Date of report: 3/21/77
Person filing report: L.H. Runnells

A. OWNER: Dept. of Land & Natural Resources
NAME: Volcano Well No. 1
ISLAND: Hawaii

B. GENERAL LOCATION:
Wright Rd.

C. DRILLING COMPANY: Roscoe Moss Company

D. TYPE OF RIG: Cable tool
DRILLING COMPLETED: 3-77
DRILLER: Ken Sanders

E. ELEVATION, msl: Top of drilling platform: 3865 ft
Bench mark and method used to determine height of drilling platform above ground surface: ft
Elevation: ft

F. HOLE SIZE:
- 12 inch dia. to 365 ft. below drilling platform.
- Width of burial: ft.
- Rock Description & Remarks: Grouted

G. CASING INSTALLED:
- 8 in. I.D. x 250 ft. wall solid section to 180 ft. below drilling platform.
- Type of perforation: ft.

H. ANNULUS: Grouted
- Gravel packed: ft. below drilling platform.

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

J. INITIAL WATER LEVEL: 334 ft. below drilling platform. Date of measurement: 2/28/77

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

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Start water level</th>
<th>Rate (gpm)</th>
<th>Drawdown (ft.)</th>
<th>Cl. (ppm)</th>
<th>Temp. F</th>
<th>Depth of well</th>
<th>Rate (gpm)</th>
<th>Drawdown (ft.)</th>
<th>Cl. (ppm)</th>
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<td>Bailed well at 9 gal. per hour</td>
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M. DRILLER'S LOG:

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level, ft.</th>
<th>Depth, ft.</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level, ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 18</td>
<td>Fill top soil</td>
<td>139 to 158</td>
<td>Med. hard rock</td>
<td></td>
<td></td>
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<tr>
<td>18 to 29</td>
<td>Rammel Broken rock</td>
<td>158 to 165</td>
<td>Loose rock</td>
<td></td>
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<tr>
<td>29 to 41</td>
<td>Hard rock</td>
<td>165 to 176</td>
<td>Cinders, ash</td>
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<tr>
<td>41 to 49</td>
<td>Broken rock</td>
<td>176 to 200</td>
<td>Hard rock</td>
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<tr>
<td>49 to 52</td>
<td>Hard rock</td>
<td>200 to 209</td>
<td>Cinders &amp; ash</td>
<td></td>
<td></td>
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<tr>
<td>52 to 78</td>
<td>Broken rock</td>
<td>209 to 216</td>
<td>Black rock</td>
<td></td>
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<tr>
<td>78 to 96</td>
<td>Very hard rock</td>
<td>216 to 302</td>
<td>Ash, cinders, clay</td>
<td></td>
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<tr>
<td>96 to 108</td>
<td>Cinders</td>
<td>302 to 363</td>
<td>Ash, cinders, clay</td>
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<tr>
<td>108 to 124</td>
<td>Med. hard rock</td>
<td>363 to 363</td>
<td>Ash &amp; clay</td>
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<tr>
<td>124 to 130</td>
<td>Cinders &amp; ash</td>
<td>to</td>
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<td>130 to 139</td>
<td>Gray rock hard</td>
<td>to</td>
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</table>

N. REMARKS: Well backfilled

FOR OFFICIAL USE
Latitude: 19° 28' 42.4"
Longitude: 155° 15' 17.2"
Well No. 2815-02

FOR DRILLER'S USE
Job Name: 
Job No.: 

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

### DRILLING LOG

**RUSCOE MOSS COMPANY**

830 AHUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 959-8888 • 933-1444

**Date:** 3/10 1977  **Job No.:** 1-76  **Hole No.:** 2815-02  **Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcano well

**Driller:** Ken Sander  8 Hrs. Rig  
**Helper:** M. D. Hogan  8 Hrs. Gas Oil  
**Helper:**  
**Arr. Job:**  
**Lv. Job:**  
**Hrs.:**  
**Or. No.:**

**Bit-Size:**  
**Type:**

**Casing-Size:** in., Length in hole ft. in., Amt. Perforated ft. in.  
**Depth Start:** ft., Depth Stop ft., Feet Drilled ft.  
**Water Levels, Time M ft., Time M ft.**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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**Measurements**

**Remarks:**

*finished loading 1 Ton hard end took to check for silt in  
  to Honolulu Jack Datson to garage for 2 hours, drilled 4 feet.  
  Cement that was on not to move. We got drilling water from  
  Channeler. Finished job.*

**Signed:** Ken Sander  **Date:** 3/10 1977
Date: 3/9 1977  
Job No.: 1-26  
Hole No.: 2815-02  
Elevation: 3865 ft.  

Customer: [Blank]  
Location: Volcano wells  

Driller: Ken Sanders  
9 Hrs.  
Rig:  

Helper: Mel Hoggan  
9 Hrs.  
Gas:  
Oil:  

Helper: [Blank]  
[Blank] Hrs.  
Repairs:  

Arv. Job: 7:00 AM  
Lv. Job: 4:00 PM  
9 Hrs.  
Or. No.: [Blank]  

Bit-Size: [Blank]  
Type: [Blank]  

Casing-Size: [Blank] in.  
Length in hole: [Blank] ft.  

Depth Start: [Blank] ft.  
Depth Stop: [Blank] ft.  
Feet Drilled: [Blank] ft.  

M [Blank] ft.  

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Measurements: [Blank]  

Remarks: Placed well #1 with 7 bags cement. 41/2 ft. of cement from top. Pilea completed filled w/ 6 bags cement w/ volcanic fanes. Fans filled & grouted (2 bags) with 5 bags cement.  

Signed: Ken Sanders  
Date: 3/9 1977
Date: 3/8/77  
Job No.: 2-76  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer: Location: Volcano Wells

Driller: 9 hrs.  
Rig:  
Helper: 9 hrs.  
Gas:  
Helper:  
Oil:  
Arv. Job: 7:00 AM  
Lv. Job: 4:00 PM  
9 hrs.  
Or. No.:  

Bit-Size:  
Type:  
Depth Start: ft., Depth Stop: ft., Feet Drilled:  
Water Levels, Time: M ft., Time: M ft.,  

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Remarks:  

Signed: Ken Sanders  
Date: 3/8/77
## Drilling Log

**RUSCOE MOSS COMPANY**

**930 AHUA STREET • HONOLULU, HAWAII 96819**
**TELEPHONE (808) 529-2988 • 833-1444**

**Date:** 3/17 1977  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcano Wells

**Driller:** Mez Sanchez  
9 Hrs.  
Rig

**Helper:** Ted Hogan  
9 Hrs.  
Gas

**Helper:**  
Hrs.  
Repairs

**Arv. Job 7:00 AM  
Lv. Job 4:30 PM**  
9 Hrs.  
Or. No.

### Bit-Size

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### Casing-Size

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### Depth Start

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<th>Stop</th>
<th>Feet Drilled</th>
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### Water Levels, Time

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### Measurements

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### Remarks:

- Moving fishing tools set to second location. Just held truck to rig location to load equipment tomorrow morning.

**Signed:** Mez Sanchez  
**Date:** 3/17 1977
Date: 3/14 1977  
Job No.: 1-76  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer:  
Location: Waimea Well

Driller: Ken Jacobs  
Helper:  
Helper:  
Arv. Job  
Job 3:00 pm  

Bit-Size  

Depth Start 36½ ft., Depth Stop ft., Feet Drilled   
Water Levels, Time M ft., Time M ft.

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Measurements

Remarks:  
We met with State man at well site, we waited for contractor till 8:00 pm. We are missing material for plugging well. Must fix well before moving to next job.

Signed: Ken Jacobs  
Date: 3/14 1977
### Drilling Log

**Date:** 3/3 1977  
**Job No.:** 1-26  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcano Well

**Driller:** Ken Saunders  
**Helper:** Med Hogan  
**Arv. Job:** 7:00 AM  
**Lav. Job:** 3:00 PM  
**Hrs.:** 8

**Rig:**  
**Gas:**  
**Oil:**  
**Repairs:**

**Bit-Size:**  
**Type:**  
**Casing-Size:** in.  
**Length in hole:** ft.  
**In., Amt. Perforated:** ft. in.

**Depth Start:** 365 ft.  
**Depth Stop:** ft.  
**Feet Drilled:**

**Water Levels, Time:** M ft.  
**Time:** M ft.

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**Measurements**

**Remarks:** Finished stockpiling gravel and cleaning well for water wells at well location for owner's inspection and plugging. The trucks will be back at Well Drilling Company to get rig and tools. I had the job done for them to keep truck idle at appointment to get Valve and made before Sat., 3/4.

**Signed:** Ken Saunders  
**Date:** 3/3 1977
Date: 2/28/1977  
Job No.: 1-76  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer:  
Location: Haleiwa Well

Driller: Ken Sanders  
Helper: Mel Hogan

Rig:  
Gas:  
Oil:  
Repairs:  

Arv. Job: 7:00 AM  
Job: 4:00 PM  
9 Hrs.

Bit-Size:  
Type:  

Casing-Size: 8 5/8 in.  
Length in hole: 179 ft.  
Amt. Perforated:  

Depth Start: 365+0 ft.  
Depth Stop:  
Feet Drilled:  

Water Levels, Time:  
M:  
ft. Time:  
M:  
ft.

