DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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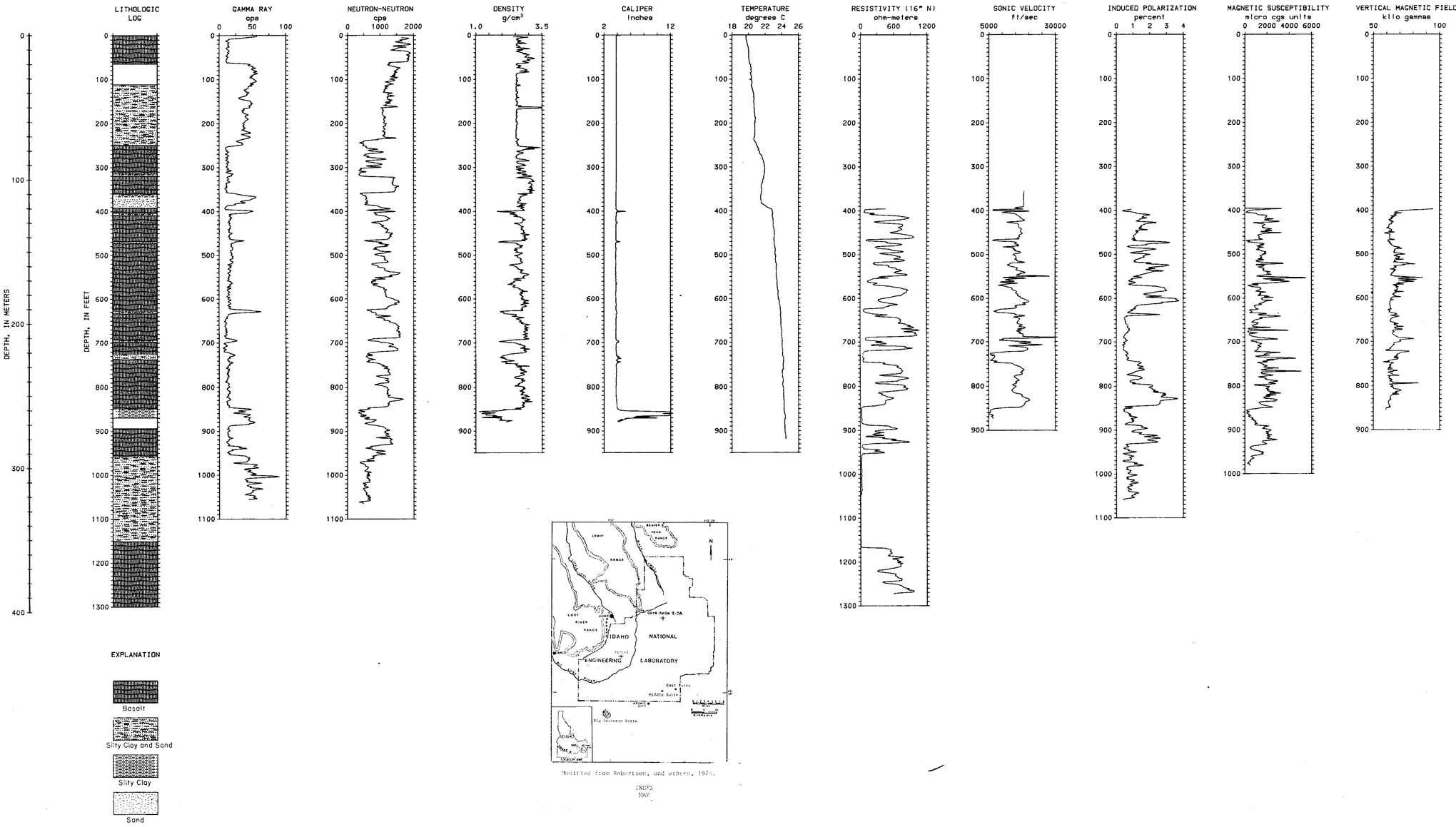

Modified from Robertson, and others, 1974.

INDEX
MAP

Discussion

The U.S. Geological Survey made geophysical well-logging measurements in exploration well 2-2a on August 31 and September 1, 1978 in order to provide in-situ physical-property information on various types of rock intersected by the upper portion of the well. Exploration well 2-2a and two other core holes, also located on the eastern Snake River Plain, Idaho, were drilled by the U.S. Department of Energy in cooperation with the U.S. Geological Survey to obtain subsurface geologic information for geothermal exploration of three geologic environments in the area (Embree and others, 1978; and Doherty, 1979a).

