Open Hole:

- Length: __________ ft.
- Diameter: __________ in.
- Bottom Elevation: __________ ft. msl*

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): (check one or more):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1527: (check one) Schedule 40 or Schedule 80
- Thermoset Plastic: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrífugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material Schedule:

- Carbon Steel: compliant with (check one or more):
  - ANSI/AWWA C200
  - API Spec. 5L
  - ASTM A53
  - ASTM A139
- Stainless Steel: (check one): (check one or more):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1527: (check one) Schedule 40 or Schedule 80
- Thermoset Plastic: (check one)
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrífugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

* 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.)

Example: Estimated Water Level — Bottom Elevation of Well Limit = (2 - 4 x 2.2) = -18.5 ft.

**Rounded Concrete Pad (to contain benchmark)**

- Thick Concrete Pad (to contain benchmark)
- 4" Thick Concrete Pad (to contain benchmark)

*Please consult with your contractor regarding water surface or whichever is less.*

- 2.2 ft.: msl*

Ground Elevation: _______ ft., msl*

Total Depth: 100 ft.

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

Elevation at top of casing: 22 ft., msl*

For Plastic conforming to

- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrífugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

- Closed Slat Perforations
- Perforated Screen

Please consult with your contractor regarding water surface or whichever is less.*

- 2.2 ft.: msl*

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

For assistance, call the Regulation Branch at 587-0225.

1. APPLICANT

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<tr>
<th>WELL NAME</th>
<th>Category</th>
<th>Plate Parcel</th>
<th>Plat</th>
<th>Plat Sec</th>
<th>Plat No.</th>
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2. WELL & PUMP INFORMATION

<table>
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<tr>
<th>Description</th>
<th>Rating</th>
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<td>Pump Type</td>
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<tr>
<td>Method of Flow Measurement</td>
<td>Flowmeter</td>
<td>Open-pipe</td>
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</tbody>
</table>

3. PROPOSED WORK

- [ ] Construct New Well
- [ ] Modify Existing Well
- [ ] Abandon/Seal

4. CONSTRUCTION

- [ ] Drilled
- [ ] Bore
- [ ] Shaft
- [ ] Tunnel

5. PROPOSED PUMP INFORMATION

- [ ] Municipal (including hotels, stores etc.)
- [ ] Domestic (individual noncommercial water system)

6. PROPOSED USE

- [ ] Domestic
- [ ] Municipal
- [ ] Industrial

7. PROPOSED AMOUNT OF WITHDRAWAL

- [ ] Not Applicable

8. LEGAL REQUIREMENTS

- [ ] CDUP
- [ ] SMAP
- [ ] EIS
- [ ] EA

9. REMARKS, EXPLANATIONS

This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

Signature

For official use only

Latitude
Longitude

Appraiser System No.
State Well No.
PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

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

Ground Elevation: 200 ft., msl

Elevation at top of casing: 23 ft., msl

Cement Grout: 165 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: 60 ft.

Material: Crushed Basalt

Estimated Water Level Elevation: 25 ft., msl

Solid Casing: (a 90% x (Ground Elevation - Water Level Elevated))

Total Length: 170 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft., msl

Open Casing: [Perforated] [Screen]
Total Length: 55 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

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 D1597 (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 C905]
[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]

ABS Plastic conforming to ASTM F480 and ASTM D1597: (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]
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[FEP Fluorocarbon Tubing conforming to ASTM D3296]