

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Geophysical logs of water wells logged for coal occurrences
in northern Campbell and eastern Sheridan Counties, Wyoming

By

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Open-File Report 83-411

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

¹USGS, Denver, Colo.

1983

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INTRODUCTION

In 1976 a project was initiated to log water wells in northern Campbell and eastern Sheridan Counties, Wyoming (fig. 1). Seventy-nine water wells were logged to determine the presence of coal. Data for these water wells were presented in Babcock and Hobbs (1976).

This report is a revision of the original report of Babcock and Hobbs (1976). It was made to include copies of the geophysical logs of individual water wells (appendix A), as well as to present the data in a format consistent with drilling reports of this area (Correia, 1980; and Hobbs, 1982).

Geophysical logs for 72 of those water wells are presented in this report. Geophysical logs of the seven remaining water wells are to be presented in later reports. The water wells logged ranged from a minimum depth of 39.6 feet to a maximum depth of 950 feet and averaged a depth of 247.5 feet. The total footage logged was 17,819.6 feet. General borehole data of the water wells are presented in table 1.

For safety purposes, routine measurements for the presence of methane, as presented by Hobbs (1978), were made at the wellhead, using a handheld methane detector (Methanometer). Wells in which methane was detected are shown in table 2. Measurements were made only to check and verify the presence of methane, not the quantity.

Water wells in this study were originally designated by the water well owner's name, but have been changed to conform more closely with other USGS project borehole designations in the same general area. A cross-reference of original well names to the present designations is shown in table 3.

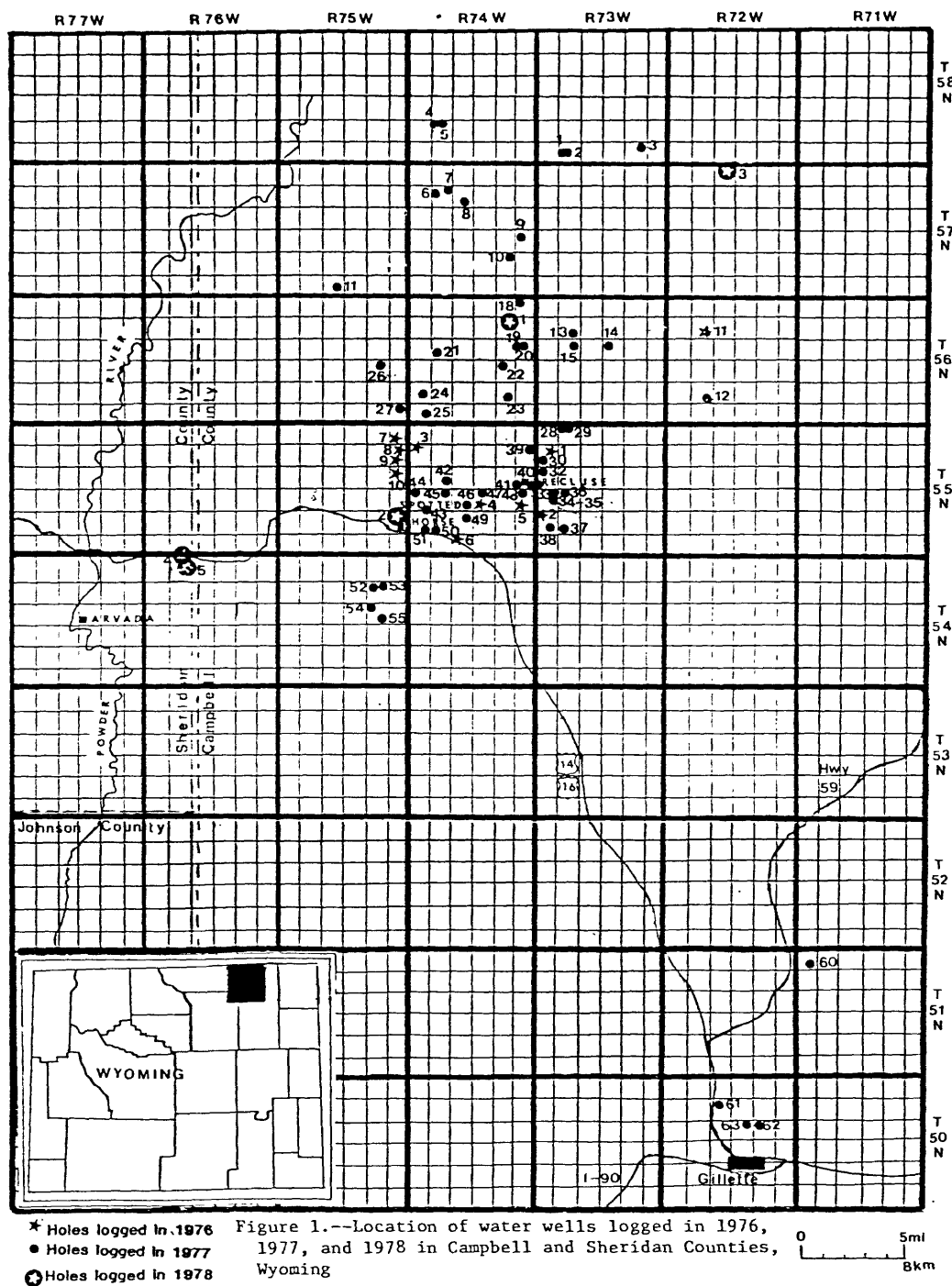


Table 1.--General hole data

| Hole number | Location | Quadrangle | Surface elevation (ft) | Depth logged (ft) |
|-------------|--|-------------------|------------------------|-------------------|
| 76 BCR-1 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 55 N., R. 73 W. | Homestead Draw SW | 4,170 | 190.0 |
| 76 BCR-2 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30, T. 55 N., R. 73 W. | Recluse | 4,185 | 316.0 |
| 76 BCR-3 | NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 55 N., R. 74 W. | Reservoir Creek | 4,021 | 150.0 |
| 76 BCR-4 | SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 22, T. 55 N., R. 74 W. | Spotted Horse | 4,155 | 39.6 |
| 76 BCR-5 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 55 N., R. 74 W. | Recluse | 4,165 | 199.0 |
| 76 BCR-6 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 55 N., R. 74 W. | Spotted Horse | 4,230 | 130.0 |
| 76 BCR-7 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 55 N., R. 75 W. | Reservoir Creek | 4,040 | 576.0 |
| 76 BCR-8 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 12, T. 55 N., R. 75 W. | Reservoir Creek | 4,022 | 96.5 |
| 76 BCR-9 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 55 N., R. 75 W. | Reservoir Creek | 4,075 | 229.0 |
| 76 BCR-10 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 55 N., R. 75 W. | Reservoir Creek | 4,130 | 226.0 |
| 76 BCR-11 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T. 56 N., R. 72 W. | White Tail Butte | 4,150 | 300.0 |
| 77 BCR-1 | NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 58 N., R. 73 W. | Corral Creek | 3,957 | 262.0 |
| 77 BCR-2 | NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 58 N., R. 73 W. | Corral Creek | 3,985 | 287.0 |
| 77 BCR-3 | SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 35, T. 58 N., R. 73 W. | Homestead Draw | 4,000 | 555.0 |
| 77 BCR-4 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T. 58 N., R. 74 W. | Dead Horse Lake | 3,740 | 167.0 |

Table 1.--General hole data--Continued

| Hole number | Location | Quadrangle | Surface elevation (ft) | Depth logged (ft) |
|-------------|--|-------------------|------------------------|-------------------|
| 77 BCR-5 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T. 58 N., R. 74 W. | Dead Horse Lake | 3,740 | 80.0 |
| 77 BCR-6 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 57 N., R. 74 W. | Dead Horse Lake | 3,690 | 268.0 |
| 77 BCR-7 | NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 57 N., R. 74 W. | Dead Horse Lake | 3,680 | 204.0 |
| 77 BCR-8 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 57 N., R. 74 W. | Dead Horse Lake | 3,775 | 113.0 |
| 77 BCR-9 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24, T. 57 N., R. 74 W. | Corral Creek | 3,800 | 148.0 |
| 77 BCR-10 | NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 26, T. 57 N., R. 74 W. | Corral Creek | 3,730 | 60.0 |
| 77 BCR-11 | NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 33, T. 57 N., R. 75 W. | Black Draw | 3,675 | 235.0 |
| 77 BCR-12 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 56 N., R. 72 W. | White Tail Butte | 4,090 | 203.5 |
| 77 BCR-13 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T. 56 N., R. 73 W. | Homestead Draw SW | 3,890 | 213.0 |
| 77 BCR-14 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 15, T. 56 N., R. 73 W. | Homestead Draw SW | 4,030 | 97.0 |
| 77 BCR-15 | NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 56 N., R. 73 W. | Homestead Draw SW | 3,895 | 95.0 |
| 77 BCR-18 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 56 N., R. 74 W. | Homestead Draw SW | 3,790 | 244.0 |
| 77 BCR-19 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 56 N., R. 74 W. | Homestead Draw SW | 3,885 | 90.0 |
| 77 BCR-20 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 56 N., R. 74 W. | Homestead Draw SW | 3,880 | 56.5 |
| 77 BCR-21 | NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 56 N., R. 74 W. | Reservoir Creek | 3,800 | 320.0 |

Table 1.--General hole data--Continued

| Hole number | Location | Quadrangle | Surface elevation (ft) | Depth logged (ft) |
|-------------|--|-------------------|------------------------|-------------------|
| 77 BCR-22 | NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.23, T. 56 N., R. 74 W. | Homestead Draw SW | 3,975 | 147.0 |
| 77 BCR-23 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 26, T. 56 N., R. 74 W. | Homestad Draw SW | 4,125 | 228.0 |
| 77 BCR-24 | NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 56 N., R. 74 W. | Reservoir Creek | 4,070 | 201.0 |
| 77 BCR-25 | NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 56 N., R. 74 W. | Reservoir Creek | 4,125 | 295.0 |
| 77 BCR-26 | NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 56 N., R. 75 W. | Reservoir Creek | 4,050 | 279.0 |
| 77 BCR-27 | SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 36, T. 56 N., R. 75 W. | Reservoir Creek | 3,895 | 110.0 |
| 77 BCR-28 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 55 N., R. 73 W. | Homestead Draw SW | 3,985 | 41.0 |
| 77 BCR-29 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 55 N., R. 73 W. | Homestead Draw SW | 3,990 | 121.0 |
| 77 BCR-30 | NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 55 N., R. 73 W. | Homestead Draw SW | 4,130 | 103.0 |
| 77 BCR-32 | SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 55 N., R. 73 W. | Recluse | 4,122 | 155.0 |
| 77 BCR-33 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T. 55 N., R. 73 W. | Recluse | 4,150 | 370.0 |
| 77 BCR-34 | SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 55 N., R. 73 W. | Recluse | 4,155 | 945.0 |
| 77 BCR-35 | NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 55 N., R. 73 W. | Recluse | 4,130 | 216.0 |
| 77 BCR-36 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 20, T. 55 N., R. 73 W. | Recluse | 4,050 | 104.5 |
| 77 BCR-37 | SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 55 N., R. 73 W. | Recluse | 4,090 | 182.0 |

Table 1.--General hole data--Continued

| Hole number | Location | Quadrangle | Surface elevation (ft) | Depth logged (ft) |
|-------------|--|---------------|------------------------|-------------------|
| 77 BCR-38 | NW 1/4 SE 1/4 sec. 30, T. 55 N., R. 73 W. | Recluse | 4,125 | 132.0 |
| 77 BCR-39 | NW 1/4 NE 1/4 sec. 12, T. 55 N., R. 74 W. | Recluse | 4,160 | 915.0 |
| 77 BCR-40 | NW 1/4 SE 1/4 sec. 13, T. 55 N., R. 74 W. | Recluse | 4,119 | 357.0 |
| 77 BCR-41 | NW 1/4 SW 1/4 sec. 13, T. 55 N., R. 74 W. | Recluse | 4,100 | 509.0 |
| 77 BCR-42 | NE 1/4 SE 1/4 sec. 17, T. 55 N., R. 74 W. | Spotted Horse | 4,110 | 88.0 |
| 77 BCR-43 | NW 1/4 SE 1/4 sec. 19, T. 55 N., R. 74 W. | Spotted Horse | 4,190 | 375.0 |
| 77 BCR-44 | NE 1/4 NW 1/4 sec. 19, T. 55 N., R. 74 W. | Spotted Horse | 4,075 | 90.0 |
| 77 BCR-45 | SE 1/4 NE 1/4 sec. 20, T. 55 N., R. 74 W. | Spotted Horse | 4,170 | 110.0 |
| 77 BCR-46 | SW 1/4 SW 1/4 sec. 21, T. 55 N., R. 74 W. | Spotted Horse | 4,205 | 353.0 |
| 77 BCR-47 | SE 1/4 NW 1/4 sec. 22, T. 55 N., R. 74 W. | Spotted Horse | 4,155 | 140.0 |
| 77 BCR-48 | NE 1/4 NW 1/4 sec. 24, T. 55 N., R. 74 W. | Recluse | 4,145 | 84.0 |
| 77 BCR-49 | SE 1/4 NE 1/4 sec. 28, T. 55 N., R. 74 W. | Spotted Horse | 4,245 | 185.0 |
| 77 BCR-50 | NE 1/4 SW 1/4 sec. 29, T. 55 N., R. 74 W. | Spotted Horse | 4,175 | 200.0 |
| 77 BCR-51 | SE 1/4 SE 1/4 sec. 30, T. 55 N., R. 74 W. | Spotted Horse | 4,060 | 152.0 |
| 77 BCR-52 | NW 1/4 SE 1/4 sec. 11, T. 54 N., R. 75 W. | Spotted Horse | 4,090 | 199.0 |

Table 1.--General hole data--Continued

| Hole number | Location | Quadrangle | Surface elevation (ft) | Depth logged (ft) |
|-------------|--|-------------------|------------------------|-------------------|
| 77 BCR-53 | NE 1/4 NW 1/4 sec. 11, T. 54 N., R. 75 W. | Spotted Horse | 4,015 | 230.0 |
| 77 BCR-54 | SE 1/4 NW 1/4 sec. 14, T. 54 N., R. 75 W. | Spotted Horse | 4,090 | 950.0 |
| 77 BCR-55 | SW 1/4 SE 1/4 sec. 14, T. 54 N., R. 75 W. | Spotted Horse | 4,160 | 189.0 |
| 77 BCR-60 | SW 1/4 NW 1/4 sec. 6, T. 51 N., R. 71 W. | Moyer Springs | 4,170 | 361.0 |
| 77 BCR-61 | SE 1/4 NW 1/4 sec. 9, T. 50 N., R. 72 W. | Gillette West | 4,445 | 518.0 |
| 77 BCR-62 | NW 1/4 NW 1/4 sec. 14, T. 50 N., R. 72 W. | Gillette East | 4,455 | 478.0 |
| 77 BCR-63 | NE 1/4 NE 1/4 sec. 15, T. 50 N., R. 72 W. | Gillette East | 4,430 | 237.0 |
| 78 BCR-1 | NW 1/4 NE 1/4 sec. 11, T. 56 N., R. 74 W. | Homestead Draw SW | 3,888 | 216.0 |
| 78 BCR-2 | SE 1/4 SW 1/4 sec. 25, T. 55 N., R. 75 W. | Spotted Horse | 4,022 | 370.0 |
| 78 BCR-3 | SW 1/4 NE 1/4 sec. 4, T. 57 N., R. 72 W. | Homestead Draw | 3,805 | 327.0 |
| 78 BCR-4 | SW 1/4 NE 1/4 sec. 5, T. 54 N., R. 76 W. | Arvada NE | 3,826 | 231.0 |
| 78 BCR-5 | SW 1/4 NE 1/4 sec. 5, T. 54 N., R. 76 W. | Arvada NE | 3,818 | 176.0 |

Table 2.--Holes in which methane was detected

| <u>Hole No.</u> | <u>Remarks</u> |
|-----------------|---|
| 76 BCR-1 | Methane detected |
| 77 BCR-5 | Methane detected |
| 77 BCR-6 | Methane detected |
| 77 BCR-7 | Methane detected |
| 77 BCR-18 | Water level surging with methane discharge |
| 77 BCR-21 | Water level surging with methane discharge |
| 77 BCR-33 | Methane detected |
| 77 BCR-34 | Methane detected |
| 77 BCR-40 | Methane detected |
| 77 BCR-41 | Hole blew out with methane discharge at conclusion of drilling |
| 77 BCR-43 | Methane detected |
| 77 BCR-45 | Methane detected |
| 77 BCR-52 | Methane detected |
| 77 BCR-53 | Methane detected |
| 77 BCR-54 | Methane detected |
| 77 BCR-61 | Methane detected |
| 78 BCR-1 | Methane detected |
| 78 BCR-2 | Methane detected |
| 78 BCR-4 | Methane detected |
| 78 BCR-5 | Water level surging with methane discharge |

Table 3.--Cross-reference by well-owner name and number to present hole designations

| | | | |
|-----------------|-----------|----------------|-----------|
| Bossman | 76 BCR-2 | Oedekoven Land | 77 BCR-39 |
| Brug #1 | 77 BCR-29 | Osborn #1 | 77 BCR-62 |
| Brug #2 | 77 BCR-28 | Osborn #2 | 77 BCR-63 |
| Brug #3 | 77 BCR-19 | Recluse School | 77 BCR-41 |
| Brug #4 | 77 BCR-20 | Saranyi #1 | 78-BCR-4 |
| Brug #5 | 77 BCR-22 | Saranyi #2 | 78 BCR-5 |
| Brug #6 | 77 BCR-23 | Smith | 76 BCR-11 |
| Brug #7 | 77 BCR-13 | Sorenson #1 | 77 BCR-43 |
| Brug #8 | 77 BCR-15 | Sorenson #2 | 77 BCR-44 |
| Brug #9 | 77 BCR-14 | Sorenson #3 | 77 BCR-45 |
| J. Cotton #1 | 77 BCR-1 | Sorenson #4 | 77 BCR-46 |
| J. Cotton #2 | 77 BCR-2 | Sorenson #5 | 77 BCR-42 |
| Davis | 77 BCR-12 | Sorenson #6 | 77 BCR-47 |
| DeSoto | 77 BCR-3 | Sorenson #7 | 77 BCR-49 |
| Heald #1 | 77 BCR-30 | Sorenson #8 | 76 BCR-4 |
| Heald #2 | 77 BCR-32 | Sorenson #9 | 76 BCR-6 |
| Kirkle | 77 BCR-25 | Spellman #1 | 77 BCR-52 |
| Mader | 77 BCR-60 | Spellman #2 | 77 BCR-53 |
| Marquis #1 | 77 BCR-10 | Spellman #3 | 77 BCR-55 |
| Marquis #2 | 77 BCR-9 | Spellman #4 | 77 BCR-51 |
| Murphy | 77 BCR-61 | Spellman #5 | 77 BCR-50 |
| Music | 78 BCR-3 | Spotted Horse | 78 BCR-2 |
| Oedekoven C-6 | 77 BCR-34 | Strode | 76 BCR-1 |
| Oedekoven D. #1 | 77 BCR-33 | TR-1 | 77 BCR-21 |
| Oedekoven D. #2 | 77 BCR-48 | TR-2 | 77 BCR-27 |
| Oedekoven D. #3 | 77 BCR-35 | TR-3 | 77 BCR-26 |
| Oedekoven E. #1 | 77 BCR-6 | TR-4 | 77 BCR-18 |
| Oedekoven E. #2 | 77 BCR-4 | TR-5 | 77 BCR-24 |
| Oedekoven E. #3 | 77 BCR-5 | TR-6 | 77 BCR-11 |
| Oedekoven E. #4 | 77 BCR-7 | TR-7 | 78 BCR-1 |
| Oedekoven E. #5 | 77 BCR-8 | VanSkite | 77 BCR-54 |
| Oedekoven J. | 77 BCR-40 | Werner #1 | 76 BCR-3 |
| Oedekoven L. #1 | 77 BCR-38 | Werner #2 | 76 BCR-7 |
| Oedekoven L. #2 | 77 BCR-37 | Werner #3 | 76 BCR-8 |
| Oedekoven L. #3 | 77 BCR-36 | Werner #4 | 76 BCR-9 |
| Oedekoven L. #4 | 76 BCR-5 | Werner #5 | 76 BCR-10 |

ACKNOWLEDGMENTS

We express our appreciation to the ranchers and residents of Campbell and Sheridan Counties, Wyoming, for their wholehearted cooperation with this project. We also wish to thank Steven Goolsby, David Haddock, Mitchel Hobbs, and Joseph Sarnecki for their assistance in the field.

Richard Oedekoven, Recluse, Wyoming, supplied expertise, patience, and advice to the authors; and Marlon Lowrey, U.S. Geological Survey, Cheyenne, Wyoming, helped coordinate all phases of the logging project. Their interest and support are gratefully acknowledged.

REFERENCES CITED

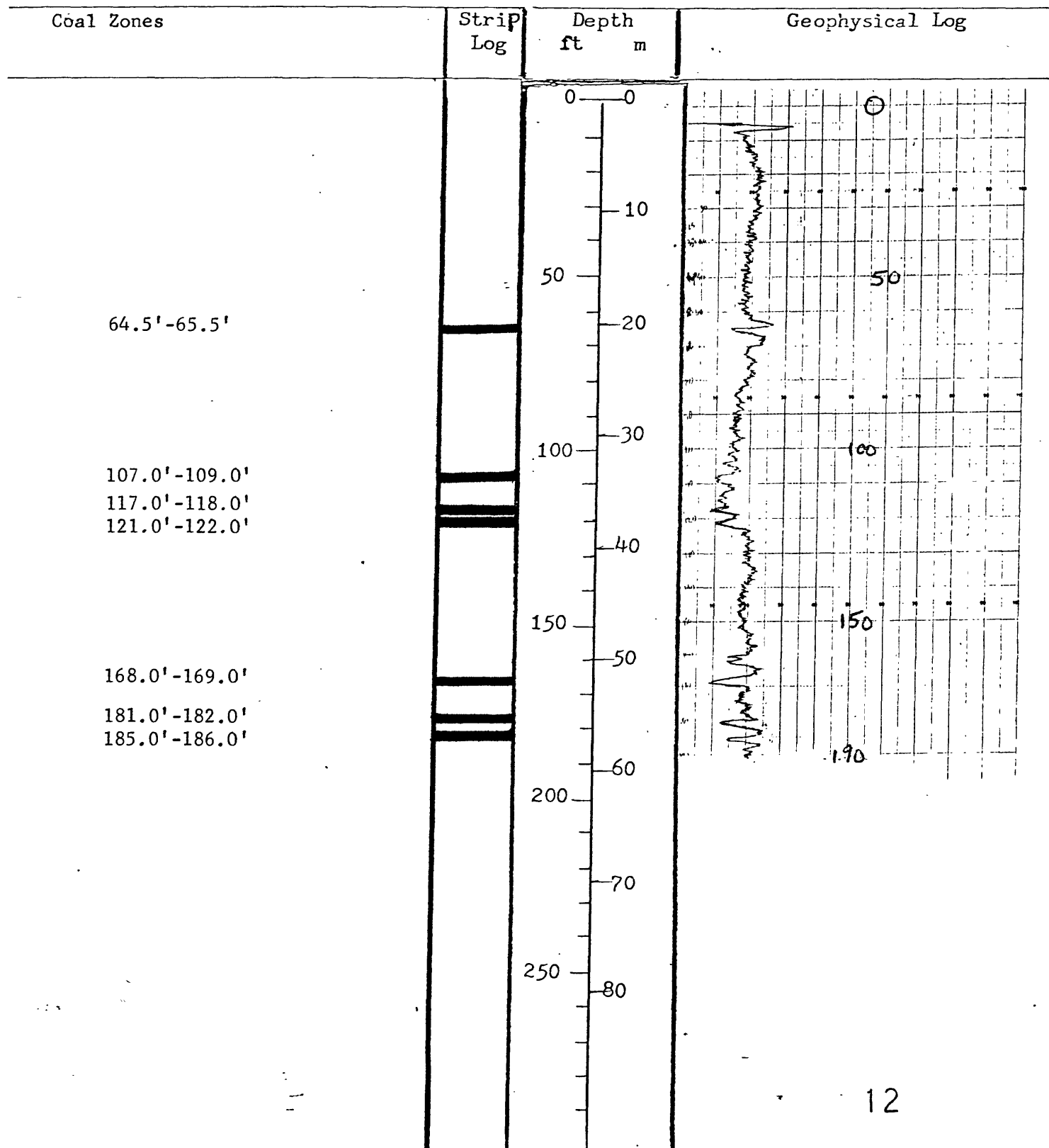
- Babcock, R. N. and Hobbs, R. G., 1979, Geophysical logging of water wells for coal occurrences in northern Campbell County and eastern Sheridan County, Wyoming: U.S. Geological Survey Open-File Report 79-1213, 12 p.
- Correia, G. A., 1980, Preliminary report and geophysical logs of 1978 coal assessment drilling program northern and western Recluse Geologic Analysis Area Northern Campbell and Eastern Sheridan Counties, Wyoming: U.S. Geological Survey Open-File Report 80-80, 72 p.
- Hobbs, R. G., 1978, Methane occurrences, hazards, and potential resources, Recluse Geologic Analysis Area, northern Campbell County, Wyoming: U.S. Geological Survey Open-File Report 78-401, 20 p.
- _____, 1982, Coal exploratory drilling 1980 Recluse and Sheridan $1/2^{\circ}$ x 1° quadrangles, Campbell, Johnson and Sheridan Counties, Wyoming: U.S. Geological Survey Open-File Report 82-799, 160 p.

APPENDIX A

GEOPHYSICAL LOGS - WATER WELL REPORT

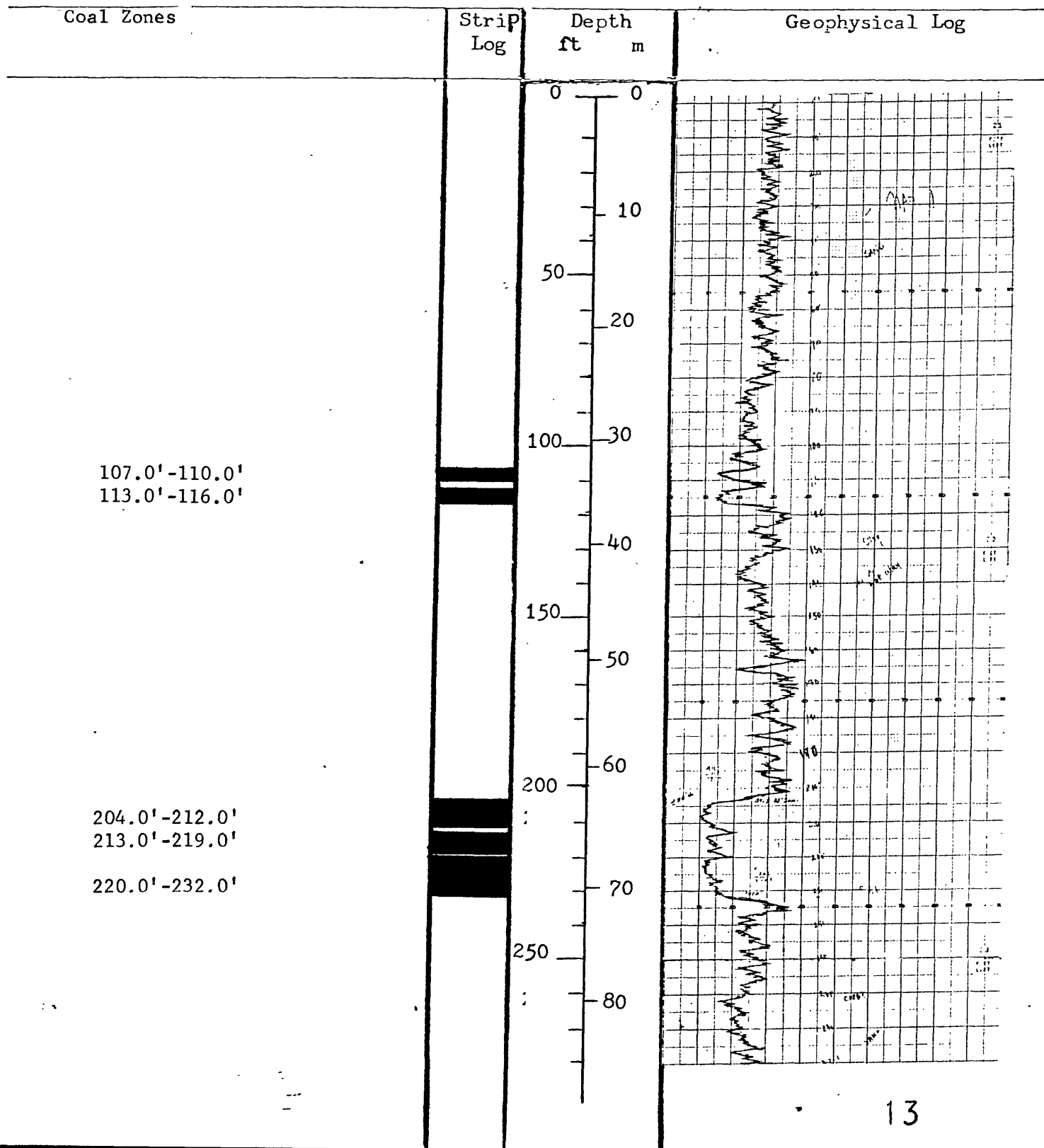
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Nat. Gamma

Project Water Well Hole no. 76 BCR-1 Surface Elevation 4170'
 Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 55N, R. 73W, County Campbell
 State Wyoming Nearest Town Recluse Quad Homestead Draw SW
 Log Depth 190' Date Logged 7/25/76 Log Run By Sarnecki/Haddock Fluid level 145'
 Remarks Hole originally designated Stode Water Well; Methane detected

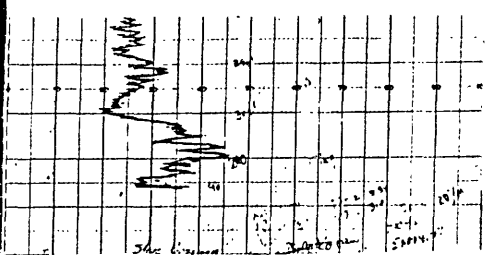


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-2 Surface Elevation 4185'
Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 316' Date Logged 7/27/76 Log Run By Hobbs, Sarnecki Fluid level 100'
Haddock
Remarks Hole originally designated Bossman Water Well

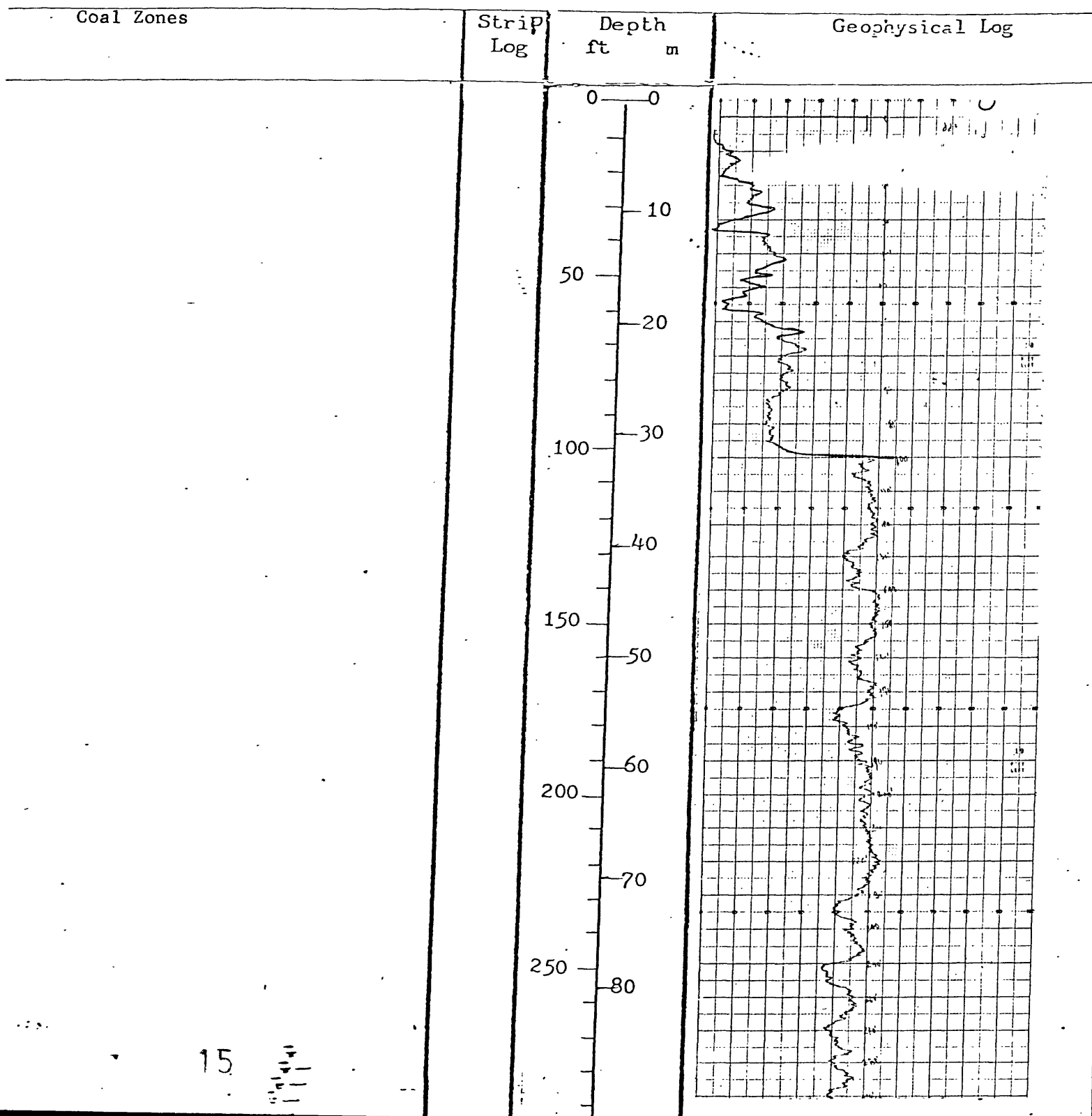


Hole no. 76 BCR-2 (cont.)

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|--------------|--|---|
| | | <div data-bbox="803 388 852 451">300</div> <div data-bbox="901 388 950 420">90</div> <div data-bbox="803 546 852 577">100</div> <div data-bbox="787 661 852 693">350</div> <div data-bbox="901 703 950 735">110</div> <div data-bbox="803 892 852 924">400</div> <div data-bbox="901 861 950 892">120</div> <div data-bbox="901 1008 950 1039">130</div> <div data-bbox="803 1144 852 1176">450</div> <div data-bbox="901 1176 950 1207">140</div> <div data-bbox="901 1323 950 1354">150</div> <div data-bbox="803 1386 852 1417">500</div> <div data-bbox="901 1480 950 1512">160</div> <div data-bbox="803 1638 852 1669">550</div> <div data-bbox="901 1638 950 1669">170</div> <div data-bbox="901 1795 950 1827">180</div> <div data-bbox="787 1869 852 1900">600</div> <div data-bbox="901 1942 950 1974">190</div> |  |

U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 76 BCR-2 Surface Elevation 4185'
Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 30, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 310' Date Logged 7/27/76 Log Run By Hobbs, Sarnecki, Fluid level 100'
Haddock
Remarks Hole originally design ated Bossman Water Well

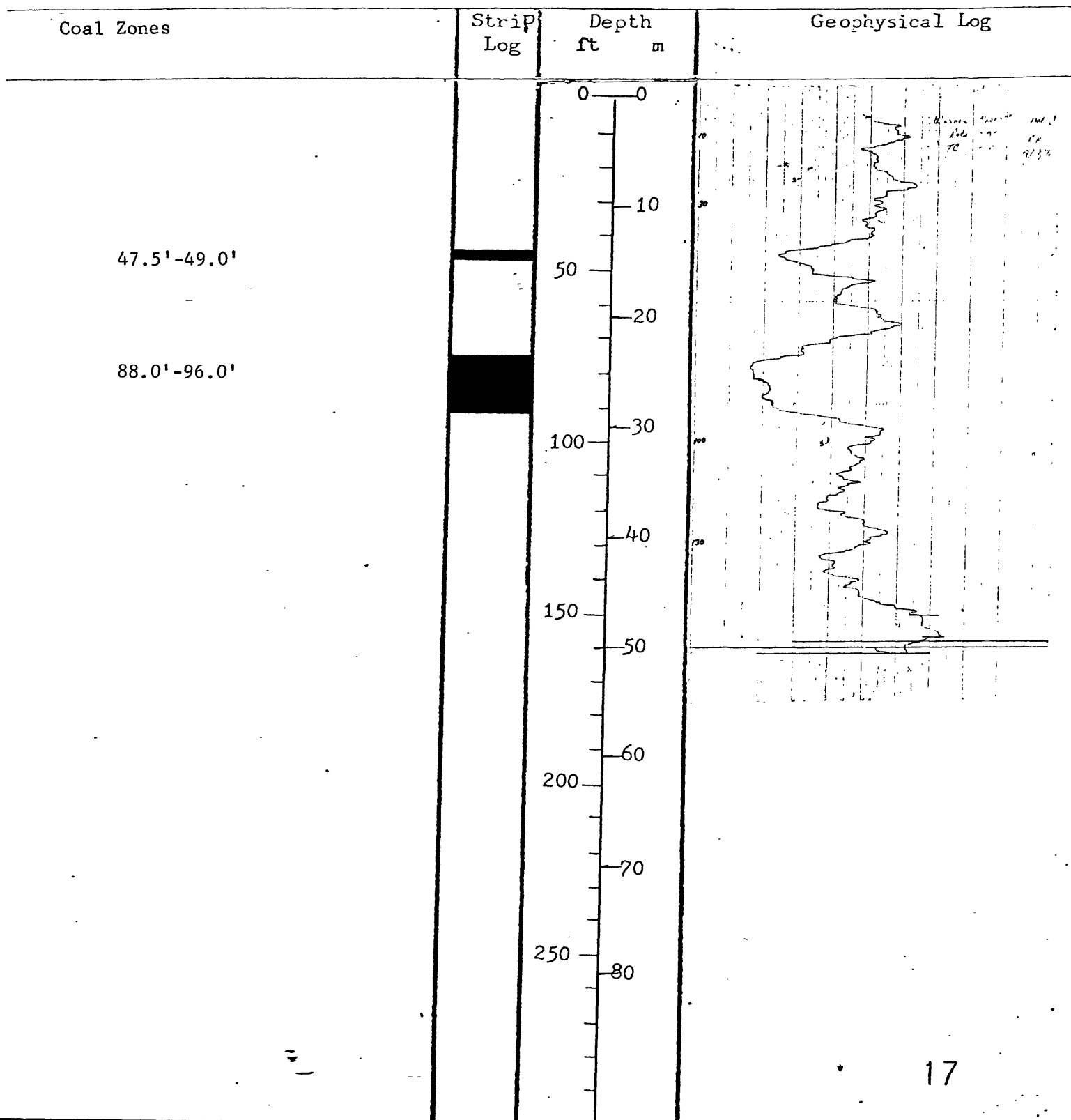


Hole no. 76 BCR-2 (cont.)

