UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Temperature-depth data for selected deep drill holes in the United States obtained using maximum thermometers

by

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Abstract

Temperature versus depth plots, calculated thermal gradients, and temperature logs are presented for 91 drill holes located in Alabama, Arkansas, California, Colorado, Illinois, Kansas, Louisiana, Michigan, Mississippi, Montana, New Mexico, New York, Oklahoma, Oregon, Pennsylvania, Texas, Utah, West Virginia, and Wyoming. These holes are selected from a much larger compilation of temperature data previously published by Spicer (1964). The selected subset consists of those holes that have been logged to depths generally greater than 600 m while at temperature equilibrium and that display conductive temperature gradients. Temperature gradients ($^{o}C/km$) calculated for each hole were used as part of the data base to produce a contoured temperature-gradient map of the conterminous United States in Guffanti and Nathenson (1980).

Introduction

In 1930, the American Petroleum Institute published results of studies of Earth temperatures in oil fields (Heald, 1930). The methods used involved very careful measurements of temperatures in deep wells throughout the U.S. with maximum thermometers (Van Orstrand, 1930). This data set and additional logs made as part of the same ongoing study were later compiled in Spicer (1964). When we decided to make a temperature-gradient map of the United States based on temperature measurements in deep holes (Guffanti and Nathenson, 1980), it was clear that this compilation could be very useful in developing the basic data set of temperature gradients. However, a systematic search through the compilation was necessary to extract the appropriate data. We wanted only those holes that: (1) had been logged to depths greater than 600 m while at temperature equilibrium and (2) that display conductive temperature gradients. Of the hundreds of drill holes in Spicer (1964) many are shallow, some occur in convective geothermal areas, some of the logs are clearly disturbed by production or recent drilling, and frequently a large number of holes are grouped in a small geographic area. A subset of 91 holes was selected that fit our criteria. This report gives the basic data for that subset; for each hole a temperature/depth plot and log are presented, along with pertinent information on lithology and drilling history.

Data in Spicer (1964) have had limited utility in heat-flow studies because core samples were not available for measurements of rock thermal conductivity in the original investigations. However, the temperature data have been used in heat-flow studies in which conductivities were estimated from representative rock cores or measured later on outcrop samples (Birch, 1954; Benfield, 1947; Joyner, 1960; Blackwell, 1967).

Gradient Determination

Disturbances of the conductive temperature gradient can occur due to water or gas flow, recent circulation of drilling fluid, recent production, etc. Such disturbances are primarily expressed as non-linear slopes of a temperature/depth plot and as significant deviations of the measured near-surface temperature from the known mean annual air temperature. For the apparently undisturbed drill holes (or portions of holes), a straight line was fit to the temperature/depth plot; from two points through which the line passes, the gradient and surface intercept were calculated. It should be noted that the calculated intercept A is not intended to be an estimate of the actual mean annual surface temperature; rather, it is a value defined solely by the line chosen and is combined with the gradient G according to the straight-line equation

$$T = Gz + A$$

to give the temperature T at a specified depth z.

Generally, drill holes logged to 600 m or more were used in order to avoid hydrologic disturbances and unrepresentative rock thermal

conductivities which are most likely to occur in the upper one or two hundred meters. For this reason in many cases, the deeper portion of a plot was emphasized in choosing the straight line.

The 91 gradients published in this report are shown on a map of the United States (fig. 1). These data make up about one-third of the gradients displayed by Guffanti and Nathenson (1980); the rest of the data for that map comes from published heat-flow determinations made in deep holes.

The gradients given in Spicer (1964) are plotted against our temperature gradients (fig. 2). In that report, gradients were calculated using a least-squares fit of all the temperature data for each hole. The small deviations of most of the plotted points from the straight line in figure 2 indicate good agreement between the two sets of gradients. Also, the data fall on both sides of the line, with a tendency for the least-squares Spicer gradients to be slightly less than our gradients. If there were a strong tendency for thermal conductivities to increase with depth, the gradients we chose from the deeper points would consistently be less than the least-squares gradients. There is little suggestion of this in the data plotted in figure 2; however, much more detailed data would be required to address this question. A table summarizing least-squares temperature gradients for most of the holes in Spicer (1964) is given by Van Orstrand (1934), one of the original investigators.

There are only 8 holes where the least-squares gradients differ by more than 10 per cent from our chosen values, with the values in only 2 of those holes differing by more than 15 per cent. These differences are usually caused by some shallow anomaly in the temperature log which we have chosen to exclude. In one case, LA Z-4, the low gradient in the near-surface probably reflects a rise in surface temperature due to the draining of a lake 40 years before the temperature log was obtained.

Explanation of Data Sheets

For each of the selected drill holes, the gradient ($^{o}C/km$) and surface intercept (^{o}C) are calculated from the temperature log in the manner outlined above and are reported in the data sheet accompanying each plot. The temperature log is also given, and the two observations which we used to calculate the gradient are underlined. The primary reference is coded on each data sheet, and a key to the codes is given in table 1. Data for all holes appear in Spicer (1964), but many were also published earlier, and these earlier publications are cited. The letters in the code refer to the first 2 letters of the author's last name, and the digits indicate the year of publication. The location in township and range, date of observations, fluid level, lithology, and remarks are abstracted directly from comments in Spicer (1964). Latitude and longitude are derived from township and range or from location maps contained in Spicer (1964). For uniformity of presentation, the temperature data are plotted at one of three scales (0-60^{o}C, 0-1000m; 0-80^{o}C, 0-1500m; 0-80^{o}C, 0-2500m) with 3 exceptions (holes CA LB-28, CA SOB-2, and CO 7).

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Table 1. Reference codes for the data sheets.

*BE47	Benfield (1947)
*BI54	Birch (1954)
*CA30	Carlson (1930)
*HA30	Hawtof (1930)
*LA37	Lang (1937)
*MC30	McCutchin (1930)
SP 64	Spicer (1964)
*V026	Van Orstrand (1926)
*V030	Van Orstrand (1930)
*V038	Van Orstrand (1938)
*V041	Van Orstrand (1941)
*V051	Van Orstrand (1951)

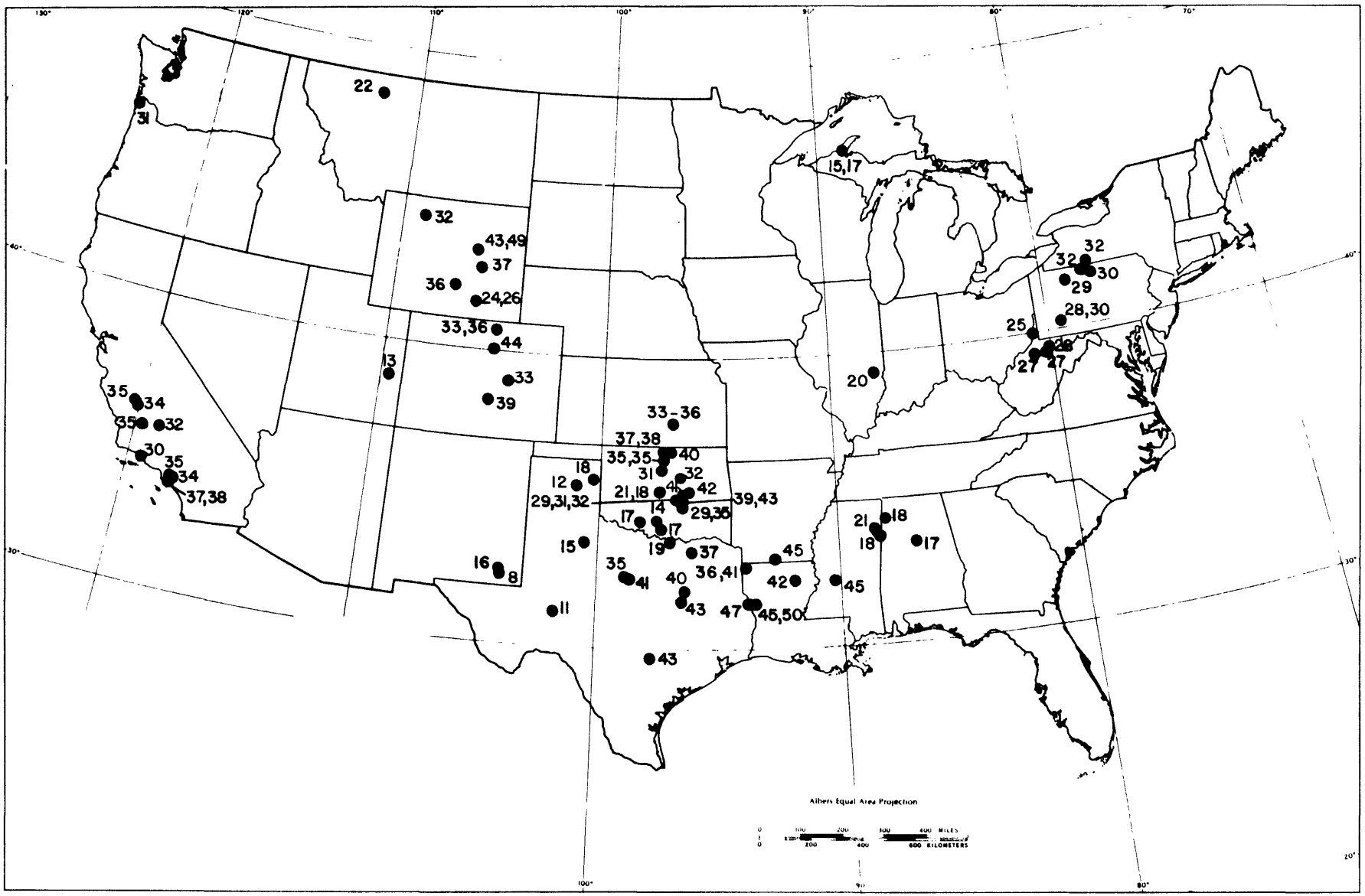


Figure 1. Map showing locations and temperature gradients of drill holes selected from Spicer (1964). Gradients are expressed as $^{o}C/km$. Closely grouped data are generalized.

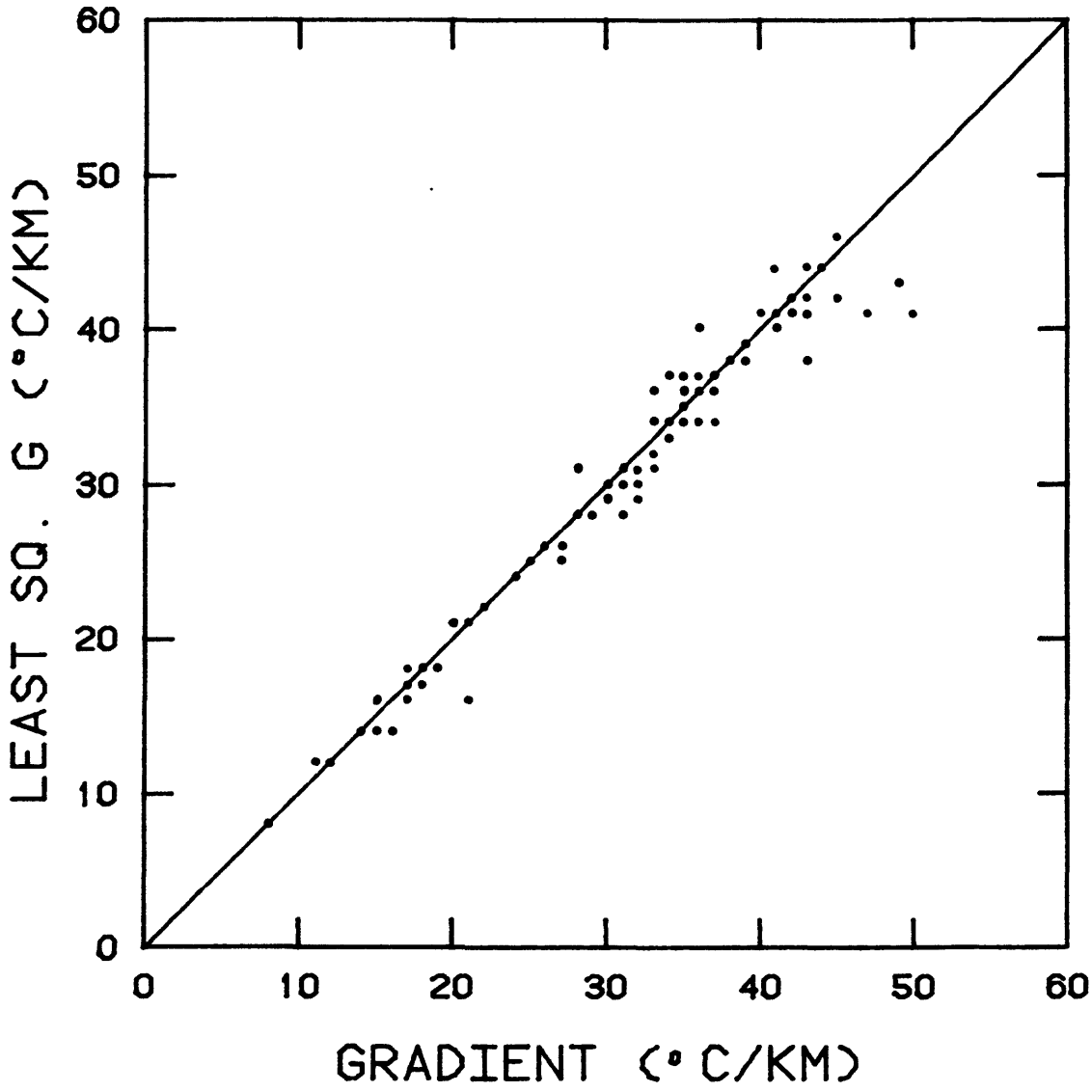
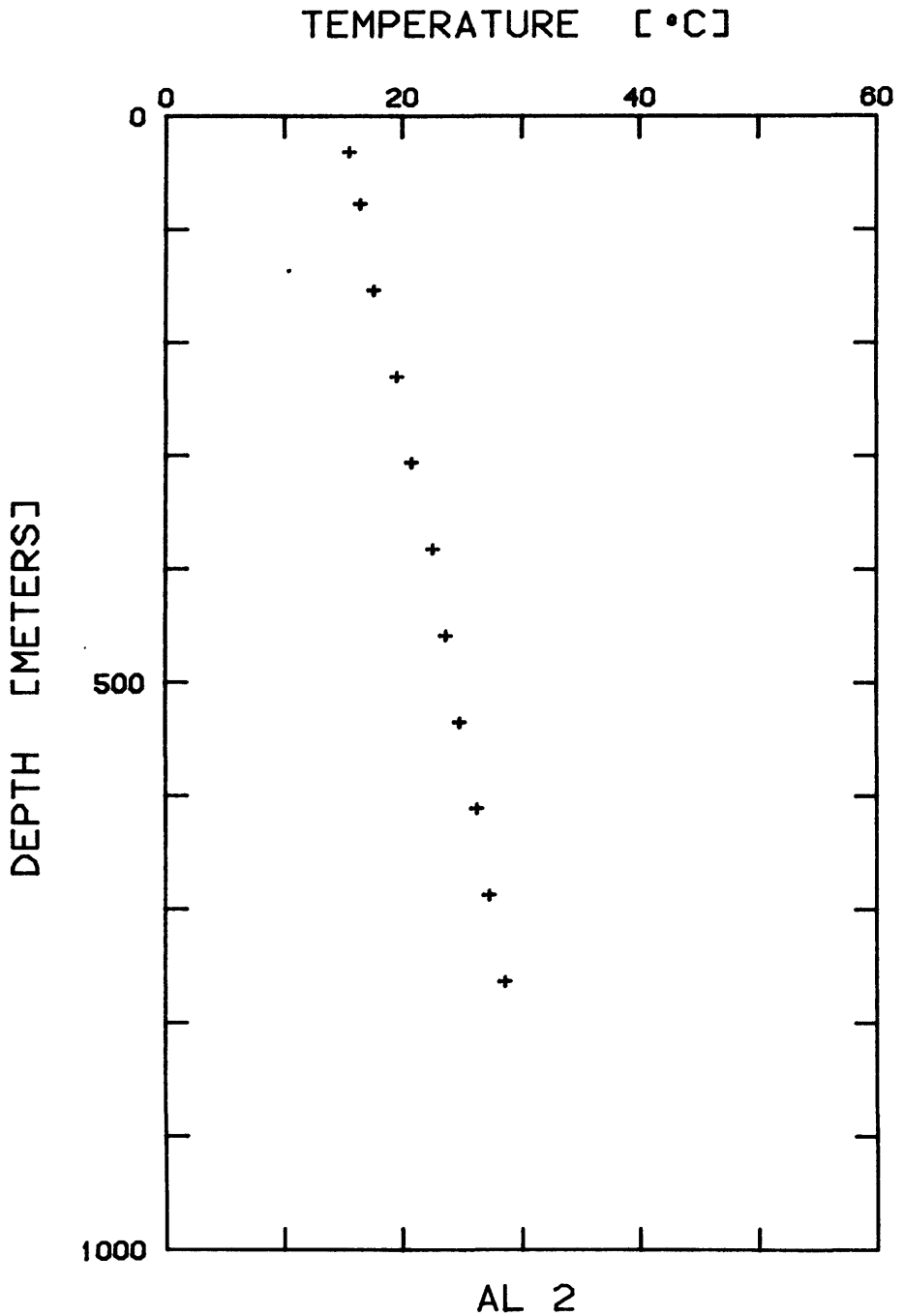


Figure 2. Plot of least-squares gradients given in Spicer (1964) versus gradients published in this report, with line of equal gradients .

Temperature/depth plots and data sheets

(Holes are arranged by decreasing latitude within each state.)



State: AL Hole name: 2

Latitude: 34 deg 20.0 min Longitude: 87 deg 58.6 min

Gradient= 18°C/km, Intercept= 15.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	15.6
76.2	16.5
152.4	17.7
228.6	19.6
304.8	20.8
381.	22.6
457.2	23.7
533.4	24.9
609.6	26.3
685.8	27.3
762.	28.6

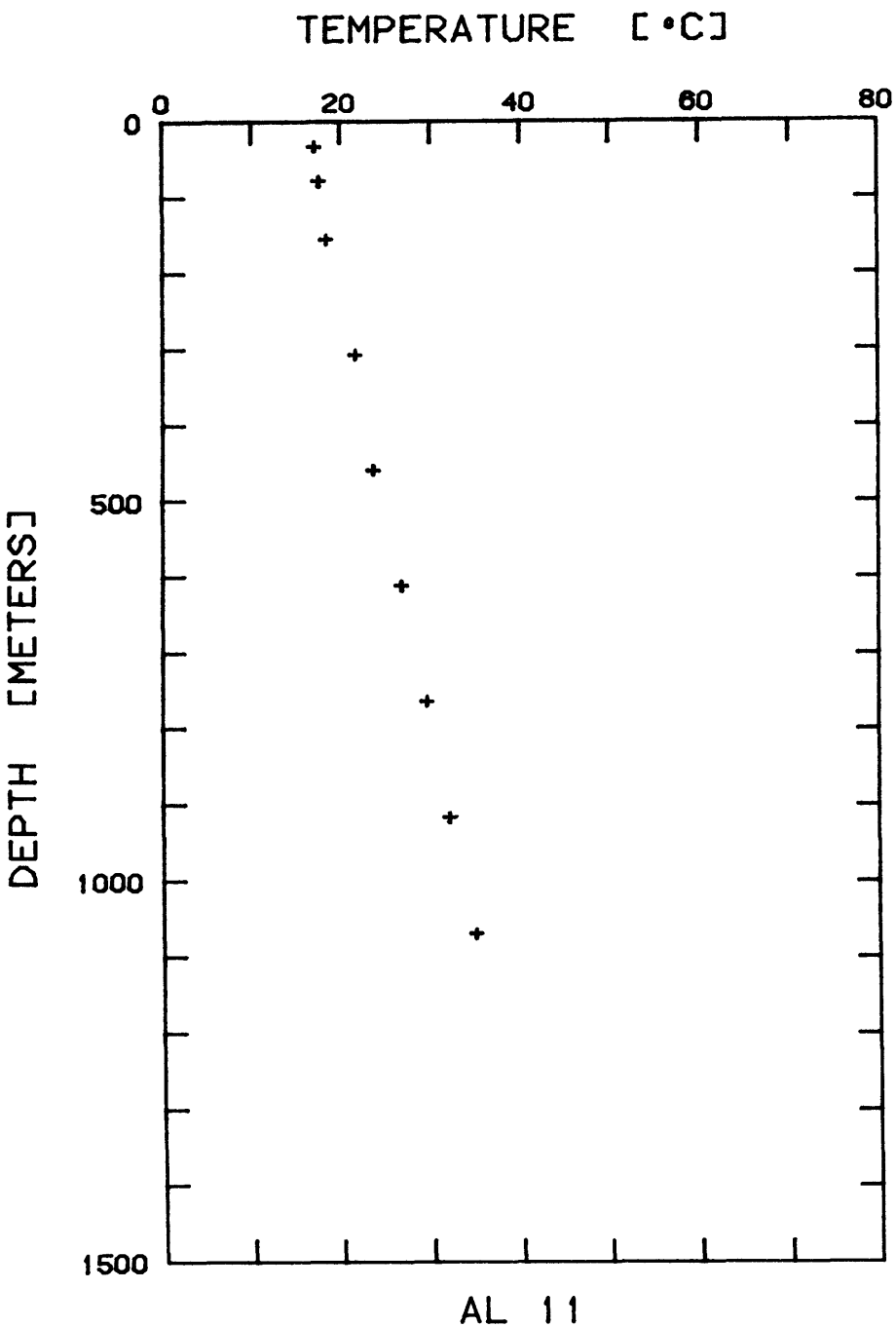
Section, Township, Range, County: Center sec. 26, T. 8 S., R. 14 W., Franklin.

Date of observations: No information.

Fluid level in drill hole: No information.

General lithology: Ordovician to Pennsylvanian shale and limestone, with sandstone.

Remarks: Altitude = 170 m. Thermometers exposed 40 min. Well drilled 4/17/26 to 1/8/57.



State: AL Hole name: 11

Latitude: 33 deg 45.0 min Longitude: 88 deg 12.4 min

Gradient= 18°C/km, Intercept= 15.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.2
76.2	17.7
152.4	18.5
304.8	21.7
457.2	23.7
609.6	26.8
762.	29.6
914.4	32.1
1066.8	35.

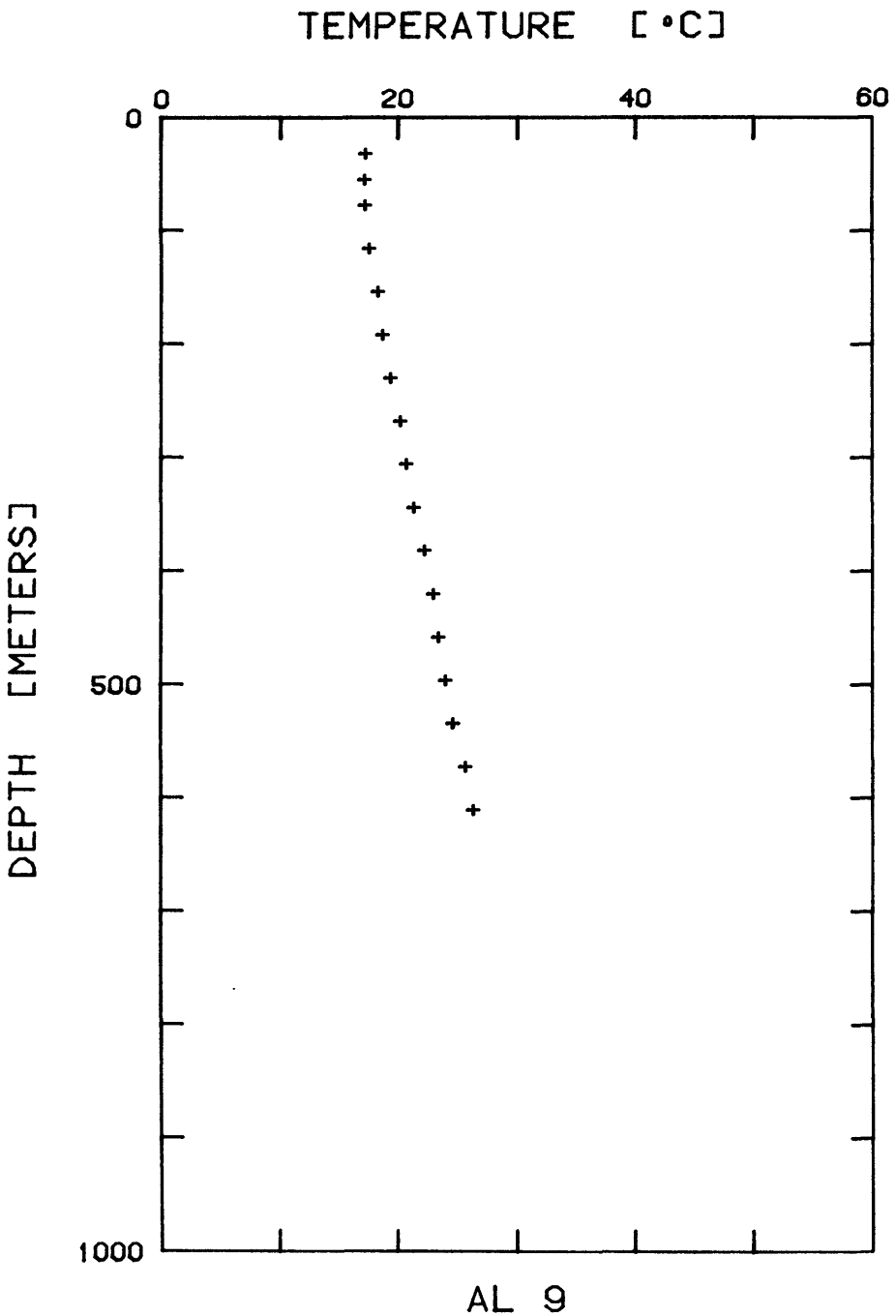
Section, Township, Range, County: NW1/4 sec. 22, T. 15 S., R. 16 W., Lamor.

Date of observations: No information.

Fluid level in drill hole: No information.

General lithology: Less-consolidated Cretaceous sediments to 161 m. Ordovician to Pennsylvanian sandstone, limestone, shale, some coal, 161-1489 m.

Remarks: Altitude = 99 m. Small gas flow outside casing. Drilled from 3/31/31 to 3/15/36. Drilling discontinued about 9 months before temperature logging. Standard rig used below 477 m.



State: AL Hole name: 9

Latitude: 33 deg 26.6 min Longitude: 86 deg 44.8 min

Gradient= 17°C/km, Intercept= 15.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.3
53.4	17.2
76.2	17.3
114.3	17.6
152.4	18.3
190.5	18.7
228.6	19.4
266.7	20.2
304.8	20.7
342.9	21.3
381.	22.2
419.1	22.9
457.2	23.4
495.3	24.
533.4	24.6
571.5	25.6
609.6	26.3

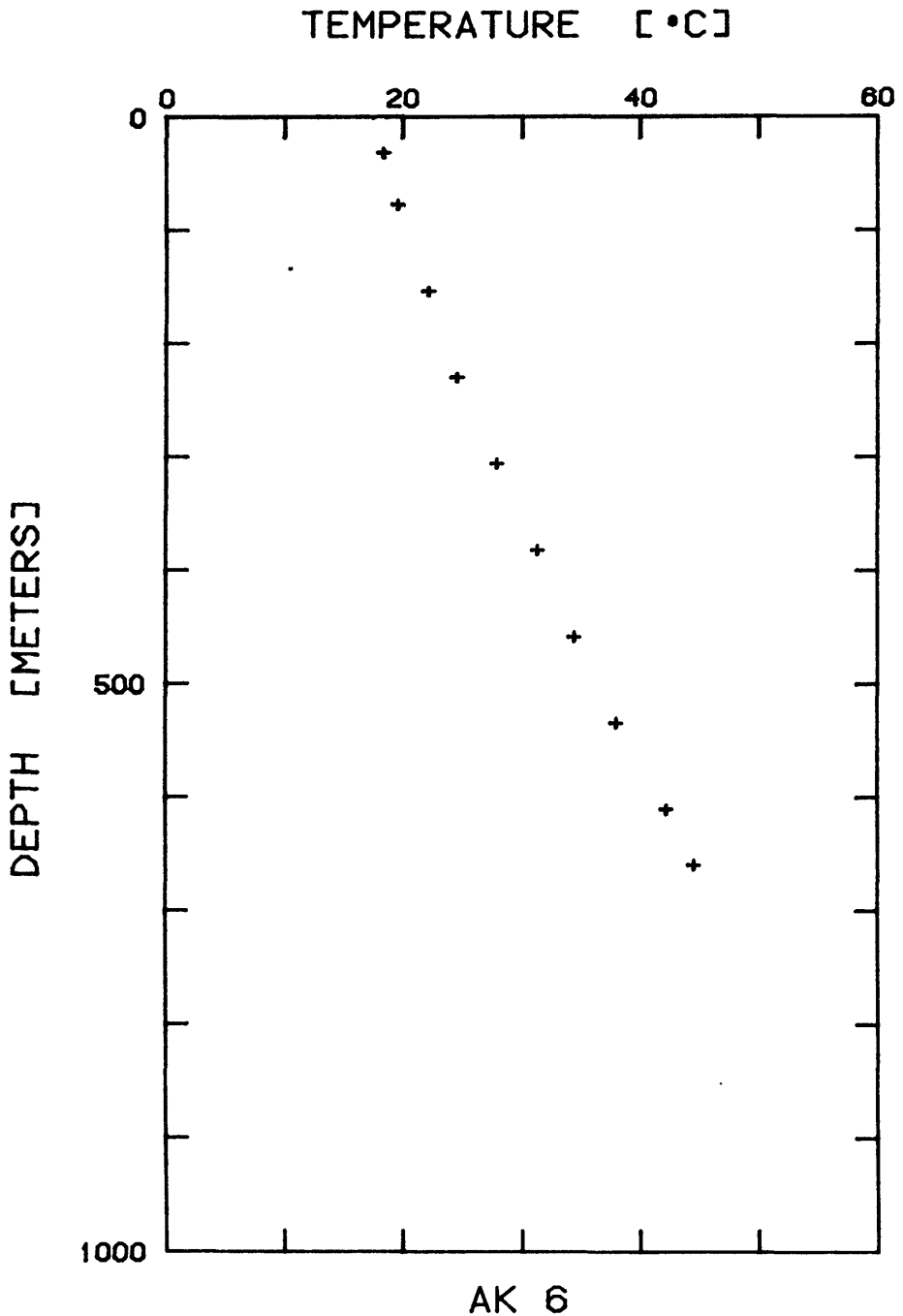
Section, Township, Range, County: NE1/4, NE1/4 sec. 28, T. 18 S., R. 2 W., Jefferson.

Date of observations: No information.

Fluid level in drill hole: 45.7 m (water).

General lithology: Coarse sandstone to 12 m; sandstone, shale, limestone to 717 m.

Remarks: Hole idle for several years. Small gas flows. Located on ridge about 61 m above valley; terrain correction may be needed.



State: AK Hole name: 6

Latitude: 33 deg 6.2 min Longitude: 92 deg 39.6 min

Gradient= 45°C/km, Intercept= 14.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	18.4
76.2	19.6
152.4	22.2
228.6	24.6
304.8	27.9
381.	31.4
457.2	34.5
533.4	38.1
609.6	42.3
658.4	44.6

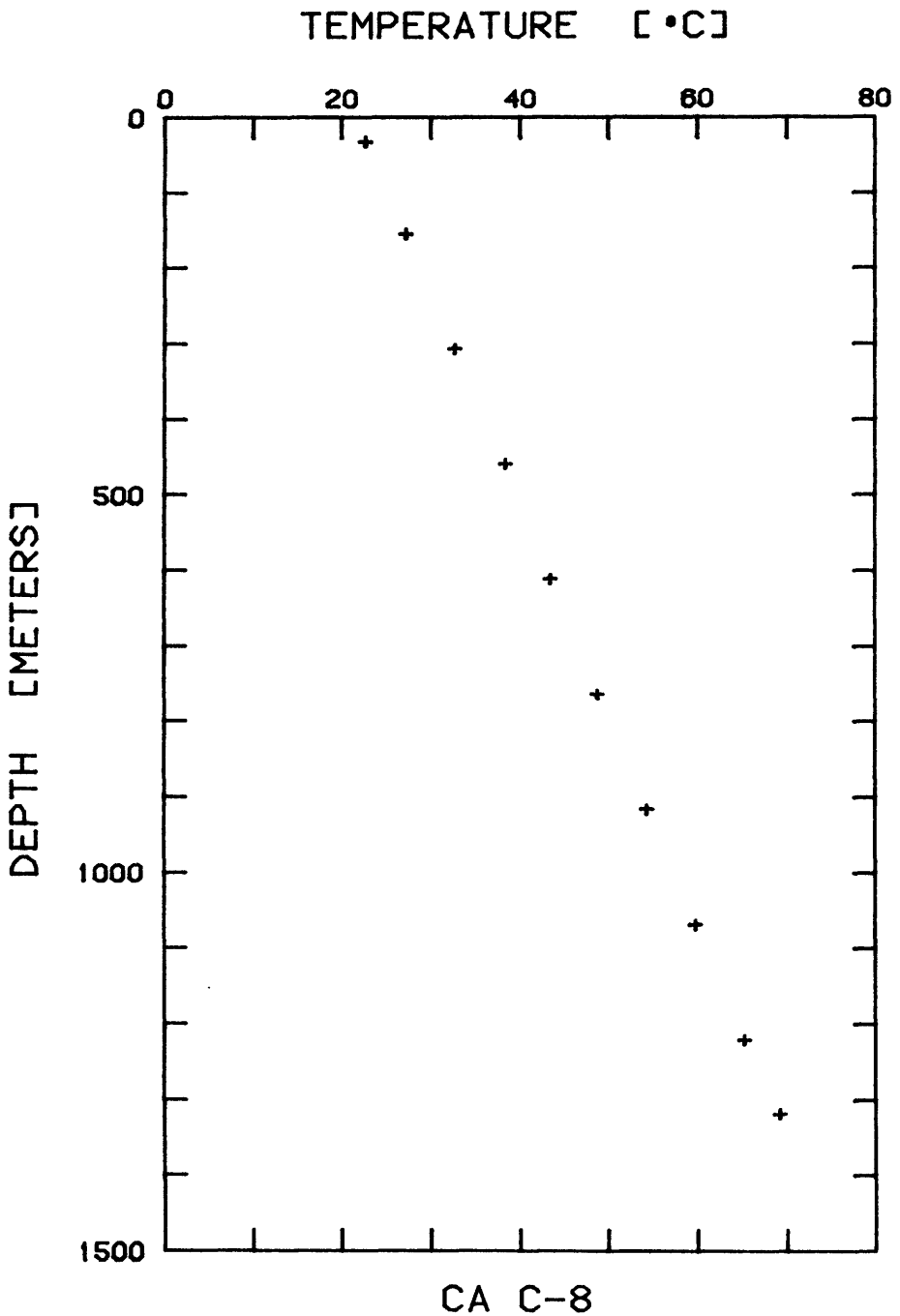
Section, Township, Range, County: Sec. 4, T. 19 S., R. 15 W., Union.

Date of observations: No information.

Fluid level in drill hole: No information.

General lithology: Upper Cretaceous and Tertiary shale, sandstone, and some limestone and clay.

Remarks: Observation at 610 m in oil. Selected from group of 7 wells.



State: CA Hole name: C-8

Latitude: 36 deg 12.4 min Longitude: 120 deg 17.6 min

Gradient= 36°C/km, Intercept= 21.9°C

Reference code: *V026

Temperature log

meters	°C
30.5	22.7
152.4	27.3
304.8	32.8
457.2	38.4
609.6	43.5
762.	48.9
914.4	54.4
1066.8	59.8
1219.2	65.3
1316.7	69.2

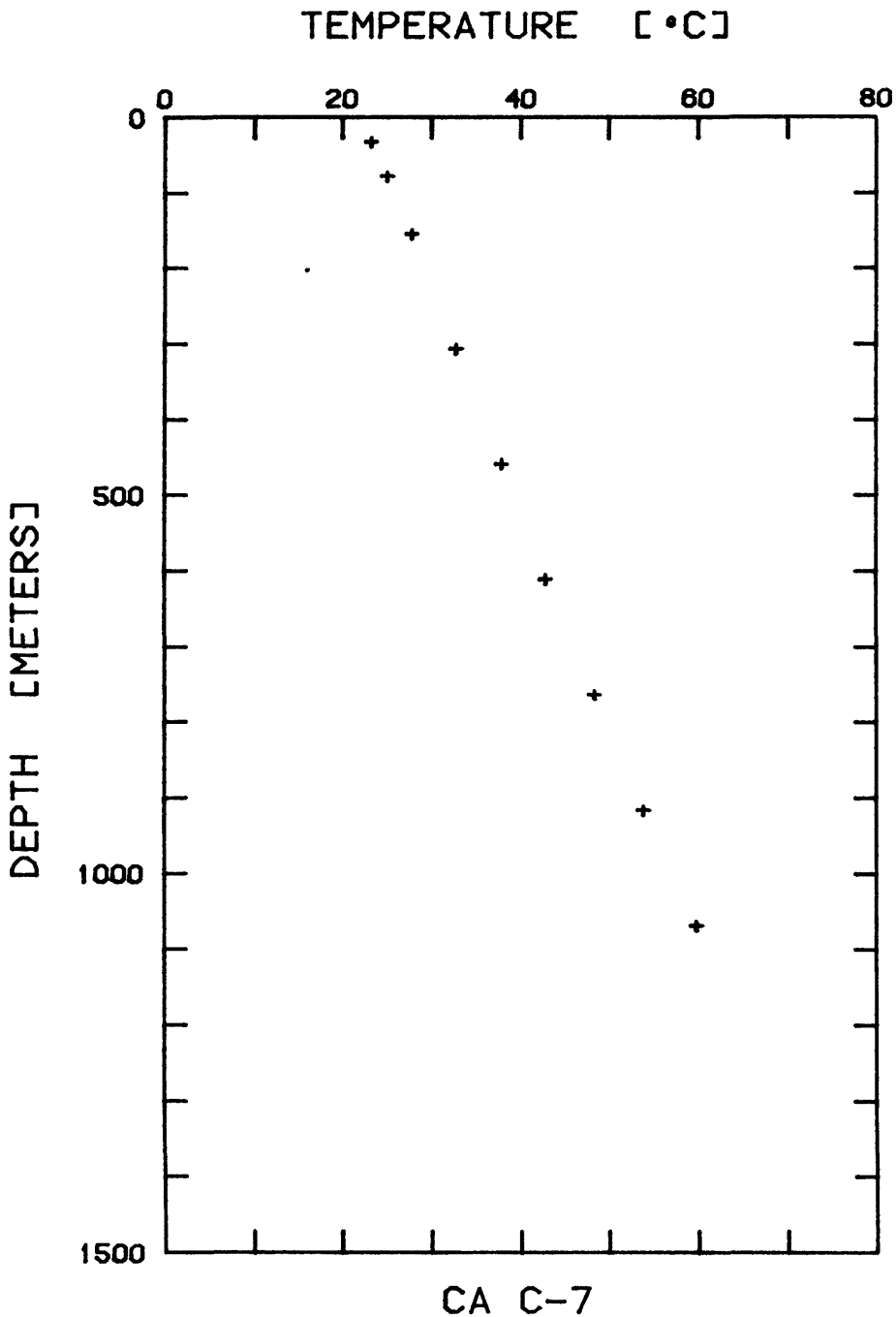
Section, Township, Range, County: NW1/4 sec. 12, T. 20 S., R. 15 E., Fresno.

Date of observations: 1920.

Fluid level in drill hole: 228 m.

General lithology: No information.

Remarks: Idle one month or less. Total depth = 1389 m. Selected from group of 57 wells.



State: CA Hole name: C-7

Latitude: 36 deg 12.2 min Longitude: 120 deg 17.5 min

Gradient= 35°C/km, Intercept= 21.9°C

Reference code: SP 64

Temperature log

meters	°C
30.5	23.3
76.2	25.1
152.4	27.8
304.8	32.8
457.2	37.9
609.6	42.9
762.	48.4
914.4	53.9
1066.8	59.8

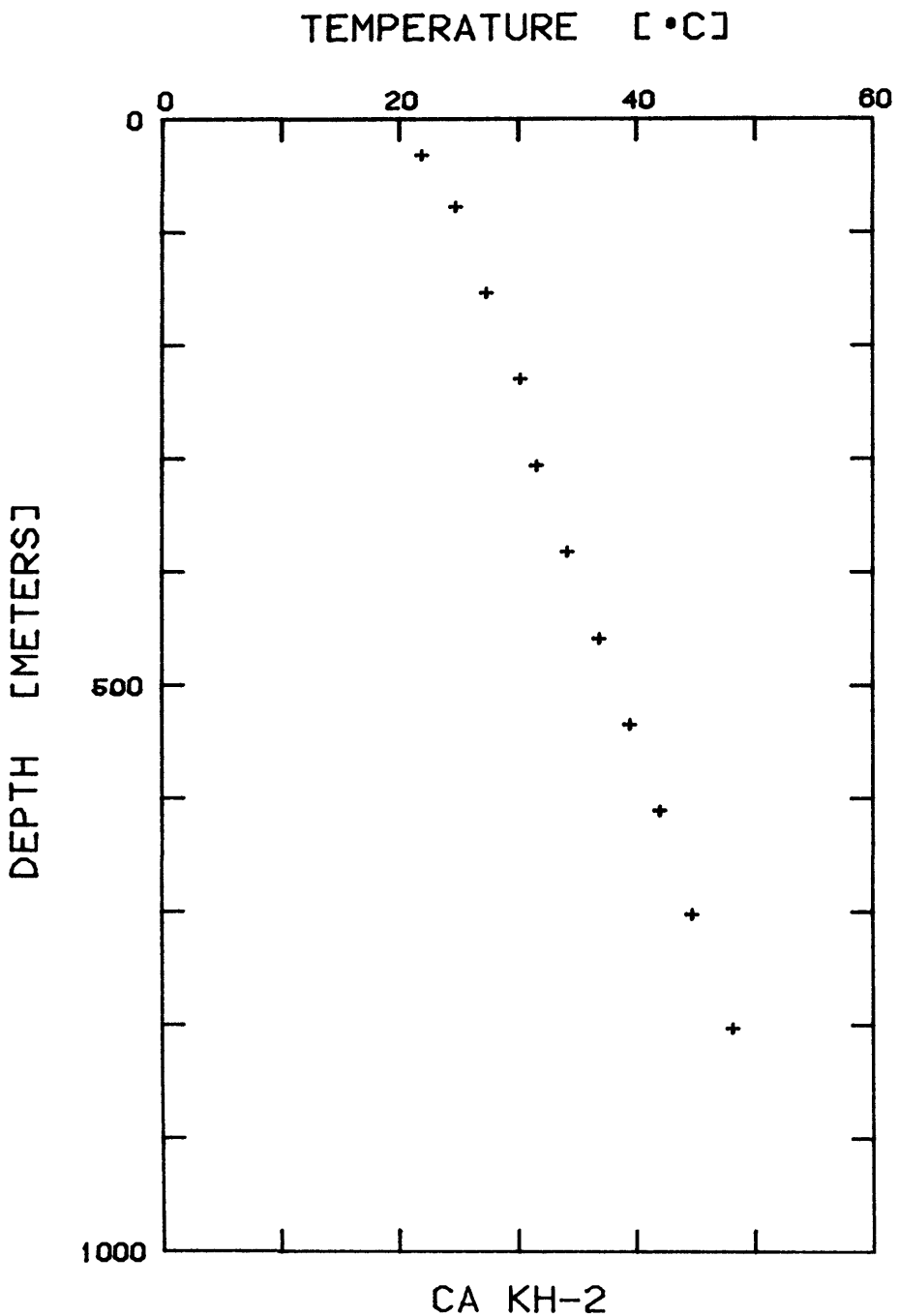
Section, Township, Range, County: NE1/4 sec. 12, T. 20 S., R. 15 E., Fresno.

Date of observations: 1920.

Fluid level in drill hole: 37 m.

General lithology: No information.

Remarks: Idle six months (?). Total depth = 1387 m. Selected from group of 57 wells.



State: CA Hole name: KH-2

Latitude: 36 deg 2.8 min Longitude: 120 deg 7.1 min

Gradient= 34°C/km, Intercept= 21.0°C

Reference code: SP 64

Temperature log

meters	°C
30.5	21.7
76.2	24.6
152.4	27.1
228.6	30.
304.8	31.4
381.	34.
457.2	36.7
533.4	39.3
609.6	41.8
701.	44.5
801.6	47.9

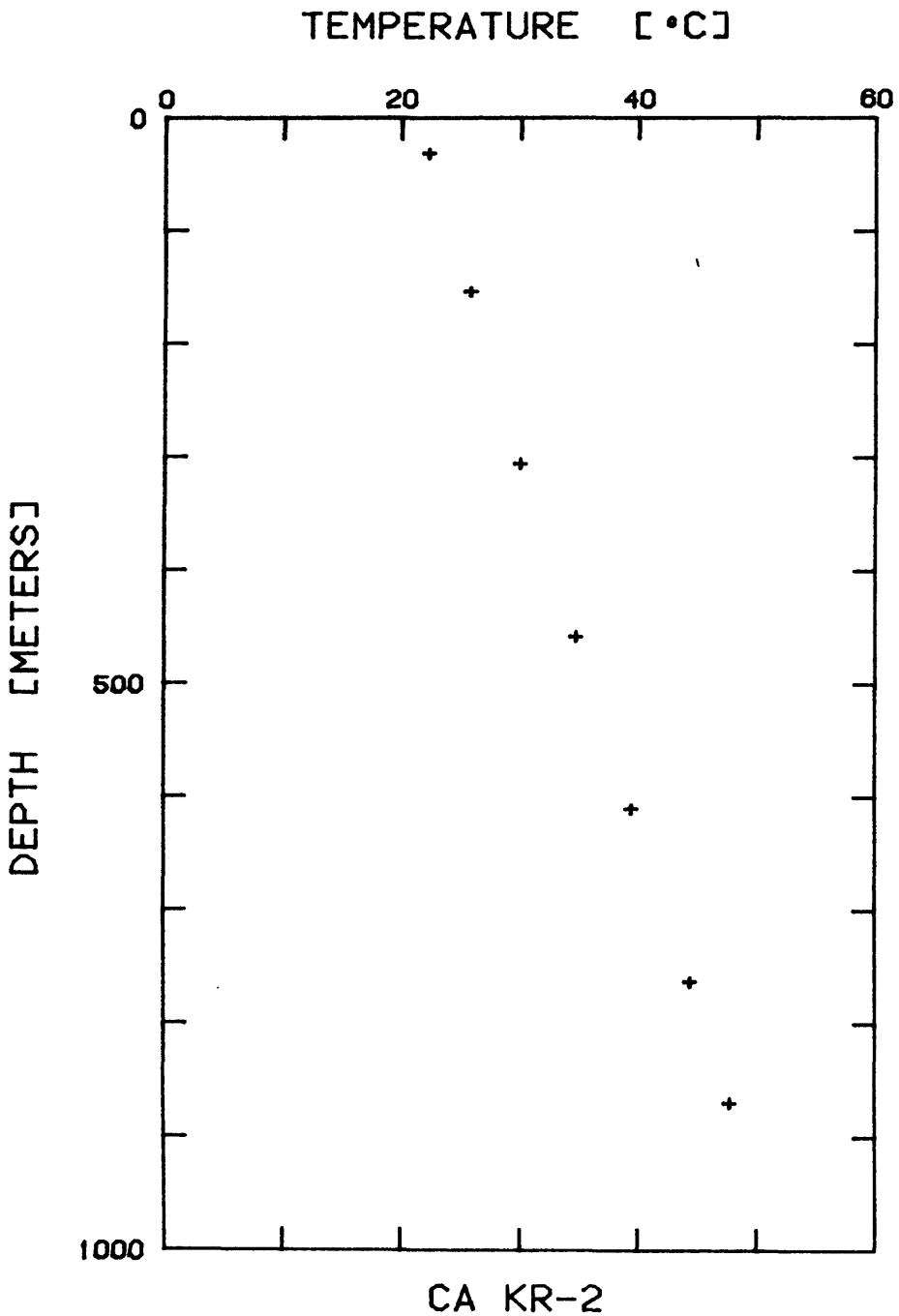
Section, Township, Range, County: Sec. 3, T. 22 S., R. 17 E., Kings.

Date of observations: 1930 or 1931.

Fluid level in drill hole: At surface.

General lithology: No information.

Remarks: No gas. Selected from group of 5 holes.



State: CA Hole name: KR-2

Latitude: 35 deg 32.2 min Longitude: 119 deg 1.1 min

Gradient= 32°C/km, Intercept= 20.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	22.3
152.4	25.8
304.8	30.
457.2	34.8
609.6	39.5
762.	44.4
868.7	47.7

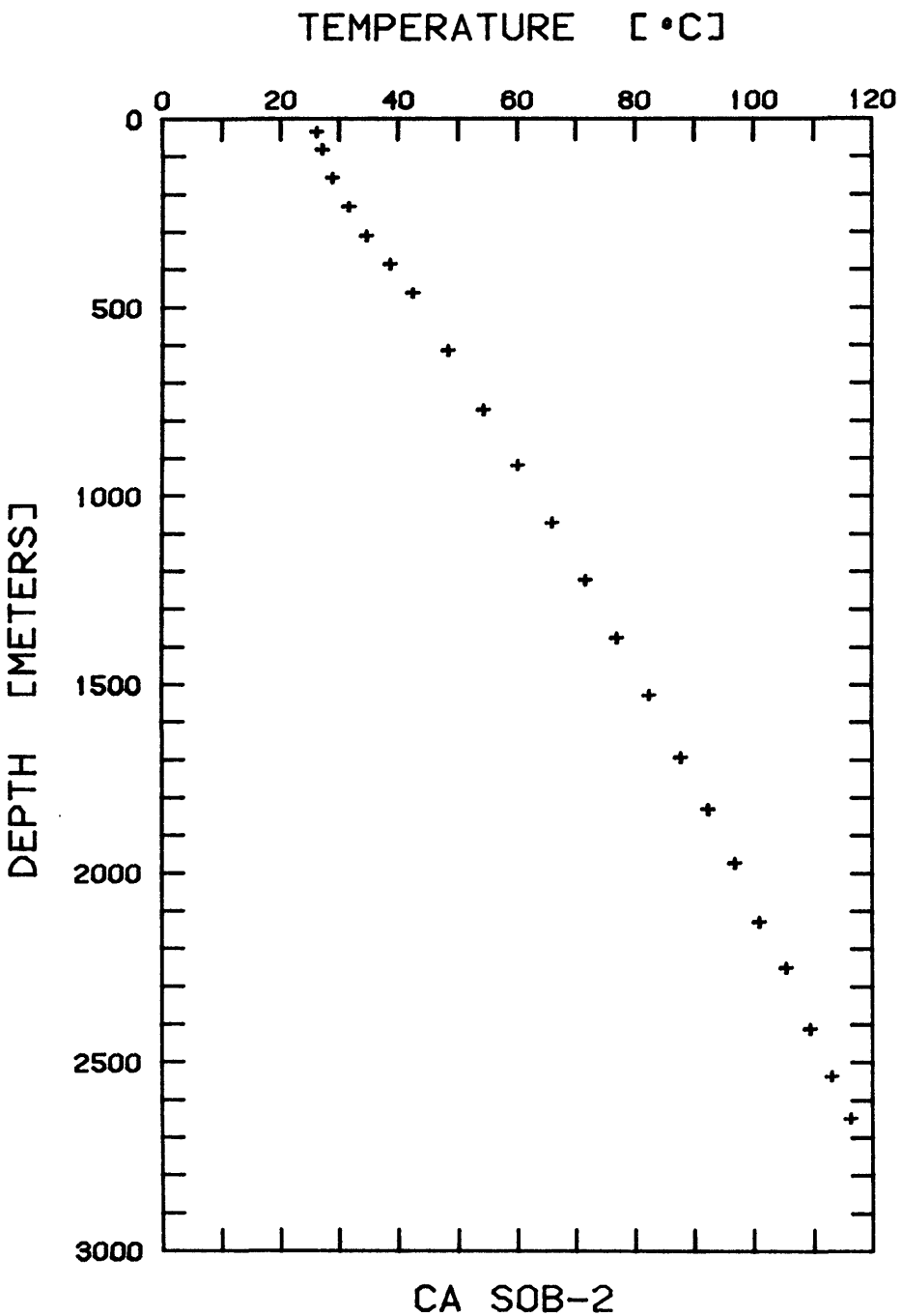
Section, Township, Range, County: Sec. 36, T. 27 S., R. 27 E., Kern.

