



GEO-HEAT CENTER

Oregon Institute of Technology, Klamath Falls, Oregon 97601 541/885-1750 FAX 541/885-1754

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July 28, 2006

KL DJ-5-55052-02: Task 1 –Report on Final Well Design, Herald and News Building, Klamath Falls, OR

The Herald and News retained Brian Brown Engineering as the licensed Professional Engineer to design the geothermal supply and injection wells, and to interface with MKK Consulting Engineers, who are responsible for the mechanical systems design in the building.

A copy of the official well log submitted to the Oregon Water Resources Department is attached.

The Geo-Heat Center assisted in siting the location of a test well based on information from geologic maps. The test well was terminated at approximately 417 ft deep when hot water was encountered. The final well was deepened to 442 ft and casing was advanced to 198 ft, as shown in the final well log. The static water level is about 88 ft below grade.

The Geo-Heat Center assisted in planning and conducting a well yield test. The well yield test consisted of pumping the well at about 100 gpm for approximately 4 hours. This flow rate was chosen based on the expected demand of the building. The discharge groundwater temperature was measured at 212°F, and the water was flashing to steam in the well casing. The boiling point of water at Klamath Falls' elevation is about 208°F.

This well is anticipated to be the supply well for the geothermal system, but this decision is not final, pending observations made during injection well drilling. An injection well permit request has been filed at the Oregon Water Resources Department, but has not been approved to date.

RECEIVED

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

DEC 02 2005

WATER RESOURCES DEPT

WELL I.D. # L 81223

START CARD # 182084

Instructions for completing this report are on the back of this form.

(1) LAND OWNER Well Number _____
Name **KLAMATH PUBLISHING LLC**
Address **1301 ESPLANADE**
City **KLAMATH FALLS** State **OR** Zip **97601**

(2) TYPE OF WORK New Well
 Deepening Alteration (repair/recondition) Abandonment Conversion

(3) DRILL METHOD
 Rotary Air Rotary Mud Cable Auger Cable Mud
 Other _____

(4) PROPOSED USE
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other _____

(5) BORE HOLE CONSTRUCTION Special Construction: Yes No
Depth of Completed Well **442** ft.
Explosives used: Yes No Type _____ Amount _____

BORE HOLE			SEAL			
Diameter	From	To	Material	From	To	Sacks or Pounds
16	0	198	3/8 BENT.	0	40	52 SACKS
10	198	442	CEMENT	40	198	186 SACKS

How was seal placed: Method A B C D E
 Other **3/8 BENTONITE POURED**
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 10	+2	198	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner: NONE				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drive Shoe used Inside Outside None
Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS

Perforations Method **NONE**
 Screens Type _____ Material _____

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
NONE						<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour
 Pump Bailor Air Flowing Artesian
Yield gal/min **200 GPM** Drawdown _____ Drill stem at **300 FT.** Time **1 hr.**

Temperature of water **194 F** Depth Artesian Flow Found **NONE**
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
Depth of strata: **NONE**

(9) LOCATION OF WELL (legal description)
County **KLAMATH**
Tax Lot **200** Lot _____
Township **38 S** N or S **09 E** E or W **WM**
Section **34 BB** NW 1/4 **NW** 1/4
Lat _____ " or _____ (degrees or decimal)
Long _____ " or _____ (degrees or decimal)

Street Address of Well (or nearest address) **2701 FOOTHILLS BLVD.**
KLAMATH FALLS, OR 97601

(10) STATIC WATER LEVEL
88 ft. below land surface. Date **11/21/2005**
_____ ft. below land surface. Date _____
Artesian pressure _____ lb. per square inch Date _____

(11) WATER BEARING ZONES

Depth at which water was first found **343 FT.**

From	To	Estimated Flow Rate	SWL
343	442	300 GPM	88

(12) WELL LOG Ground Elevation **4175**

Material	From	To	SWL
GRAVEL	0	1	
YELLOW CLAYSTONE	1	58	
GRAY CLAYSTONE	58	343	
FRACTURED BLACK ROCK	343	442	88

Date Started **11/09/2005** Completed **11/21/2005**

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number _____ Date _____
Signed _____

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number **777** Date **11/29/2005**
Signed *Stephen R. Hines*