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|-----------|--|--|
| | | <div data-bbox="803 304 998 2068"> <div>300</div> <div>90</div> <div>100</div> <div>350</div> <div>110</div> <div>120</div> <div>400</div> <div>130</div> <div>450</div> <div>140</div> <div>150</div> <div>500</div> <div>160</div> <div>550</div> <div>170</div> <div>180</div> <div>600</div> <div>190</div> </div> | <div data-bbox="1015 378 1518 577"> <p>The geophysical log plot displays resistivity curves (solid and dashed lines) against depth. A grid of numerical data is overlaid on the right side of the plot, with values ranging from 1 to 20. The plot is located between the 90 ft and 110 ft depth markers.</p> </div> |

U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-3 Surface Elevation 4021'
Location NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 150' Date Logged 7/9/76 Log Run By Knotteck Fluid level --
Remarks Hole originally designated Werner "2000" (1)



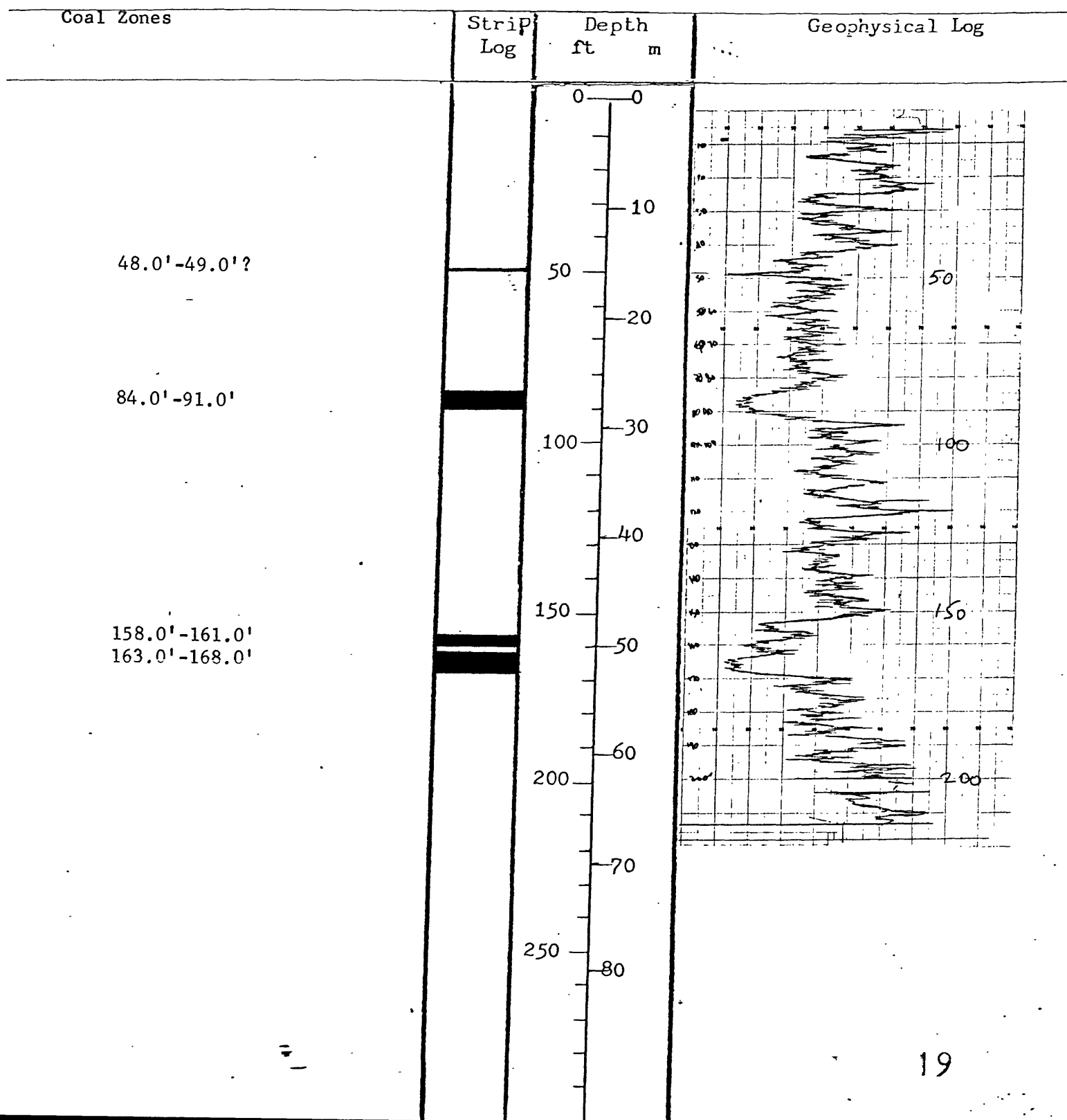
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-4 Surface Elevation 4155'
 Location SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 22, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 39.6' Date Logged 7/28/76 Log Run By Hobbs Fluid level --
 Remarks Hole originally designated R.L.Sorenson Water Well 1; No coal

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|-----------|---|-----------------|
| | | 0—0 10 50 20 30 100 40 150 50 60 200 70 250 80 | |

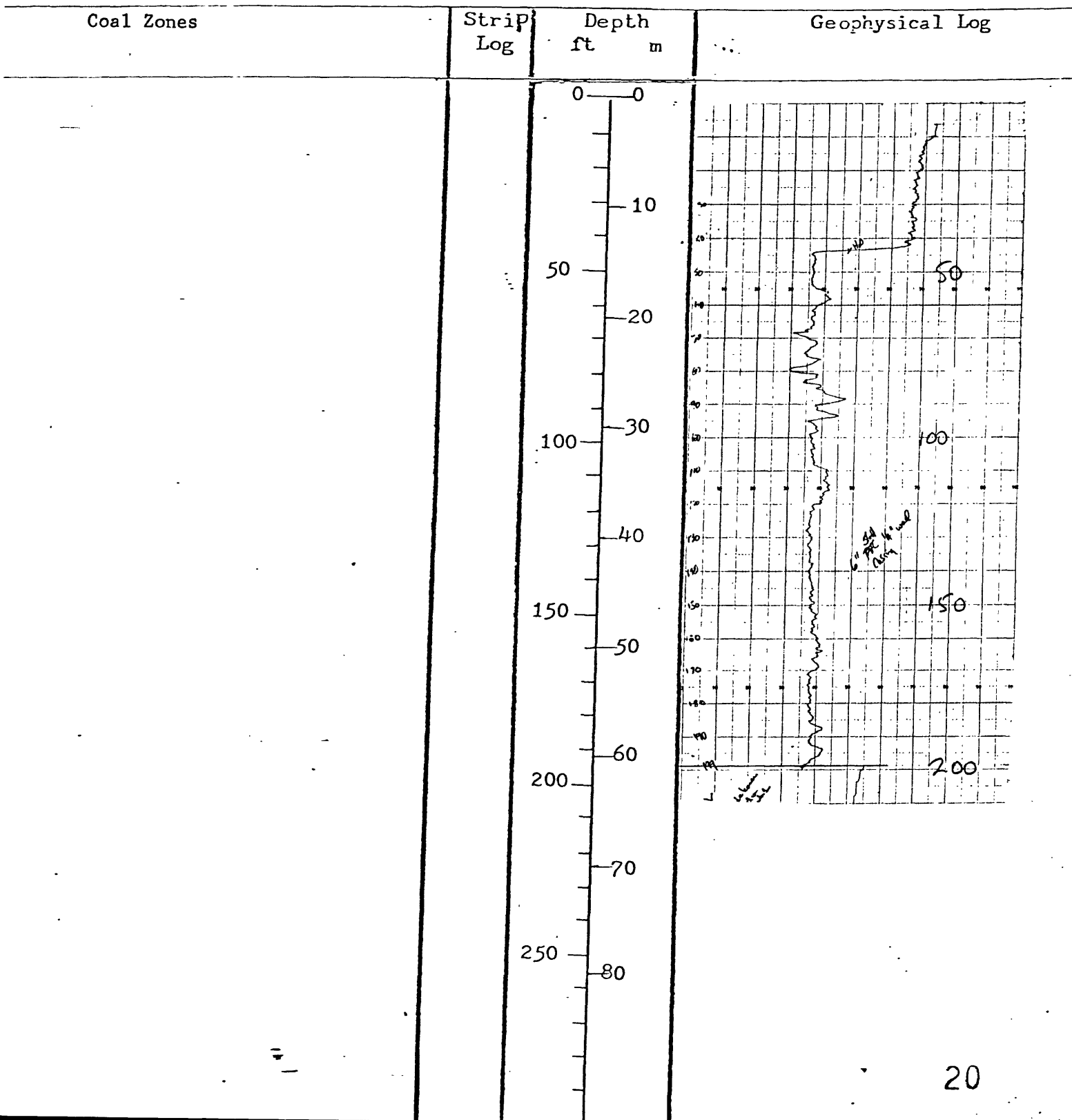
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-5 Surface Elevation 4165'
 Location SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Recluse
 Log Depth 199' Date Logged 7/29/76 Log Run By Hobbs Fluid level 44'
 Remarks Hole originally designated L. Oedekoven water well



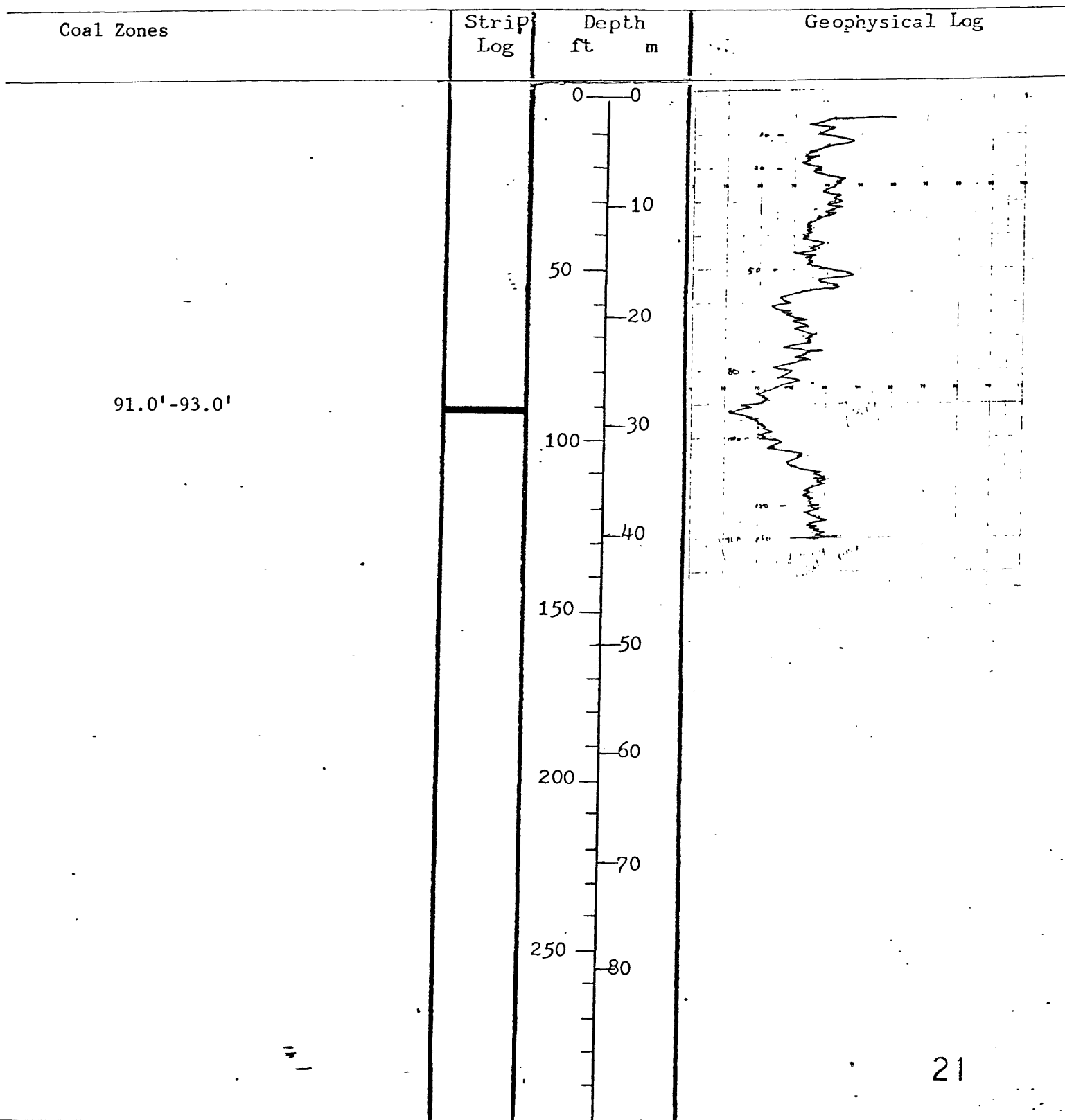
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 76 BCR-5 Surface Elevation 4165'
 Location SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Recluse
 Log Depth 199' Date Logged 7/29/76 Log Run By Hobbs Fluid level 44'
 Remarks Hole originally designated L. Oedekoven water well



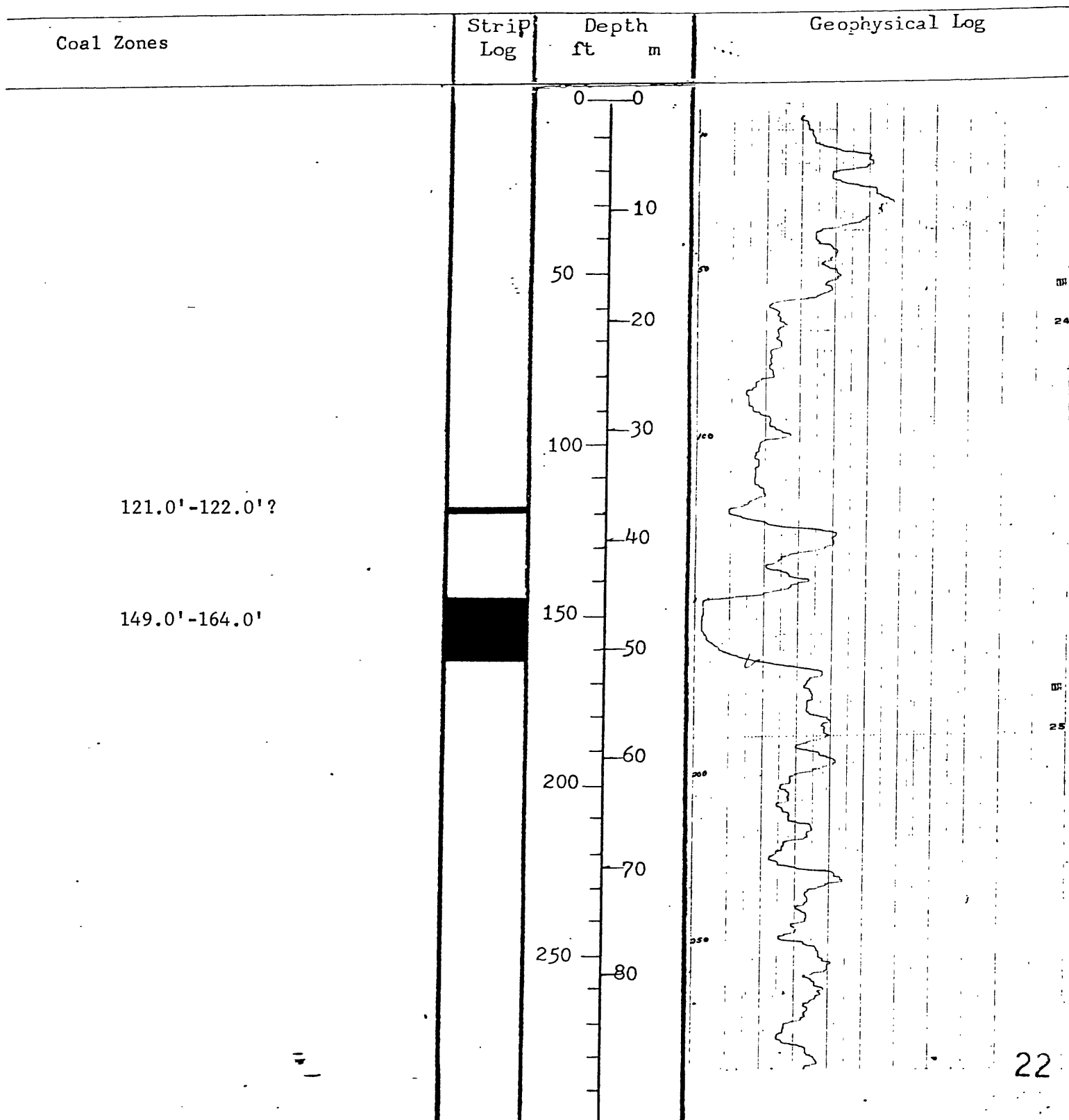
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-6 Surface Elevation 4230'
Location NE¹/₄NW¹/₄ sec. 33, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 130' Date Logged 7/11/76 Log Run By Hobbs Fluid level --
Remarks Hole originally designated Sorenson Sr. Water Well 1

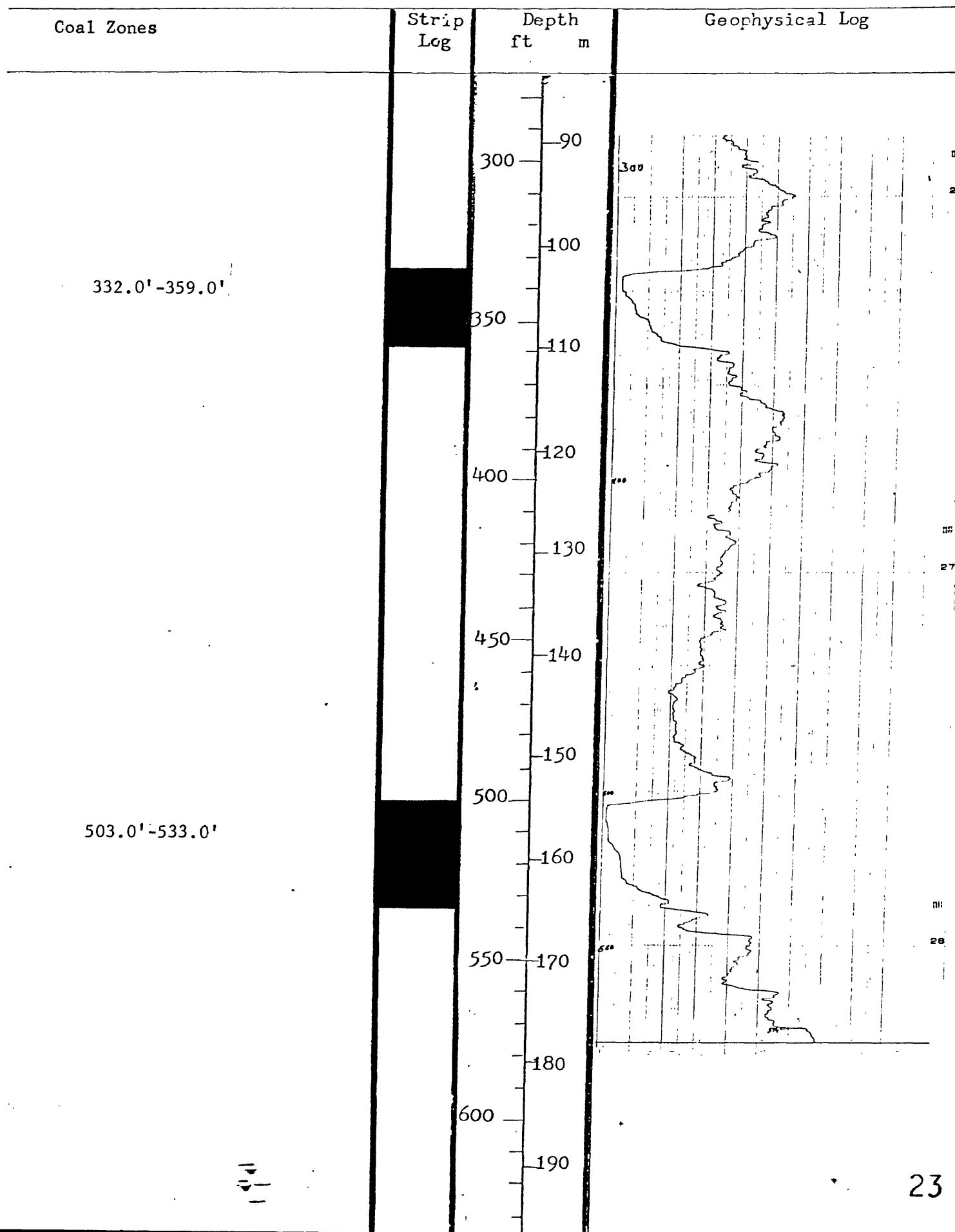


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-7 Surface Elevation 4040'
 Location SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 55N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Reservoir Creek
 Log Depth 576' Date Logged 7/14/76 Log Run By Hobbs Fluid level 209'
 Remarks Hole originally designated Werner 2 water well



Hole no. 76 BCR-7 (cont.)



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

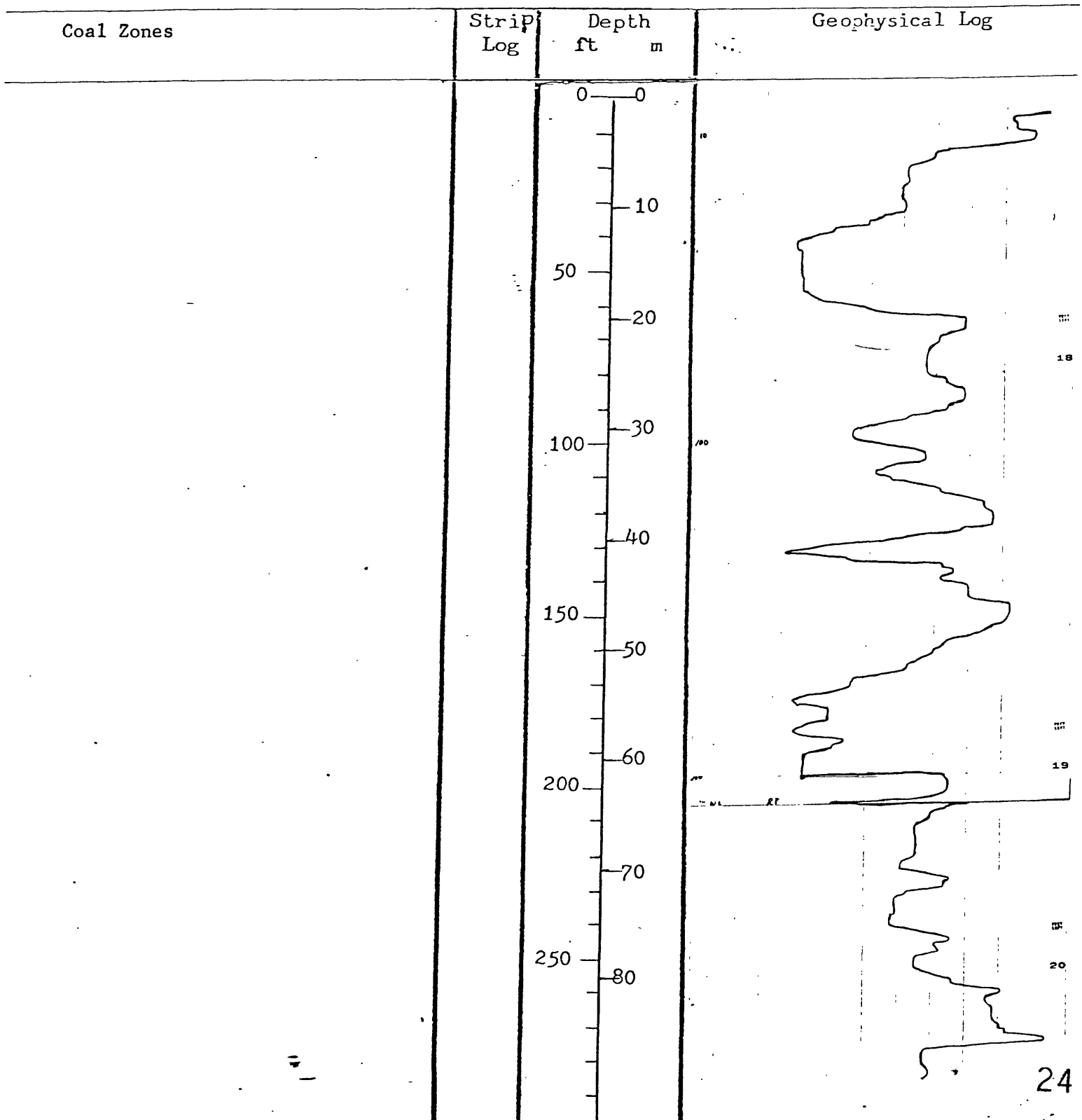
Project Water Well Hole no. 76 BCR-7 Surface Elevation 4040'

Location SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 55N, R. 75W, County Campbell

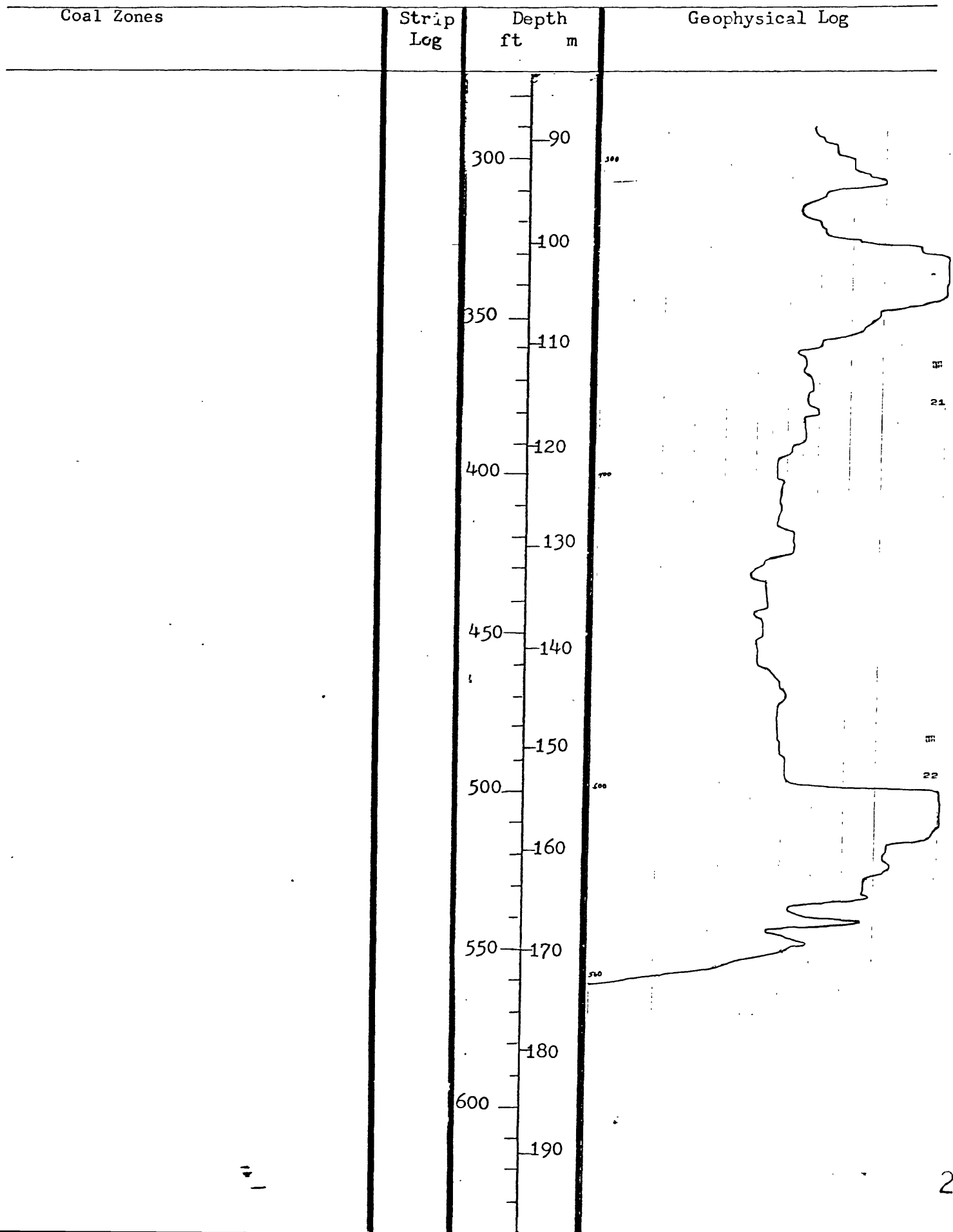
State Wyoming Nearest Town Recluse Quad Reservoir Creek

Log Depth 560' Date Logged 7/14/76 Log Run By Hobbs Fluid level 209'

Remarks Hole originally designated Werner 2 water well

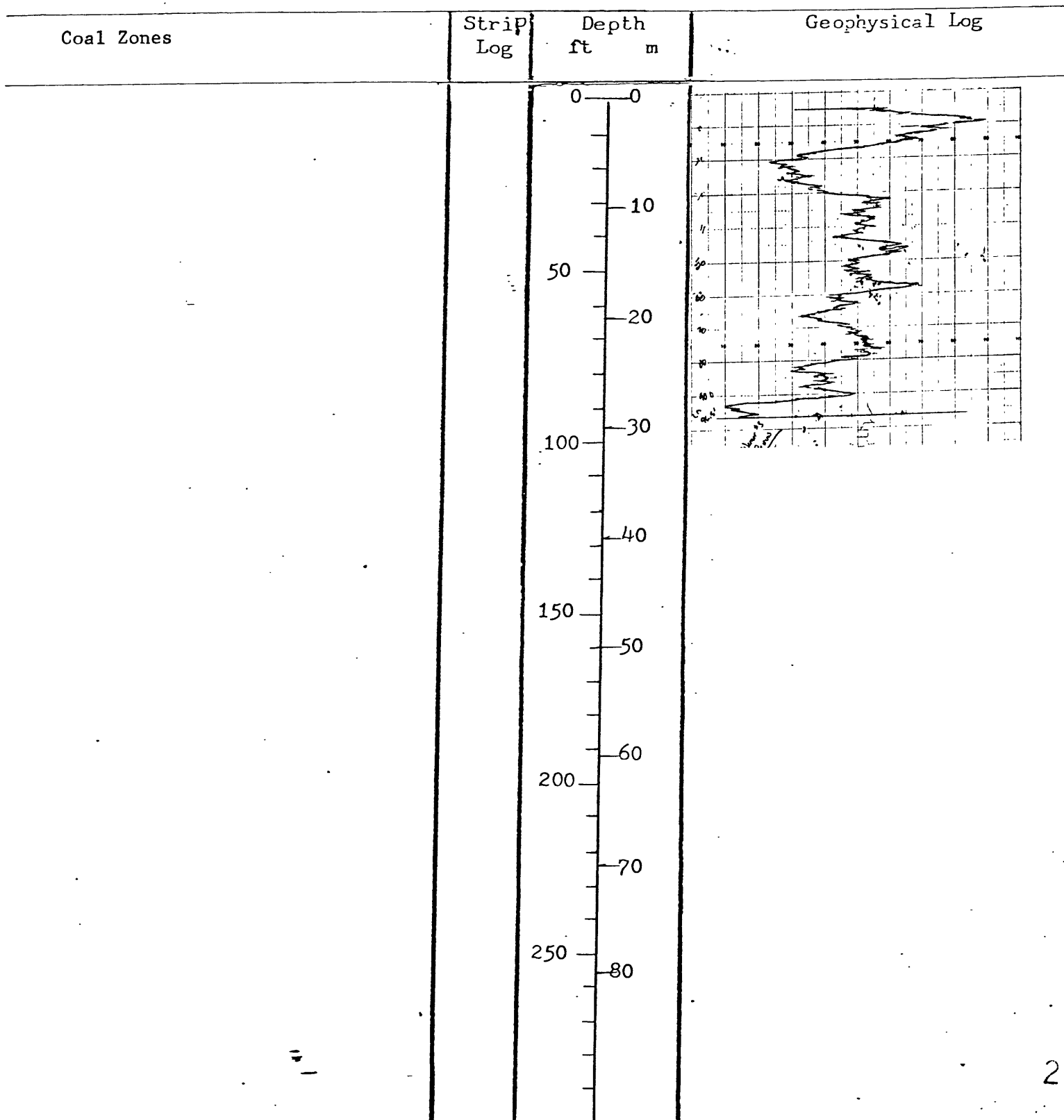


Hole no. 76 ECR-7 (cont.)