Date of observations: 12/21.

Fluid level in drill hole: 100 m.

General lithology: Sandstone, shale, shell, clay to 1059 m. Show of gas at 835 and 840 m.

Remarks: Altitude = 183 m. Drilling discontinued during test. Small oil production. Selected from group of 7 wells.



State: CA Hole name: SOB-2

Latitude: 35 deg 27.8 min Longitude: 119 deg 45.1 min

Gradient= 35°C/km, Intercept= 28.2°C

Reference code: *BE47

Temperature log

meters	°C
30.5	26.22
76.2	27.22
152.4	28.89
228.6	31.67
304.8	34.72
381.	38.77
457.2	42.5
609.6	48.44
768.1	54.33
914.4	60.11
1066.8	65.95
1219.2	71.78
1371.6	77.11
1524.	82.5
1688.6	87.84
1825.7	92.39
1969.	96.95
2124.5	101.06
2246.4	105.44
2407.9	109.39
2532.9	113.
2645.7	116.22

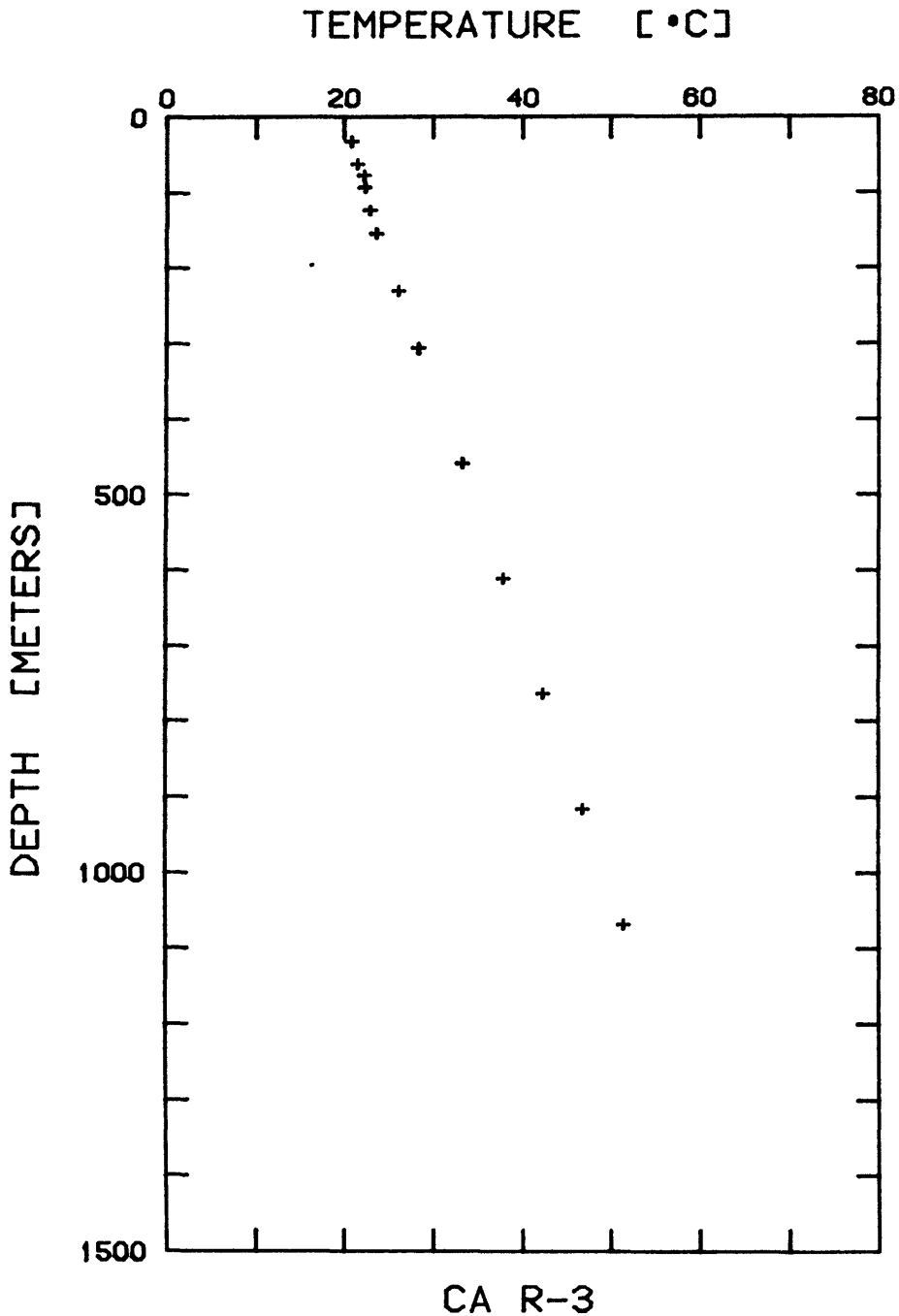
Section, Township, Range, County: Sec. 30, T. 28 S., R. 21 E., Kern.

Date of observations: 6/36.

Fluid level in drill hole: At top of casing.

General lithology: No information.

Remarks: Altitude = 207 m. Idle about 14 months. Small gas flow when tested. Total depth = 3468 m.



State: CA Hole name: R-3

Latitude: 34 deg 21.3 min Longitude: 119 deg 25.9 min

Gradient= 30°C/km, Intercept= 19.3°C

Reference code: *V051

Temperature log

meters	°C
30.5	20.9
61.	21.6
76.2	22.3
91.4	22.4
121.9	23.
152.4	23.8
228.6	26.2
304.8	28.4
457.2	33.3
609.6	37.9
762.	42.4
914.4	46.9
1066.8	51.5

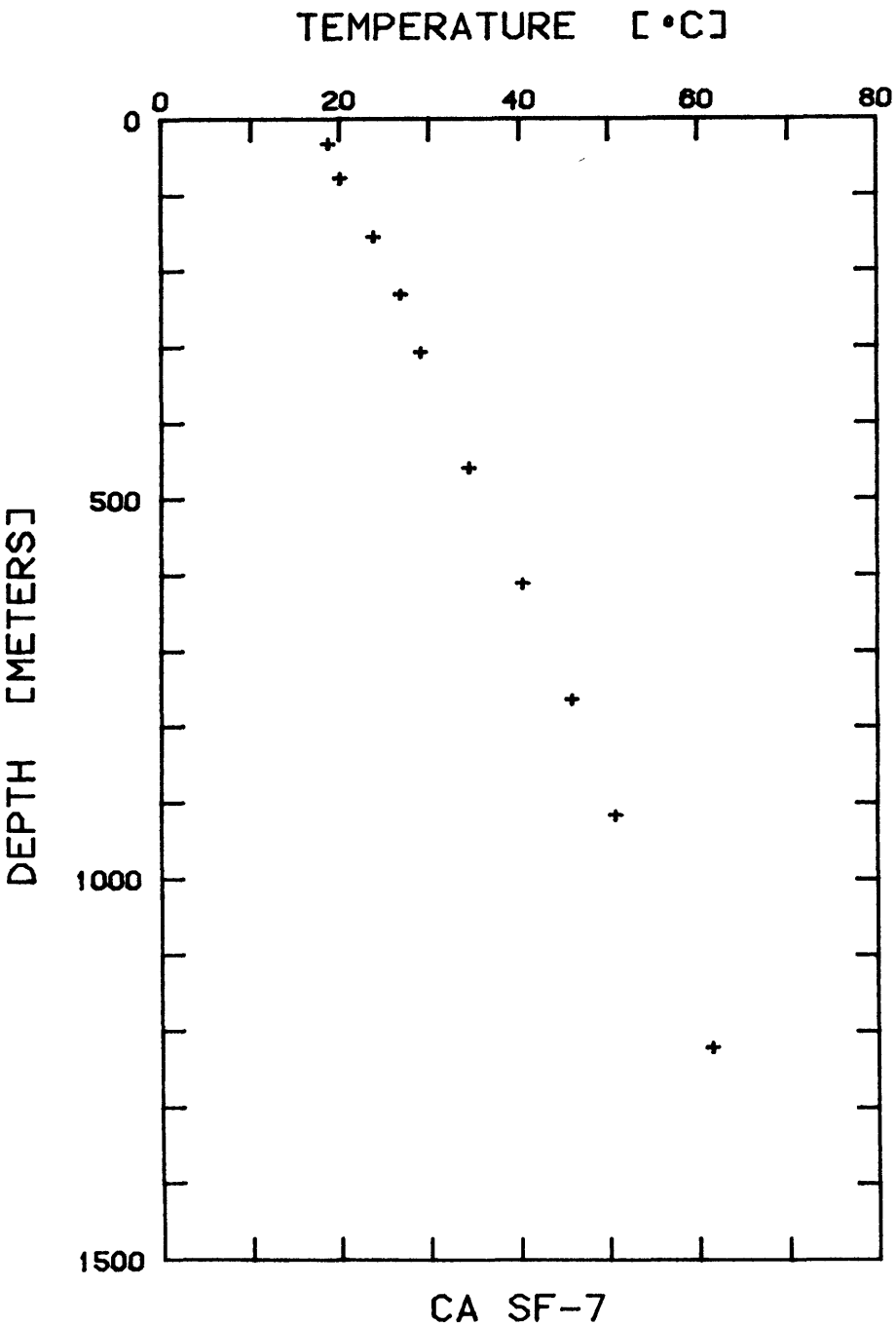
Section, Township, Range, County: Sec. 8, T. 3 N., R. 24 W., Ventura.

Date of observations: 1935.

Fluid level in drill hole: No information.

General lithology: Hard sand with boulders, shale to 457 m.

Remarks: Altitude = 17 m. Located inland about 91.5 m from shore. Measurements at 61 m in air; at 76 m and below, measurements in fluid. Idle about four years. Total depth = 1375 m. Selected from group of 3 wells.



State: CA Hole name: SF-7

Latitude: 33 deg 57.0 min Longitude: 118 deg 4.5 min

Gradient= 35°C/km, Intercept= 18.9°C

Reference code: *CA30

Temperature log

meters	°C
30.5	18.8
76.2	20.2
152.4	23.9
228.6	26.9
304.8	29.1
457.2	34.5
609.6	40.3
762.	45.9
914.4	50.8
1219.2	61.5

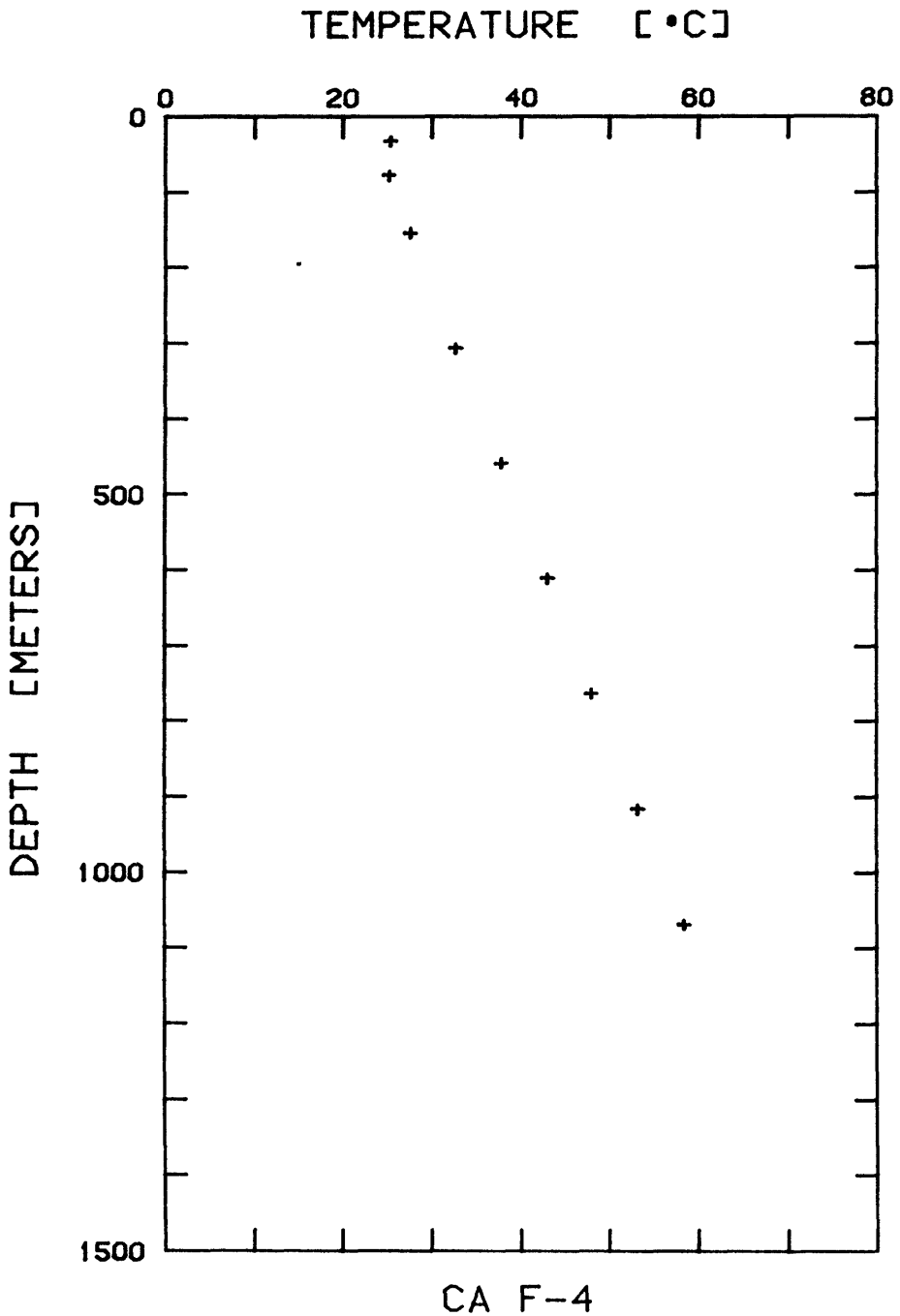
Section, Township, Range, County: Sec. 31, T. 2 S., R. 11 W., Los Angeles.

Date of observations: 1928.

Fluid level in drill hole: 493 m.

General lithology: No information.

Remarks: Altitude = 46 m. An old producer; idle two years.



State: CA Hole name: F-4

Latitude: 33 deg 54.2 min Longitude: 117 deg 56.4 min

Gradient= 34°C/km, Intercept= 22.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	25.4
76.2	25.3
152.4	27.7
304.8	32.7
457.2	37.8
609.6	43.
762.	48.1
914.4	53.3
1066.8	58.5

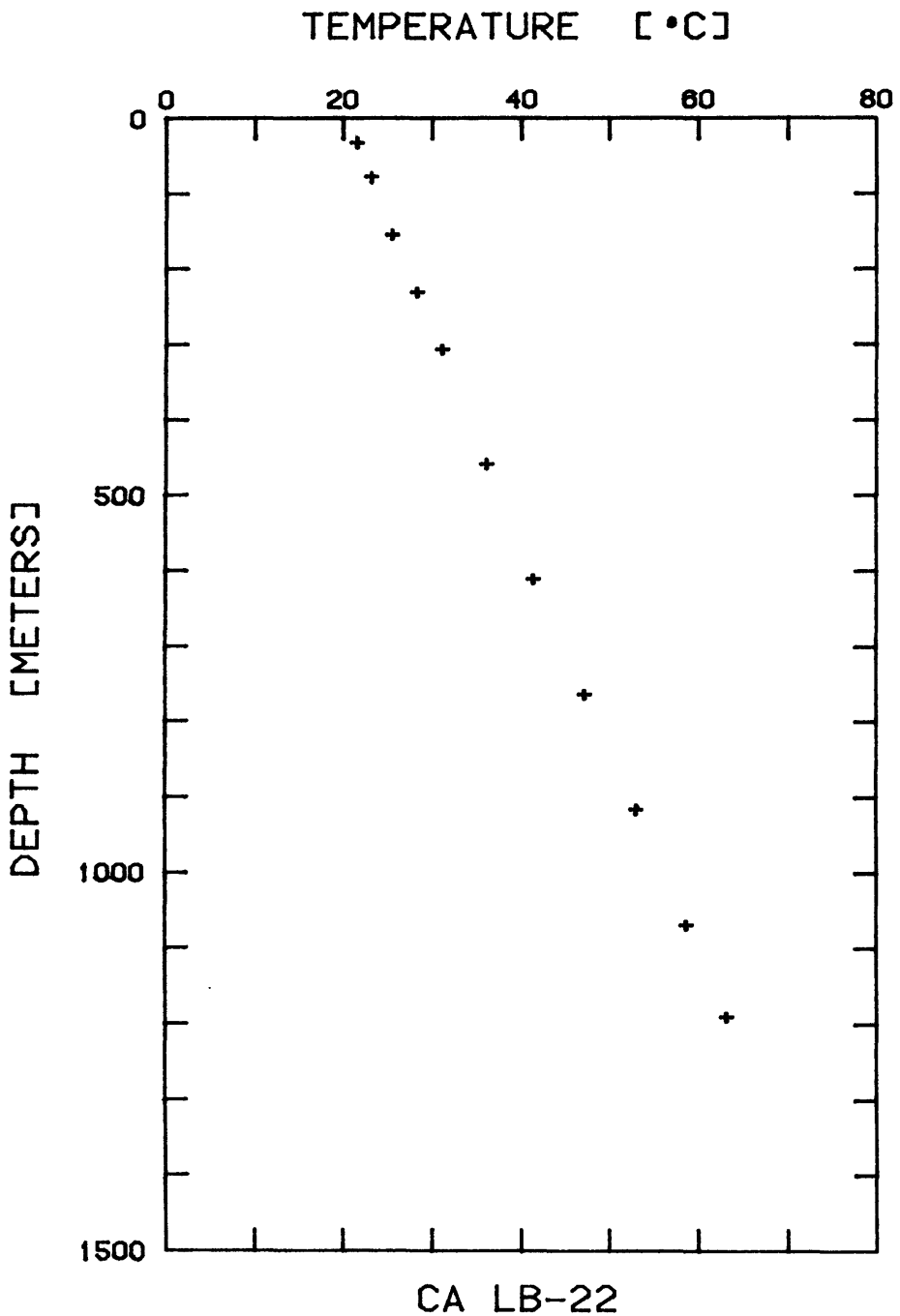
Section, Township, Range, County: Sec. 17, T. 3 S., R. 10 W., Orange.

Date of observations: Summer 1920.

Fluid level in drill hole: 228 m.

General lithology: Sandy shale, blue shale.

Remarks: Altitude = 123 m. Located at bottom of narrow ravine; walls about 30 m above well.



State: CA Hole name: LB-22

Latitude: 33 deg 49.1 min Longitude: 118 deg 11.2 min

Gradient= 37°C/km, Intercept= 19.2°C

Reference code: *CA30

Temperature log

meters	°C
30.5	21.6
76.2	23.2
152.4	25.6
228.6	28.4
304.8	31.2
457.2	36.2
609.6	41.4
762.	47.3
914.4	53.1
1066.8	58.8
1188.7	63.2

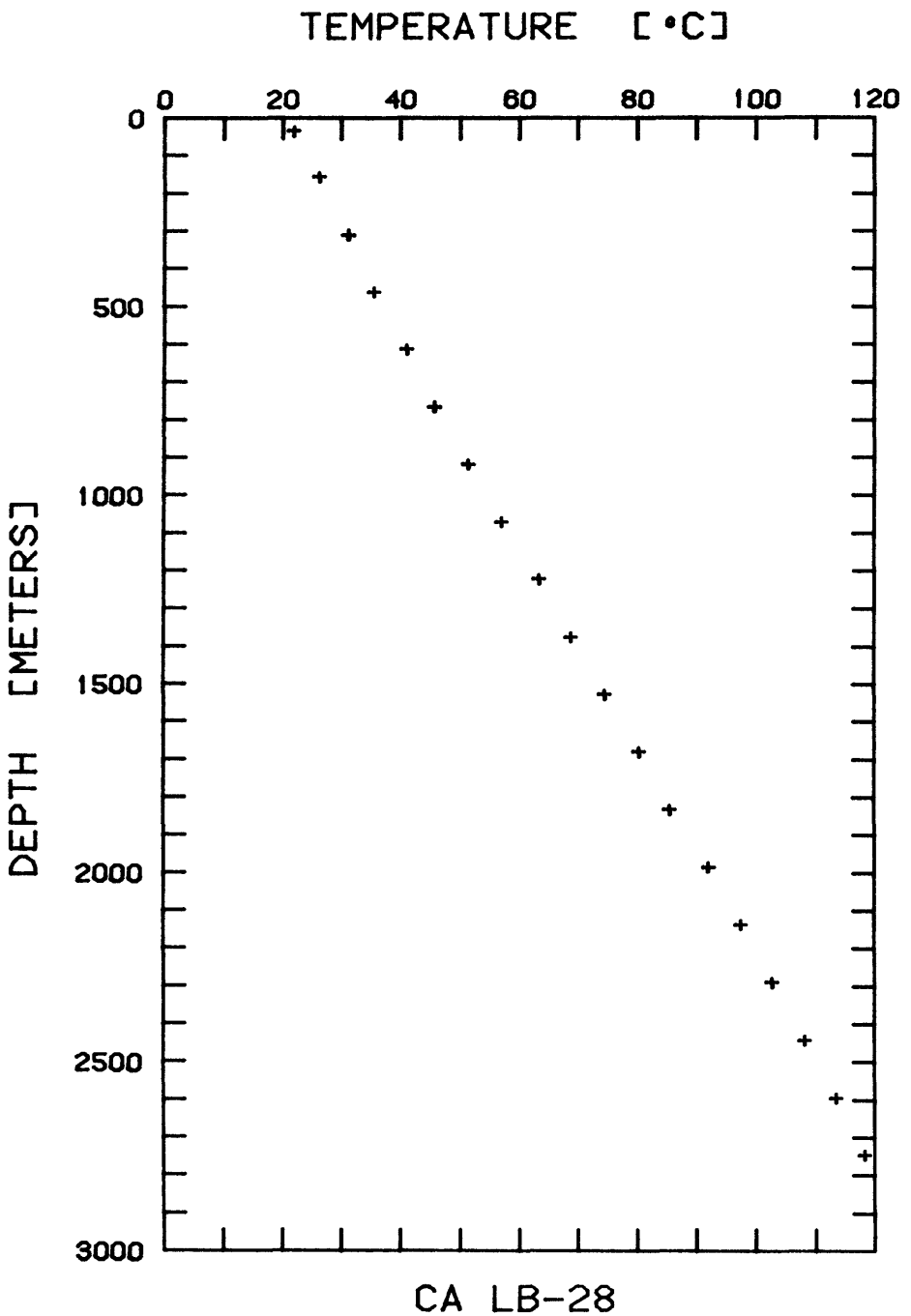
Section, Township, Range, County: Los Angeles.

Date of observations: 1926.

Fluid level in drill hole: 131 m.

General lithology: No information.

Remarks: Idle about six months. Observer (C. E. Van Orstrand) considered well in complete equilibrium for temperature test; results excellent. Selected from group of 53 wells.



State: CA Hole name: LB-28

Latitude: 33 deg 48.0 min Longitude: 118 deg 9.9 min

Gradient= 37°C/km, Intercept= 18.4°C

Reference code: *V041

Temperature log

meters	°C
30.5	21.9
152.4	26.4
304.8	31.3
457.2	35.7
609.6	41.2
762.	45.8
914.4	51.5
1066.8	57.1
1219.2	63.4
1371.6	68.9
1524.	74.6
1676.4	80.4
1828.8	85.7
1981.2	92.1
2133.6	97.5
2286.	102.7
2438.4	108.2
2590.8	113.5
2743.2	118.3

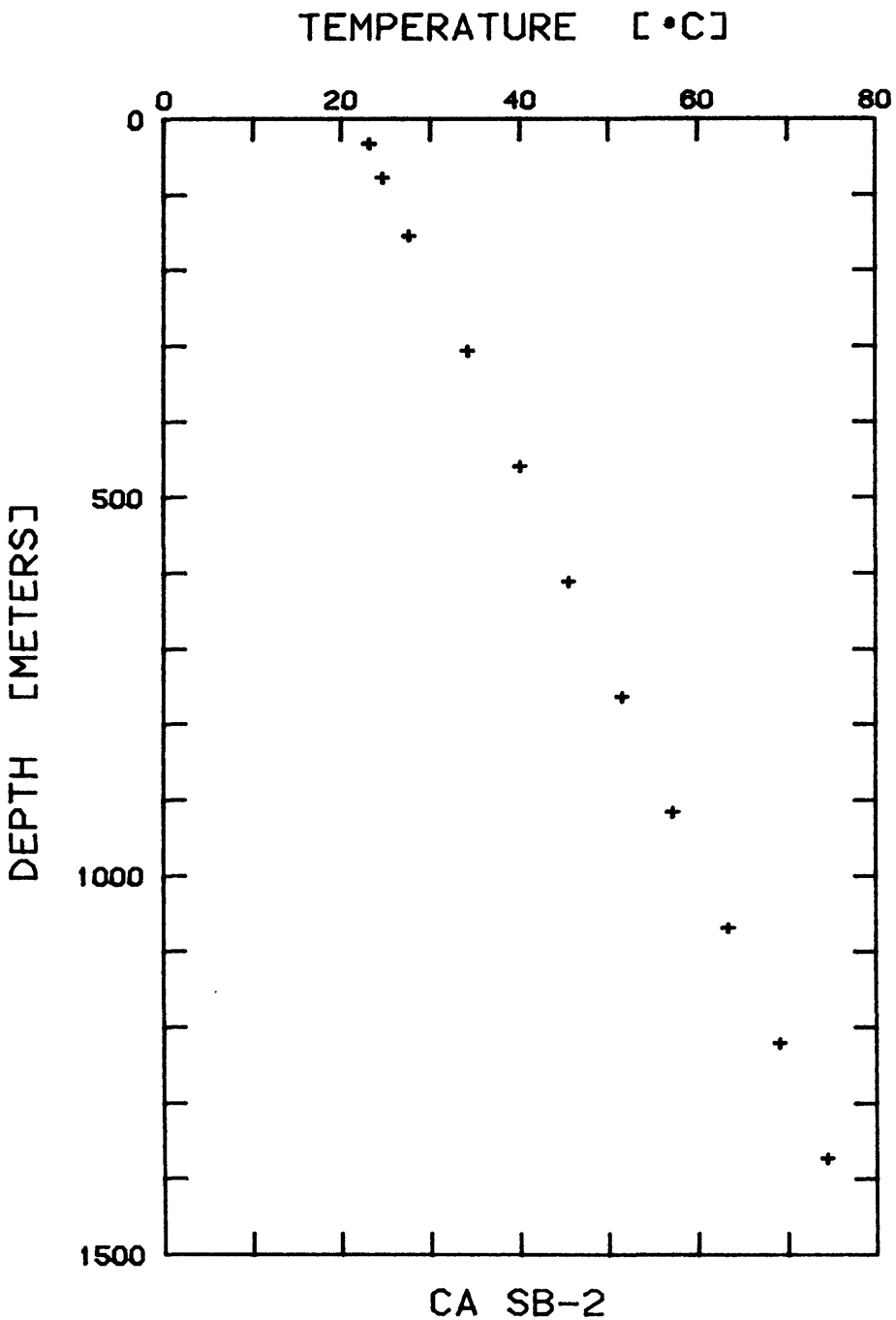
Section, Township, Range, County: Los Angeles.

Date of observations: 6/36.

Fluid level in drill hole: At surface.

General lithology: No information.

Remarks: Idle several years.



State: CA Hole name: SB-2

Latitude: 33 deg 46.2 min Longitude: 118 deg 7.4 min

Gradient= 38°C/km, Intercept= 22.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	23.2
76.2	24.7
152.4	27.7
304.8	34.2
457.2	40.1
609.6	45.6
762.	51.6
914.4	57.3
1066.8	63.4
1219.2	69.1
1371.6	74.4

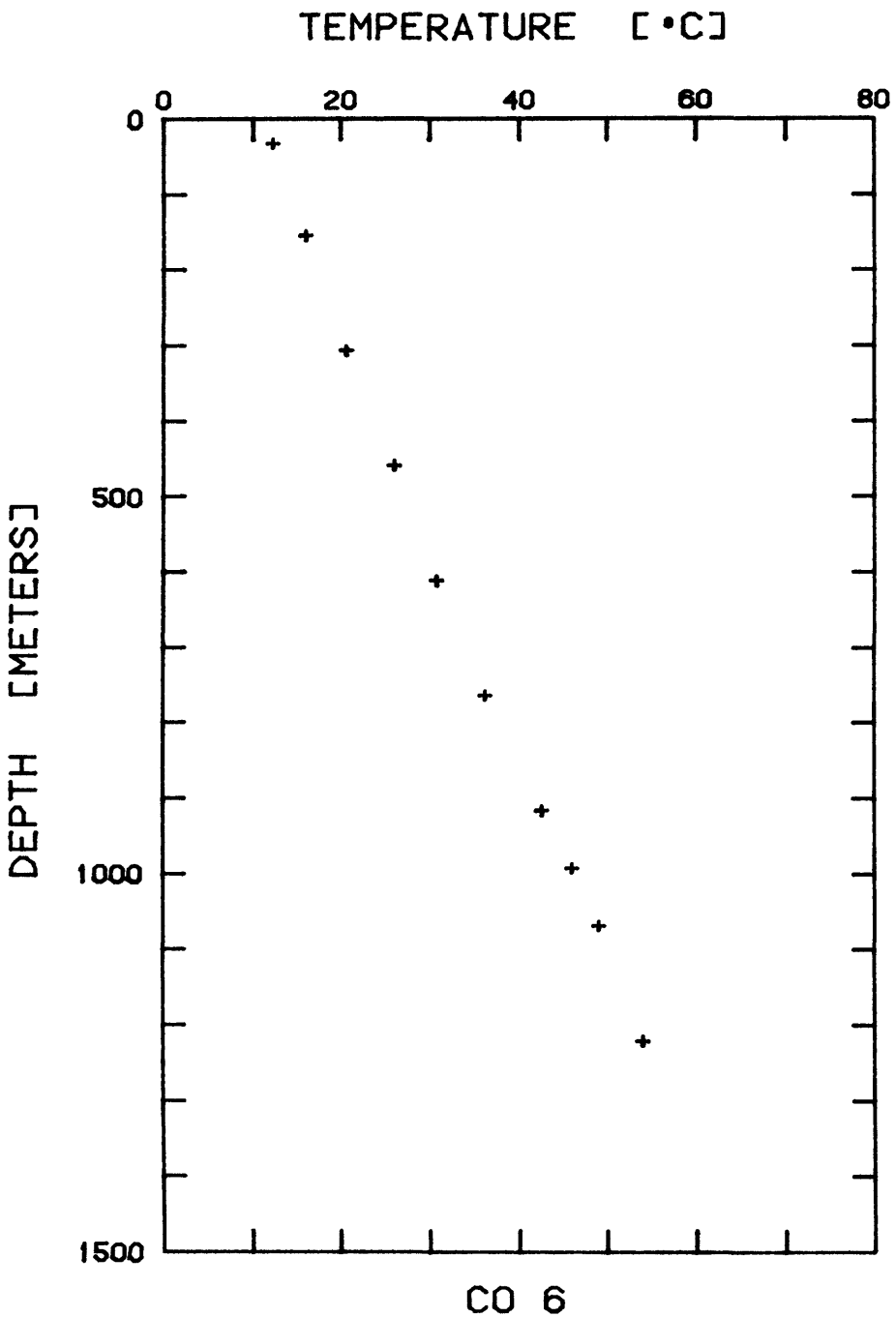
Section, Township, Range, County: Los Angeles.

Date of observations: 1931.

Fluid level in drill hole: No information.

General lithology: Miocene to Pleistocene sandstones, siltstones, shales.

Remarks: Water between 914 and 1067 m. May have been recently produced. Selected from group of 5 wells.



State: CO

Hole name: 6

Latitude: 40 deg 45.8 min

Longitude: 105 deg 1.6 min

Gradient= 36°C/km,

Intercept= 9.6°C

Reference code: SP 64

Temperature log

meters	°C
30.5	12.4
152.4	16.1
304.8	20.7
457.2	26.1
609.6	30.8
762.	36.3
914.4	42.6
990.6	46.1
1066.8	49.1
1219.2	54.1

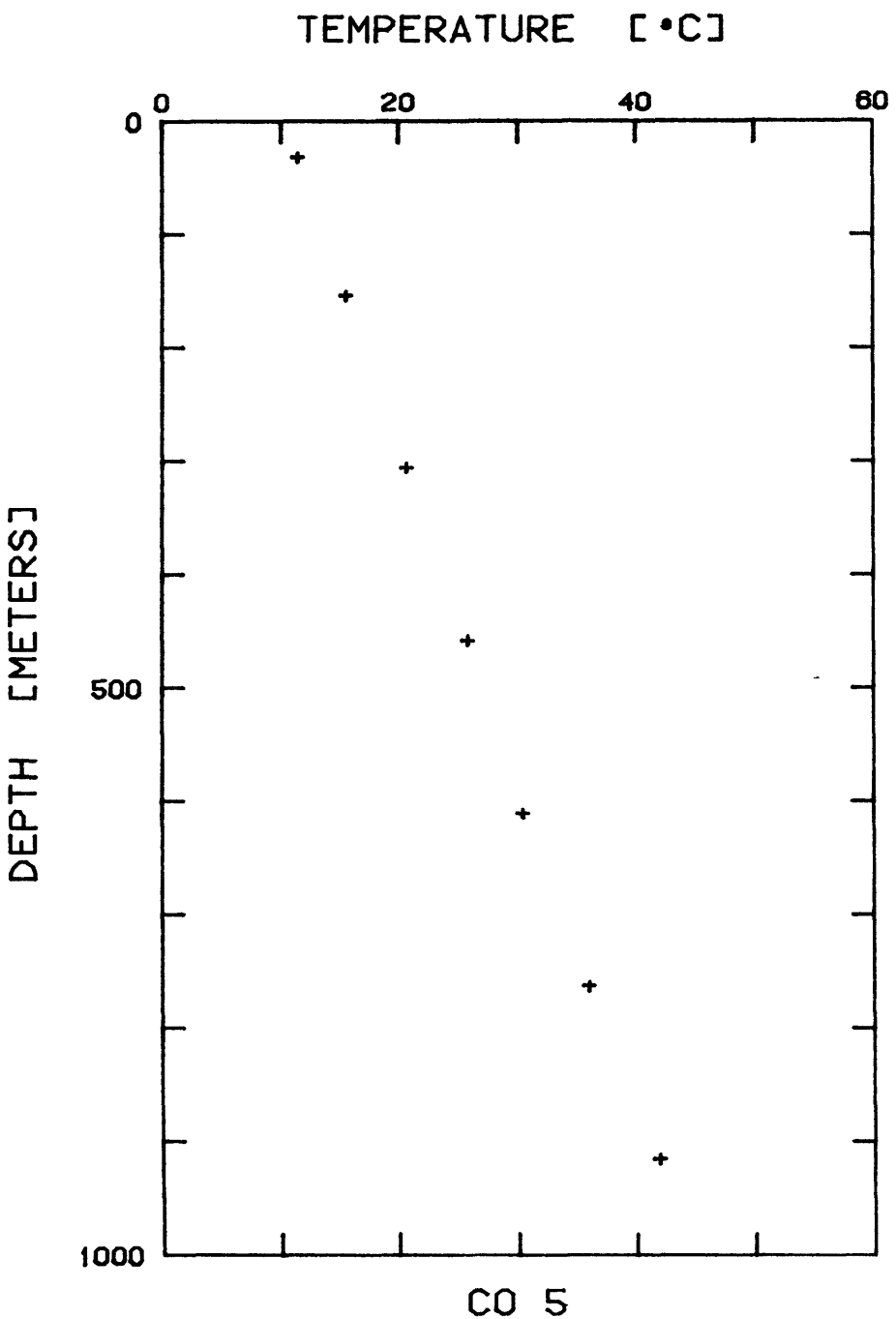
Section, Township, Range, County: SW1/4, NE1/4, sec. 8, T. 9 N., R. 68 W., Larimer

Date of observations: 1925 or 1926.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Total depth = 1542 m. 87 m of oil in hole.



State: CO Hole name: 5

Latitude: 40 deg 44.4 min Longitude: 105 deg 3.0 min

Gradient= 33°C/km, Intercept= 10.5°C

Reference code: SP 64

Temperature log

meters	°C
30.5	11.5
152.4	15.6
304.8	20.7
457.2	25.8
609.6	30.4
762.	36.
914.4	41.9

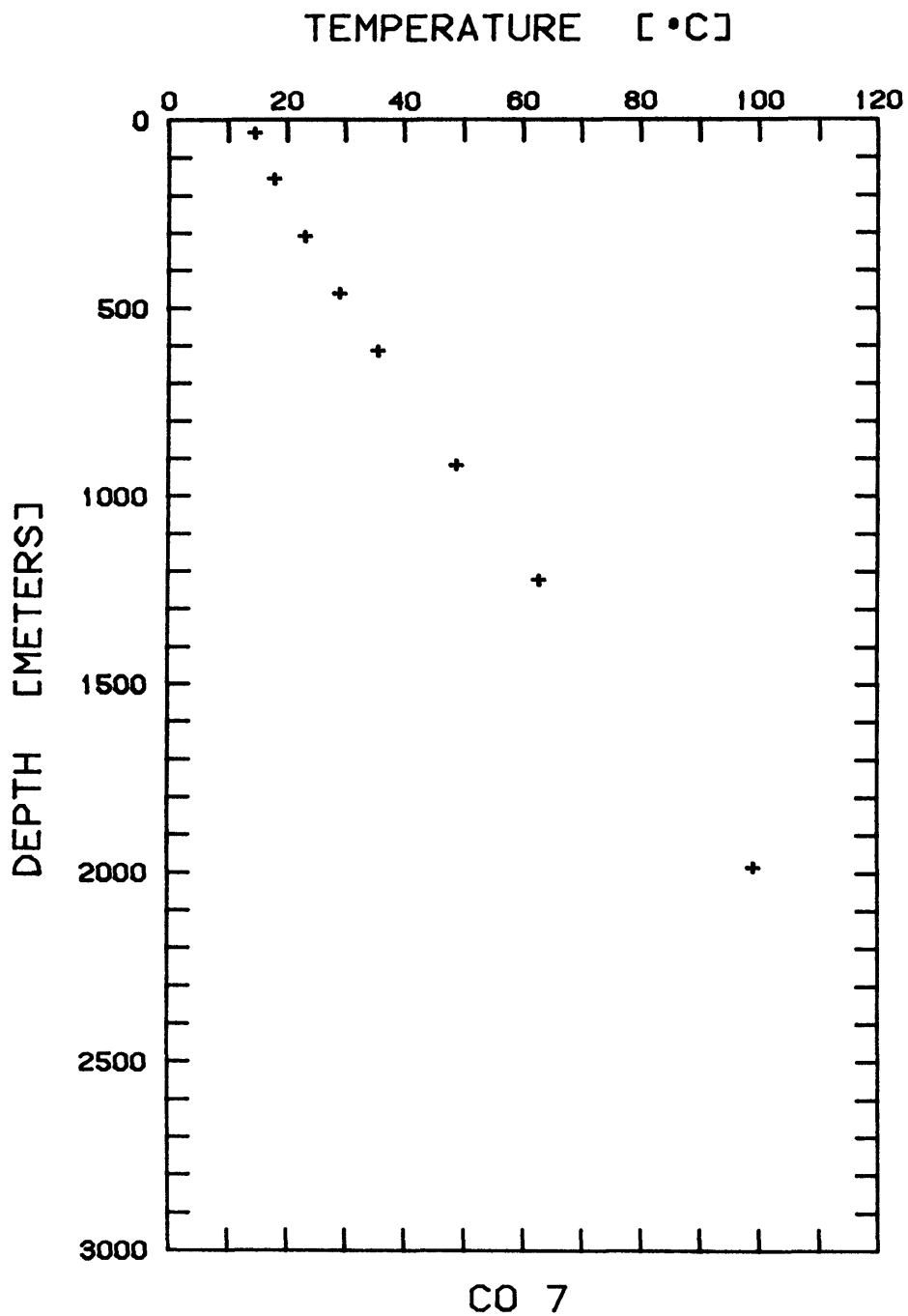
Section, Township, Range, County: Center NE1/4, NW1/4 sec. 19, T. 9 N., R. 68 W., Larimer.

Date of observations: 1920's.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Altitude = 1615 m. Temperature measurements probably made during lull in drilling operations. Total depth = 1513 m.



State: CO Hole name: 7

Latitude: 40 deg 5.5 min Longitude: 105 deg 6.4 min

Gradient= 44°C/km, Intercept= 9.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.5
152.4	17.9
304.8	23.3
457.2	29.2
609.6	35.7
914.4	48.8
1219.2	62.7
1981.2	99.1

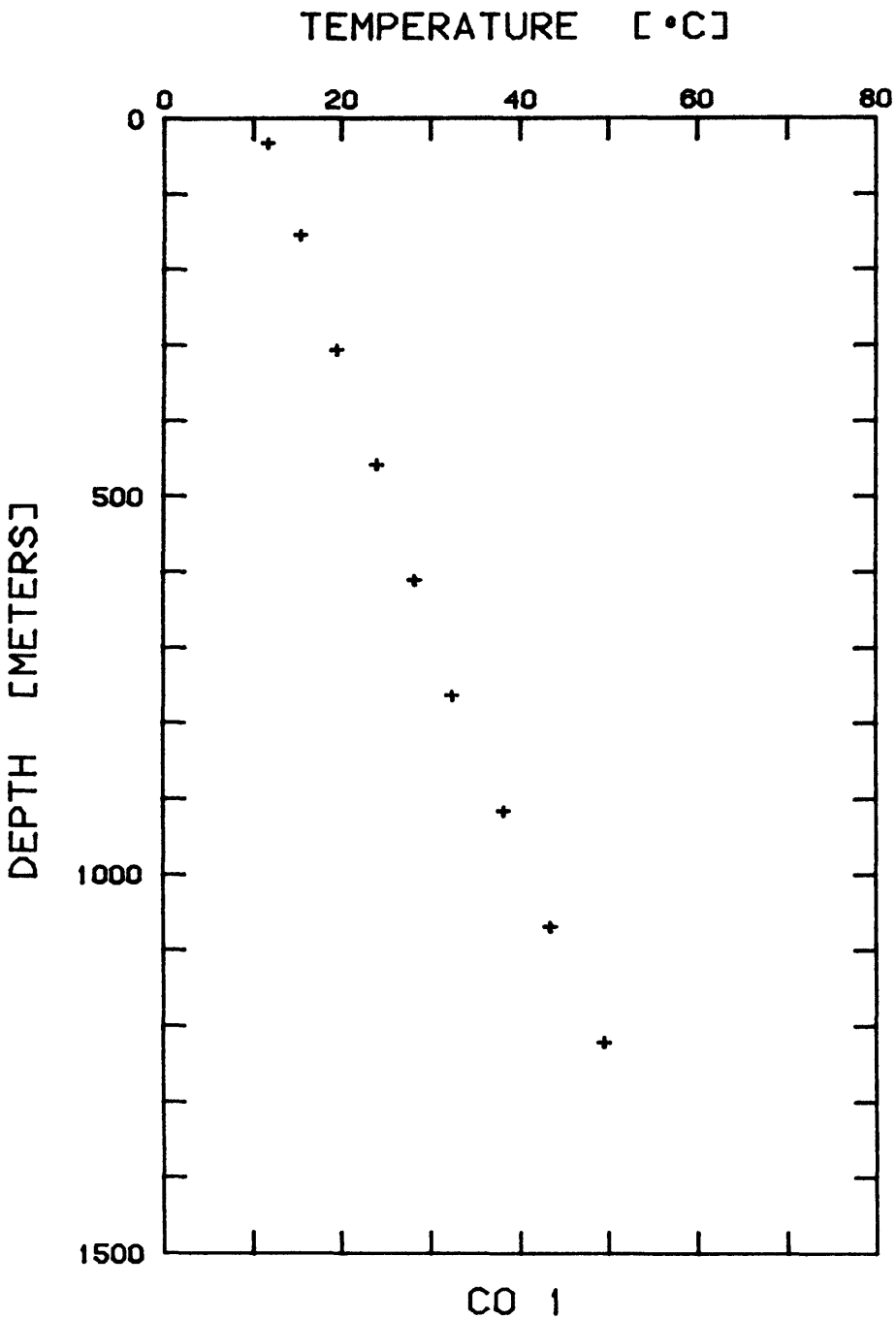
Section, Township, Range, County: SW1/4 sec. 34, T. 2 N., R. 69 W., Boulder.

Date of observations: 1925 or 1926.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Total depth = 2234 m. Altitude about 1509 m. Drilling begun 7/17/24 and finished 10/16/25 (standard tools). Temperature measurements probably made while drilling operations were in progress; observation at 1981 m probably made near bottom of hole on wire-line and is too high.



State: CO Hole name: 1

Latitude: 39 deg 0.3 min Longitude: 104 deg 20.2 min

Gradient= 33°C/km, Intercept= 8.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	11.7
152.4	15.4
304.8	19.6
457.2	24.1
609.6	28.3
762.	32.5
914.4	38.2
1067.	43.4
1219.2	49.6

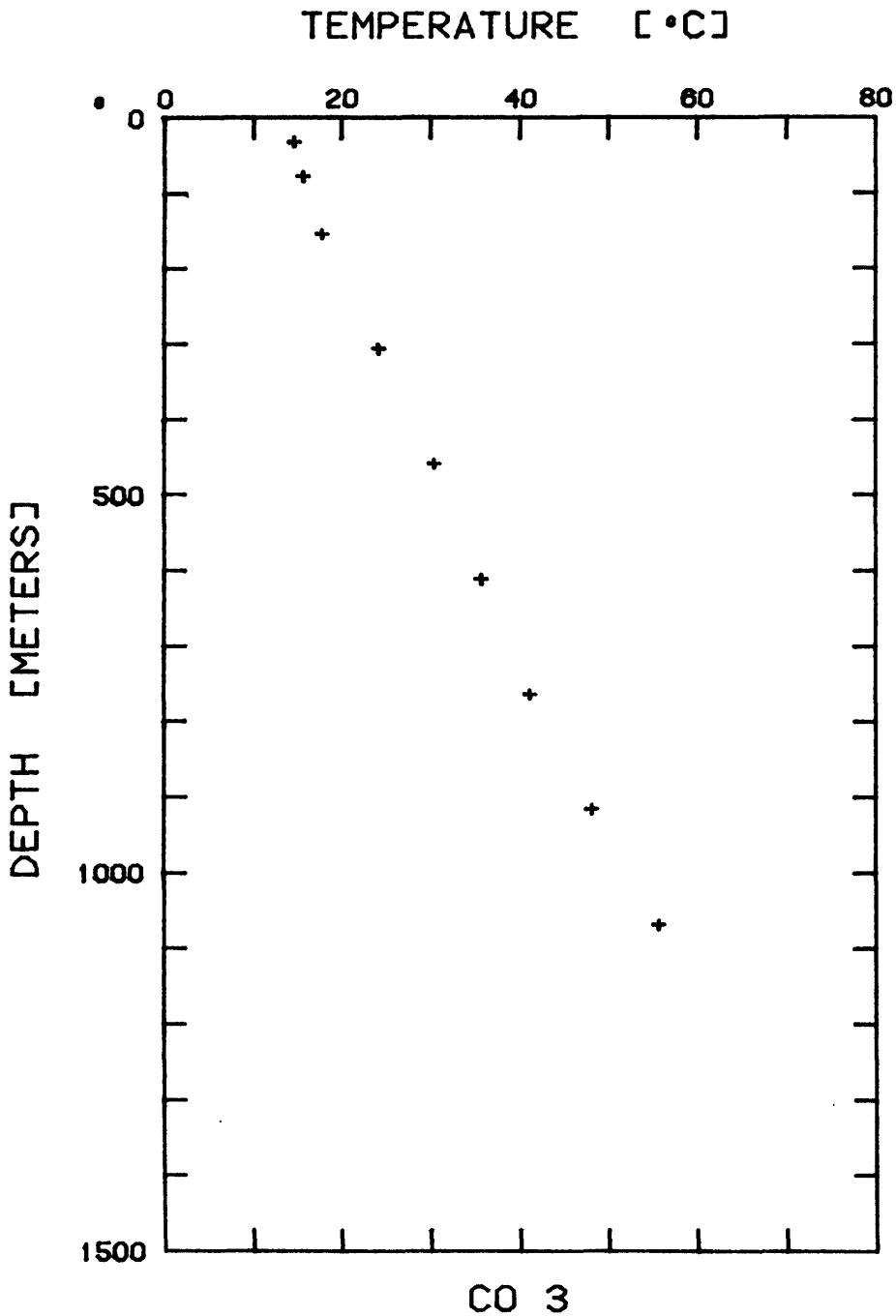
Section, Township, Range, County: SE1/4 sec. 9, T. 12 S., R. 62 W., El Paso.

Date of observations: 1920's.

Fluid level in drill hole: No information.

General lithology: Sandstone, shale, slate, shell, limestone. Some coal at about 175 m. (Same formation from 334 m to total depth.)

Remarks: Well completed in 1926. Total depth = 1324 m.



State: CO Hole name: 3

Latitude: 38 deg 21.0 min Longitude: 105 deg 8.2 min

Gradient= 39°C/km, Intercept= 12.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.6
76.2	15.6
152.4	17.8
304.8	24.2
457.2	30.4
609.6	35.7
762.	41.1
914.4	48.1
1066.8	55.6

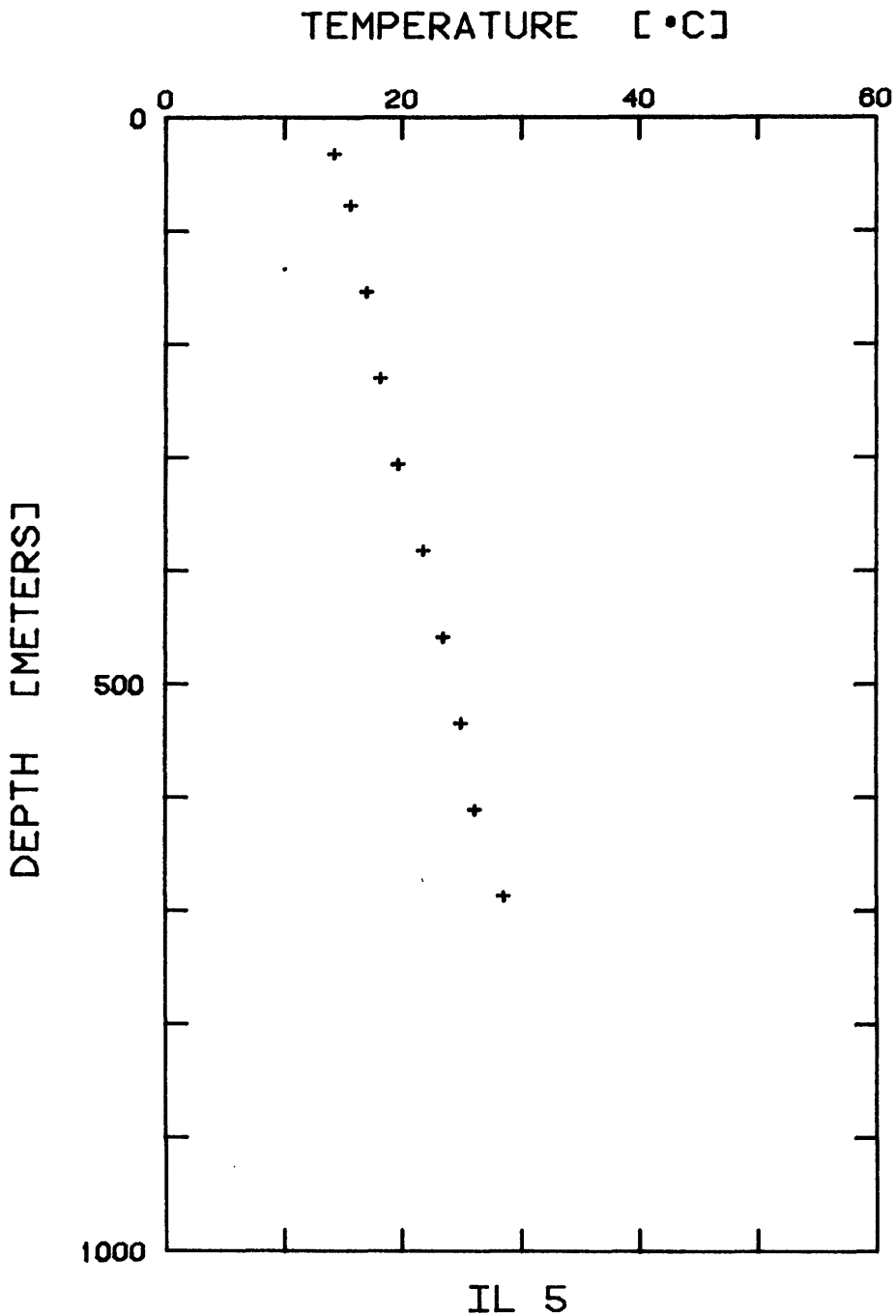
Section, Township, Range, County: SW1/4, SE1/4 sec. 32, T. 18 S., R. 69 W., Fremont.

