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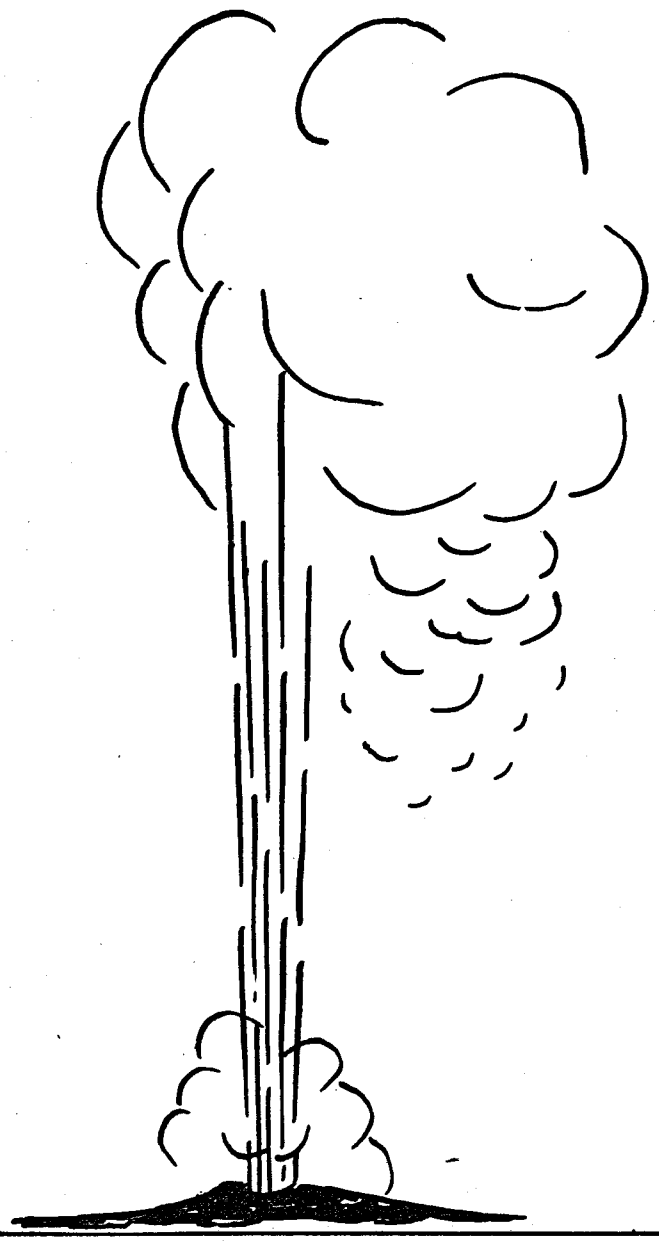

EVALUATION AND TARGETING OF GEOTHERMAL ENERGY RESOURCES IN THE SOUTHEASTERN UNITED STATES

Progress Report, October 1, 1978—March 30, 1979

By
John K. Costain
Lynn Glover III
A. Krishna Sinha

Work Performed Under Contract No. ET-78-C-05-5648

Virginia Polytechnic Institute and State University
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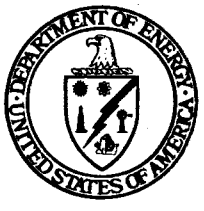

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John K. Costain, Lynn Glover III, and A. Krishna Sinha

Principal Investigators

Department of Geological Sciences

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Blacksburg, VA 24061

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PREPARED FOR THE U. S. DEPARTMENT OF ENERGY UNDER

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Lithologic Analysis of Sediment Samples from the Intermediate Drilling Program

Michael Svetlichny

During the period October 1, 1978 - March 15, 1979, 32 holes were completed as part of the Atlantic Coastal Plain drilling program. In each of the 300 m deep holes, drill cuttings were collected at 3.0 m intervals and sealed in airtight plastic bags to prevent sediments from drying out.

At least two attempts were made to recover core in each hole. A minimum of 15 m was cored. Recovery of unconsolidated, clean sand frequently was poor because material tends to be washed away by the coring process, and sediments were not always retained in the core barrel by the core catcher. In an effort to maximize core recovery and minimize drilling costs, one coring interval was selected to be within a thick (↑15 m) sequence of clayey, silty, or consolidated sediments, and the other coring attempt was made near the maximum depth of 300 m. Detailed analyses of the cores has begun, but there are no results to report as yet.

Lithologic descriptions of the drill cuttings have been completed for each hole; the results are presented as a table following this text. The descriptions are based on Folk's (1974) classification. Each category reflects the proportion of gravel, sand, and silt plus clay in that sample. In cases where well-sorted gravel was present, a distinction was made between granules, pebbles, and cobbles. Similarly, the sand fraction was subdivided into very fine, fine, medium, coarse, and very coarse sand. If silt and clay occurred in equal proportion, they were collectively referred to as mud. Whole and fragmented macrofossils were reported as shells.