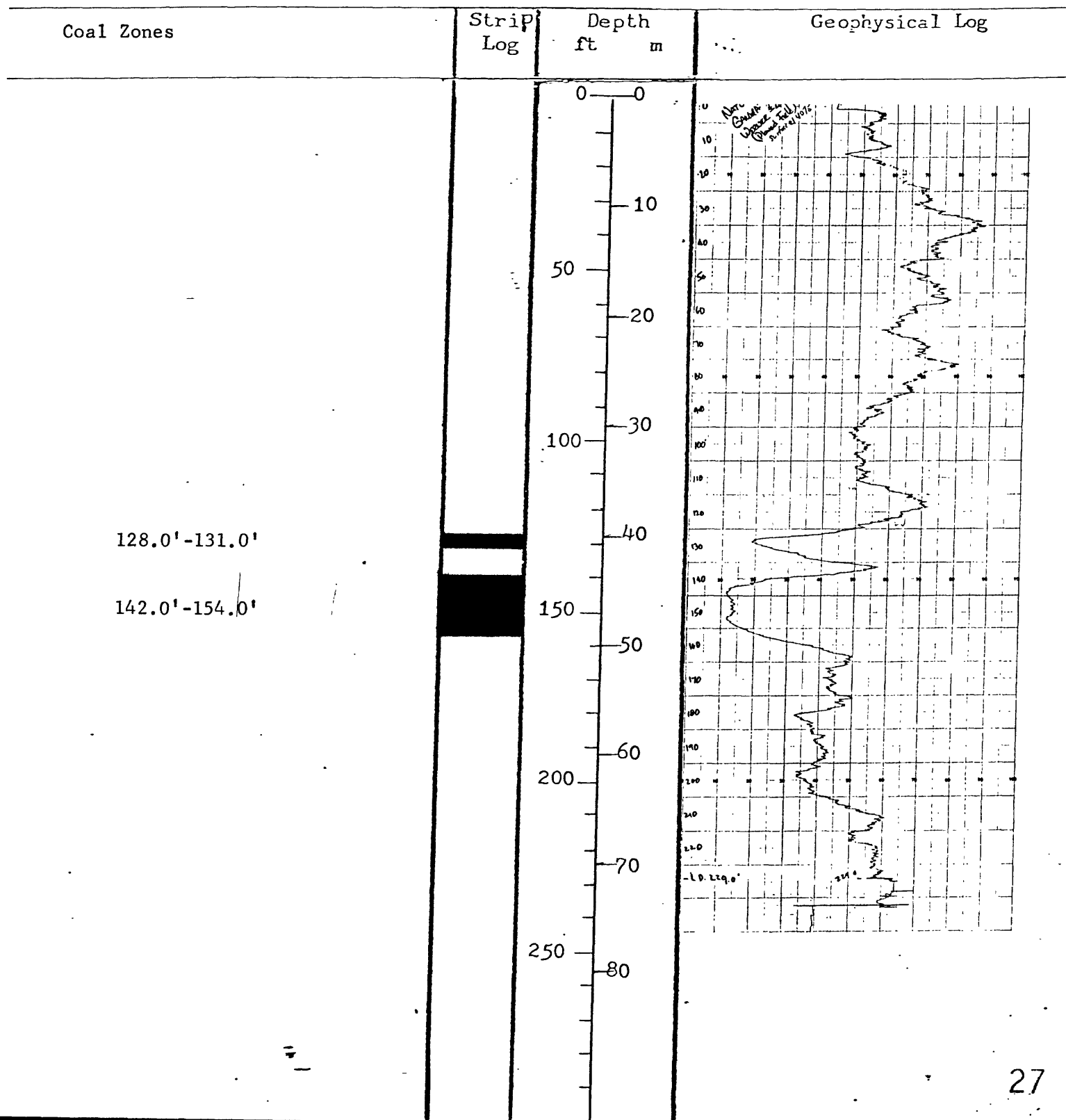
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 76 BCR-8 Surface Elevation 4022'
Location SE¹/₄ NW¹/₄ sec. 12, T. 55N, R. 75W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 96.5' Date Logged 7/18/76 Log Run By Hobbs Fluid level 94'
Remarks Hole originally designated Werner 3 water well; Bottom in coal



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-9 Surface Elevation 4075'
 Location SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 55N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Reservoir Creek
 Log Depth 229' Date Logged 7/22/76 Log Run By Hobbs Fluid level 140'
 Remarks Hole originally designated Werner 4 water well



Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

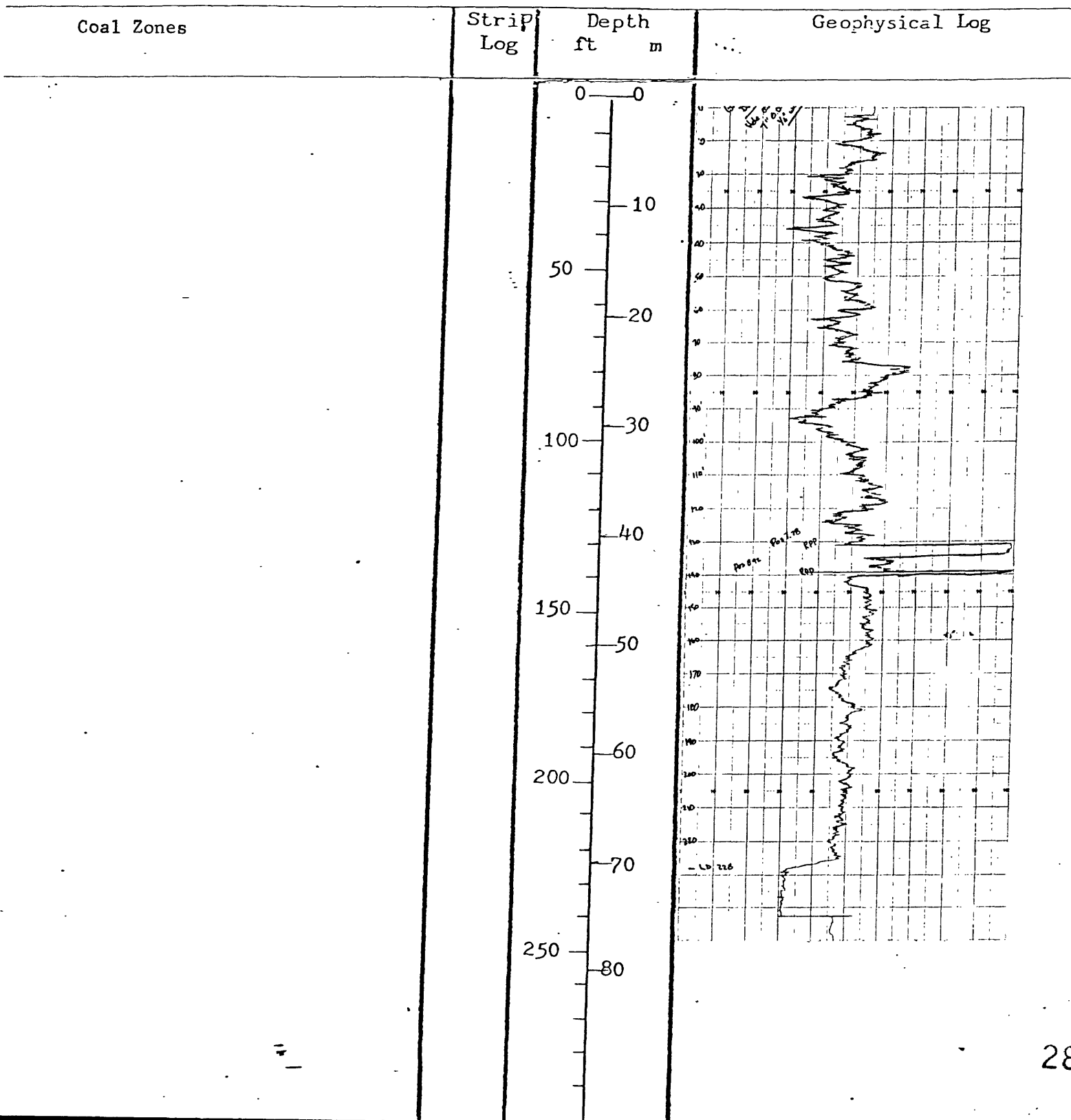
Project Water Well Hole no. 76 BCR-9 Surface Elevation 4075'

Location SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 55N, R. 75W, County Campbell

State Wyoming Nearest Town Recluse Quad Reservoir Creek

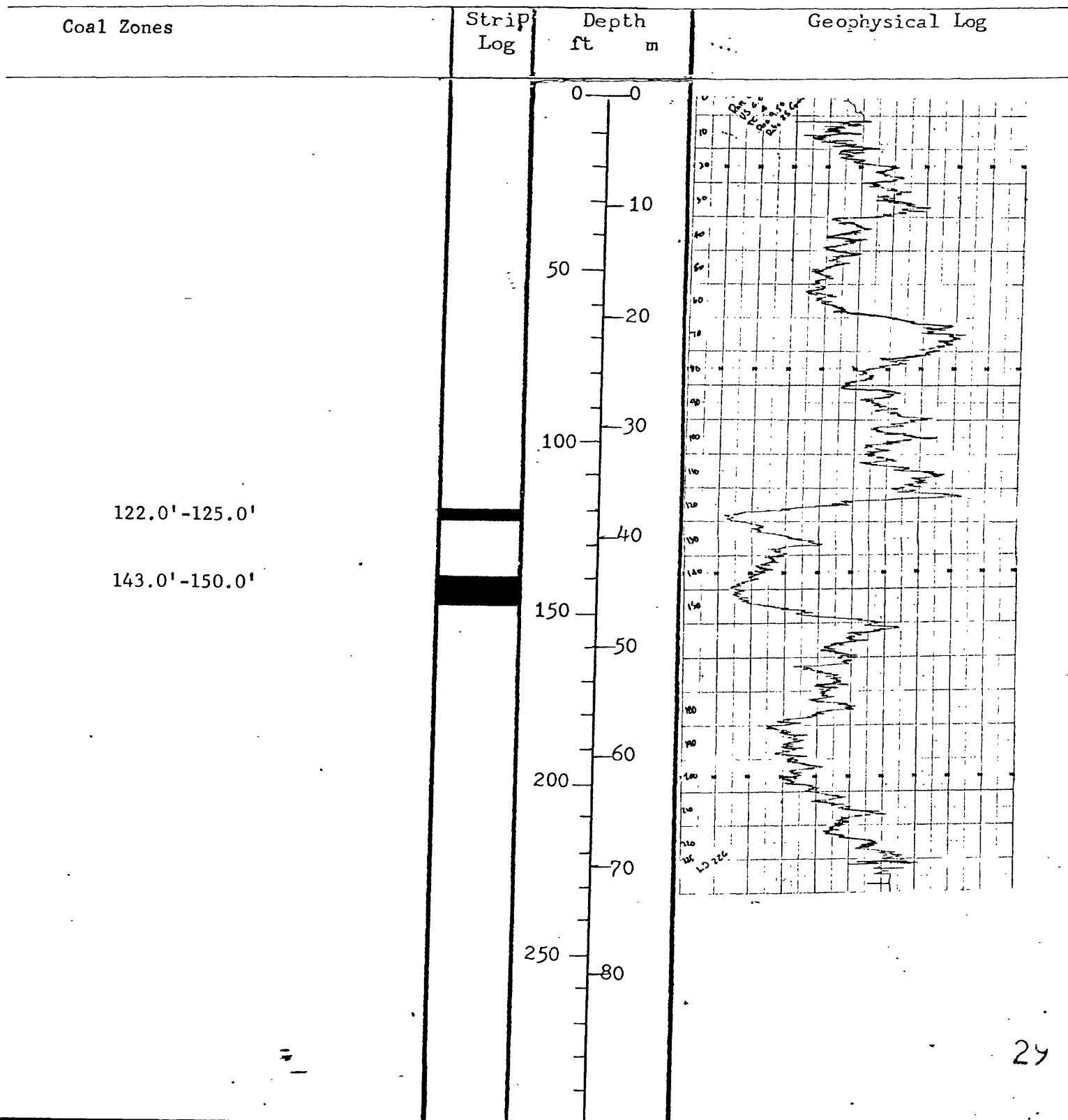
Log Depth 229' Date Logged 7/22/76 Log Run By Hobbs Fluid level 140'

Remarks Hole originally designated Werner 4 water well



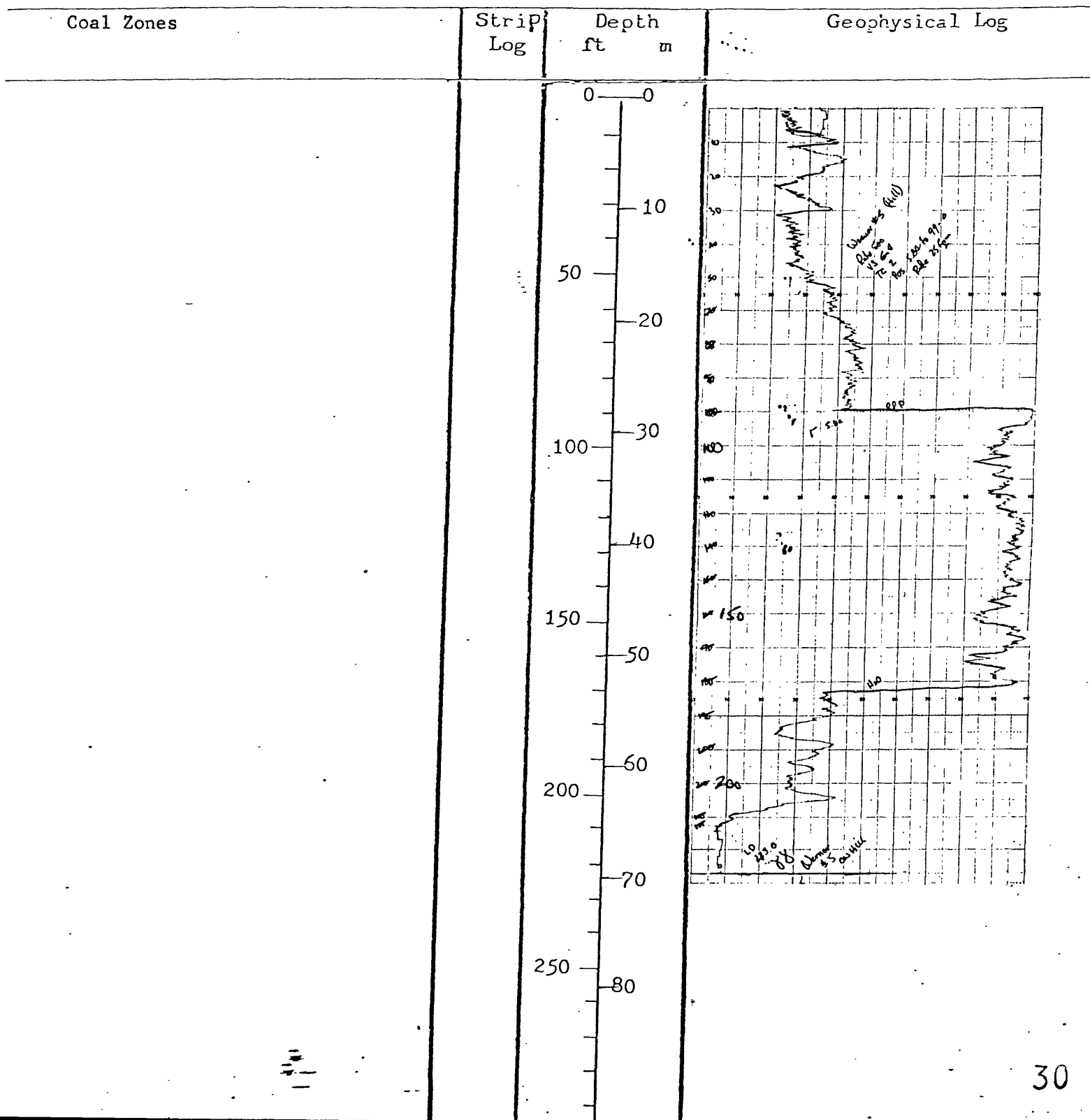
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-10 Surface Elevation 4130'
Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 55N, R. 75W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 226' Date Logged 7/20/76 Log Run By Hobbs Fluid level 182'
Remarks Hole originally designated Werner 5 water well



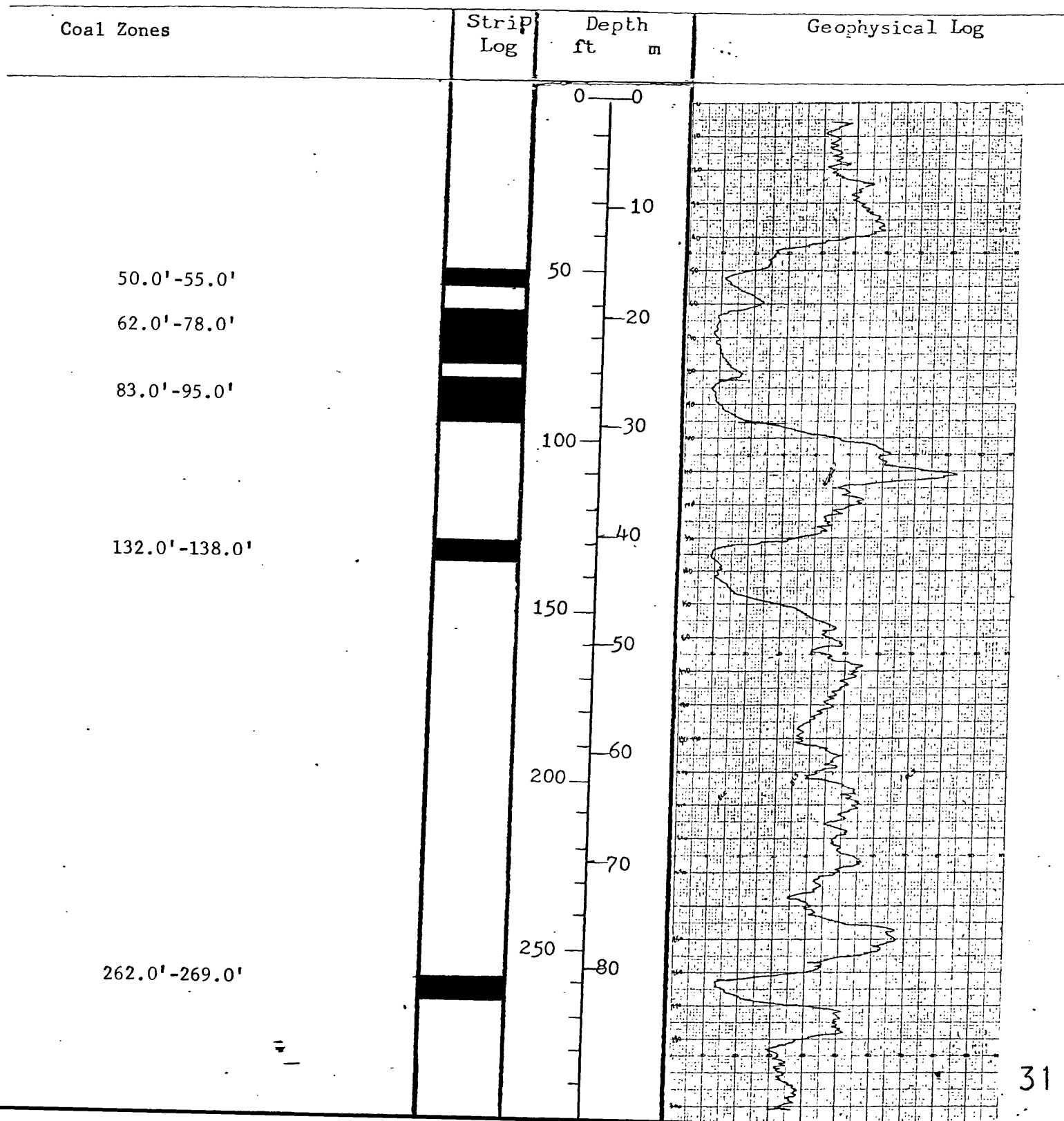
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 76 BCR-10 Surface Elevation 4130'
Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13 , T. 55N , R. 75W , County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 213' Date Logged 7/20/76 Log Run By Hobbs Fluid level 182'
Remarks Hole originally designated Werner 5 water well



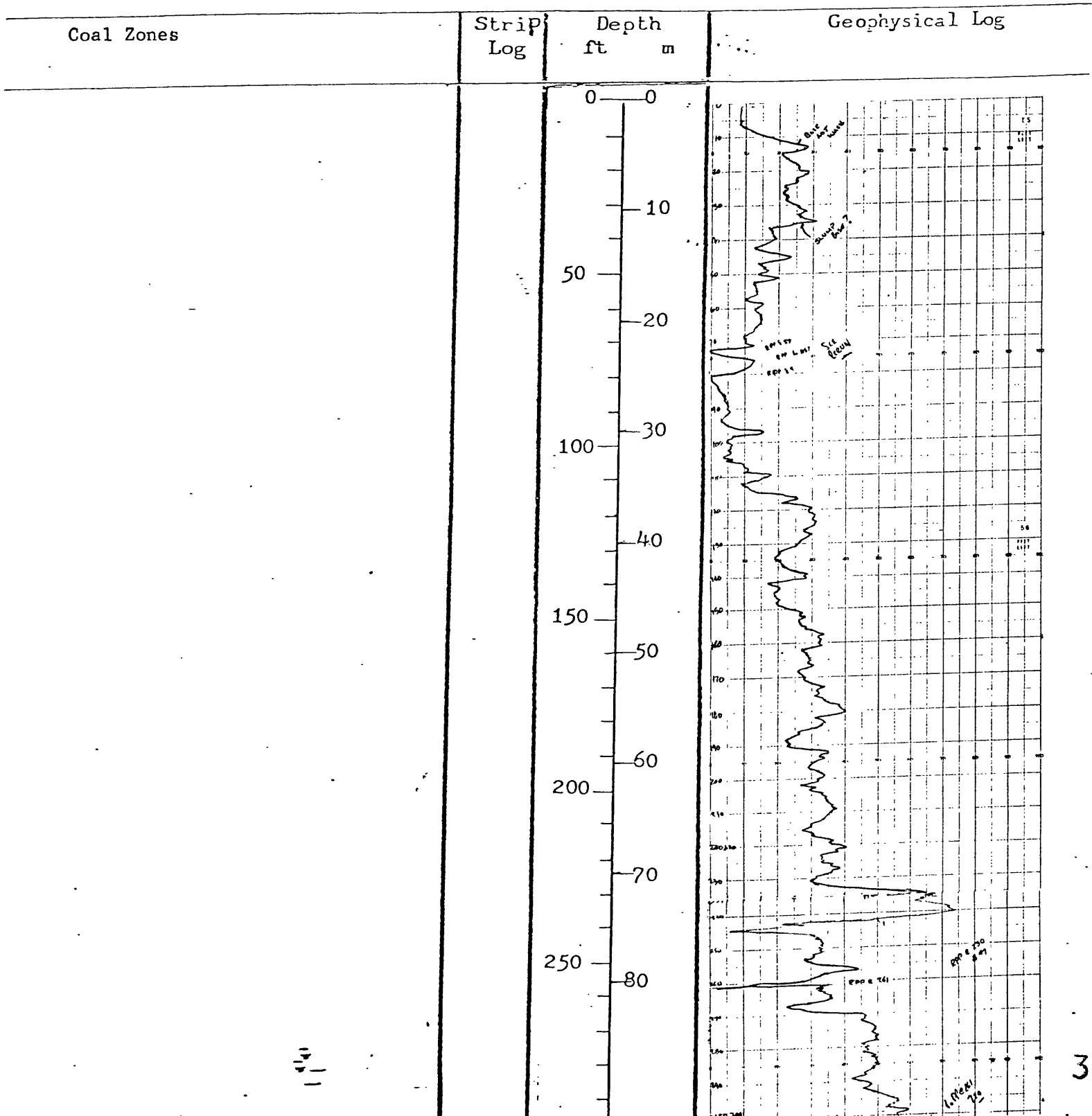
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 76 BCR-11 Surface Elevation 4150'
 Location SE¹₄SE¹₄ sec. 8, T. 56N, R. 72W, County Campbell
 State Wyoming Nearest Town Recluse Quad White Tail Butte
 Log Depth 300' Date Logged 9/20/76 Log Run By Hobbs Fluid level 235'
 Remarks Hole originally designated Smith water well



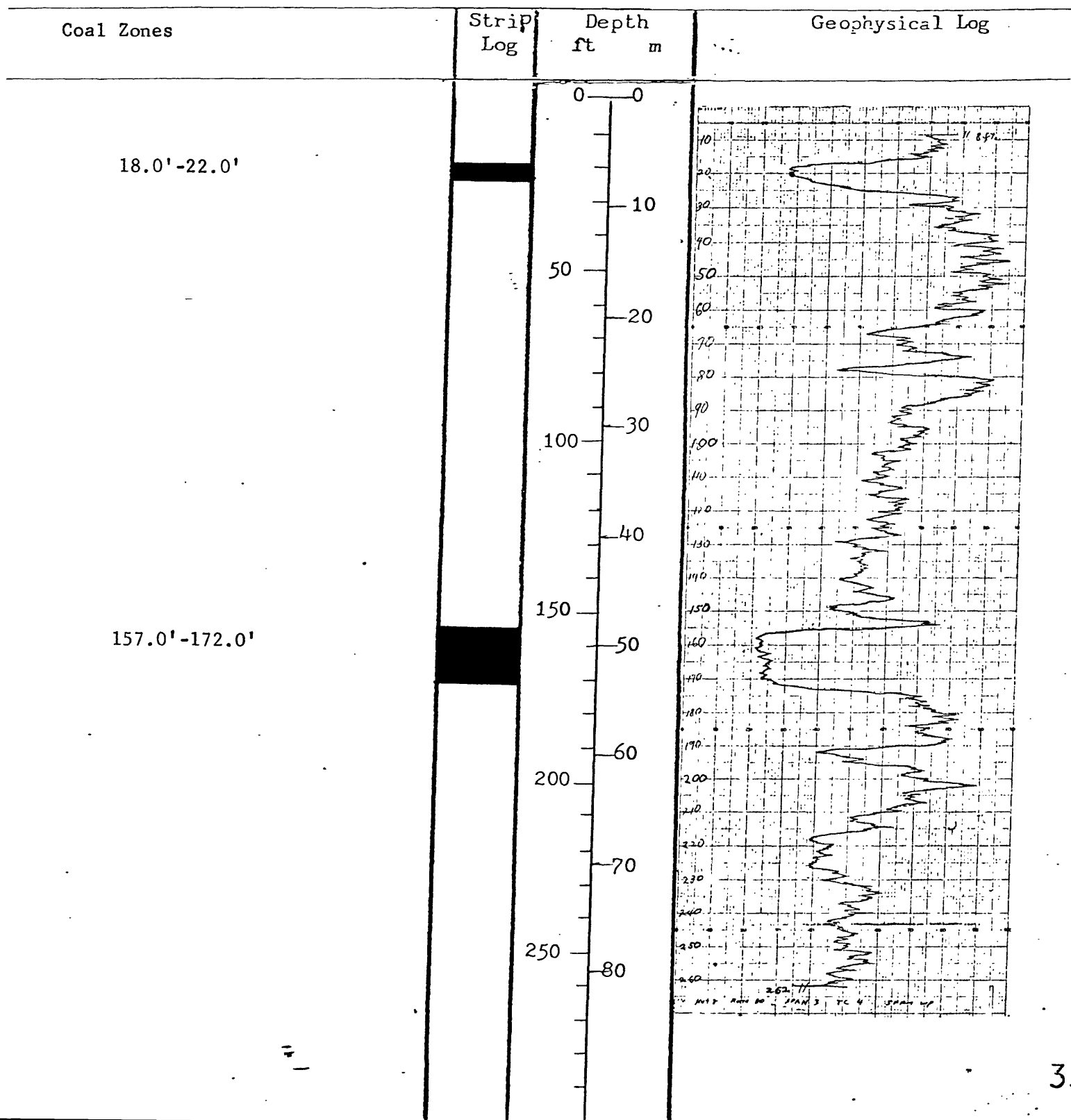
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 76 BCR-11 Surface Elevation 4150'
Location SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T. 56N, R. 72W, County Campbell
State Wyoming Nearest Town Recluse Quad White Tail Butte
Log Depth 300' Date Logged 9/20/76 Log Run By Hobbs Fluid level 235'
Remarks Hole originally designated Smith water well



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-1 Surface Elevation 3957'
 Location NW¹SW¹ sec. 32, T. 58N, R. 73W, County Campbell
 State Wyoming Nearest Town Recluse Quad Corral Creek
 Log Depth 262' Date Logged 9/5/77 Log Run By Babcock Fluid level 179'
 Remarks Hole originally designated J.Cotton WW1; Bottom in coal



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

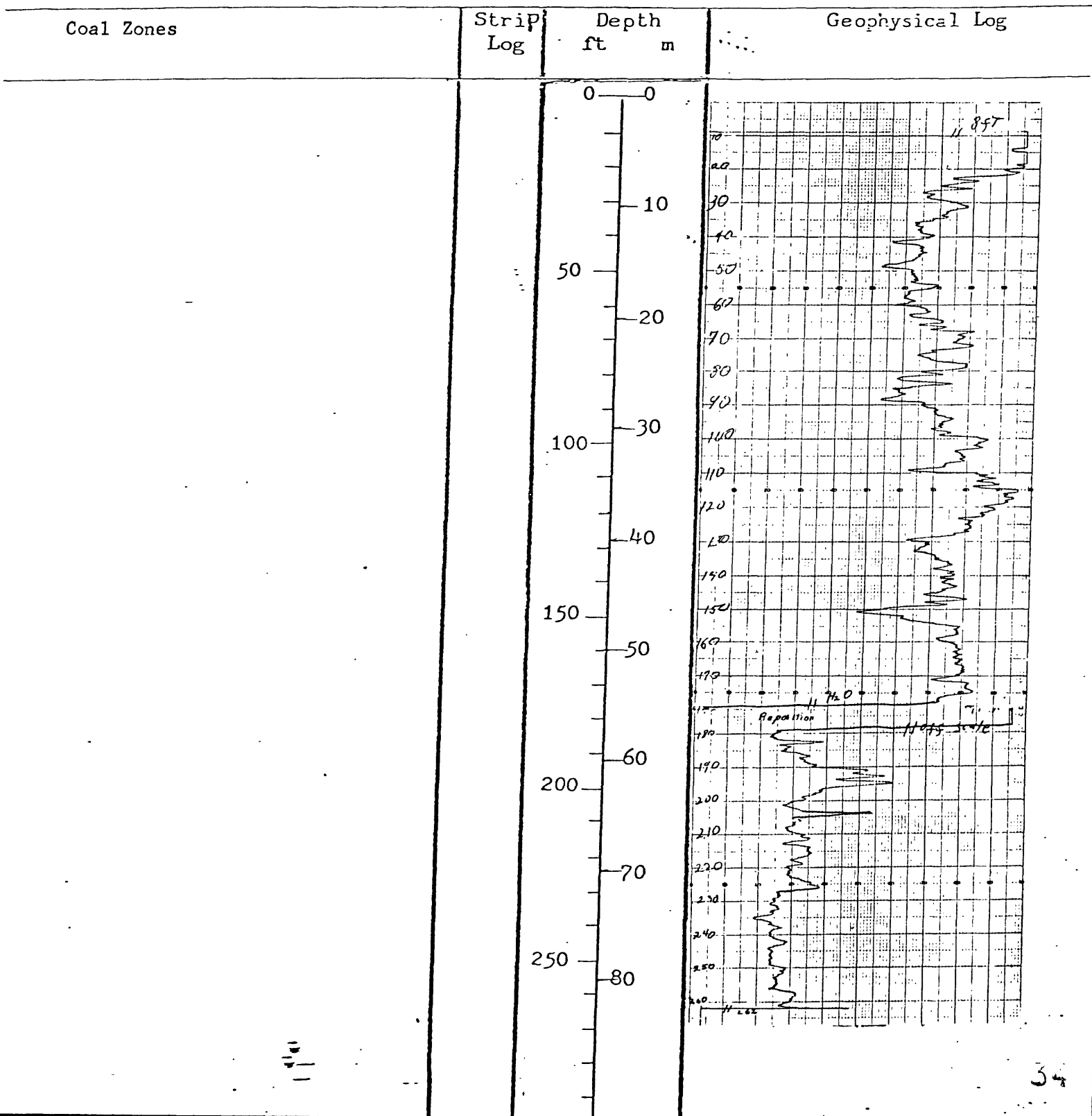
Project Water Well Hole no. 77 BCR-1 Surface Elevation 3957'

Location NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 58N, R. 73W, County Campbell

State Wyoming Nearest Town Recluse Quad Corral Creek

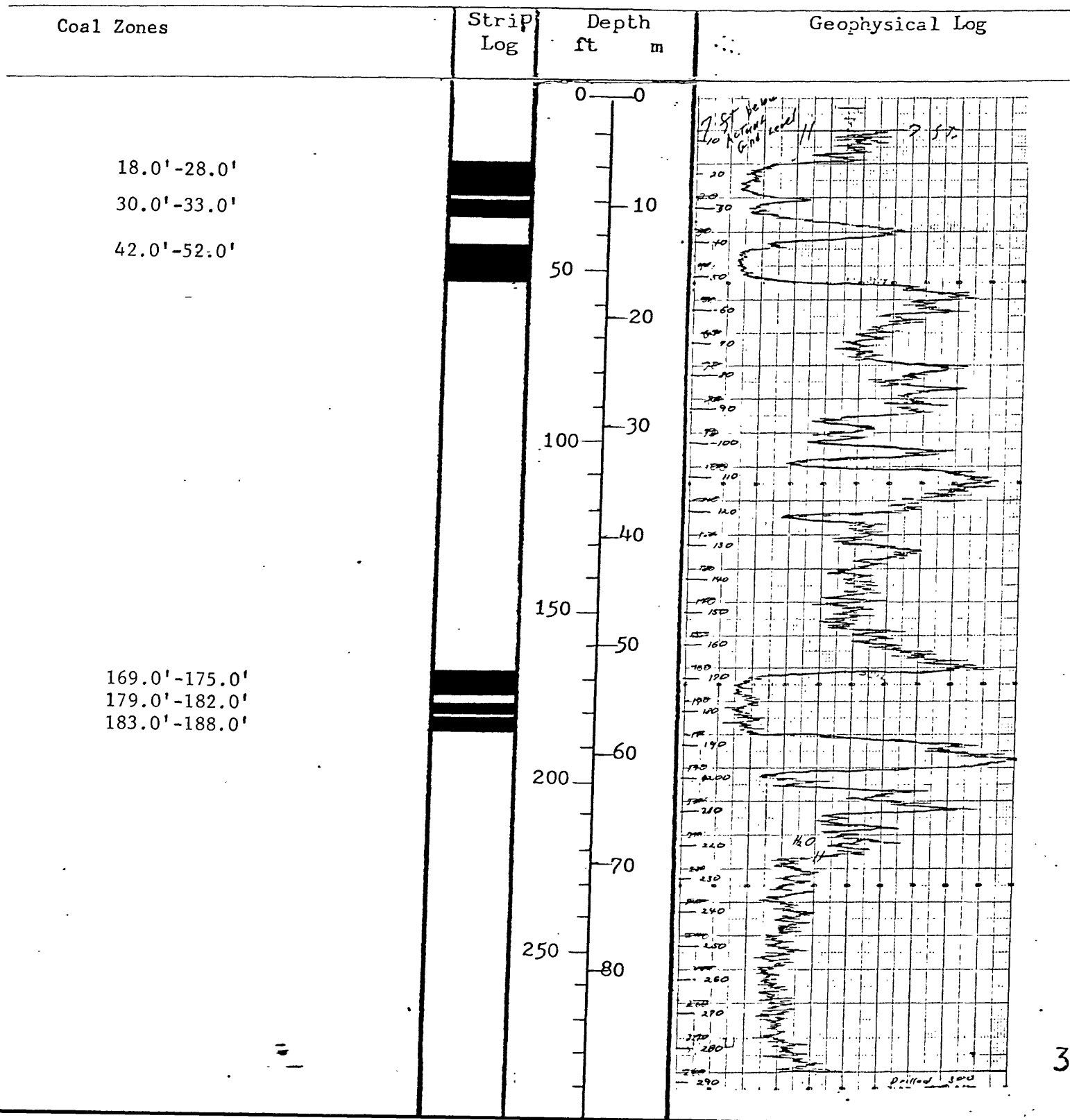
Log Depth 262' Date Logged 9/5/77 Log Run By Babcock Fluid level 179'

Remarks Hole originally designated J.Cotton WW1 ; Bottom in coal



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-2 Surface Elevation 3985'
Location NE¹/₄SW¹/₄ sec. 32, T. 58N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Corral Creek
Log Depth 287' Date Logged 9/16/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated J. Cotton WW 2



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

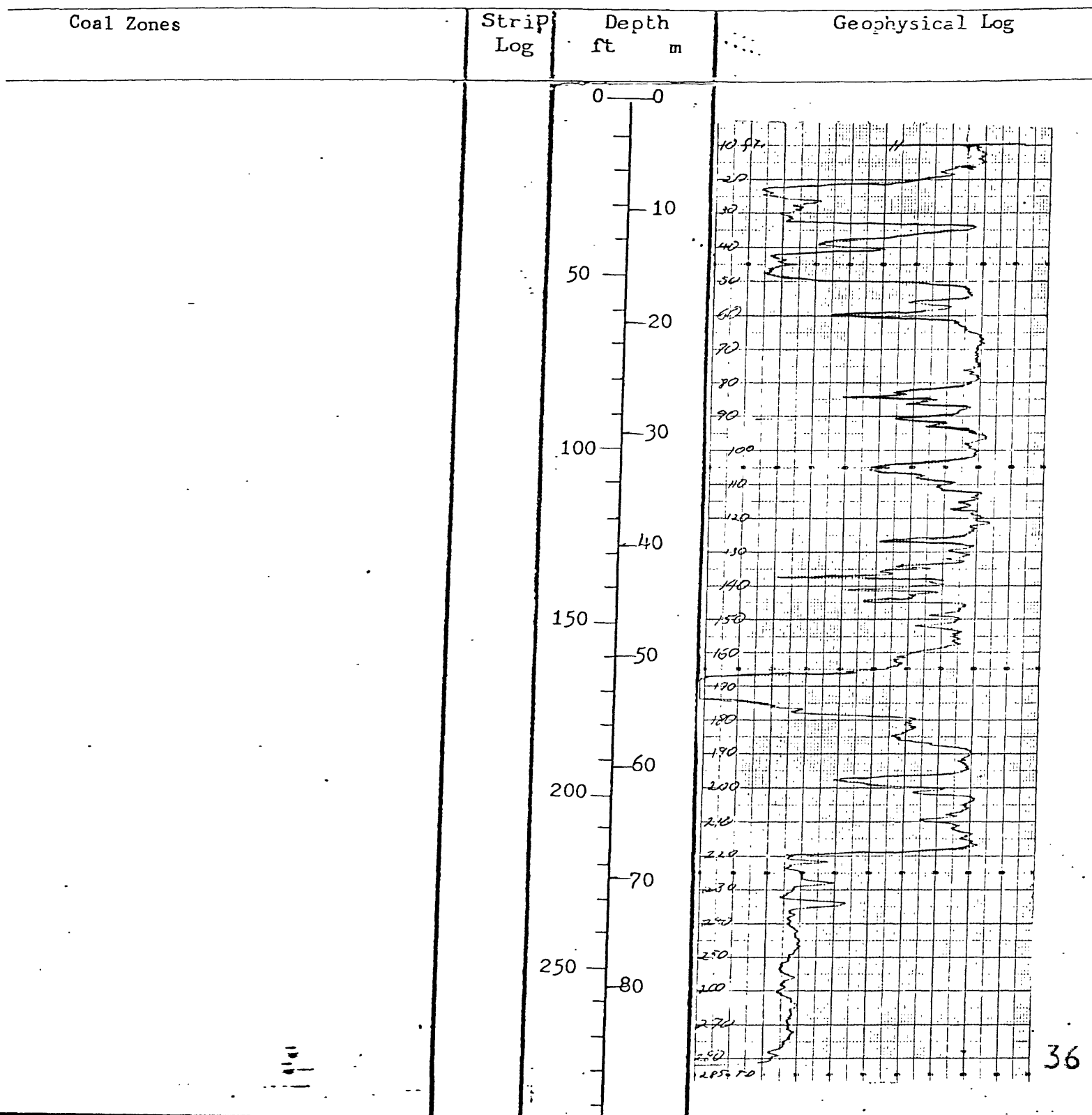
Project Water Well Hole no. 77 BCR-2 Surface Elevation 3985'