Date of observations: 1920's.

Fluid level in drill hole: No information.

General lithology: Sandstone, shale, limestone.

Remarks: Probably drilled with standard tools, with temperature log obtained while drilling was temporarily discontinued. Selected from group of 3 wells.



State: IL Hole name: 5

Latitude: 39 deg 22.0 min Longitude: 87 deg 56.6 min

Gradient= 20°C/km, Intercept= 14.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.4
76.2	15.8
152.4	17.1
228.6	18.3
304.8	19.8
381.	21.9
457.2	23.6
533.4	25.1
609.6	26.2
685.8	28.6

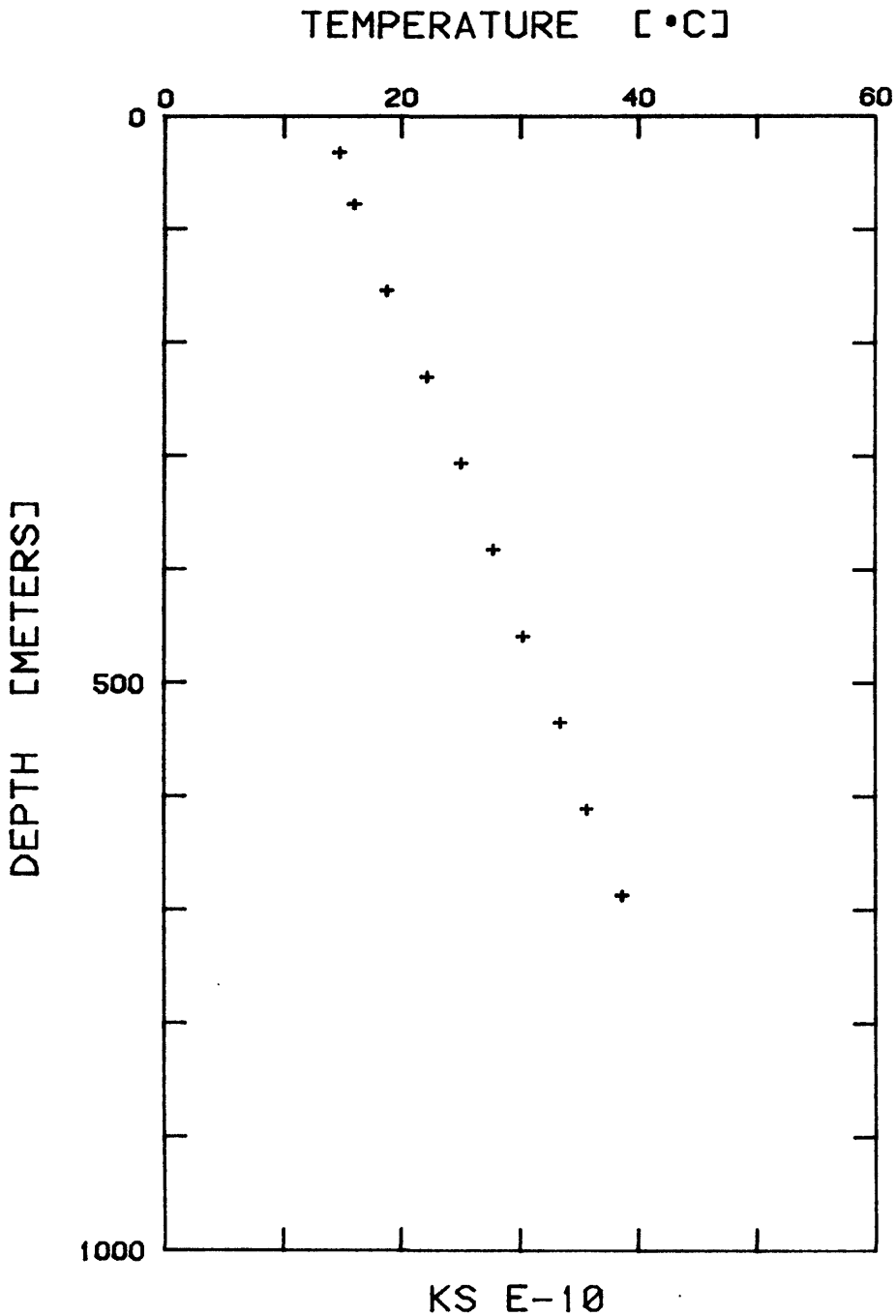
Section, Township, Range, County: NW1/4, NW1/4, NW1/4 sec. 7, T. 11 N., R. 14 W., Clark.

Date of observations: 1920's (?).

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Small gas flow when tested. A pumping well to be drilled deeper.



State: KS Hole name: E-10

Latitude: 37 deg 50.0 min Longitude: 96 deg 55.9 min

Gradient= 35°C/km, Intercept= 14.5°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.8
76.2	16.1
152.4	18.8
228.6	22.2
304.8	25.1
381.	27.8
457.2	30.3
533.4	33.4
609.6	35.7
685.8	38.7

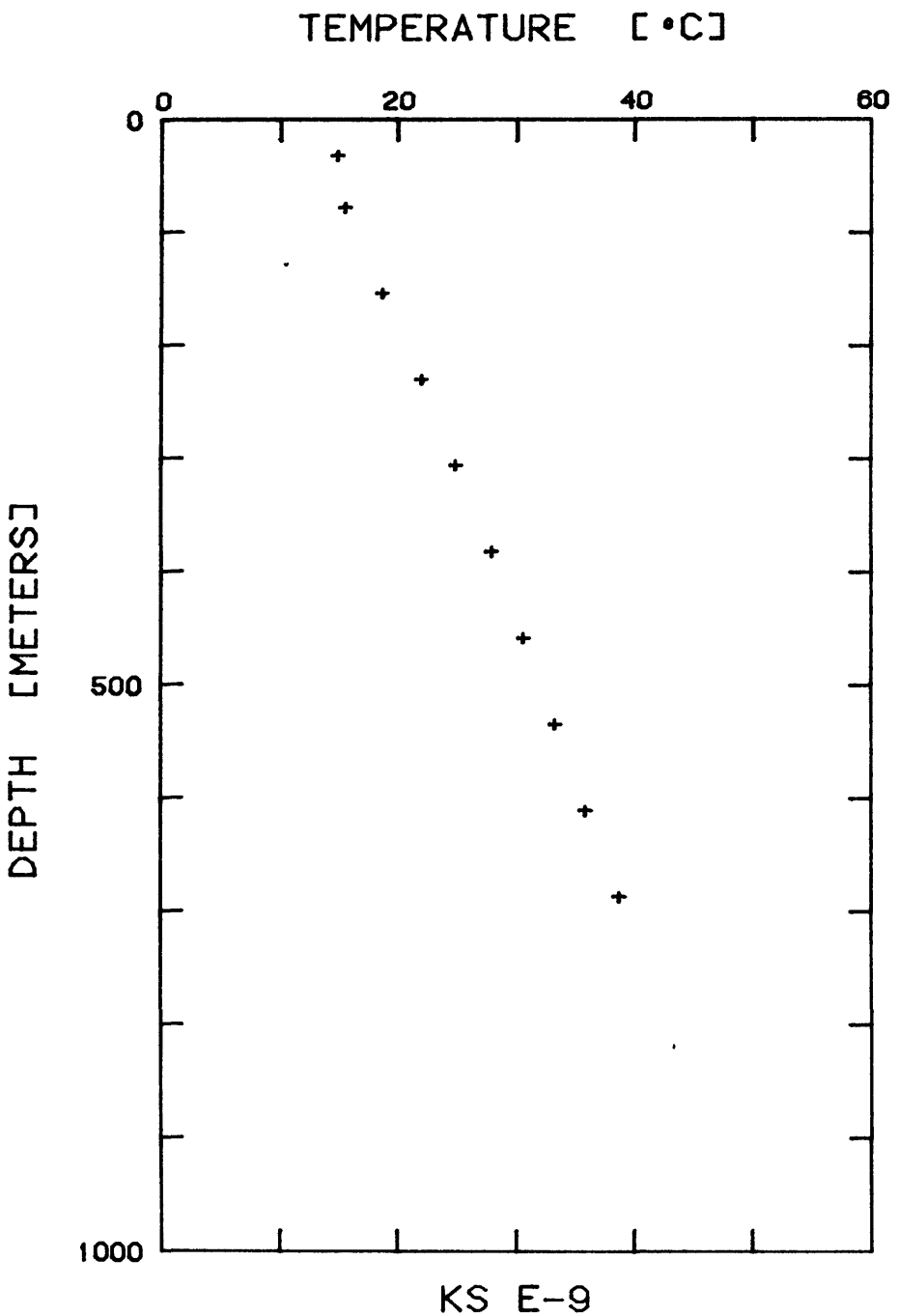
Section, Township, Range, County: Sec. 36, T. 25 S., R. 4 E., Butler.

Date of observations: 9/28.

Fluid level in drill hole: 192 m (oil).

General lithology: No information.

Remarks: Idle several months. Located in shallow wash. Selected from group of 26 wells.



State: KS Hole name: E-9

Latitude: 37 deg 49.8 min Longitude: 96 deg 57.8 min

Gradient= 36°C/km, Intercept= 13.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.8
76.2	15.5
152.4	18.6
228.6	21.9
304.8	24.8
381.	27.8
457.2	30.4
533.4	33.1
609.6	35.7
685.8	38.6

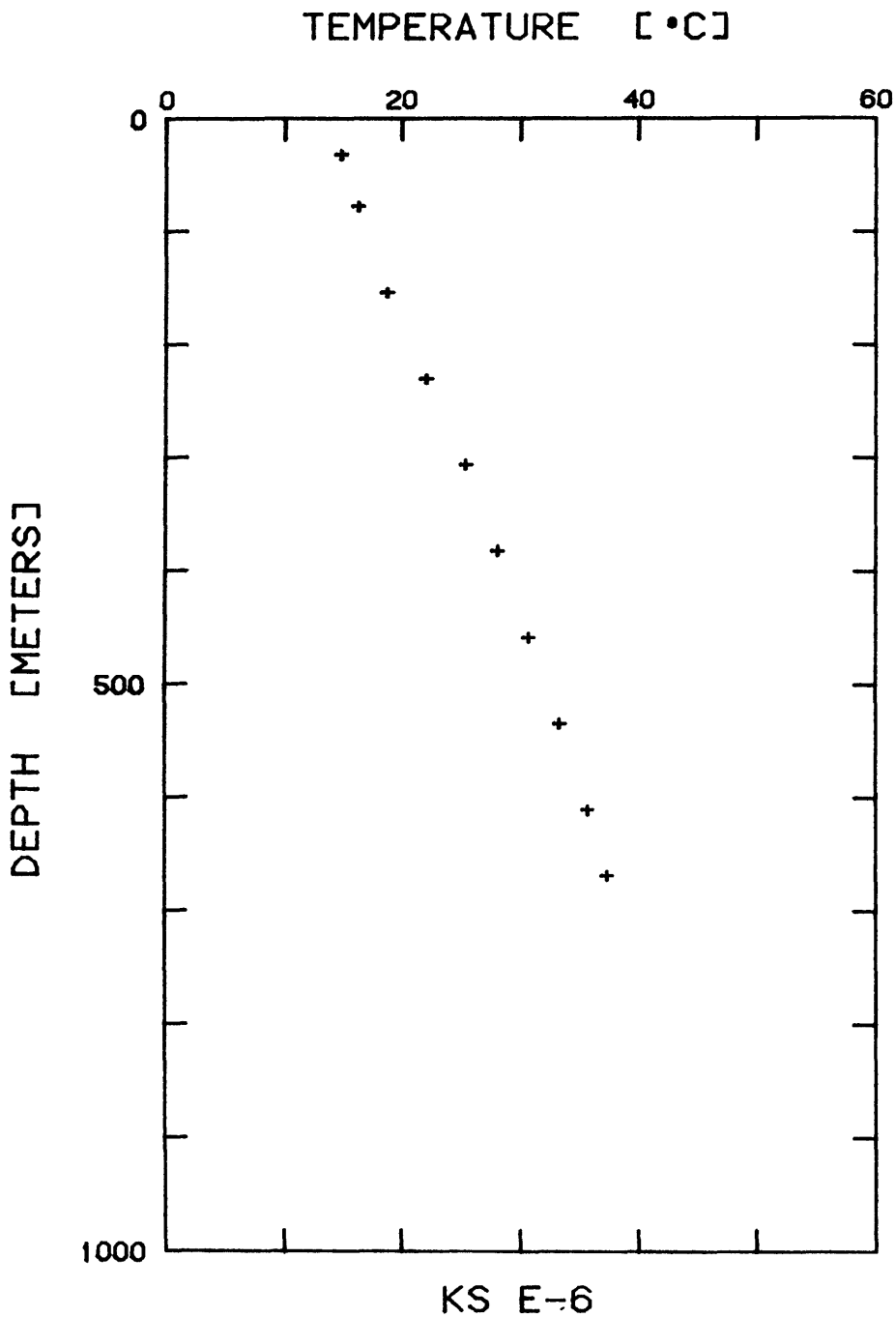
Section, Township, Range, County: Sec. 2, T. 26 S., R. 4 E., Butler.

Date of observations: 8/29/28.

Fluid level in drill hole: 549 m.

General lithology: No information.

Remarks: Idle two days; had been pumping about 5 barrels of fluid per day. Selected from group of 26 wells.



State: KS Hole name: E-6

Latitude: 37 deg 49.6 min Longitude: 96 deg 56.7 min

Gradient= 33°C/km, Intercept= 15.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.9
76.2	16.3
152.4	18.8
228.6	22.1
304.8	25.4
381.	28.1
457.2	30.7
533.4	33.3
609.6	35.7
667.5	37.4

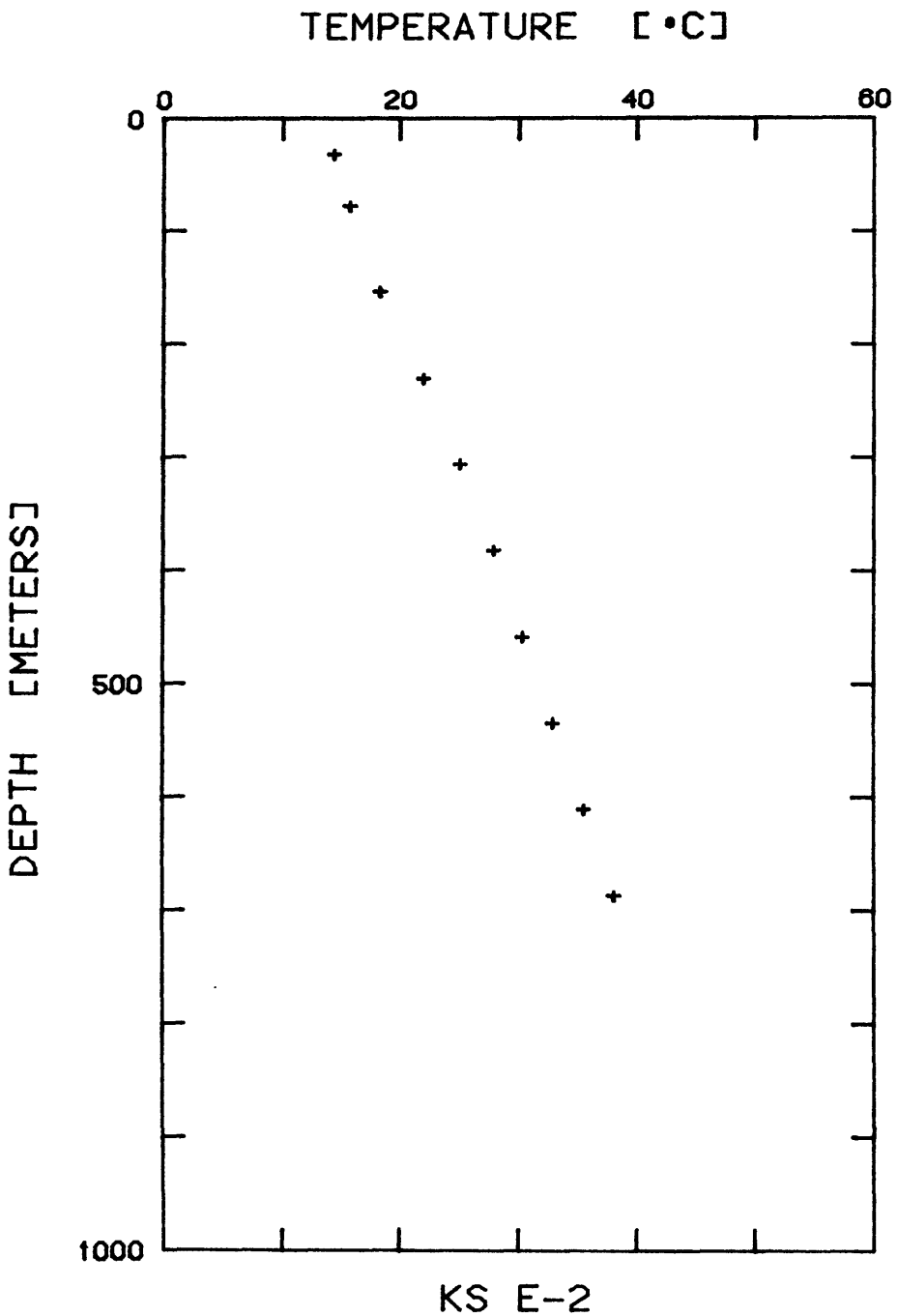
Section, Township, Range, County: Sec. 12, T. 26 S., R. 4 E., Butler.

Date of observations: 7/15/28.

Fluid level in drill hole: 275 m (oil).

General lithology: No information.

Remarks: Abandoned pumper; idle 4.5 months. No gas. Selected from group of 26 wells. Duplicate log on 9/3/28 (well idle six months). Fluid level 305 m. Temperature measurements at identical depths varied only ± 0.1 to 0.3 between logs.



State: KS Hole name: E-2

Latitude: 37 deg 48.8 min Longitude: 96 deg 56.6 min

Gradient= 34°C/km, Intercept= 14.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.4
76.2	15.8
152.4	18.3
228.6	22.
304.8	25.1
381.	27.9
457.2	30.3
533.4	32.9
609.6	35.5
685.8	38.1

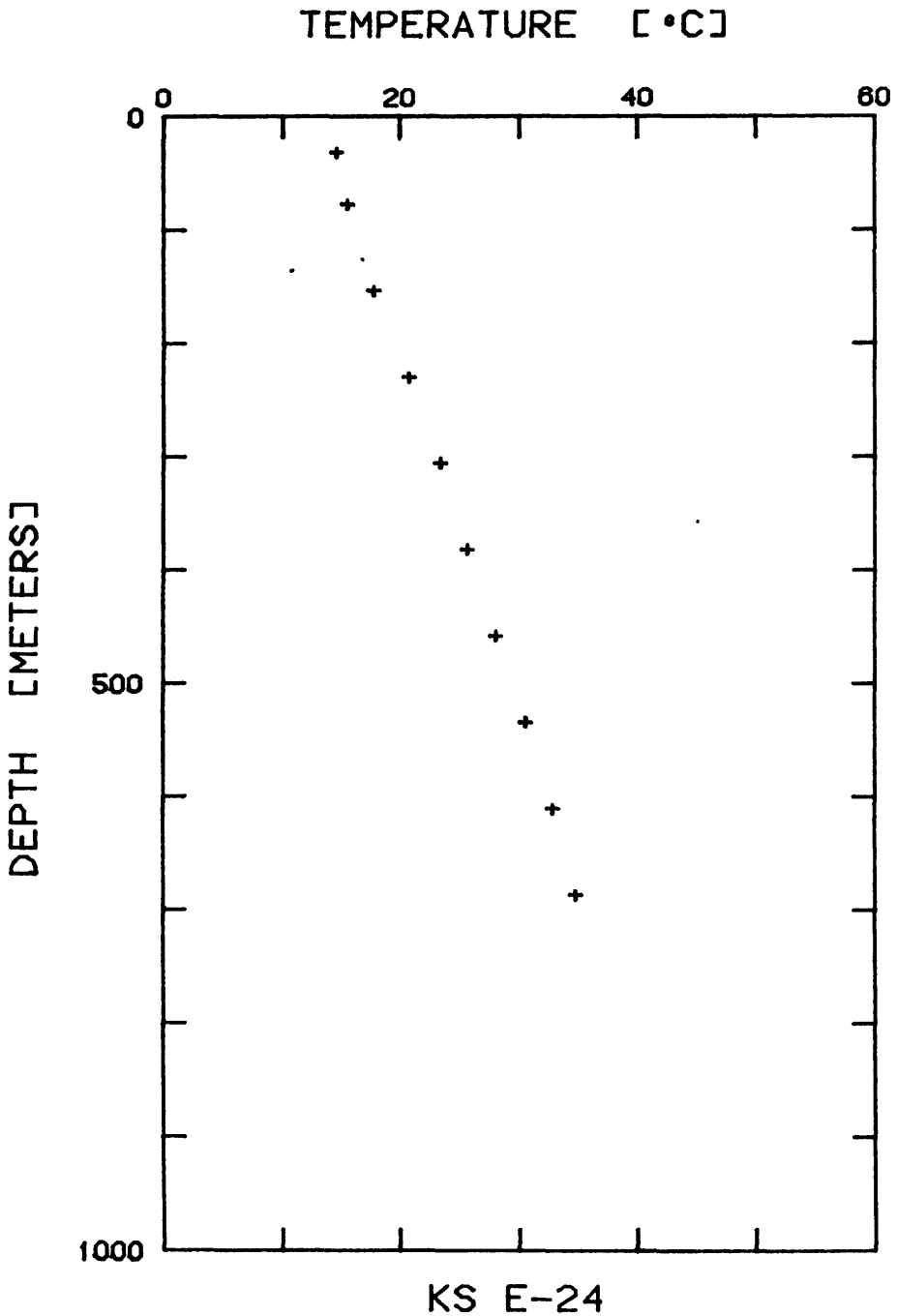
Section, Township, Range, County: Sec. 1, T. 26 S., R. 4 E., Butler.

Date of observations: 9/22/28.

Fluid level in drill hole: 262 m.

General lithology: No information.

Remarks: Idle one year. No gas when tested. Selected from group of 26 wells.



State: KS

Hole name: E-24

Latitude: 37 deg 48.8 min

Longitude: 96 deg 52.9 min

Gradient= 33°C/km,

Intercept= 12.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.7
76.2	15.6
152.4	17.8
228.6	20.8
304.8	23.4
381.	25.7
457.2	28.1
533.4	30.6
609.6	32.9
685.8	34.8

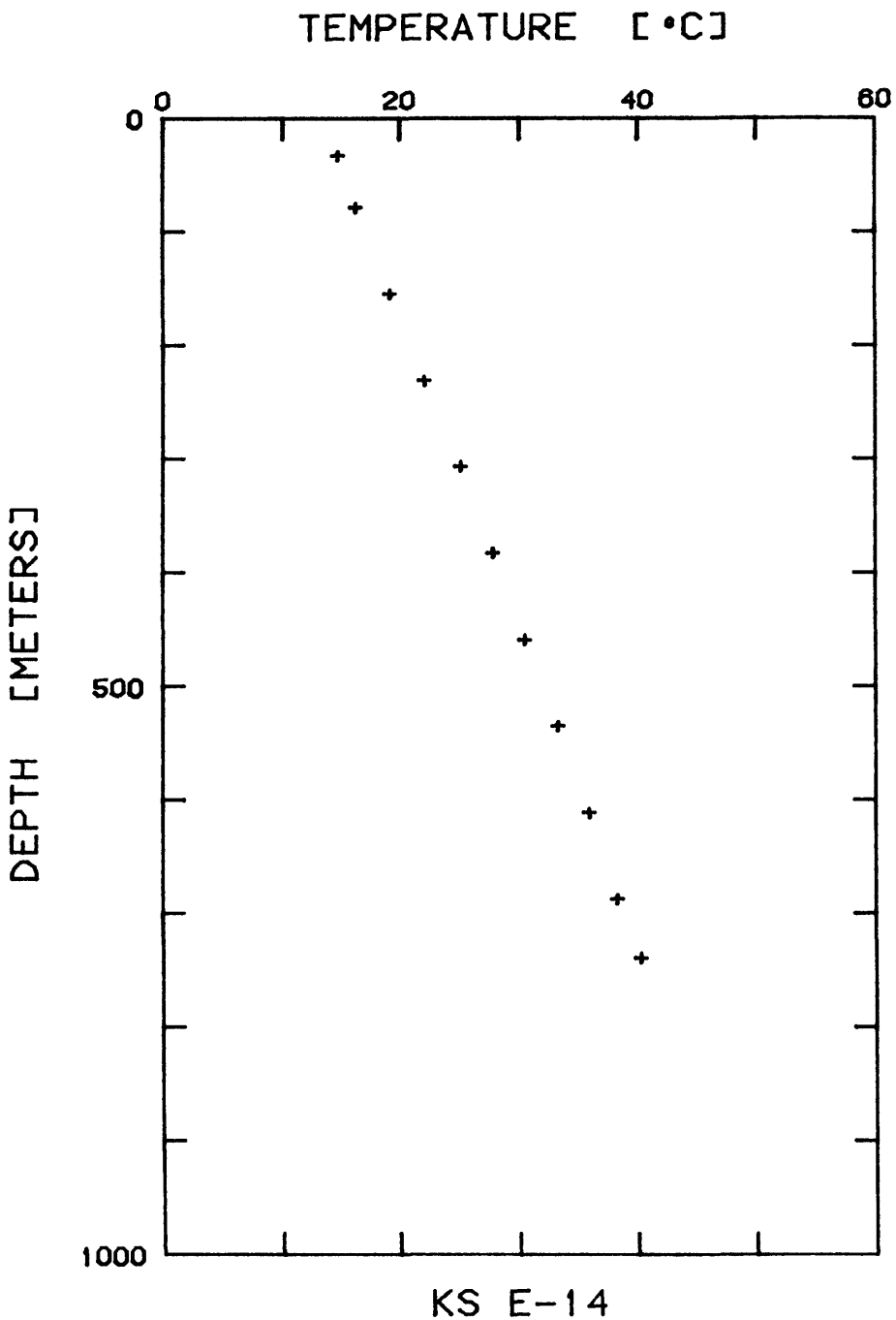
Section, Township, Range, County: Sec. 4, T. 26 S., R. 5 E., Butler.

Date of observations: 9/20/29.

Fluid level in drill hole: 374 m.

General lithology: No information.

Remarks: Idle one year. No gas. Water well on edge of oil field. Selected from group of 26 wells.



State: KS Hole name: E-14

Latitude: 37 deg 48.0 min Longitude: 96 deg 56.0 min

Gradient= 35°C/km, Intercept= 14.40C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.8
76.2	16.3
152.4	19.2
228.6	22.1
304.8	25.1
381.	27.8
457.2	30.4
533.4	33.2
609.6	35.8
685.8	38.2
737.3	40.2

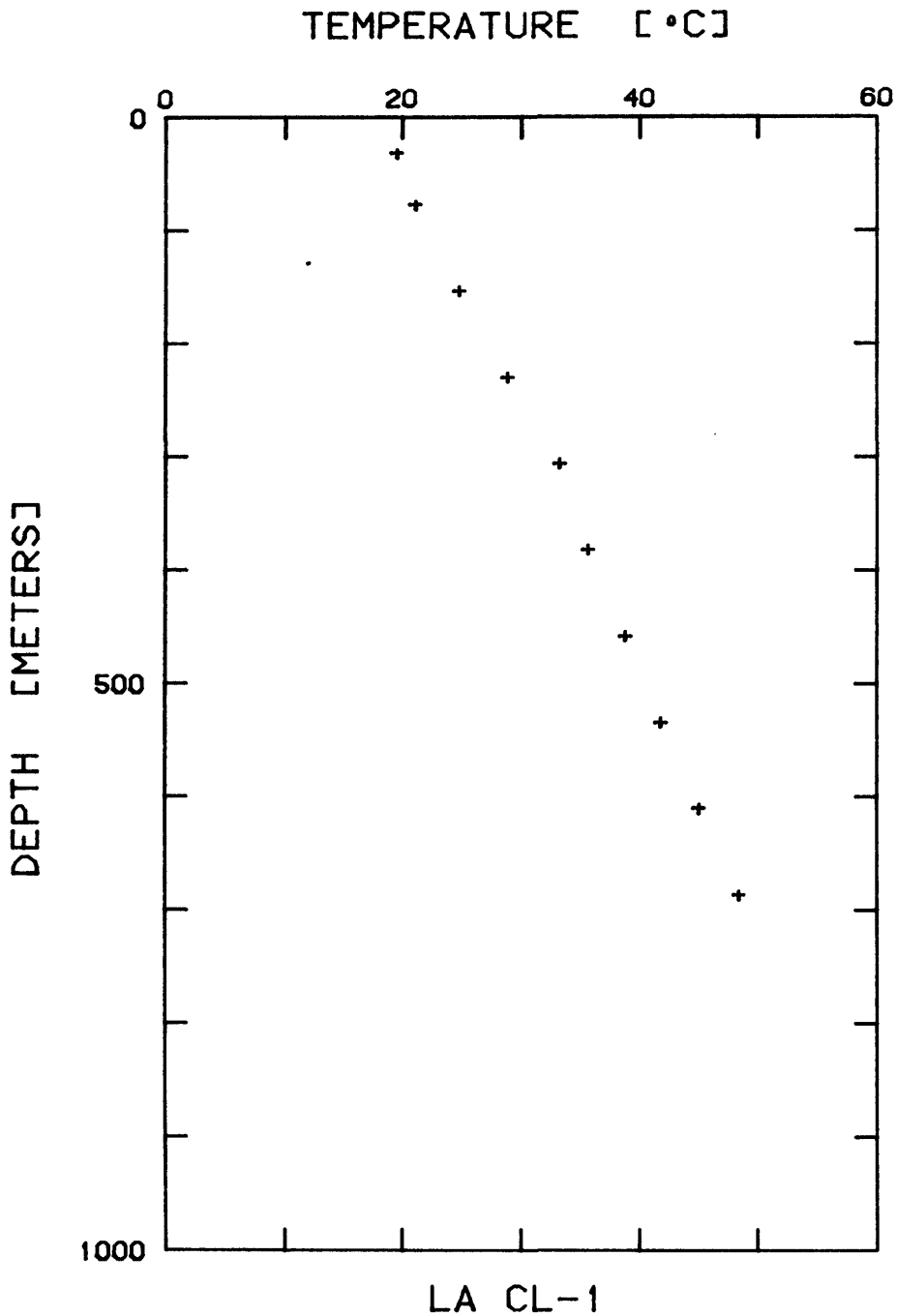
Section, Township, Range, County: Sec. 12, T. 26 S., R. 4 E., Butler.

Date of observations: 9/25/28.

Fluid level in drill hole: 152 m.

General lithology: No information

Remarks: Idle six months. 2-inch tubing in hole. Selected from group of 26 wells.



State: LA Hole name: CL-1

Latitude: 32 deg 50.8 min Longitude: 94 deg 1.2 min

Gradient= 41°C/km, Intercept= 20.00C

Reference code: SP 64

Temperature log

meters	°C
30.5	19.6
76.2	21.2
152.4	24.9
228.6	29.
304.8	33.3
381.	35.7
457.2	38.9
533.4	41.9
609.6	45.1
685.8	48.5

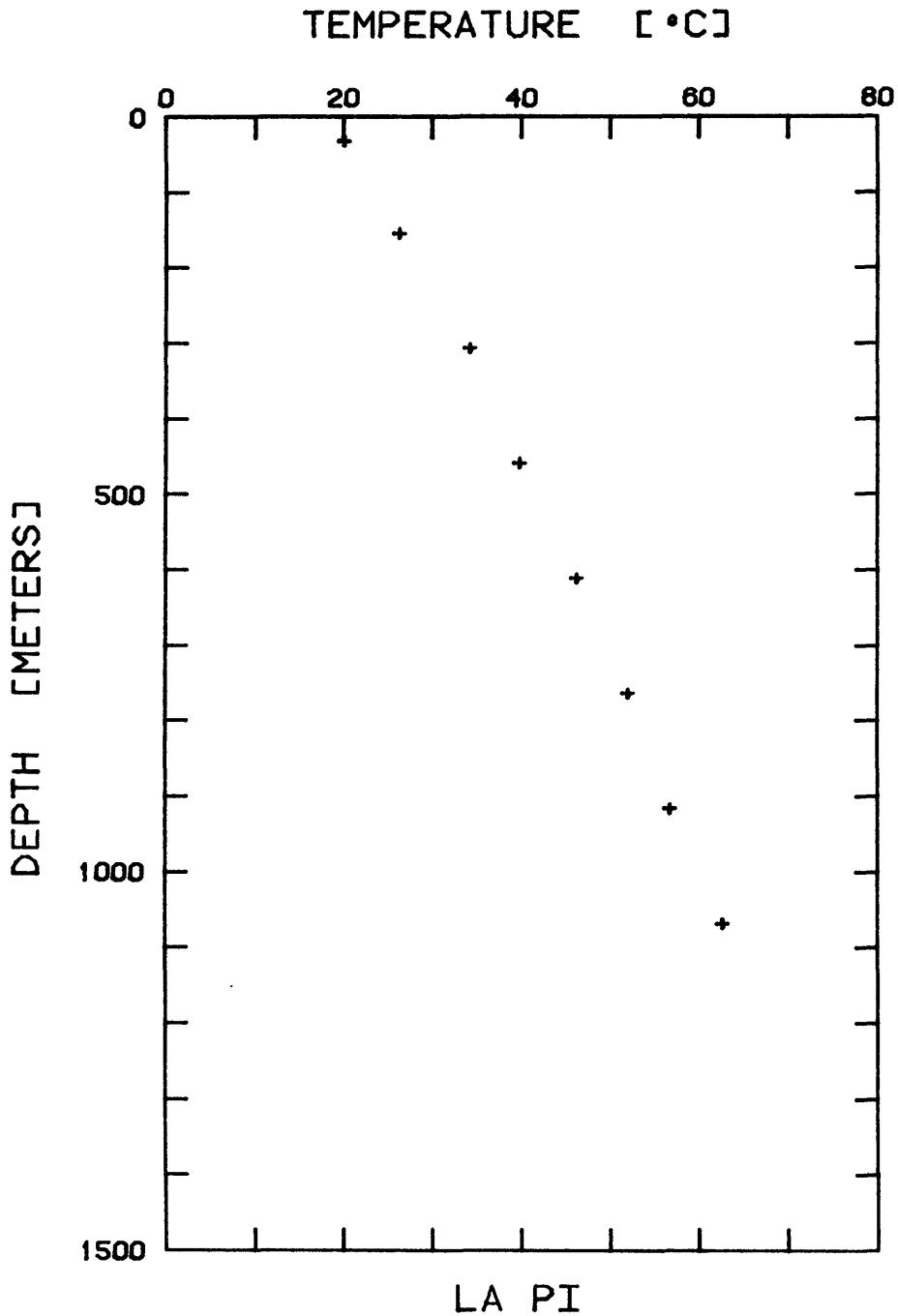
Section, Township, Range, County: NW1/4 sec. 4, T. 21 N., R. 16 W., Caddo Parish.

Date of observations: 1933.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Near Caddo Lake; water depth is 5 feet. Area formerly a swamp, but was flooded by dam about 20 years prior to test.



State: LA Hole name: PI

Latitude: 32 deg 48.6 min Longitude: 93 deg 53.4 min
Location is to nearest half minute.

Gradient= 36°C/km, Intercept= 24.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	20.2
152.4	26.4
304.8	34.3
457.2	39.8
609.6	46.2
762.	52.1
914.4	56.8
1066.8	62.7

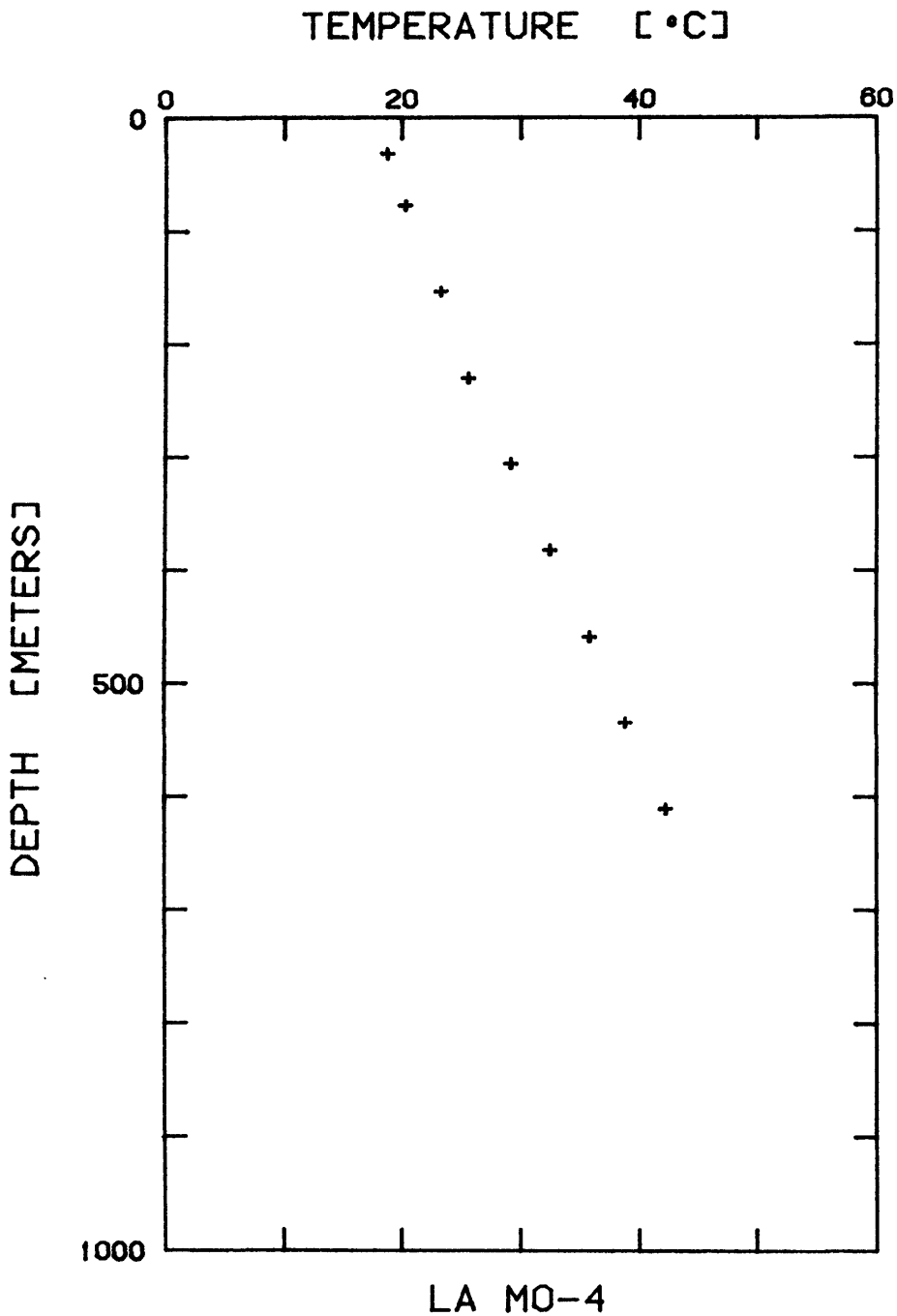
Section, Township, Range, County: Sec. 14, T. 21 N., R. 15 W., Caddo Parish.

Date of observations: 1933.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: No information.



State: LA Hole name: MO-4

Latitude: 32 deg 21.8 min Longitude: 91 deg 52.4 min

Gradient= 42°C/km, Intercept= 16.5°C

Reference code: SP 64

Temperature log

meters	°C
30.5	18.8
76.2	20.3
152.4	23.3
228.6	25.6
304.8	29.2
381.	32.5
457.2	35.8
533.4	38.9
609.6	42.3

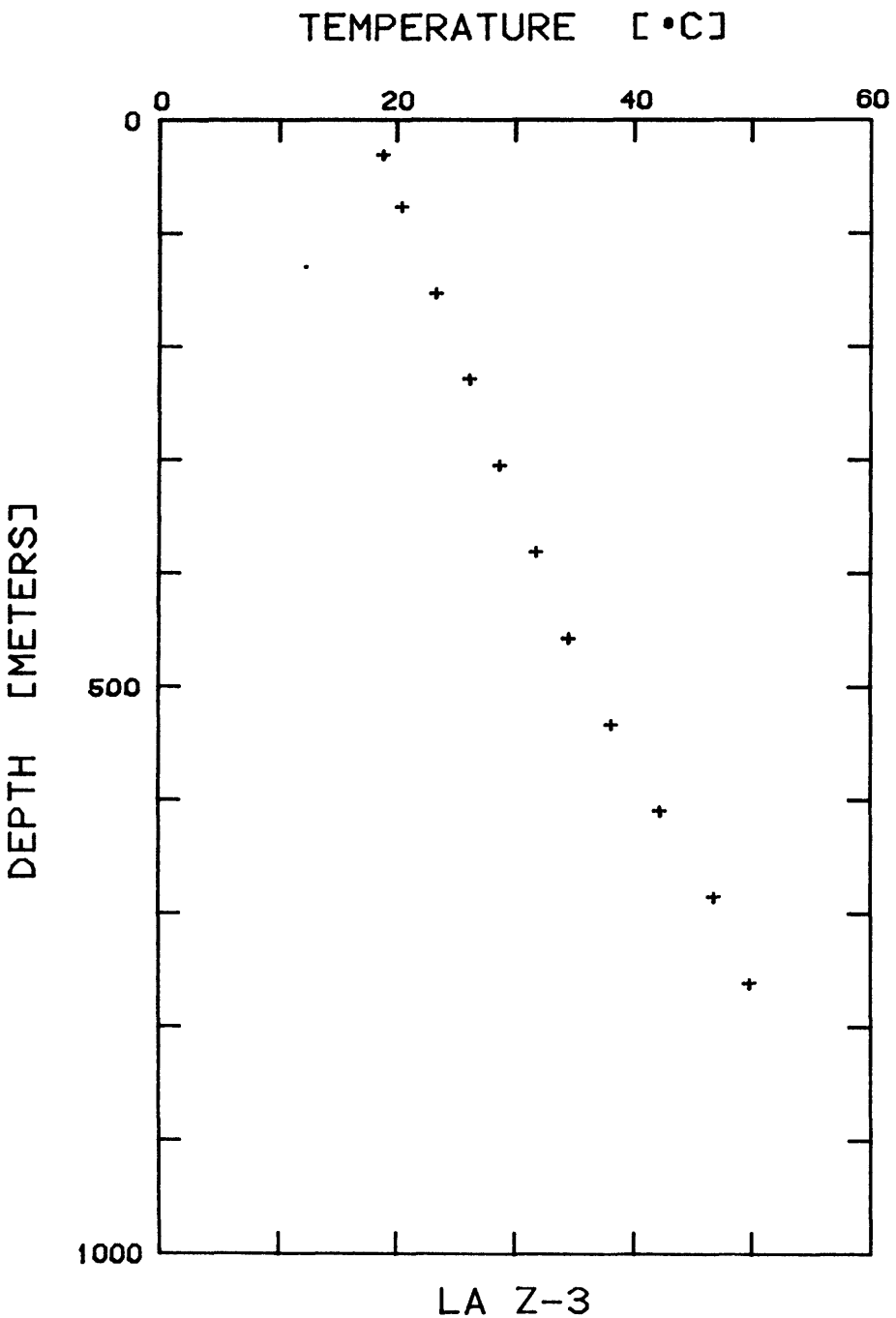
Section, Township, Range, County: Sec. 24, T. 16 N., R. 5 E., Richland Parish.

Date of observations: 1935.

Fluid level in drill hole: No water in hole.

General lithology: No information.

Remarks: Temperature measurements made in tubing. Selected from group of 5 wells; 2 other logs give similar gradients (at least one is also dry).



State: LA Hole name: Z-3

Latitude: 31 deg 36.0 min Longitude: 93 deg 29.0 min

Gradient= 45°C/km, Intercept= 14.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	18.8
76.2	20.4
152.4	23.3
228.6	26.1
304.8	28.6
381.	31.7
457.2	34.4
533.4	37.9
609.6	42.1
685.8	46.6
762.	49.6

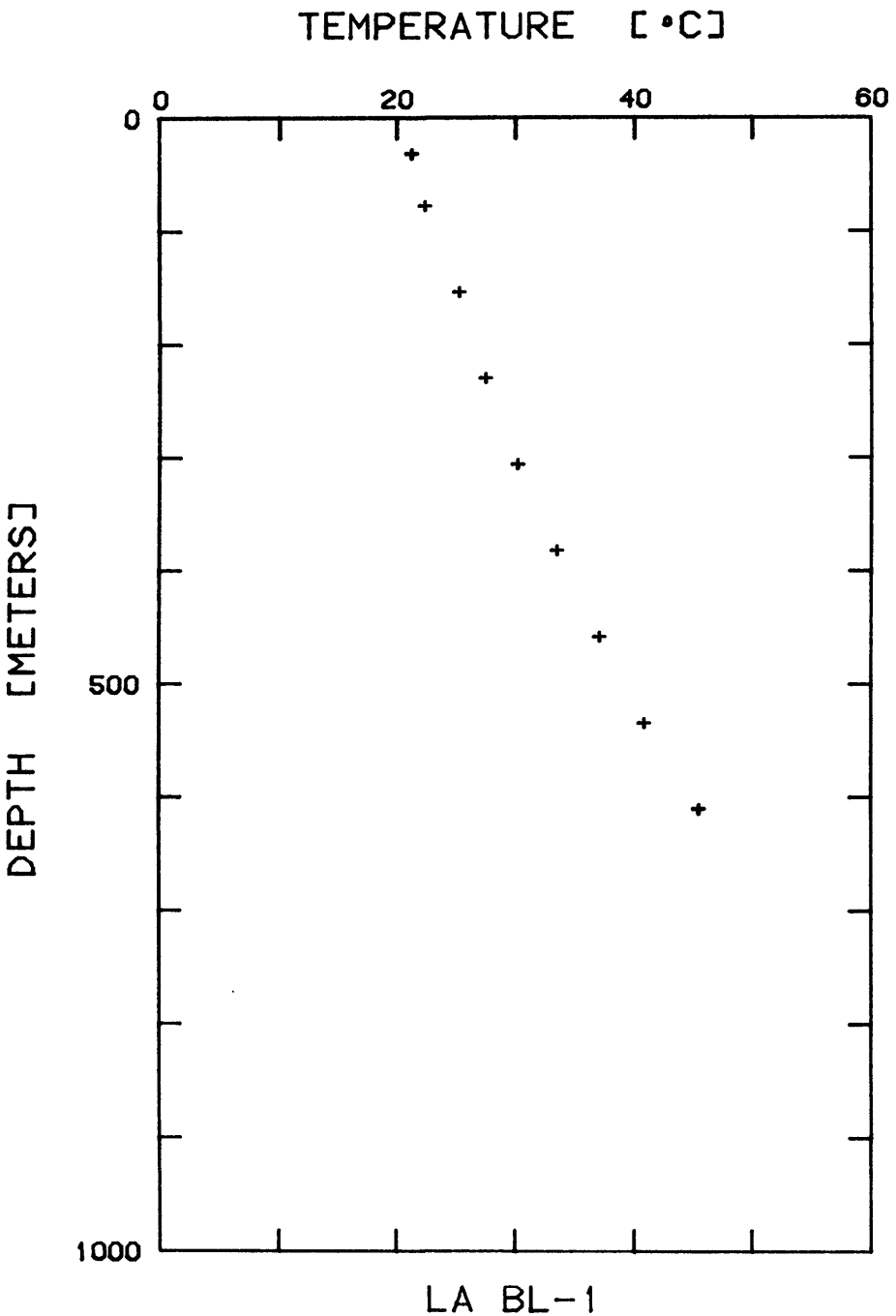
Section, Township, Range, County: Sec. 10, T. 7 N., R. 11 W., Sabine Parish.

Date of observations: 1933.

Fluid level in drill hole: No information.

General lithology: No. information.

Remarks: Area surrounding well was a lake bed 40 years ago. Selected from group of 10 wells.



State: LA Hole name: BL-1

Latitude: 31 deg 35.5 min Longitude: 93 deg 46.2 min

Gradient= 47°C/km, Intercept= 15.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	21.2
76.2	22.3
152.4	25.2
228.6	27.4
304.8	30.1
381.	33.4
457.2	37.
533.4	40.8
609.6	45.4

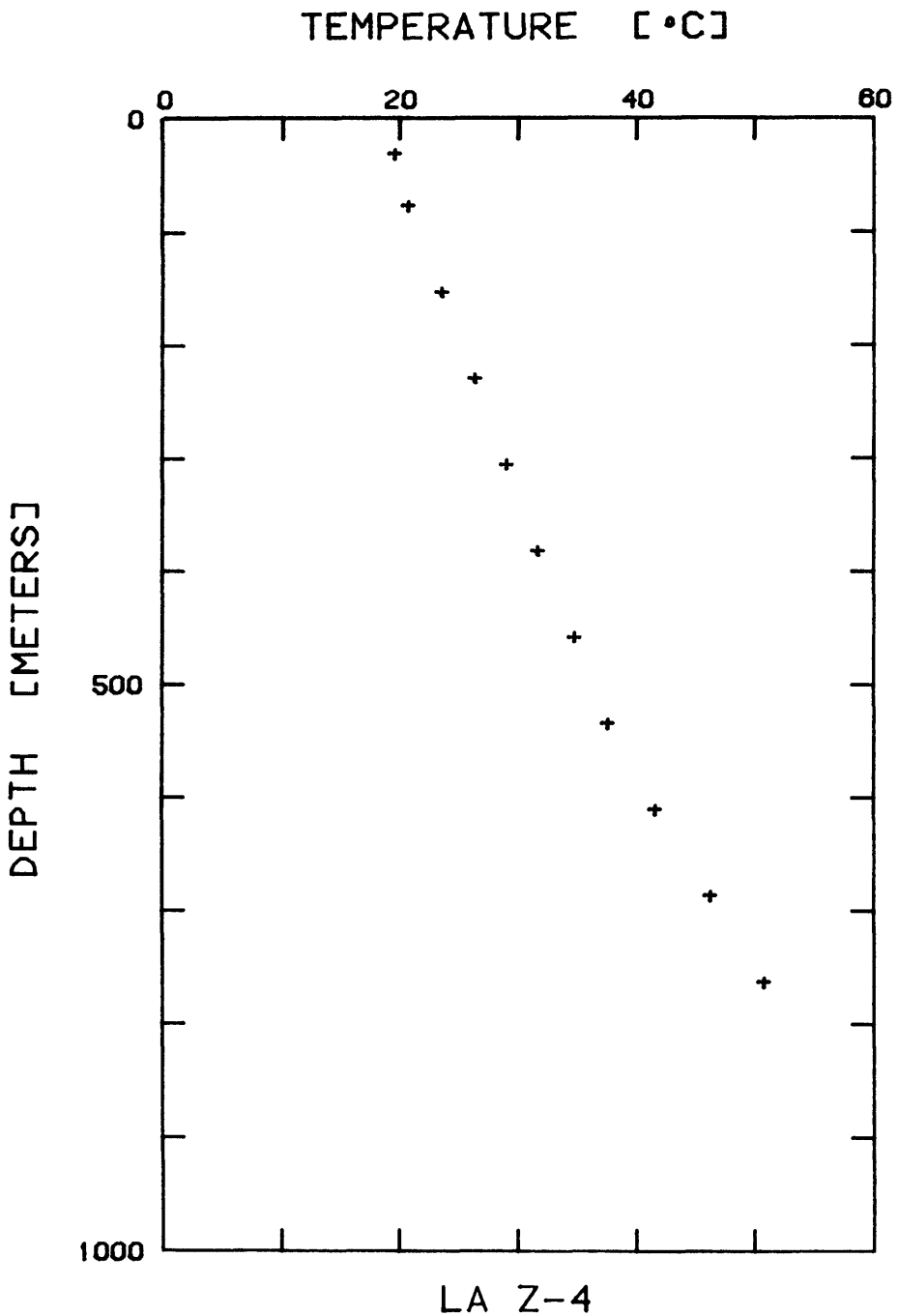
Section, Township, Range, County: Sec. 14, T. 7 N., R. 14 W., Sabine Parish.

