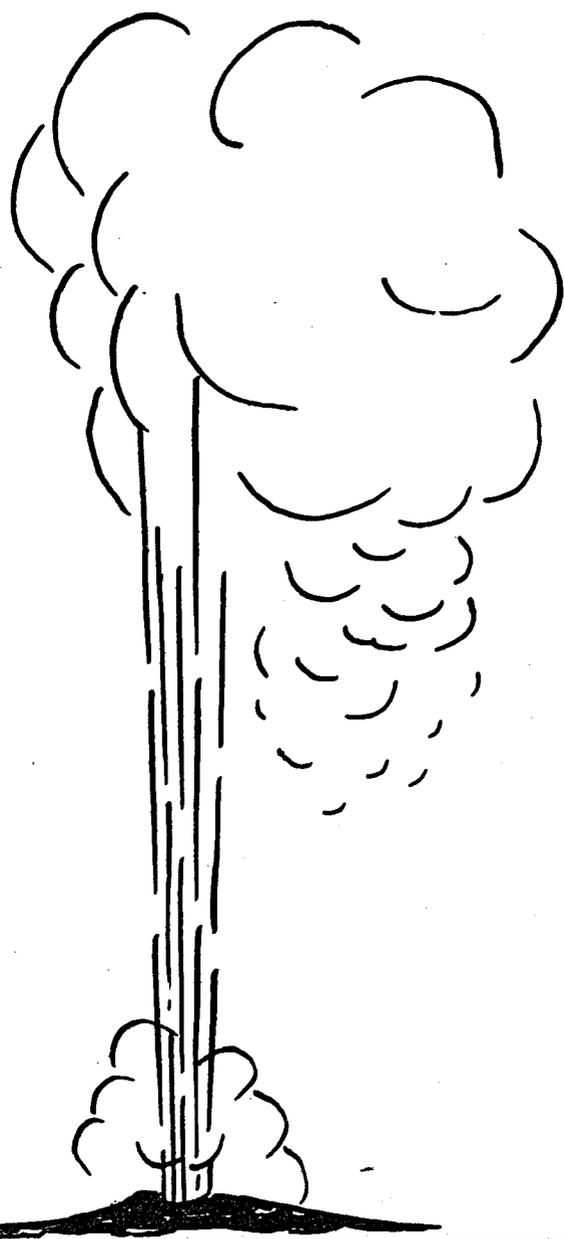


143
8/16/79

Dr. # 3056

VPI-SU-5648-5



**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
Blacksburg, Virginia



**U. S. DEPARTMENT OF ENERGY
Geothermal Energy**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

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

Progress Report

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

Principal Investigators

Department of Geological Sciences

Virginia Polytechnic Institute and State University

Blacksburg, VA 24061

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

October 1, 1978 - March 30, 1979

PREPARED FOR THE U. S. DEPARTMENT OF ENERGY UNDER

CONTRACT NO. ET-78-C-05-5648

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED *EB*

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. 33 Cambridge, MD

| INTERVAL (METERS) | FORMATION-AGE | DESCRIPTION | COMMENTS | SAMPLES SIEVED | RATIO COARSE/FINE | PERCENT FINES |
|----------------------|---------------|---------------------------------------------------------|----------------------------------------------------------------------------|----------------|----------------------|------------------|
| 0-15 | | | No samples | | | |
| 15.2-21.3 | | Silty grey clay | | | | |
| 21.3-33.5 | | Silty grey clay | Shells toward end of interval | | | |
| 33.5-48.8 | | Fine sandy silt with pebbles | Decreasing sand over interval. Shells. | | | |
| 48.8-115.8 | | Grey clayey silt | Shells | | | |
| 115.8-121.9 | | Sandy grey silt | | | | |
| 121.9-137.2 | | Light grey fine-medium sand | Shells at beginning of interval. Some dark grey silt at center of interval | | | |
| 137.2-158.5 | | Slightly granular grey silty fine sand | Silt increases over interval | | | |
| 158.5-164.5 | | Fine sandy grey silt | | | | |
| 164.5-178.3 | | Cored | Recoveries from 170.7-172.5 and 176.1-178.3 | | | |
| 178.3-192.0 | | Fine black sandy grey silt with some medium-coarse sand | Clay at center of interval | | | |
| 192.0-201.2 | | Granular light clayey grey silt with pebbles | Fine black sand. Shells | | | |
| 201.2-207.3 | | Silty light grey clay | | | | |
| 207.3-216.4 | | Fine-coarse sandy dark grey silt | Shells | | | |
| 216.4-222.5 | | Fine-coarse sandy grey silt with some clay | | | | |

C-80

C

C

222.5-237.7

Slightly pebbly
coarse sandy red
and grey clay

Sand decreasing over
interval

237.7-253.0

Red clay

Some dark grey silt
at center of interval.
Coarse sand near end
of interval

253.0-256.0

Slightly coarse
sandy dark grey
silty red clay

256.0-298.7

Red clay

Increasing fine-
medium sand up to
286.5. Some grey
silt at end of
interval

298.7-312.4

Cored

Recovery from
309.7-312.4