Location NE¹/₄SW¹/₄ sec. 32, T. 58N, R. 73W, County Campbell

State Wyoming Nearest Town Recluse Quad Corral Creek

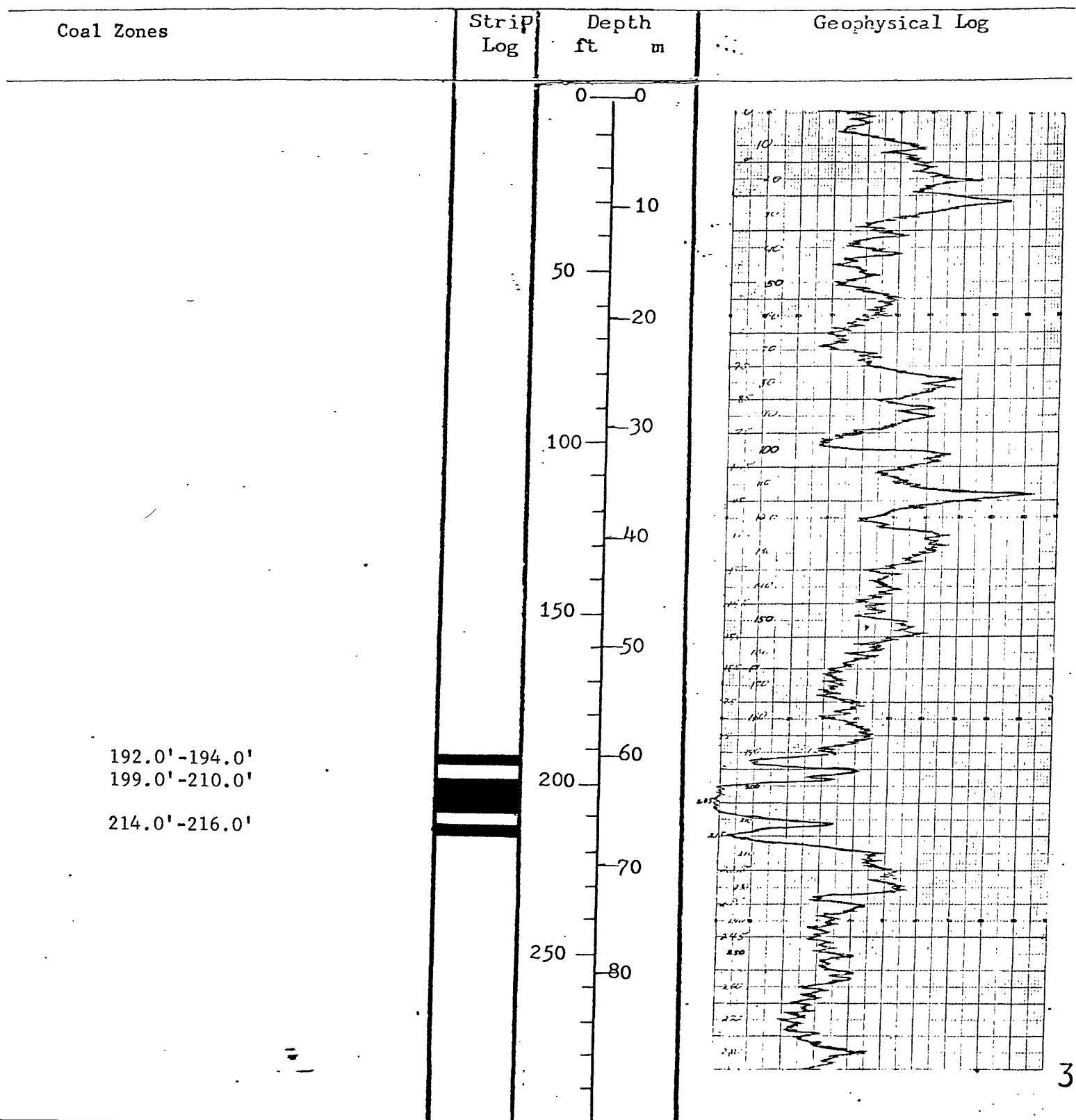
Log Depth 287' Date Logged 9/16/77 Log Run By Babcock Fluid level ---

Remarks Hole originally designated J. Cotton WW 2

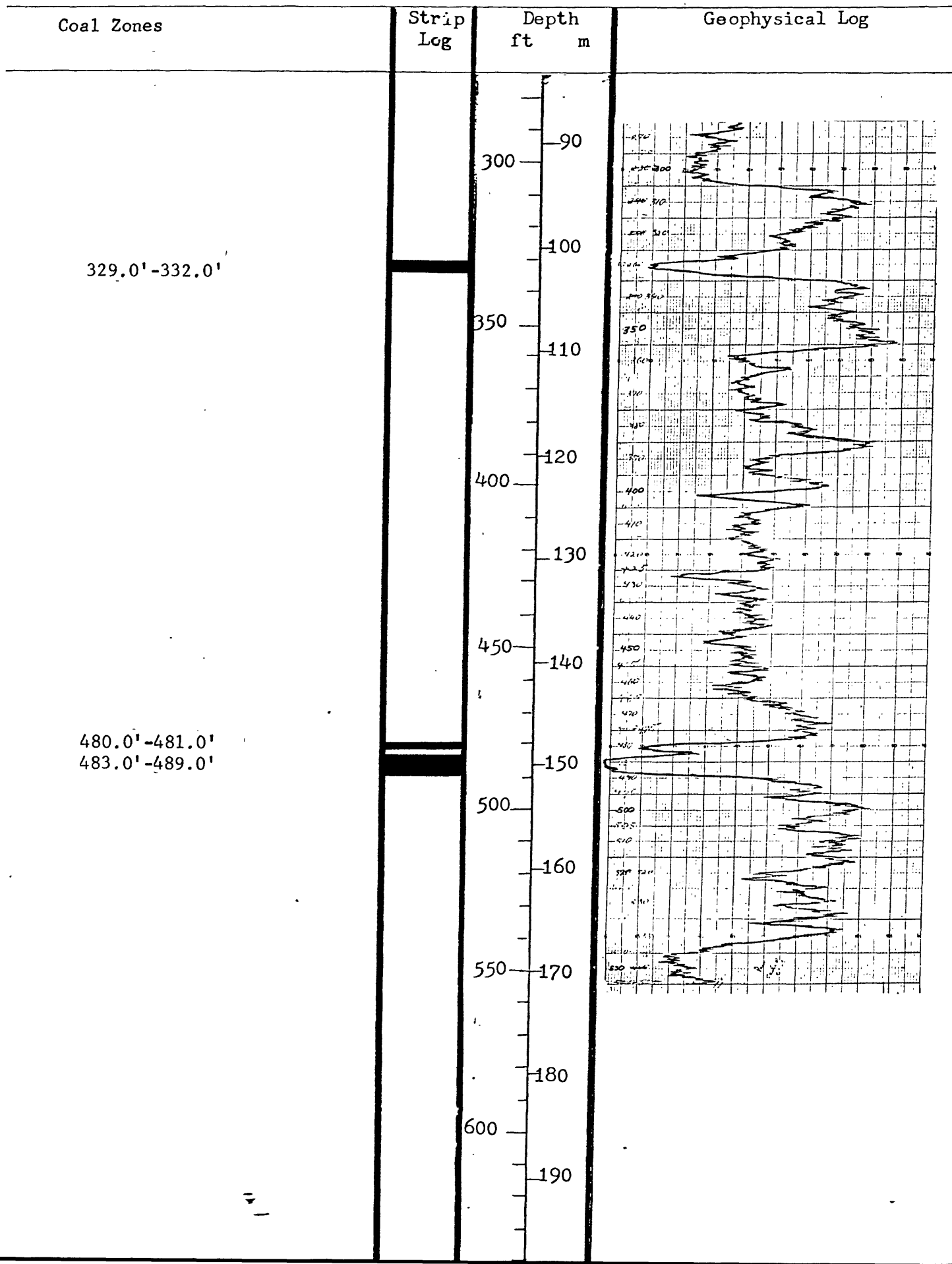


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-3 Surface Elevation 4000'
Location SW¹/₄NE¹/₄ sec. 35, T. 58N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw
Log Depth 555' Date Logged 9/18/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Desoto WW 1

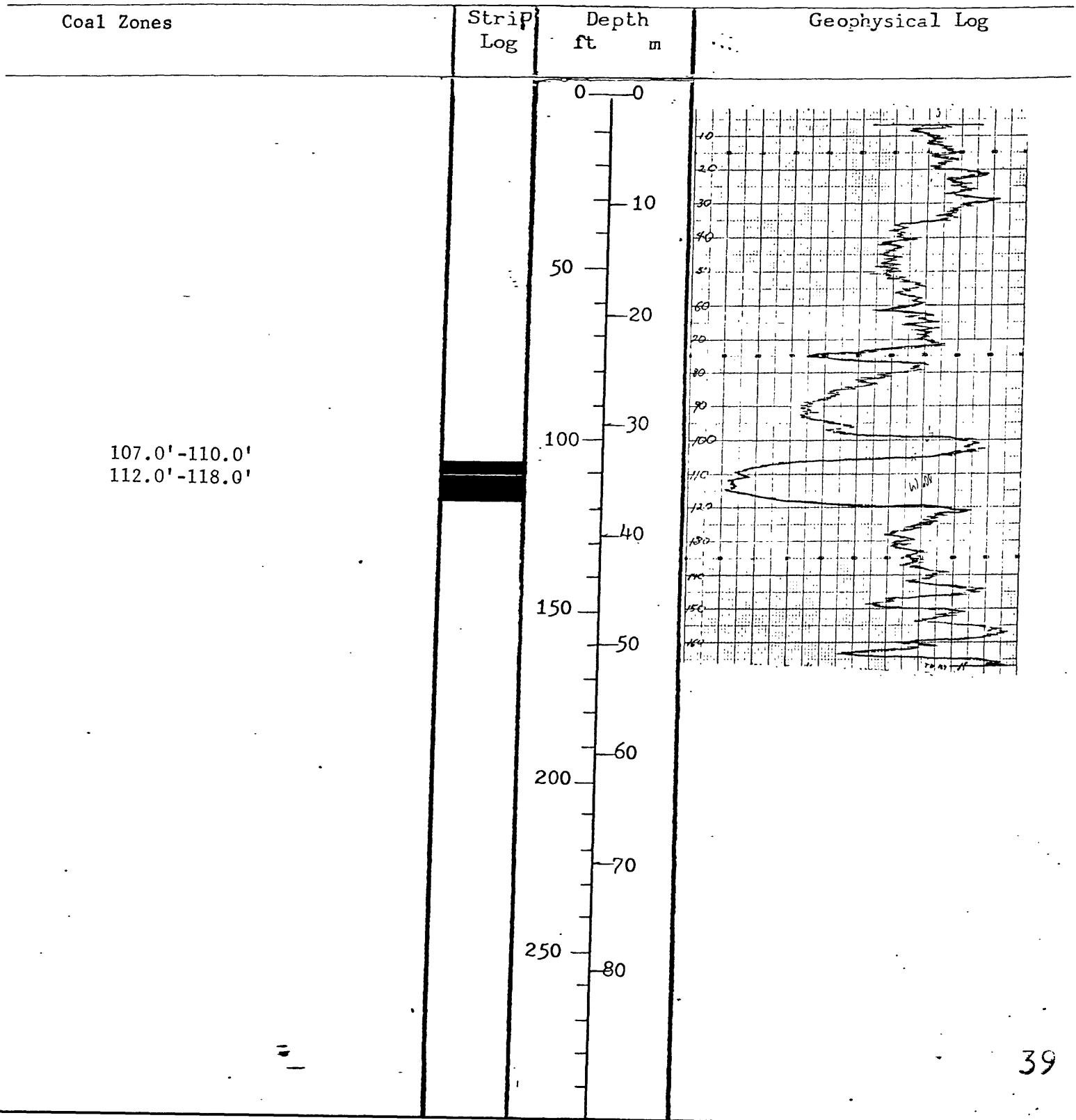


Hole no. 77 BCR-3 (cont.)



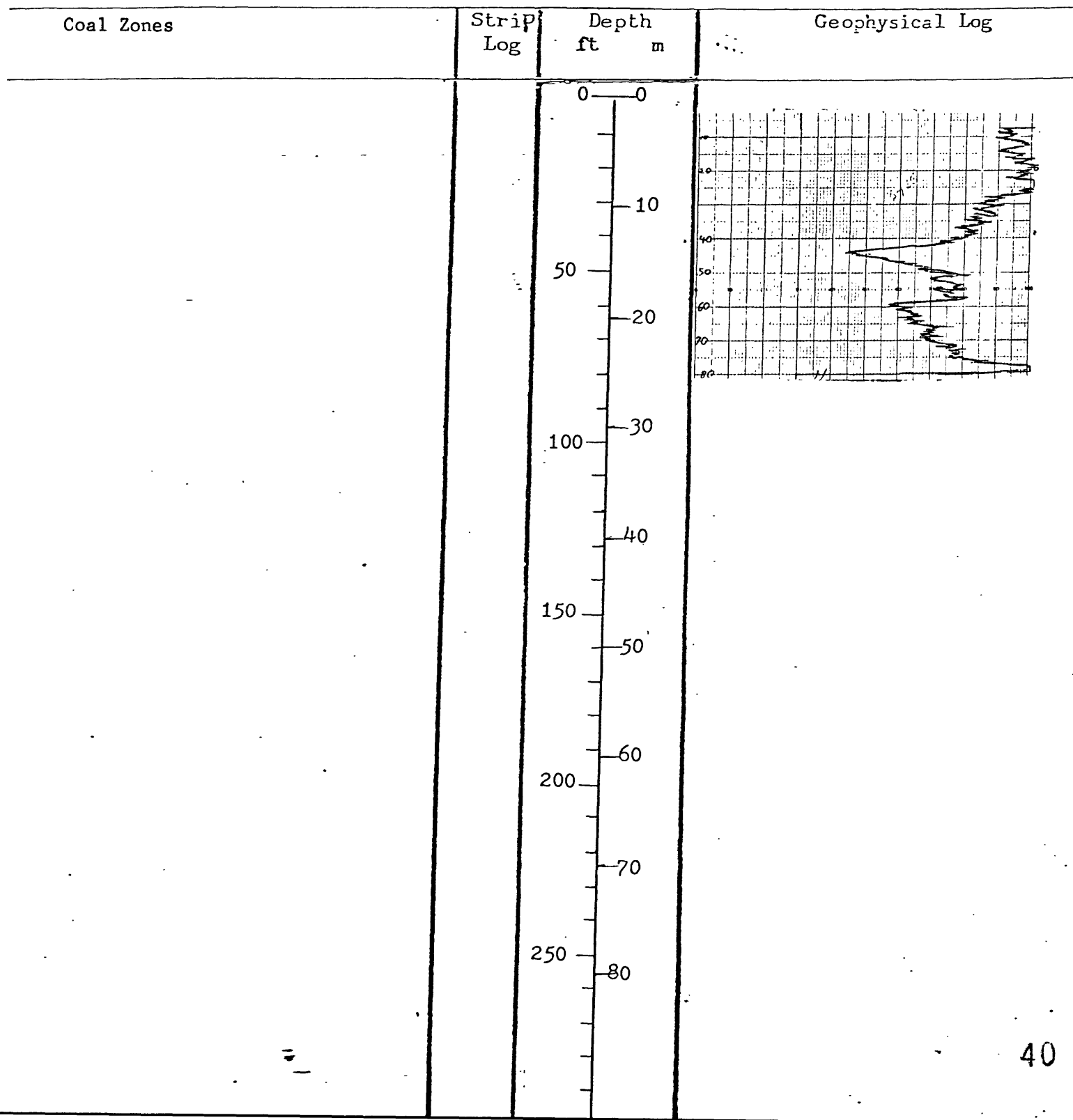
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-4 Surface Elevation 3740'
 Location NE¹/₄NW¹/₄ sec. 29, T. 58N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Dead Horse Lake
 Log Depth 167' Date Logged 9/16/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated E. Oedekoven 2 water well



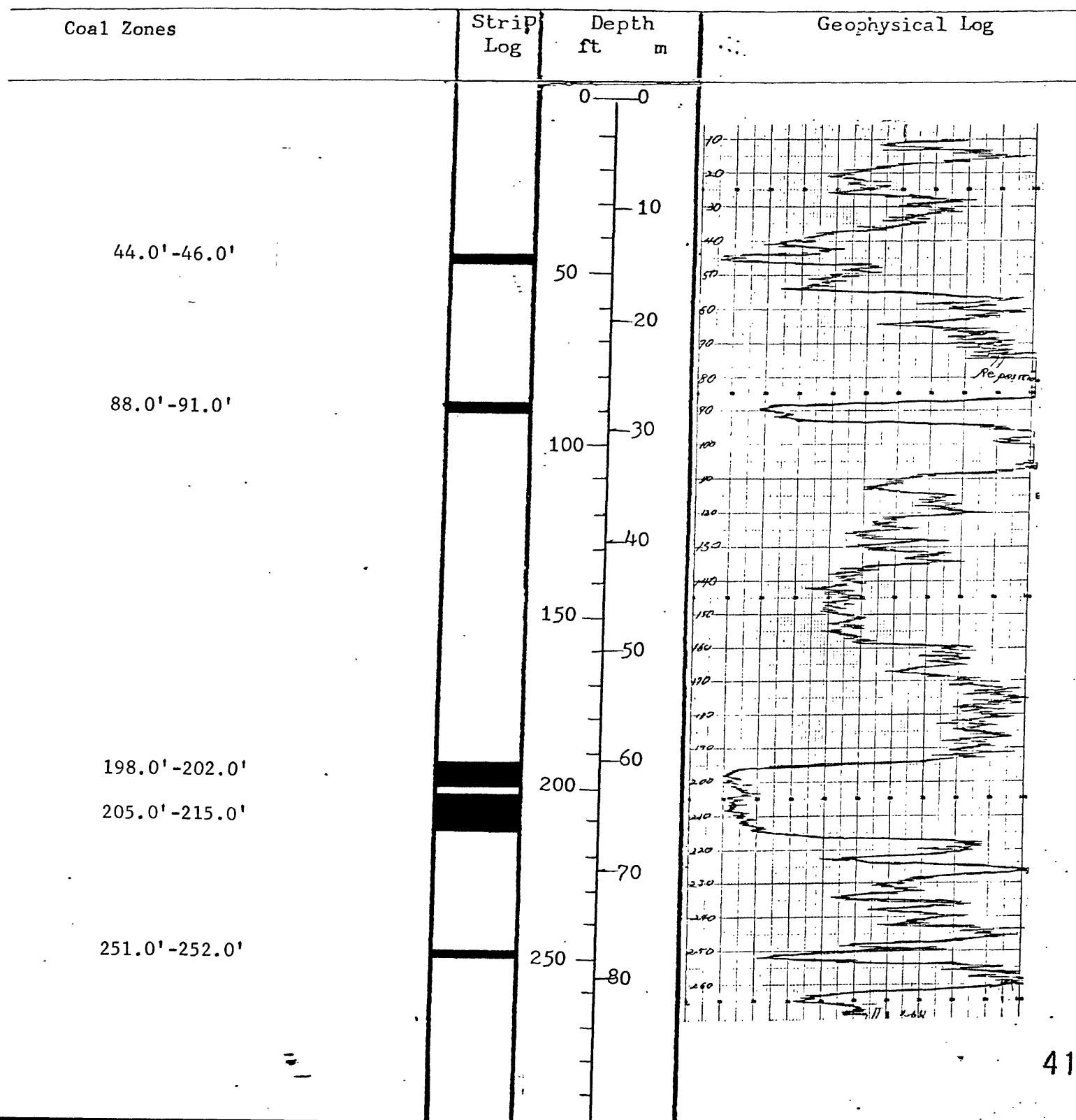
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-5 Surface Elevation 3740'
Location NE¹NW¹ sec. 29, T. 58N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Dead Horse Lake
Log Depth 80' Date Logged 9/16/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated E. Oedekoven 3 water well ; No coal ; Methane detected



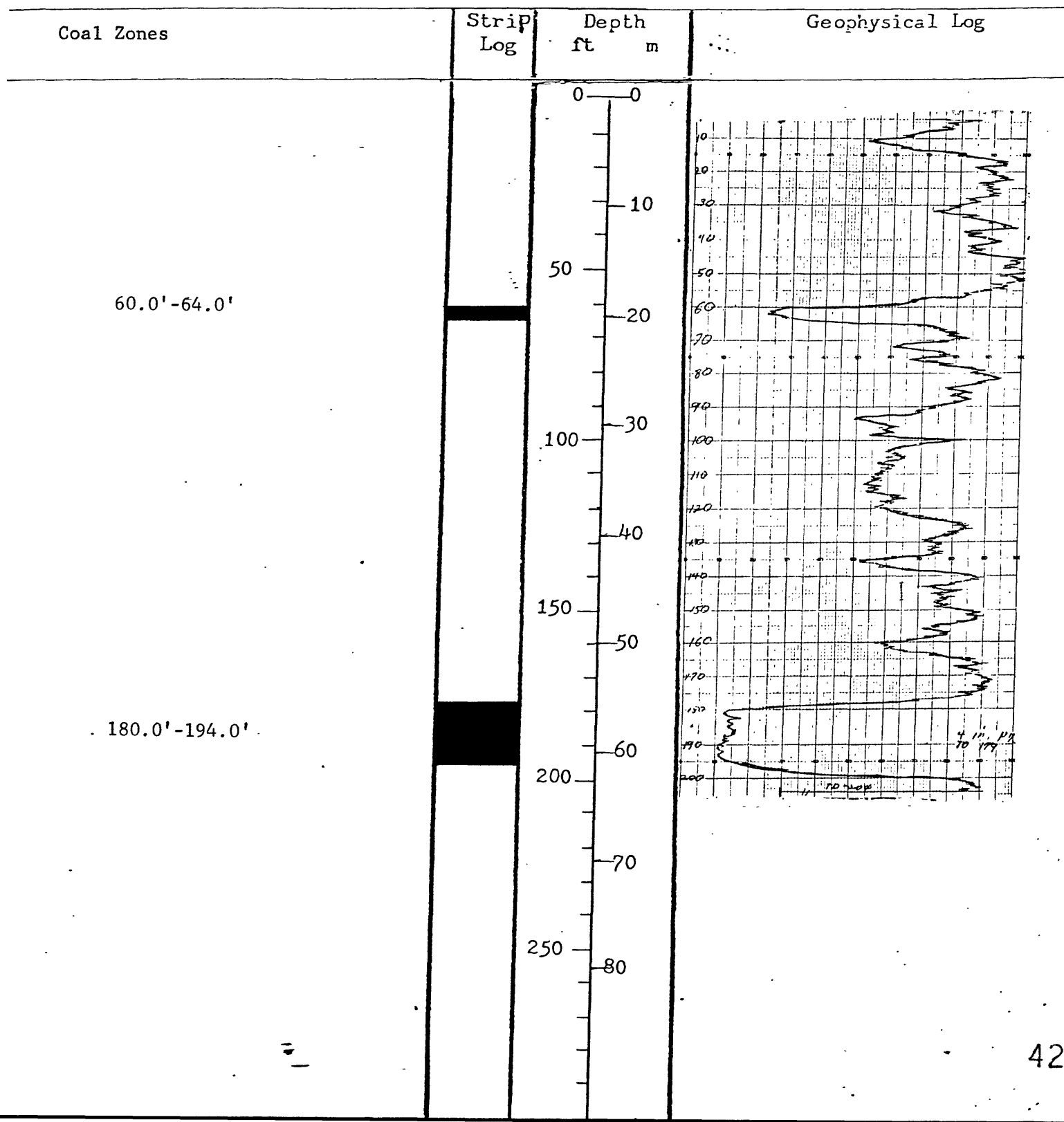
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-6 Surface Elevation 3690'
Location SW¹/₄ NW¹/₄ sec. 8, T. 57N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Dead Horse Lake
Log Depth 268' Date Logged 9/14/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated E. Oedskoven 1 water well ; Methane detected



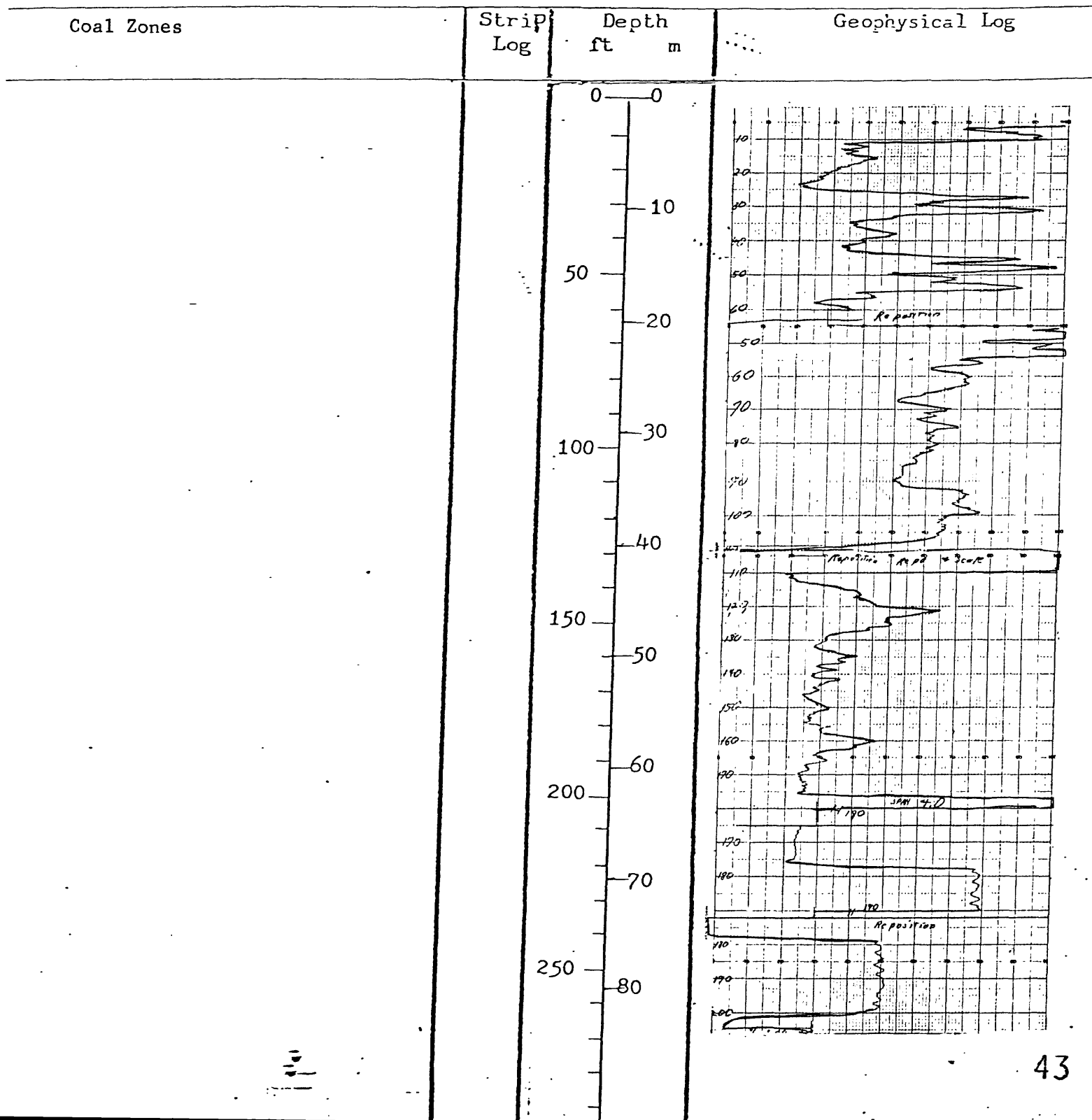
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-7 Surface Elevation 3680'
Location NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 57N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Dead Horse Lake
Log Depth 204' Date Logged 8/17/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated E. Oedekoven 4 water well ; Methane detected



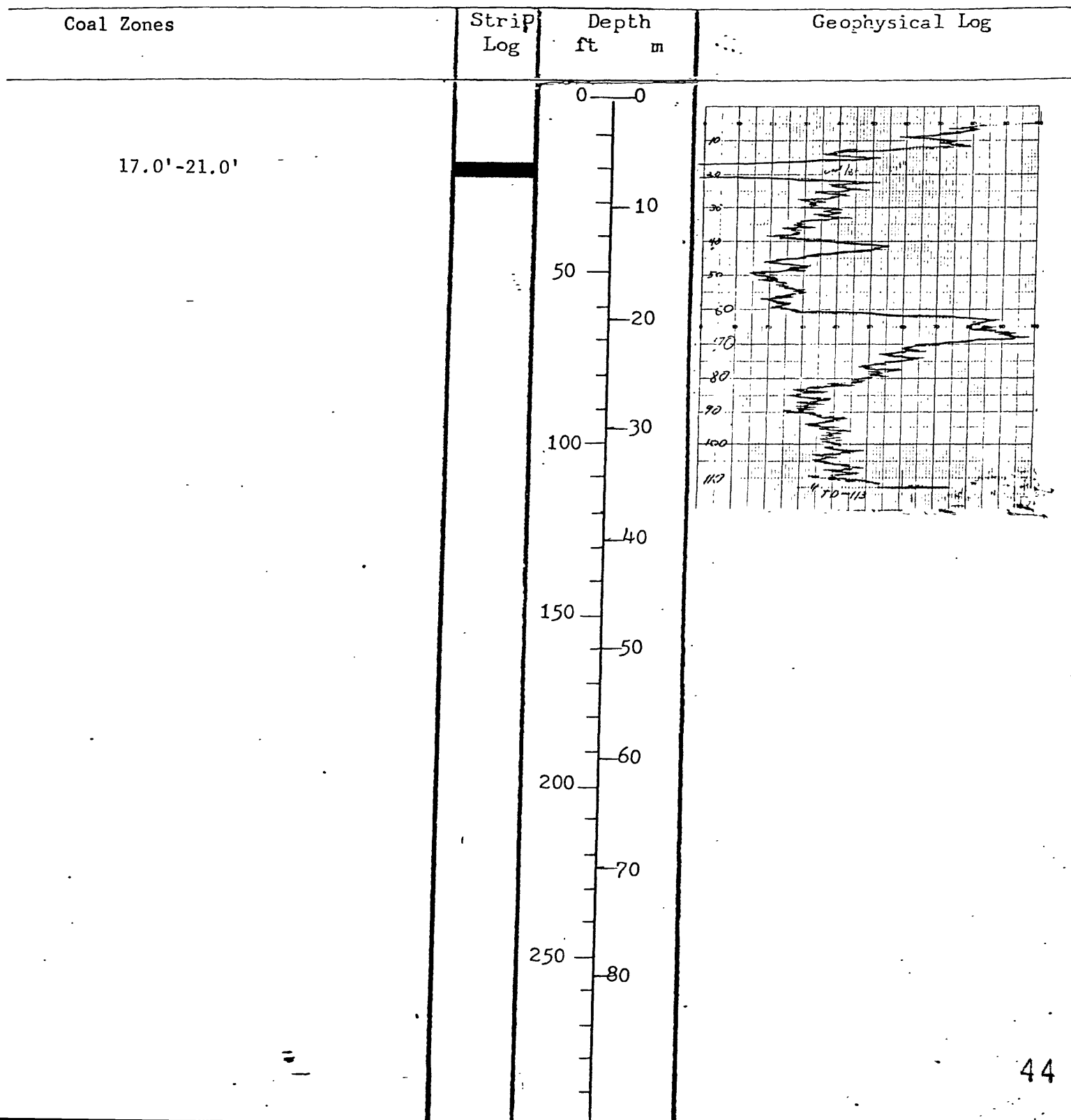
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 77 ECR-7 Surface Elevation 3680'
Location NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 57N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Dead Horse Lake
Log Depth 204' Date Logged 8/17/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated E. Oedekoven 4 water well; Methane detected



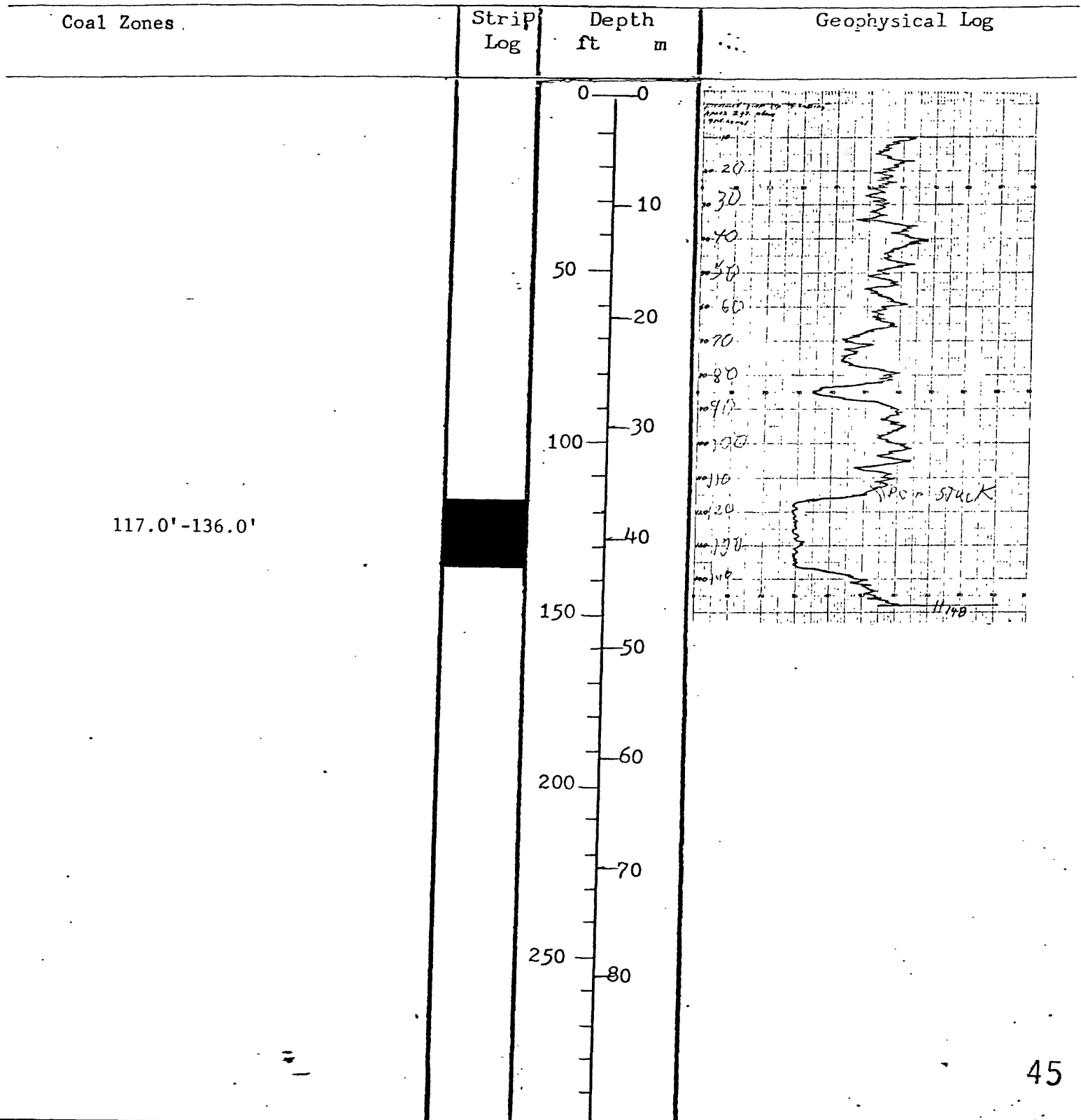
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-8 Surface Elevation 3775'
Location SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 57N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Dead Horse Lake
Log Depth 113' Date Logged 9/17/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated E. Oedekoven 5 water well



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-9 Surface Elevation 3800'
 Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24, T. 57N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Corral Creek
 Log Depth 148' Date Logged 8/2/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated D. Marquis #2 water well