Date of observations: 1933.

Fluid level in drill hole: No information.

General lithology: In same type structure as Z-series holes.

Remarks: No information.



State: LA Hole name: Z-4

Latitude: 31 deg 35.3 min Longitude: 93 deg 27.0 min

Gradient= 50°C/km, Intercept= 11.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	19.5
76.2	20.7
152.4	23.5
228.6	26.3
304.8	29.
381.	31.6
457.2	34.7
533.4	37.5
609.6	41.6
685.8	46.2
762.	50.7

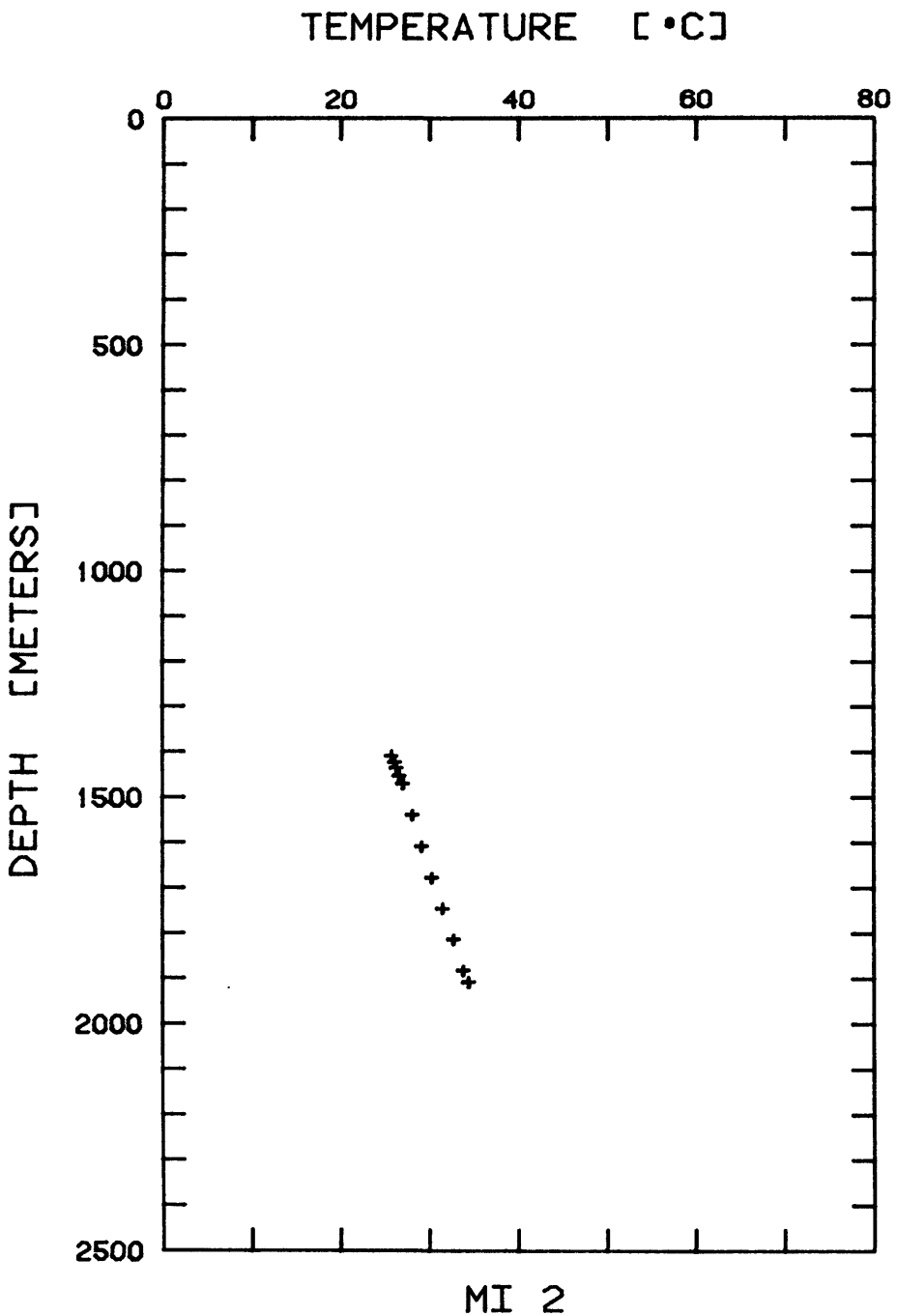
Section, Township, Range, County: Sec. 13, T. 7 N., R. 11 W., Sabine Parish.

Date of observations: 1933.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Area surrounding well was a lake bed 40 years ago. Selected from group of 10 wells.



State: MI Hole name: 2

Latitude: 47 deg 4.0 min Longitude: 88 deg 37.7 min

Gradient= 17°C/km, Intercept= 2.3°C

Reference code: *BI54

Temperature log

meters	°C
1405.7	25.8
1419.5	26.2
1433.2	26.4
1450.2	26.7
1467.6	27.1
1535.9	28.2
1604.5	29.3
1673.1	30.4
1741.3	31.6
1809.9	32.8
1878.5	33.9
1905.	34.5

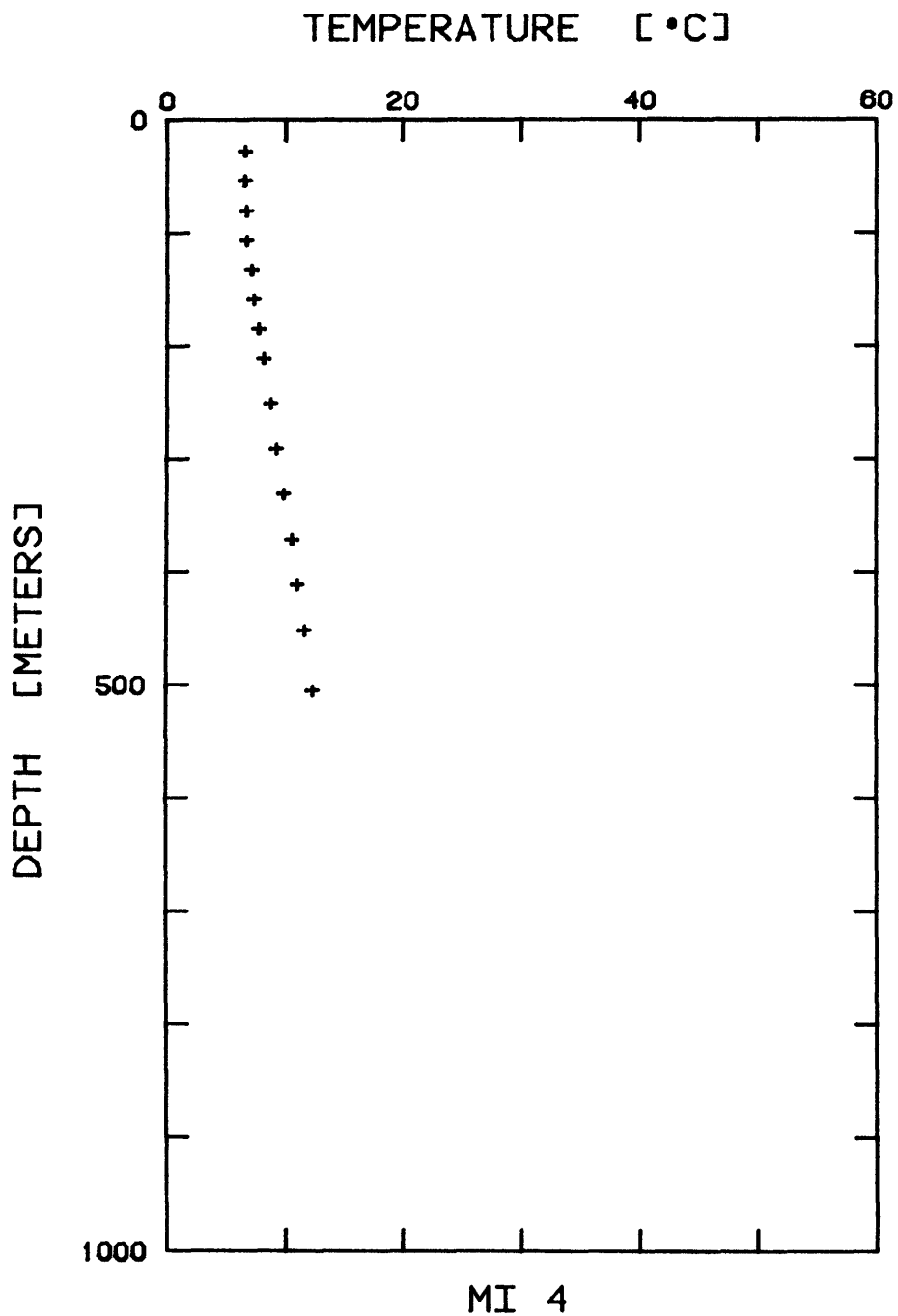
Section, Township, Range, County: Houghton.

Date of observations: 9/12/30.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Hole begins on 1433-m level in Baltic #2 shaft. Shaft is inclined 72°; drill hole dips 64° with respect to horizontal. Depths are given in vertical distance from surface of shaft. Well flowed water and gas intermittently; level of water frequently fell about 1.5 m, giving flow-rate estimate of 0.5 barrel of water per day with small amount of gas. Air temperature in shaft during test varied between 25-25.6°C. Room in mine opened 5/1/30; drilling began at once and was completed by about 9/1/30. Selected from group of 4 wells.



State: MI Hole name: 4

Latitude: 47 deg 1.3 min Longitude: 88 deg 41.4 min

Gradient= 15°C/km, Intercept= 5.1°C

Reference code: *BI54

Temperature log

meters	°C
26.5	6.6
52.7	6.6
79.2	6.7
105.5	6.8
131.7	7.2
157.9	7.4
184.1	7.8
210.3	8.2
249.9	8.8
290.2	9.3
330.1	9.9
370.3	10.6
410.6	11.1
450.8	11.7
504.1	12.4

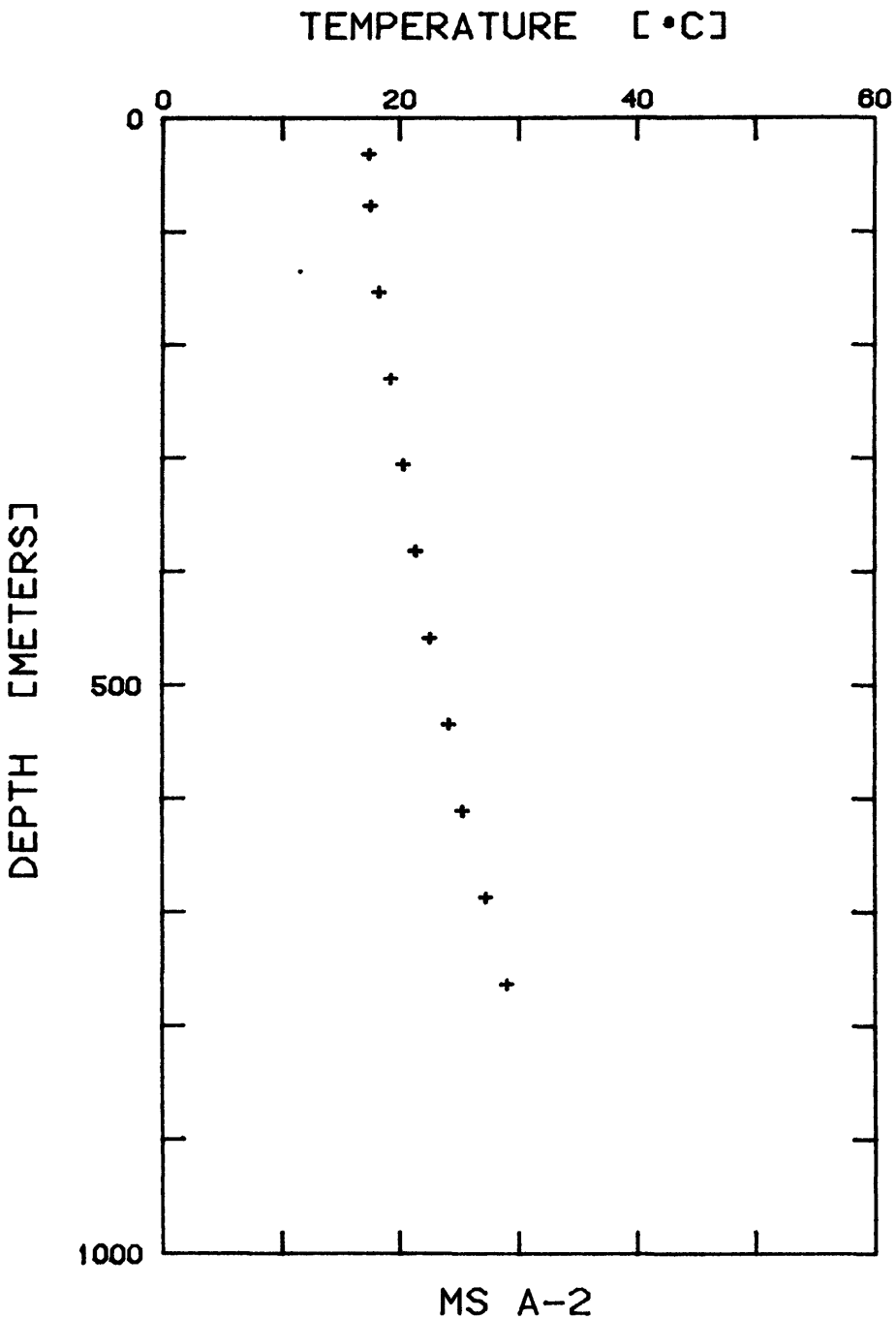
Section, Township, Range, County: NW1/4 sec. 1, T. 53 N., R. 35 W., Houghton.

Date of observations: 9/31.

Fluid level in drill hole: 27 m.

General lithology: No information.

Remarks: Idle about one year. Total depth = 1505 m. Selected from group of 4 wells.



State: MS Hole name: A-2

Latitude: 33 deg 58.2 min Longitude: 88 deg 25.5 min

Gradient= 21°C/km, Intercept= 13.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.4
76.2	17.6
152.4	18.3
228.6	19.3
304.8	20.4
381.	21.4
457.2	22.6
533.4	24.2
609.6	25.4
685.8	27.3
762.	29.1

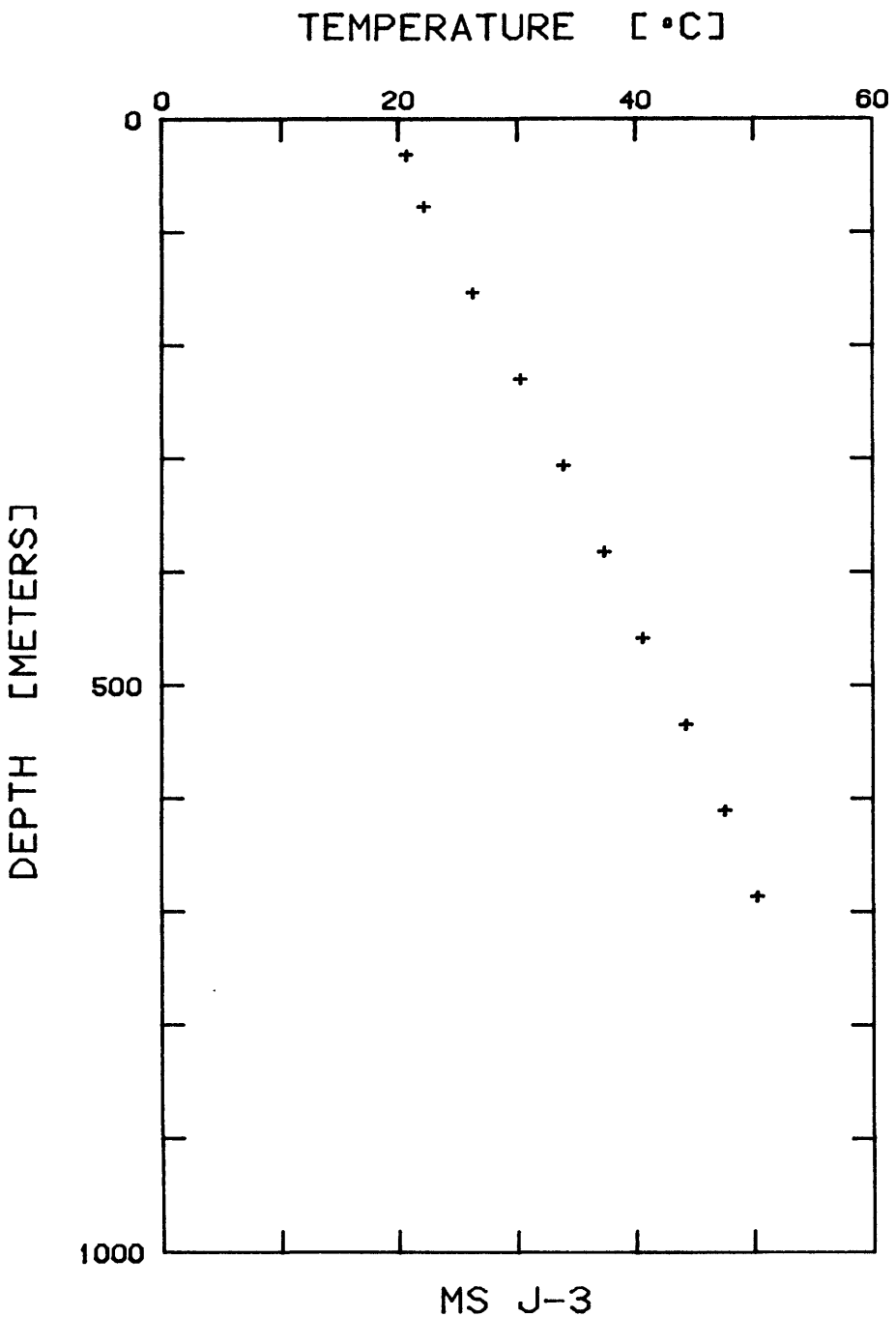
Section, Township, Range, County: SE1/4, NE1/4, NE1/4 sec. 4, T. 13 S., R. 18 W., Monroe.

Date of observations: 1930's.

Fluid level in drill hole: 9+ m.

General lithology: No information.

Remarks: Altitude = 126 m. Drilled with standard rig. Selected from group of 4 wells.



State: MS Hole name: J-3

Latitude: 32 deg 18.1 min Longitude: 90 deg 11.8 min

Gradient= 45°C/km, Intercept= 20.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	20.7
76.2	22.2
152.4	26.3
228.6	30.3
304.8	33.9
381.	37.4
457.2	40.7
533.4	44.3
609.6	47.6
685.8	50.3

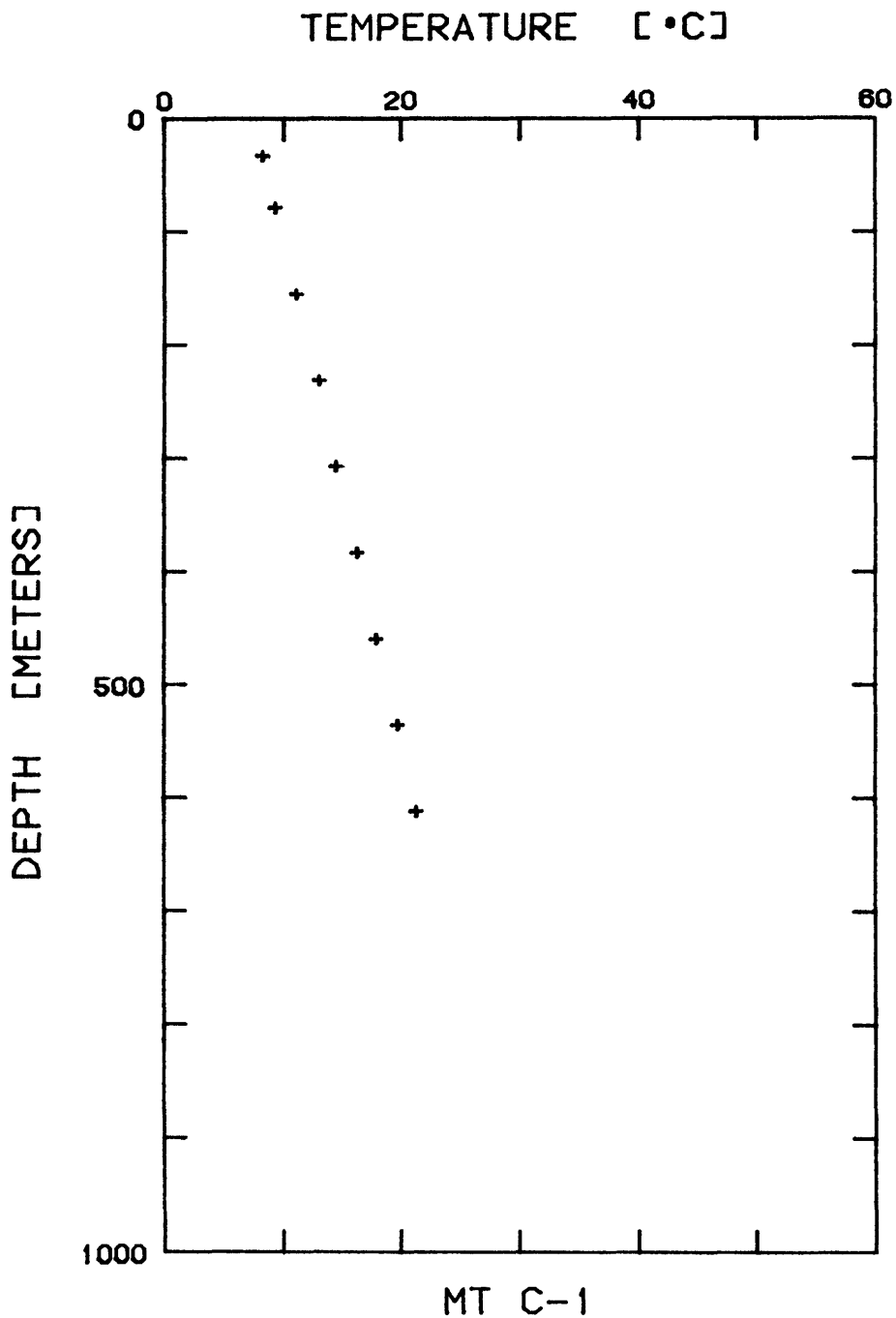
Section, Township, Range, County: NE1/4 sec. 4, T. 5 N., R. 1 E., Hinds.

Date of observations: 4/18/35.

Fluid level in drill hole: 55+ m.

General lithology: No information.

Remarks: Idle about three months (?). Total depth = 758 m. No gas when tested. Bottom of well in chalk. Selected from group of 3 wells.



State: MT Hole name: C-1

Latitude: 48 deg 21.6 min Longitude: 111 deg 57.0 min

Gradient= 22°C/km, Intercept= 7.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	8.3
76.2	9.3
152.4	11.1
228.6	13.
304.8	14.4
381.	16.2
457.2	17.8
533.4	19.6
609.6	21.2

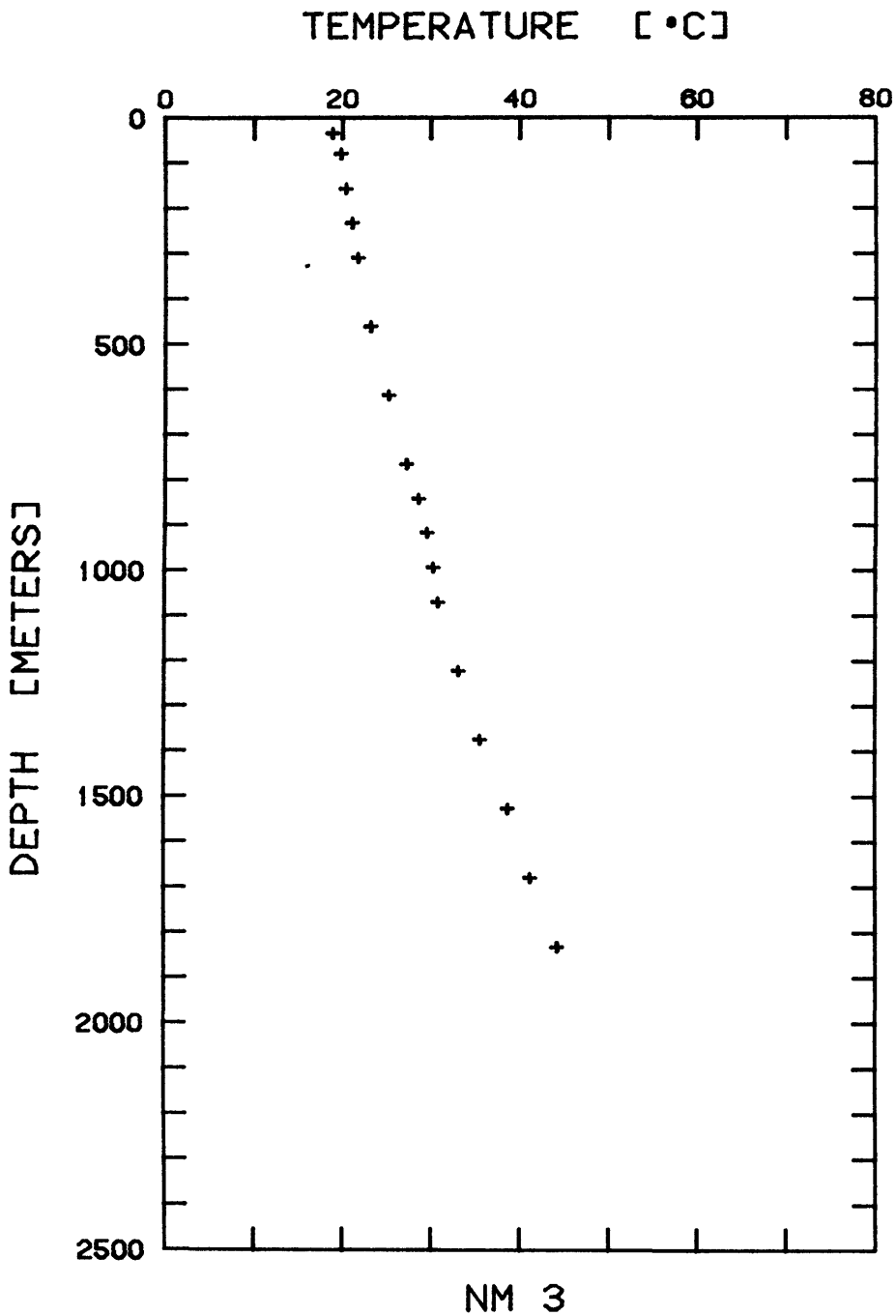
Section, Township, Range, County: NE1/4, NW1/4, NE1/4 sec. 32, T 30 N., R. 2 W., Pondera.

Date of observations: 7/28.

Fluid level in drill hole: 99 m.

General lithology: Sunburst sand, 622 m. Ellis-Madison contact, 710 m.

Remarks: Observer (C. E. Van Orstrand) considered conditions good for temperature observations. Altitude = 1097 m. Total depth = 984 m. Selected from group of 2 wells.



State: NM Hole name: 3

Latitude: 32 deg 33.6 min Longitude: 104 deg 2.0 min
Location is to nearest half minute.

Gradient= 16°C/km, Intercept= 14.4°C

Reference code: *LA37

Temperature log

meters	°C
30.5	18.9
76.2	19.8
152.4	20.4
228.6	21.1
304.9	21.8
457.2	23.2
609.6	25.3
762.	27.3
838.2	28.6
914.4	29.6
990.6	30.3
1066.8	30.9
1219.2	33.2
1371.6	35.7
1524.	38.8
1676.4	41.3
1828.8	44.3

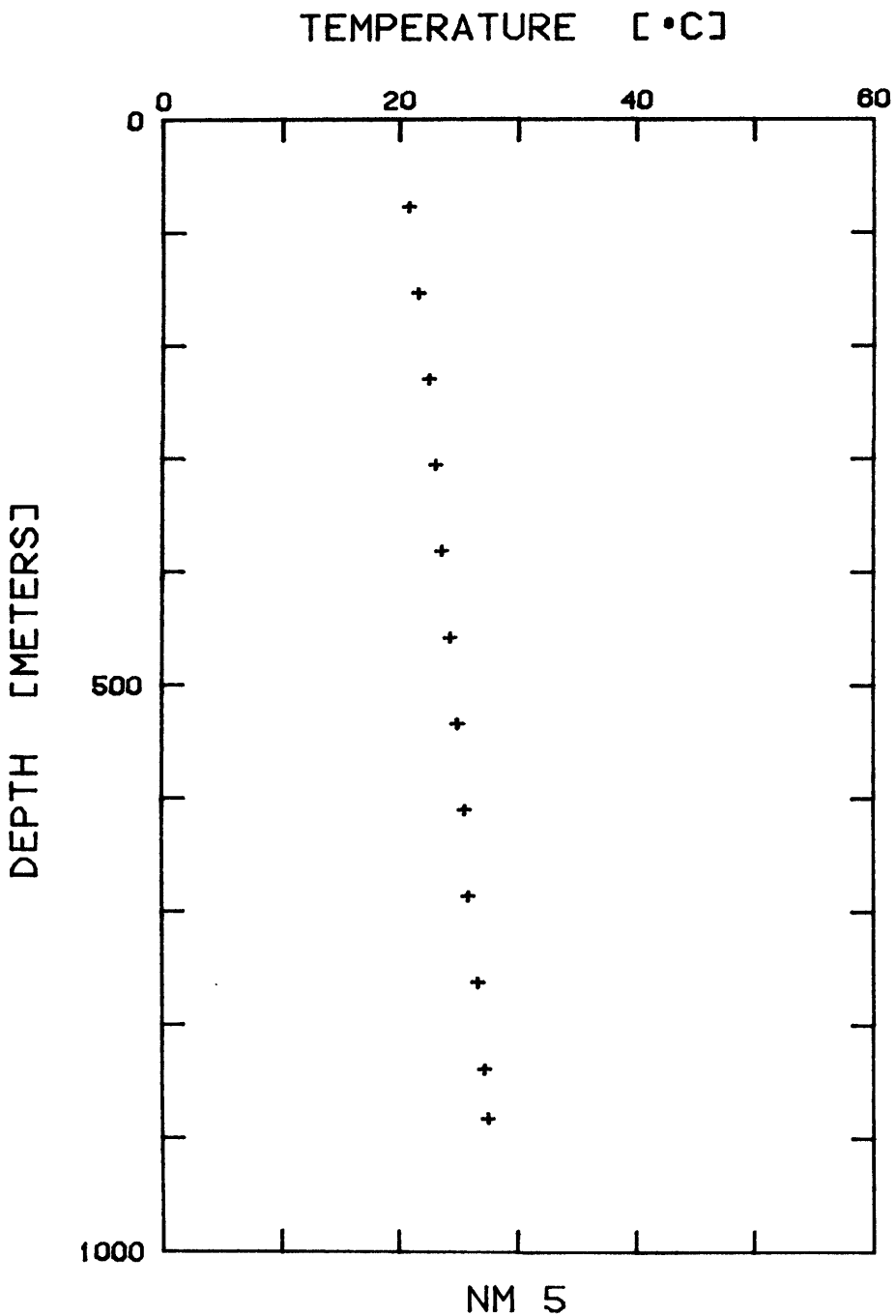
Section, Township, Range, County: NW1/4 sec. 24, T. 20 S., R. 29 E., Eddy.

Date of observations: 4/25/36.

Fluid level in drill hole: Above to near top of well (water with heavy oil).

General lithology: Red beds, 0-107 m. Salt, 107-302 m. Anhydrite, 302-315 m. Dolomitic limestone, 315-1161 m. Salt water, approx. 1158-1219 m. Oil, 404-452 m.

Remarks: Drilled 1/25/35 to 11/16/35. Rotary drilled to 1845 m; standard tools for other intervals. Logged five months after drilling completed. Altitude = 1009 m. Total depth = 2037 m. Selected from group of 9 wells.



State: NM Hole name: 5

Latitude: 32 deg 23.4 min Longitude: 103 deg 57.3 min
Location is to nearest half minute.

Gradient= 8°C/km, Intercept= 20.8°C

Reference code: SP 64

Temperature log

meters	°C
76.2	20.8
152.4	21.6
228.6	22.5
304.8	23.1
381.	23.6
457.2	24.3
533.4	24.9
609.6	25.5
685.8	25.8
762.	26.6
838.2	27.1
881.5	27.4

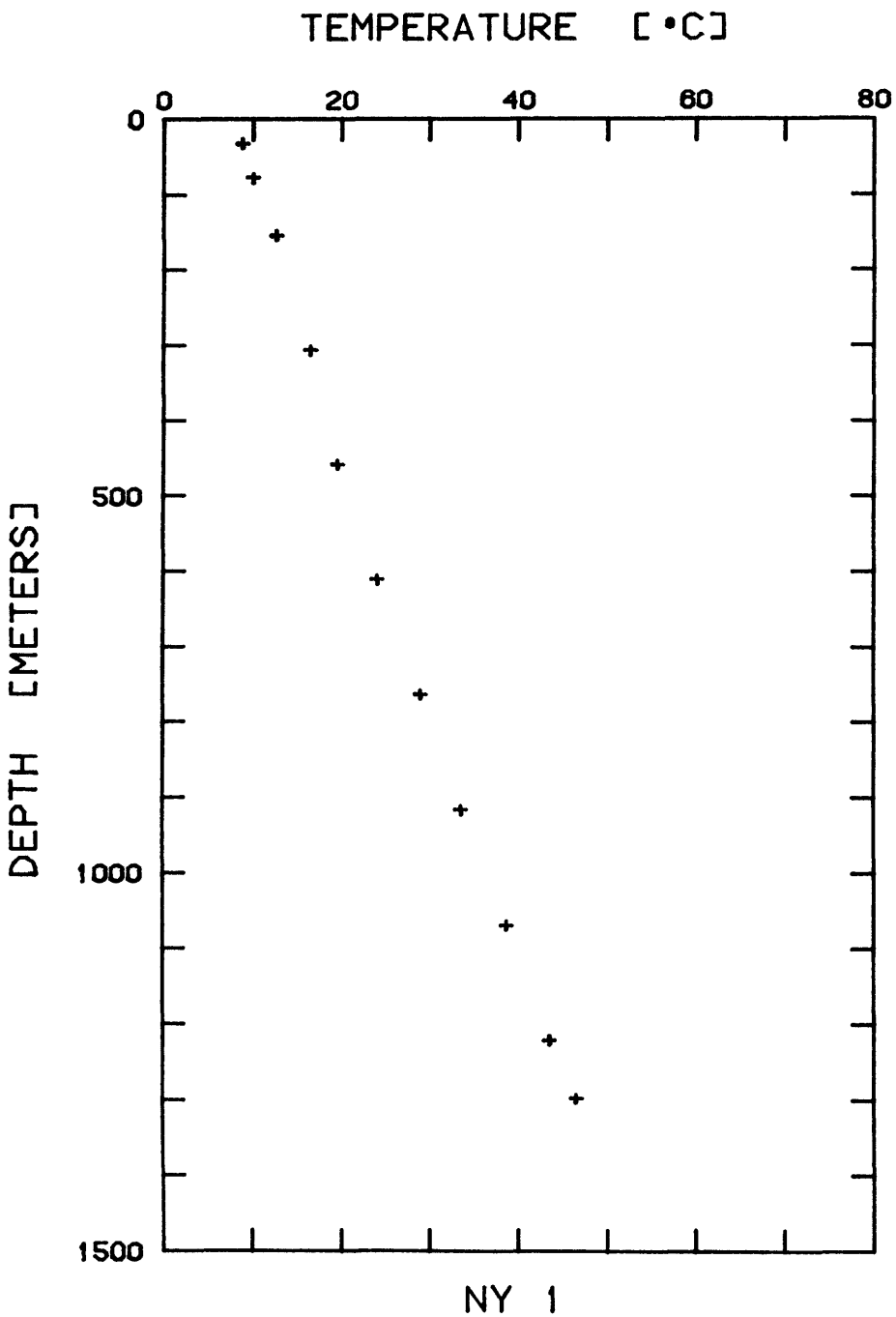
Section, Township, Range, County: SW1/4 sec. 13, T. 22 S., R. 29 E., Eddy.

Date of observations: 1927.

Fluid level in drill hole: 56 m.

General lithology: Salt series 98 m to 882 m.

Remarks: Shut down for more than one week at 994 m (total depth). No oil or gas. Altitude = 933 m. Selected from group of 9 wells.



State: NY Hole name: 1

Latitude: 42 deg 10.0 min Longitude: 77 deg 40.5 min

Gradient= 32°C/km, Intercept= 4.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	8.9
76.2	10.1
152.4	12.7
304.8	16.6
457.2	19.7
609.6	24.2
762.	29.1
914.4	33.7
1066.8	38.8
1219.2	43.6
1295.4	46.6

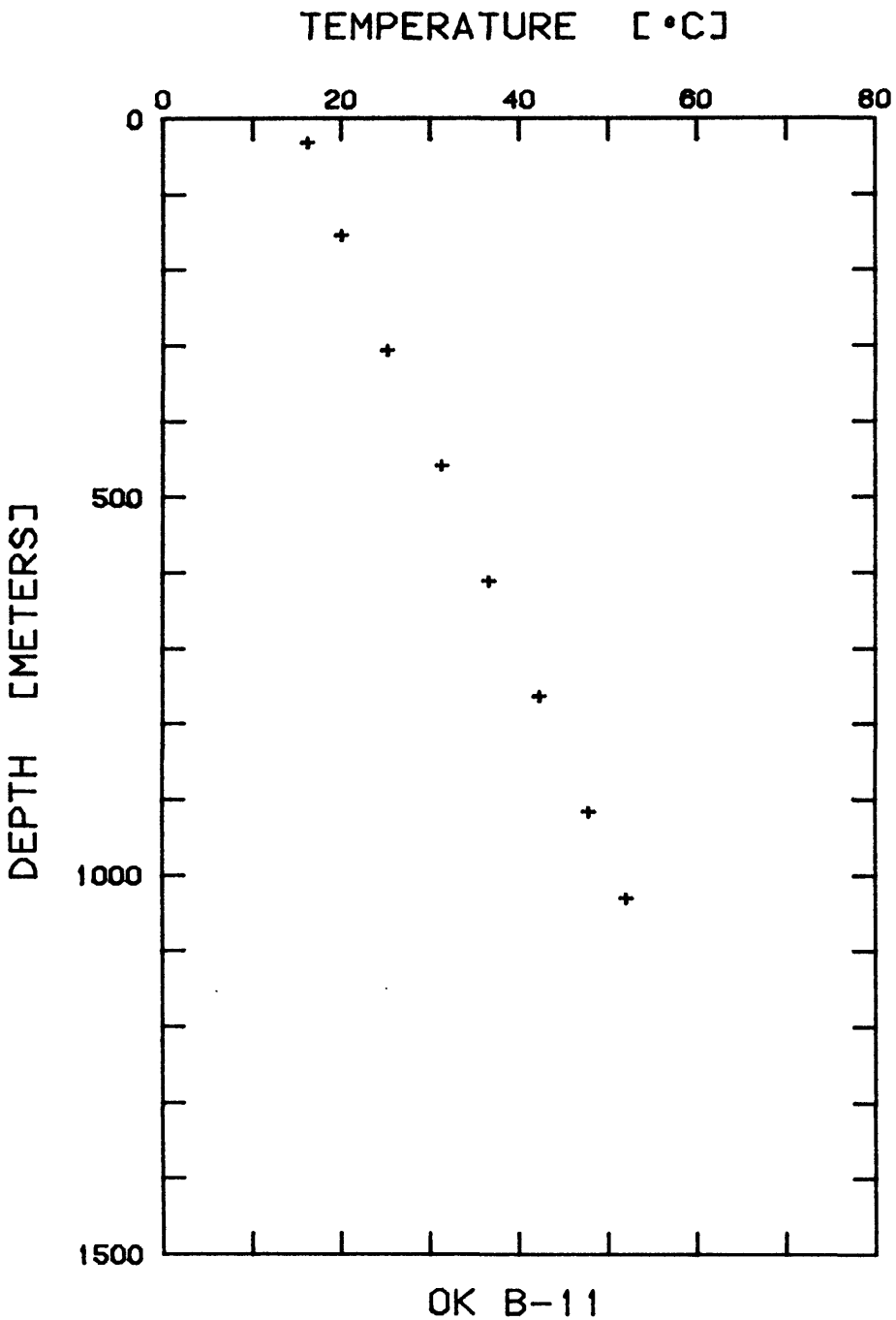
Section, Township, Range, County: Steuben.

Date of observations: 1935.

Fluid level in drill hole: No information.

General lithology: Devonian shales and limestone. Predominantly shale below 835 m.

Remarks: Logged about two years after completion of drilling. Altitude = 546 m. Some gas flow. Total depth = 1302 m.



State: OK Hole name: B-11

Latitude: 36 deg 55.1 min Longitude: 97 deg 13.0 min

Gradient= 37°C/km, Intercept= 14.0°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.2
152.4	20.1
304.8	25.3
457.2	31.4
609.6	36.7
762.	42.3
914.4	47.9
1028.6	52.1

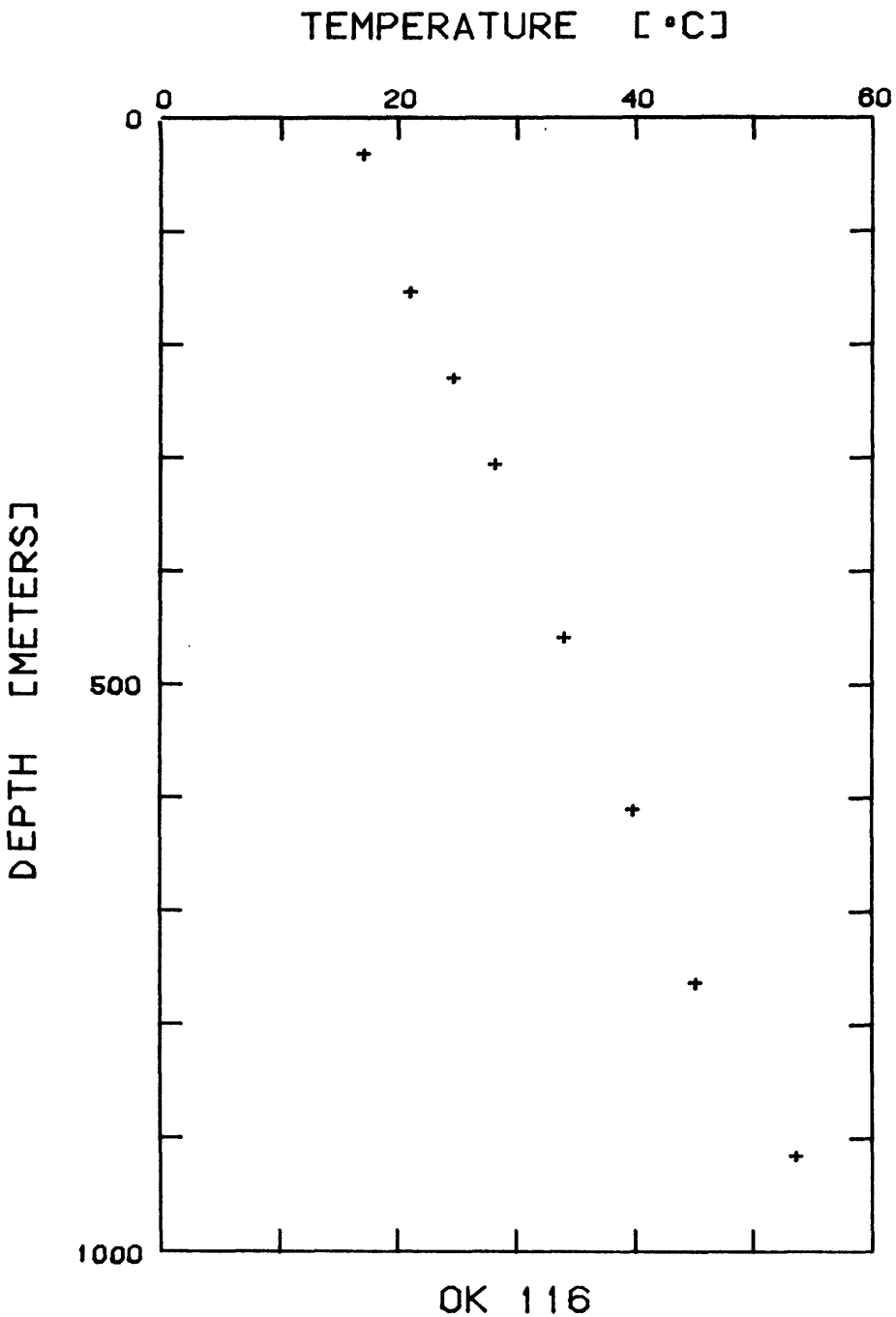
Section, Township, Range, County: SW1/4 sec. 8, T. 28 N., R. 1 E., Kay.

Date of observations: 1929.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Altitude = 340 m. No gas flow; located away from edge of field. Idle one year. Considered an ideal log by observer. Selected from group of 11 wells.



State: OK Hole name: 116

Latitude: 36 deg 49.6 min Longitude: 96 deg 58.2 min

Gradient= 40°C/km, Intercept= 15.5°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.9
152.4	20.9
228.6	24.6
304.8	28.1
457.2	33.9
609.6	39.7
762.	45.
914.4	53.4

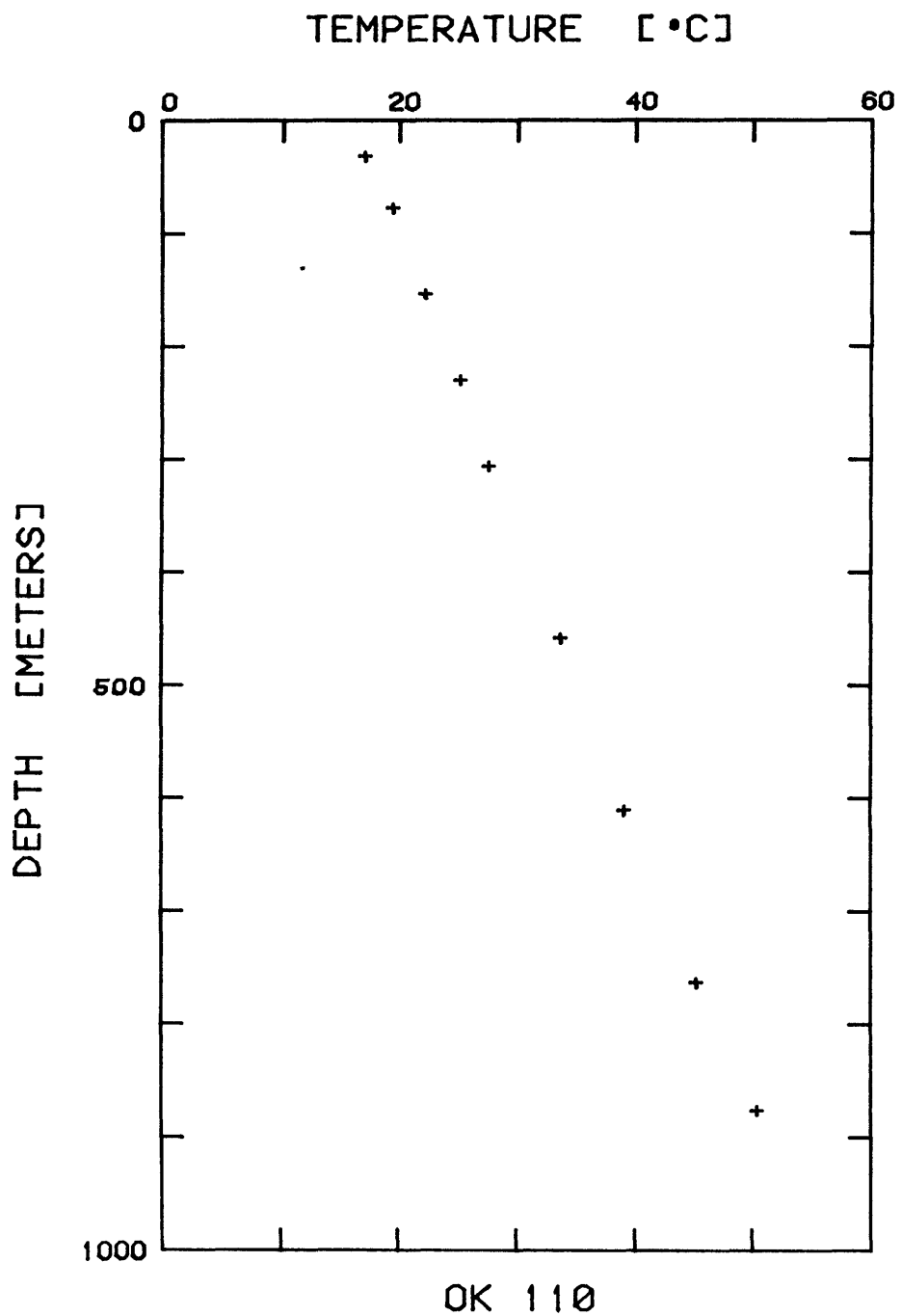
Section, Township, Range, County: SW1/4, NE1/4, SW1/4 sec. 15, T. 27 N., R. 3 E., Kay.

Date of observations: 1920's (?).

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Drilled 1918; a non-producing well. Located about 183 m from well which had been producing for six months prior to logging of this hole. Total depth = 959 m.



State: OK Hole name: 110

Latitude: 36 deg 44.8 min Longitude: 97 deg 21.1 min

Gradient= 38°C/km, Intercept= 16.0°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.6
76.2	19.
152.4	21.8
228.6	24.7
304.8	27.1
457.2	33.2
609.6	38.6
762.	44.7
874.7	49.8

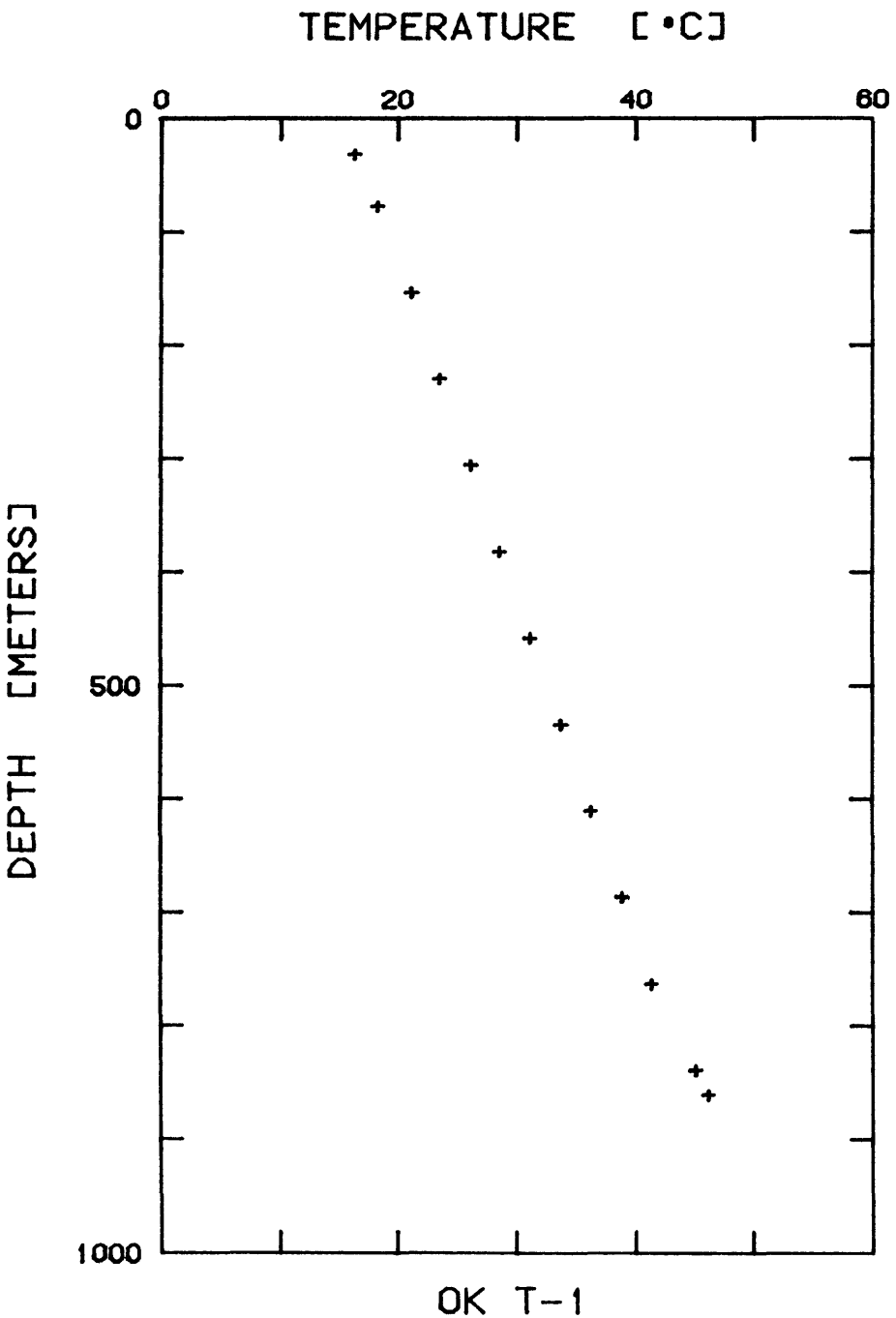
Section, Township, Range, County: SW1/4, SW1/4, NW1/4 sec. 12, T. 26 N., R. 2 W., Kay.