Geology, lithology, and mineralogy of rock penetrated by well 2-2a are discussed in detail by Doherty (1979b). In general, the sequence of rocks penetrated by the upper part of the well where the geophysical logs were obtained is dominated by a number of thick basaltic flows intercalated with thin layers of sand and silty clay along with a few thick layers of interbedded silty clay and sand. The lithologic log presented in this report is taken from Doherty (1979b). The well logs were made with U.S. Geological Survey Well-Logging System #1 equipped with a computer-based digital data acquisition system. The system includes a capability for making standard logs including gamma ray, neutron, density, caliper, temperature, electrical resistivity, sonic velocity, and nonstandard logs including induced polarization, magnetic susceptibility, and vertical magnetic field intensity. Detailed information on the interpretation of standard logs has been reported by Keys and MacCary (1971, Hilchie (1978), and Pirson (1963). Nonstandard logs have been discussed by Broding and others (1952), Dakhnov (1962), Dakhnov and others (1967), Dyck and others (1975), Scott and Daniels (1976), Scott and Tibbetts (1974), and Zablocki (1966 and 1974).

References

Broding, R. A., Zimmerman, C. N., Somers, E. V., Wilhelm, E. S., and Stripling, A. A., 1952, Magnetic well logging: Geophysics, v. 17, no. 1, p. 1-26.

Dakhnov, V. N., 1962, Geophysical well logging (translation from Russian to English by George V. Keller): Quarterly of the Colorado School of Mines, v. 57, no. 2, 445 p.

Dakhnov, V. N., Latishova, M. G., and Ryapolov, V. A., 1967, Well logging by means of induced polarization (translation by George V. Keller): Log Analyst, v. 8, no. 1, p. 3-18.

Doherty, D. J., 1979a, Drilling data from exploration well 1, NE¼ sec. 22, T. 2 N., R. 27 E., Brigham County, Idaho: U.S. Geological Survey Open-File Report 79-

Doherty, D. J., 1979b, Drilling data from exploration well 2-2a, NW¼ sec. 15, T. 5 N., R. 31 E., Idaho National Engineering Laboratory, Butte County, Idaho: U.S. Geological Survey Open-File Report 79-851.

Dyck, A. V. (editor), Hood, P. J., Hunter, J. A., Killeen, P. G., Overton, A., Jessop, A. M., and Judge, A. S., 1975, Borehole geophysics applied to metallic mineral prospecting--a review: Geological Survey of Canada, paper 75-31, 66 p.

Embree, G. F., Lovell, M. D., and Doherty, D. J., 1978, Drilling data from Sugar City Exploration well, Madison County, Idaho: U.S. Geological Survey Open-File Report 78-1095, 1 p.

Hilchie, D. W., 1978, Applied openhole log interpretation: Douglas W. Hilchie, Inc., Golden, Colorado, 300 p.

Keys, W. S., and MacCary, L. M., 1971, Application of borehole geophysics to water-resources investigations in Techniques of water-resources investigations of the United States Geological Survey, Book 2: U.S. Geological Survey, 126 p.

Pirson, S. J., 1963, Handbook of well log analysis: Prentice-Hall, Englewood Cliffs, N. J., 326 p.

Robertson, J. B., Schoen, R., and Barraclough, J. T., 1974, The influence of liquid waste disposal on the geochemistry of water at the National Reactor Testing Station, Idaho: 1952-1970: U.S. Geological Survey Open-File Report, 231 p.

Scott, J. H., and Daniels, J. J., 1976, Nonradiometric borehole geophysical detection of geochemical halos surrounding sedimentary uranium deposits (in Exploration for uranium ore deposits): IAEA proceedings of symposium, Vienna, p. 379-389.

Scott, J. H., and Tibbetts, B. L., 1974, Well-logging techniques for mineral deposit evaluation--a review: U.S. Bureau of Mines Information Circular IC 8627, 45 p.

Zablocki, C. J., 1966, Some applications of geophysical logging methods in mineral exploration drill holes: SPWLA Seventh Annual Logging Symposium Transactions, p. F1-C13.

Zablocki, C. J., 1974, Magnetic assays from magnetic susceptibility measurements in taconite production blast holes, northern Minnesota: Geophysics, v. 39, no. 2, p. 175-189.

GEOPHYSICAL WELL-LOGGING DATA FROM EXPLORATION WELL 2-2A, NW 1/4 SEC. 15 T.5N., R.31E., IDAHO NATIONAL ENGINEERING LABORATORY, BUTTE COUNTY, IDAHO

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