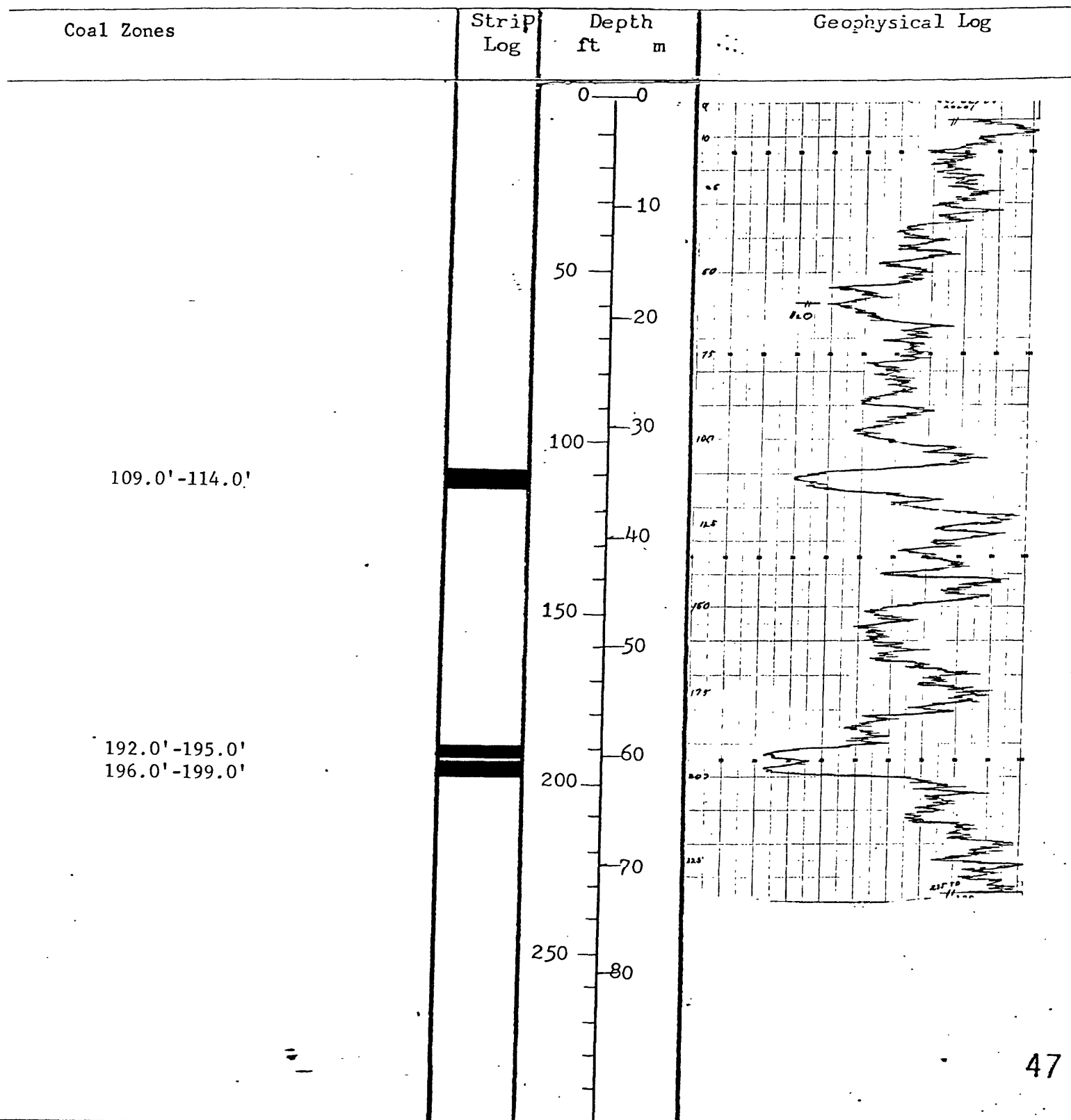
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-10 Surface Elevation 3730'
 Location NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 26, T. 57N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Corral Creek
 Log Depth 60' Date Logged 9/2/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated D. Marquis 1 water well ; No coal

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|-----------|---------------|-----------------|
| | | 0—0 | |
| | | 10 | |
| | | 50 | |
| | | 20 | |
| | | 30 | |
| | | 100 | |
| | | 40 | |
| | | 150 | |
| | | 50 | |
| | | 60 | |
| | | 200 | |
| | | 70 | |
| | | 250 | |
| | | 80 | |
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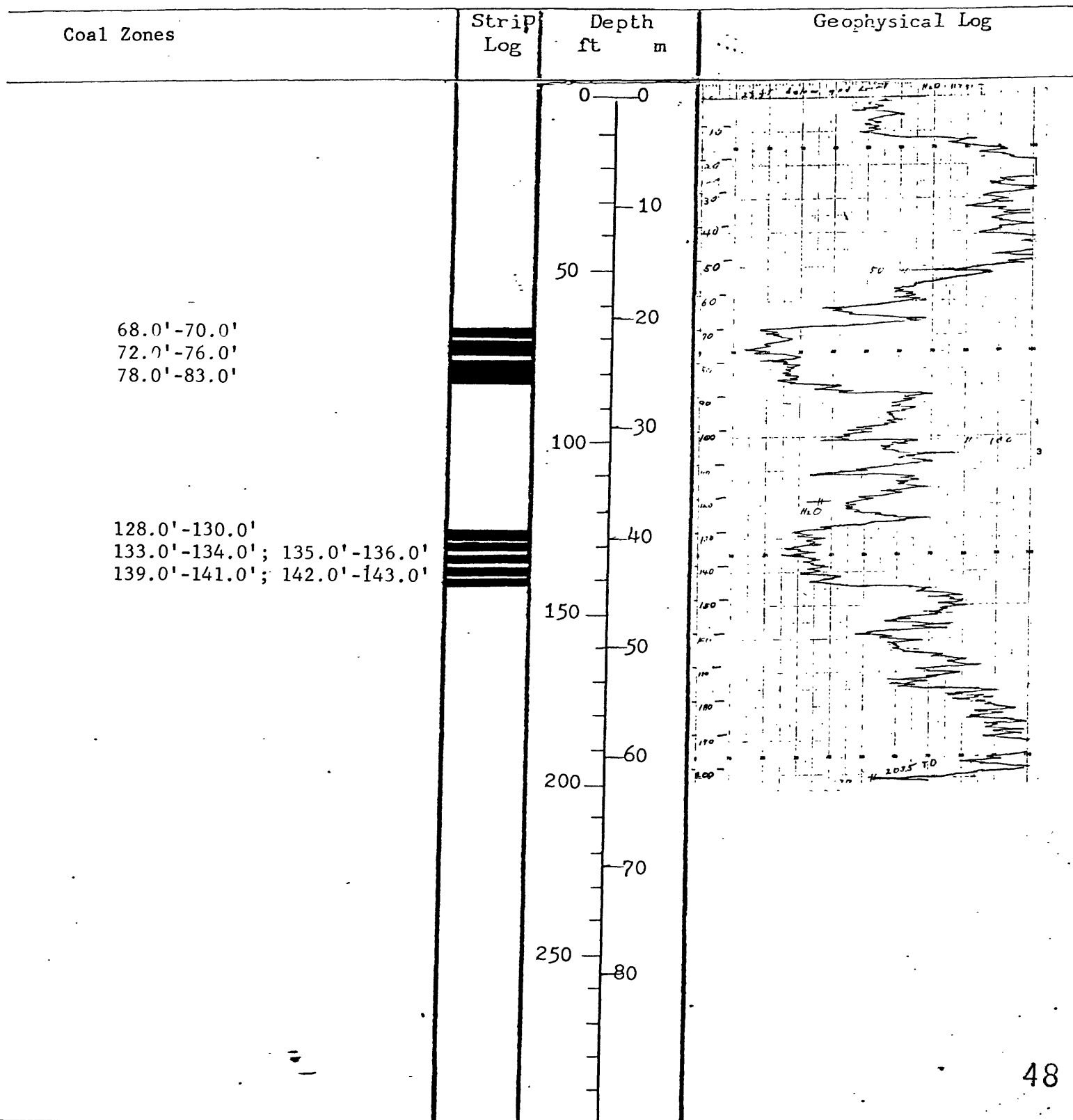
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-11 Surface Elevation 3675'
 Location NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 33, T. 57N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Black Draw
 Log Depth 235' Date Logged 12/16/77 Log Run By Babcock Fluid level 59'
 Remarks Hole originally designated TR-6



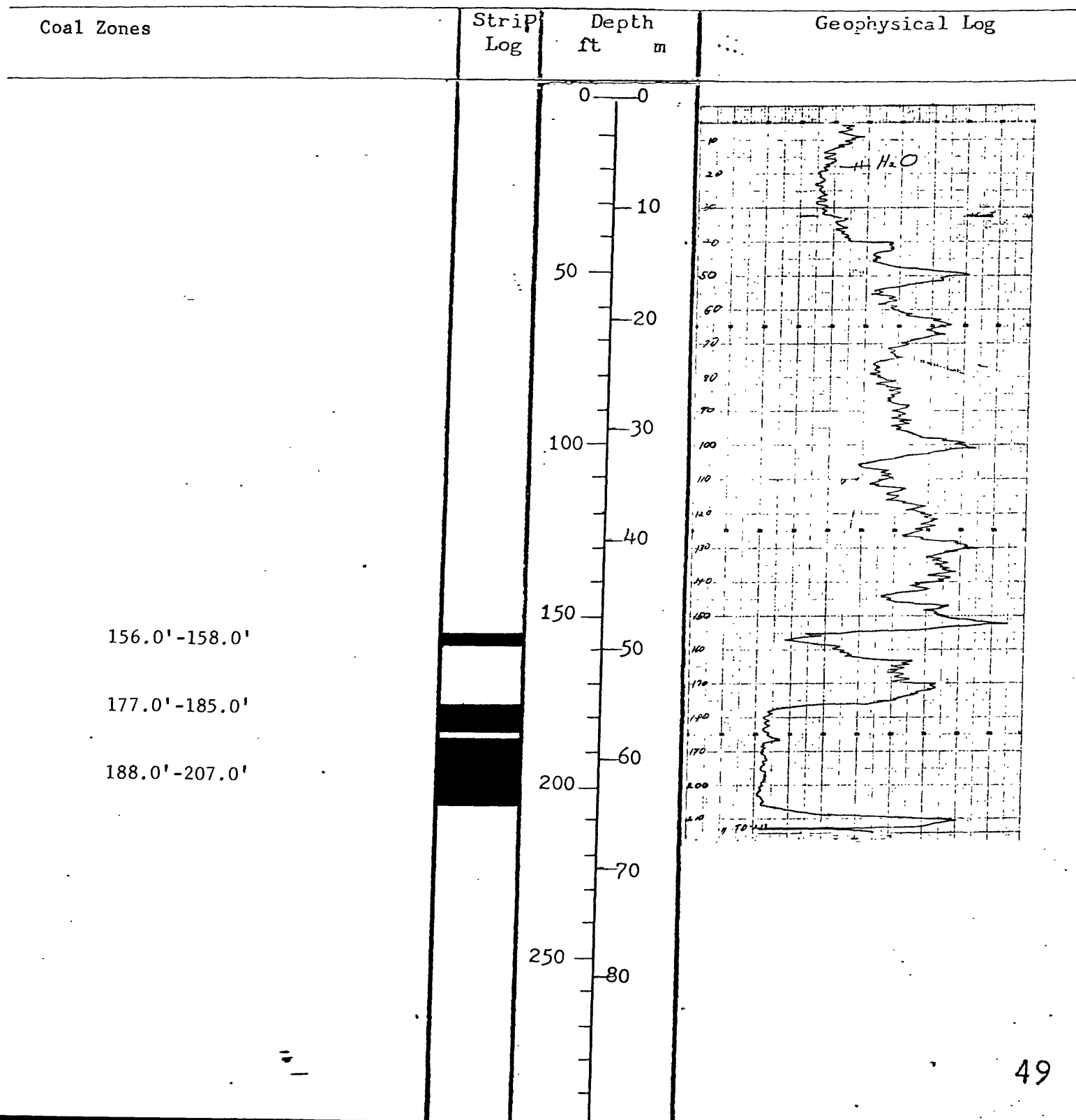
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 ECR-12 Surface Elevation 4090'
Location SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 56N, R. 72W, County Campbell
State Wyoming Nearest Town Recluse Quad White Tail Butte
Log Depth 203.5' Date Logged 11/16/77 Log Run By Babcock Fluid level 119'
Remarks Hole originally designated Davis WW 1



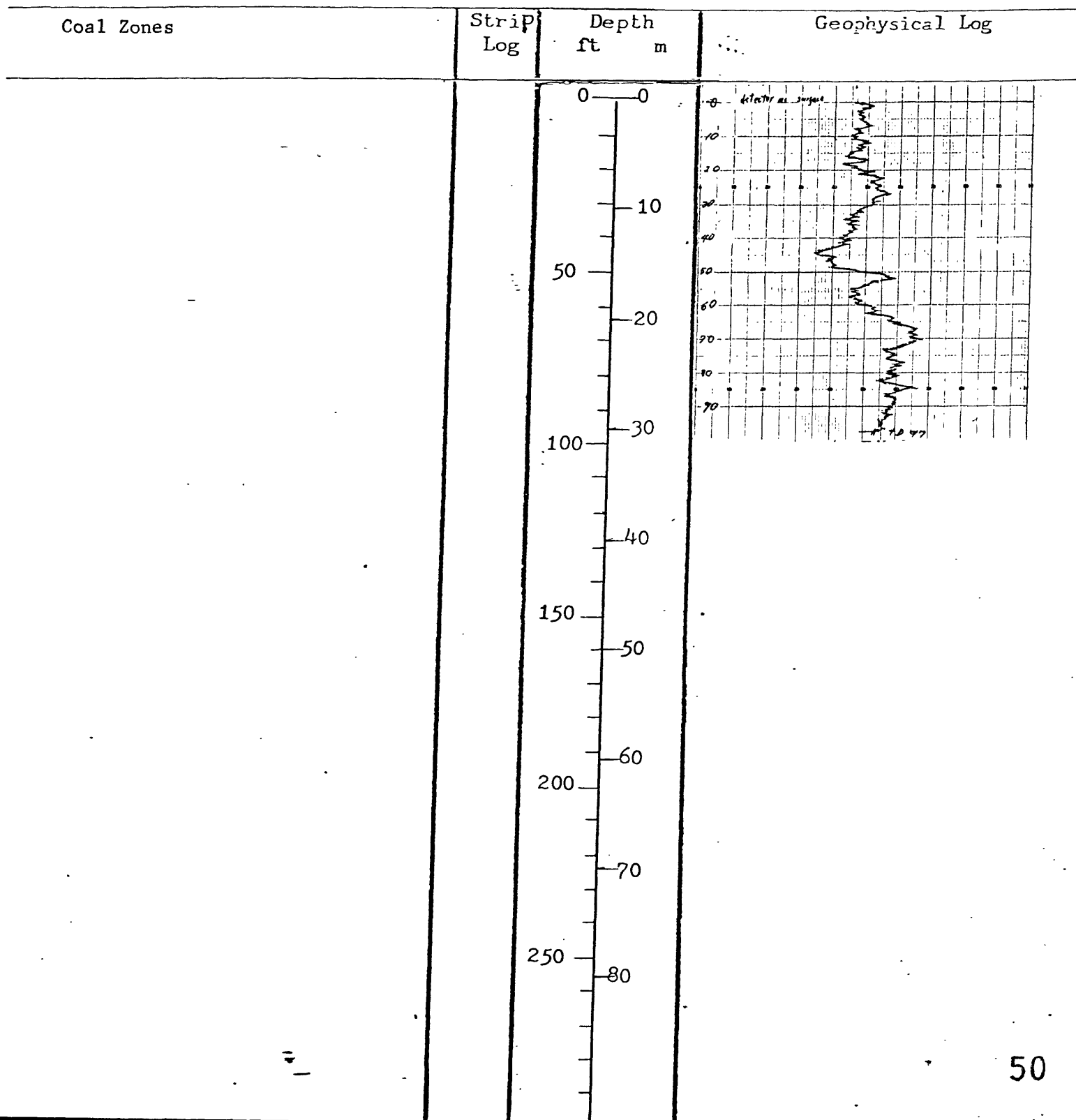
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-13 Surface Elevation 3890'
Location SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T. 56N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 213' Date Logged 10/13/77 Log Run By Babcock Fluid level 18'
Remarks Hole originally designated Brug 7 water well ; Bottom in coal



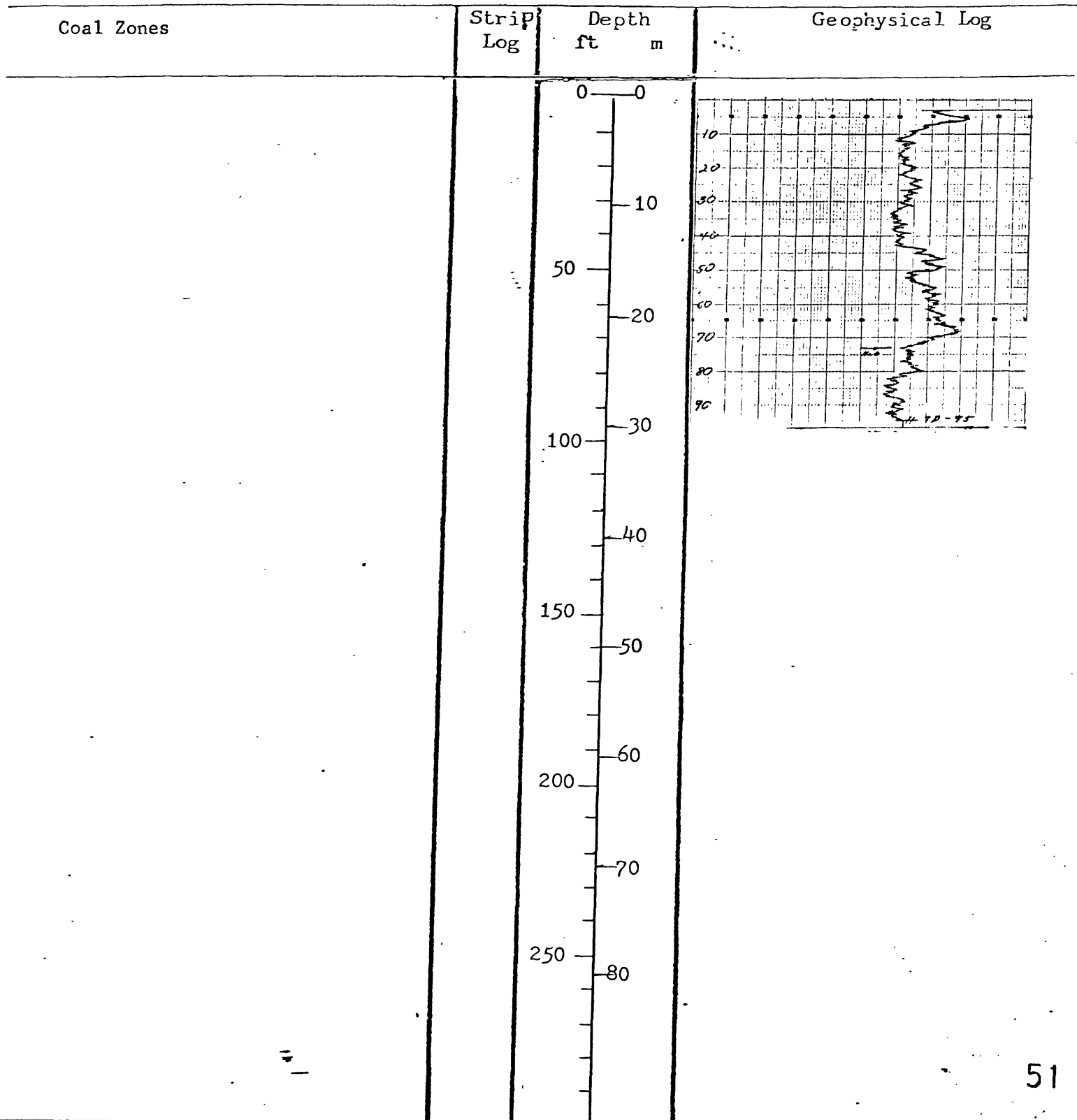
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-14 Surface Elevation 4030'
Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 15, T. 56N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 97' Date Logged 10/14/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Brug 9 water well ; No coal



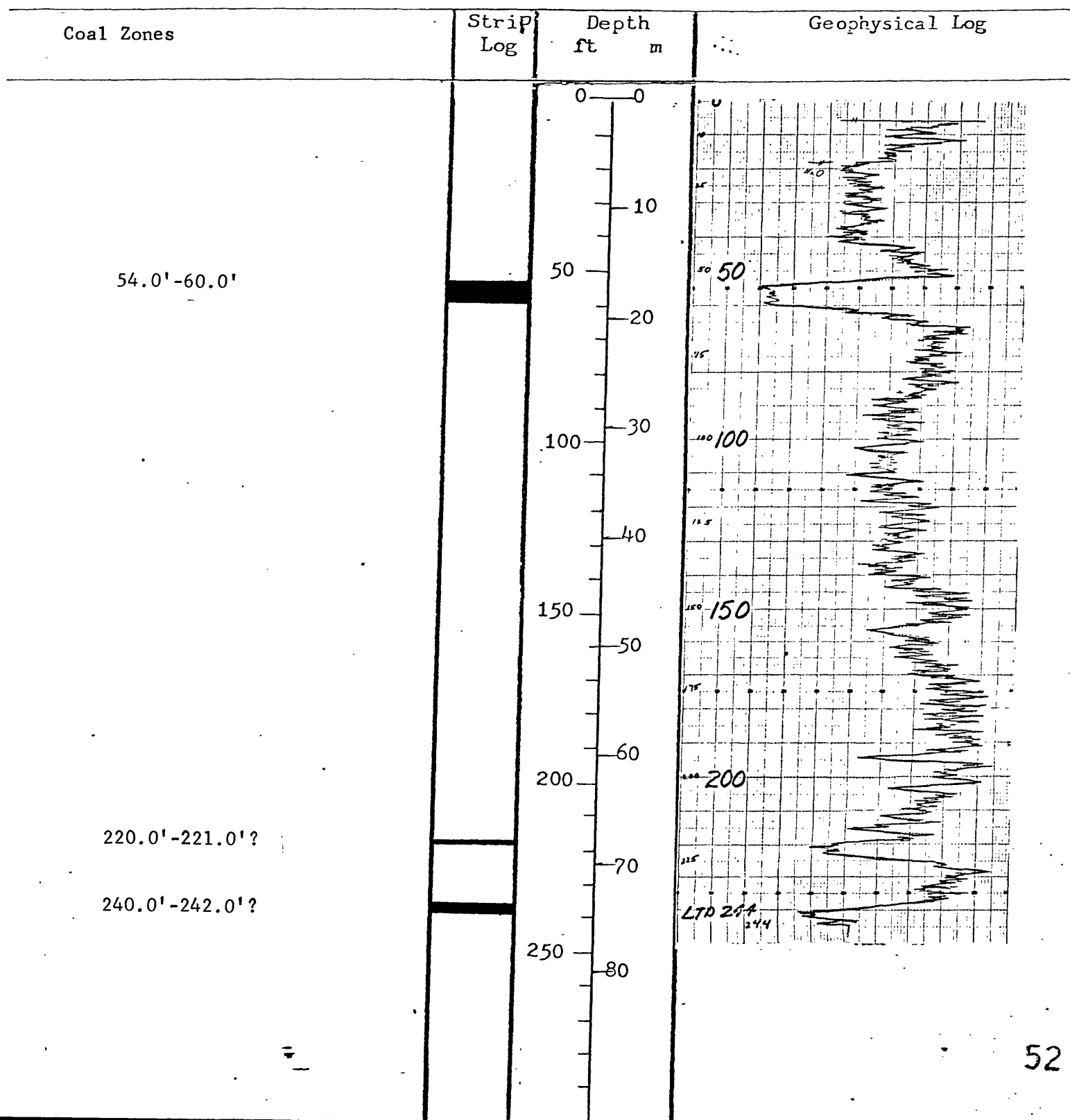
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-15 Surface Elevation 3895'
 Location NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 56N, R. 73W, County Campbell
 State Wyoming Nearest Town Recluse Quad Homestead Draw SW
 Log Depth 95' Date Logged 10/3/77 Log Run By Babcock Fluid level 73'
 Remarks Hole originally designated Brug 8 water well ; No coal



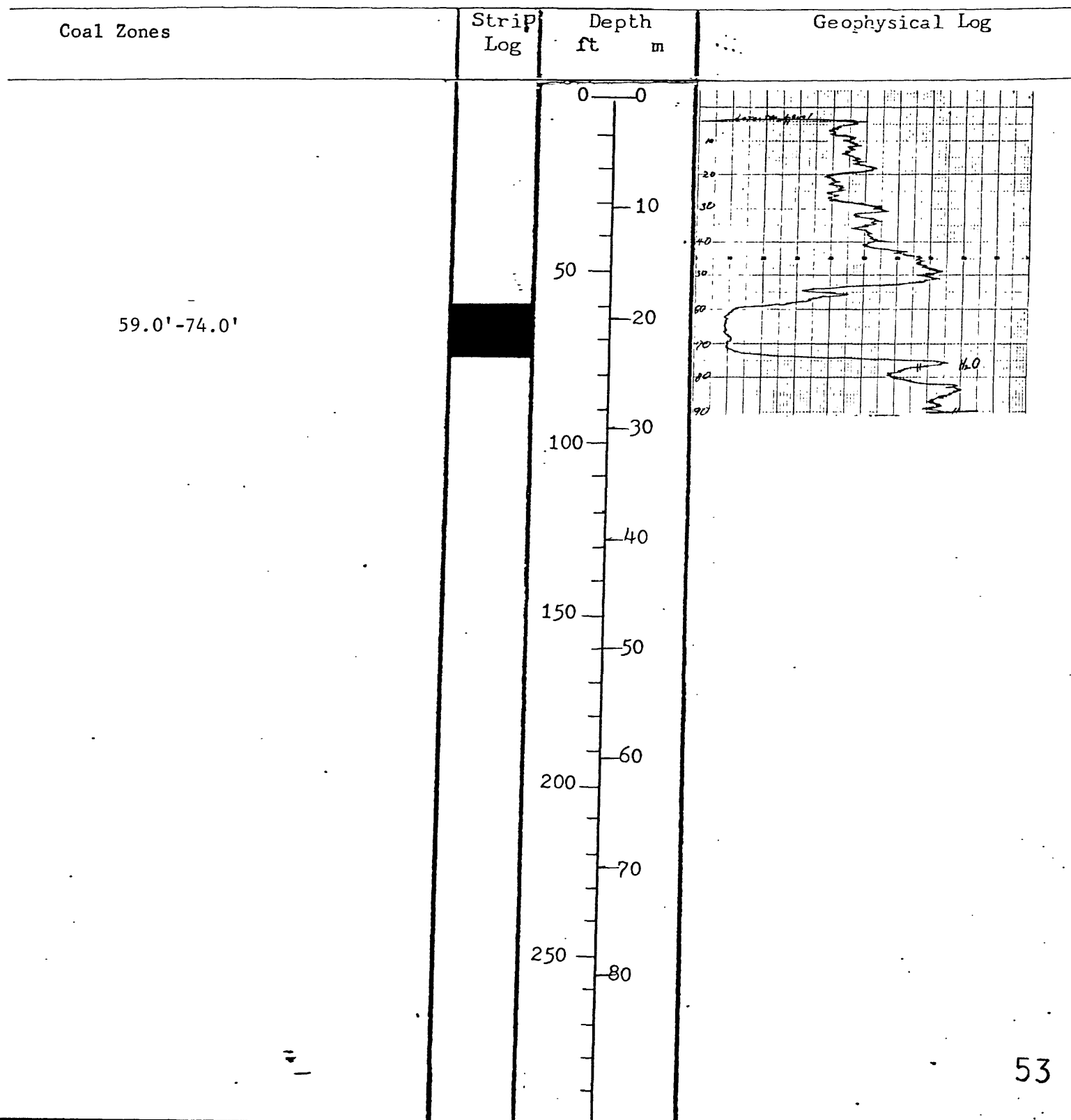
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-18 Surface Elevation 3790'
Location NE¹/₄NW¹/₄ sec. 1, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 244' Date Logged 12/14/77 Log Run By Babcock Fluid level 18'
Remarks Hole originally designated TR-4; Irregular section; Methane detected



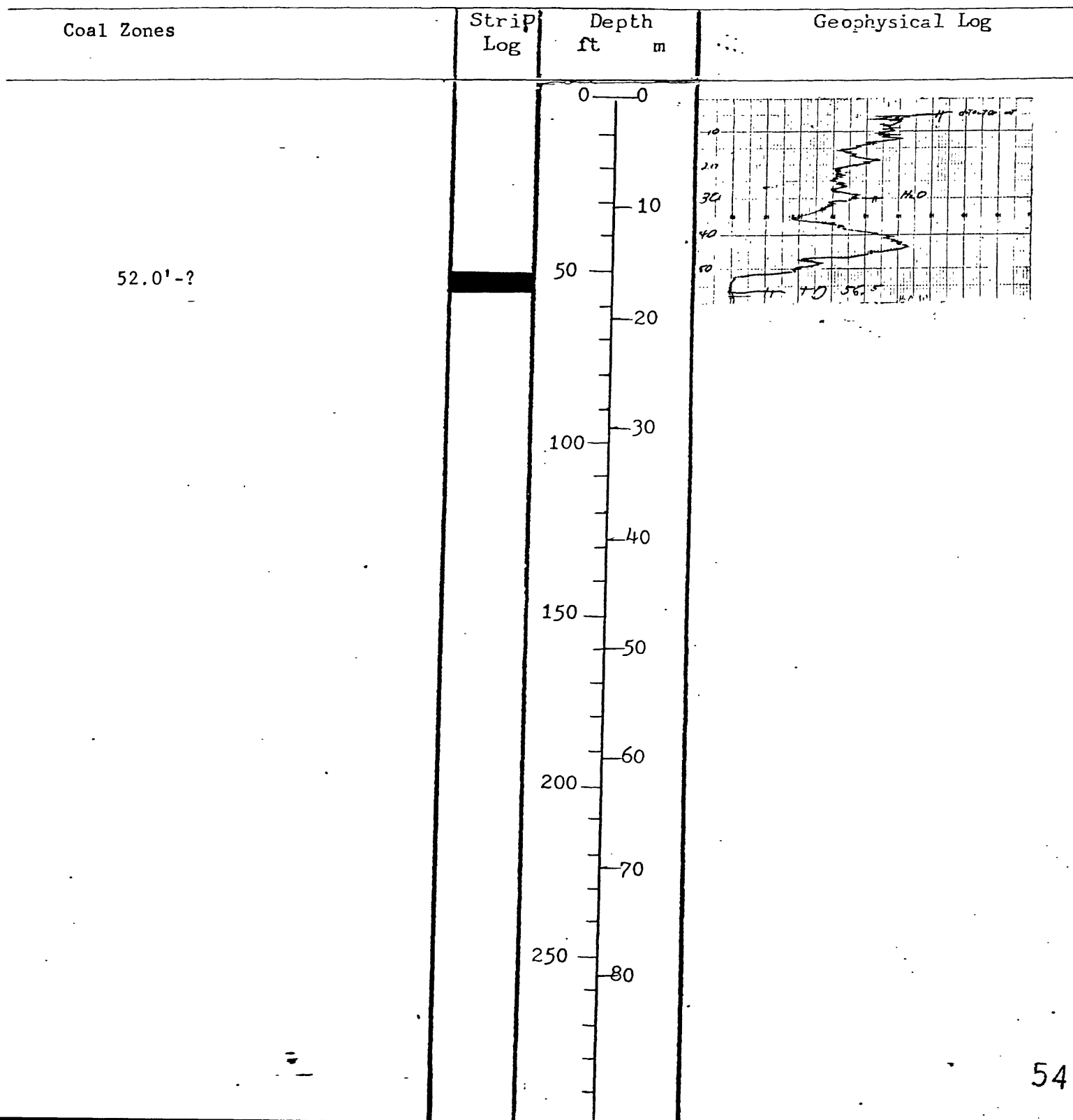
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-19 Surface Elevation 3885'
Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 90' Date Logged 10/12/77 Log Run By Babcock Fluid level 76'
Remarks Hole originally designated Brug 3 water well



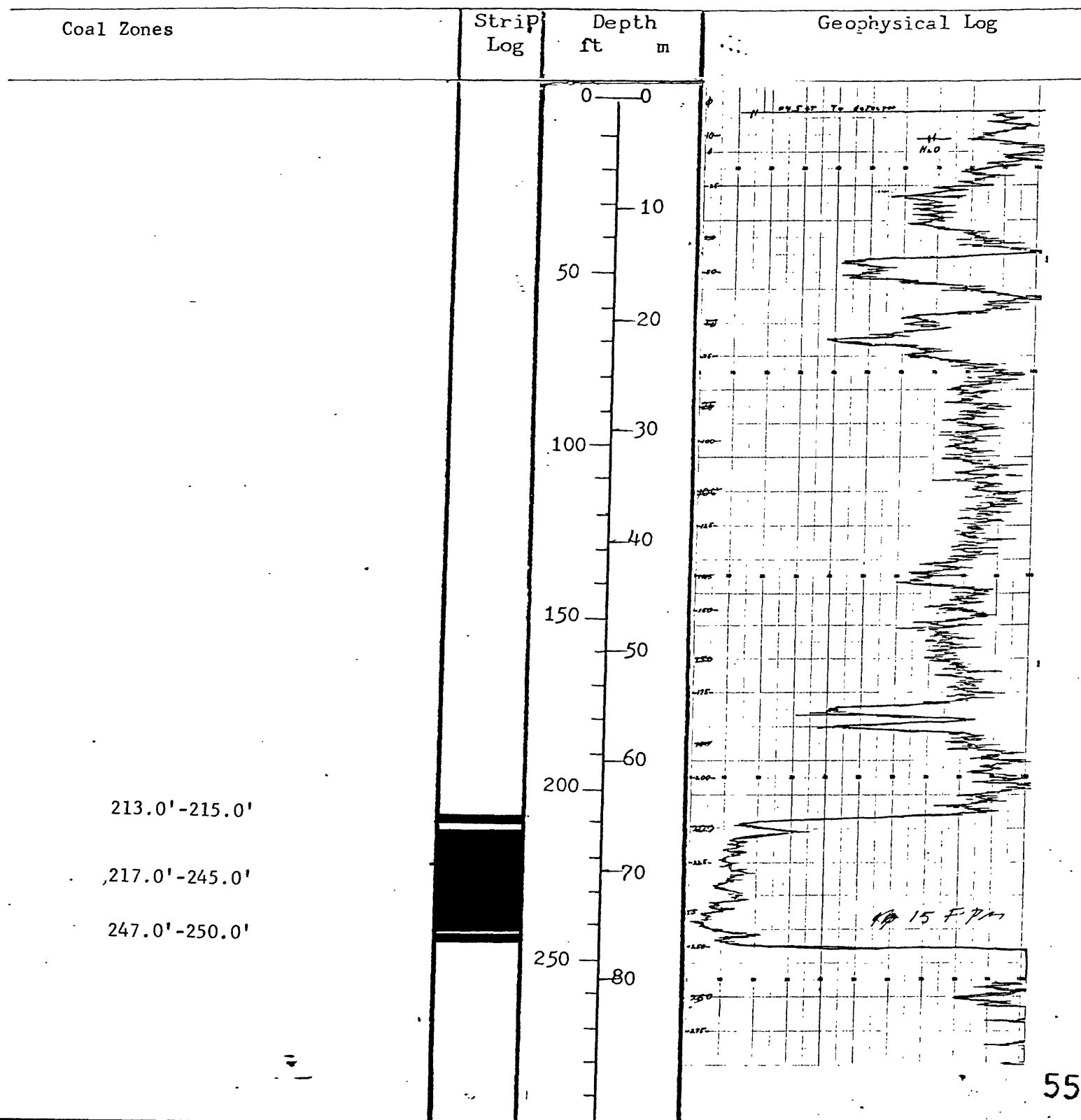
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-20 Surface Elevation 3880'
Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 56.5' Date Logged 10/12/77 Log Run By Babcock Fluid level 30'
Remarks Hole originally designated Brug 4 water well ; Bottom in coal

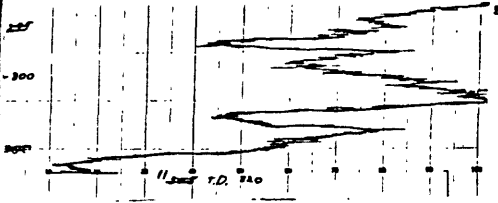


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-21 Surface Elevation 3800'
 Location NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 56N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Reservoir Creek
 Log Depth 320' Date Logged 12/7/77 Log Run By Babcock Fluid level 18'
 Remarks Hole originally designated TR-1 ; Bottom in coal ; Methane detected



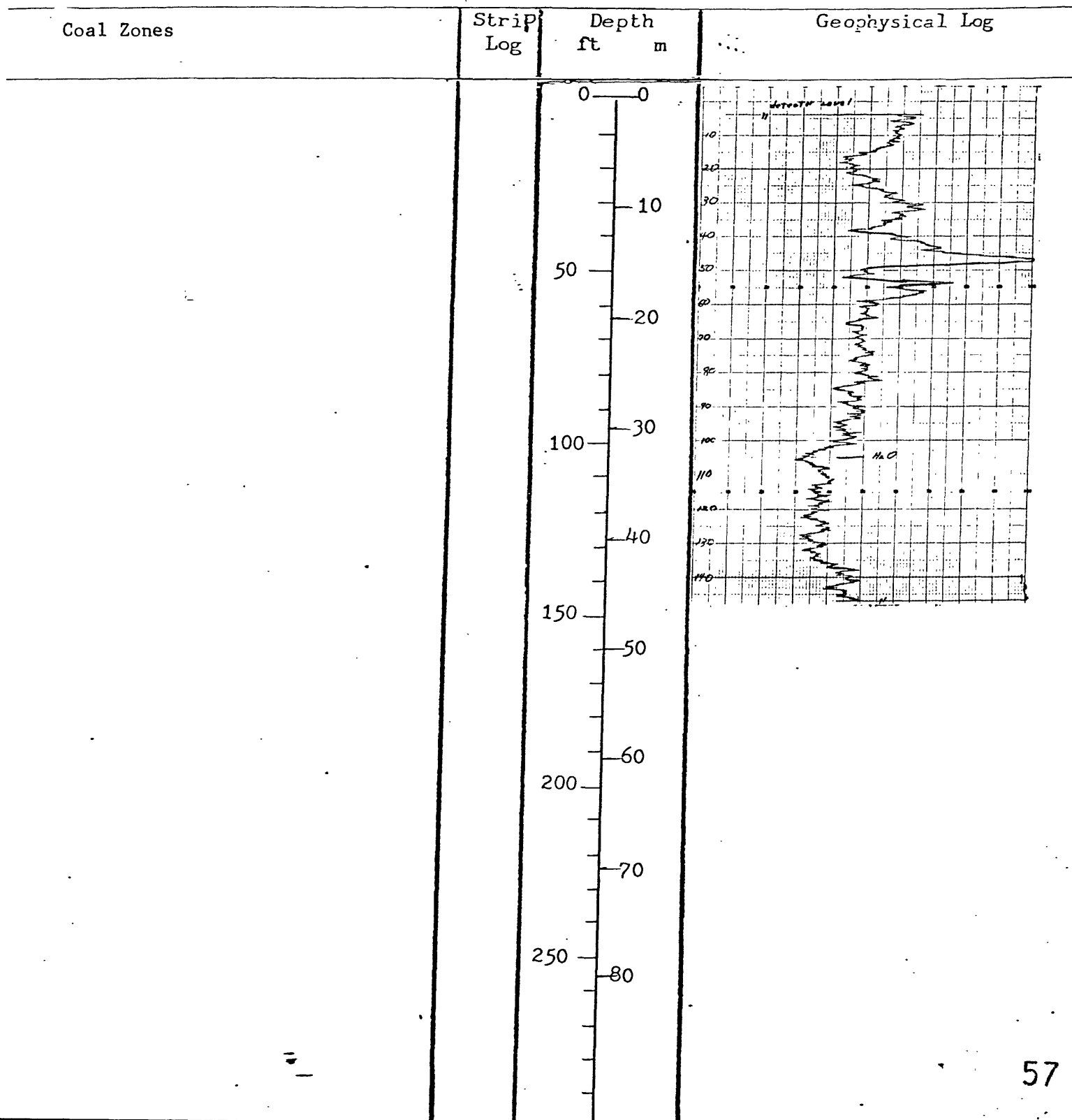
Hole no. 77 BCR-21 (cont.)