Date of observations: 1928.

Fluid level in drill hole: 378 m.

General lithology: No information.

Remarks: Idle one year.



State: OK Hole name: T-1

Latitude: 36 deg 35.2 min Longitude: 97 deg 16.5 min
Location is to nearest half minute.

Gradient= 35°C/km, Intercept= 15.5°C

Reference code: *MC30

Temperature log

meters	°C
30.5	16.3
76.2	18.3
152.4	21.2
228.6	23.6
304.8	26.2
381.	28.6
457.2	31.2
533.4	33.8
609.6	36.3
685.8	38.9
762.	41.4
838.2	45.1
859.5	46.2

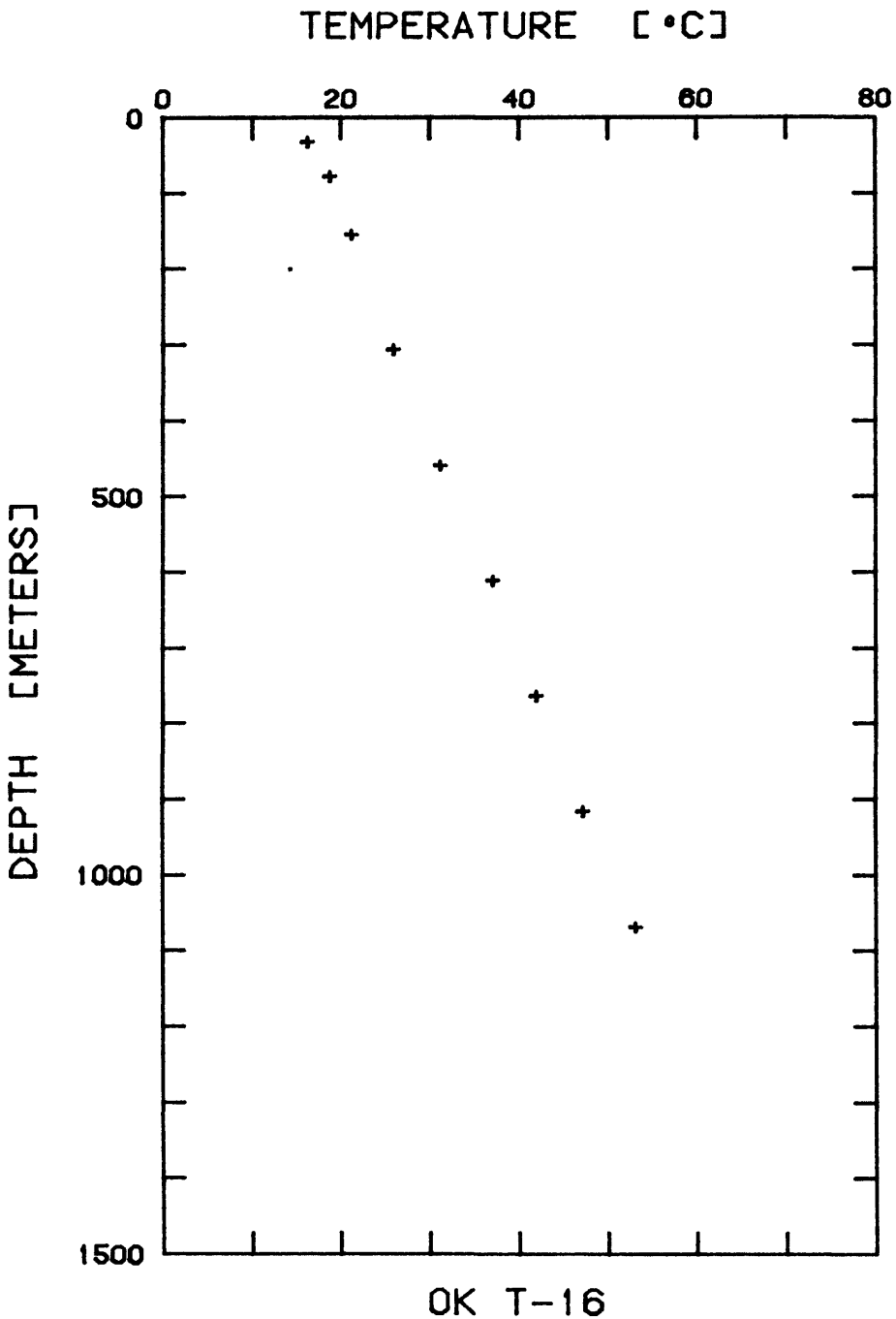
Section, Township, Range, County: Sec. 2, T. 24 N., R. 1 W., Noble.

Date of observations: 10/25/28.

Fluid level in drill hole: 777 m.

General lithology: No information.

Remarks: Idle two years. Small gas flow from outer casing. Selected from group of 17 wells.



State: OK Hole name: T-16

Latitude: 36 deg 31.4 min Longitude: 97 deg 20.2 min

Gradient= 35°C/km, Intercept= 15.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.2
76.2	18.8
152.4	21.3
304.8	26.
457.2	31.3
609.6	37.1
762.	42.
914.4	47.2
1066.8	53.1

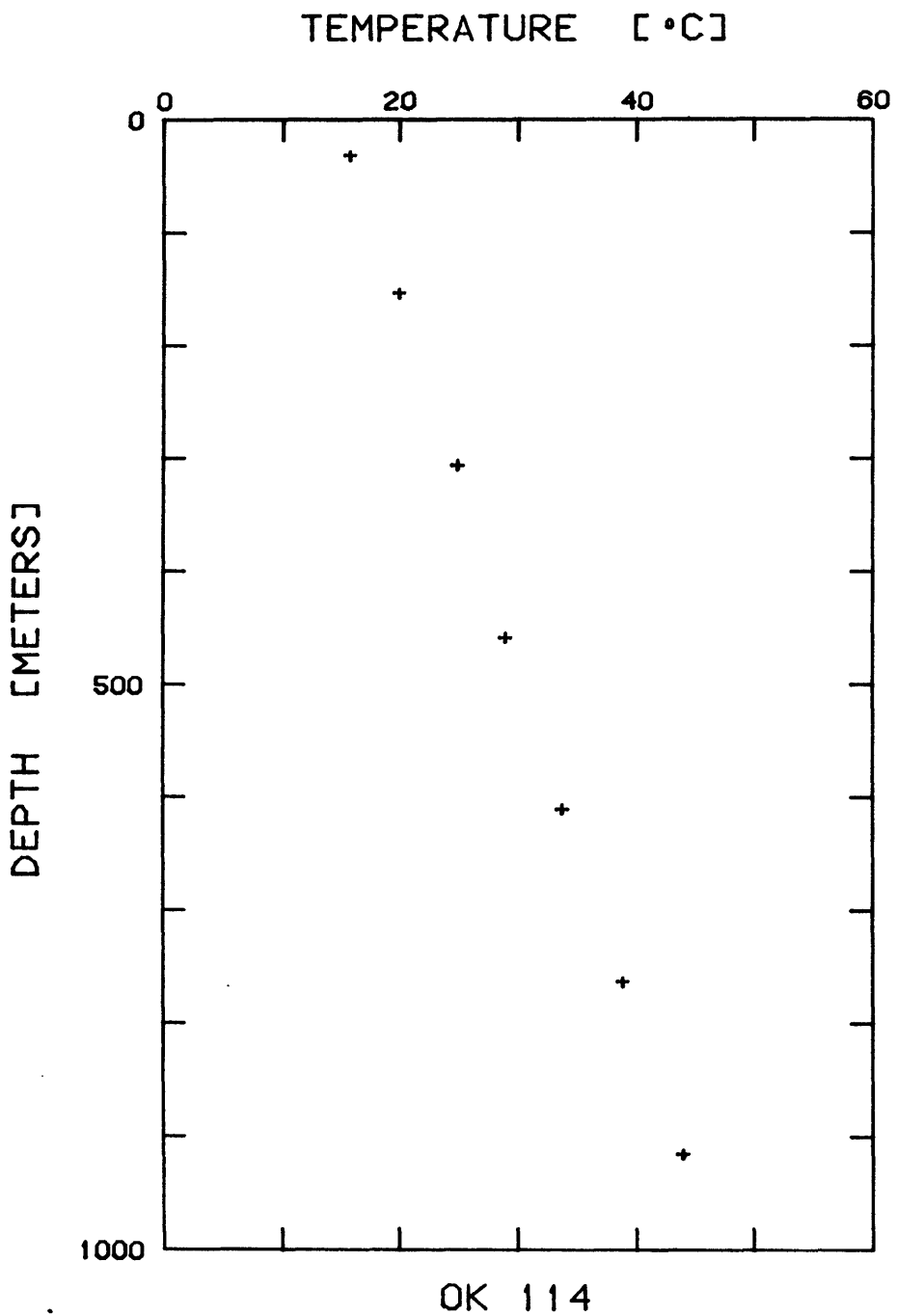
Section, Township, Range, County: NE1/4, NE1/4 sec. 20, T. 24 N., R. 1 W.., Noble.

Date of observations: 1920's.

Fluid level in drill hole: 91 m (water).

General lithology: No information.

Remarks: Idle five to ten years. Altitude = 334 m. Total depth = 1367 m. Selected from group of 17 wells.



State: OK Hole name: 114

Latitude: 36 deg 13.5 min Longitude: 97 deg 24.4 min
Location is to nearest half minute.

Gradient= 31°C/km, Intercept= 15.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	15.8
152.4	20.
304.8	24.9
457.2	28.9
609.6	33.7
762.	38.8
914.4	43.9

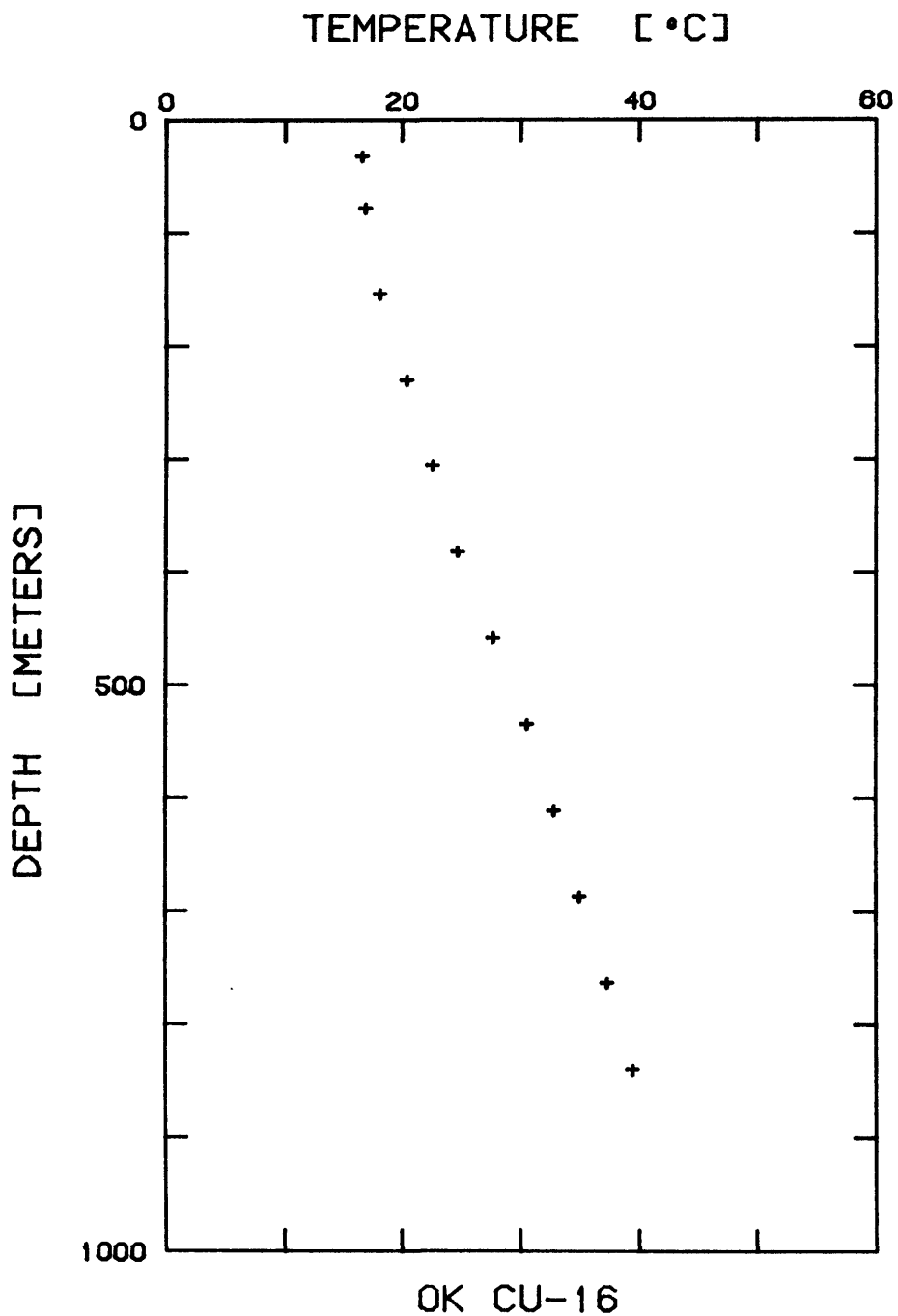
Section, Township, Range, County: Sec. 9, T. 20 N., R. 2 W., Noble.

Date of observations: 1920's (?).

Fluid level in drill hole: 172 m.

General lithology: No information.

Remarks: Altitude = 366 m.



State: OK Hole name: CU-16

Latitude: 35 deg 56.6 min Longitude: 96 deg 34.4 min

Gradient= 32°C/km, Intercept= 13.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.6
76.3	16.9
152.4	18.2
228.6	20.4
304.8	22.6
381.	24.7
457.2	27.7
533.4	30.6
609.6	32.9
685.8	35.
762.	37.3
838.2	39.5

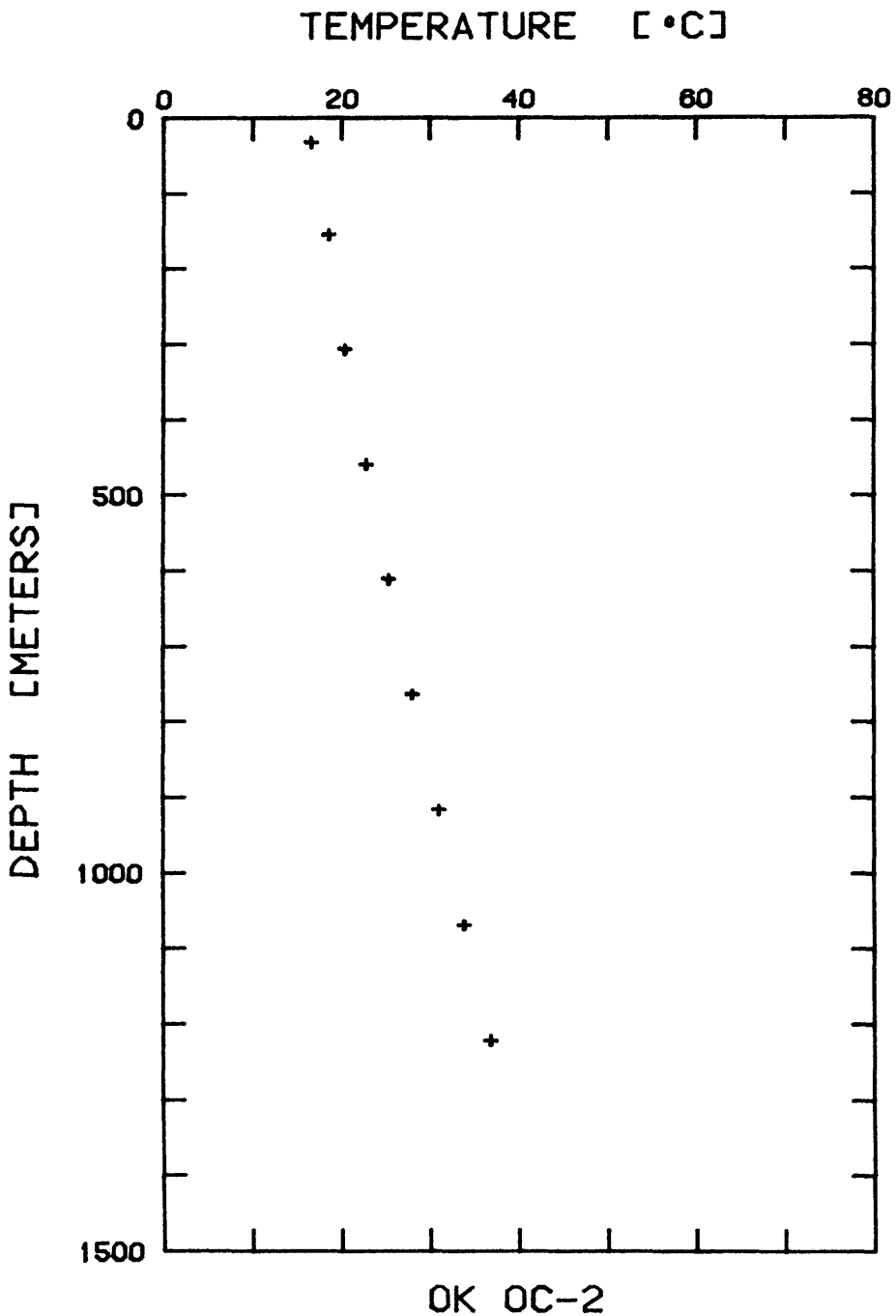
Section, Township, Range, County: SW1/4, SE1/4 sec. 16, T. 17 N., R. 7 E., Creek.

Date of observations: 1929.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: No gas from well during test. Located near center of oil-producing field. Idle one year. On vacuum prior to test. Selected from group of 28 wells.



State: OK Hole name: OC-2

Latitude: 35 deg 31.1 min Longitude: 97 deg 30.0 min

Gradient= 18°C/km, Intercept= 14.7°C

Reference code: *MC30

Temperature log

meters	°C
30.5	16.6
152.4	18.6
304.8	20.5
457.2	22.9
609.6	25.4
762.	28.1
914.4	31.1
1066.8	33.9
1219.2	36.9

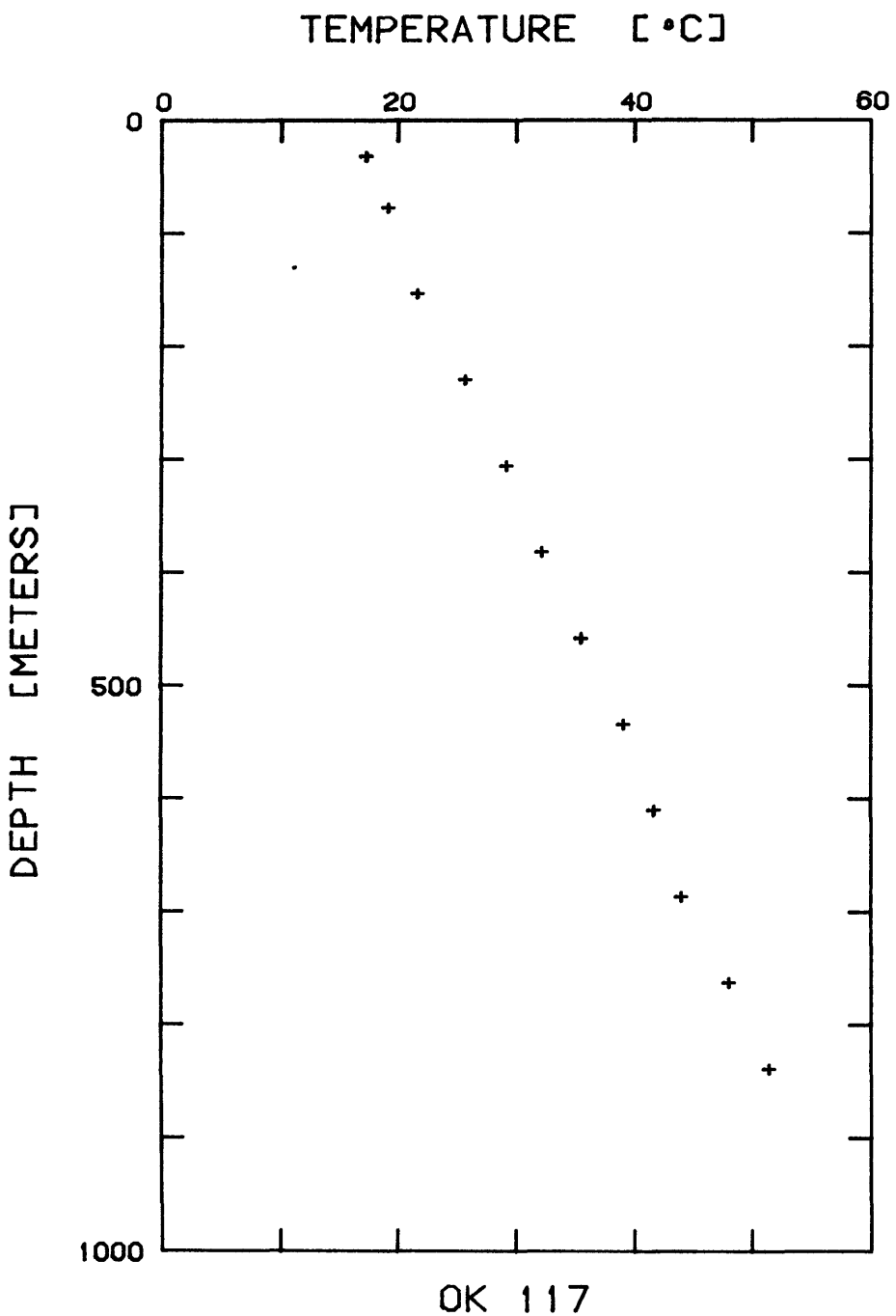
Section, Township, Range, County: SW1/4, NE1/4, NE1/4 sec. 15, T. 12 N., R. 3 W., Oklahoma..

Date of observations: 11/26/28.

Fluid level in drill hole: 67 m.

General lithology: No information.

Remarks: Total depth = 2134 m. Drilled by standard and rotary tools; idle for thirty days. Granite at 2185 m. Dry hole about 4 miles north of oil-producing field.



State: OK Hole name: 117

Latitude: 35 deg 28.4 min Longitude: 96 deg 12.2 min
Location is to nearest half minute.

Gradient= 42°C/km, Intercept= 16.0°C

Reference code: *MC30

Temperature log

meters	°C
30.5	17.2
76.2	19.1
152.4	21.6
228.6	25.6
304.8	29.1
381.	32.1
457.2	35.4
533.4	39.
609.6	41.6
685.8	43.9
762.	47.9
838.2	51.3

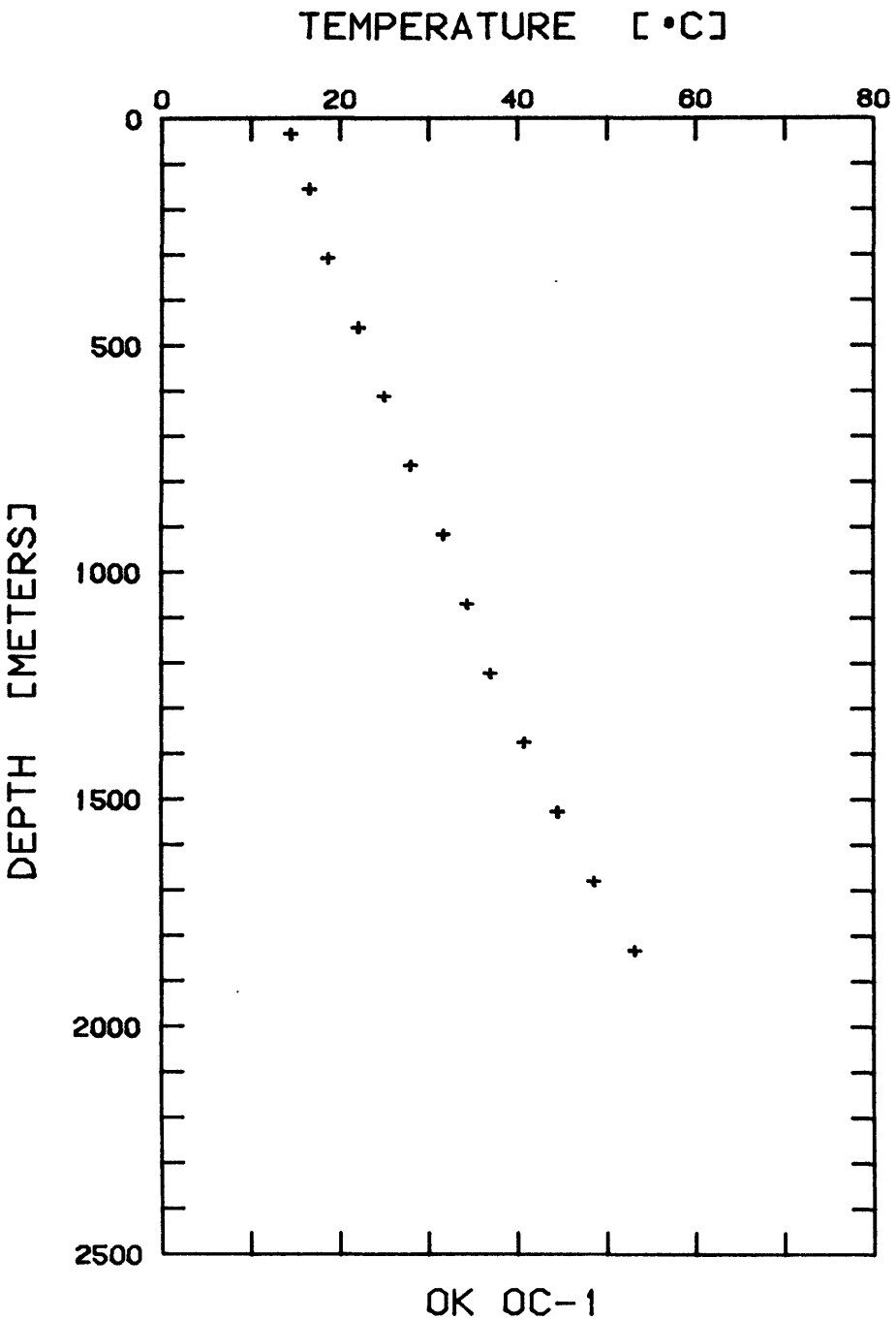
Section, Township, Range, County: Sec. 36, T. 12 N., R. 10 E., Okfuskee.

Date of observations: 1928.

Fluid level in drill hole: 762 m.

General lithology: No information.

Remarks: Small gas flow from casing. Idle three months.



State: OK Hole name: OC-1

Latitude: 35 deg 26.0 min Longitude: 97 deg 27.7 min

Gradient= 21°C/km, Intercept= 12.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	14.5
152.4	16.6
304.8	18.7
457.2	22.2
609.6	25.1
762.	28.1
914.4	31.8
1066.8	34.5
1219.2	37.1
1371.6	40.9
1524.	44.6
1676.4	48.6
1828.8	53.2

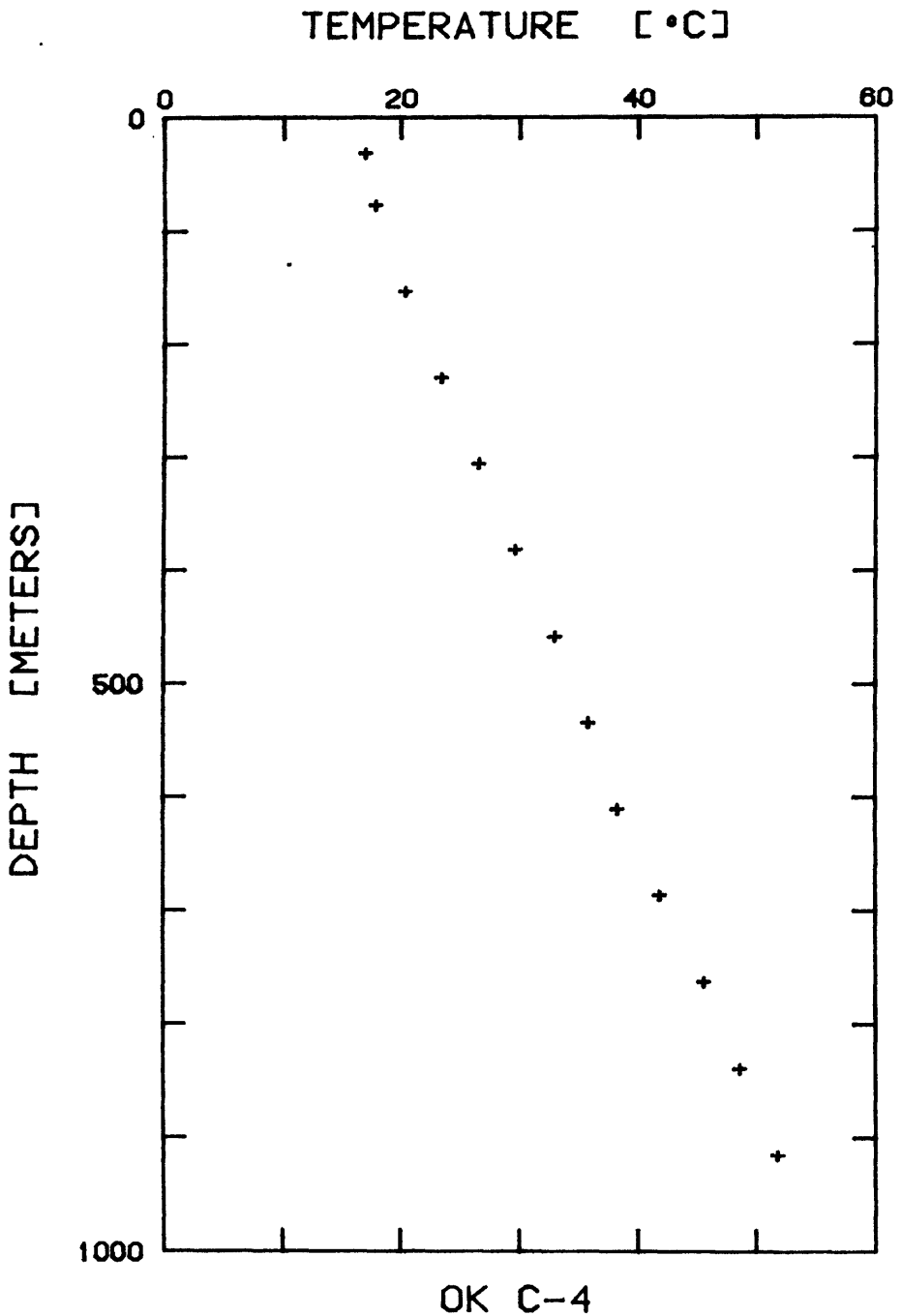
Section, Township, Range, County: NE1/4, NW1/4, NE1/4 sec. 13, T. 11 N., R. 3 W., Oklahoma

Date of observations: 1927.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Altitude = 382 m.



State: OK

Hole name: C-4

Latitude: 35 deg 21.4 min

Longitude: 96 deg 27.0 min

Gradient= 41°C/km,

Intercept= 14.0°C

Reference code: *MC30

Temperature log

meters	°C
30.5	17.
76.2	17.8
152.4	20.4
228.6	23.4
304.8	26.6
381.	29.7
457.2	33.
533.4	35.8
609.6	38.3
685.8	41.9
762.	45.6
838.2	48.6
914.4	51.8

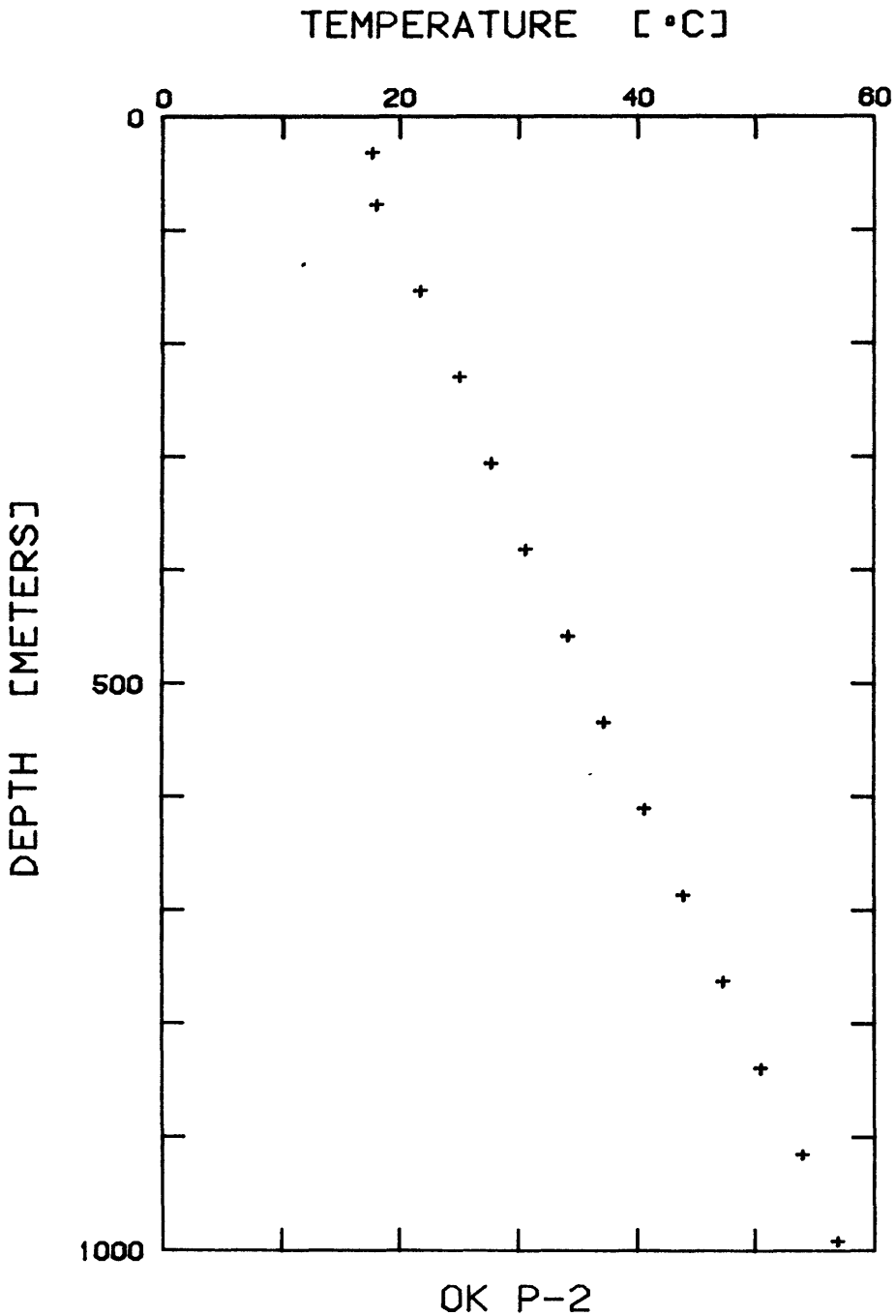
Section, Township, Range, County: NW1/4, SE1/4, NW1/4 sec. 10, T. 10 N., R. 8 E., Seminole.

Date of observations: 8/15/28.

Fluid level in drill hole: No fluid in hole.

General lithology: No information.

Remarks: Idle one year. Located on 15-m sandstone hill; altitude = 273 m. Total depth = 1062 m. Drilling completed 1924; produced oil. Selected from group of 9 wells.



State: OK Hole name: P-2

Latitude: 35 deg 17.6 min Longitude: 96 deg 19.2 min

Gradient= 43°C/km, Intercept= 14.7°C

Reference code: *MC30

Temperature log

meters	°C
30.5	17.7
76.2	18.
152.4	21.7
228.6	25.
304.8	27.7
381.	30.6
457.2	34.2
533.4	37.2
609.6	40.6
685.8	43.9
762.	47.2
838.2	50.4
914.4	53.9
990.6	56.8

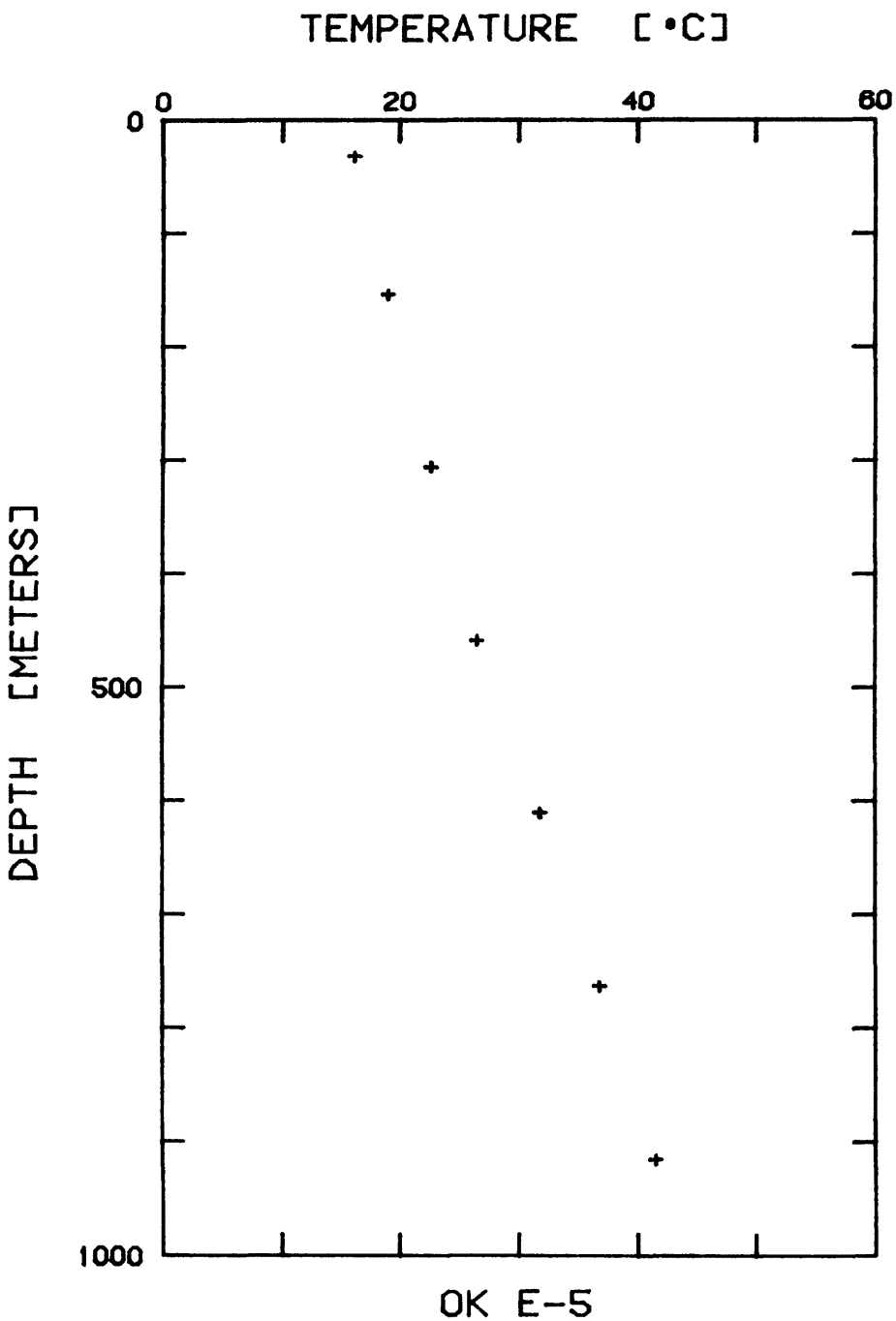
Section, Township, Range, County: NW1/4, SE1/4, SE1/4 sec. 35, T. 10 N., R. 9 E., Okfuskee.

Date of observations: 5/25/29.

Fluid level in drill hole: 762 m.

General lithology: No information.

Remarks: Idle two months. Gas bubbles outside of casing. Well is an edge-of-field water well; no production. Altitude = 250 m. Selected from group of 4 wells.



State: OK Hole name: E-5

Latitude: 35 deg 14.0 min Longitude: 96 deg 43.0 min

Gradient= 32°C/km, Intercept= 12.4°C

Reference code: *MC30

Temperature log

meters	°C
30.5	16.2
152.4	19.
304.8	22.6
457.2	26.5
609.6	31.8
762.	36.8
914.4	41.5

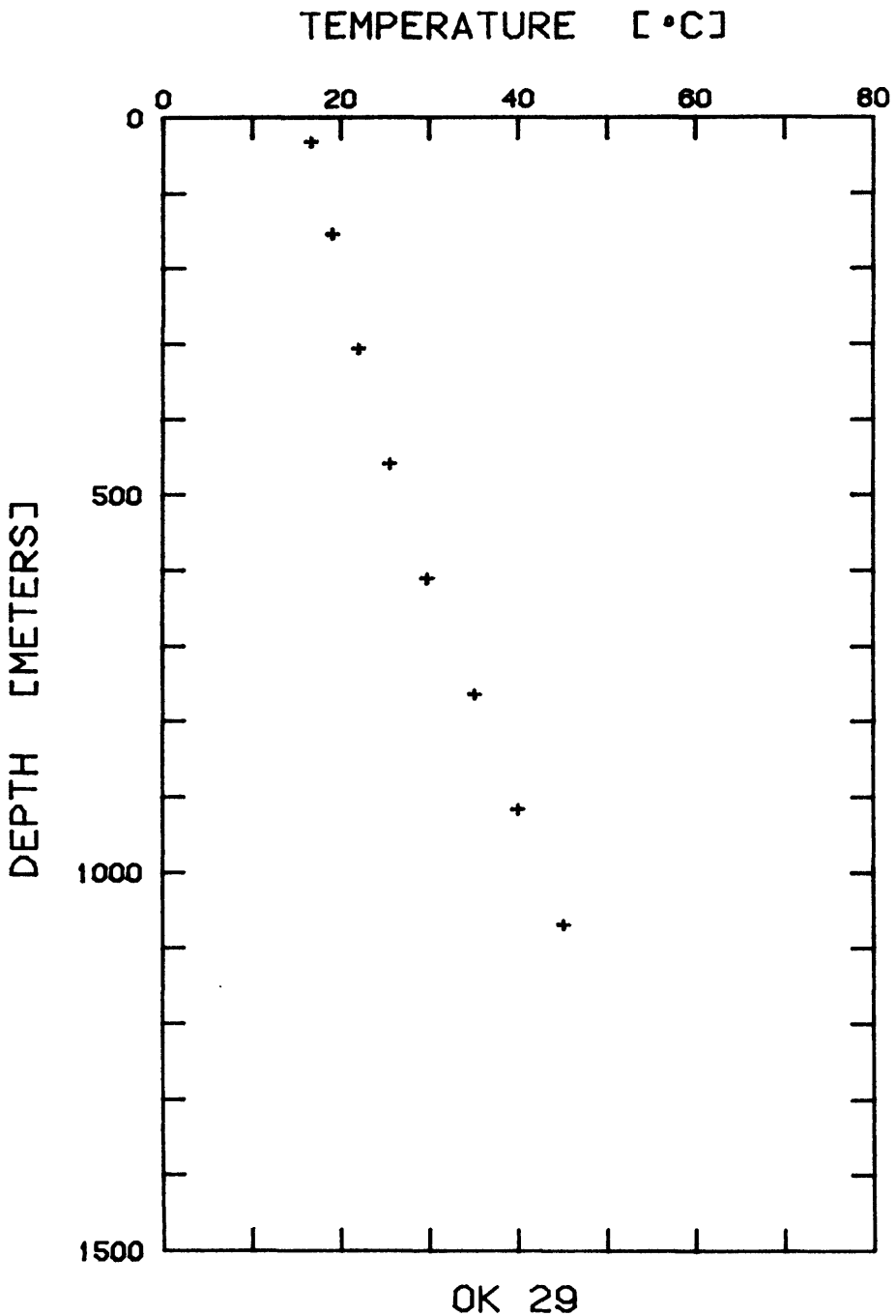
Section, Township, Range, County: SE1/4, SE1/4, SW1/4 sec. 19, T. 9 N., R. 6 E., Seminole.

Date of observations: 1930.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Idle one year; never produced. Altitude = 279 m. Total depth = 1309 m. Drilled in 1930. Selected from group of 6 wells.



State: OK Hole name: 29

Latitude: 35 deg 10.8 min Longitude: 96 deg 45.6 min

Gradient= 31°C/km, Intercept= 11.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.7
152.4	19.1
304.8	22.2
457.2	25.7
609.6	29.8
762.	35.2
914.4	40.1
1066.8	45.2

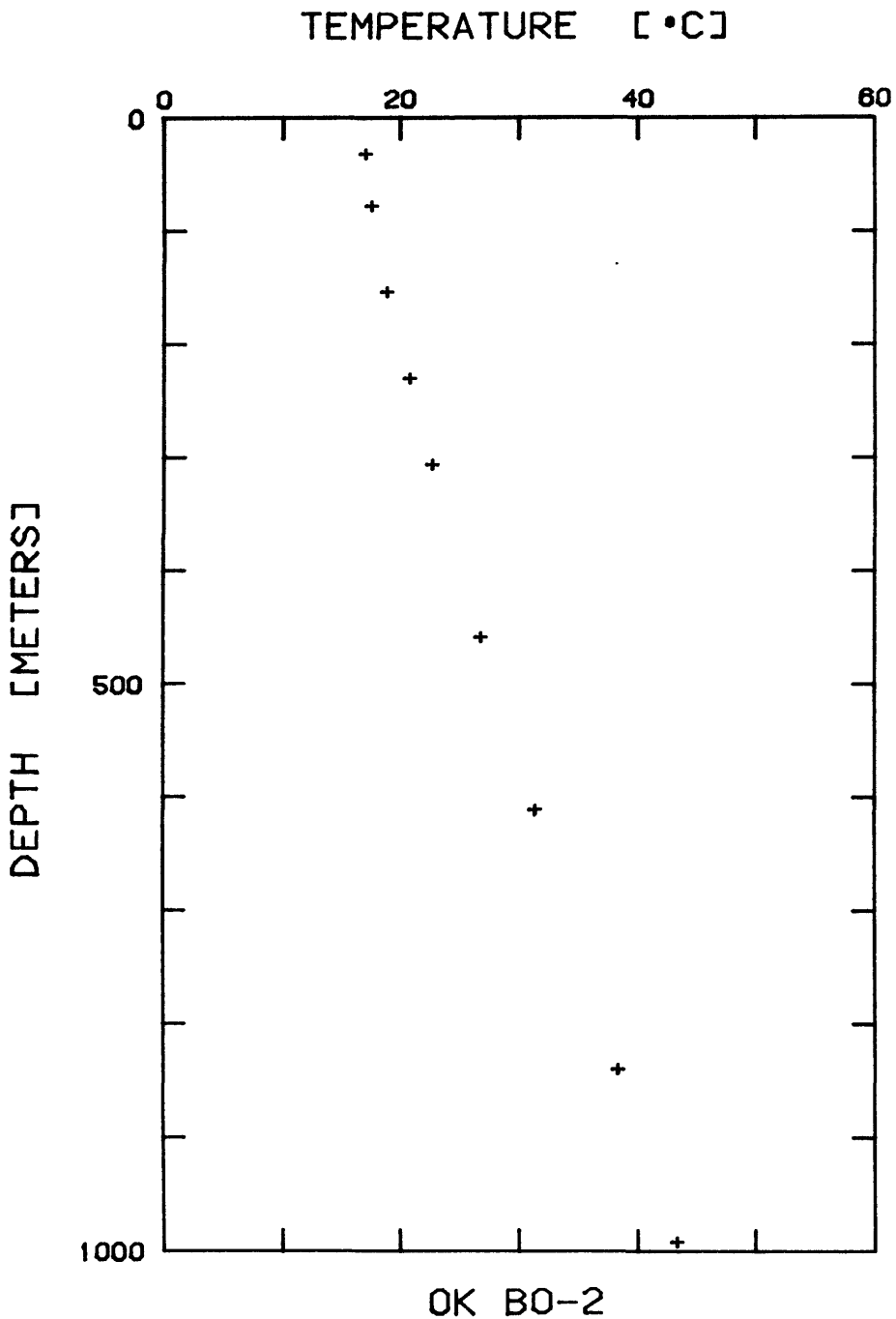
Section, Township, Range, County: NE1/4, NE1/4, SE1/4 sec. 10, T. 8 N., R. 5 E., Seminole.

Date of observations: 1929.

Fluid level in drill hole: No fluid in hole.

General lithology: No information.

Remarks: Idle 16 months. Altitude = 279 m. Total depth = 1271 m.



State: OK Hole name: BO-2

Latitude: 35 deg 10.1 min Longitude: 96 deg 40.1 min

Gradient= 29°C/km, Intercept= 13.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.1
76.2	17.6
152.4	18.9
228.6	20.8
304.8	22.7
457.2	26.8
609.6	31.4
838.2	38.3
990.6	43.3

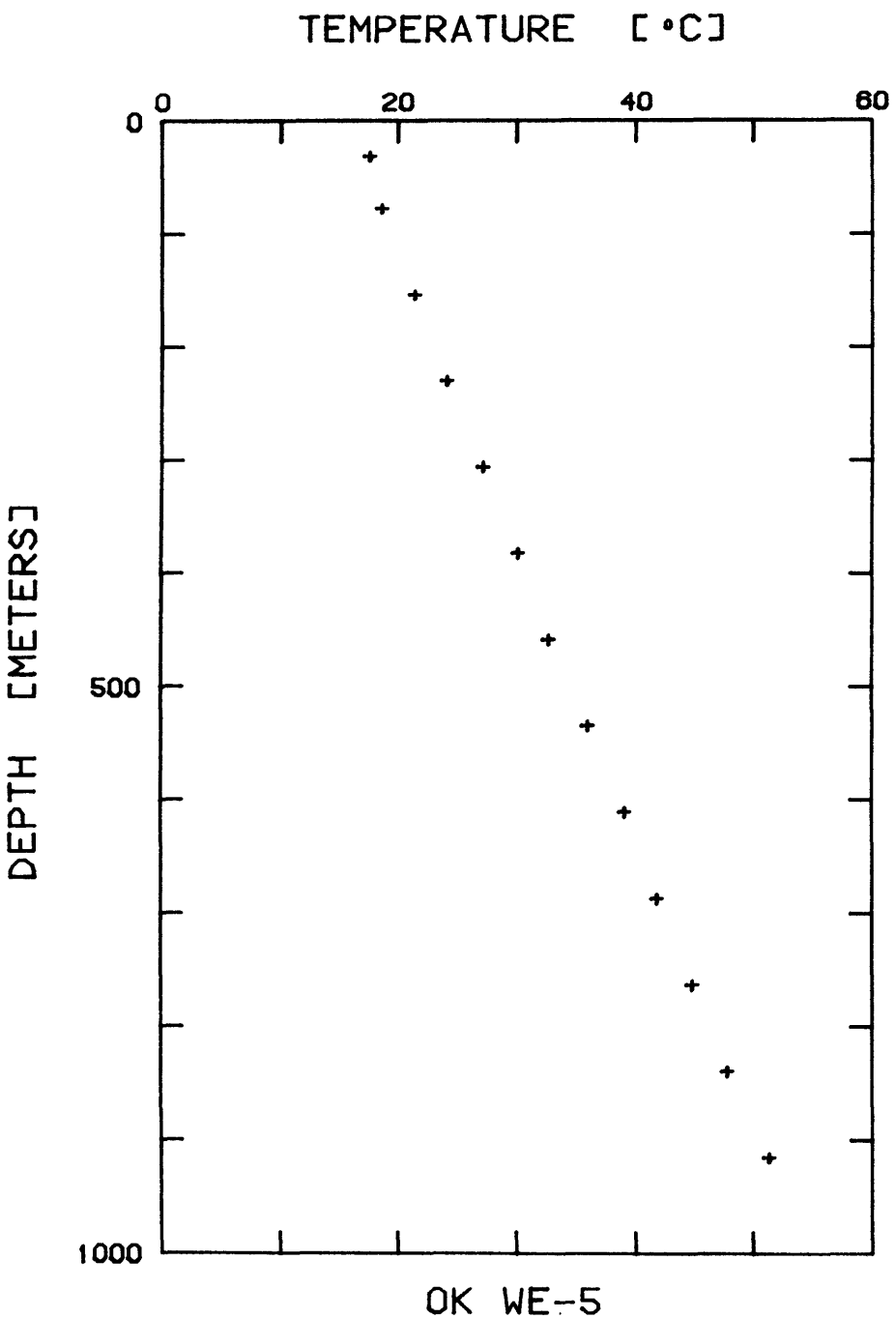
Section, Township, Range, County: NE1/4, SE1/4, NE1/4 sec. 16, T. 8 N., R. 6 E., Seminole.