**Depth** | **Formation** | **Remarks** | **Top**
---|---|---|---

**Measurements**

**Remarks:**
Bailer tied off well, water level at start of tour.  
334 ft. failed 72 gal. water out of hole. Waited 1 hr. then failed 129 gal. water. Waited 3 1/2 hrs. Got 29.5 gal. water. Bailer well very dry. Got from 6 to 7 gal. per hr. Very slow recovery water.

Signed: Ken Sanders  
Date: 2/28/1977
Date 2/25  1977  Job No. 1-76  Hole No. 2815-02  Elevation 3865 ft.

Customer ____________________  Location Kalaau well

Driller Ken Sanders  9 Hrs.  Rig
Helper and Hogan  9 Hrs.  Gas
Helper _______________________  Hrs.  Repairs
Av. Job 7:00 AM  Job 4:00 PM  9 Hrs.  Or. No. ___________

Bit-Size  "8"  Type Paddle

Casing-Size  8  \\
in., Length in hole  12 ft.  in., Amt. Perforated  ft.  in.

Depth Start  3.30 ft., Depth Stop  365 ft., Feet Drilled  35

Water Levels, Time  M  ft., Time  M  ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.30</td>
<td>Basalt Rock</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>3.63</td>
<td>Sand and clay</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>3.67</td>
<td>Sand and clay</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>3.65</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Remarks: 2 ft. water in hole at start of work after setting casing. 15 lb. no increase in water to 365 ft. It will check out okay due to water 178 ft. 85 but will not produce plus above in hole.

Signed Ken Sanders  Date 2/25  1977
<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>305</td>
<td>lava rock</td>
<td></td>
</tr>
<tr>
<td>330</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks: No increase in water. Had 3 ft. water in hole at start of day. Not enough water to drill with have to add water for drilling.

Signed: Ken Sanders  Date: 2/24/1977
Date: 2/18 1977  Job No. 1-76  Hole No.  Elevation ft.  

Customer:  Location: Volcano well

Driller: Ken Hughes  10 Hrs.  Rig:  
Helper: Mel Hogan  10 Hrs.  Gas: Oil:  
Helper:  Hrs.  Repairs:  
Arv. Job 7:00 AM. Lf. Job 5:00 PM.  10 Hrs.  Or. No.  

Bit-Size: 8 in.  Type: Pedestal

Depth Start: 20 ft. Depth Stop: 212 ft. Feet Drilled: 11

Water Levels, Time: M. ft., Time: M. ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>20ft</td>
<td>Limestone, ash and shale</td>
<td>used lots of well slush casing</td>
</tr>
<tr>
<td>109ft</td>
<td>Shale of long rock, some crumbling water</td>
<td>@ Drills 3</td>
</tr>
<tr>
<td>20ft</td>
<td>Basalt, black</td>
<td>m. d. hard</td>
</tr>
<tr>
<td>212ft</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measurements

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 1/2</td>
<td>3 3/4</td>
</tr>
</tbody>
</table>

Remarks: will try to keep pumping water, will likely make, can get loose formation to stand up if it won't run water eyes it too much. Have to set ash and stuff @ 217. Came to help and got the cement that we finished for drilling water (25 bags) at 4 or 5 bags that was rented from him on last week.

Signed: Ken Hughes  Date: 2/18 1977
### Drilling Log

**Date:** 2/17 1977  
**Job No.:** 1-76  
**Hole No.:** 1-76  
**Elevation:** ft.  
**Driller:** Ken Sandus  
**Helper:** Mike Hogan  
**Rig:**  
**Gas:**  
**Oil:**  
**Location:** Kalaupapa Well  
**Arv. Job:** 7:00 AM  
**Lv. Job:** 5:00 PM  
**10 Hrs.**  
**Repairs:**  
**Or. No.:**  
**Bit-Size:**  
**Type:**  
**Casing-Size:**  
**Length in hole:** 129 ft.  
**In.:**  
**Depth Start:** 192 ft.  
**Depth Stop:** 201 ft.  
**Feet Drilled:** 9  
**Water Levels, Time:** M ft.  
**Time:** M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>192</td>
<td>Br. Black and Hard</td>
<td>3 3/8 3 3/8</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>Gray</td>
<td>3 3/8 3 3/8</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Coraline, ash and</td>
<td>3 3/8 3 3/8</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>chunks of lava rock, lost water</td>
<td>3 3/8 3 3/8</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** broke through basalt, lost water, drilling dry, started putting gel in hole to condition it to hold some fluid.  

**Signed:** Ken Sandus  
**Date:** 2/17 1977
**Drilling Log**

**Date:** 2/16 1977  
**Job No.:** 1-96  
**Hole No.:**  
**Elevation:** ft.  
**Location:** Walemanu Pl.  

**Customer:**  
**Driller:** Ken Sanders  
**Helper:** Ted Hogan  

**Rig:**  
**Gas:** Oils  
**Repair:**  

**Arr. Job:** 7:00 AM  
**Lunch Job:** 11:00 AM  
**Time:** 10 Hrs.  
**Or. No.:**  

**Bit Size:**  
**Casing Size:** 3 7/8 in., Length in hole 124 ft.  
**In. Amt. Perforated:** ft. _ in.  
**Depth Start:** 18 ft.  
**Depth Stop:** 192 ft.  
**Feet Drilled:** 8  

**Water Levels, Time:** M ft., Time M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 ft.</td>
<td>Basalt, black and hard</td>
<td>Hard</td>
<td>3 7/8 3 7/8</td>
</tr>
<tr>
<td>192 ft.</td>
<td>Grey in color</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Everything going ok, just hand drilling.

**Signed:** Ken Sanders  
**Date:** 2/16 1977
**DRILLING LOG**

**RUSCOE MOSS COMPANY**

830 AHUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 539-6588 • 833-1444

<table>
<thead>
<tr>
<th>Date</th>
<th>2/15 1977</th>
<th>Job No.</th>
<th>1-26</th>
<th>Hole No.</th>
<th>Elevation</th>
<th>Customer</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Welcome well</td>
</tr>
</tbody>
</table>

| Driller | Ken Sanders | 10 Hrs. | Rig    |          |          |           |
| Helper  | Mel Hogan   | 10 Hrs. | Gas    |          |          |           |
| Helper  |             |         | Oil    |          |          |           |

<table>
<thead>
<tr>
<th>Arv. Job</th>
<th>7:00AM</th>
<th>Lv. Job</th>
<th>5:00AM</th>
<th>10 Hrs.</th>
<th>Or. No.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Bit-Size</th>
<th>8 in.</th>
<th>Type</th>
<th>Paddle</th>
</tr>
</thead>
</table>

|-------------|-------|----------------------|---------|----|----------------|----|

<table>
<thead>
<tr>
<th>Depth Start</th>
<th>17 8 ft.</th>
<th>Depth Stop</th>
<th>18 4 ft.</th>
<th>Feet Drilled</th>
<th>6</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Water Levels, Time</th>
<th>M</th>
<th>ft.</th>
<th>Time</th>
<th>M</th>
<th>ft.</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pike stated good nothing coming around.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signed</th>
<th>Ken Sanders</th>
<th>Date</th>
<th>2/15 1977</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 5/3 8</td>
</tr>
</tbody>
</table>
**DRILLING LOG**

**RUSCOE MOSS COMPANY**

**650 AHAU STREET • HONOLULU, HAWAII 96819**
**TELEPHONE (808) 539-6868 • 535-1444**

---

**Date:** 2/9 1977  
**Job No.:** 1 - 76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Kahana Well

**Driller:** Ken Jacobs  
**Hrs.:** 7  
**Rig:**  
**Helper:** Monty Hogan  
**Hrs.:** 8  
**Gas:**  
**Helper:**  
**Hrs.:** 1  
**Oil:**  
**Arv. Job:** 7:30 AM  
**Lv. Job:** 11:30 AM  
**Repairs:**  
**Or. No.:**

**Bit-Size:** 1 2 in.  
**Type:** P-129

**Casing-Size:** 12 1/2 in.  
**Length in hole:** 55 ft.  
**Amt. Perforated:**  
**Depth Start:** 178 ft.  
**Depth Stop:**  
**Feet Drilled:** 0

**Water Levels, Time:** M ft.  
**Time:** M ft.

**Depth**  
**Formation**  
**Remarks**  
**Top**  

---

**Measurements**

---

**Remarks:**  
*Gravel failing a little more. Fishing socket and rework being sent from Honolulu.*

**Signed:** Ken Sanders  
**Date:** 2/9 1977
<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
</table>

Remarks: Wishing for drilling tools, can get site but no plans catch, hole is too big and too deep to use tools and of hole.