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|-----------|--|---|
| 317.0' - ? | | <div><div>90</div><div>300</div><div>100</div><div>350</div><div>110</div><div>120</div><div>400</div><div>130</div><div>450</div><div>140</div><div>150</div><div>500</div><div>160</div><div>550</div><div>170</div><div>180</div><div>600</div><div>190</div></div> |  |



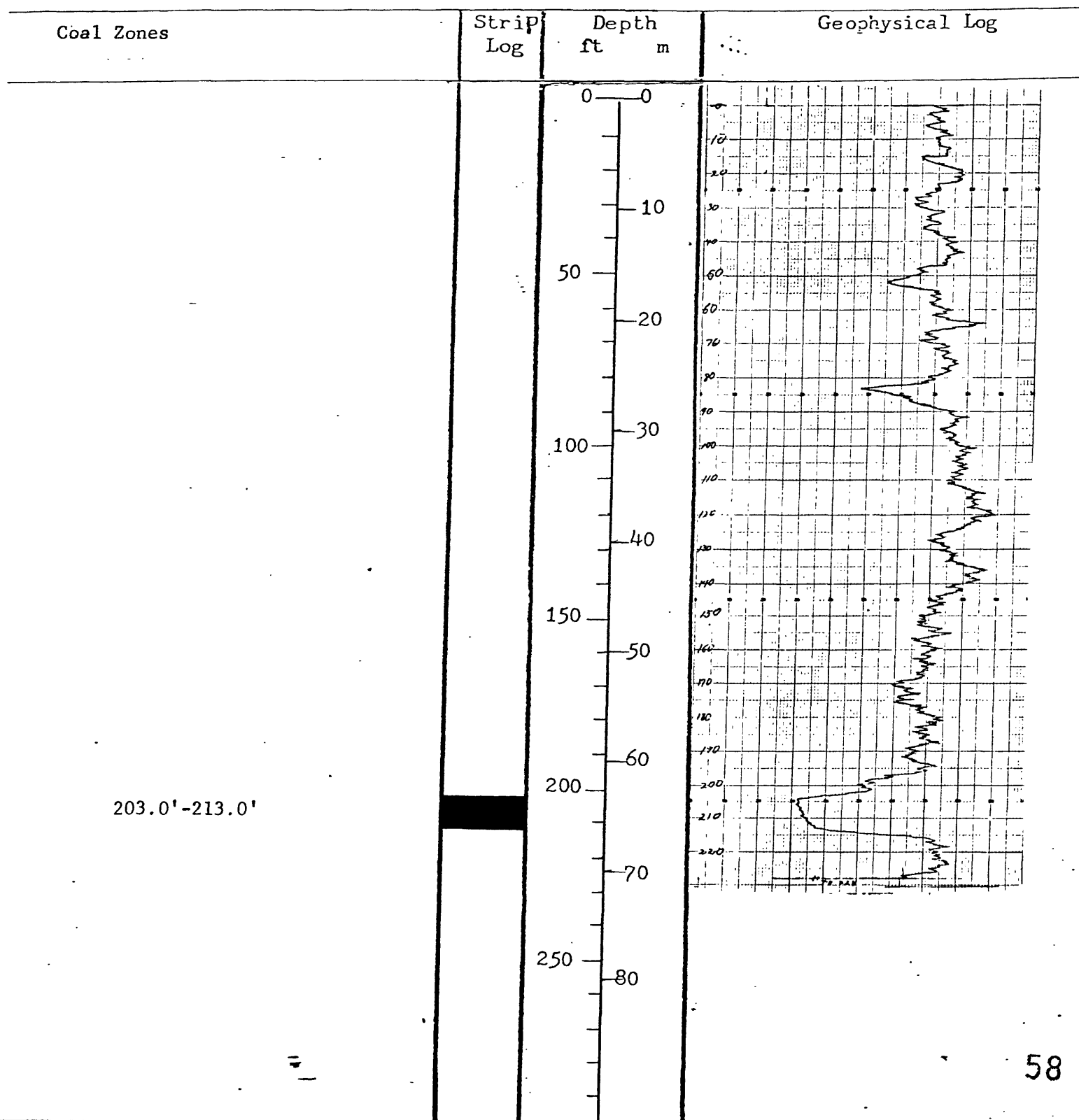
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-22 Surface Elevation 3975'
Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 23, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 147' Date Logged 10/13/77 Log Run By Babcock Fluid level 105'
Remarks Hole originally designated Brug 5 water well; No coal



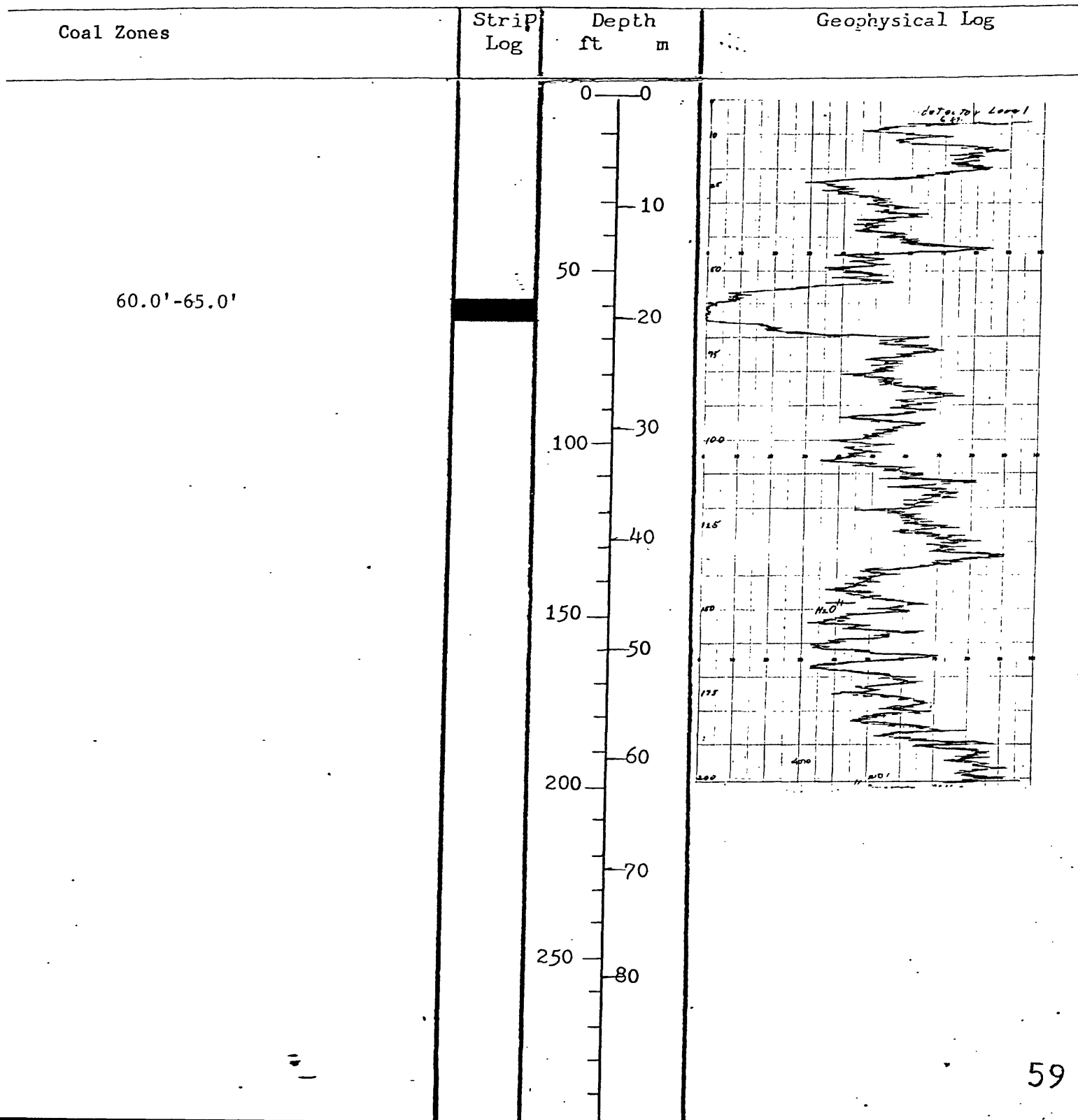
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-23 Surface Elevation 4125'
Location SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 26, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 228' Date Logged 10/13/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Brug 6 water well



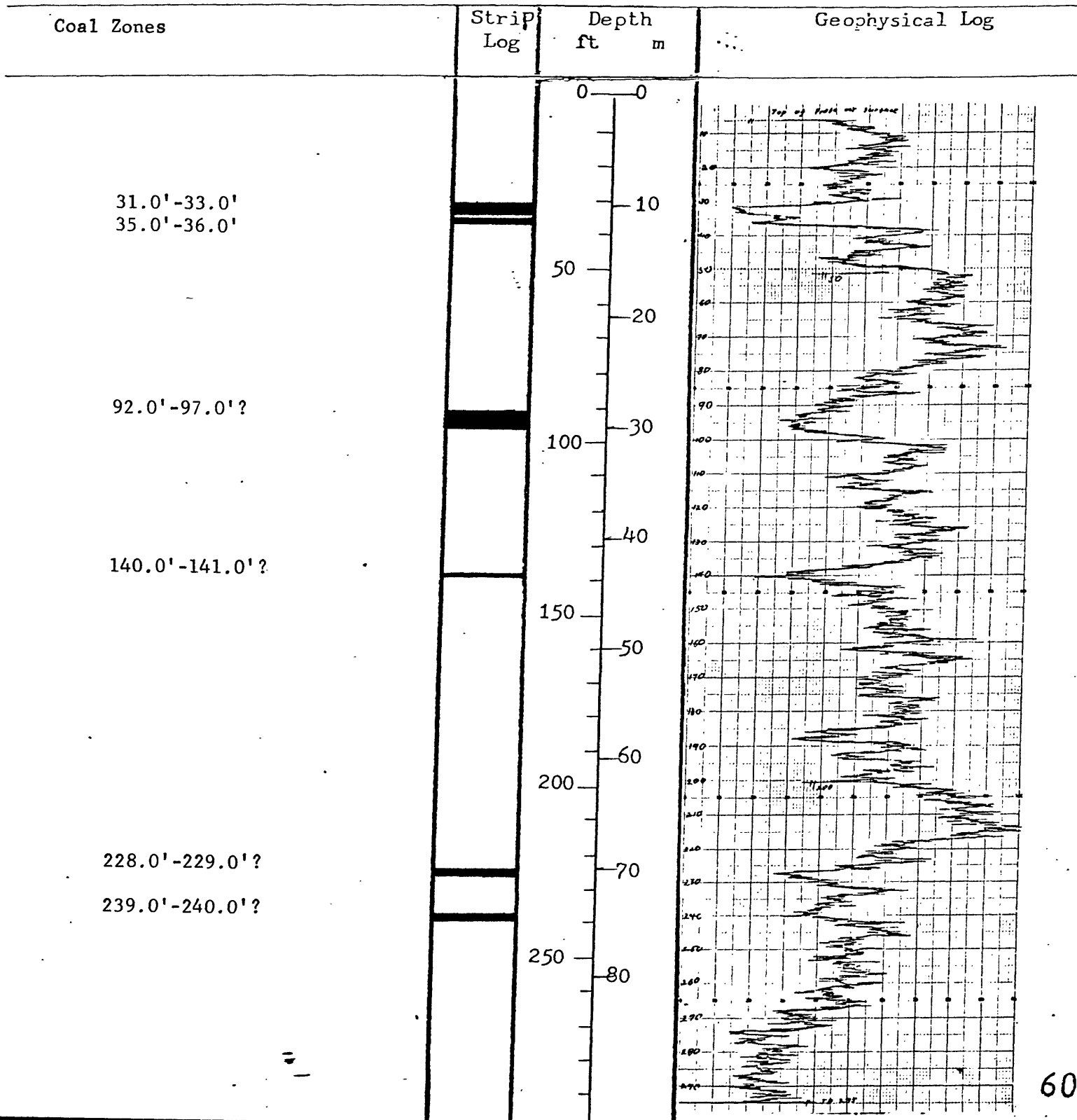
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-24 Surface Elevation 4070'
Location NW 1/4 SE 1/4 sec. 30, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 201' Date Logged 12/16/77 Log Run By Babcock Fluid level 148'
Remarks Hole originally designated TR-5



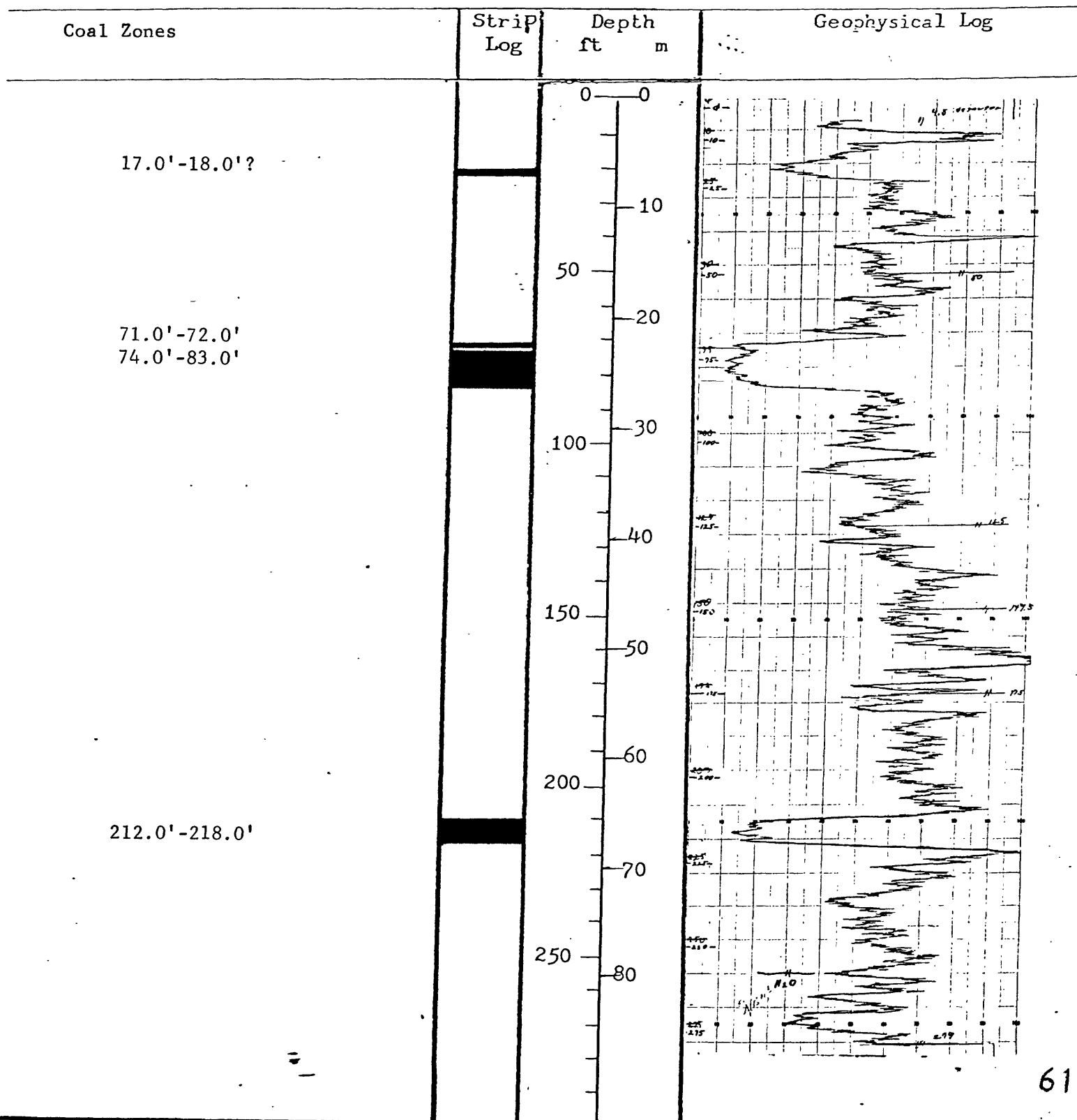
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-25 Surface Elevation 4125'
Location NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 295' Date Logged 11/15/77 Log Run By Babcock Fluid level 274'
Remarks Hole originally designated Kirkle WW 1



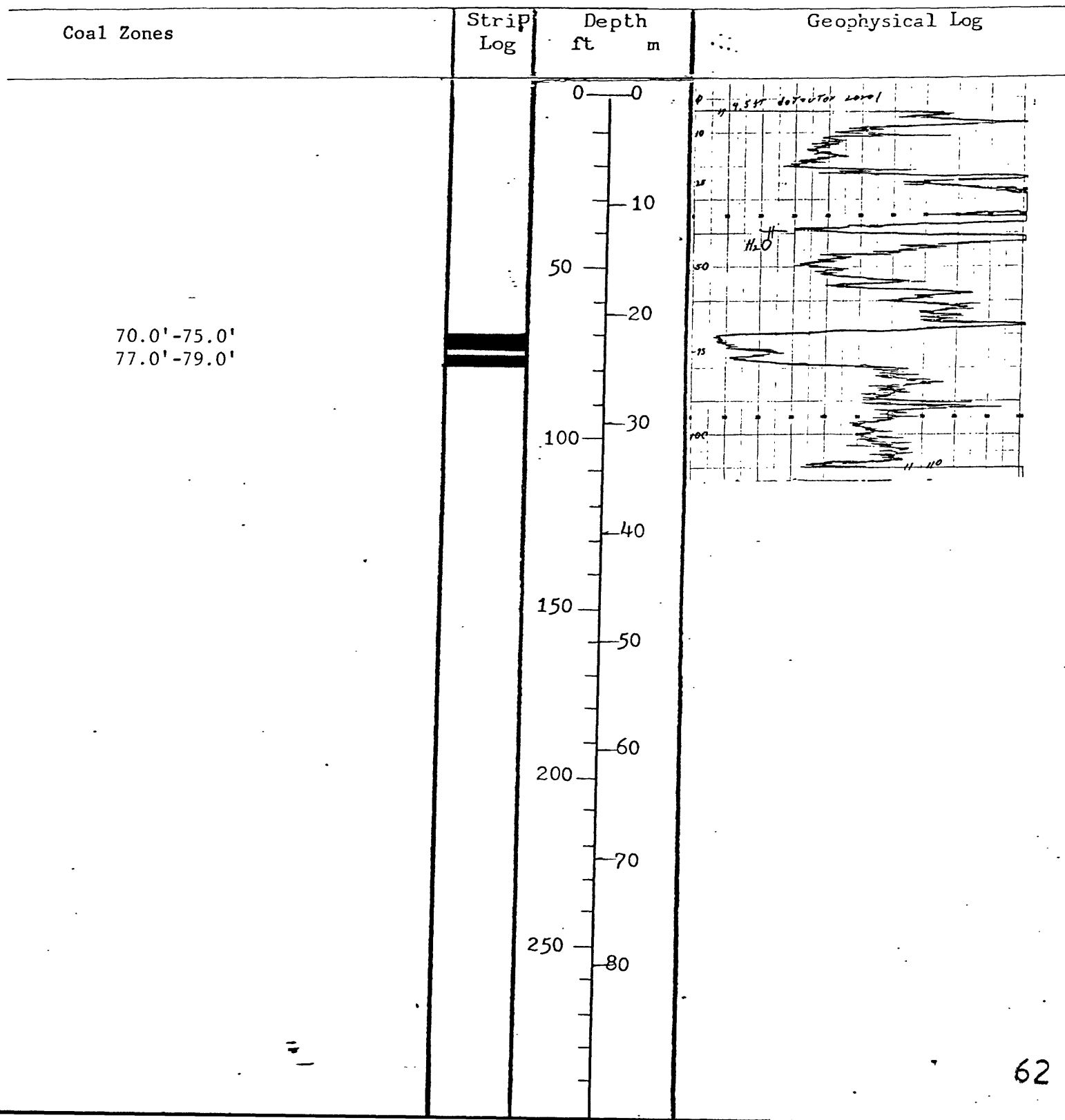
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-26 Surface Elevation 4050'
Location NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 56N, R. 75W, County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 279' Date Logged 12/12/77 Log Run By Babcock Fluid level 260'
Remarks Hole originally designated TR-3



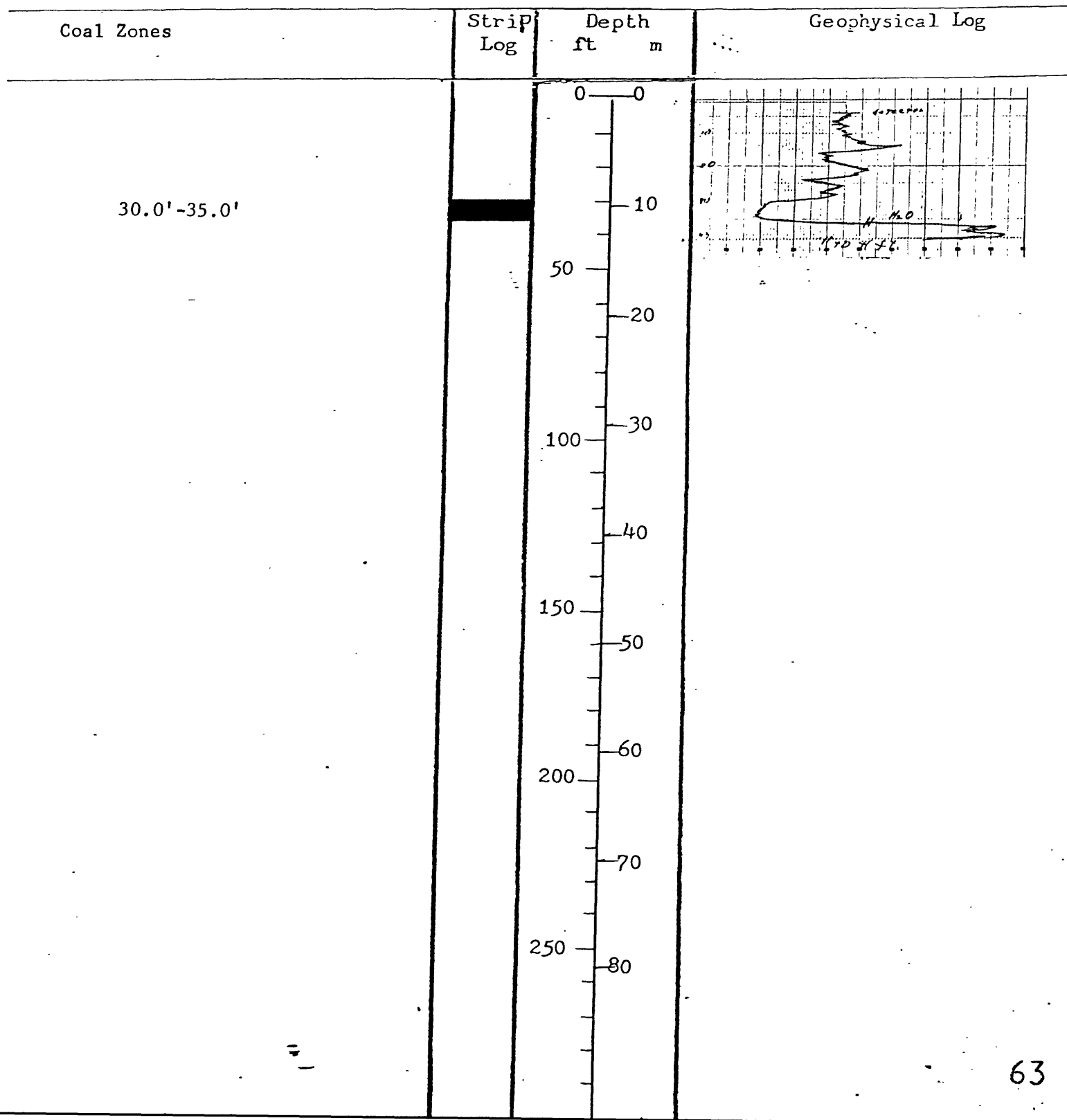
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-27 Surface Elevation 3895'
Location SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 36 , T. 56N , R. 75W , County Campbell
State Wyoming Nearest Town Recluse Quad Reservoir Creek
Log Depth 110' Date Logged 12/12/77 Log Run By Babcock Fluid level 39'
Remarks Hole originally designated TR-2



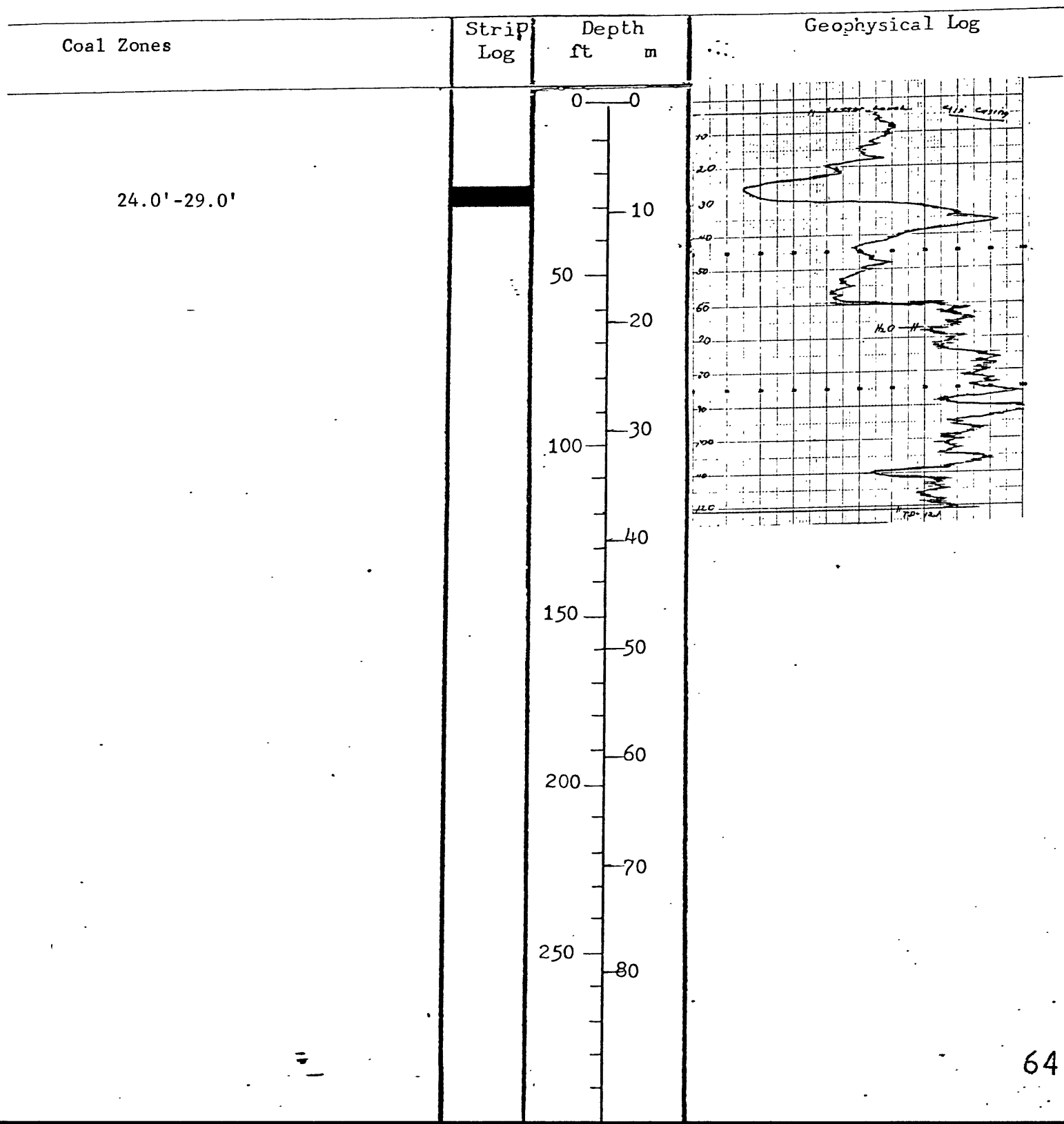
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-28 Surface Elevation 3985'
Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 41' Date Logged 10/12/77 Log Run By Babcock Fluid level 36'
Remarks Hole originally designated Brug 2 water well; Irregular section



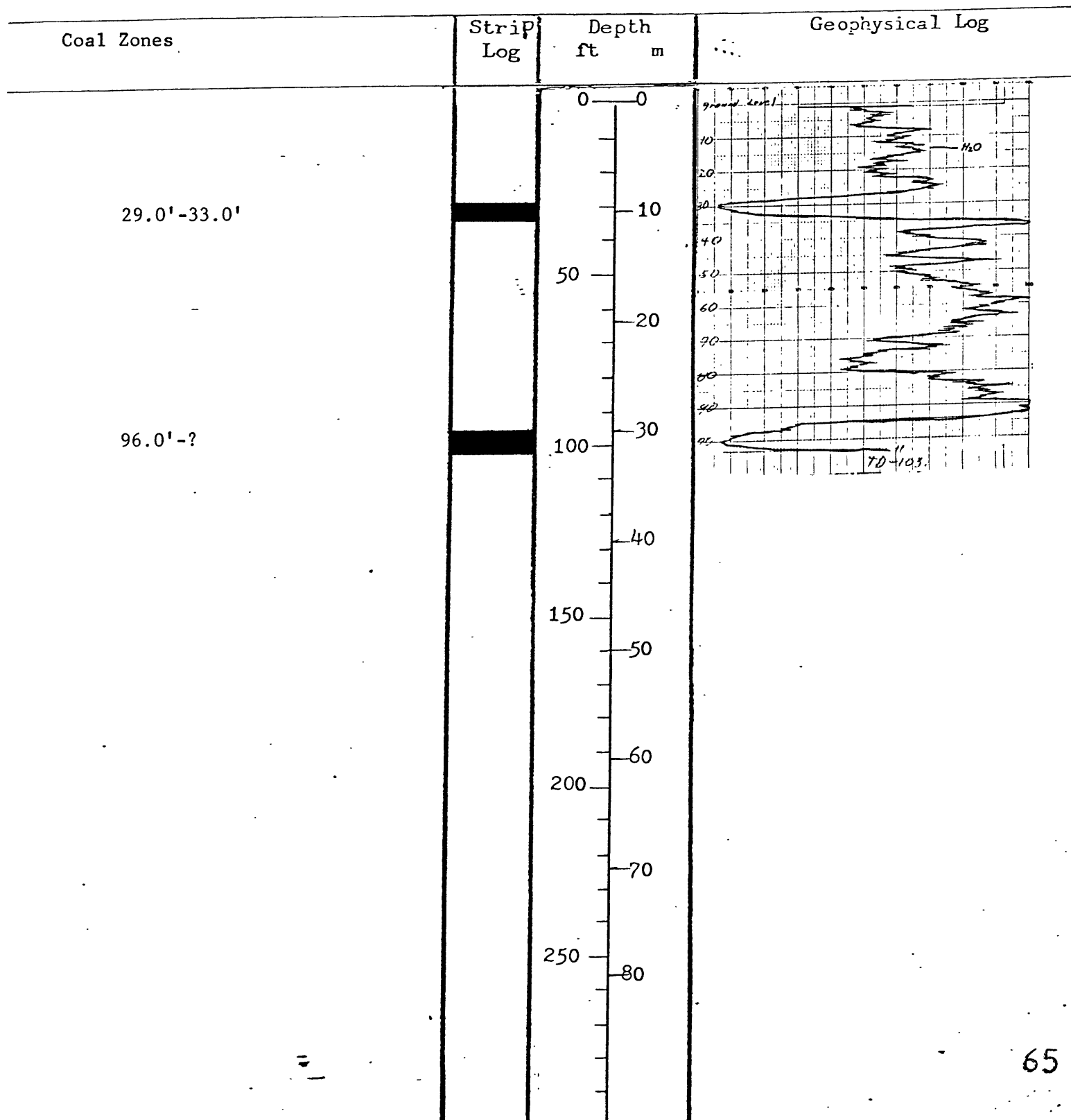
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-29 Surface Elevation 3990'
Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 121' Date Logged 10/12/77 Log Run By Babcock Fluid level 67'
Remarks Hole originally designated Brug 1 water well ; Irregular section



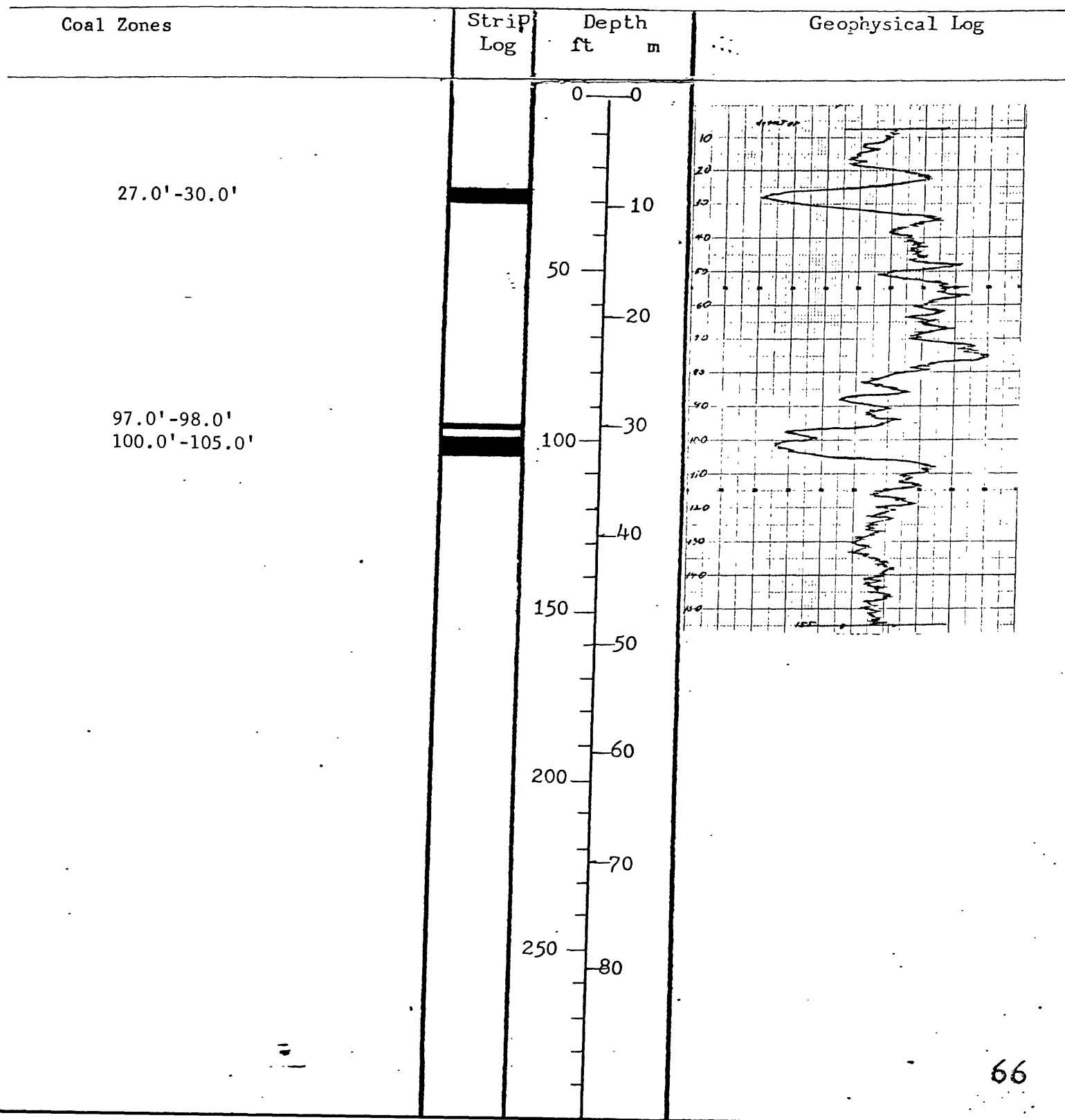
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-30 Surface Elevation 4130'
Location NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 103' Date Logged 10/3/77 Log Run By Babcock Fluid level 14'
Remarks Hole originally designated Heald water well ; Projected section; Bottom in coal