Date of observations: 1929.

Fluid level in drill hole: No fluid in hole.

General lithology: No information.

Remarks: Small gas flow from casing. Idle six months. Altitude = 285 m. Total depth = 1338 m. Selected from group of 5 wells.



State: OK Hole name: WE-5

Latitude: 35 deg 9.9 min Longitude: 96 deg 27.0 min

Gradient= 39°C/km, Intercept= 15.2°C

Reference code: *MC30

Temperature log

meters	°C
30.5	17.6
76.2	18.6
152.4	21.4
228.6	24.1
304.8	27.2
381.	30.2
457.2	32.7
533.4	36.
609.6	39.1
685.8	41.8
762.	44.9
838.2	47.8
914.4	51.3

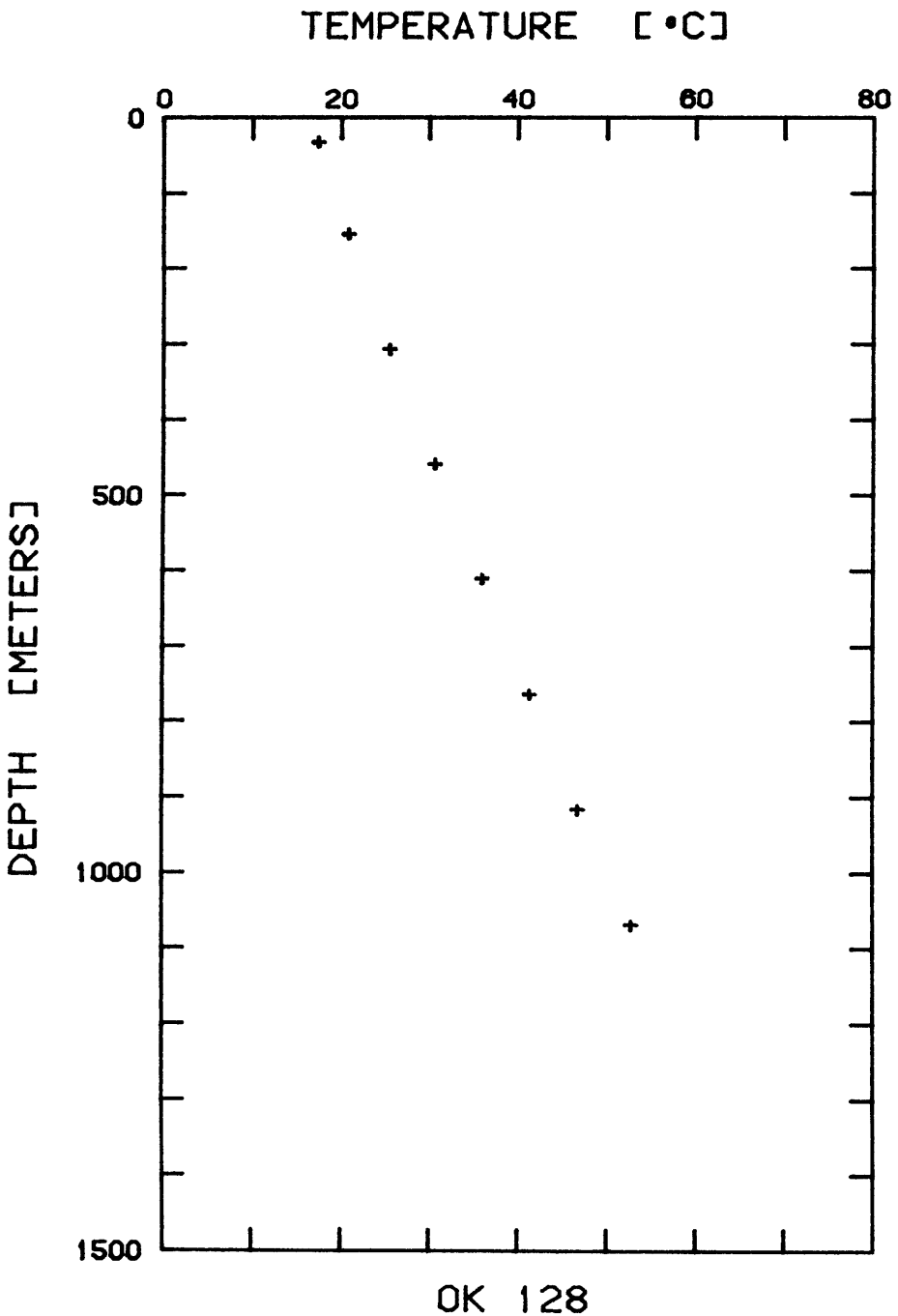
Section, Township, Range, County: SW1/4, NE1/4, SW1/4 sec. 15, T. 8 N., R. 8 E., Seminole.

Date of observations: 8/5/28.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Idle one year. Well is located on sandstone hill about 30 m above surrounding area. No production from well. Total depth = 1005 m. Producing well nearby. Considered an ideal well for logging by observer. Selected from group of 5 wells.



State: OK Hole name: 128

Latitude: 35 deg 0.2 min Longitude: 96 deg 29.9 min

Gradient= 35°C/km, Intercept= 14.5°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.4
152.4	20.9
304.8	25.6
457.2	30.7
609.6	36.1
762.	41.4
914.4	46.9
1066.8	52.8

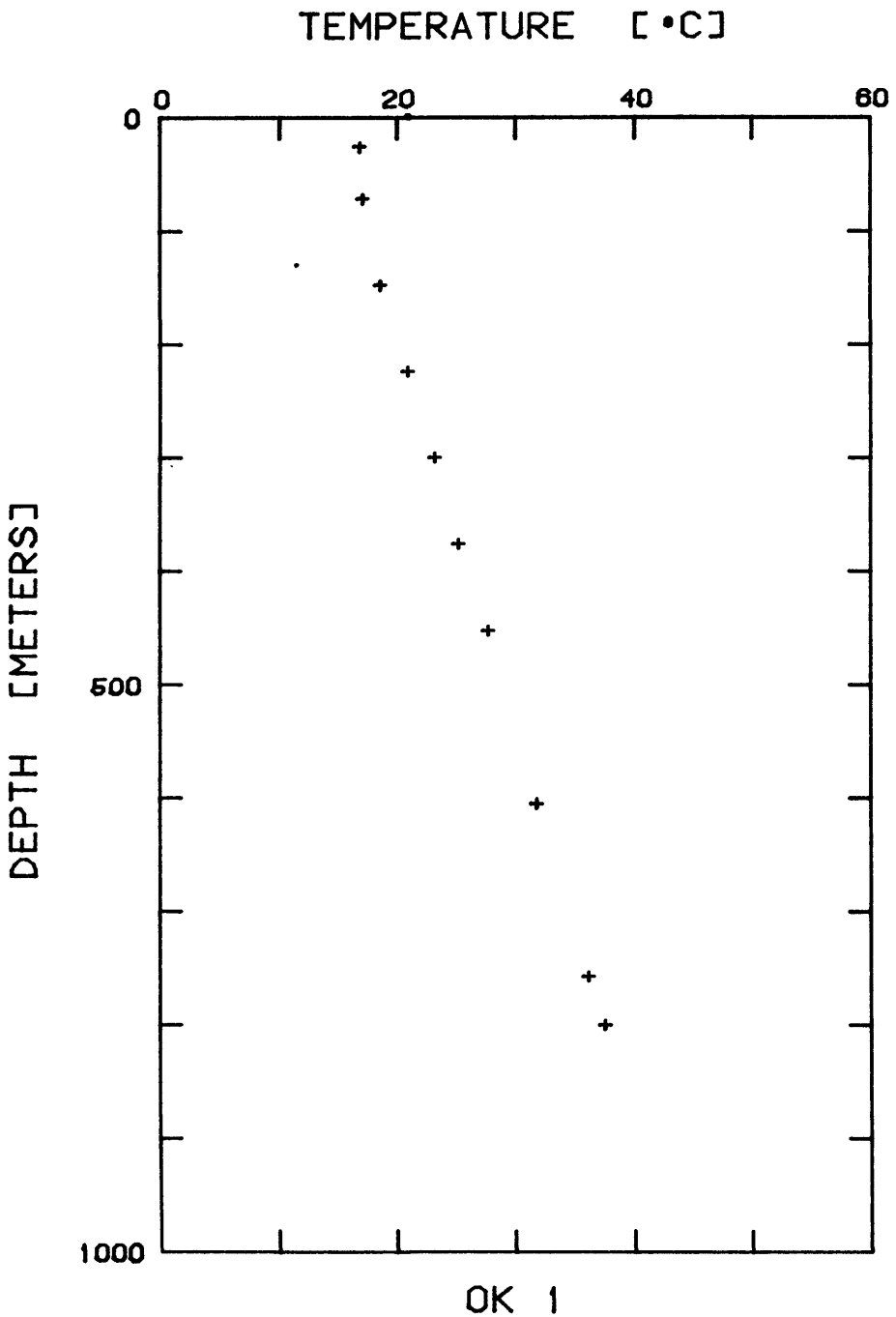
Section, Township, Range, County: SW1/4, SE1/4 sec. 7, T. 6 N., R. 8 E., Seminole.

Date of observations: 1929.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Idle six months.



State: OK Hole name: 1

Latitude: 34 deg 54.7 min Longitude: 96 deg 31.8 min

Gradient= 29°C/km, Intercept= 14.4°C

Reference code: SP 64

Temperature log

meters	°C
24.4	16.7
70.1	17.
146.3	18.5
222.5	20.8
298.7	23.1
374.9	25.1
451.1	27.6
603.5	31.7
755.9	36.
798.6	37.4

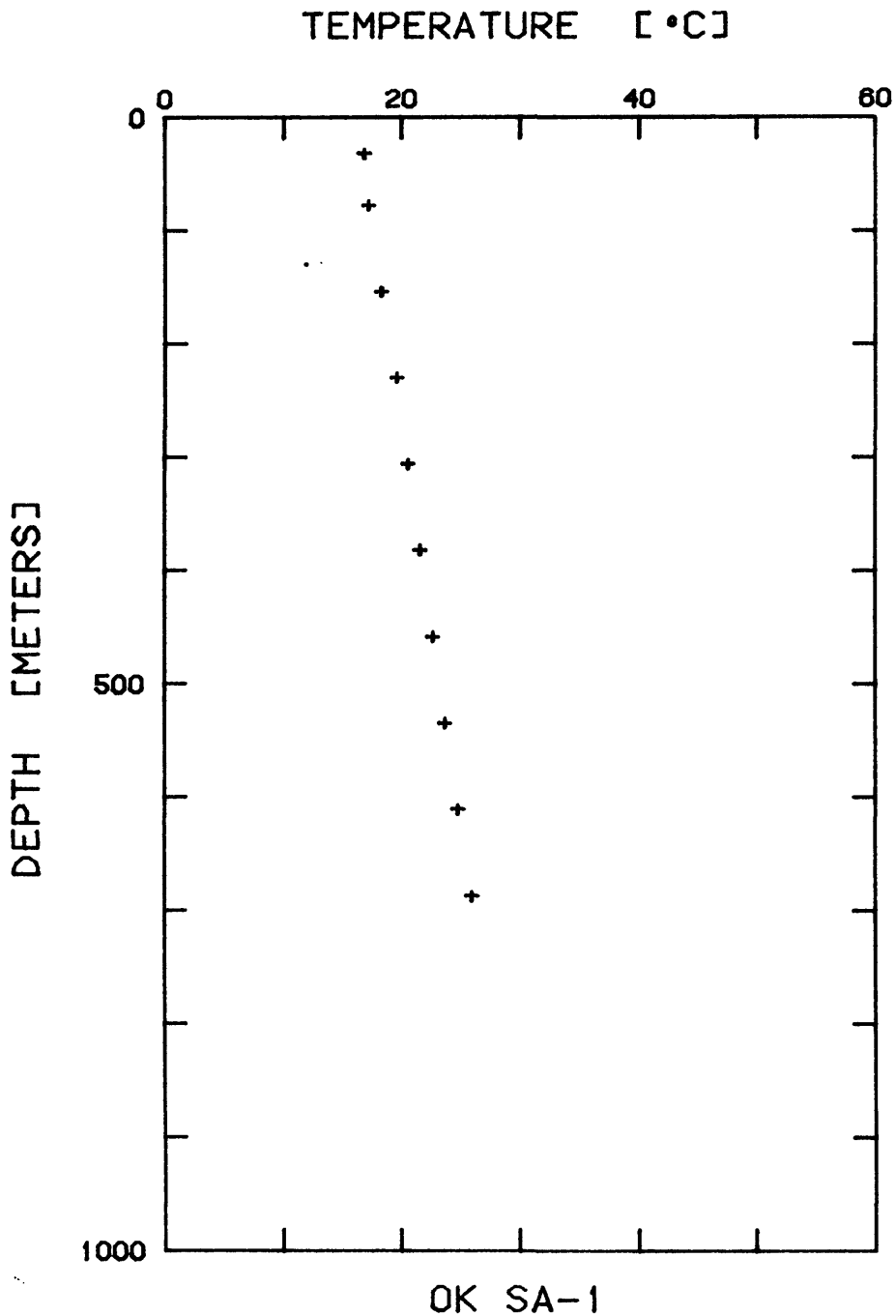
Section, Township, Range, County: NE1/4, NE1/4, NE1/4 sec. 14, T. 5 N., R. 7 E., Seminole.

Date of observations: 5/24/29.

Fluid level in drill hole: 168 m (salt water).

General lithology: No information.

Remarks: Idle two months following drilling (probably logged before drilling was completed). No production except for small show of gas. Located on 15-m sandstone hill. Total depth = 975 m.



State: OK Hole name: SA-1

Latitude: 34 deg 28.2 min Longitude: 97 deg 33.4 min

Gradient= 14°C/km, Intercept= 16.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	16.8
76.2	17.2
152.4	18.3
228.6	19.6
304.8	20.6
381.	21.6
457.2	22.7
533.4	23.7
609.6	24.8
685.8	26.

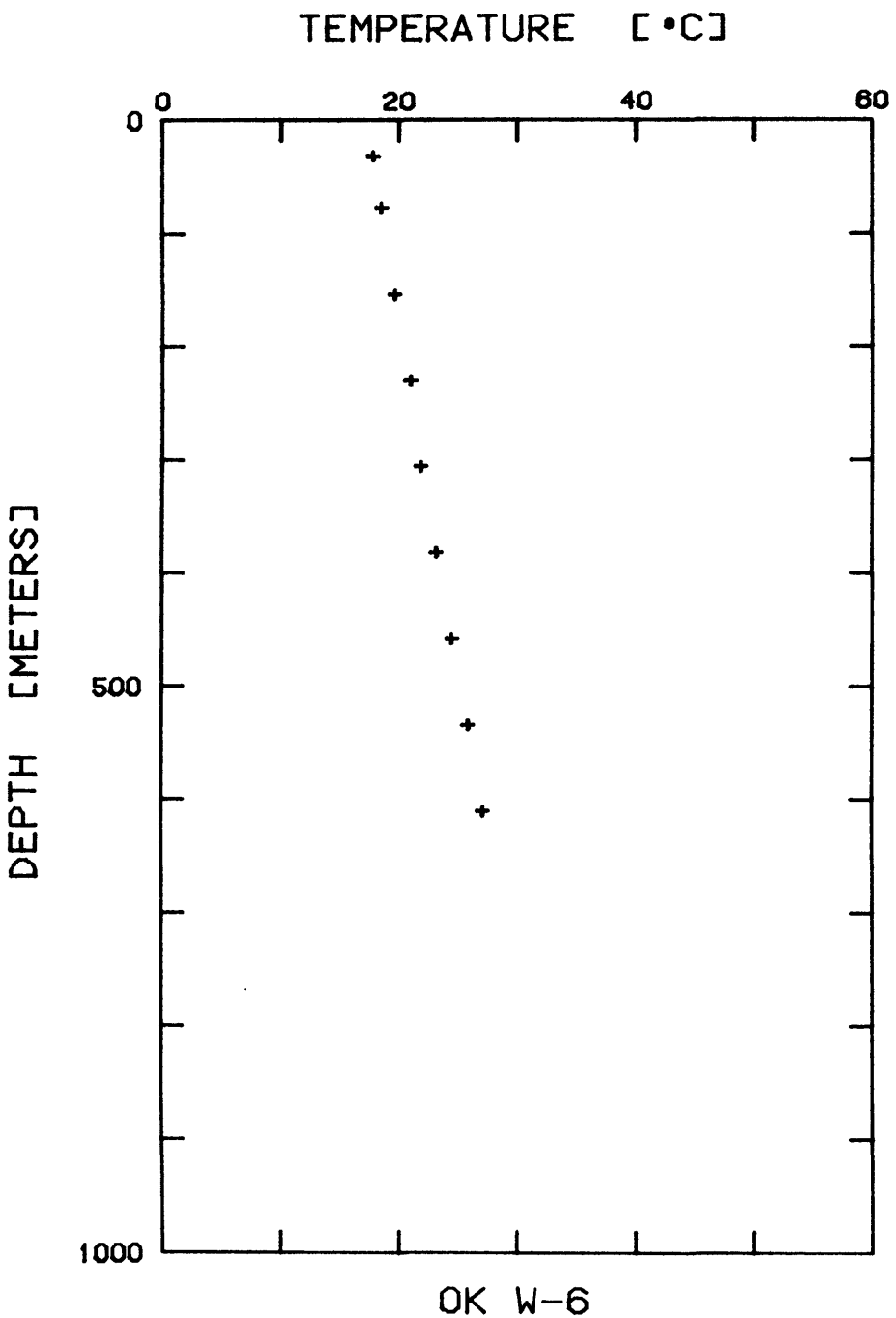
Section, Township, Range, County: NW1/4, NW1/4, SW1/4 sec. 18, T. 1 S., R. 3 W., Carter.

Date of observations: 1928 or 1929.

Fluid level in drill hole: About 300 m.

General lithology: No information.

Remarks: No oil production; well is located just off the oil-bearing structure. Producing wells are nearby. Well is located between two branches of a dry run. Total depth = 930 m.



State: OK Hole name: W-6

Latitude: 34 deg 25.1 min Longitude: 98 deg 15.4 min

Gradient= 17°C/km, Intercept= 17.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.8
76.2	18.5
152.4	19.6
228.6	21.
304.8	21.9
381.	23.2
457.2	24.5
533.4	25.9
609.6	27.2

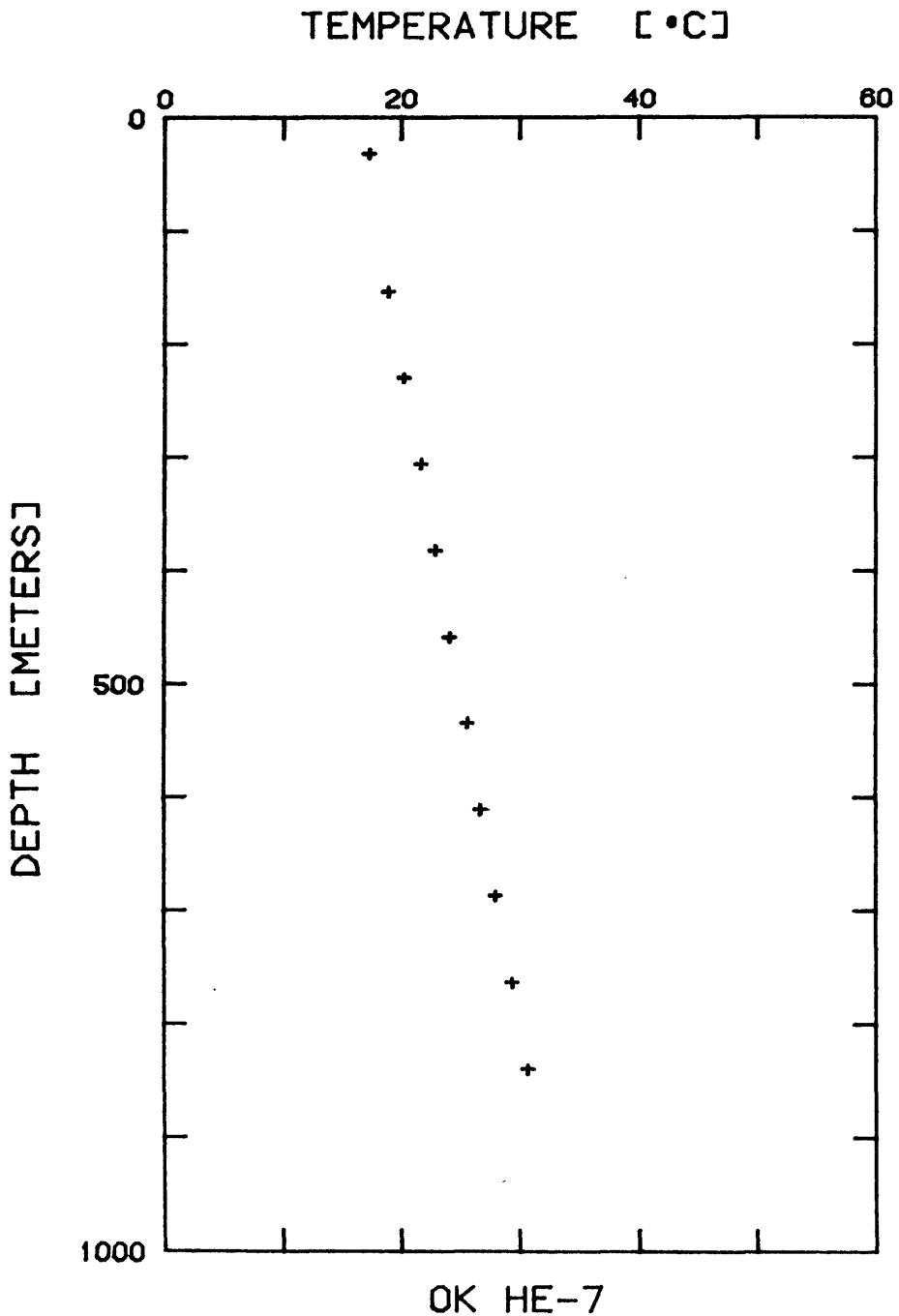
Section, Township, Range, County: NW1/4, NE1/4, SW1/4 sec. 4, T. 2 S., R. 10 W., Cotton.

Date of observations: 1929.

Fluid level in drill hole: 91 m.

General lithology: No information.

Remarks: Idle two years. No gas flow. An abandoned pumping well near edge of oil field. Total depth = 639 m. Selected from group of 10 wells.



State: OK Hole name: HE-7

Latitude: 34 deg 11.7 min Longitude: 97 deg 23.6 min
Location is to nearest half minute.

Gradient= 17°C/km, Intercept= 16.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	17.3
152.4	18.9
228.6	20.2
304.8	21.7
381.	22.9
457.2	24.1
533.4	25.6
609.6	26.7
685.8	28.
762.	29.4
838.2	30.7

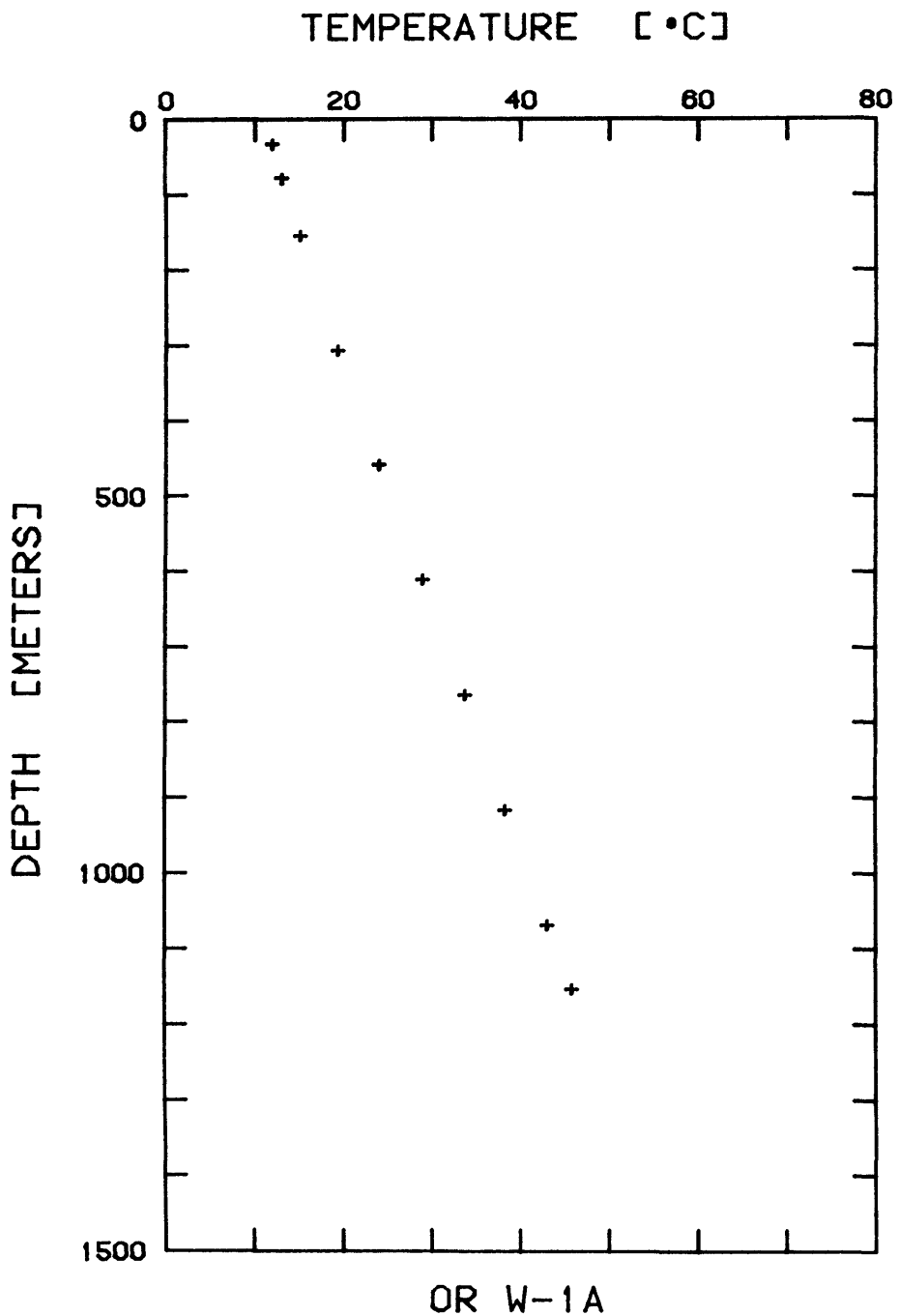
Section, Township, Range, County: Sec. 22, T. 4 S., R. 2 W., Carter.

Date of observations: 1928.

Fluid level in drill hole: 390 m.

General lithology: No information.

Remarks: Well located about 15 m from edge of bayou and about 1 m above flood stage. No production from this well; producer located about 15 m away. Selected from group of 10 wells.



State: OR Hole name: W-1A

Latitude: 46 deg 8.7 min Longitude: 123 deg 52.7 min

Gradient= 31°C/km, Intercept= 9.8°C

Reference code: *V038

Temperature log

meters	°C
30.5	12.
76.2	13.1
152.4	15.2
304.8	19.4
457.2	24.1
609.6	29.1
762.	33.8
914.4	38.4
1066.8	43.1
1152.1	45.9

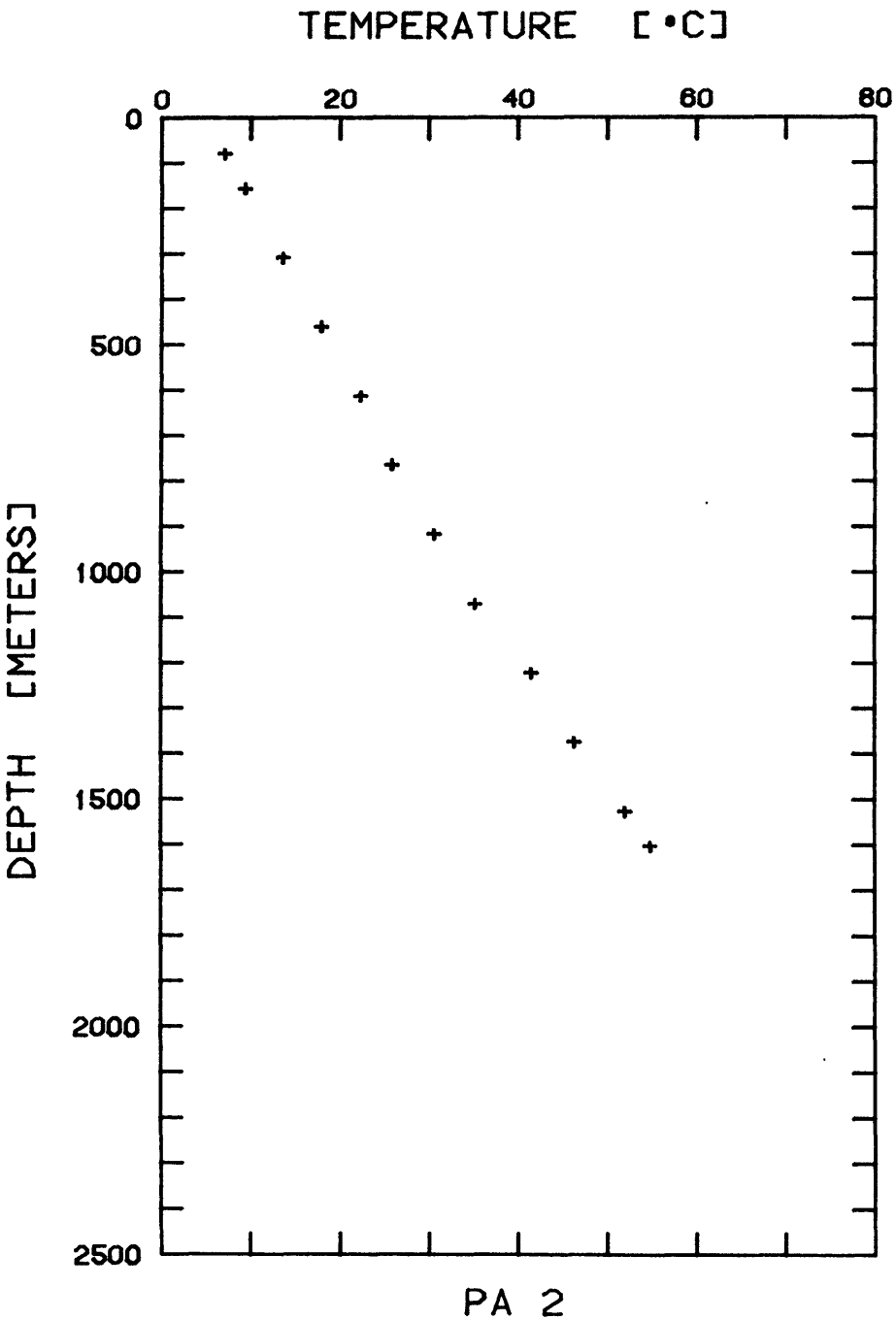
Section, Township, Range, County: Sec. 25, T. 8 N., R. 10 W., Clatsop.

Date of observations: Summer, 1922.

Fluid level in drill hole: 68 m (water).

General lithology: No information.

Remarks: Idle six weeks prior to test; drilled with standard tools. Located about four miles inland from Pacific Ocean. A temperature log made in 1921 in this well is disturbed due to recent drilling (intercept is higher and gradient lower than for 1922 log).



State: PA Hole name: 2

Latitude: 41 deg 52.8 min Longitude: 77 deg 59.4 min

Gradient= 32°C/km, Intercept= 3.1°C

Reference code: SP 64

Temperature log

meters	°C
76.2	7.2
152.4	9.4
304.8	13.7
457.2	18.
609.6	22.4
762.	25.9
914.4	30.7
1066.8	35.3
1219.2	41.6
1371.6	46.5
1524.	52.1
1600.2	54.9

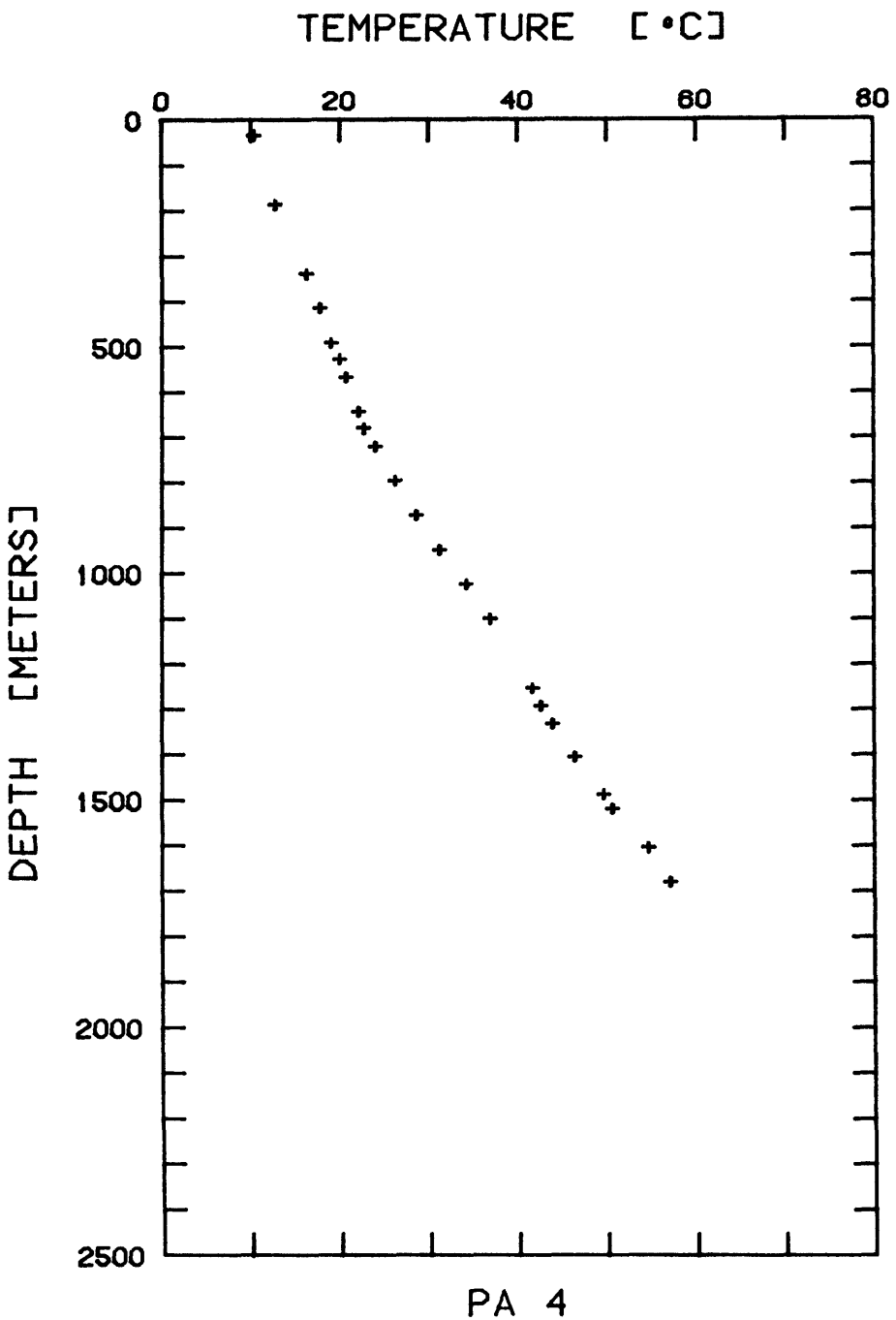
Section, Township, Range, County: Potter.

Date of observations: 1935.

Fluid level in drill hole: No information.

General lithology: Limestone, 1430 to 1612 m. Oriskany sandstone, 1612 m.

Remarks: Altitude = 657 m. Total depth = 1614 m. Initial gas production = 3500 MCF. Rock pressure = 2175 psi. Drilling completed 10/21/32.



State: PA Hole name: 4

Latitude: 41 deg 44.4 min Longitude: 77 deg 34.8 min

Gradient= 30°C/km, Intercept= 4.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	10.4
182.9	12.8
335.3	16.3
411.5	17.8
487.7	19.1
524.3	20.
563.9	20.7
640.1	22.2
676.7	22.7
716.3	24.
792.5	26.2
868.7	28.6
944.9	31.3
1021.1	34.2
1097.3	37.
1249.7	41.7
1289.3	42.6
1328.9	44.
1402.1	46.5
1484.4	49.7
1514.9	50.7
1600.2	54.6
1676.4	57.1

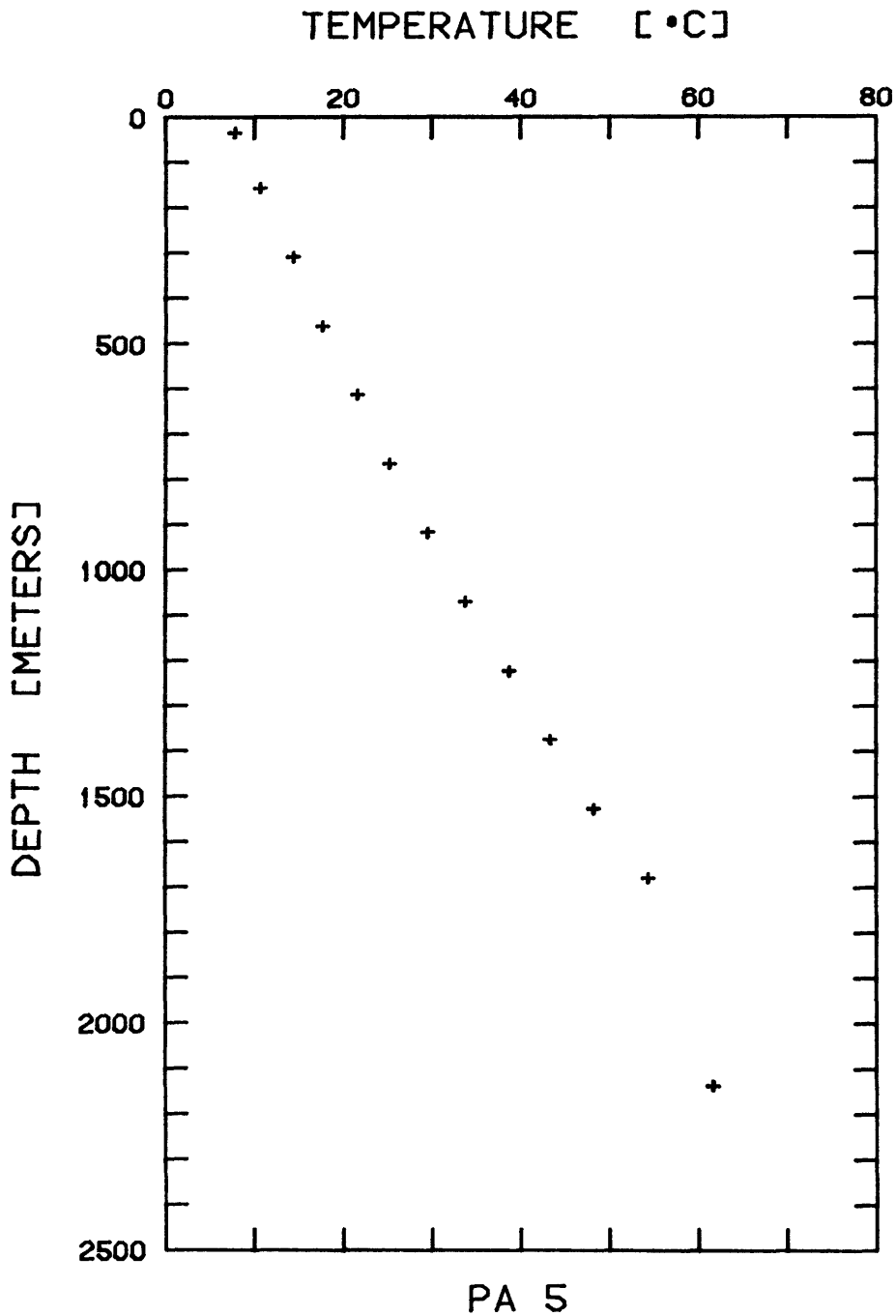
Section, Township, Range, County: Tioga.

Date of observations: 1909 or 1910.

Fluid level in drill hole: No information.

General lithology: Ononadaga at 1524 m.

Remarks: Altitude = 396 m. Observations probably obtained on bailer line. Completed 4/15/09. Total depth = 1981 m. Dry hole in Oriskany sandstone.



State: PA Hole name: 5

Latitude: 41 deg 35.9 min Longitude: 78 deg 49.9 min

Gradient= 29°C/km, Intercept= 4.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	7.8
152.4	10.7
304.8	14.4
457.2	17.7
609.6	21.6
762.	25.3
914.4	29.6
1066.8	33.8
1219.2	38.8
1371.6	43.4
1524.	48.3
1676.4	54.4
2133.6	61.7

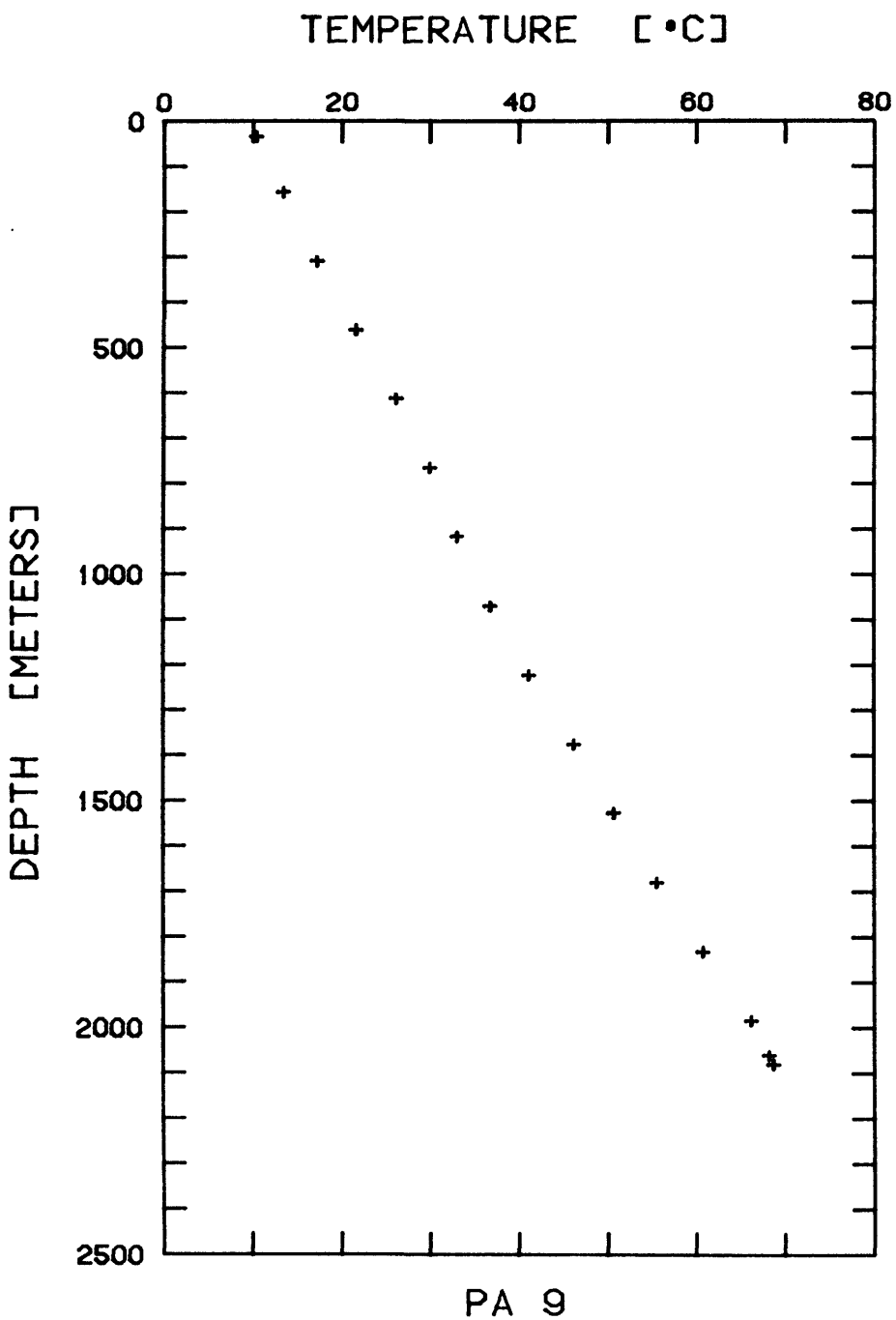
Section, Township, Range, County: Elk.

Date of observations: 1928.

Fluid level in drill hole: No information.

General lithology: Limestone, 1485 to 1631 m. Salt beds, 1748 m to 1977 m. Oriskany sand absent.

Remarks: Altitude = 560 m. Total depth = 2417 m. Dry hole (for gas from Oriskany sandstone). Observations at greatest depths probably obtained on bailer line.



State: PA Hole name: 9

Latitude: 40 deg 17.1 min Longitude: 79 deg 18.2 min

Gradient= 30°C/km, Intercept= 6.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	10.4
152.4	13.4
304.8	17.3
457.2	21.7
609.6	26.2
762.	30.1
914.4	33.1
1066.8	36.9
1219.2	41.2
1371.6	46.2
1524.	50.7
1676.4	55.6
1828.8	60.8
1981.2	66.2
2057.4	68.2
2077.2	68.7

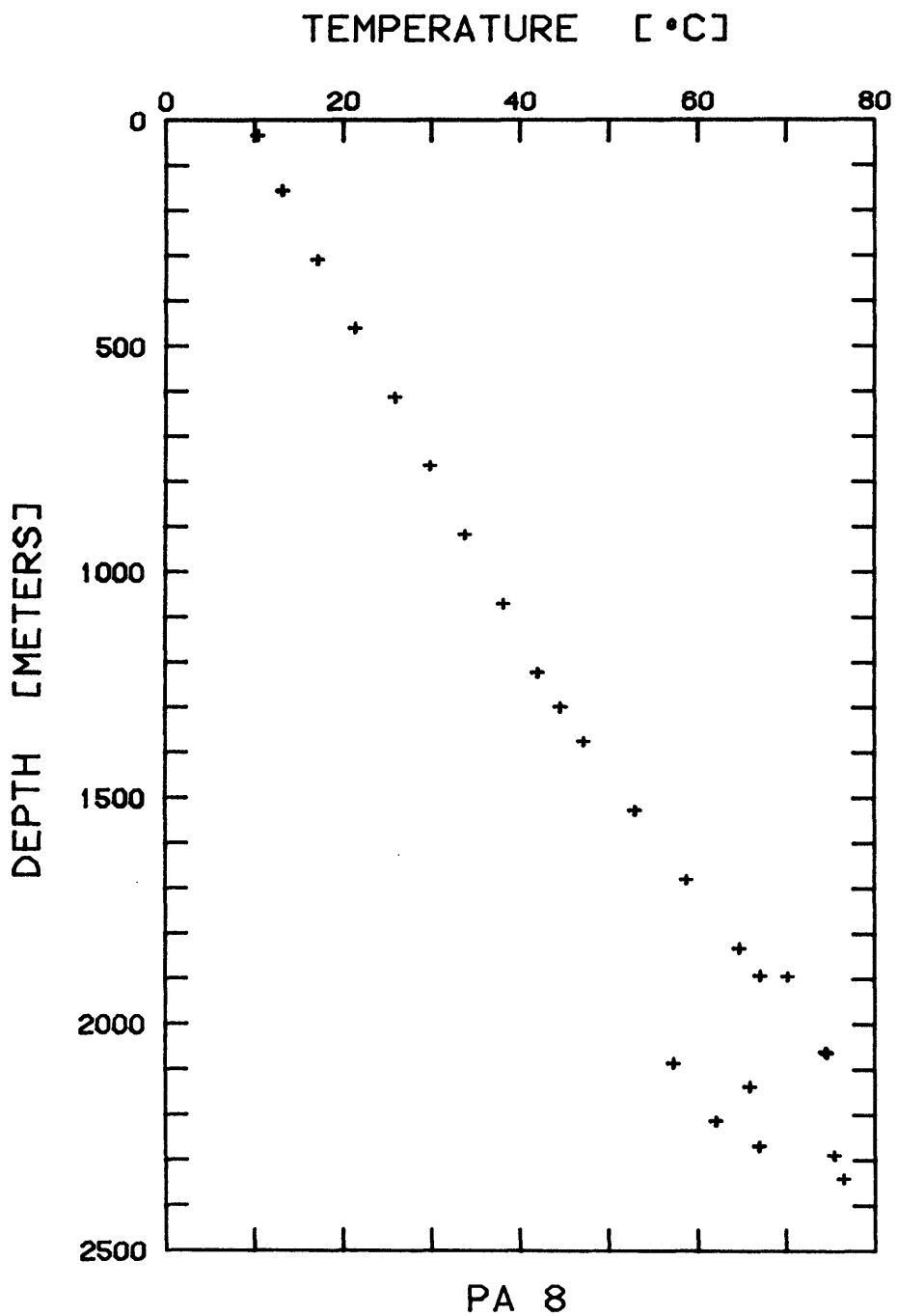
Section, Township, Range, County: Westmoreland.

Date of observations: Late 1924 or early 1925.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Altitude = 348 m. Total depth = 2130 m. Dry hole above Onandaga limestone. Drill hole completed 10/3/24; abandoned 12/20/24.



