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# TerraTek

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J. F. KUNZE

June 3, 1975

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Asst.:	Info:
	RCS
	JFK

Dr. J. Kunze  
 Aerojet Nuclear Company  
 550 Second Street  
 Idaho Falls, Idaho 83401

Dear Dr. Kunze:

The following is a description of the tests and a summary of the results obtained by Terra Tek, Inc. on core samples taken by the Aerojet Nuclear Company, Idaho Falls, in drilling at the Raft River geothermal well project. Tests were performed on each of the two samples to determine the permeability at *in situ* conditions. These conditions were specified and are listed in the following table:

RRGE #2      RRGE #1

Sample Depth (feet)	4,227	4,506
Axial Stress - Vertical (psi)	4,855	5,175
Lateral Stress (psi)	3,480	3,710
Pore Pressure (psi)	1,880	2,005
Temperature (° F)	220°	210°

The lateral stress was calculated by assuming Poisson's ratio to be 0.35 at *in situ* conditions. Tests were performed on two inch diameter samples cored from the original four inch core. Specimen axes were parallel to the core axes. The tests were carried out in a two kilobar pressure vessel equipped with external heaters. All stresses and pressures were measured inside the vessel and controlled to within one percent of the *in situ* values listed in the above table. Typical temperature fluctuation is less than one degree Fahrenheit for the tests.

Permeability was determined via the transient pressure decay method which requires a gradient of less than five percent of the pore pressure across the samples. Distilled water was used as the pore fluid. The permeability values obtained were:

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	#2	#1
Sample Depth (feet)	4,227	4,506
Permeability (millidarcies)	0.003 0.04	5

*Siltstone Tuff*

*Exp. band  
says:  
3 ≈ 1890  
K = 8.41 md (0.1  
2.55 cm/cc*

Two samples were prepared from the 4,227 foot level core because of inconsistent fractures through the rock. Both values show the rock to be tight and close grained; furthermore, the noted variation in permeability is not uncommon in such rock even without the sample intersecting fractures and flaws. To obtain an average permeability value for any formation, a minimum of five tests should be performed.

The sample taken from the 4,506 foot level has a permeability typical of tuff (usually 0.1 to 10 millidarcies).

If you have any questions regarding test procedures, equipment, results or capabilities, please feel free to call.

Sincerely,

*Arfon H. Jones*  
Arfon H. Jones  
Vice President

*Randy R. Nielsen*  
Randy R. Nielsen  
Research Engineer

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