Signed: Ken Sanders  Date: 2/8 1977
**Drilling Log**

**RUSCOE MOSS COMPANY**

850 ANUA STREET, HONOLULU, HAWAII 96819
TELEPHONE (808) 949-8888 • 823-1444

---

**Date:** 2/4/77  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcano well.

<table>
<thead>
<tr>
<th>Driller</th>
<th>9 Hrs.</th>
<th>Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sandlin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Helper        | 9 Hrs. |Gas                | Oil |
|---------------|--------|-------------------|
| Ted Hogan     |        |                   |

| Helper        | Hrs.  | Repairs           | Or. No. |
|---------------|-------|-------------------|
|               |       |                   |

<table>
<thead>
<tr>
<th>Arv. Job</th>
<th>7:00 AM</th>
<th>Lv. Job</th>
<th>4:00 PM</th>
<th>9 Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Bit Size</th>
<th>12</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing Size</th>
<th>12 3/4  in.</th>
<th>Length in hole</th>
<th>55 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Am. Perforated</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Start</th>
<th>178 ft.</th>
<th>Depth Stop</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Feet Drilled</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Levels, Time</th>
<th>M</th>
<th>ft.</th>
<th>Time</th>
<th>M</th>
<th>ft.</th>
</tr>
</thead>
</table>

**Measurements**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
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<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Remarks:**  
Met Farge tools. Dr. Lemy gave tall second farge would be in at 3:30 pm. Last day tools till Monday. Next week truck for inspection.  
Tool falling to make it all right.  
Charged oil and filter to big. Old and old parts.  
Dr. Lemy will meet farge first this Monday noon. Small farge a little normal.

**Signed:** Ken Sandlin  
**Date:** 2/4/77
**Date:** 2/3/77  
**Job No.:** 1-26  
**Hole No.:** 291402  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Kalseco well

**Driller:** Ken Grandstaff  
**Helper:** Mark Hogan  
**Aux.**

**Rig:**  
**Gas:** Oil

**Arv. Job:** 7:00 AM.  
**Lv. Job:** 3:00 PM

**Hrs.:** 8

**Bit-Size:** 12 in.  
**Casing-Size:** 12 1/4 in.  
**Length in hole:** 65 ft.  
**Depth Start:** 172 ft.  
**Depth Stop:** 0 ft.  
**Feet Drilled:** 0

**Water Levels, Time:** M 44 ft., Time: M 44 ft.

**Notes:**

**Remarks:** Tossed on tools for a while, moved him casing from Hans location to mine. waiting for pumps for a haul or barge.

**Signed:** Ken Grandstaff  
**Date:** 2/3/77
Date 2/2 1977  Job No. 1-76  Hole No. 281502  Elevation 3865 ft.

Customer Location  Volcano well

Driller  Ken Sandus  10 Hrs.  Rig
Helper  McD Hogan  10 Hrs.  Gas
Helper  8 Hrs.  Oil

Bit-Size 12  Type Star
Depth Start  ft., Depth Stop  ft., Feet Drilled
Water Levels, Time M ft., Time M ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>176</td>
<td>Basalt</td>
<td>Hard</td>
</tr>
<tr>
<td>177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>178</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>2</td>
</tr>
<tr>
<td>1/2</td>
<td>2</td>
</tr>
<tr>
<td>1/2</td>
<td>2</td>
</tr>
</tbody>
</table>

Remarks: Hole started coming some small stones didn't bother too bad went ahead drilling. Large stones came in between the bit kept working took 3 hrs. Drilled from 175 ft. to 165 ft. crew up at the point started to the core out. At 165 ft. jered up to 160 ft. crews went back down. Very hard boring for.

Signed  Ken Sandus  Date 2/2 1977
Date: 2/17/77  
Job No.: 1-76  
Hole No.: 281502  
Elevation: 386.5 ft.

Customer:  
Location: Valley Well

Driller: Jim Sanders  
10 Hrs.  
Rig:  
Gas: Oil

Helper: Ed Hogan  
10 Hrs.  
Hrs. Repairs:  

Arv. Job: 7:00 AM  
Lv. Job: 5:00 PM  
10 Hrs.  
Or. No.:  

Bit-Size: 12"  
Type:  

Casing-Size: 12 1/2" in.  
Length in hole: 65 ft.  
Amt. Perforated:  

Depth Start: 16 4/8 ft.  
Depth Stop: 17 6 ft.  
Feet Drilled: 12

Water Levels:  
Time: M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 4/8</td>
<td>Basalt</td>
<td>Hard</td>
</tr>
<tr>
<td>16 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 7/8</td>
<td>Confin o sandstone</td>
<td>Pretty loose but standing up well</td>
</tr>
<tr>
<td>16 8 1/8</td>
<td>Clay</td>
<td></td>
</tr>
<tr>
<td>16 9/16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 15/16</td>
<td></td>
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</tr>
</tbody>
</table>

Remarks:  
Drilling mud to keep hole in condition need to get to 17 ft if I can figure out how to use 281502.
That is where the ash and guff starts.

Signed: Jim Sanders  
Date: 2/17/77
<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Remarks: Hole filled in from 144 to 178 ft. filled in with large rock, sand, and stones of all kinds. Carried job as clean out hole. Put pipe down and cased 178 ft. of 8 in. cas. with shot in well.

Signed: Ken Sanchez  Date: 2/14 1977
**Drilling Log**

**RUSCOE MOSS COMPANY**

830 AMUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 523-6969 • 533-1444

---

**Date:** 2/12 1977  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Waipahu

---

**Driller:** Ken Sanders  3 Hrs.  
**Rig:**  
**Helper:** Mel Hagan  3 Hrs.  
**Gas:**  
**Helper:**  
**Oil:**  
**Repairs:**  
**Arv. Job 7:00 AM, Lv. Job 10:00 AM, 3 Hrs.**  
**Or. No.:**

---

**Bit-Size:** 8 in.  
**Type:** Reg. Paddle  
**Casing-Size:** 8 1/8 in.  
**Length in hole:** 150 ft.  
**Amt. Perforated:** ft. In.

---

**Depth Start:** 178 ft.  
**Depth Stop:**  
**Feet Drilled:**

---

**Water Levels, Time:** M  
**ft., Time:** M  
**ft.**

---

**Depth** | **Formation** | **Remarks** | **Top**
--- | --- | --- | ---

---

**Remarks:** went out to finish running casing (3 joints) (60 ft.)  
These 60 ft. casing. Than 30 ft. Pipe started. Hole  
Friggered or filled in 30 ft. shut down till Monday  
will clean out and carry pipe as 3 ft.

---

**Signed:** Ken Sanders  
**Date:** 2/12 1977
Date 2/11 1977 Job No. 1-26 Hole No. 2815-02 Elevation 3865 ft.
Customer ____________________ Location Volcano well

Driller Ken Sandhia 10 Hrs. Rig ____________________
Helper Ned Hogan 10 Hrs. Gas. ____________________
Helper ____________________ Hrs. Oil ____________________
Arv. Job 7:00 AM Lv. Job 5:00 PM 10 Hrs. Repairs ____________________
Or. No. ____________________

Bit-Size ____________________ Type ____________________
Casing-Size ___________ in., Length in hole ___________ ft. ___________ in., Amt. Perforated ___________ ft. ___________ in.
Depth Start ___________ ft., Depth Stop ___________ ft., Feet Drilled ___________ ft.
Water Levels, Time ___________ M ___________ ft., Time ___________ M ___________ ft. Measurements

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
</table>

Remarks: ground 12 in tools 6 in tools and 12 in pipe to old location again 8 in pipe in place to run in well rig 800 ft west to drill 8 in hole to bottom of hole 120 ft (6 joints) 8 in casing, Fraser to go Pile Sung at 200 ft.

Signed Ken Sandhia Date 2/11 1977
DRILLING LOG

Date: 2/10 1977  Job No. 1-76  Hole No. 2815-02  Elevation 3865 ft.

Customer: ___________________  Location: Valana well

Driller: Ken Sanders  10 Hrs.  Rig: ______________
Helper: Mike Hogan  10 Hrs.  Gas: ______________

Arv. Job 7:00 AM  Lv. Job 5:00 PM  10 Hrs.  Or. No. ______________

Helper: ___________________  Hrs.  Repairs: ______________

Driller: ___________________  Hrs.  ______________

Bit-Size: ______________  Type: ______________

Casing-Size: ______________ in., Length in hole ______________ ft. ______________ in., Amt. Perforated ______________ ft. ______________ in.

Depth Start: 198 ft., Depth Stop: ______________ ft., Feet Drilled: 0

Water Levels, Time: ______________ ft., Time: ______________ ft.

Measurements

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
</table>

Depth: ______________ ft., Time: ______________ ft., ______________ ft.

Remarks: Picked up fishing tools from air line. Put on long socket. Picked up fish, first gum, and drilling tools out of hole went for food. Picked up tools from pole truck to move out, drilling tools, etc. from down tools.

Signed: Ken Sanders  Date: 2/10 1977
Date: 1/31 1977  
Job No.: 1-74  
Hole No.: 281502  
Elevation: 3466 ft.

Customer:  
Location: Volcano Well

Driller:  Ken Sanders  
10 Hrs.  
Rig:  
Helper:  Mike Hogan  
10 Hrs.  
Gas:  
Helper:  
Rig Repairs:  
Arv. Job:  7:00 AM  
Lv. Job:  5:00 PM  
40 Hrs.  
Or. No.:  

Bit-Size:  12 in.  
Type:  Staircase

Casing-Size:  12 1/2 in.  
Length in hole:  55 ft.  
Amt. Perforated:  15 ft.  