State: PA Hole name: 8

Latitude: 40 deg 16.2 min Longitude: 79 deg 18.0 min

Gradient= 28°C/km, Intercept= 8.9°C

Reference code: *V030

Temperature log

meters	°C
30.5	10.4
152.4	13.2
304.8	17.2
457.2	21.4
609.6	25.9
762.	29.9
914.4	33.9
1066.8	38.2
1219.2	42.1
1295.4	44.6
1371.6	47.3
1524.	53.
1676.4	58.8
1828.8	64.8
1889.8	67.1
1891.2	70.2
2057.4	74.5
2060.5	74.6
2082.1	57.3
2133.6	65.9
2209.8	62.1
2266.2	67.
2286.	75.4
2337.8	76.5

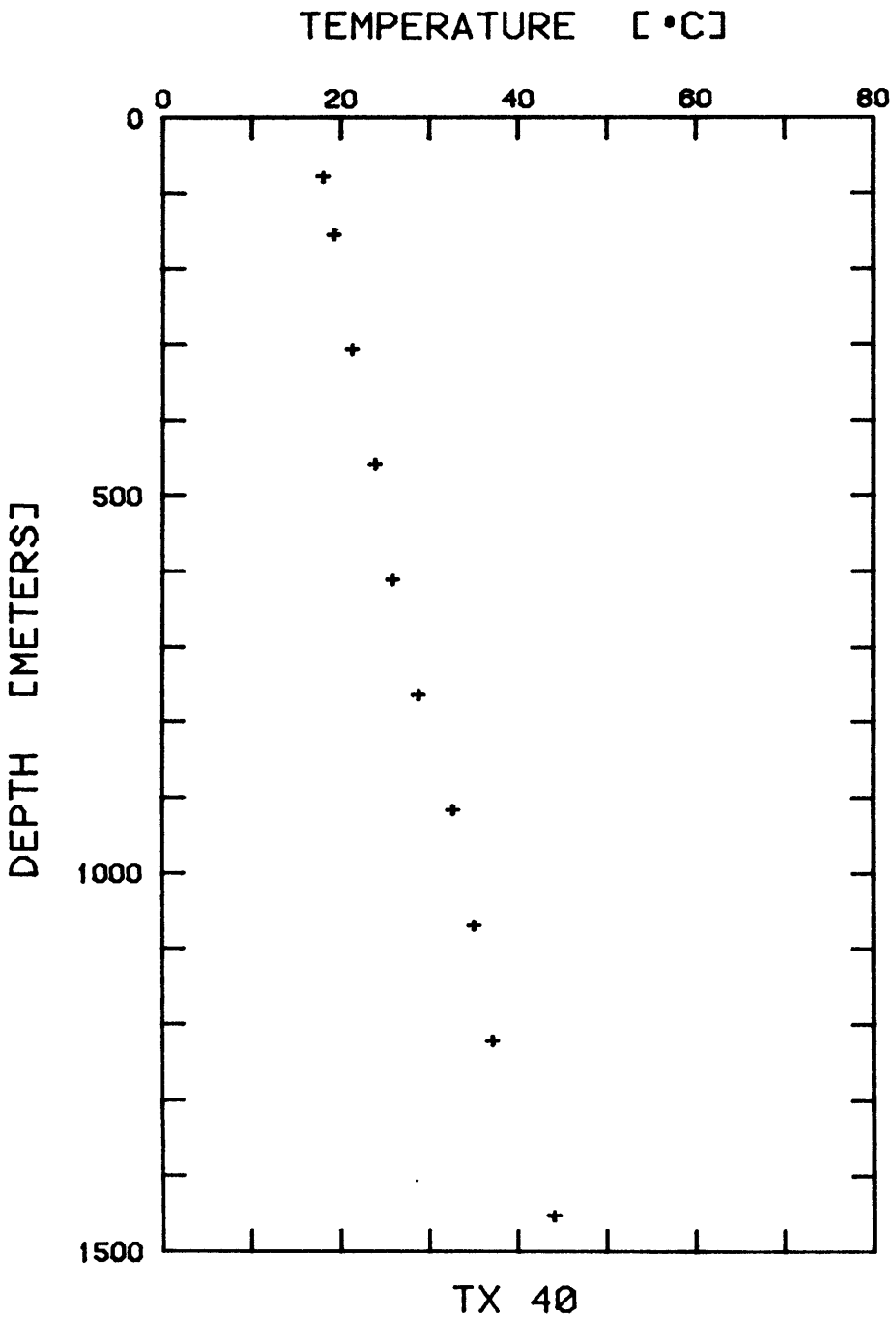
Section, Township, Range, County: Westmoreland.

Date of observations: Probably 1925.

Fluid level in drill hole: No information.

General lithology: Onandaga limestone, 2068 to 2141 m. Show of gas at 2072 m. Oriskany sandstone, 2141 to 2164 m. 298 MCF sour gas at 2264 m.

Remarks: Altitude = 342 m. Gas below 1370 m cased off and flowing through 4" casing when test was made. Estimated gas temperatures 2082.1 m and below. Total depth = 2364 m. Completed in 1925.



State: TX Hole name: 40

Latitude: 35 deg 50.0 min Longitude: 100 deg 19.0 min
Location is to nearest minute.

Gradient= 18°C/km, Intercept= 15.5°C

Reference code: *HA30

Temperature log

meters	°C
76.2	18.1
152.4	19.3
304.8	21.4
457.2	23.9
609.6	25.9
762.	28.9
914.4	32.7
1066.8	35.1
1219.2	37.2
1450.2	44.1

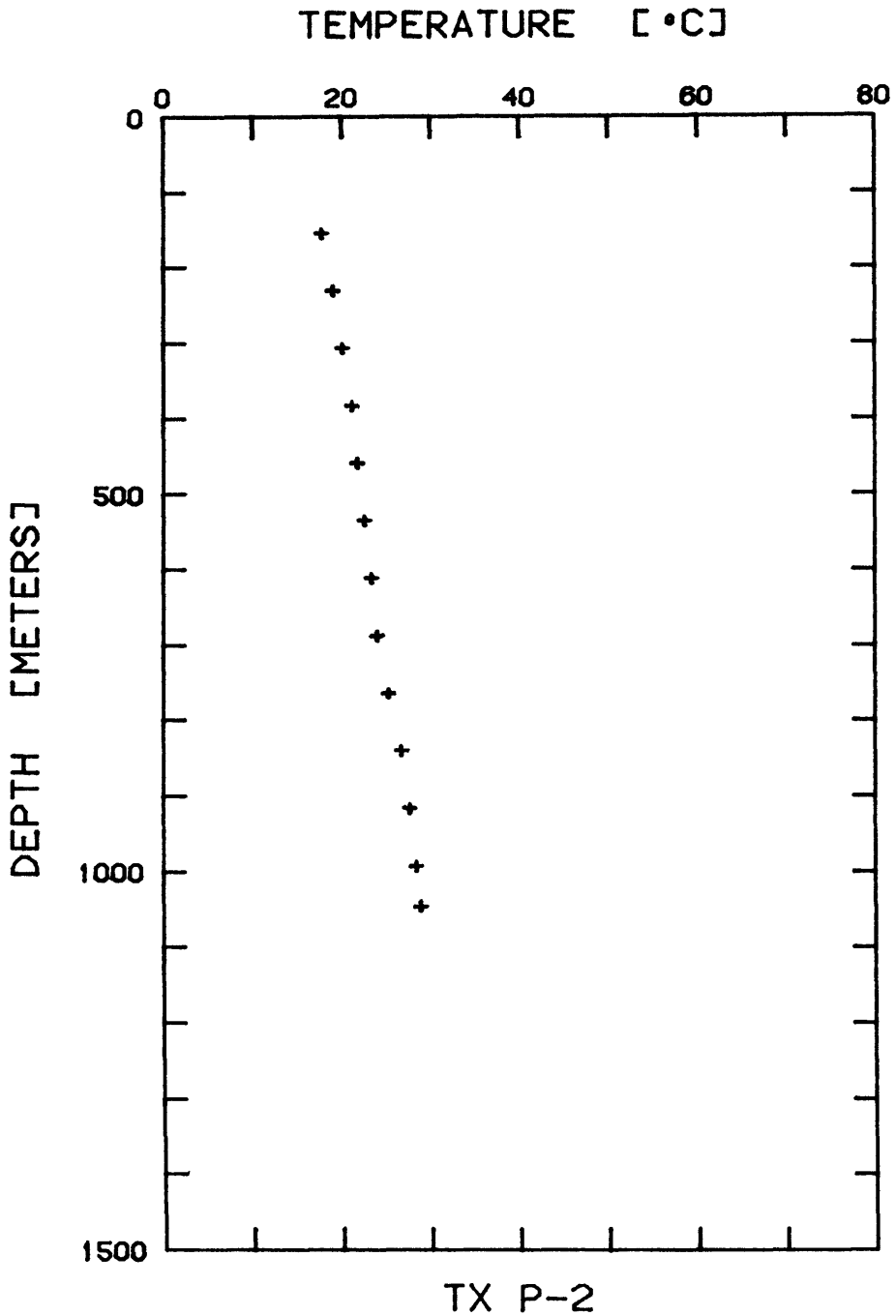
Section, Township, Range, County: Hemphill.

Date of observations: Circa 1928.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Drilled with cable tools; shut down two days prior to test. Temperature at 1450 m probably obtained on bailer. 762 m of water in hole.



State: TX Hole name: P-2

Latitude: 35 deg 35.0 min Longitude: 101 deg 1.0 min
Location is to nearest minute.

Gradient= 12°C/km, Intercept= 16.2°C

Reference code: *HA30

Temperature log

meters	°C
152.4	17.8
228.6	19.
304.8	20.2
381.	21.2
457.2	21.8
533.4	22.6
609.6	23.4
685.8	24.
762.	25.3
838.2	26.7
914.4	27.7
990.6	28.4
1044.	28.9

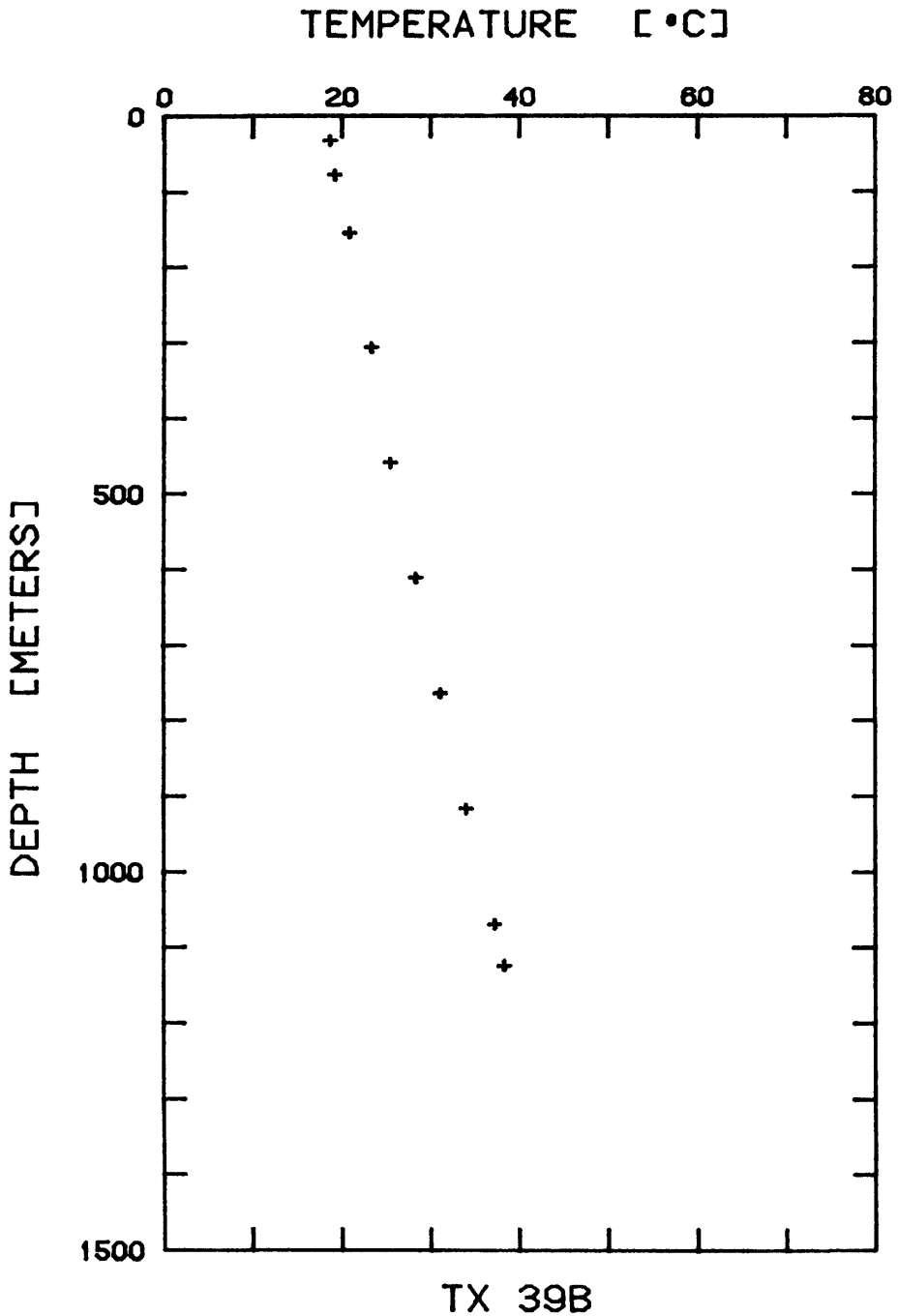
Section, Township, Range, County: Gray.

Date of observations: Circa 1928.

Fluid level in drill hole: Surface (water).

General lithology: Thin strata of salt in shale, 348-613 m. Show of gas, 988-994 m. Small show of oil, 1000-1010 m. Salt water filled hole (no overflow), 1012-1024 m. Granite wash, 1028-1097 m.

Remarks: Drilled with cable tools; shut down several weeks when tested. Altitude = 988 m. Total depth = 1106 m. Selected from group of 6 wells.



State: TX Hole name: 39B

Latitude: 33 deg 43.0 min Longitude: 96 deg 59.0 min
Location is to nearest minute.

Gradient= 19°C/km, Intercept= 16.7°C

Reference code: *HA30

Temperature log

meters	°C
30.5	18.7
76.2	19.2
152.4	20.9
304.8	23.4
457.2	25.5
609.6	28.4
762.	31.2
914.4	34.1
1066.8	37.3
1121.7	38.3

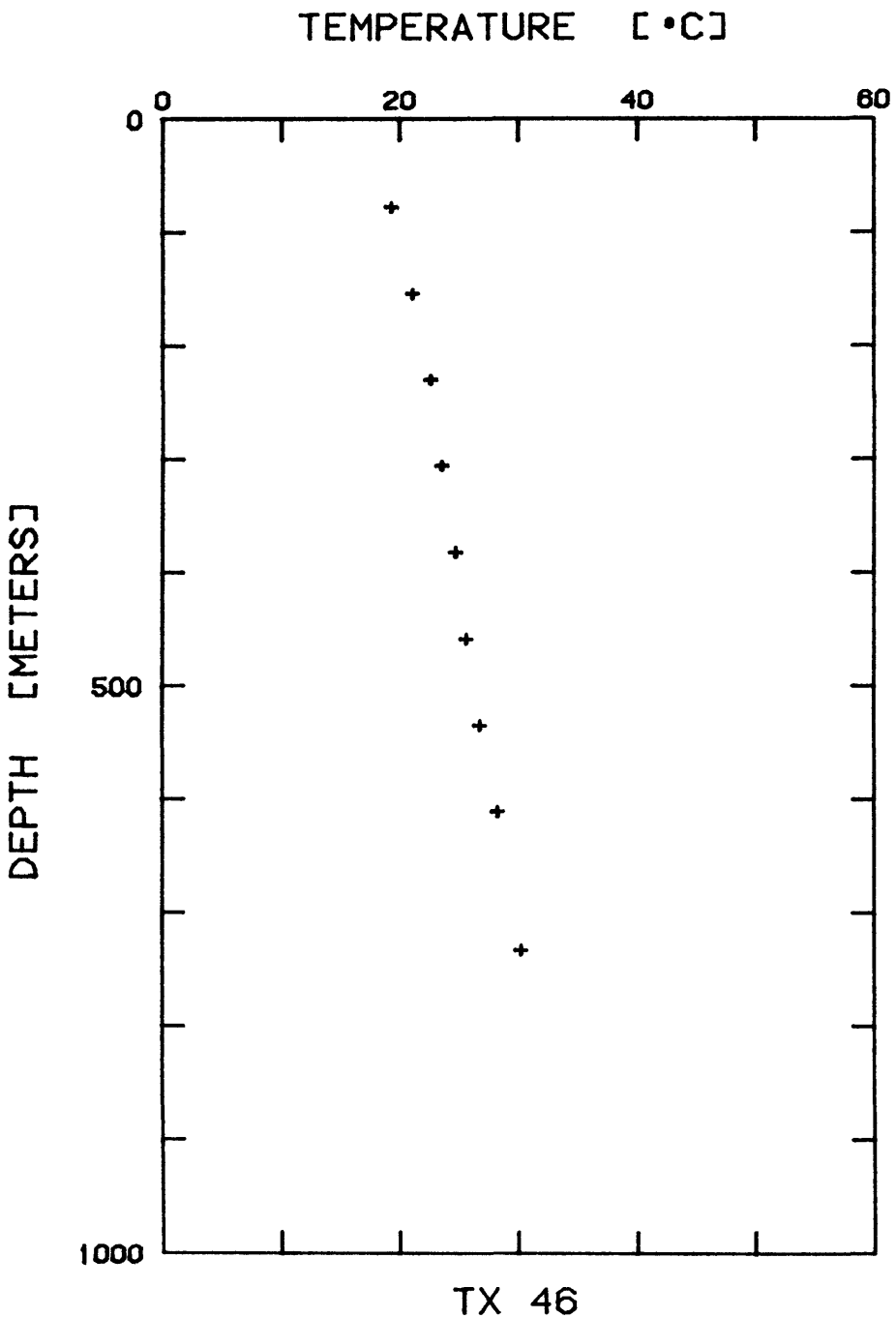
Section, Township, Range, County: Cooke.

Date of observations: Circa 1927-1929.

Fluid level in drill hole: 117 m (water and oil).

General lithology: No information.

Remarks: Drilled with rotary rig; well shut down two years prior to test.
No gas flow. Altitude = 263 m.



State: TX Hole name: 46

Latitude: 33 deg 38.0 min Longitude: 100 deg 35.0 min
Location is to nearest minute.

Gradient= 15°C/km, Intercept= 18.9°C

Reference code: *HA30

Temperature log

meters	°C
76.2	19.3
152.4	21.1
228.6	22.7
304.8	23.6
381.	24.8
457.2	25.7
533.4	26.8
609.6	28.3
731.5	30.3

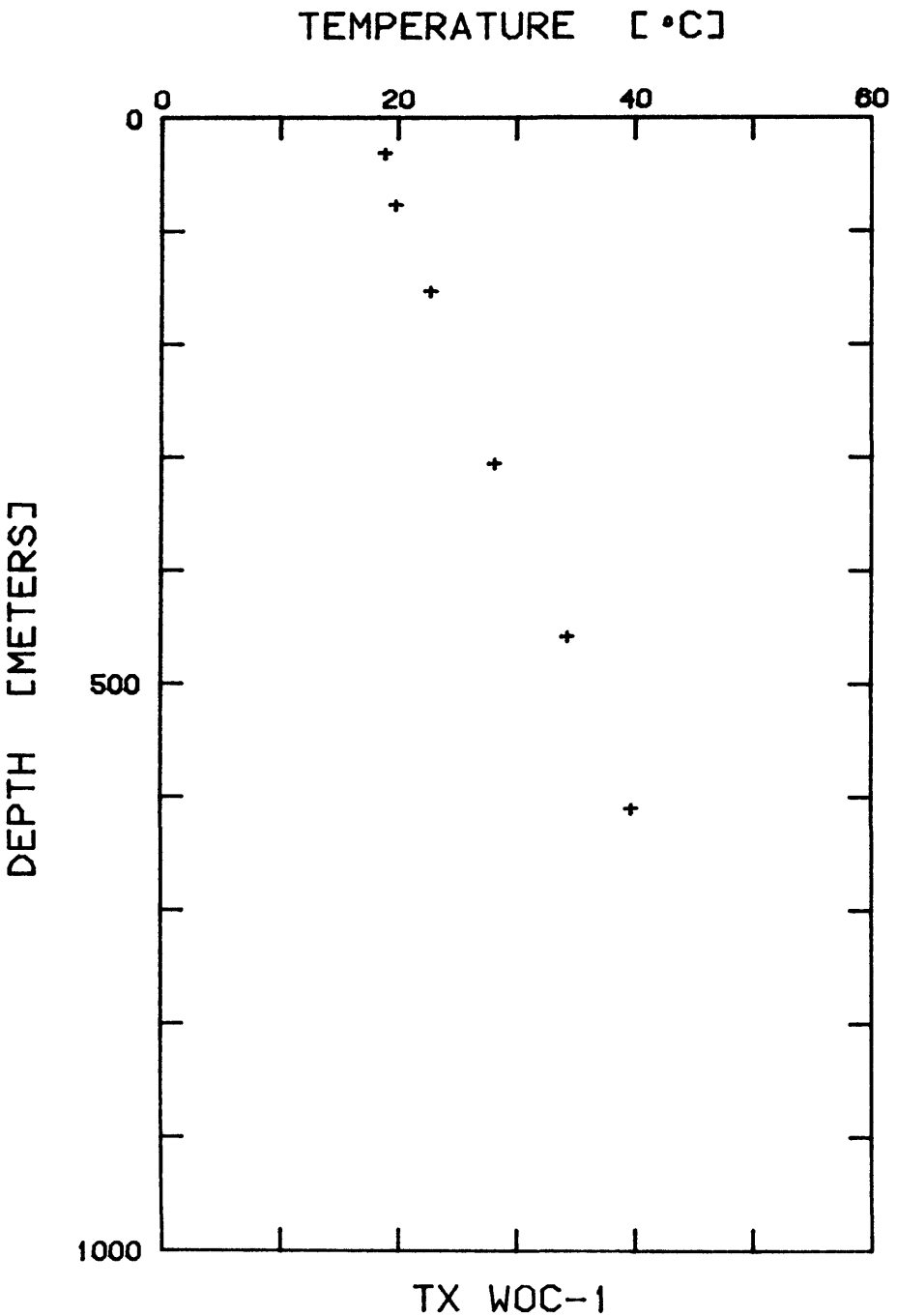
Section, Township, Range, County: Dickens.

Date of observations: Circa 1928.

Fluid level in drill hole: 12 m (water).

General lithology: No information.

Remarks: Drilled with cable tools; shut down eight weeks prior to test.
Total depth = 1031 m.



State: TX Hole name: WOC-1

Latitude: 33 deg 22.0 min Longitude: 96 deg 4.0 min
Location is to nearest minute.

Gradient= 37°C/km, Intercept=17.1°C

Reference code: SP 64

Temperature log

meters	°C
30.5	18.9
76.2	19.8
152.4	22.8
304.8	28.2
457.2	34.4
609.6	39.8

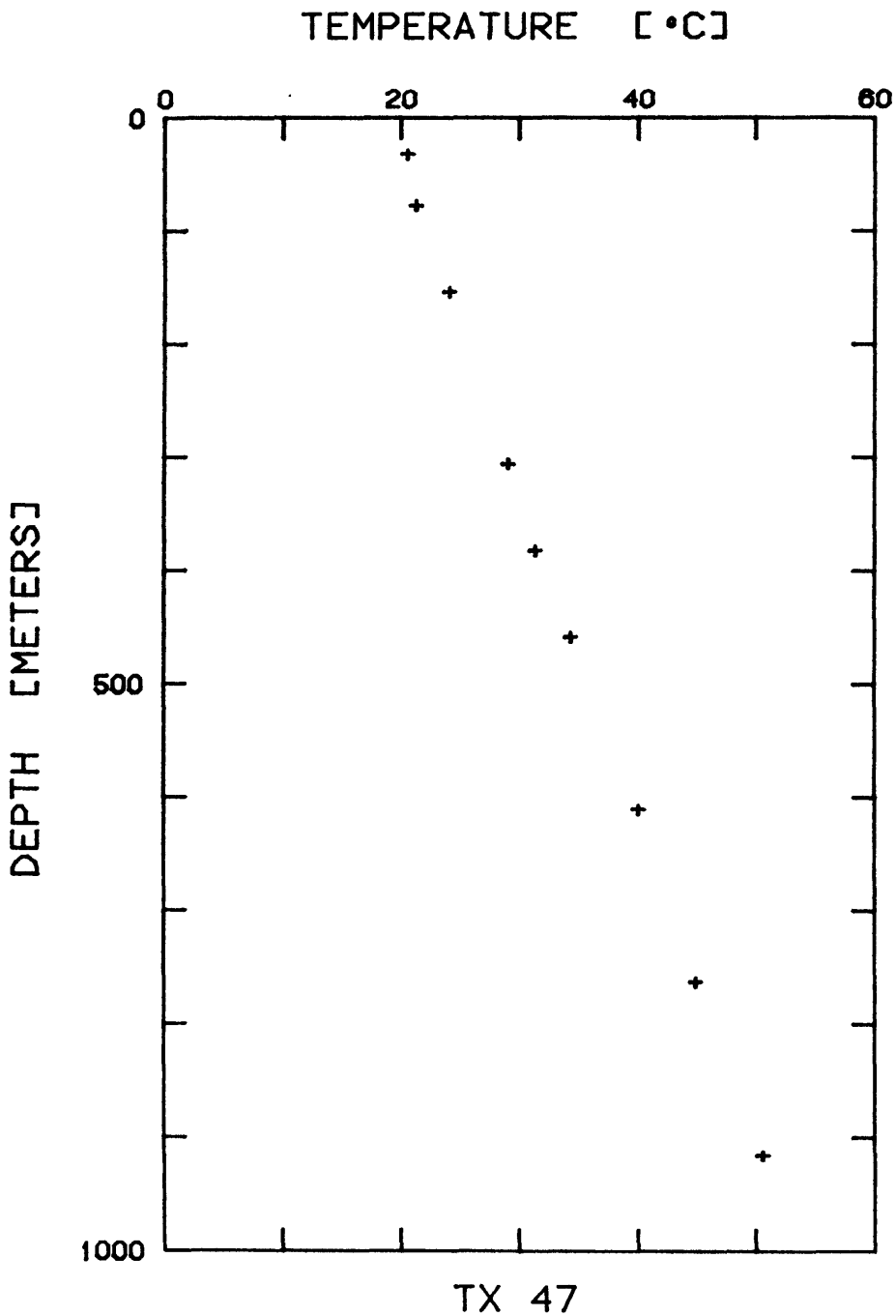
Section, Township, Range, County: Hunt.

Date of observations: Circa 1929.

Fluid level in drill hole: 17 m.

General lithology: No information.

Remarks: Idle several years. Selected from group of 2 wells.



State: TX Hole name: 47

Latitude: 32 deg 30.0 min Longitude: 98 deg 49.0 min
Location is to nearest minute.

Gradient= 35°C/km, Intercept=18.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	20.6
76.2	21.3
152.4	24.1
304.8	29.1
381.	31.4
457.2	34.4
609.6	40.1
762.	44.9
914.4	50.6

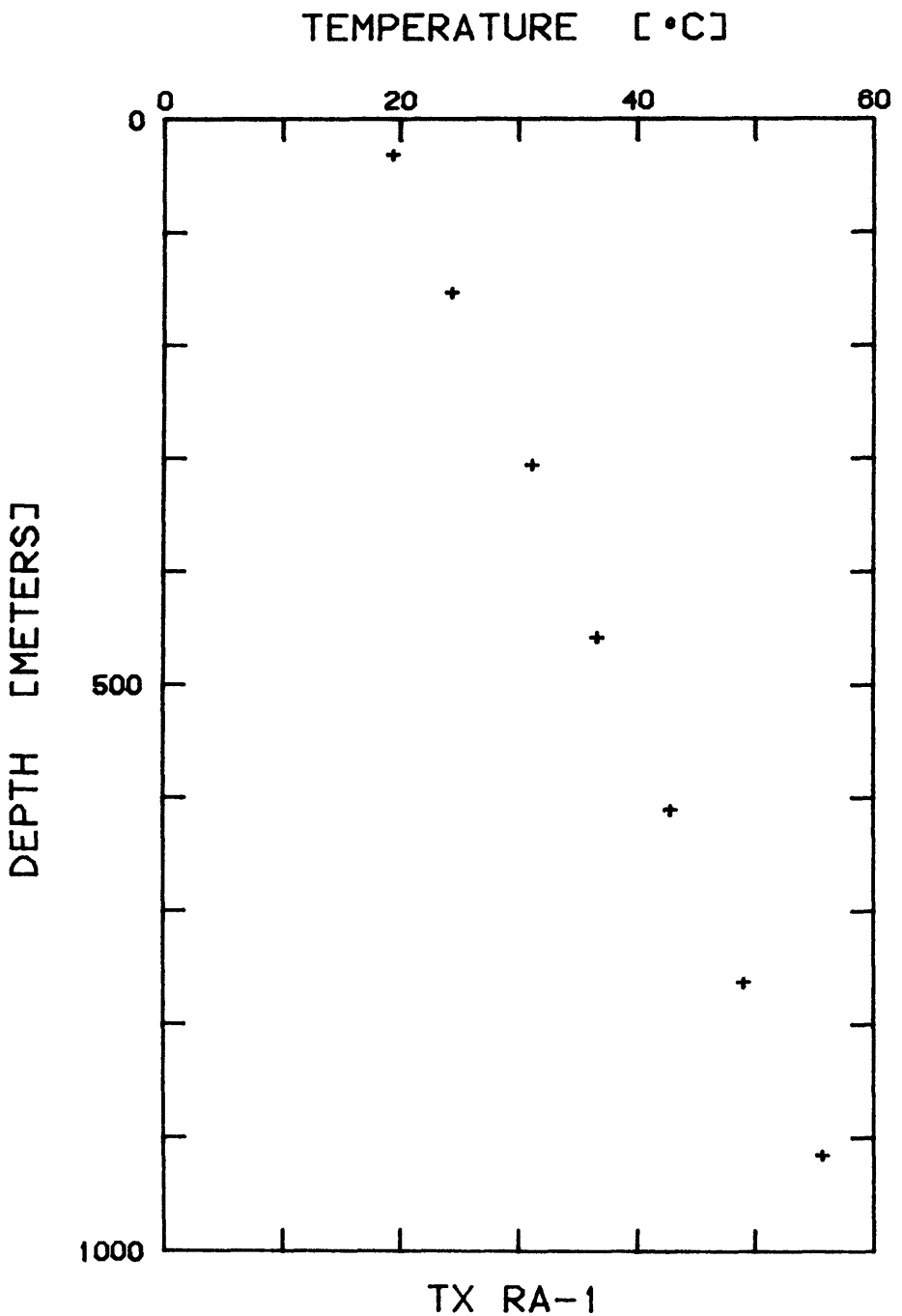
Section, Township, Range, County: Eastland.

Date of observations: Circa 1928.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Drilled with cable tools. Shut down about three months. Location approximate.



State: TX Hole name: RA-1

Latitude: 32 deg 27.0 min Longitude: 98 deg 39.0 min
Location is to nearest minute.

Gradient= 41°C/km, Intercept= 18.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	19.4
152.4	24.4
304.8	31.2
457.2	36.7
609.6	42.9
762.	49.1
914.4	55.7

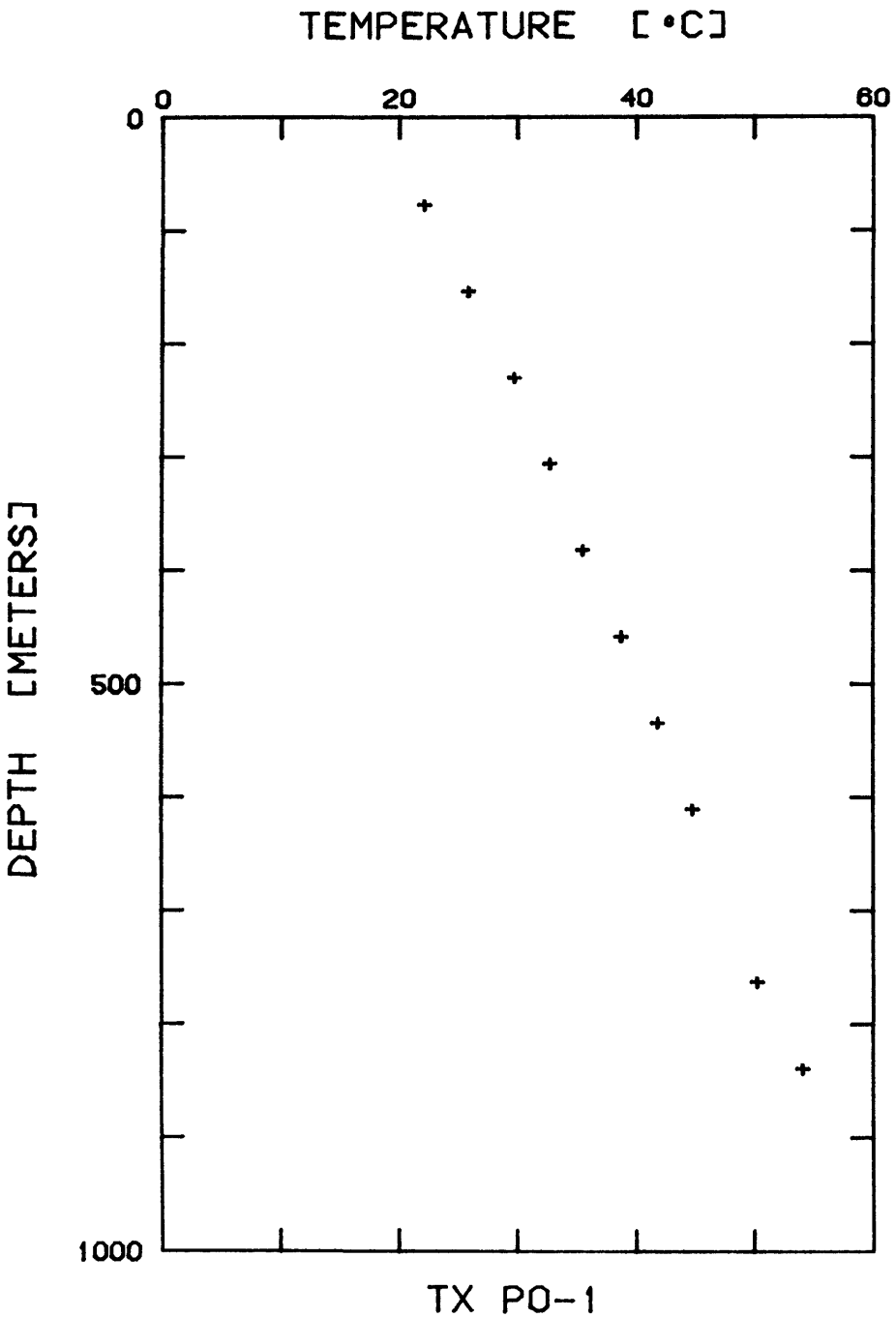
Section, Township, Range, County: Eastland.

Date of observations: 1920's (?).

Fluid level in drill hole: 305 m (oil).

General lithology: Sand and gravel, 6-12 m. Shale, limestone, sandstone 12-952 m. Gas at 954 m. Show of oil at 956 m. Limestone, sandstone 952-957 m.

Remarks: Small quantity of oil and gas from about 956 m was escaping from outside of casing. Selected from group of 5 wells.



State: TX Hole name: PO-1

Latitude: 32 deg 4.0 min Longitude: 96 deg 23.0 min
Location is to nearest minute.

Gradient= 40°C/km, Intercept= 20.2°C

Reference code: *HA30

Temperature log

meters	°C
76.2	22.2
152.4	25.9
228.6	29.8
304.8	32.8
381.	35.6
457.2	38.8
533.4	41.9
609.6	44.8
762.	50.3
838.2	54.1

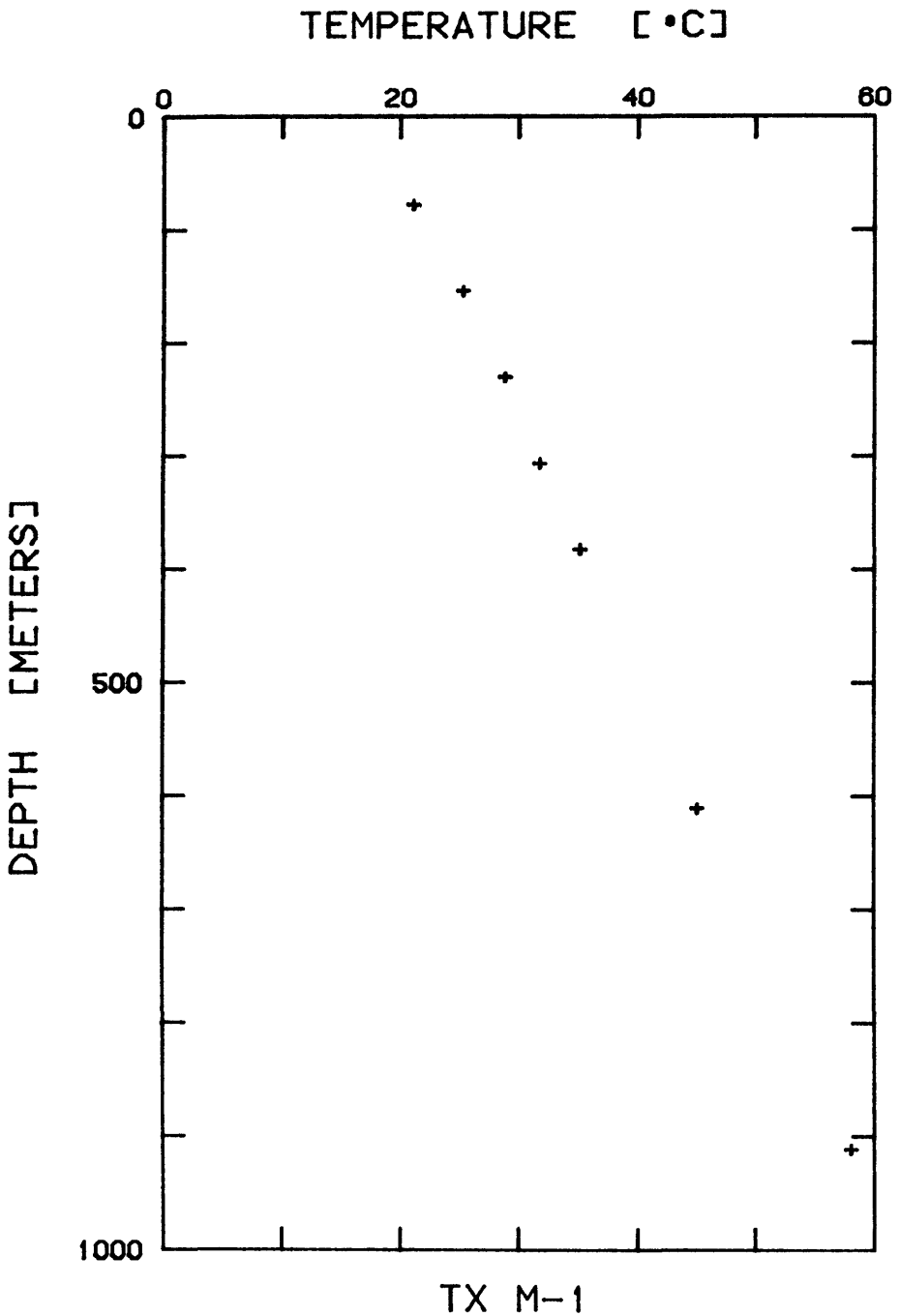
Section, Township, Range, County: Navarro.

Date of observations: Circa 1929.

Fluid level in drill hole: 213 m (water).

General lithology: No information.

Remarks: Shut down two years when tested; no gas or oil detected. Selected from group of 14 wells.



State: TX Hole name: M-1

Latitude: 31 deg 41.0 min Longitude: 96 deg 31.0 min
Location is to nearest minute.

Gradient= 43°C/km, Intercept= 18.8°C

Reference code: *HA30

Temperature log

meters	°C
76.2	21.2
152.4	25.4
228.6	28.9
304.8	31.9
381.	35.3
609.6	45.1
909.9	58.1

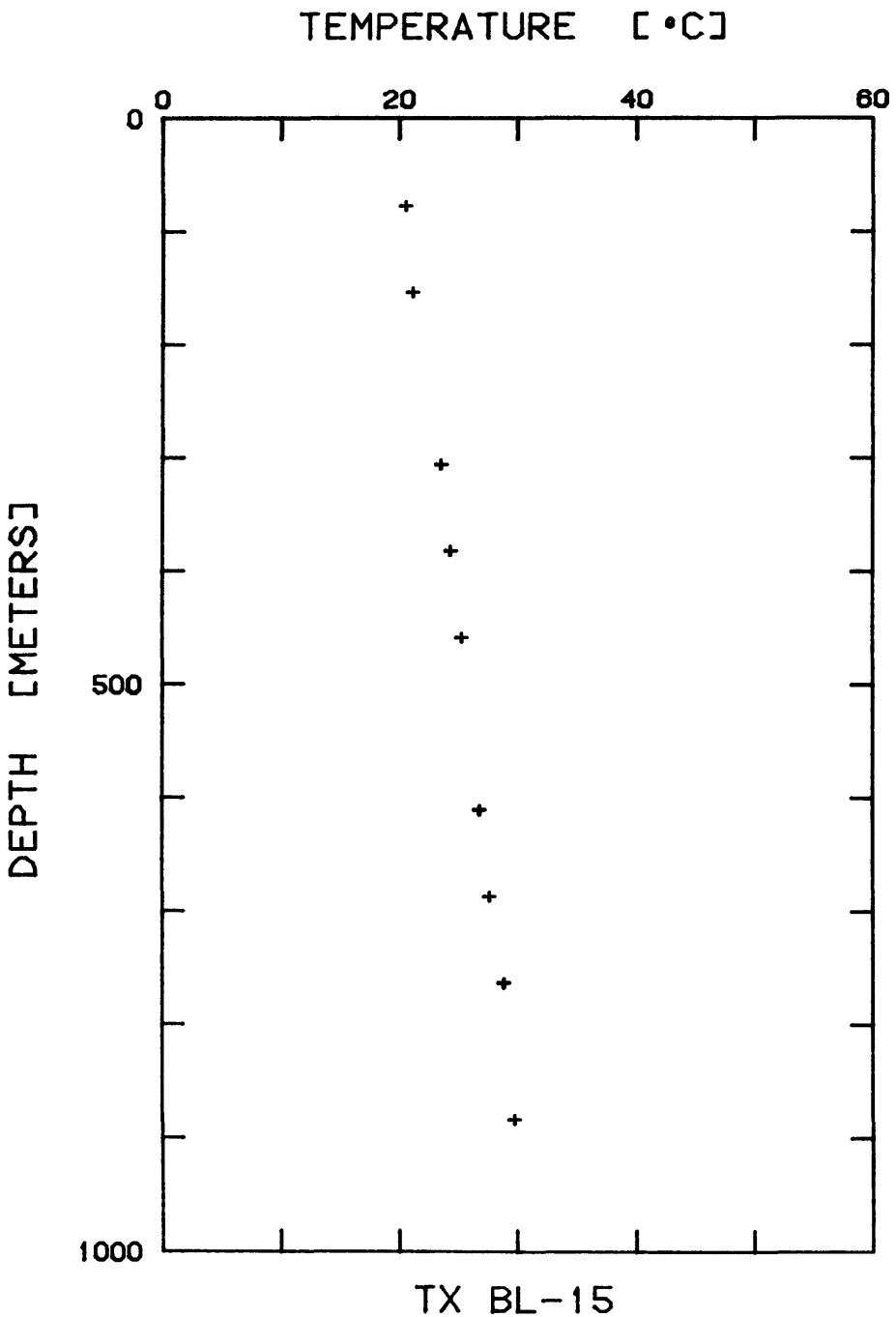
Section, Township, Range, County: Limestone.

Date of observations: Circa 1929.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Drilled by rotary rig. Formerly a producing well, but idle five months when tested. No gas. Total depth = 933 m. Selected from group of 7 wells.



State: TX Hole name: BL-15

Latitude: 31 deg 14.0 min Longitude: 101 deg 41.0 min
Location is to nearest minute.

Gradient= 11°C/km, Intercept= 20.3°C

Reference code: *HA30

Temperature log

meters	°C
76.2	20.6
152.4	21.2
304.8	23.6
381.	24.4
457.2	25.4
609.6	26.9
685.8	27.7
762.	28.9
882.4	29.8

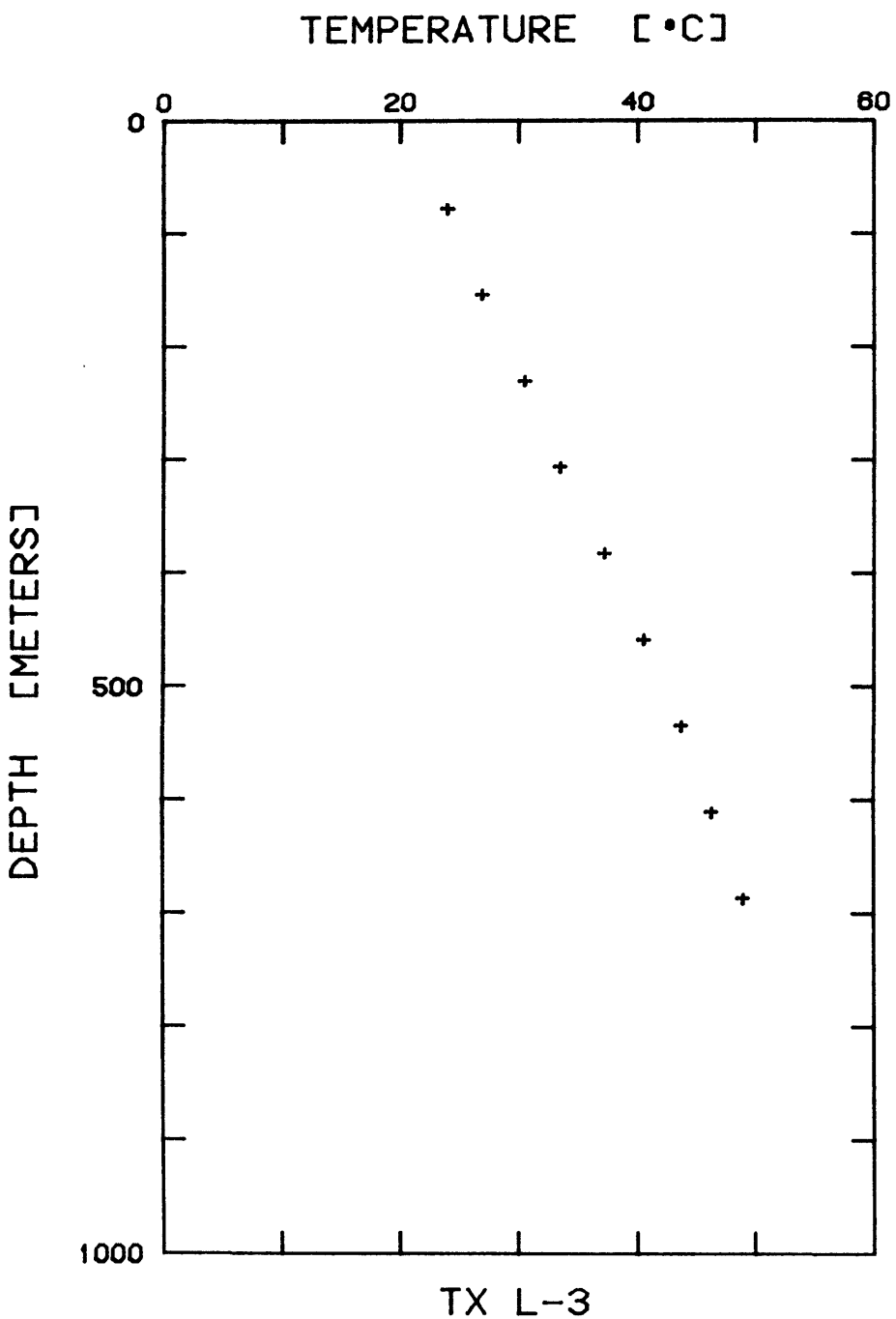
Section, Township, Range, County: Reagan.

Date of observations: 1927-1929.

Fluid level in drill hole: No information.

General lithology: Top of salt series, 326 m. Top of lime, 858 m. Top of Texon pay-sand, 888 m.

Remarks: Altitude = 813 m. Drilled with cable tools; shut down several days prior to test on top of pay-sand. No gas or oil when tested. Selected from group of 26 wells.



State: TX Hole name: L-3

Latitude: 29 deg 43.0 min Longitude: 97 deg 44.0 min
Location is to nearest minute.

Gradient= 43°C/km, Intercept= 20.4°C

Reference code: *HA30

Temperature log

meters	°C
76.2	24.1
152.4	27.
228.6	30.6
304.8	33.6
381.	37.3
457.2	40.6
533.4	43.8
609.6	46.4
685.8	49.

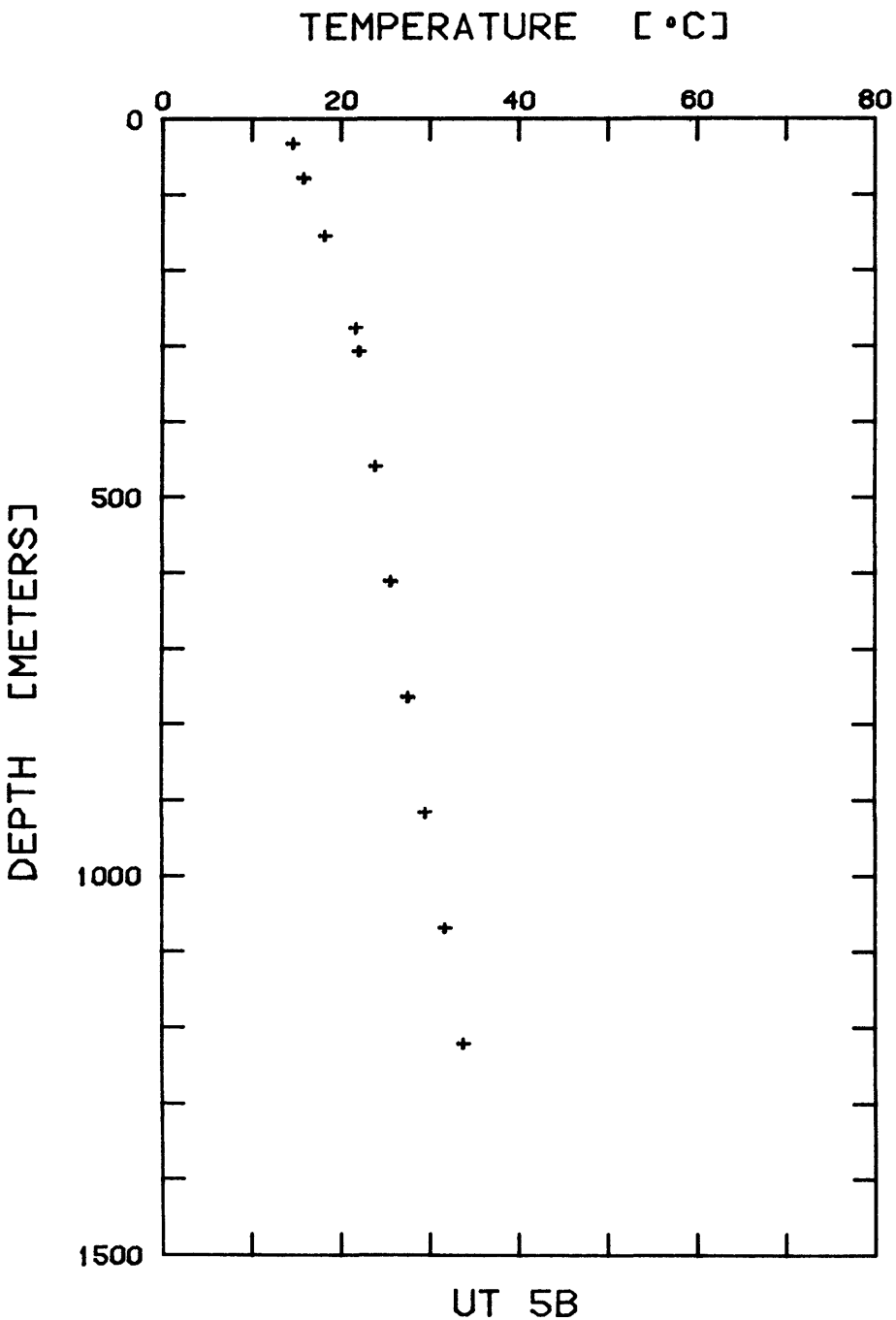
Section, Township, Range, County: Caldwell.

Date of observations: Circa 1928.

Fluid level in drill hole: 5 m (water).

General lithology: Located on down-thrown side of fault. Austin chalk, 558-614 m.

Remarks: Altitude = 136 m. Abandoned two years prior to test; no oil or gas production. Selected from group of 4 wells.



State: UT Hole name: 5B

Latitude: 38 deg 47.8 min Longitude: 109 deg 37.8 min
Location is to nearest half minute.