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-32 Surface Elevation 4122'
 Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 55N, R. 73W, County Campbell
 State Wyoming Nearest Town Recluse Quad Recluse
 Log Depth 155' Date Logged 10/8/77 Log Run By Babcock Fluid level 70'
 Remarks Hole originally designated Heald 2 water well; Projected section



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

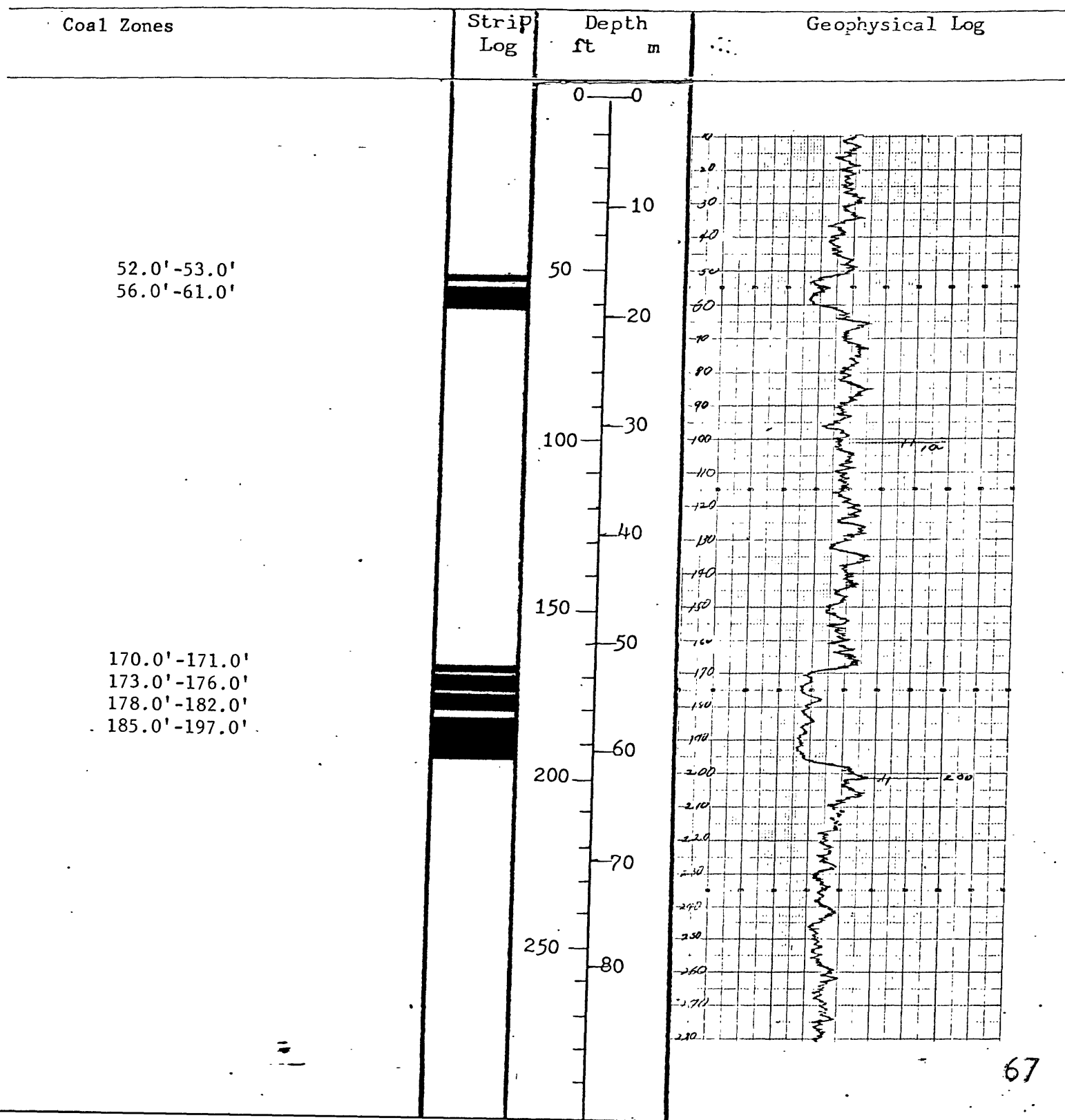
Project Water Well Hole no. 77 BCR-33 Surface Elevation 4150'

Location SE 1/4 SW 1/4 sec. 18, T. 55N, R. 73W, County Campbell

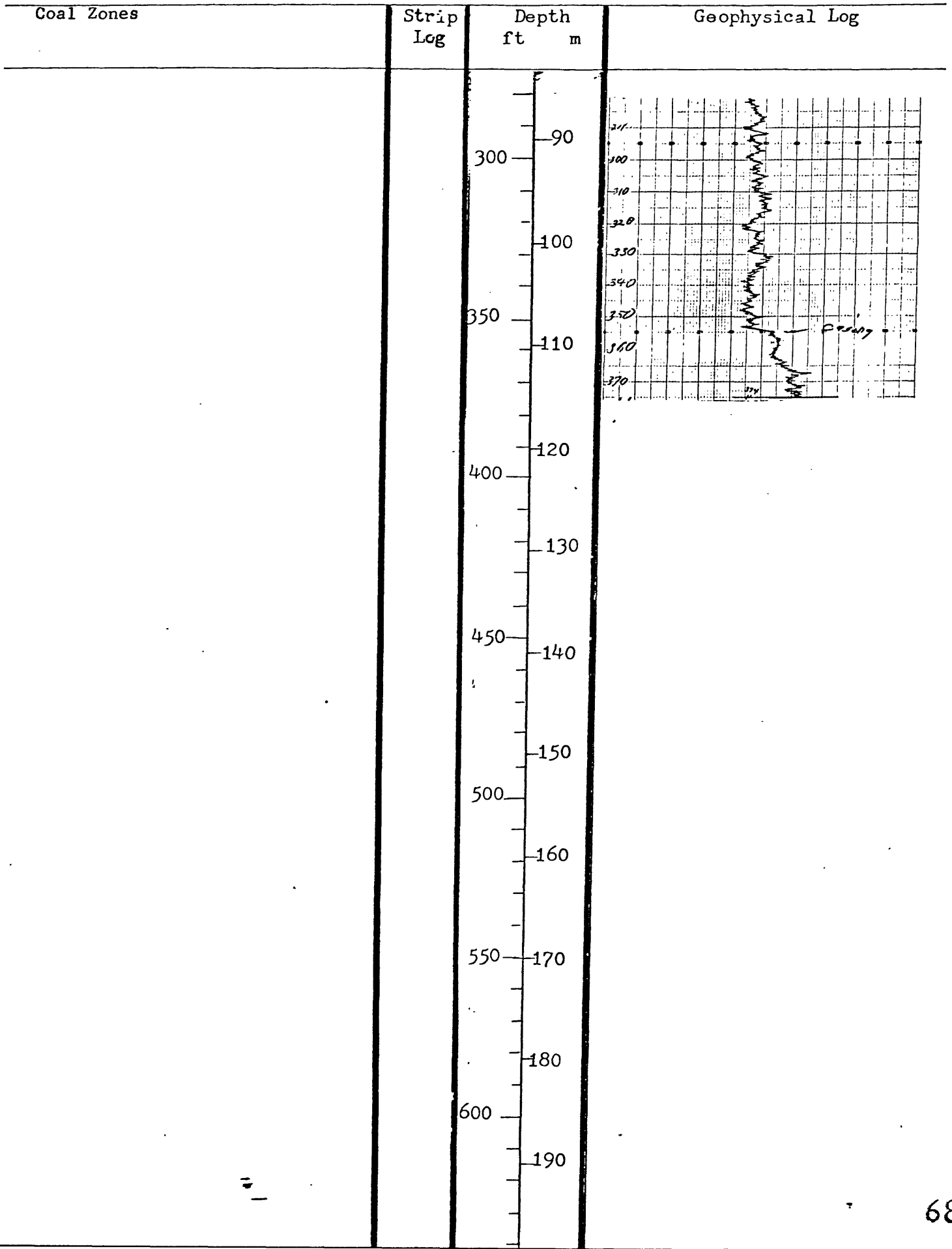
State Wyoming Nearest Town Recluse Quad Recluse

Log Depth 370' Date Logged 8/27/77 Log Run By Babcock Fluid level ---

Remarks Hole originally designated Oedekoven D-1 (Anshutz); Projected section; Methane detected



Hole no. 77 BCR-33 (cont.)



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

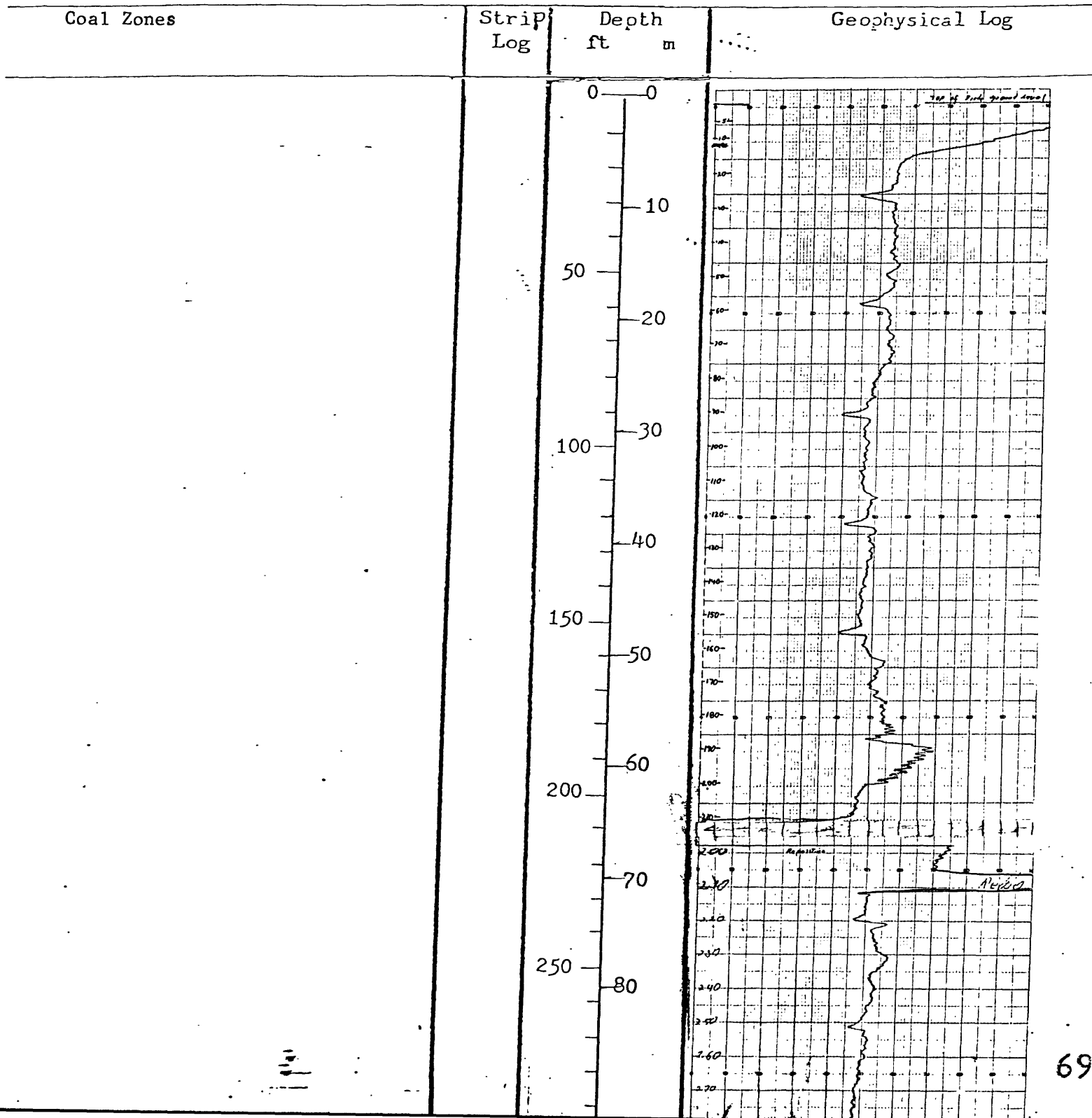
Project Water Well Hole no. 77 BCR-33 Surface Elevation 4150'

Location SE 1/4 SW 1/4 sec. 18, T. 55N, R. 73W, County Campbell

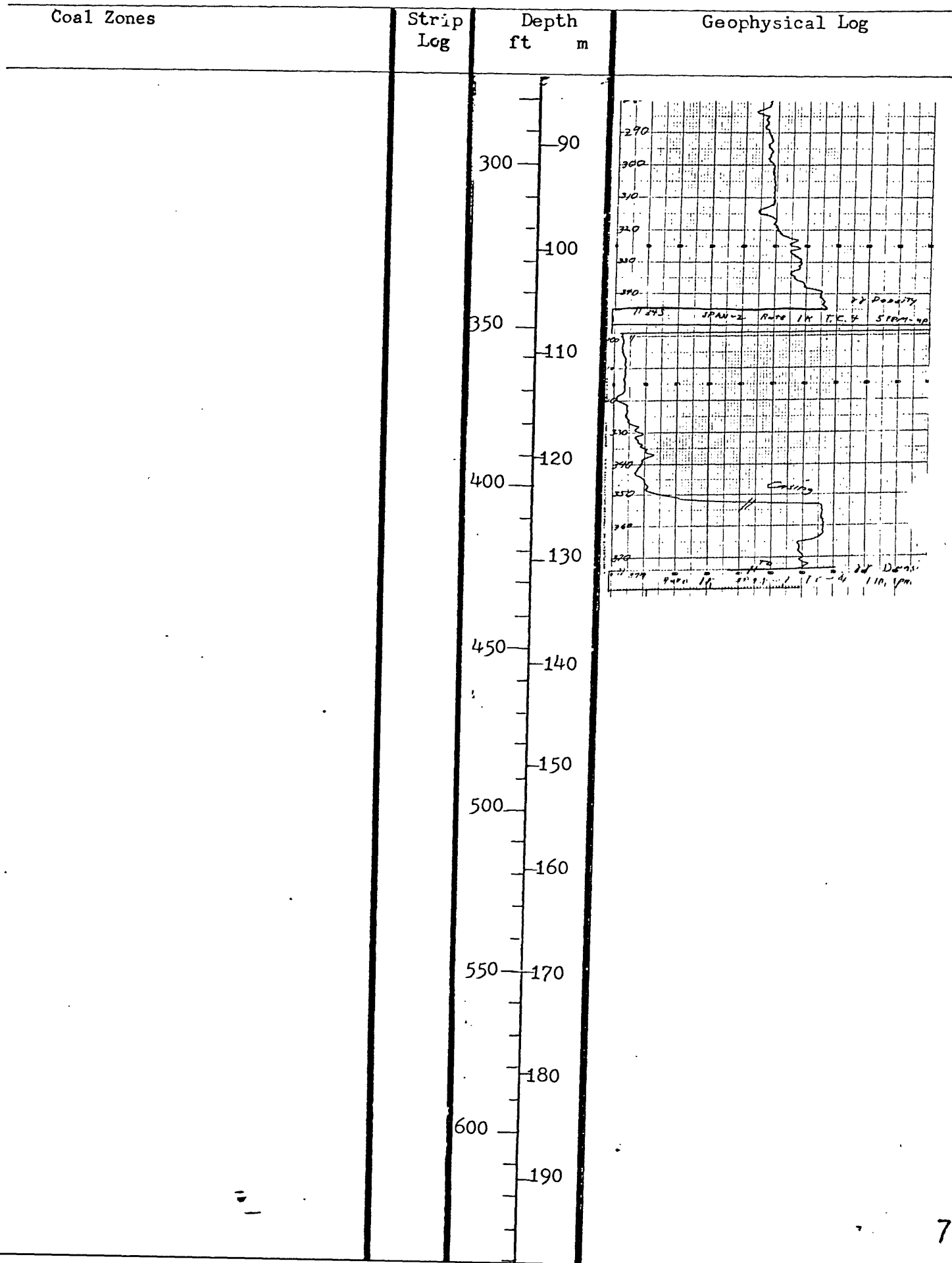
State Wyoming Nearest Town Recluse Quad Recluse

Log Depth 370' Date Logged 8/27/77 Log Run By Babcock Fluid level ---

Remarks Hole originally designated Oedekoven D-1 (Anshutz); Projected section; Methane detected

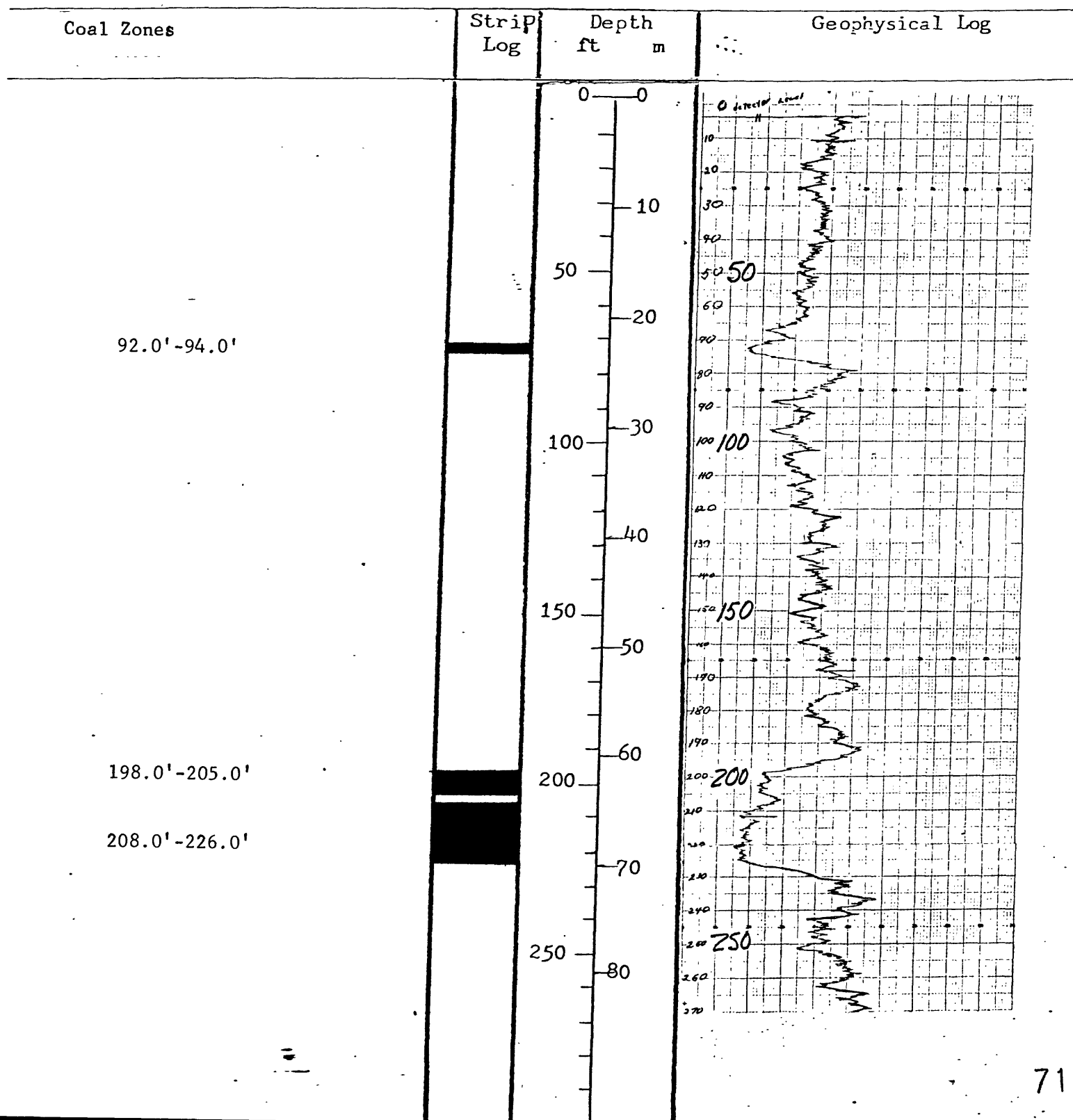


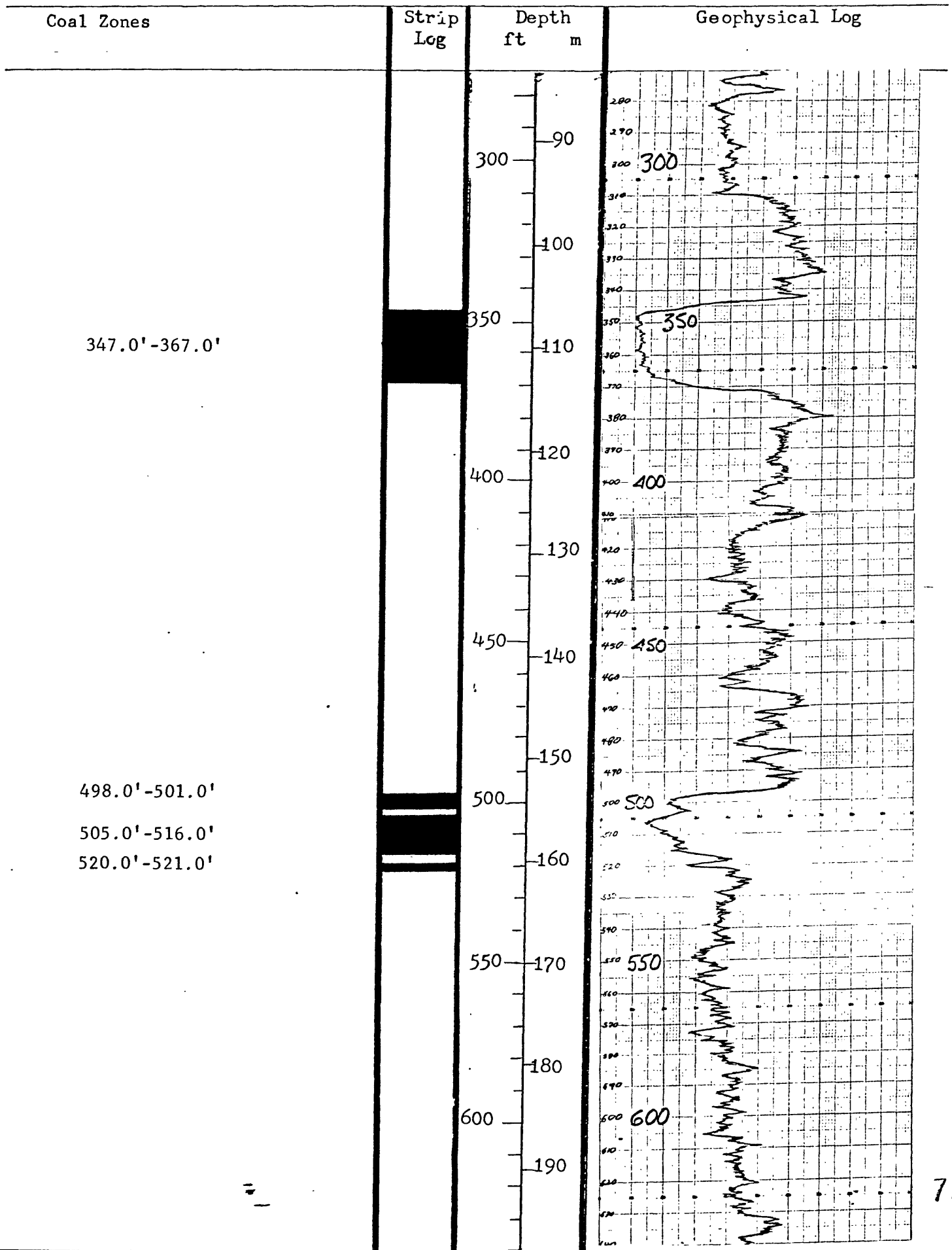
Hole no. 77 BCR-33 (cont.)



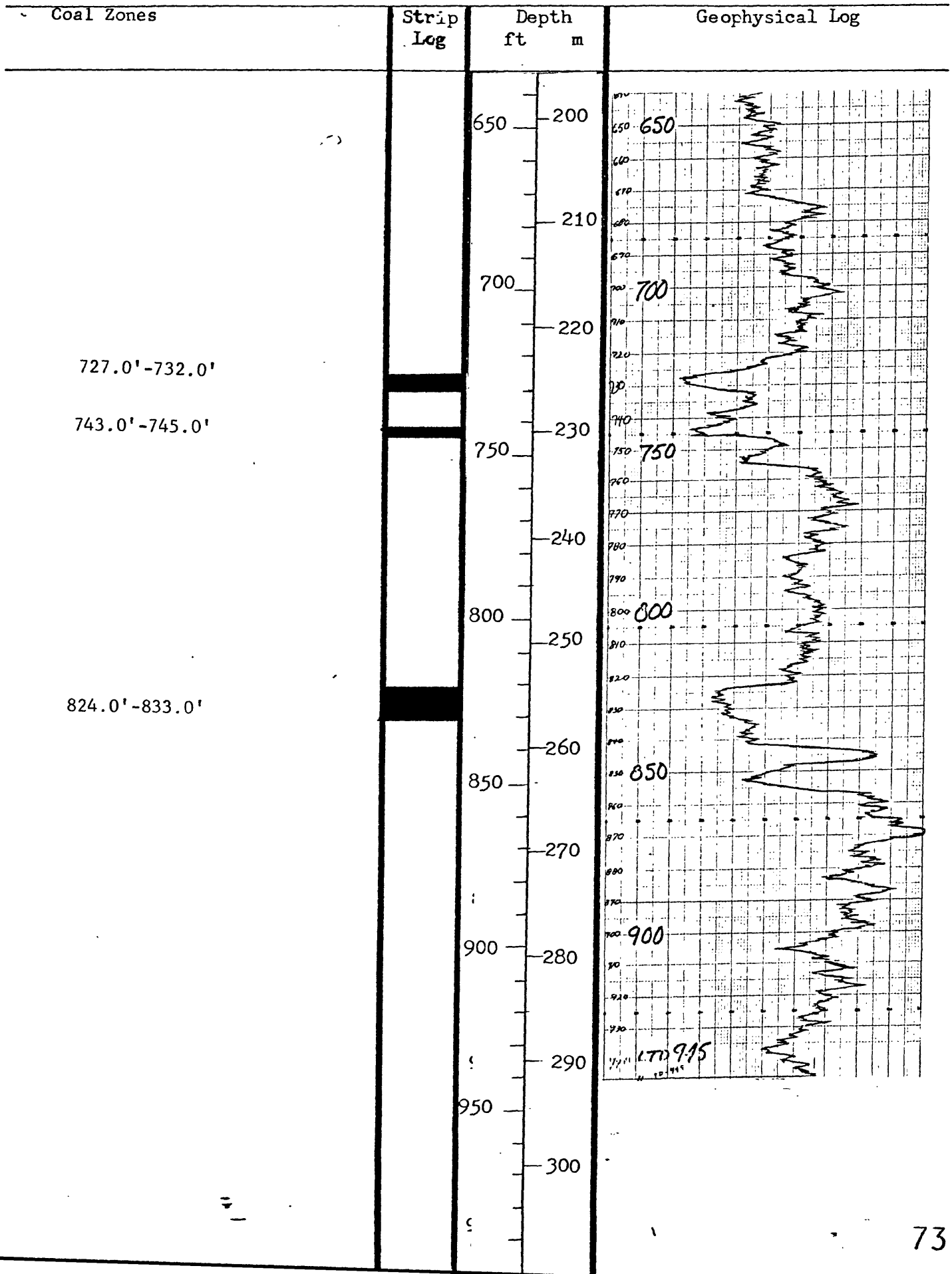
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-34 Surface Elevation 4155'
Location SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 945' Date Logged 10/16/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Oedekoven C-6 ; Projected section; Methane detected



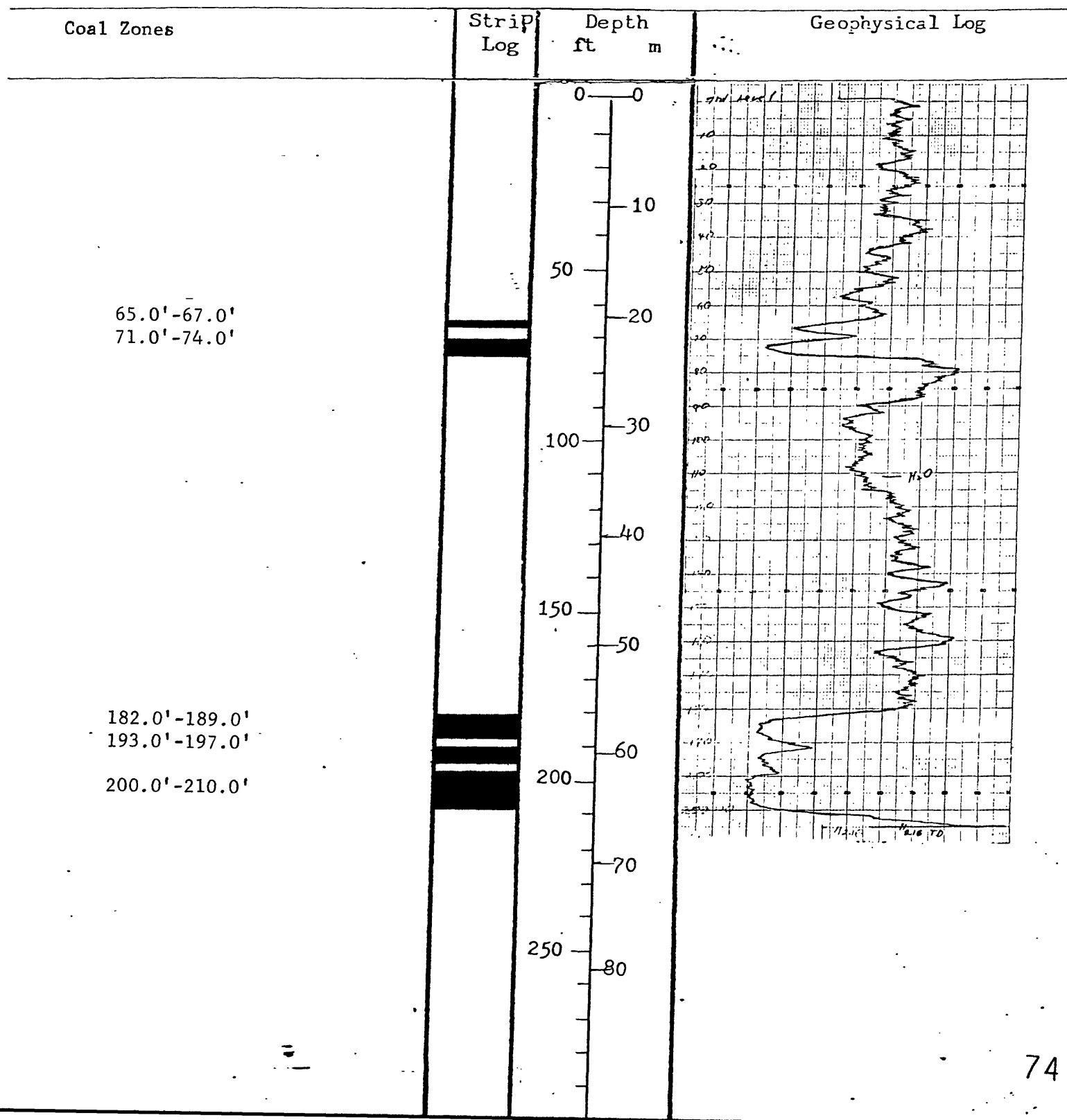


Hole no. 77 BCR-34 (cont.)



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-35 Surface Elevation 4130'
Location NE1/4NE1/4 sec. 19, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 216' Date Logged 10/1/77 Log Run By Babcock Fluid level 111'
Remarks Hole originally designated D. Oedekoven 3 water well; Projected section



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

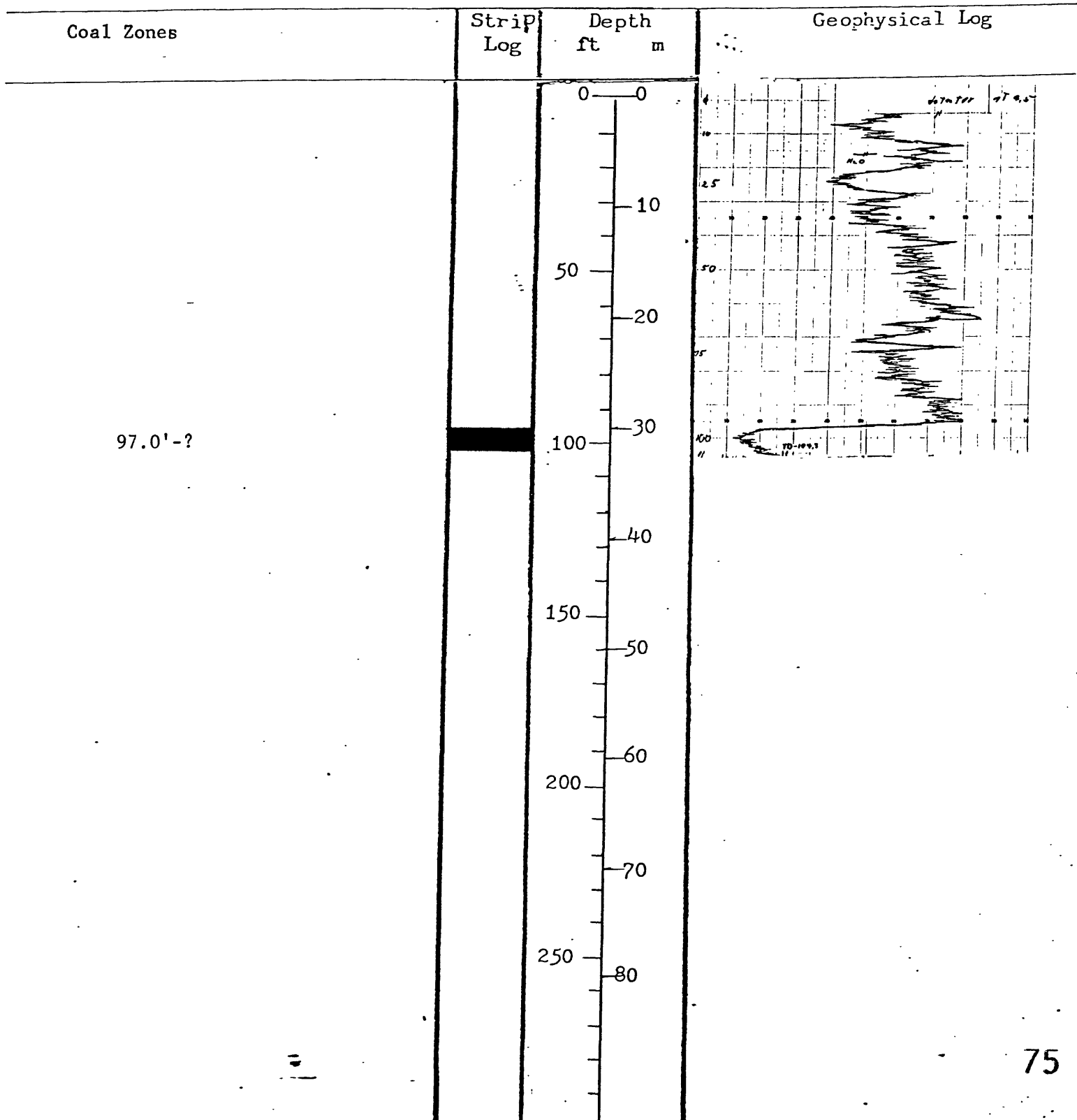
Project Water Well Hole no. 77 BCR-36 Surface Elevation 4050'