Depth Start:  161 ft.  
Depth Stop:  164 ft.  
Feet Drilled:  3

Water Levels, Time:  M  
ft., Time:  M  
ft.

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>161-164</td>
<td>Basalt</td>
<td>Hard</td>
</tr>
</tbody>
</table>

Remarks:  No down time. Just had to small and gravel stuffing.

Signed:  Ken Sanders  
Date:  1/31 1977
**DRILLING LOG**

Date: 11/28 1977  
Job No.: 1-76  
Hole No.: 291502  
Elevation: 3865 ft.

Customer: Ken Sandels  
Location: Koko Head

Driller: Ken Sandels  
Rig:  

Helper: N.D. Hogan  
Gas:  

Arv. Job: 7:00 AM  
Job 5:30 PM  
10 Hrs.

Bit Size: 12"  
Type: Star

Casing Size: 12 3/4" in.  
Length in hole: 55 ft.  
Amt. Perforated:  

Depth Start: 149 ft.  
Depth Stop: 161 ft.  
Feet Drilled: 12

Water Levels:  
Time M ft.; Time M ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td>Lava Rock</td>
<td>Not too hard</td>
<td>A B</td>
</tr>
<tr>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>158</td>
<td>Gravel Size</td>
<td>Very loose, instable</td>
<td></td>
</tr>
<tr>
<td>161</td>
<td>Lava Rock</td>
<td>Drilling dry</td>
<td></td>
</tr>
</tbody>
</table>

Signed: Ken Sandels  
Date: 11/28 1977
**Date**: 11/27/1977  
**Job No.**: 1-76  
**Hole No.**: 2515-02  
**Elevation**: 365 ft.

**Customer**:  
**Location**: Valcano well

**Driller**: Ken Sanchez  
**Helper**:  
**Helper**:  
**Arv. Job**: 7:00 AM  
**Lv. Job**: 5:00 PM  
**Or. No.**:  
**10 Hrs.**

**Bit-Size**: 12  
**Casing-Size**: 12  
**Depth Start**: 137 ft.  
**Depth Stop**: 147 ft.  
**Feet Drilled**: 12

**Water Levels, Time**: M ft. - M ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>137</td>
<td>Dry gravel</td>
<td>Hard</td>
<td>16 4</td>
</tr>
<tr>
<td>139</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>Lava Rock</td>
<td>Not too hard</td>
<td>16 3</td>
</tr>
</tbody>
</table>

**Remarks:**

**Signed**: Ken Sanchez  
**Date**: 11/27/1977
**Drilling Log**

830 Ahua Street • Honolulu, Hawaii 96819
Telephone (808) 839-6888 • 833-1444

<table>
<thead>
<tr>
<th>Date</th>
<th>11/26/77</th>
<th>Job No.</th>
<th>1-26</th>
<th>Hole No.</th>
<th>2816-02</th>
<th>Elevation</th>
<th>3865 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td></td>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td>Valcanwel</td>
<td></td>
</tr>
</tbody>
</table>

**Driller**
Name: Ken Sandhu
Hours: 10 Hrs.

**Helper**
Name: Ted Hogan
Hours: 10 Hrs.

**Arv. Job** 7:00 AM, Lvs. Job 5:00 PM, 10 Hrs.

**Bit-Size** 12 in.
**Type** Tia

**Casing-Size** 12 1/2 in., Length in hole 55 ft., Amt. Perforated 4 ft., in.

**Depth Start** 130 ft., Depth Stop 137 ft., Feet Drilled 7

**Water Levels**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>Gravel</td>
<td>Hard</td>
<td></td>
</tr>
<tr>
<td>137</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**: First hole socket

**Signed**: Ken Sandhu  Date: 11/26/77
### Drilling Log

**Company:** RUSCOE MOSS COMPANY

**Address:** 830 AHUA STREET • HONOLULU, HAWAII 96819

**Telephone:** (808) 839-6688 • 833-1444

---

**Date** 11.25.77  
**Job No.** F-76  
**Hole No.** 2415-02  
**Elevation** 2566 ft.

**Location:** [Valcon wall]

<table>
<thead>
<tr>
<th><strong>Driller</strong></th>
<th><strong>10 Hrs.</strong></th>
<th><strong>Rig</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sanders</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Helper</strong></th>
<th><strong>10 Hrs.</strong></th>
<th><strong>Gas</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Matt Hogan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Arv. Job 7:00 AM, Job 5:00 PM**  
**10 Hrs.**

**Bit-Size** 12 in.  
**Type** Ill.

**Casing-Size** 12 3/4 in., Length in hole 55 ft. in., Amt. Perforated 0 ft. in.

**Depth Start** 120 ft., Depth Stop 130 ft., Feet Drilled 10

**Water Levels, Time** M ft., Time M ft.

**Remarks:**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>Porous sand rock</td>
<td>Drilling dry.</td>
</tr>
<tr>
<td>124</td>
<td>Cinders &amp; Ash</td>
<td>Very loose</td>
</tr>
<tr>
<td>130</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measurement:**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

**Remarks:**

---

**Signed:** Ken Sanders  
**Date:** 11.25.77
Date: 1/24/77  
Job No: 1-76  
Hole No: 2815-09  
Elevation: 3865 ft.

Customer:  
Location: Volcano Well  

Driller: Ken Sanders  
10 Hrs.  
Rig:  

Helper: Jim Hogan  
10 Hrs.  
Gas:  

Helper:  
Hrs.:  
Repairs:  

Arv. Job 7:00AM, Lv. Job 5:00PM  
10 Hrs.  
Or. No.:  

Bit-Size: 1  
Type:  
Star:  

Casing-Size: 12  
in., Length in hole: 55  
ft. in., Amt. Perforated: ft. in.  

Depth Start: 119 ft., Depth Stop: 130 ft., Feet Drilled: 1  

Water Levels, Time: M ft., Time: M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>Porous Basalt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measurements

- A
- B

7/FEBRA PN: 25

RECEIVED

Remarks:
FULL 12 1/2 Surface Casing Built out bit with 8" hole, 3 1/2" casing. Bit went off. Pushed rock back into well. Hole in bed makeup, blowout forces rock stops in place. Put pipe toer in well starting drilling today.

Signed: Ken Sanders  
Date: 1/24/77
**Date**: 1/31/77  
**Job No.**: 1-76  
**Hole No.**: 2815-02  
**Elevation**: 3865 ft.

**Customer**:  
**Location**: Waianae well

<table>
<thead>
<tr>
<th>Driller</th>
<th>Ken Sanders</th>
<th>10 Hrs.</th>
<th>Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helper</td>
<td>John Hillary</td>
<td>10 Hrs.</td>
<td>Gas</td>
</tr>
<tr>
<td>Helper</td>
<td></td>
<td></td>
<td>Oil</td>
</tr>
<tr>
<td>Arv. Job</td>
<td>7:00 AM Lw. Job 5:00 PM</td>
<td>10 Hrs.</td>
<td>Repairs</td>
</tr>
</tbody>
</table>

| Bit-Size | 12 in. | Type |  
| Casing-Size | 12 1/4 in., Length in hole 55 in., Amt. Perforated |  
| Depth Start | 1/3 ft., Depth Stop 119 ft., Feet Drilled |  

**Water Levels, Time**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>Porous Frac Rock Drilling dry</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>119</td>
<td></td>
<td></td>
<td>34</td>
</tr>
</tbody>
</table>

**Remarks**: Lower rock still working around at 816 it may have to work in that shot with large one bit to get it out in style, it starts causing too much trouble or if think it is going to cause a major problem.

**Signed**: Ken Sanders  
**Date**: 1/31/77
Date: 11/20/77  Job No. 1-76  Hole No. 2815-02  Elevation: 3865 ft.

Customer: __________________________ Location: [Valence] well

Driller: [Name] 10 Hrs.  Rig: ________________
Helper: [Name] 10 Hrs.  Gas: ________________
Helper: [Name] ______ Hrs.  Oil: ________________
Arv. Job: 7:00 a.m.  Lv. Job 5:00 p.m.  10 Hrs.  Repairs: ________________

Bit-Size:  1 2 in.  Type: [Star]

Water Levels, Time: ______ ft., Time: ______ ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>10</td>
<td>Cleared stope and cleaned</td>
<td>5/2</td>
</tr>
<tr>
<td>113</td>
<td>12</td>
<td>99 to 108 ft. drilling hard rock</td>
<td>5/2</td>
</tr>
</tbody>
</table>

Water levels, time and Remarks:

Remarks: [Handwritten notes]

Signed: [Name]  Date: 11/20/77
Date: 11/19 1976  
Job No.: 1-26  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer:  
Location:  

Driller: Ken Sandlie  
10 Hrs.  
Rig:  

Helper: Milt Hopkins  
10 Hrs.  
Gas:  

Or. No.:  

Arv. Job: 7:00 AM, Job: 5:00 PM  
10 Hrs.  
Oil:  

Repairs:  

Depth: 98 ft., Depth Stop: 108 ft., Feet Drilled: 10

Water Levels, Time:  

Bit-Size: 12 in.  
Type:  


Formation:  
Remarks:  

Top: 5 ft.  
A  B

98 ft.  
Cinders  

5 ft.  