Gradient= 13°C/km, Intercept= 17.6°C

Reference code: *V041

Temperature log

meters	°C
30.5	14.6
76.2	15.8
152.4	18.2
274.3	21.7
304.8	22.1
457.2	23.9
609.6	25.7
762.	27.7
914.4	29.6
1066.8	31.8
1219.2	33.8

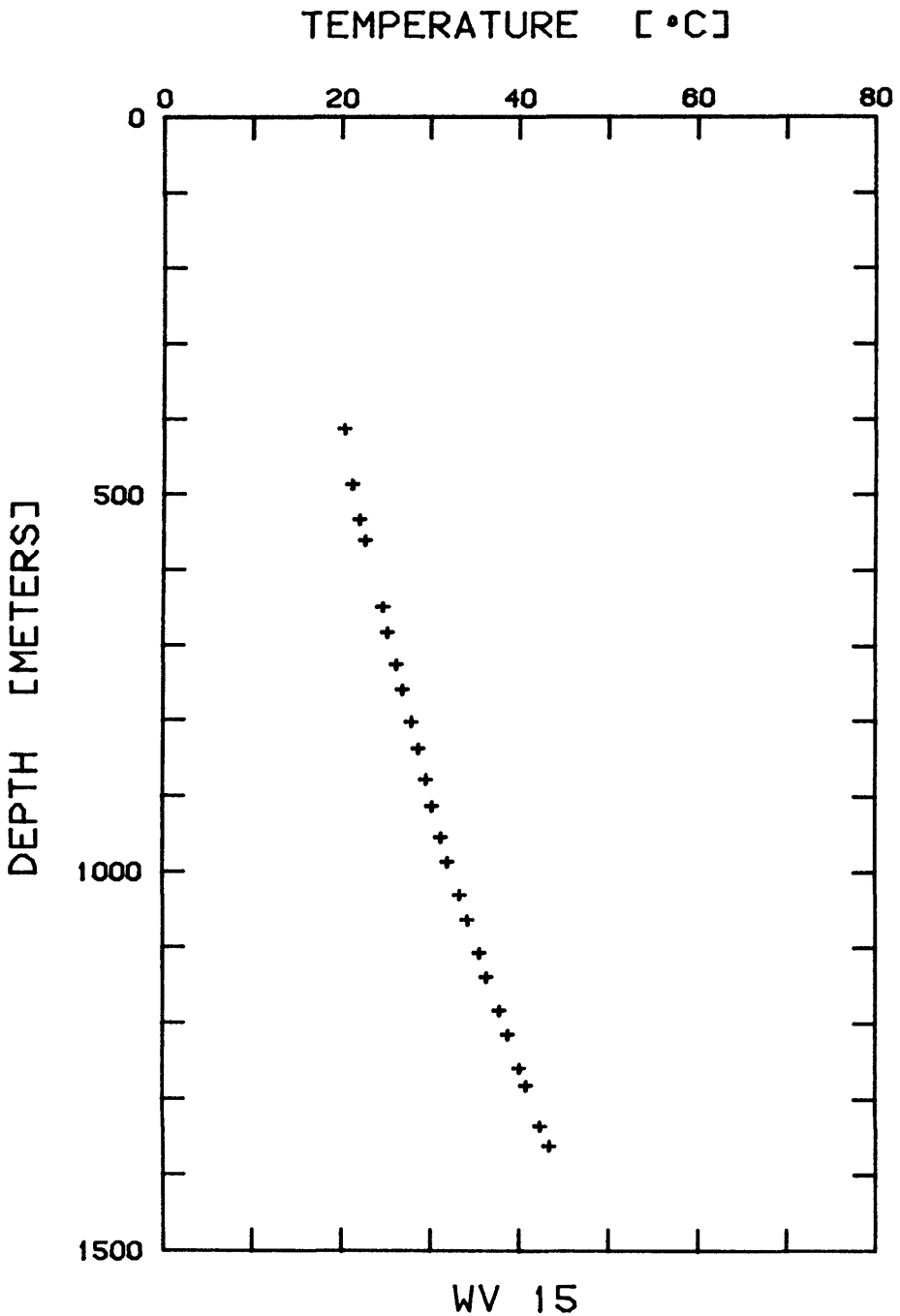
Section, Township, Range, County: NW1/4, NW1/4 sec. 32, T. 23 S., R. 21 E., Grand.

Date of observations: 12/33.

Fluid level in drill hole: No information.

General lithology: Salt, 267-1865 m.

Remarks: Well completed 10/32; idle over three years. Altitude = 1484 m.



State: WV Hole name: 15

Latitude: 40 deg 0.2 min Longitude: 80 deg 41.9 min

Gradient= 25°C/km, Intercept= 8.4°C

Reference code: SP 64

Temperature log

meters	°C
411.5	20.4
484.9	21.2
485.2	21.2
531.9	22.1
559.3	22.7
647.7	24.6
681.5	25.2
723.9	26.2
757.7	26.9
800.1	27.9
835.2	28.7
876.3	29.7
911.4	30.3
952.5	31.3
985.1	32.1
1028.7	33.4
1061.3	34.2
1104.9	35.6
1136.9	36.4
1181.1	37.8
1213.1	38.8
1257.3	40.1
1280.2	40.9
1333.5	42.4
1360.	43.4

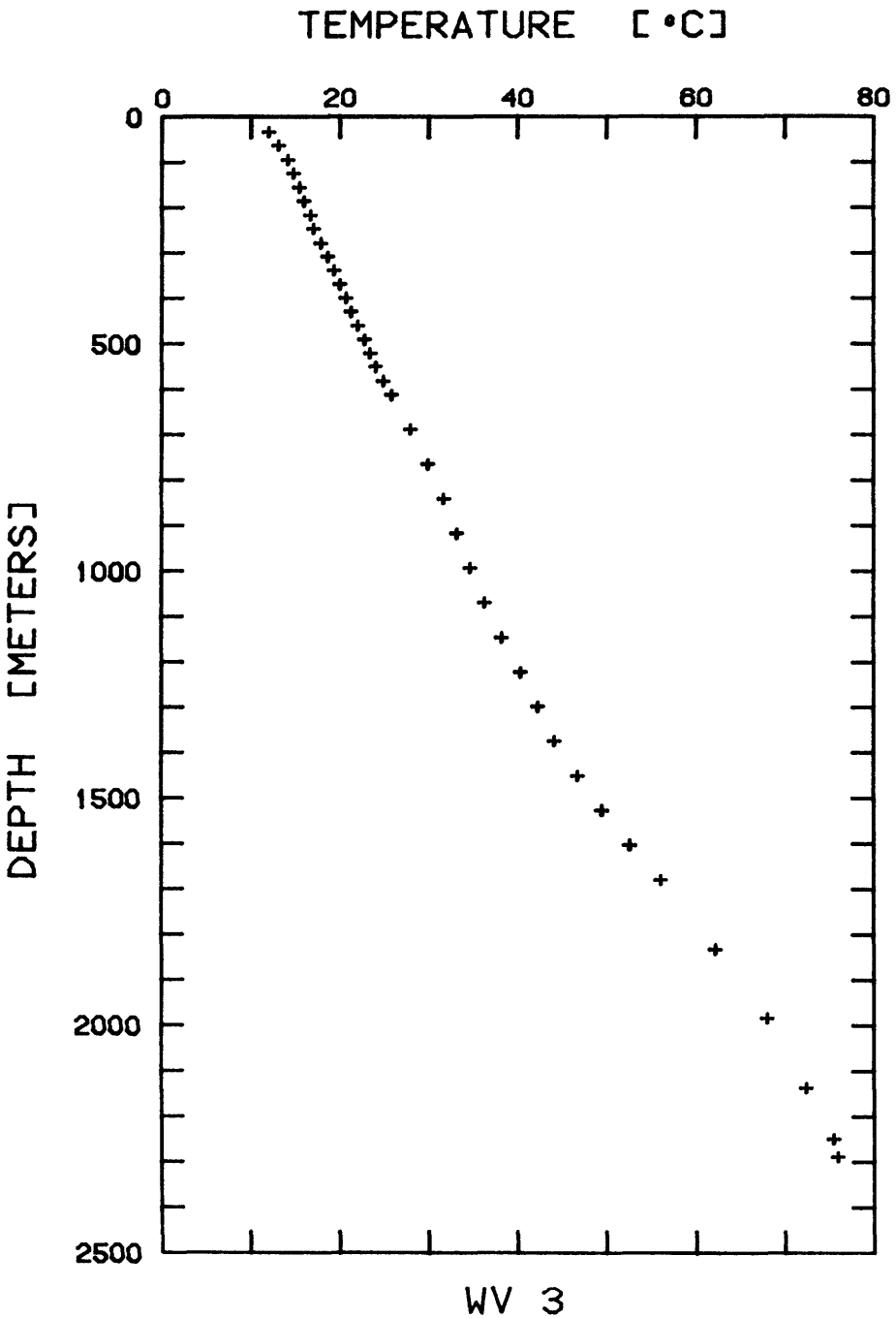
Section, Township, Range, County: Marshall.

Date of observations: July 1891.

Fluid level in drill hole: No fluid in well.

General lithology: Devonian shales, with change from siltstone to shale (with increasing depth) at 945 m.

Remarks: Altitude = approx. 310 m. Drilled with cable tools. Cased to 509 m with 4-7/8 inch casing. These measurements made in air after a few-months idle period. Another set of measurements was made in water in 1893 after two-year idle period. Difference between the two logs is small. Total depth = 1390 m.



State: WV Hole name: 3

Latitude: 39 deg 25.4 min Longitude: 80 deg 2.8 min

Gradient= 28°C/km, Intercept= 7.6°C

Reference code: SP 64

Temperature log

meters	°C		
30.5	12.1	685.8	28.
61.	13.2	762.	30.
91.4	14.2	838.2	31.8
121.9	14.9	914.4	33.3
152.4	15.5	990.6	34.7
182.9	16.1	1066.8	36.4
213.4	16.8	1143.	38.3
243.8	17.1	1219.2	40.4
274.3	18.	1295.4	42.4
304.8	18.7	1371.6	44.2
335.3	19.4	1447.8	46.9
365.8	20.1	1524.	49.5
396.2	20.7	1600.2	52.6
426.7	21.4	1676.4	56.1
457.2	22.1	1828.8	62.2
487.7	22.9	1981.2	68.1
518.2	23.5	2133.6	72.4
548.6	24.1	2246.4	75.4
579.1	24.9	2286.	75.9
609.6	25.8		

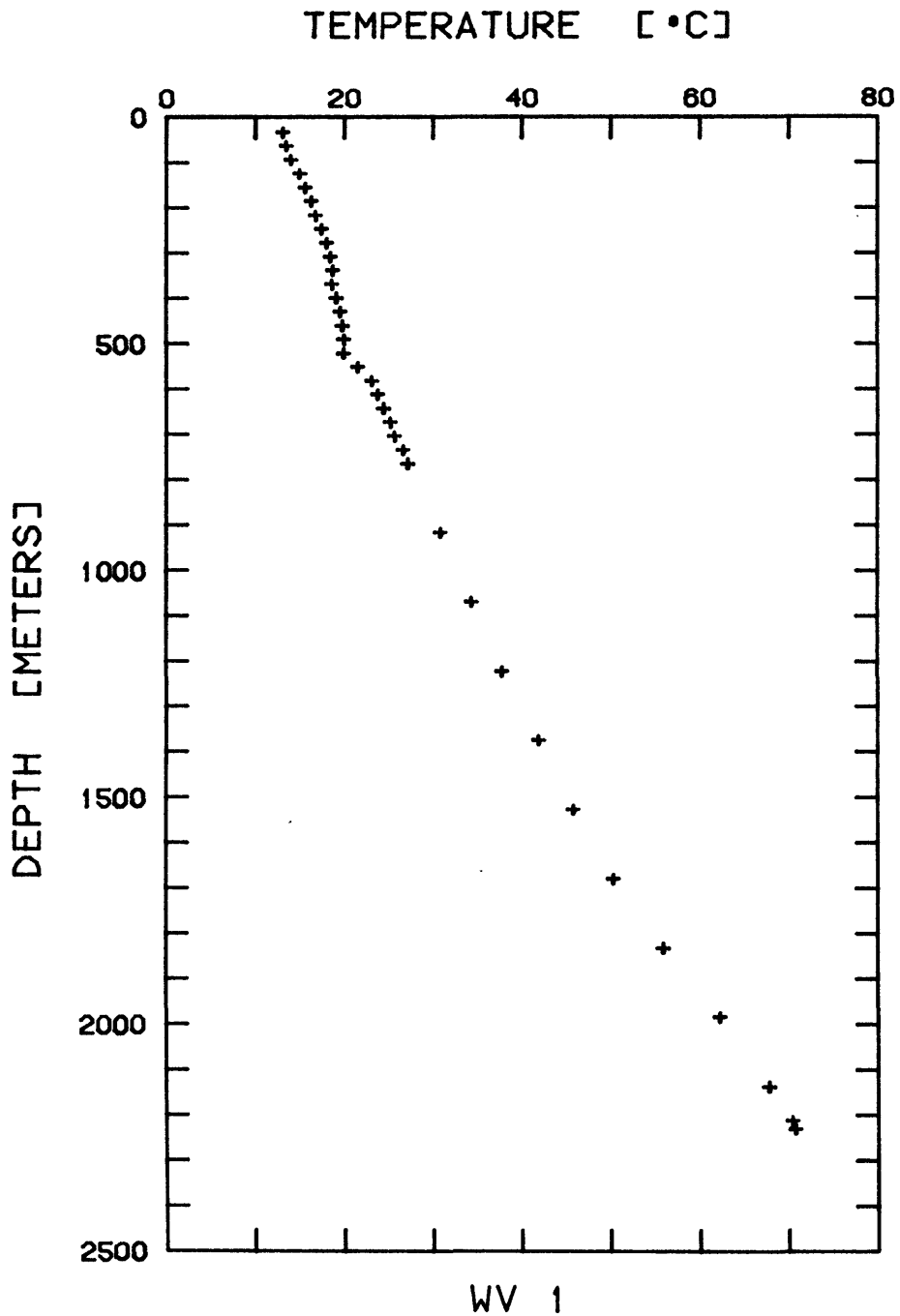
Section, Township, Range, County: Marion.

Date of observations: 5/19 or 6/19.

Fluid level in drill hole: No information.

General lithology: Gas at 250 m. Pennsylvanian and Mississippian sedimentary sequence above 310 m; Devonian shales below. Formation change at 1311 m, from Chemung to Portage Formation within upper Devonian shales. Limestone and sandstone at 2121-2310 m.

Remarks: Altitude = 366 m. Some gas. Drilling began 8/5/16; completed 6/18/19 at 2310 m.



State: WV Hole name: 1

Latitude: 39 deg 20.2 min Longitude: 80 deg 12.7 min

Gradient= 27°C/km, Intercept= 5.9°C

Reference code: SP 64

Temperature log

meters	°C		
30.5	13.1	579.1	23.1
61.	13.5	609.6	23.8
91.4	14.1	640.1	24.5
121.9	15.	670.6	25.2
152.4	15.7	701.	25.7
182.9	16.4	731.5	26.6
213.4	16.9	762.	27.2
243.8	17.5	914.4	30.9
274.3	18.1	1066.8	34.4
304.8	18.5	1219.2	37.8
335.3	18.8	1371.6	41.9
365.8	18.6	1524.	45.8
396.2	19.2	1676.4	50.3
426.7	19.6	1828.8	55.9
457.2	19.9	1981.2	62.2
487.7	20.	2133.6	67.8
518.2	19.9	2209.8	70.4
548.6	21.5	2228.1	70.7

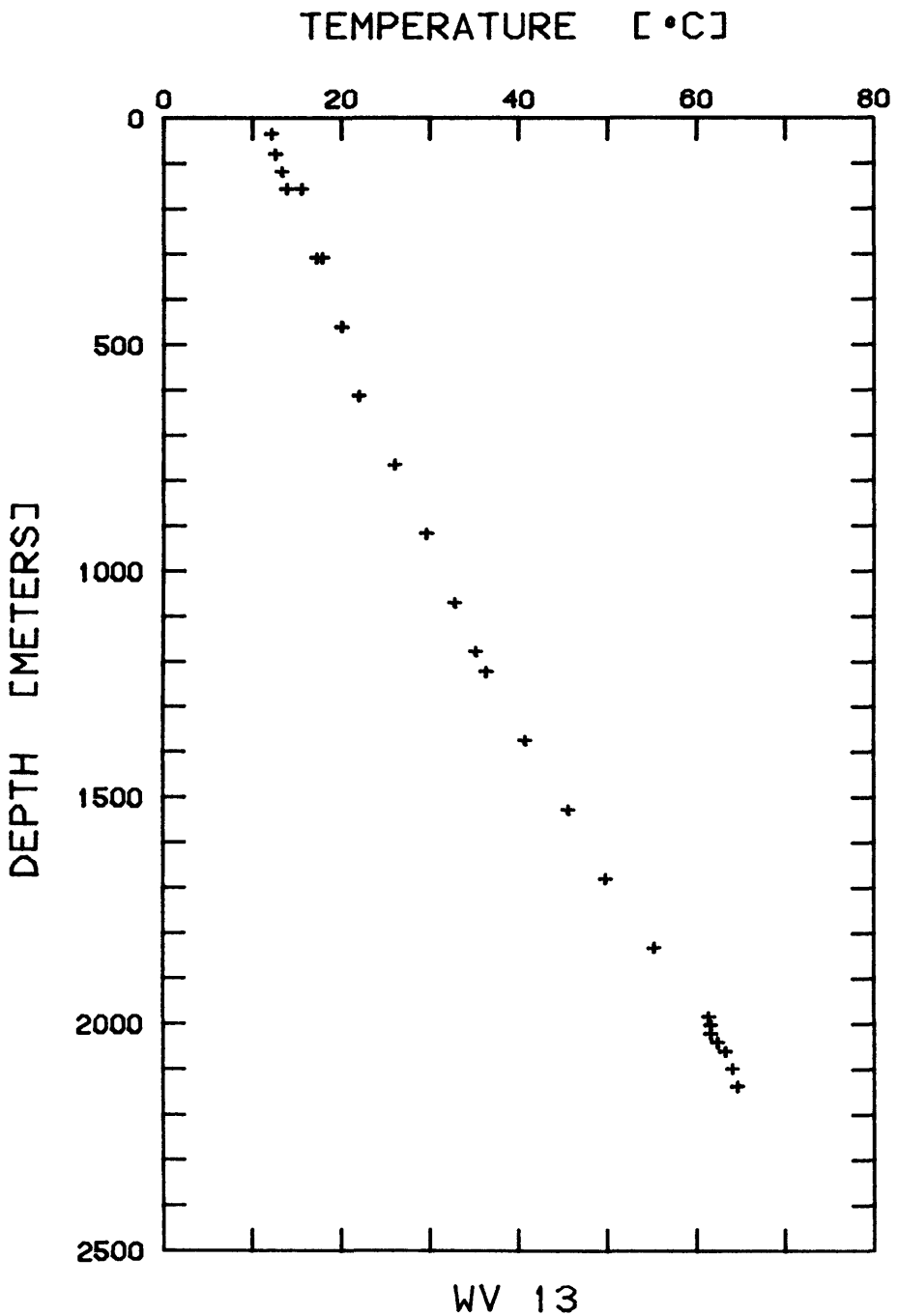
Section, Township, Range, County: Harrison.

Date of observations: 2/1/18 to 3/1/18.

Fluid level in drill hole: No information.

General lithology: Gas at 378 m and 521 m. Devonian shales below about 500 m (1775 m thick). Formation change at 1432 m, from Chemung to Portage Formation within upper Devonian shales.

Remarks: Drilling stopped for test. Altitude = 354 m. Drilling began 12/11/16; finished 3/4/18; cemented 10/3/18.



State: WV Hole name: 13

Latitude: 39 deg 16.5 min Longitude: 80 deg 45.7 min

Gradient= 27°C/km, Intercept= 5.4°C

Reference code: SP 64

Temperature log

meters	°C
30.5	12.2
152.4	15.6
304.8	17.9
457.2	20.2
76.2	12.6
114.3	13.4
152.4	13.9
304.8	17.3
457.2	20.1
609.6	22.
762.	26.1
914.4	29.6
1066.8	32.9
1173.5	35.3
1219.2	36.4
1371.6	40.9
1524.	45.7
1676.4	49.8
1828.8	55.3
1981.2	61.4
2000.1	61.6
2019.3	61.6
2037.9	62.4
2057.4	63.3
2095.5	64.1
2133.6	64.6

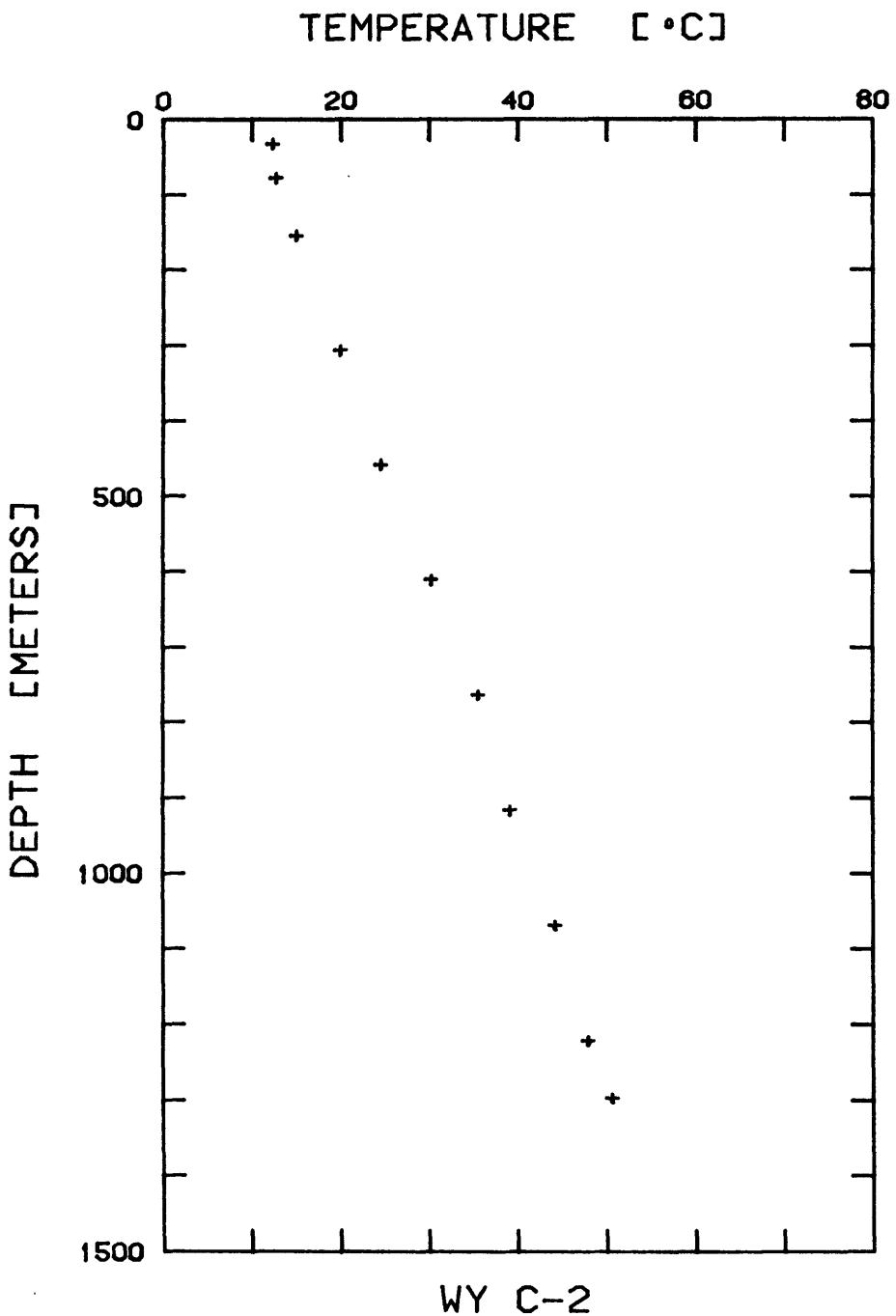
Section, Township, Range, County: Doddridge.

Date of observations: 1935 and 1936.

Fluid level in drill hole: No information.

General lithology: Pennsylvanian and Mississippian sedimentary rocks to 701 m; Devonian shales and sandstone below 701 m.

Remarks: Altitude = 347 m. Drilling to 625 m completed in 1916. Deepening began 2/34; still drilling 7/36 below 2331 m. Well produced 47 MCF from 613 m initially; still flowing when tested. Temperatures at depths 76.2 to 609.6 m amd 2000.1 to 2133.6 measured in 1936; others measured in 1935.



State: WY Hole name: C-2

Latitude: 44 deg 22.4 min Longitude: 108 deg 57.0 min

Gradient= 32°C/km, Intercept= 10.0°C

Reference code: SP 64

Temperature log

meters	°C
30.5	12.3
76.2	12.7
152.4	15.
304.8	20.1
457.2	24.6
609.6	30.3
762.	35.6
914.4	39.2
1066.8	44.2
1219.2	47.9
1295.4	50.6

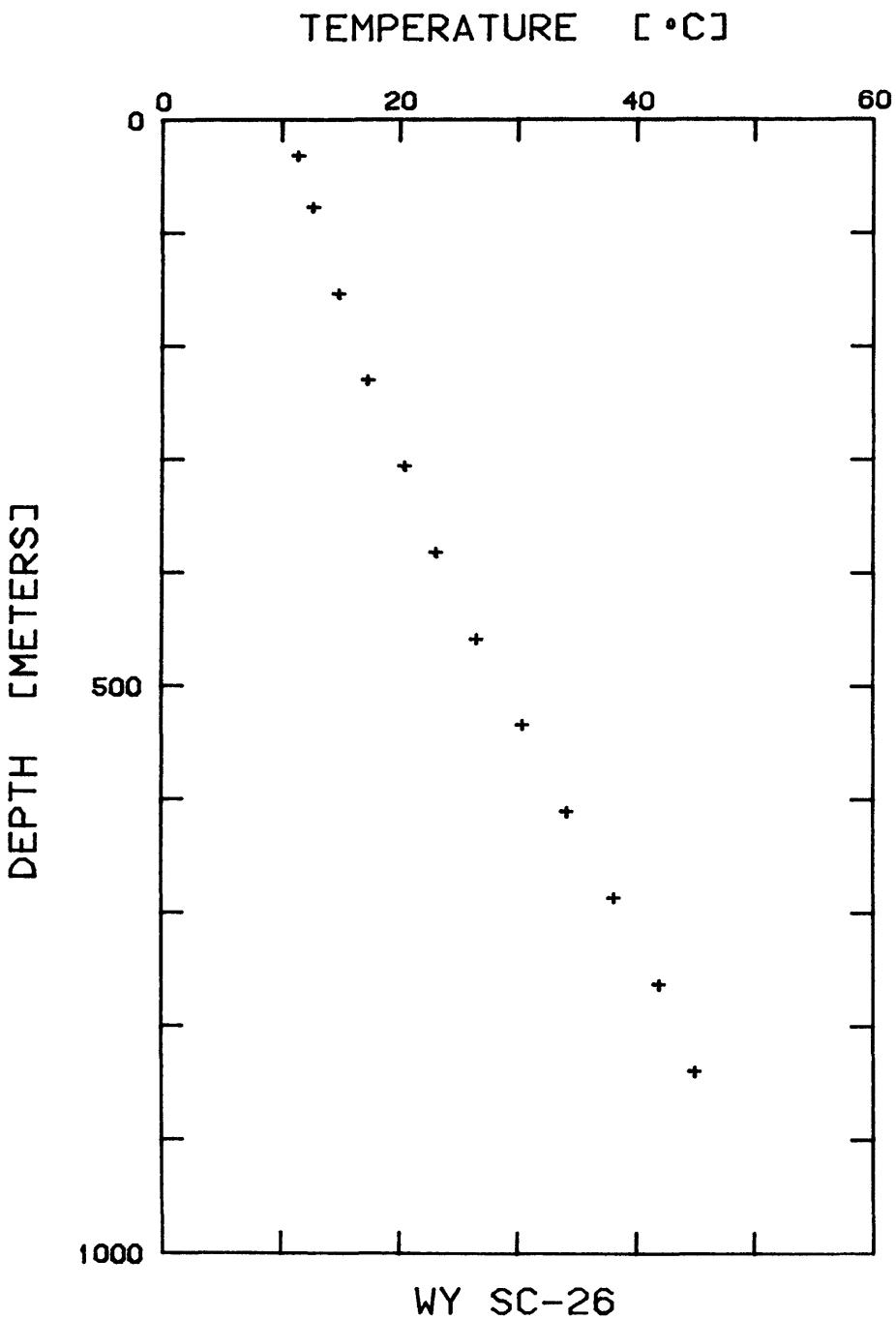
Section, Township, Range, County: Sec. 24, T. 51 N., R. 101 W., Park.

Date of observations: Circa 1920's.

Fluid level in drill hole: 156 m (water).

General lithology: No information.

Remarks: Non-producing well. Rotary drilled; idle about two months. Altitude = 1649 m. Located near base of ridge. Selected from group of 2 wells.



State: WY Hole name: SC-26

Latitude: 43 deg 25.0 min Longitude: 106 deg 15.0 min
Location is to nearest minute.

Gradient= 49°C/km, Intercept= 4.4°C

Reference code: *V026

Temperature log

meters	°C
30.5	11.4
76.2	12.7
152.4	14.8
228.6	17.3
304.8	20.4
381.	23.1
457.2,	26.5
533.4	30.4
609.6	34.2
685.8	38.1
762.	41.9
838.2	44.9

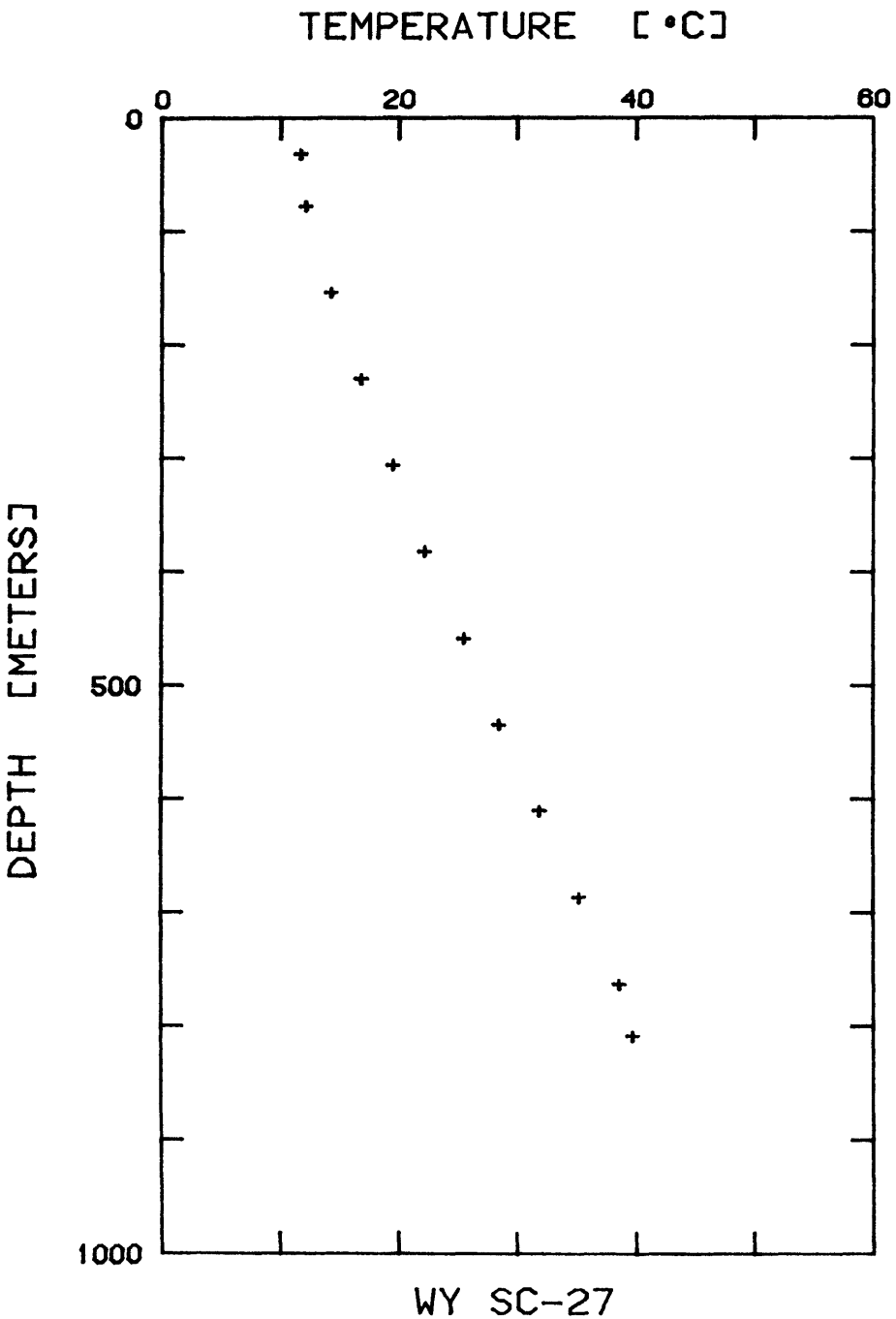
Section, Township, Range, County: NW1/4 sec 10, T. 39 N., R. 79 W., Natrona.

Date of observations: Circa 1920's.

Fluid level in drill hole: 165 m (water).

General lithology: Shale at 0-119 m. Shannon sandstone at 119-152 m. Shale, sandstone at 152-823 m. 1st Wall Creek sandstone at 823-856 m. Sandstone, shale at 856-944 m. 2nd Wall Creek sandstone at 944-946 m.

Remarks: Non-producing well. Total depth = 946 m. Selected from group of 29 wells.



State: WY Hole name: SC-27

Latitude: 43 deg 25.0 min Longitude: 106 deg 15.0 min
Location is to nearest minute.

Gradient= 43°C/km, Intercept= 5.8°C

Reference code: SP 64

Temperature log

meters	°C
30.5	11.7
76.2	12.2
152.4	14.3
228.6	16.8
304.8	19.5
381.	22.2
457.2	25.5
533.4	28.5
609.6	31.9
685.8	35.3
762.	38.6
807.7	39.7

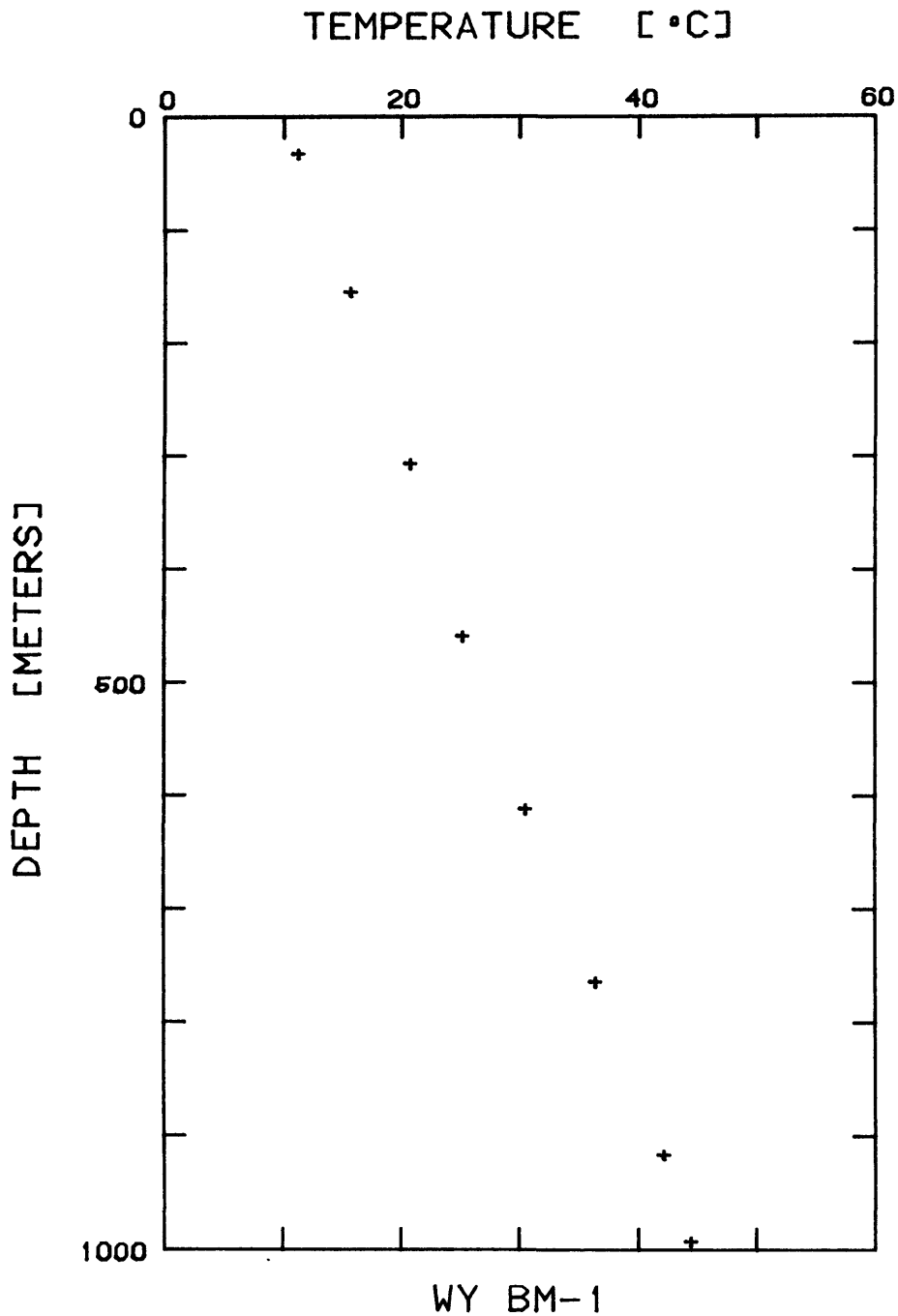
Section, Township, Range, County: NW1/4 sec. 15, T. 40 N., R. 79 W., Natrona.

Date of observations: Circa 1920's.

Fluid level in drill hole: 194 m (water).

General lithology: Shannon sandstone at 104-142 m. 1st Wall Creek sandstone (with water) at 794-831 m. 2nd Wall Creek sandstone (with water) at 917-924 m.

Remarks: Altitude = 1510 m. Idle several months; well abandoned due to water in both Wall Creek sandstones. Selected from group of 29 holes.



State: WY Hole name: BM-1

Latitude: 42 deg 50.1 min Longitude: 105 deg 59.1 min

Gradient= 37°C/km, Intercept= 8.2°C

Reference code: SP 64

Temperature log

meters	°C
30.5	11.1
152.4	15.5
304.8	20.6
457.2	25.
609.6	30.3
762.	36.2
914.4	41.8
990.6,	44.1

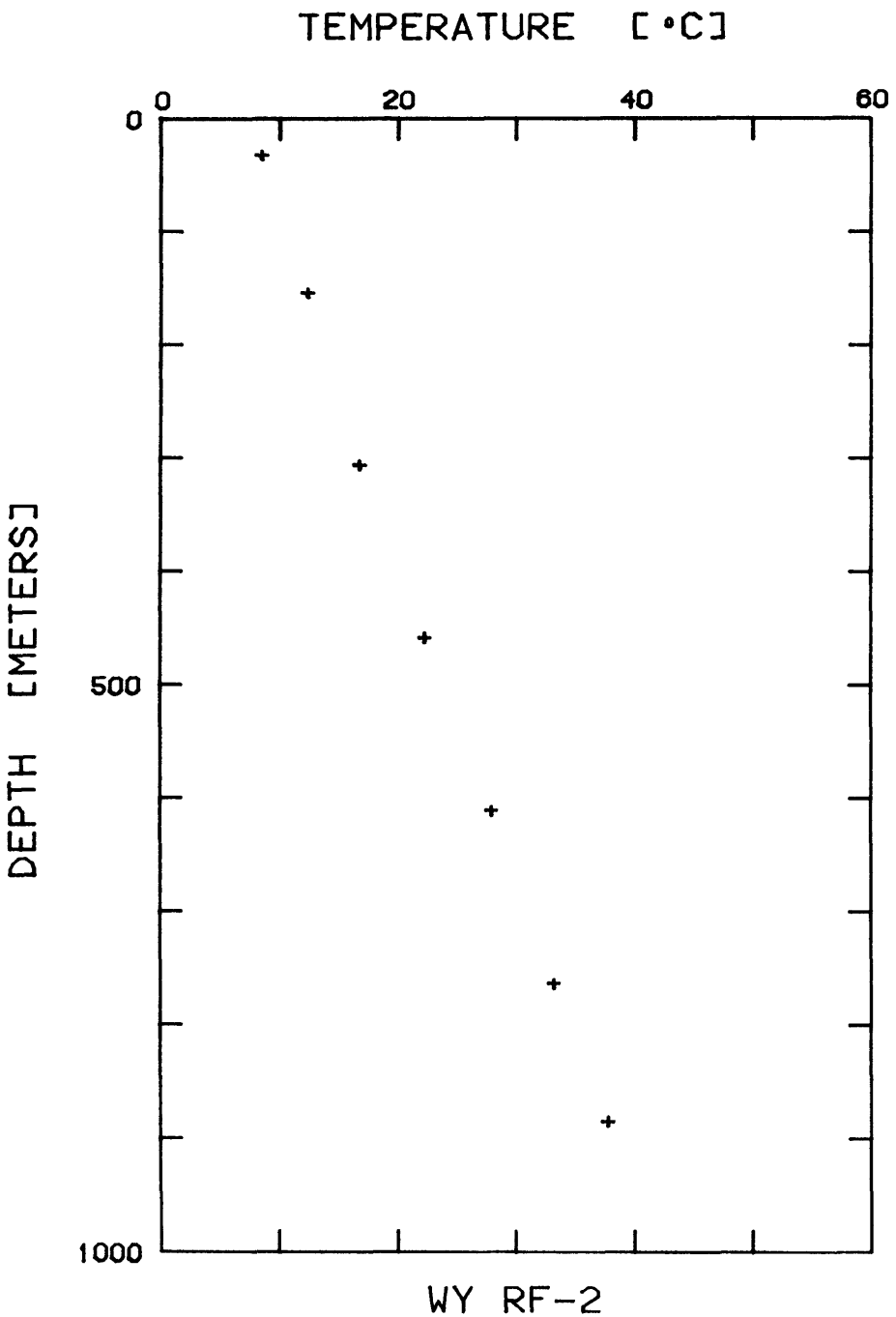
Section, Township, Range, County: SW1/4, SW1/4, SE1/4 sec. 9, T. 33 N., R. 76 W., Converse.

Date of observations: Circa 1920's.

Fluid level in drill hole: No information.

General lithology: Shale at 0-40 m. Sandstone, water at 40-53 m. Shale at 53-280 m. Sandstone at 280-295 m. Shale at 295-980 m. Sandstone at 980-1002 m.

Remarks: Non-producing hole. Selected from group of 4 wells.



State: WY Hole name: RF-2

Latitude: 42 deg 10.5 min Longitude: 107 deg 9.4 min

Gradient= 36°C/km, Intercept= 5.6°C

Reference code: SP 64

Temperature log

meters	°C
30.5	8.4
152.4	12.3
304.8	16.7
457.2	22.2
609.6	27.9
762.	33.1
883.9	37.7

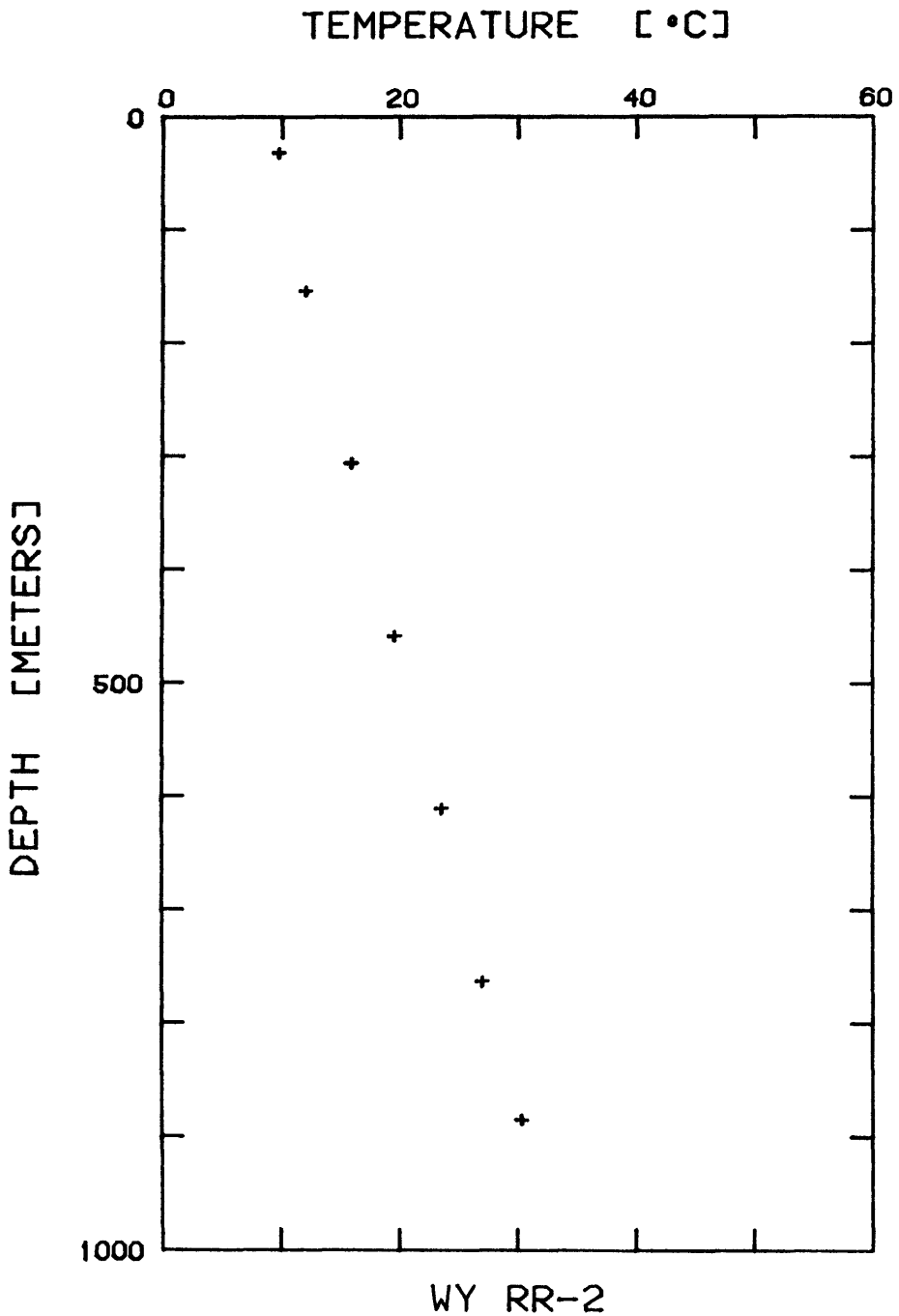
Section, Township, Range, County: SW1/4, SE1/4 sec. 31, T. 26 N., R. 86 W., Carbon.

Date of observations: Circa 1920's.

Fluid level in drill hole: No information.

General lithology: Sandstone at 0-15 m. Shale, sandstone, shell at 15-776 m. Sandstone, water at 776-794 m. Sandstone, shell, limestone, shale at 794-1116 m. Bentonite at 1116-1119 m. Shale, shell at 1119-1143 m.

Remarks: No oil production. Selected from group of 4 wells.



State: WY Hole name: RR-2

Latitude: 41 deg 39.8 min Longitude: 106 deg 7.6 min

Gradient= 24°C/km, Intercept= 8.3°C

Reference code: SP 64

Temperature log

meters	°C
30.5	9.6
152.4	11.9
304.8	15.7
457.2	19.4
609.6	23.4
762.	26.8
883.9	30.1

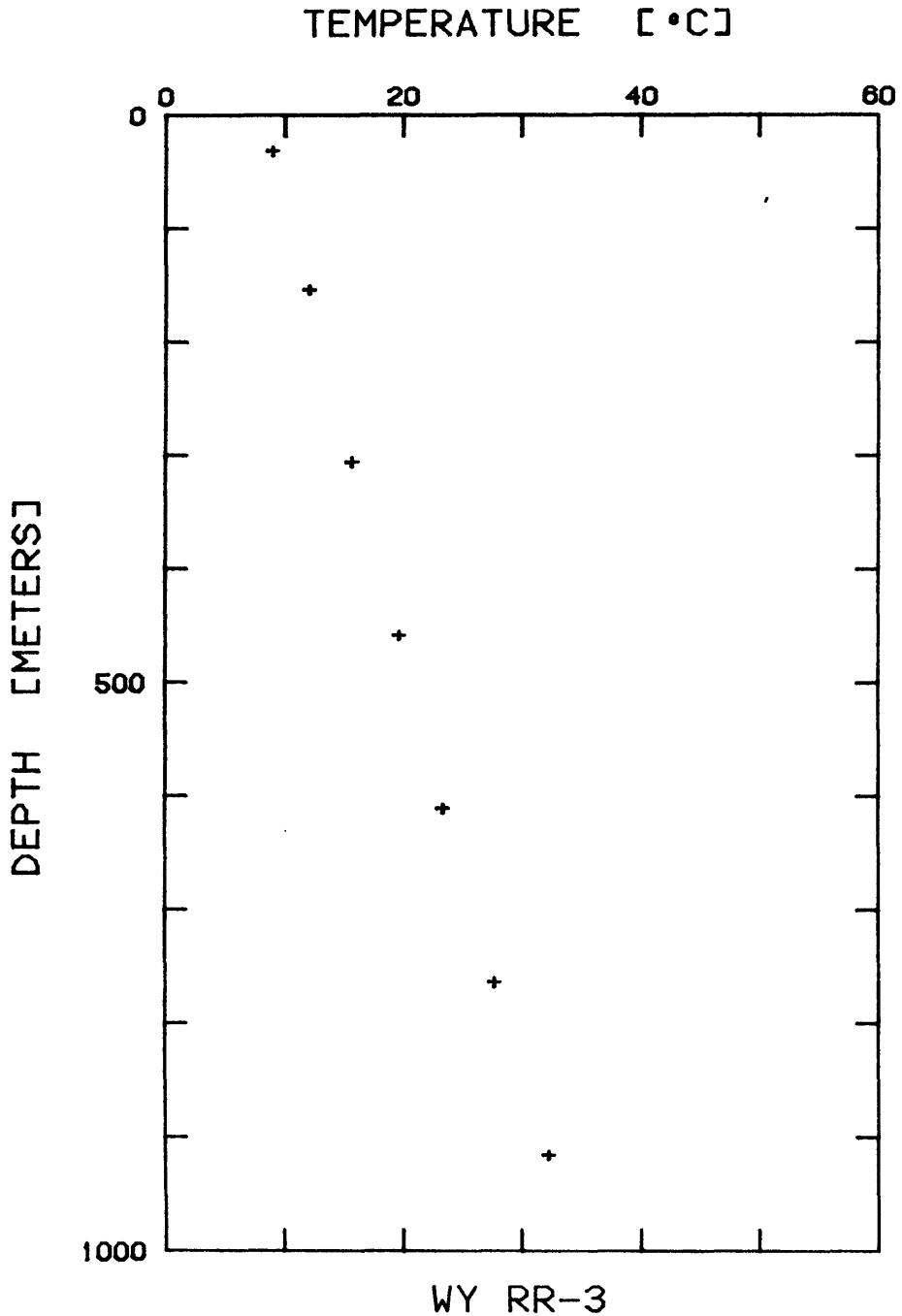
Section, Township, Range, County: S1/2 sec. 35, T. 20 N., R. 78 W., Carbon.

Date of observations: 3/25/36.

Fluid level in drill hole: No information.

General lithology: No information.

Remarks: Non-producing well. Altitude = 2352 m. Selected from group of 3 wells.



State: WY Hole name: RR-3

Latitude: 41 deg 39.2 min Longitude: 106 deg 7.2 min

Gradient= 26°C/km, Intercept= 7.7°C

Reference code: SP 64

Temperature log

meters	°C
30.5	9.
152.4	12.1
304.8	15.7
457.2	19.7
609.6	23.4
762.	27.7
914.4	32.3

Section, Township, Range, County: Sec. 2, T. 19 N., R. 78 W., Carbon.

Date of observations: 3/25/36.

Fluid level in drill hole: 393 m (water).

General lithology: No information.

Remarks: Drilled by rotary rig and changed to standard tools; not yet drilled into oil sand. Altitude = 2207 m. Selected from group of 3 wells.