CALIFORNIA GEOLOGIC DATA MAP SERIES
MAP NO. 4—GEOTHERMAL RESOURCES OF CALIFORNIA

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Geothermal Resources of California

1980

Scale 1:750,000
One centimeter equals 7.5 kilometers
One inch equals approximately 12 miles

Contour interval 500 feet
Dotted line represents the 100-foot contour
National geodetic vertical datum of 1929
Depth curves at 100-fathom interval
Datum is mean lower low water
1927 North American datum
Lambert conformal conic projection based on standard parallels 33° and 45°

Base map data is reduced from the 1:500,000 scale topographic map of California (U.S. Geological Survey, 1970).

Geothermal data compiled by the
DIVISION OF MINES AND GEOLOGY
CALIFORNIA DEPARTMENT OF CONSERVATION

Map produced by the
National Geophysical and Solar-Terrestrial Data Center
National Oceanic and Atmospheric Administration
for the
Division of Geothermal Energy
United States Department of Energy

EXPLANATION:

This map is a product of a statewide inventory and evaluation of California's geothermal resources conducted by the Division of Mines and Geology under the sponsorship of the U.S. Department of Energy. Emphasis in this study has been on identification of low-temperature (less than 90°C) and moderate-temperature (90°-150°C) subsurface water to expand our knowledge of geothermal geology beyond the more intensively studied high-temperature (greater than 150°C) resources of The Geysers and Imperial Valley. Because of this emphasis, most of the wells shown are agricultural or domestic wells, many of which are suitable for direct heat (non-electric) applications. Many commercial high-temperature wells, especially in closely-spaced production fields, have not been plotted because of space limitations and proprietary restrictions on the publication of their temperatures and flow potential.

Until recently, nearly all industrial interest in geothermal energy in this country was for electrical generation. Although generation of electricity is and will be an important use of geothermal energy, it is now recognized that a much greater and widespread use is for direct heat application. Such applications include space heating and cooling of buildings, agricultural operations, and many industrial processes that require heat or cooling. The primary purpose of this map is to aid potential users in developing this important resource in California.

DATA PRESENTED

The minimum temperature for the wells and springs shown on the map is 20°C. Because of both graphical limitations and the intended use of the map, not every well and spring in the State that is 20°C or above can be shown. The emphasis of this map is on areas of geothermal activity as evidenced by the distribution of low-temperature wells and springs, and in some cases, by geophysical information.

Most of the data for the wells and springs were obtained from published and unpublished works by the U.S. Geological Survey, the California Department of Water Resources, the California Division of Oil and Gas, and the California Division of Mines and Geology. A much smaller amount of data was obtained from random sources and from the U.S. Geological Survey's computer file GEOTHERM. As yet, some of the data have not been updated since the early 1900's.

In the accompanying table of wells and springs, the temperatures reported are the most recent available. Temperature and total dissolved solids data can vary with time; consequently they should be regarded as approximate. Flow rates are even more variable. Commonly, springs do not flow from a single orifice but from a group of orifices. In these cases, the temperature reported is the highest of the group; the flow rate reported is for the group as a whole. In cases where a group of wells was drilled in a very small area, they are represented by only one symbol on the map, and the temperature reported is the highest for the group. The depth reported is that of the deepest of the group.

AVAILABILITY OF ADDITIONAL DATA

Detailed chemical data for most thermal springs and wells shown on this map are available from the computer file GEOTHERM (contact: Project GEOTHERM, Mail Stop 84, U.S. Geological Survey, Menlo Park, California, 94025). Information on drilling requirements and leasing in geothermal areas may be obtained from the Geothermal Resources Unit, California Division of Oil and Gas, 1416 Ninth Street, Room 1316, Sacramento, California, 95814.

Information on how geothermal resources can be used may be obtained from the Geothermal Energy Office, California Energy Commission, 1111 Howe Avenue, Sacramento, California, 95825.

Persons who desire or can provide additional information on thermal springs and wells in California are encouraged to contact the Geothermal Resources Officer, California Division of Mines and Geology, Sacramento District Office, 2815 O Street, Sacramento, California, 95816 in order that we may update this map and related files.

KEY TO TABLE OF THERMAL SPRINGS AND WELLS

The majority of column headings in the above key are self-explanatory. Position information is given in degrees, minutes, and decimal parts of minutes of latitude and longitude. Where longitude is not given, the position indicates an approximate position. An asterisk indicates a computed estimate of total dissolved solids. A bar (—) symbol in the depth column means that a spring orifice could not be reached. Numerous wells are named by the California well-numbering system, a brief description of that system follows.

WELL-NUMBERING SYSTEM USED IN CALIFORNIA

The well-numbering system used in California is in accordance with the township-section system of the U.S. Bureau of Land Management. As shown by the example (well number 11S/13E-22H1 S) in the accompanying diagram, that part of the number preceding the slash indicates the township (T. 11 S.); the number following the slash indicates the range (R. 13 E.); the number following the hyphen indicates the section (sec. 22); the letter following the section number indicates the 40-acre subdivision (H) of the section. The last number is a serial number for wells in that 40-acre subdivision; in this case, it indicates the first well to be listed in the SE 1/4 NE 1/4 sec. 22, T. 11 S., R. 13 E. The final letter, separated from the rest of the number by a space, indicates the base line and meridian. Base line and meridian designations are as follows: M, Mount Diablo; S, San Bernardino; H, Humboldt.

THERMAL SPRINGS AND WELLS

(See Key to the left of this column)