99 ft.  
Cinders, stones, and  

5 3

108 ft.  
left  

5 3

Remarks:  
Having to drill and redrill section 99 to 108 ft.  

to get rid of stones and Cinders. Made up of hanging  
tools, stones are small and not hard. More like Cinders,  

Getting it cleaned out.

Signed: Ken Sandlie  
Date: 11/19 1976
**DRILLING LOG**

830 ANUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 833-5588 • 833-1444

Date: 11/18 1977  \( \text{Job No.} 1-76 \)  \( \text{Hole No.} 281502 \)  \( \text{Elevation} 3865 \) ft.

Customer:  
Location: **Welcome Well**

**Driller**  
Ken Sandlin  
10 Hrs.  
Rig:  

**Helper**  
Mel Hogan  
10 Hrs.  
Gas:  
Oil:  

**Helper**  
Hrs.  
Repairs:  

**Arv. Job** 7:00 AM  
**Lv. Job** 5:00  
10 Hrs.  
Or. No.:  

**Bit-Size** 12 in  
**Type**  
**Depth** 93 ft., **Depth Stop** 98 ft., **Feet Drilled** 5

**Casing-Size** 12 1/2 in., **Length in hole** 35 ft.  
**in., Amt. Perforated**  

**Depth Start** 93 ft., **Depth Stop** 98 ft., **Feet Drilled** 5

**Water Levels, Time**  
**M** ft., **Time**  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>93 / 96</td>
<td>Dry Basalt</td>
<td>Hard</td>
<td></td>
</tr>
<tr>
<td>96 / 98</td>
<td>Cinder</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Complete water loss @ 96 f.t.

Signed: Ken Sandlin  
**Date** 11/18 1977
Date: 11/17/77  Job No. 1-76  Hole No. 2815-02  Elevation: 3865 ft.
Customer: __________________________  Location: Valcano hill

Driller: Ken Sanders  10 Hrs.  Rig: __________
Helper: Nick Hogan  16 Hrs.  Gas: __________
Helper: __________  Hrs.  Oil: __________
Arv. Job: 7:00 AM  Job: 500 ft  10 Hrs.  Repairs: __________

Or. No.: __________________________

Bit-Size: 1-2 in  Type: Star
Depth Start: 90 ft.  Depth Stop: 93 ft.  Feet Drilled: 3
Water Levels, Time: __________ ft., Time: __________ ft.

Depth | Formation | Remarks | Top
--- | --- | --- | ---
90 | Dry Basalt | Hard | 38
93 | | | 3

Measurements

Signed: Ken Sanders  Date: 11/17/77
### DRILLING LOG

**Customer:**

**Location:** Volcano well

**Date:** 11/14 1976  
**Job No:** 1-76  
**Hole No:** 2815-02  
**Elevation:** 3865 ft.

<table>
<thead>
<tr>
<th>Drillers</th>
<th>Job</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sanders</td>
<td>10 Hrs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helper</td>
<td>10 Hrs.</td>
<td></td>
</tr>
<tr>
<td>Mad Regan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Arv. Job:** 7:00 AM  
**Rev. Job:** 5:00 PM  
**10 Hrs.**

**Rig:**

**Gas:**

**Oil:**

**Repairs:**

**Bit-Size:** 12" in.

**Type:** Slab

**Casing-Size:** 12 1/2" OD in., Length in hole 55 ft.

**In., Amt. Perforated:**

**Depth Start:** 88 ft.  
**Depth Stop:** 90 ft.  
**Feet Drilled:** 2

**Water Levels, Time:**

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

**Formation:**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>64</td>
</tr>
<tr>
<td>90</td>
<td>55</td>
</tr>
</tbody>
</table>

**Remarks:**

- Rig requires 2 days. Took 3 guys off rig to get to machine shop and replaced it. Replaced guid.  

**Signed:** Ken Sanders  
**Date:** 11/14 1976
# DRILLING LOG

**Customer:** [Redacted]  
**Location:** Volcano well

---

**Date:** 11/13/1976  
**Job No.:** 1-26  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

---

**Driller:**  
**10 Hrs.**  
**Helper:**  
**10 Hrs.**  
**Arv. Job:** 7:00 AM  
**Lv. Job:** 5:00 PM  
**Or. No.:**

---

**Bit-Size:** 18 in.  
**Type:**  
**Casing-Size:** 12 1/2 in., Length in hole 55 ft.  
**Depth Start:** 87 ft., Depth Stop:** 88 ft.,  
**Feet Drilled:** 1  
**Water Levels, Time:** M. ft., **Time:** M. ft.

---

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>87</td>
<td>Light Gray Basalt</td>
<td>Drilling, hole came back</td>
<td>88</td>
</tr>
<tr>
<td>88</td>
<td>Light Gray Basalt</td>
<td>Hard formation</td>
<td>85</td>
</tr>
</tbody>
</table>

---

**Remarks:** Hole pretty good shake considering the shale it was in.

---

**Signed:** Ken Sanders  
**Date:** 11/13/1976
**Drilling Log**

**Ruscoe Moss Company**

650 Amph Street - Honolulu, Hawaii 96819
Telephone (808) 526-6866 - 523-1444

<table>
<thead>
<tr>
<th>Date</th>
<th>11/12 1976</th>
<th>Job No.</th>
<th>1-76</th>
<th>Hole No.</th>
<th>2815-02</th>
<th>Elevation</th>
<th>3865 ft.</th>
</tr>
</thead>
</table>

**Customer**

**Location:** Valcano well

**Driller:** Ken Sandusky 10 Hrs.
**Helper:** Mike Hogan 10 Hrs.
**Helper:**

<table>
<thead>
<tr>
<th>Arv. Job</th>
<th>7:00 AM</th>
<th>Lv. Job</th>
<th>5:00</th>
<th>10 Hrs.</th>
<th>Or. No.</th>
</tr>
</thead>
</table>

**Bit-Size:** 12 in.  Type: S10s.
**Casing-Size:** 12\(\frac{1}{2}\) in., Length in hole 65 ft. in., Amt. Perforated 1 ft. in.
**Depth Start:** 87 ft., Depth Stop 
**Feet Drilled:** 0

**Water Levels, Time**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>Bug Basalt</td>
<td>Hole don't want to come back very good material</td>
<td>23</td>
</tr>
<tr>
<td>87</td>
<td></td>
<td>proceed</td>
<td>13</td>
</tr>
</tbody>
</table>

**Remarks:**

But in lots of scrap iron, hope taking a lot of it but seem to be getting same to hold.

**Signed:** Ken Sandusky  Date: 11/12 1976
Date: 11/11/76

Job No.: 1-76

Hole No.: 2815-02

Elevation: 3865 ft.

Customer: Valve well

Location:

Driller: Ken Johnson

10 Hrs.

Rig:

Helper: Mike Hogan

10 Hrs.

Gas: Oil

Helper: 

Hrs.

Repairs:

Arr. Job: 7:00 AM

Ltv. Job: 5:00

10 Hrs.

Or. No.: 

Bit-Size: 12 in.

Type: Stan.

Casing-Size: 12½0 in.

Length in hole: 55 ft.

In., Am. Perforated: 

Depth Start: 87 ft.

Depth Stop: 87 ft.

Feet Drilled: 0

Water Levels, Time: 

M ft., Time: 

M ft.

Depth

Formation

Remarks

Top

A

B

84

Grey Basalt (Dark)

Hitting hole from 84 to 87 ft.

with strong rambler in

hole starting to cave in hole 23' 13'

87


Remarks:

Came into Hilo to get starter for water truck

fuel, drill rig nut

Signed: Ken Johnson

Date: 11/11/76
# Drilling Log

**Date:** 1/10/1976  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Waihoi well

**Driller:** Ken Sanders  
**10 Hrs.**

**Helper:** Mel Hogan  
**10 Hrs.**

**Arr. Job:** 7:00 AM  
**Job:** 5:00 PM  
**10 Hrs.**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>83</td>
<td>Light Gray Basalt</td>
<td>Drilling tool went off or far to the south west north side of the hole</td>
</tr>
<tr>
<td>84</td>
<td>Fracture</td>
<td>tools the other up against the sides wall started filling up cavity and</td>
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<tr>
<td>87</td>
<td></td>
<td>reming</td>
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</tbody>
</table>

**Water Levels, Time:** M ft., Time M ft.  

**Bit-Size:** 12 in.  
**Type:** Star

**Casing-Size:** 12 1/4 in., Length in hole 65 ft.  
**In., Amt. Perforated:** 23 ft. In.

**Depth Start:** 83 ft., Depth Stop 87 ft., Feet Drilled 4

**Signed:** Ken Sanders  
**Date:** 1/10/1976
Date: 11-7-1977  Job No.: 1-76  Hole No.: 2815-02  Elevation: 3865 ft.
Customer:  
Location: Volcano Well

Driller: Ken Sanders  10 Hrs.  Rig:  
Helper: Mel Hogan  10 Hrs.  Gas:  
Helper:  1.5 Hrs.  Oil:  
Arv. Job: 7:00 AM  Lw. Job: 5:00 PM  10 Hrs.  Or. No.:  

Bit-Size: 12  Type: Star  
Depth Start: 81 ft.  Depth Stop: 83 ft.  Feet Drilled: 2  
Water Levels, Time: M. ft., Time: M. ft.  

