



Ewbank and associates

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Thermal Conductivity Test Results Story Telling Center Jonesborough, Tennessee

Earth Energy Engineering performed a thermal conductivity test at the Story Telling Center in Jonesborough, Tennessee on June 8, 1999. Testing was done by Bill Nagle with a Ewbank portable test unit.

The test borehole was 300 feet in depth and 6" in diameter. A 1" inch loop was installed and the borehole was backfilled with #8 stone. Static water level was reported at 70 feet. The formations encountered were primarily limestone and shale.

The graph of the power input for this test shows a gradual increase in power input for the test. This will may cause the results to be slightly conservative.

The thermal conductivity (**k**) value for this borehole is **1.3 btu/degree F-hr-foot**. This is an average conductivity per foot for the borehole. This value represents the rate at which the borehole and rock will transfer heat. To accurately measure the thermal conductivity of the formation a borehole should be drilled and grout with a bentonite grout to prevent any flow of water through the borehole.

All test equipment, methods, procedures, calculations, and interpretation is done in accordance with the recommendations and guidelines of the International Ground Source Heat Pump Association.

1363 minutes = 22.7 hours

Drill Log for Story Telling Center

Hole # 1
Back of property

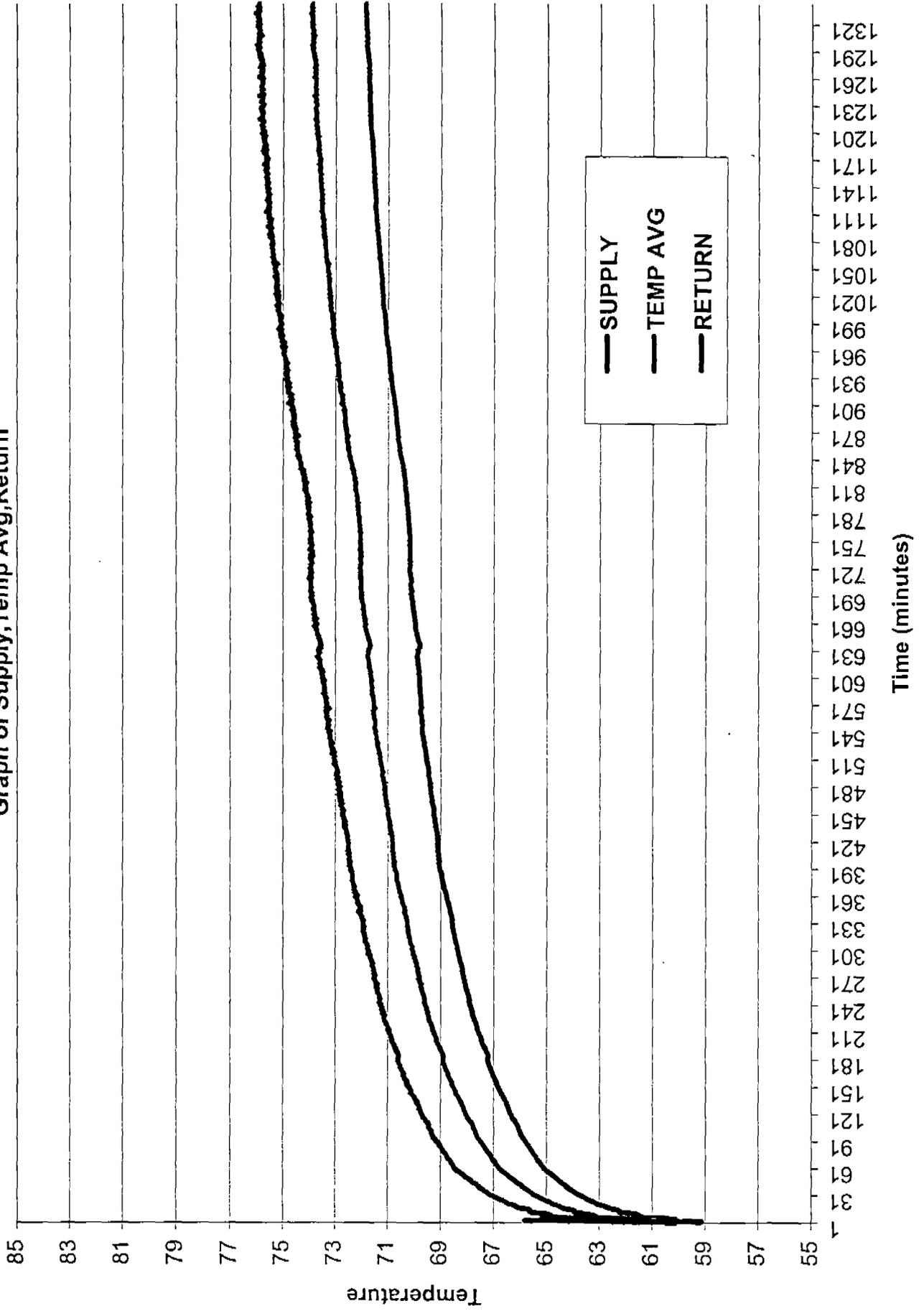
Hole # 2
Nearest side street

53 ft steel casing inserted and removed

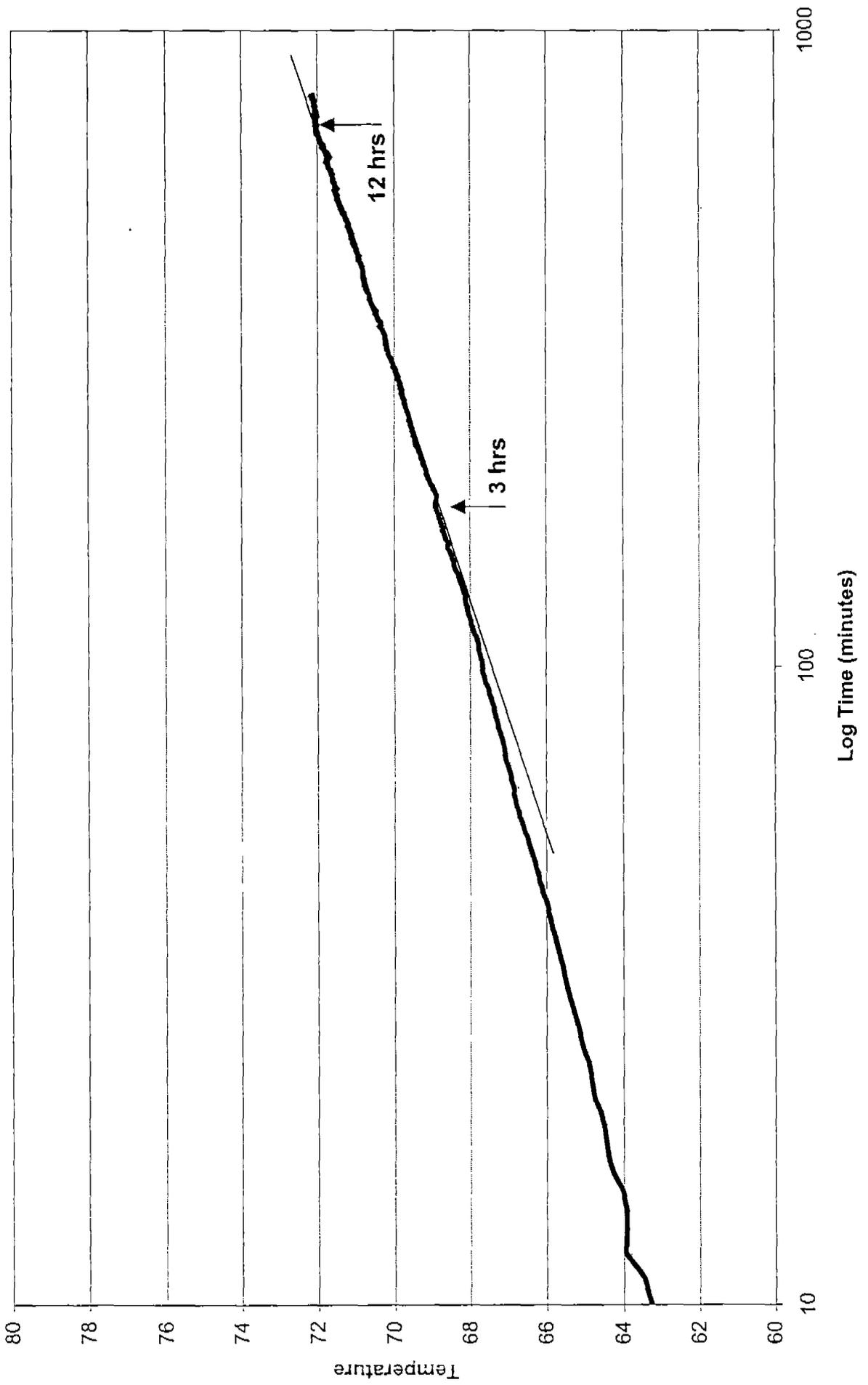
45 ft steel casing left in place

From ft	To ft	Material	GPM	From ft	To ft	Material	GPM
0	7	Surface Fill		0	7	Surface Fill	
7	46	Clay		7	40	Clay	
46	300	Limestone	2	40	180	Limestone	
				180	192	Mud seam	
				192	205	Limestone	2

Story Telling Center
Thermal Test
Graph of Supply, Temp Avg, Return



Story Telling Center
Thermal Test
Graph of Log Time of Temp Avg



Story Telling Center
Thermal Test
Graph of Wattage