Selected samples from each hole are being wet sieved with a number 230 U.S. standard sieve to determine the proportion of sediment that is finer than 4.0 phi. This work began recently so that the data set is incomplete. The results to date are included in the table that follows this text.

ACKNOWLEDGEMENT

The following Gruy Federal Personnel assisted in sample descriptions and sieving: Kenneth Hurst, Ronald Herzick, Paul Caprio, Michael Hoffman, and Donald Hostvedt.

NO. 43 Ocean City, MD

INTERVAL (METERS)	FORMATION-AGE	DESCRIPTION	COMMENTS	SAMPLES SIEVED	RATIO COARSE/FINE	PERCENT FINES
0-3.0		Fine to medium sand				
3.0-9.1		Clay and silty fine sand	Shells			
9.1-12.2		Silty clay				
12.2-15.2		Silty fine sand	Shells			
15.2-24.4		Silty fine-medium sand with gravel	Minor shells			
24.4-30.5		Fine-very coarse sand with silt				
30.5-36.6		Silty medium very coarse sand	Shells			
36.6-39.6		Gravel, sand and silt				
39.6-45.7		Silty coarse sand and gravel				
45.7-61.0		Silty clay	Minor shells			
61.0-73.2		Sandy clay, slightly glauconitic				
73.2-103.6		Silty clay	Shells			
103.6-112.6		Clay	Shells			
112.8-121.9		Silty fine-coarse sand with gravel				
121.9-125.0		Silty fine-medium sand with gravel	Minor shells			
125.0-149.4		Very fine-very coarse sand and gravel				
149.4-152.4		Fine-medium sand with some quartz gravel				
152.4-155.4		Silty fine-medium sand with gravel				

	and siltstone	
155.4-167.6	Clay	Minor shells
167.6-175.3	Cored	Recovery from 167.6-175.3

NO. 43A Ocean City, MD

INTERVAL (METERS)	FORMATION-AGE	DESCRIPTION	COMMENTS	SAMPLES SIEVED	RATIO COARSE/FINE	PERCENT FINES
0-61		Very fine to medium sand		30.5-33.5 51.8-54.9	6.09 7.36	14.10 11.96
61.0-70.1		Fine to coarse sand	Abundant shells			
70.1-88.4		Fine to coarse sand		73.2-76.2 82.3-85.3	6.33 15.80	13.65 5.95
88.4-121.9		Medium to coarse sand	Minor shells	91.4-94.5 100.6-103.6 112.8-115.8	10.70 12.30 8.54	8.55 7.52 10.48
121.9-125.0		Medium to very coarse sand	Abundant shells	131.1-134.1	14.95	6.27
125.0-137.2		Fine to medium sand	Shells	131.1-134.1	14.95	6.27
137.2-140.2		Medium to very coarse sand	Minor shells			
140.2-167.6		Fine to medium micaceous sand.	Shells	143.3-146.3 161.5-164.6	12.16 15.44	7.60 6.08
167.6-189.0		Silty medium to coarse sand	Shells	182.9-185.9	9.12	9.88
189.0-204.2		Fine to medium sand	Shells	19 8.1-201.2	11.35	8.10
204.2-210.3		Medium to coarse sand	Shells			
210.3-231.6		Fine to very coarse sand	Minor shells	210.3-213.4 228.6-231.6	20.35 29.53	4.68 3.28
231.6-240.8		Fine to medium sand with some very coarse sand	Minor shells	234.7-237.7	26.91	3.58
240.8-259.1		Medium to very coarse sand	Shells	240.8-243.8	38.77	2.51
259.1-268.2		Medium to coarse sand	Minor shells	259.1-262.1	20.96	4.55
268.2-280.4		Fine to very coarse sand	Shells	268.2-271.3	6.61	13.14

280.4-283.5	Fine to very coarse sand	Shells			
283.5-289.9	Silty medium to very coarse sand	Shells	283.5-286.5	10.52	8.86
289.9-297.8	Cored	Recovery from 289.9-297.8			
297.8-313.9	Silty medium to coarse sand	Shells	298.7-301.8 307.8-310.9	16.86 18.60	5.60 5.10
313.9-320.0	Silty fine sand with some very coarse grains	Minor shells			
320.0-338.3	Silty medium-coarse sand with some very coarse grains	Minor shells	329.2-332.2	11.48	8.01
338.3-341.1	Fine to medium sandy mud. Some gravel.	Minor shells			
341.1-344.4	Silty fine sand with some coarse grains.	Minor shells			
344.4-347.5	Muddy fine to medium sand with some gravel	Minor shells			
347.5-353.6	Fine sand with coarse grains.	Minor shells	347.5-350.5	26.16	3.68
353.6-364.0	Silty medium to coarse sand.	Minor shells			
364.0-373.1	Cored	Recovery from 364.8-373.1			