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<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>81</td>
<td>Basalt, grey with Hard 10 ft.  Getting more Red material but last run, not good at all through this hard spot.</td>
<td></td>
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<tr>
<td>83</td>
<td>Red P.O.</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Hole still improving. Drilling and welding liable

Signed: Ken Sanders  Date: 11-7-1977
Date: 12/31 1976  Job No. 1276  Hole No. 2815-02  Elevation: 3865 ft.
Customer: ___________________  Location: Volcano well

Driller: Ken Sandies  10 Hrs.  Rig: 
Helper: John Hogan  10 Hrs.  Gas: 
Helper: ___________________  Hrs.  Oil: 
Arv. Job 7:00 AM  Lv. Job 5:00 PM  10 Hrs.  Repairs: 
Or. No.: ___________________

Bit-Size: 12  Type: 
Casing-Size: 12 1/2 in.  Length in hole: 5.5 ft.  in., Amt. Perforated: __________ ft. __________ in.
Depth Start: __________ ft., Depth Stop: __________ ft., Feet Drilled: 
Water Levels, Time: __________________ M ft., Time: __________________ M ft.

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>6 4/7</td>
<td>6 7</td>
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<tr>
<td>6 7/5</td>
<td></td>
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<tr>
<td>7 5/7</td>
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</tbody>
</table>

Measurements

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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</thead>
<tbody>
<tr>
<td>0°</td>
<td>0°</td>
</tr>
<tr>
<td>8°</td>
<td>1 1/4</td>
</tr>
</tbody>
</table>

Remarks: Not enough stuff in hole to hold drill tools.
Reaming hole: Having to drill daily can't keep any water
in hole.

Signed: Ken Sandies  Date: 12/31 1976
Date: 12/30 1976  Job No. _______  Hole No. 2245-02  Elevation 3865' ft.

Customer: __________________________ Location: Volcano Well

Driller: Ken Sanders  10 Hrs.  Rig: __________________________
Helper: Neil Hogan  10 Hrs.  Gas: Oil
Helper: __________________________  Hrs.  Repairs: __________________________

Arv. Job: 7:00 AM  Lv. Job: 5:00  10 Hrs.  Or. No. __________________________

Bit-Size: 12 in.  Type: Drill
Depth Start: 7.6 ft.  Depth Stop: 0 ft.  Feet Drilled: 0

Water Levels, Time: M ft., Time: M ft.

<table>
<thead>
<tr>
<th>Depth Start</th>
<th>Formation</th>
<th>Remarks</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.6</td>
<td></td>
<td>Stilling a Dreaming Hole</td>
<td>5/2</td>
</tr>
</tbody>
</table>

Measurements:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Remarks: Still handling tools & iron to fill fractures. Hole not taking as much cut before coming back into line slowly. Can't roof any wets in hole drilling day.

Signed: Ken Sanders  Date: 12/30 1976
Date 12/29 1976 Job No. J-26 Hole No. 2815-02 Elevation 3865 ft.
Customer ______________________ Location Waimea well

Driller Ken Sanders 10 Hrs. Rig
Helper Ted Hogan 10 Hrs. Gas
Helper ______________________ Hrs. Oil
Arv. Job 7:00 AM Lv. Job 5:00 PM 10 Hrs. Repairs

Bit-Size 1.2 in. Type Star
Casing-Size 2 1/2 in. Length in hole 55 ft. in. Amt. Perforated ft. in.
Depth Start 76 ft., Depth Stop 0 ft., Feet Drilled 0
Water Levels, Time M ft., Time M ft., Time M ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td></td>
<td>Reaming hole 64' to 76' 37 25</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Still putting rocks and scrap iron in hole. Rock and sand being pushed out into fracture. Well is reaming well .
John was to reed putting rock and iron in hole till it can get through in the fracture to hold tools to ream. Drilling dry.

Signed Ken Sanders Date 12/29 1976
### Drilling Log

**Date:** 12/28/1976  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:**  

**Driller:** Ken Sandles  
**10 Hrs.**  

**Helper:** M. D. Hogan  
**10 Hrs.**  

**Arv. Job:** 7:00 AM  
**Lv. Job:** 5:00 PM  
**10 Hrs.**

---

**Bit-Size:** 12  
**Type:** Star

**Casing-Size:** 12 1/2 in.  
**Length in hole:** 55 ft.  
**Amt. Perforated:** 15 ft.

**Depth Start:** 121 ft.  
**Depth Stop:** 76 ft.  
**Feet Drilled:** 15

**Water Levels, Time:**  
**M ft., Time:**  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
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</thead>
<tbody>
<tr>
<td>64</td>
<td>Hard Black Lava</td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Fracture</td>
<td>Very large fracture, drilling 14&quot; 4&quot;</td>
<td></td>
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</tbody>
</table>

**Remarks:** Drilling tools are catching about 4" of the hole on one side. Started hanging cooks and cementing to fill fracture so I can start hole.

**Signed:** Ken Sandles  
**Date:** 12/28/1976
**DRILLING LOG**

**RUSCOE MOSS COMPANY**

630 AHUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 935-6888 • 833-1444

<table>
<thead>
<tr>
<th>Date</th>
<th>12/27 1976</th>
<th>Job No.</th>
<th>1-76</th>
<th>Hole No.</th>
<th>2815-02</th>
<th>Elevation</th>
<th>3865 ft.</th>
</tr>
</thead>
</table>

**Customer**

**Location**

**Driller**

Ken Sanders

10 Hrs.

**Helper**

Med Hogan

10 Hrs.

**Rig**

**Gas**

**Oil**

**Repairs**

**Arv. Job**

7:00 AM

**LV. Job**

5:00 PM

10 Hrs.

**Bit-Size**

12 in.

**Type**

Nor.

**Casing-Size**

12 1/2 in.

**Length in hole**

55 ft.

**In., Amt. Perforated**

**Depth Start**

61 ft.

**Depth Stop**

**Feet Drilled**

0

**Water Levels, Time**

M 

**Depth**

**Formation**

**Remarks**

**Top**

A

B

**Measurements**

**Remarks:**

Had to reset rig, rig settled to one side, bent hole. Socket went for Boyd water and cleaned out hole to 61 ft. and put pile down to 55 ft.

**Signed**

Ken Sanders

Date 12/27 1976
**DRILLING LOG**

**Date:** 12/17/1976  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcano well

**Driller:** Ken Sanders  
**Hrs.:** 3  
**Rig:**  
**Gas:**  
**Oil:**

**Helper:**  
**Hrs.:** 3  
**Repairs:**

**Arv. Job:** 7:00 AM  
**Lr. Job:** 10:00 AM  
**Hrs.:** 3  
**Or. No.:**

**Bit-Size:** 12  
**Type:** Stan

**Casing-Size:** 12  
**in., Length in hole:** 40 ft.  
**In., Amt. Perforated:** ft.  
**in.**

**Depth Start:** 61 ft.  
**Depth Stop:** ft.  
**Feet Drilled:** 0

**Water Levels, Time:** M ft., Time M ft.  

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<th>Depth</th>
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<td>61</td>
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</table>

**Measurements**

**Signed:** Ken Sanders  
**Date:** 12/17/1976

**Remarks:** Went out to rig unloading water tank and brought motor head to 4 ft. yard. Secured tool boxes, tarped small tool box in well truck.
Date: 12/16 1976  Job No.: 1 - 26  Hole No.: 281502  Elevation: 3865 ft.

Customer:  

Location: Kilauea well

Driller: Ken Sanders  Hrs.: 9  Rig:  

Helper: Mel Hogan  Hrs.: 9  Gas:  Oil:  

Arv. Job: 7:00 AM  Lv. Job: 4:00 PM  Hrs.: 9  Repairs:  

Bit-Size: 12 in. Type: Star

Casing-Size: 12 3/8 in., Length in hole: 600 ft.  Amt. Perforated:  

Depth Start: 61 ft.  Depth Stop:  

Feet Drilled:  

Water Levels, Time: M ft., Time: M ft.

Measurements:

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Remarks: Set by loose holder, got tool out of hole @ 12:00 noon. Ran 47 fj in casing in hole. Started cleaning out checked at 8:30 to 4:30 ft. Came out to 200 ft. got tool stuck. Mechanic from shop took it to firm to be shifted back to Honolulu.

Signed: Ken Sanders  Date: 12/16 1976
**DRILLING LOG**

**RUSCOE MOSS COMPANY**

830 AHUA STREET • HONOLULU, HAWAII 96819
TELEPHONE (808) 539-8888 • 833-1444

---

**Date:** 12/15/1976  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 380' ft.

**Customer:**  
**Location:** Volcano well

**Driller:** Ken Sanders  
**10 Hrs.**  
**Rig:**  

**Helper:** Ken Hogan  
**10 Hrs.**  
**Gas:**  
**Oil:**

**Helper:**  
**Hrs.**  
**Repairs:**

**Arv. Job:** 7:00AM  
**Lv. Job:** 5:00PM  
**10 Hrs.**  
**Or. No.:**

**Bit-Size:** 12  
**Type:** Star

**Casing-Size:** 12 1/2 in.  
**Length in hole:** 9 ft.  
**In., Amt. Perforated:** 0 ft.  
**In.**

**Depth Start:** 61 ft.  
**Depth Stop:**  
**Feet Drilled:** 0

**Water Levels, Time:** M 1/2 ft.,  
**Time:** M 1/2 ft.  
**Measurments**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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**Remarks:** went by the fire for casing and escalator, upload job done. Had 1/2 in. drill unloading, went to job and drill job done. Finished and back to job site. Drill hand wanted to tell us, got it up to 85' ft.

**Signed:** Ken Sanders  
**Date:** 12/15/1976
Date: 12/14 1976  
Job No.: 1-76  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer:  
Location: Valco Mills

Driller: Ken Saunders  
10 Hrs.  
Rig:  
Gas:  
Oil:  
Helper: M.D. Hogan  
10 Hrs.  
Hrs.:  
Repaired:  
Arr.:  
Lv.:  
Or. No.:  

Bit-Size: 12 in.  
Type:  

Casing-Size: 12 1/2 in.  
Length in hole: 9 ft.  
In., Amt. Perforated: ft.  
in.  
Depth Start: 61 ft.  
Depth Stop: 0 ft.  
Feet Drilled:  

Water Levels, Time: M ft., Time: M ft.

<table>
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<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>65</td>
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Remarks: Drilled out fit with acc. 60 cm hole for 121/2 in. pipe  
Gained to 56 ft. Very large rock came up to 56 ft.  
But did not force tools. Started drill back at 56 ft.  
Made about 10 ft.

Signed: Ken Sanders  
Date: 12/14 1976
Date: 12/13 1976  
Job No.: 1-76  
Hole No.: 2815-07  
Elevation: 2865 ft.

Customer: 
Location: Volcano Rd.

Driller: Ken Sanders  
Hrs.: 11 Hrs.

Helper: Mel Hogan  
Hrs.: 11 Hrs.

Arv. Job: 6:30 Am  
Job End: 5:30 Pm  
Hrs.: 10 Hrs.

Bit-Size: 12

Casing-Size: 12 1/4 in., Length in hole: 9 ft.

Depth Start: 61 ft., Depth Stop: __ ft., Feet Drilled: 0

Water Levels, Time: M ft., Time: M ft.

Measurements

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
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<tr>
<td>61</td>
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</table>

Remarks: Reaming hole for 12 1/4 in. pipe, well is plugged. Came in to help to get someone to go on top of 40 ft. and get back to site. Ken left June 16th to start after work up 10-12 ft. Good luck, one coming from Honolulu.

Signed: Ken Sanders  
Date: 12/13 1976
**Drilling Log**

**830 Auwa Street • Honolulu, Hawaii 96819**

**Telephone (808) 838-6888 • 833-1444**

---

**Date:** 12/10/1976  
**Job No.:** 1-76  
**Hole No.:** 281502  
**Elevation:** 3865 ft.

**Customer:**  
**Location:**  

**Driller:** Ken Kandaw  
**Hrs.:** 11  
**Rig:**  

**Helper:** John Hillery  
**Hrs.:** 11  
**Gas:**  
**Oil:**  

**Helper:**  
**Hrs.:**  
**Repairs:**  

**Arv. Job No.:** 556  
**Schm. Lv. Job 5:**  
**Hrs.:** 11  
**Or. No.:**

**Bit-Size:** 1-27/64 in.  
**Type:** Alum  

**Casing-Size:** 12-3/8 in., Length in hole: 9 ft.  
**in., Am. Perforated:**  

**Depth Start:** 61 ft., Depth Stop: 0 ft., Feet Drilled: 0  

**Water Levels, Time:**  
**M ft., Time:**  
**M ft.**

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<table>
<thead>
<tr>
<th>Measurement</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td></td>
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</tbody>
</table>

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**Remarks:** Client hole went to bottom, started drilling new hole.  
**Note:** Note is taken from service report.  

**Signed:** John Kandaw  
**Date:** 12/10/1976  

---
**Drilling Log**

830 Ahua Street • Honolulu, Hawaii 96819
Telephone (808) 939-6888 • 833-1444

Date: 12/7/1976  
Job No: 1-76  
Hole No: 2815-02  
Elevation: 3845 ft.

Customer: ____________________  
Location: Vailea Well

Driller: Jim Sandin  
10 Hrs.  
Rig: __________

Helper:  
Hrs.  
Gas: __________

Helper:  
Hrs.  
Oil: __________

Arv. Job:  
Job 1.  
500 AP  
Hrs.  
Repairs: __________

Bit-Size: 12 in.  
Type: __________

Casing-Size: 12 1/2 in.  
Length in hole: 7 ft.  
Amt. Perforated: __________ ft. __________ in.

Depth Start: 61 ft.  
Depth Stop: __________ ft.  
Feet Drilled: __________

Water Levels, Time: __________ M __________ ft., __________ M __________ ft.

---

**Depth**  
**Formation**  
**Remarks**

61 ft.  
**Note:** Drilled to 58 ft.

**Measurements**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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</table>

**Remarks:**

Drilled to 54 ft. to 61 ft. Drilled to clean out hole  
Till 2:00 p.m. got back to 58 ft. Bentonite at water.  
2.00 p.m. The soil levels enough plastic pipe for line to line from well to well.  
Came to surface for plastic pipe, fuel, grease, corrections for plastic pipe and  
let John help for tomorrow

**Signed:** Jim Sandin  
Date: 12/7/1976
Date: 2/8 1976  
Job No.: 1-76  
Hole No.: 2815-02  
Elevation: 3865 ft.

Customer:  
Location:  

Driller: Ken Sandzas  
Hrs. Rig:  

Helper: Paul Johnson  
Hrs. Gas: Oil  
Hrs. Repairs:  

Arv. Job 7:00 AM, Job 7:00 PM  
Hrs. Or. No.:  

Bit-Size: 12  
Type: Star  

Casing-Size: 1 1/2 in.  
Length in hole: 9 ft.  
In., Amt. Perforated: 3 ft.  
In.

Depth Start: 59 ft.  
Depth Stop: 61 ft.  
Feet Drilled: 3  

Water Levels, Time M ft., Time M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>Cave Rock</td>
<td>Excellent Very Bad</td>
<td></td>
</tr>
<tr>
<td>61</td>
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</tr>
</tbody>
</table>

Remarks: Hole Burred off 46 ft. The presence with large brown rock. There some rock hanging and in hole from 54 ft to 59 ft one of the rock is the cause of the pinch out at phone reading 3 am sure. But only helper marked feet with stick jack.

Signed: Ken Sandzas  
Date: 2/8 1976
**DRILLING LOG**

**RUSCOE MOSS COMPANY**

850 AMUA STREET • HONOLULU, HAWAII 96819

TELEPHONE (808) 839-8888 • 833-1444

---

**Date:** 12/7/76  
**Job No.:** 1-76  
**Hole No.:** 2815-02  
**Elevation:** 3865 ft.

**Customer:**  
**Location:** Volcan well

<table>
<thead>
<tr>
<th>Driller</th>
<th>10 Hrs.</th>
<th>Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sanders</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Helper</th>
<th>10 Hrs.</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ted Hogan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Helper</th>
<th>10 Hrs.</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Arv. Job:** 7:00 a.m.  
**Job End:** 5:00 p.m.  
**10 Hrs.**  
**Or. No.:**

**Bit-Size:** 12  
**Type:** Slur

**Casing-Size:** 12 in.  
**Length in hole:** 9 ft.  
**in., Amt. Perforated:**  
**ft.**  
**in.**

**Depth Start:** 54 ft.  
**Depth Stop:** 59 ft.  
**Feet Drilled:** 5

**Water Levels, Time:** M ft.  
**Time:** M ft.

---

### Depth, Formation, Remarks, Top

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>Backman Tane</td>
<td>Rock</td>
<td>0°</td>
</tr>
<tr>
<td>59</td>
<td></td>
<td>Gneiss in fractured</td>
<td>0°</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very bad.</td>
<td></td>
</tr>
</tbody>
</table>

---

**Remarks:** Water low completely at 5 1/2 ft. Having to drill and cull drill.  
Some section of hole still having to lift rig very often due in part to heavy rain.

---

**Signed:** Ken Sanders  
**Date:** 12/7/76  
**1976**
Date 12/6/1976  
Job No. 1-76  
Hole No. 2815-02  
Elevation 3865 ft.

Customer:  
Location: Volcano Well

Driller: Ken Sanders  
10 Hrs.  
Rig:  
Gas:  
Oil:  
Repairs:  
Helper: Sid Hogan  
10 Hrs.  
Arv. Job 7:00 Am.  
Job 1-02B  
10 Hrs.

Bit-Size 1-2  
Type Star

Casing-Size 1-1/4 in.  
Length in hole 9 ft.  
Amt. Perforated  
Depth Start 50 ft.  
Depth Stop 54 ft.  
Feet Drilled 4

Water Levels, Time  
M  ft.  
Time  
M  ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Hard Lava Rock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Broken Lava Rock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signed Ken Sanders  
Date 12/6/1976

Remarks: Broken Lava rock falling in from 41 to 50. Having to level rig very often. Because of fill and loose formation all around location, also naming very hard all day.
### Drilling Log

**Customer:**

**Location:**

**Date:** 12/3 1976

**Job No.:** 1-76

**Hole No.:** 2815-02

**Elevation:** 3865 ft.

**Driller:** Ken Jacobsen

**Helper:** Jack Hagan

**Arv. Job:**

**Casing Size:** 12 in.

**Bil-Size:** 12

**Depth Start:** 37 ft.

**Depth Stop:** 50 ft.

**Feet Drilled:** 13

**Remarks:**

- Hole Traveled: Cemented 9 ft. of 12-in. cement with 5 tack cement.

---

**Formation**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>37/41</td>
<td>Hard Lava Rock</td>
</tr>
<tr>
<td>41/45</td>
<td>Bunker Lava Rock</td>
</tr>
<tr>
<td>45/50</td>
<td>Hard Lava Rock</td>
</tr>
</tbody>
</table>

**Water Levels:**

<table>
<thead>
<tr>
<th>M ft</th>
<th>M ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

**Signed:** Ken Jacobsen

**Date:** 12/3 1976
Date 12/2/76  Job No. 1 - 76  Hole No. 2815-02  Elevation 3865 ft.
Customer ______________________ Location Waialae well

Driller Ken Sanchez 10 Hrs.  Rig ______________________
Helper and Bryan 10 Hrs.  Gas ______________________
Helper ______________________ Hrs.  Repairs ______________________
Arr. Job __________ 0000 Job 5:0000 10 Hrs.  Or. No. __________

Bit-Size 12  Type Star
Casing-Size 12-3/16 in., Length in hole 97 ft. 7 in., Amt. Perforated __________ ft. __________ in.
Depth Start 25 ft., Depth Stop 37 ft., Feet Drilled __________

Water Levels, Time __________ ft., Time __________ ft.,

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top A</th>
<th>Top B</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Bicen Tawa Rock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Hard Tawa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measurements

Remarks: Drilled 27.5 to 29 ft. Hole straight

Signed Ken Sanchez  Date 12/2/76
**DRILLING LOG**

---

**Date:** 12/1/1976  
**Job No:** 1-26  
**Hole No:** 281502  
**Elevation:** 3865 ft.

**Customer:** Location:  

**Driller:** Ken Sanders  
**Helper:** Mel Hogan  
**Arv. Job:** 7:00 AM  
**Avg. Job:** 5:00 PM

**Bit-Size:** 12  
**Casing-Size:** 12  
**Depth Start:** 14 ft.  
**Depth Stop:** 25 ft.  
**Feet Drilled:** 11

**Water Levels:**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Time</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td></td>
<td>Top coal</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>Bunkin slua rock</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

Signed: Ken Sanders  
**Date:** 12/1/1976
**DRILLING LOG**

RUSCOE MOSS COMPANY

850 AHU STREET - HONOLULU, HAWAII 96819
TELEPHONE (808) 839-8888 - 833-1444


Customer:  
Location: Volcano well  

Driller: Ken Sandine  10 Hrs.  Rig  
Helper: Mike Hogan  10 Hrs.  Gas Oil  
Arv. Job 7:00 AM  Lv. Job 5:00  10 Hrs.  Repairs  

Casing-Size: 12 1/2 in.  Type: Star  
Bit-Size: 12 in.  
Depth Start: 0 ft.  Depth Stop: 14 ft.  Feet Drilled: 14 

Water Levels, Time  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Water Level, Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ft.</td>
<td>M 0 ft. Time M 0 ft.</td>
</tr>
</tbody>
</table>

**Measurements**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ft.</td>
<td>Drill and stop soil</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**  
Quoted rigging up. Picked up yard tank from dock.  
Brought truck back to Sande’s rig.  
Hauled load water.  
Started to drill.

Signed Ken Sandine  
Date 11/30 1976
### Drilling Log

**Date:** 11/29 1976  
**Job No.:** J-76  
**Hole No.:** 2815-02  
**Elevation:** 3864 ft.

**Customer:**  
**Location:** Waikiki well

<table>
<thead>
<tr>
<th>Driller</th>
<th>10 Hrs.</th>
<th>Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sanders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helper</td>
<td>10 Hrs.</td>
<td>Gas</td>
</tr>
<tr>
<td>Mel Hogan</td>
<td></td>
<td>Oil</td>
</tr>
<tr>
<td>Helper</td>
<td>Hrs.</td>
<td>Repairs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Arv. Job     | 7:00 AM | Lv. Job 5:00 PM | 10 Hrs.  
|              |         | Or. No.  |  

**Bit-Size:**  
**Type:**  

**Casing-Size:** in., Length in hole ft. in., Amt. Perforated ft. in.  
**Depth Start:** ft., Depth Stop ft., Feet Drilled  
**Water Levels, Time:** M ft., Time M ft.  

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Remark:** Final moving to new location. Rigging up.

**Signed:** Ken Sanders  
**Date:** 11/29 1976
Date: 1/16 1976  Job No. 1-96  Hole No. 2815-02  Elevation 3865 ft.

Customer:  
Location: Volcano well

Driller: Ken Sanford  10 Hrs.  Rig:  
Helper: Ted Hogan  10 Hrs.  Gas:  
Helper:  
Arv. Job 7:00 AM, Lv. Job 5:00 PM  10 Hrs.  Oil:  
Repairs: 
Or. No.:  

Bit-Size: 12  Type: HAS  
Casing-Size: 12 1/8 in., Length in hole 55 ft.  
Depth Start: 79 ft., Depth Stop 81 ft., Feet Drilled 2  
Water Levels, Time: M ft., Time: M ft.  

Depth  Formation  Remarks  Top  Measurements
79
81

Remarks: Drilling hard all day to make 28 ft. Some last
time welding on bits

Signed: Ken Sanford  Date: 1/16 1976
Date: 1/5 1976 Job No: 1-76 Hole No: 2815-02 Elevation: 3865 ft.

Customer: Location: Volcano Well

Driller: Ken Sanders 10 Hrs. Rig: Gas: Oil
Helper: Med Hogan 10 Hrs. Gas: Oil
Rig: Oil
Arv. Job: 7:00 AM Lv. Job: 5:00 PM 10 Hrs.
Reps.:
Or. No:

Bit-Size: 12 in. Type: Stan
Depth Start: 78 ft., Depth Stop: 79 ft., Feet Drilled: 1

Water Levels, Time M ft., Time M ft.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Basalt with very hard 4.5 hrs to make</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>red particles, they one foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>in color</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Drilling sand, rough on site.

Signed: Ken Sanders  Date: 1/5 1976
Date 11/4/77  Job No. 1-26  Hole No. 2815-72  Elevation 3865 ft.
Customer __________________ Locality __________________
Driller Ken Sandusky  10 Hrs.  Rig __________________
Helper Ted Hogan  10 Hrs.  Gas __________________
Helper __________________  Hrs.  Oil __________________
Arr. Job 7:00AM  Lv. Job 5:00PM  '10 Hrs.  Repairs __________________

Bit-Size  12 in.  Type Star
Casing-Size  12 1/2  in., Length in hole 55 ft.  Length in in., Amt. Perforated 0 ft.  in.
Depth Start  78 ft., Depth Stop  8 ft., Feet Drilled 0 ft.

Water Levels, Time M Time M

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td></td>
<td>Reaming Hole</td>
<td>1 3/4</td>
</tr>
<tr>
<td>76</td>
<td></td>
<td></td>
<td>1 3/4</td>
</tr>
<tr>
<td>76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td></td>
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</tbody>
</table>

Remarks: Reaming hole was length of strake, fill back refrigeration coming back.

Signed Ken Sandusky  Date 11/4/77
**DRILLING LOG**

**Date:** 1/3/77  **Job No.:** 1-76  **Hole No.:** 2815-02  **Location:** Vulcan, HI

**Customer:**  

<table>
<thead>
<tr>
<th>Driller</th>
<th>10 Hrs.</th>
<th>Rig</th>
<th>Gas</th>
<th>Oil</th>
<th>Repairs</th>
<th>Or. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ken Sanders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Helper</th>
<th>10 Hrs.</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mel Hogan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arv. Job</th>
<th>9:00 AM</th>
<th>Liv. Job</th>
<th>5:00</th>
<th>10 Hrs.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Bit-Size</th>
<th>12 in.</th>
<th>Type</th>
<th>Star</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing-Size</th>
<th>12 1/2 in.</th>
<th>Length in hole</th>
<th>76 ft.</th>
<th>in.</th>
<th>Amt. Perforated</th>
<th>ft.</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Start</th>
<th>76 ft.</th>
<th>Depth Stop</th>
<th>78 ft.</th>
<th>Feet Drilled</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Levels, Time</th>
<th>M</th>
<th>ft., Time</th>
<th>M</th>
<th>ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth</th>
<th>Formation</th>
<th>Remarks</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Basalt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Remarks: Hole coming back into line, just slow.

Signed: Ken Sanders  **Date:** 1/3/77