Location SE 1/4 NW 1/4 sec. 20, T. 55N, R. 73W, County Campbell

State Wyoming Nearest Town Recluse Quad Recluse

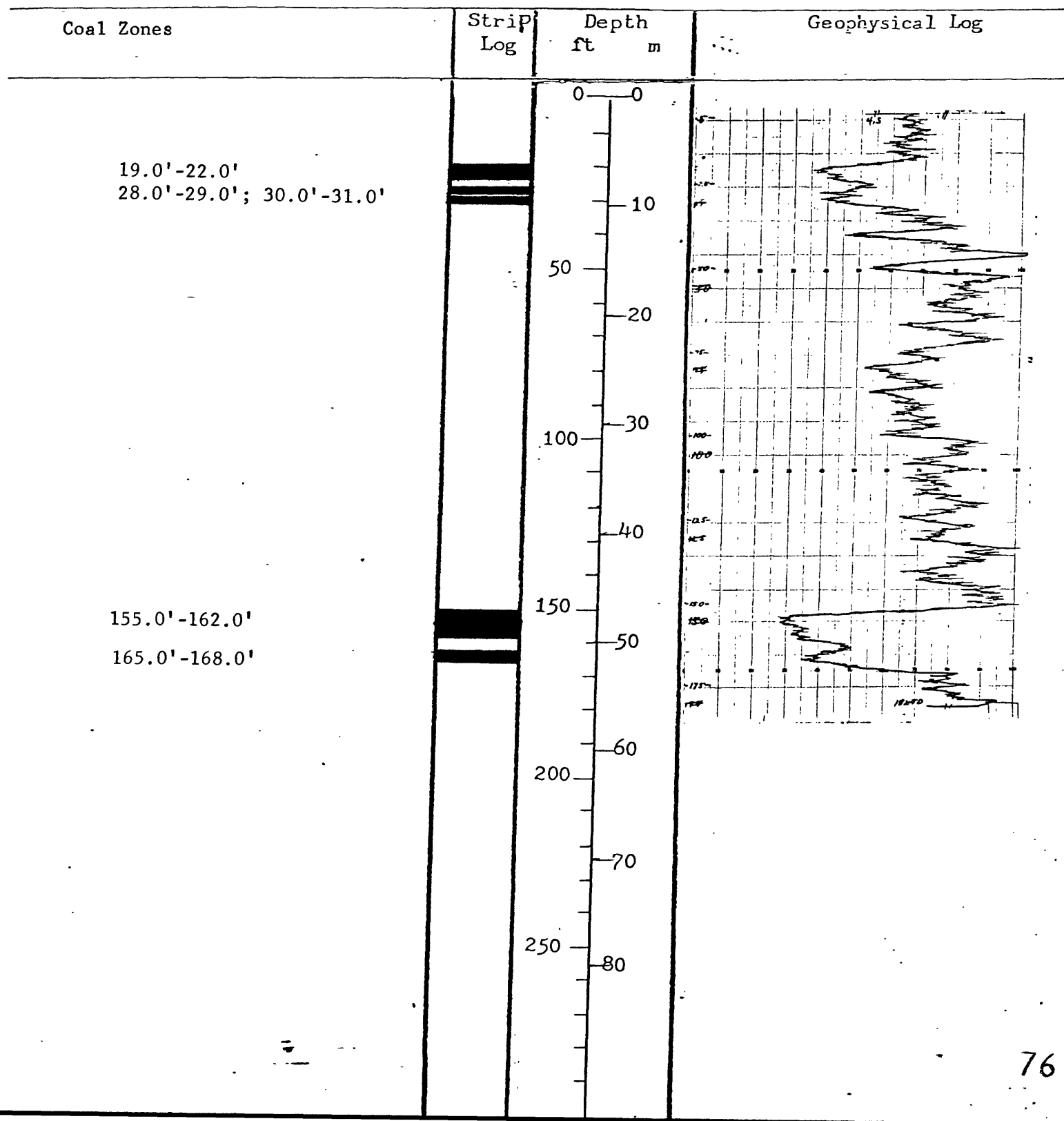
Log Depth 104.5' Date Logged 12/16/77 Log Run By Babcock Fluid level 16'

Remarks Hole originally designated L. Oedekoven 3 water well; Projected section; Bottom in coal



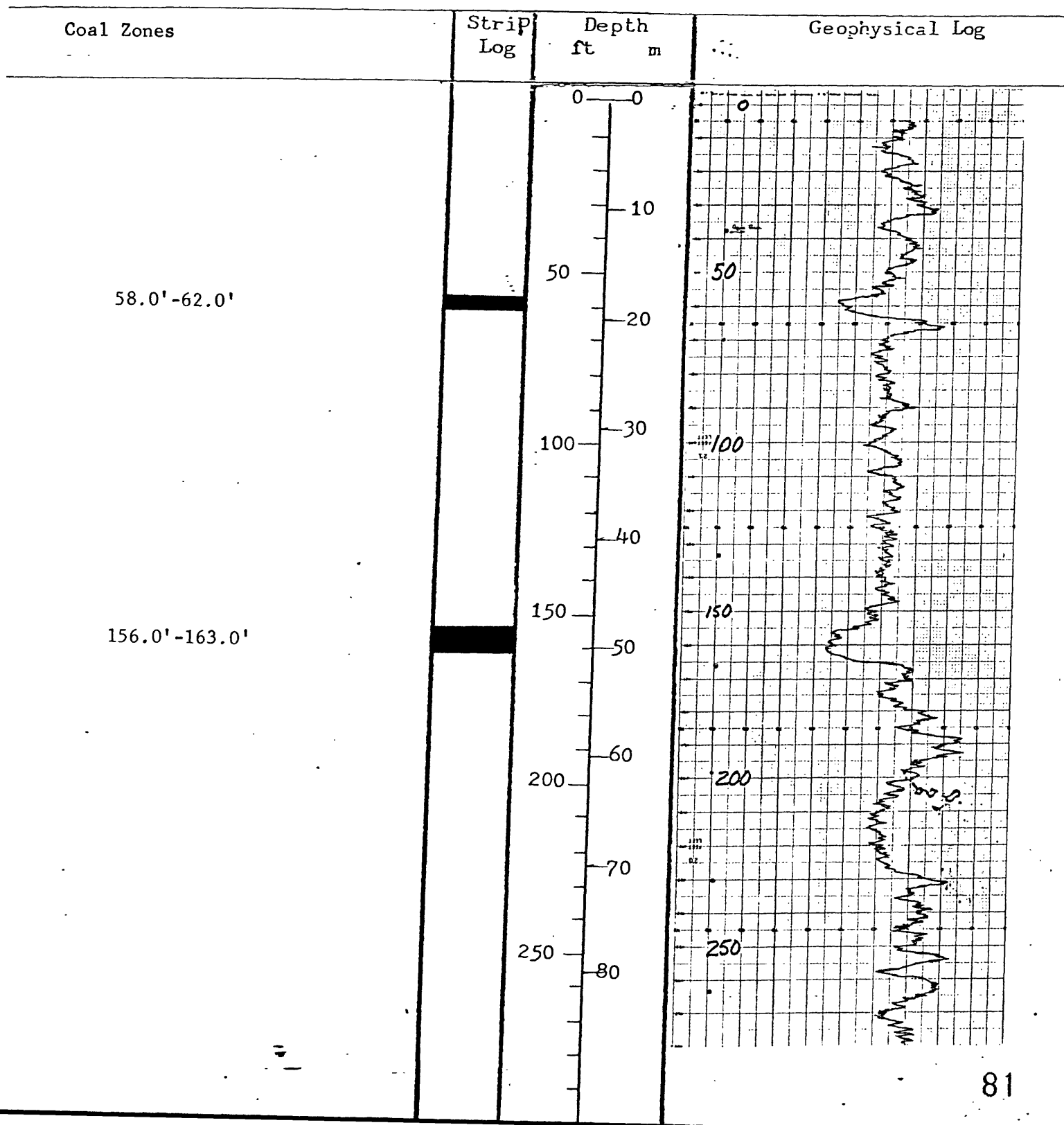
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-37 Surface Elevation 4090'
Location SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 182' Date Logged 12/16/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated L. Oedekoven 2 water well; Projected section

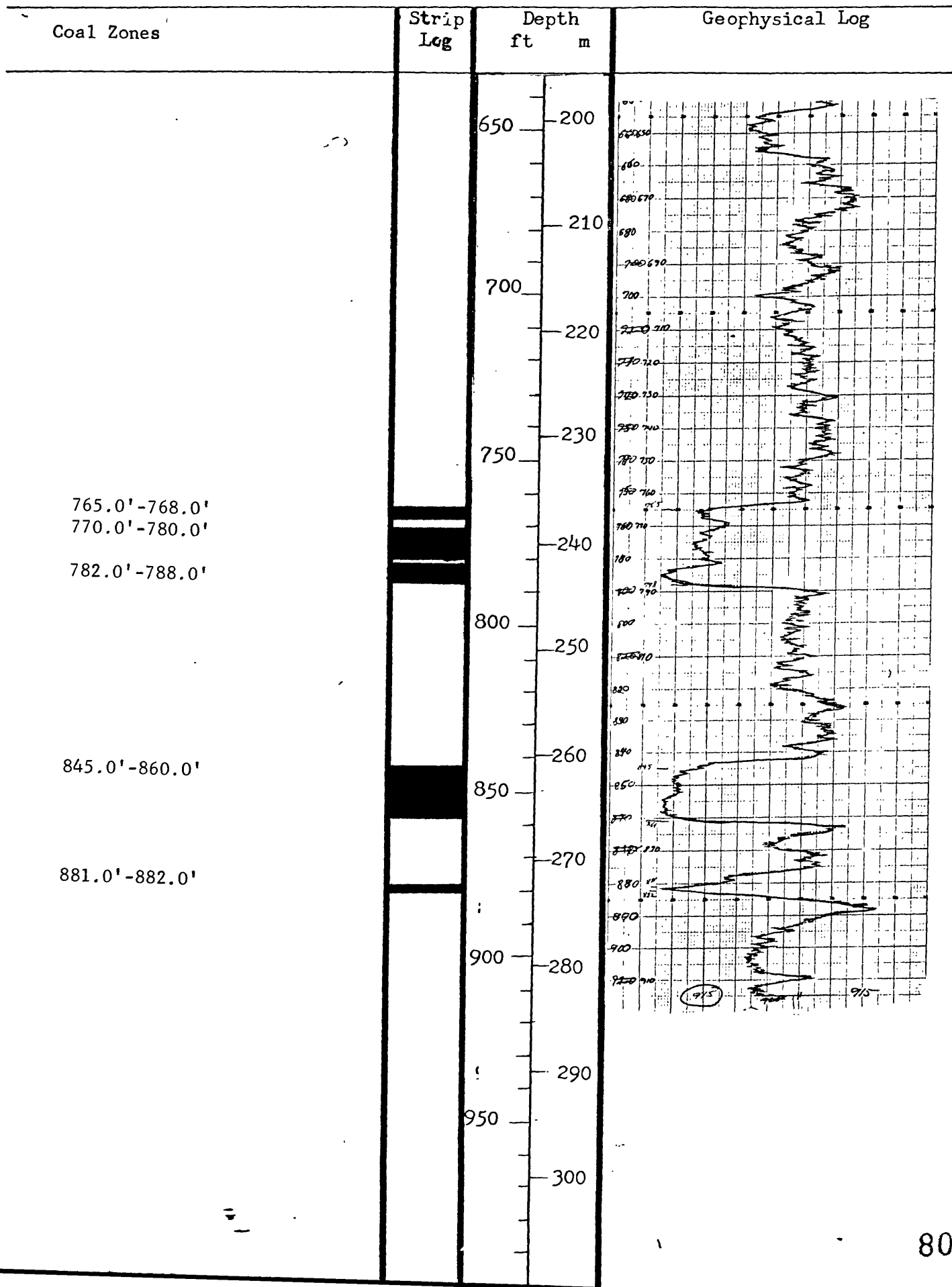


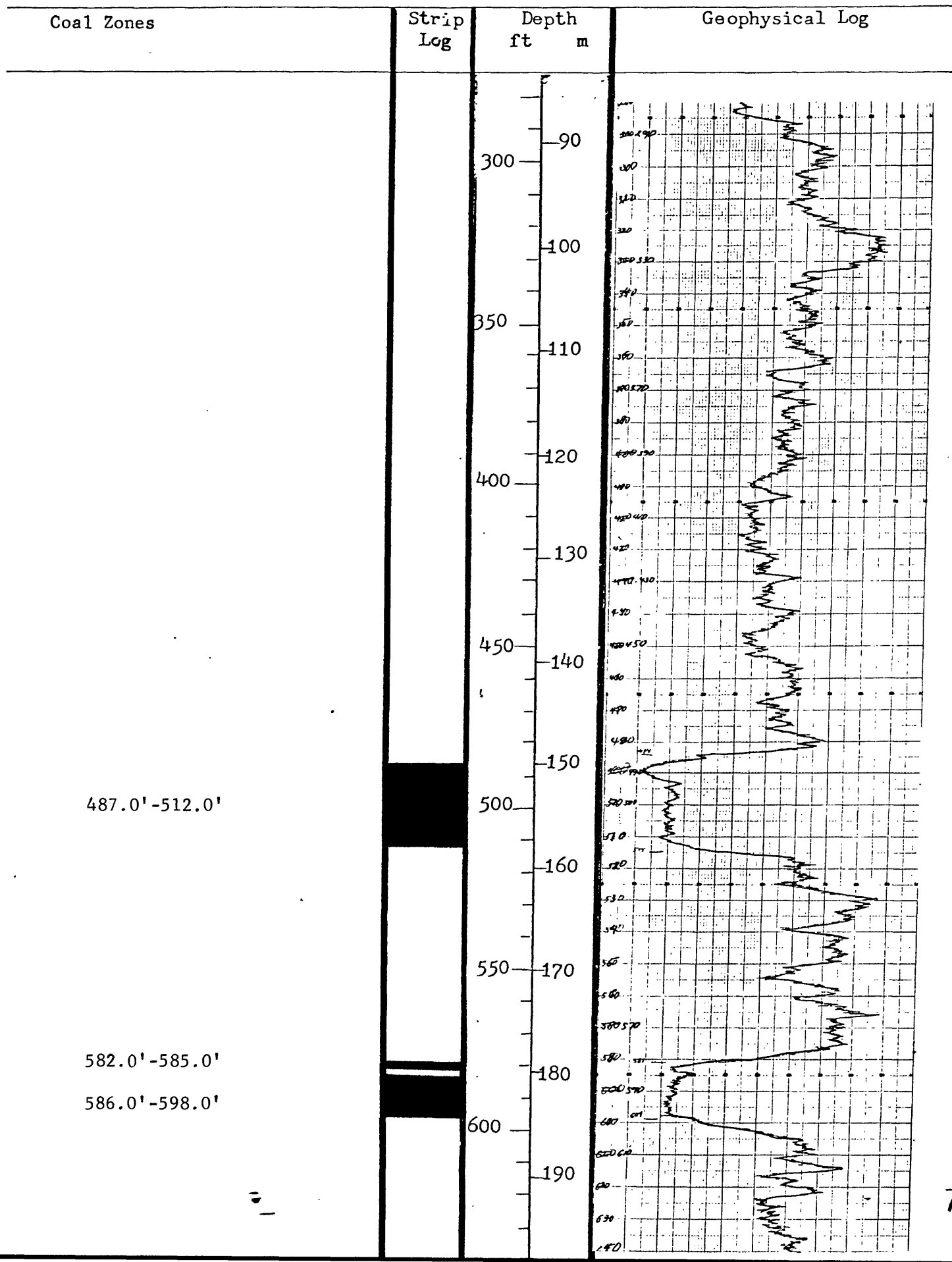
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-40 Surface Elevation 4119'
Location NW 1/4 SE 1/4 sec. 13, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 357' Date Logged 3/25/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated James Oedekoven 1 ; Projected section ; Methane detected



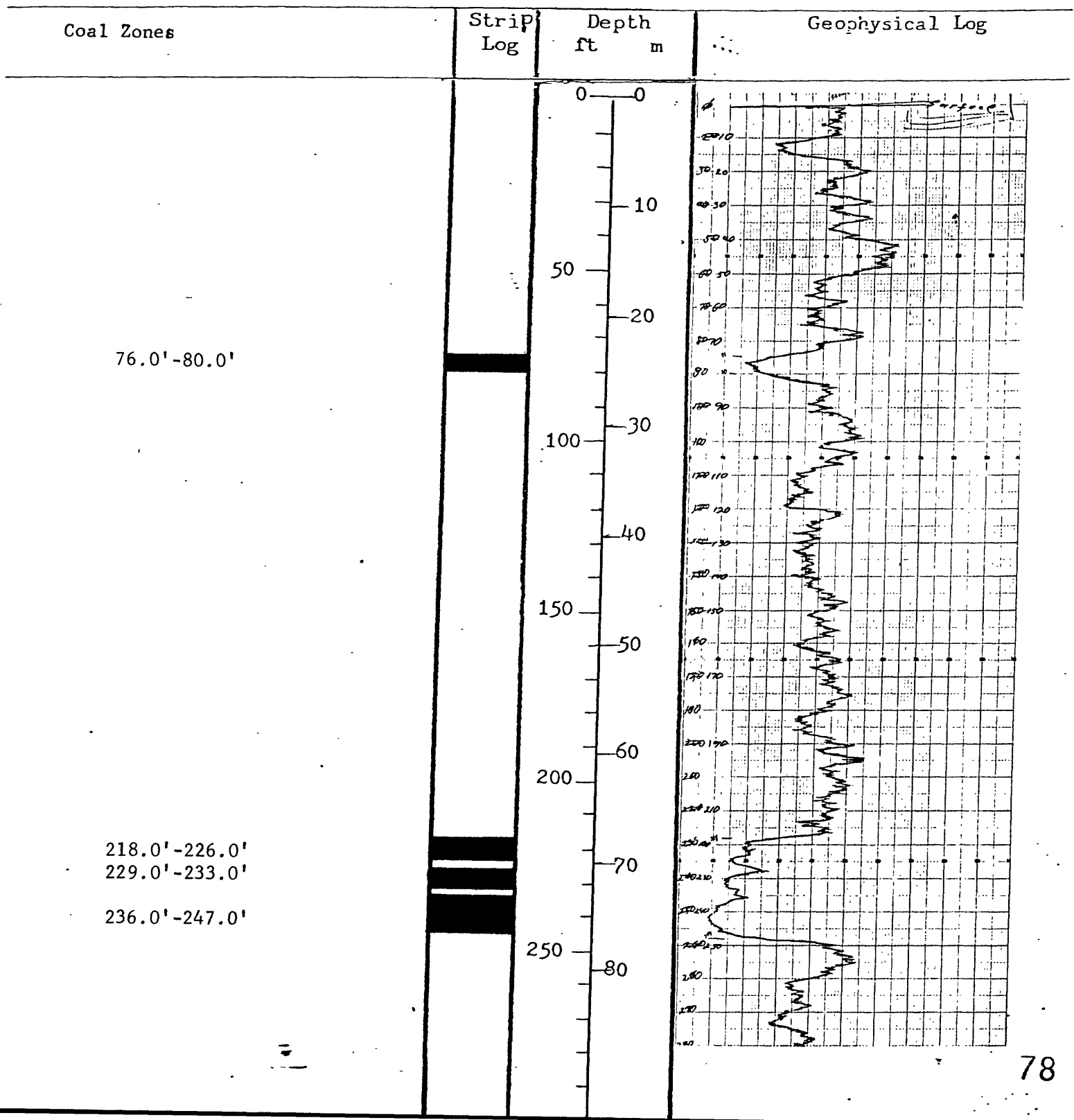
Hole no. 77 BCR-39 (cont.)





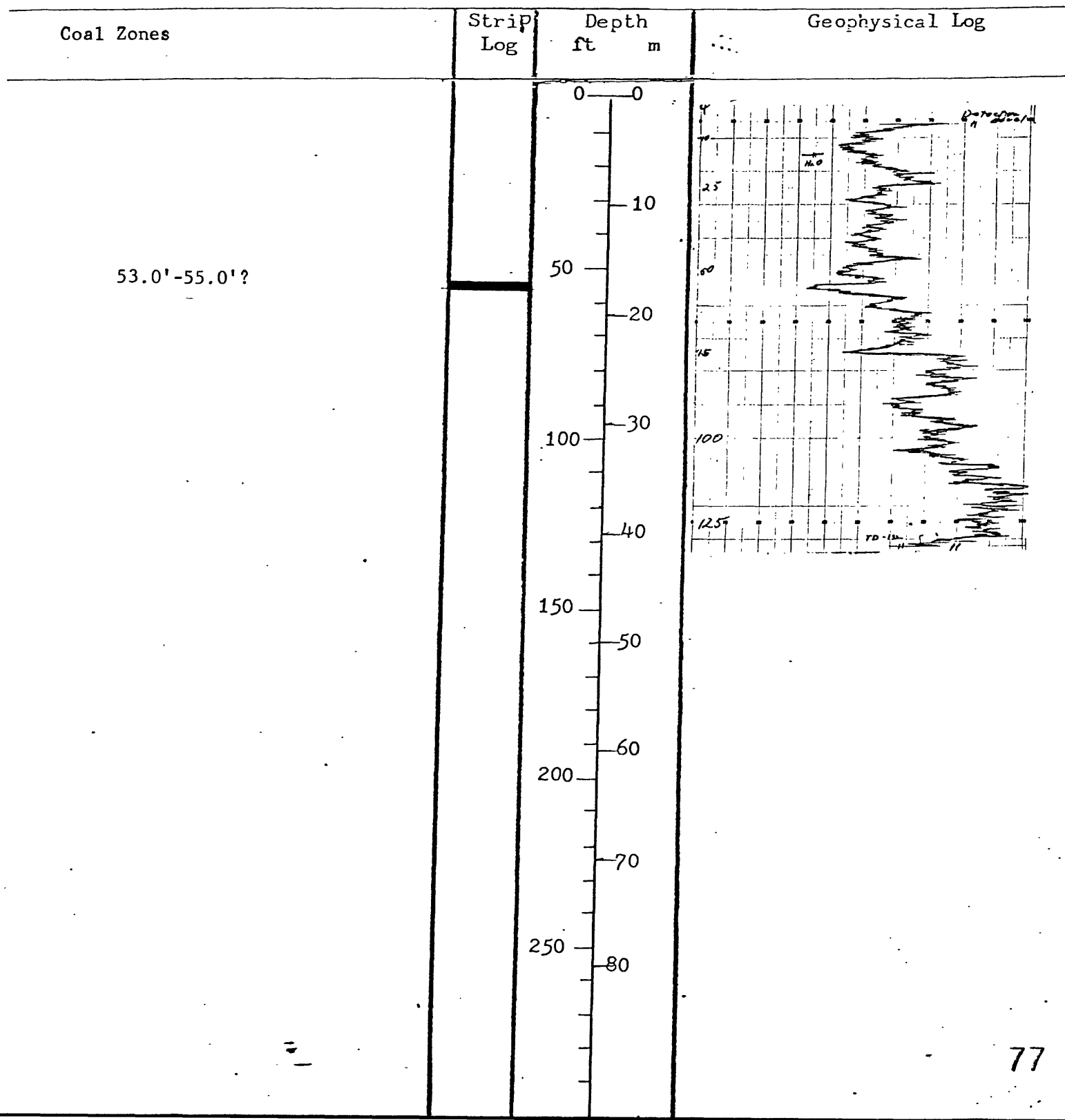
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-39 Surface Elevation 4160'
 Location NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Homestead Draw SW
 Log Depth 915' Date Logged 10/12/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated L. Oedekoven OW ; Projected section

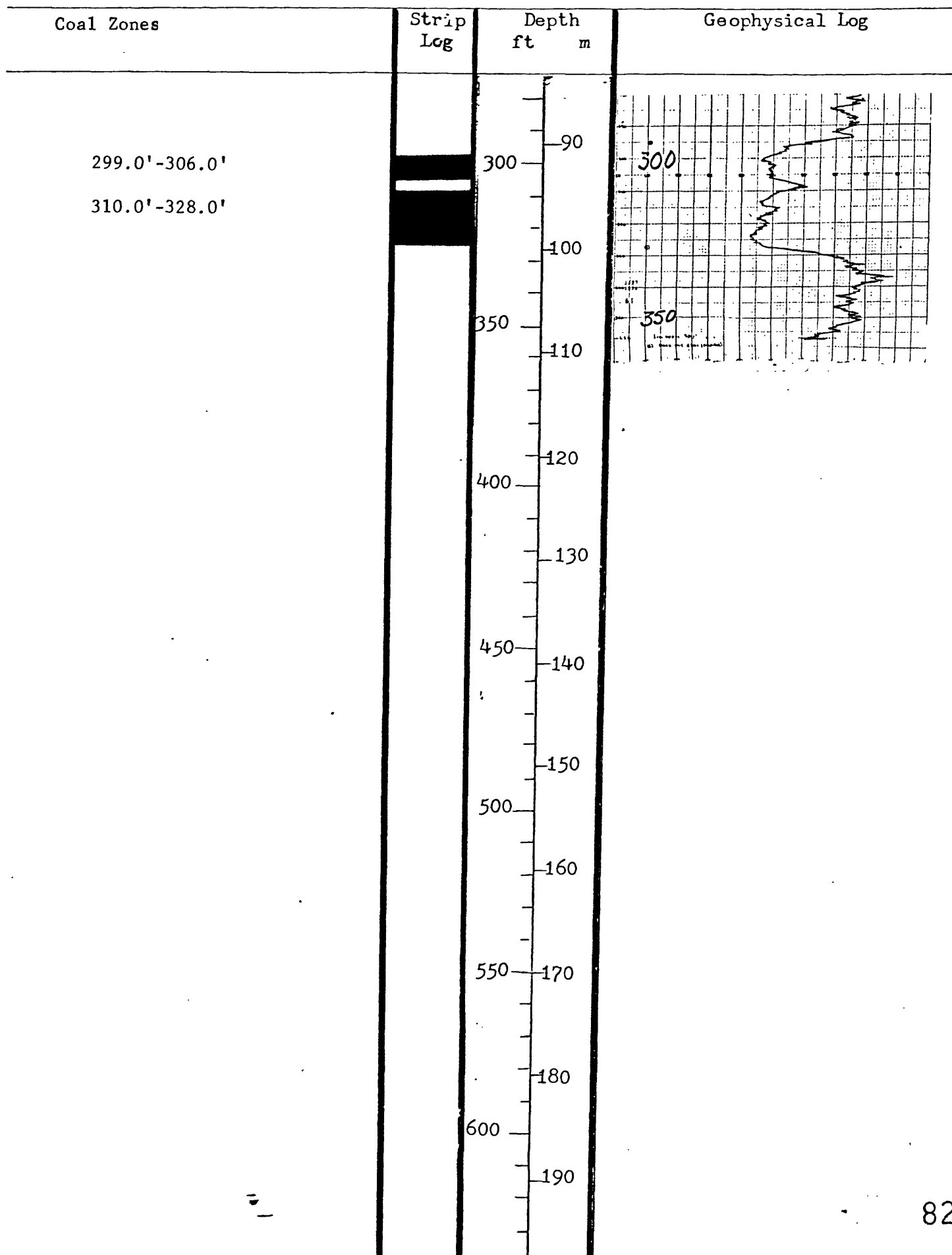


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-38 Surface Elevation 4125'
Location NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 55N, R. 73W, County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 132' Date Logged 12/16/77 Log Run By Babcock Fluid level 15'
Remarks Hole originally designated L. Oedekoven 1 water well; Projected section



Hole no. 77 BCR-40 (cont.)



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

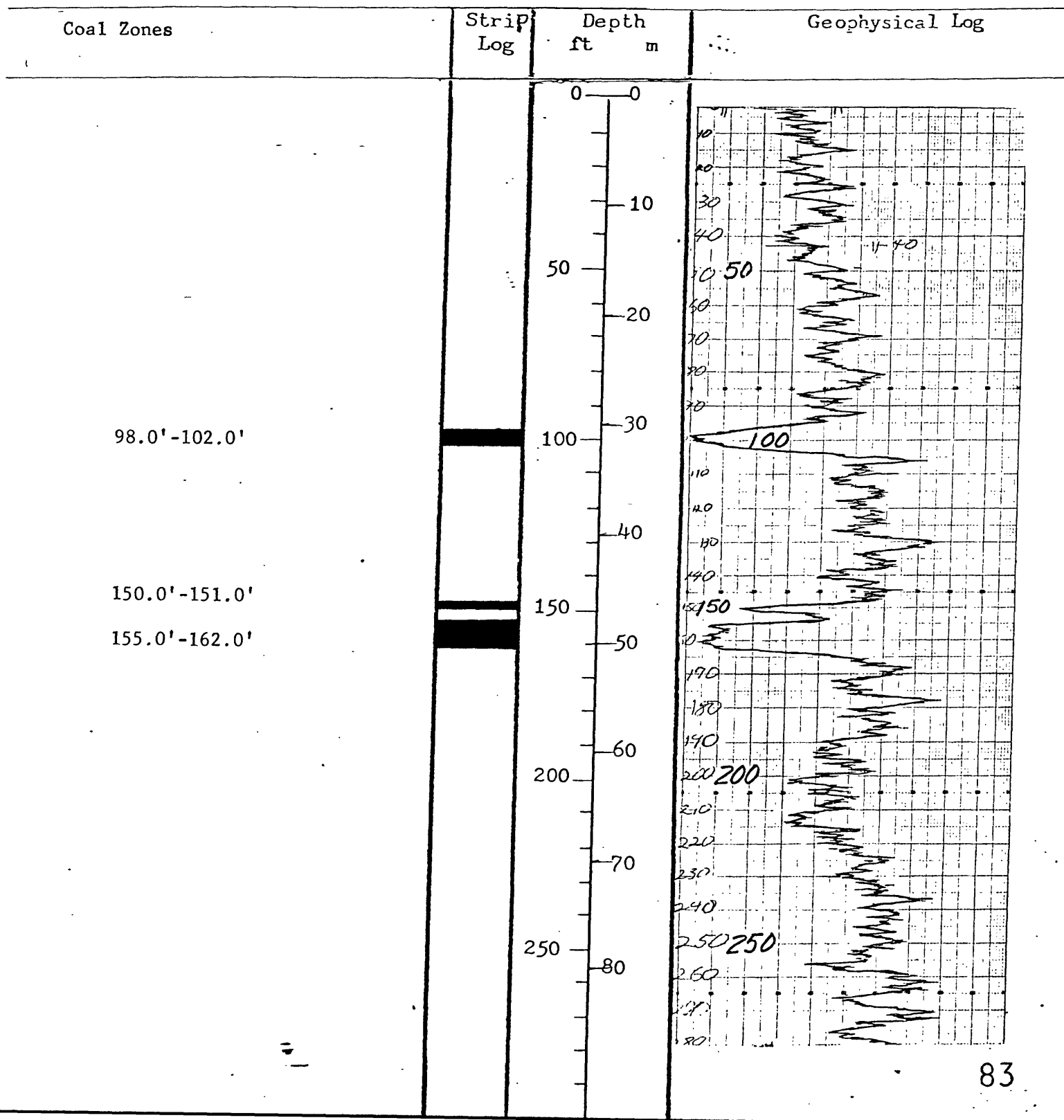
Project Water Well Hole no. 77 BCR-41 Surface Elevation 4100'

Location NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 13, T. 55N, R. 74W, County Campbell

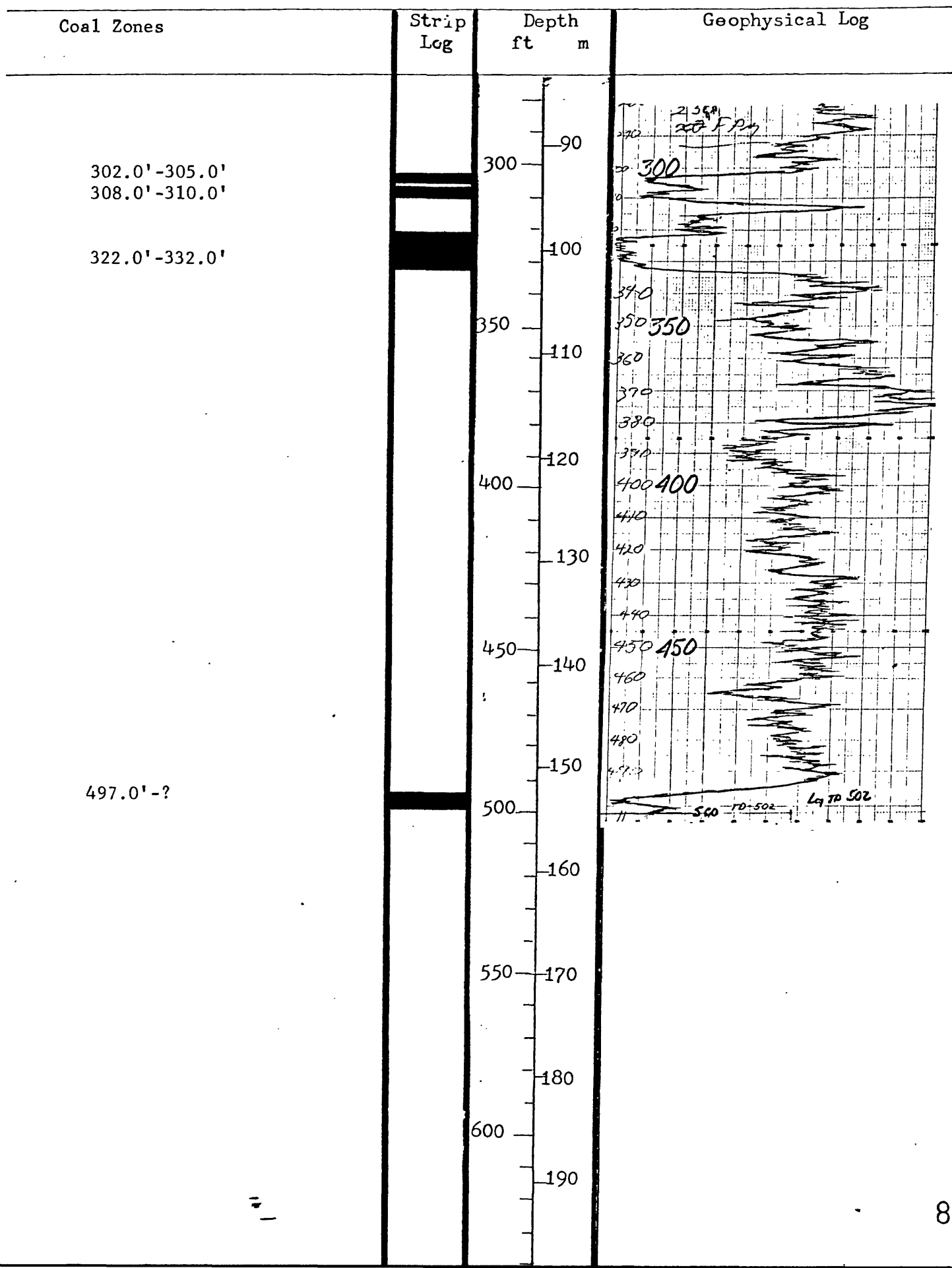
State Wyoming Nearest Town Recluse Quad Recluse

Log Depth 509' Date Logged 9/14/77 Log Run By Babcock Fluid level ---

Remarks Hole originally designated Recluse school; Projected section; Bottom in coal; Metha detected

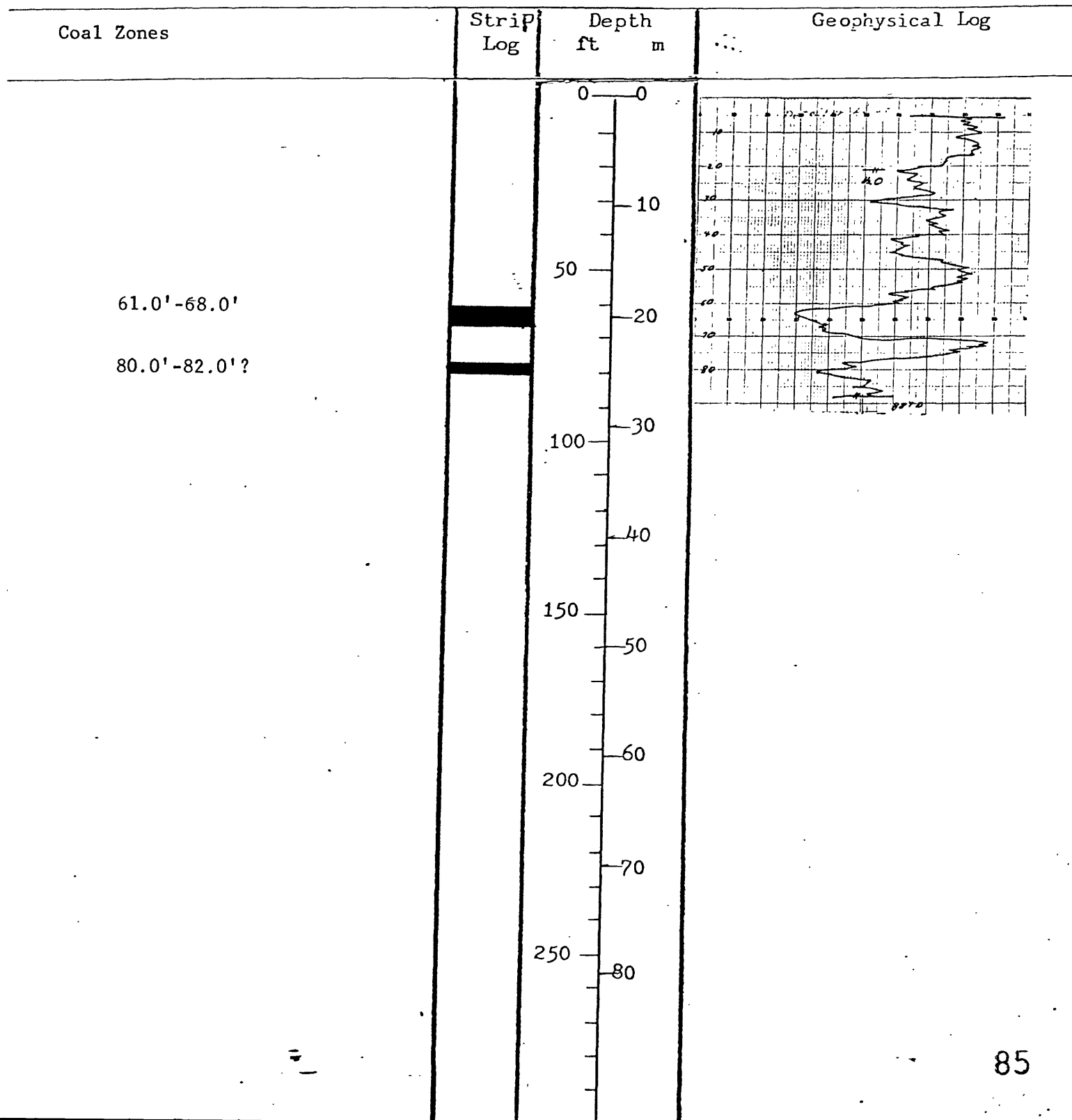


Hole no. 77 BCR-41 (cont.)



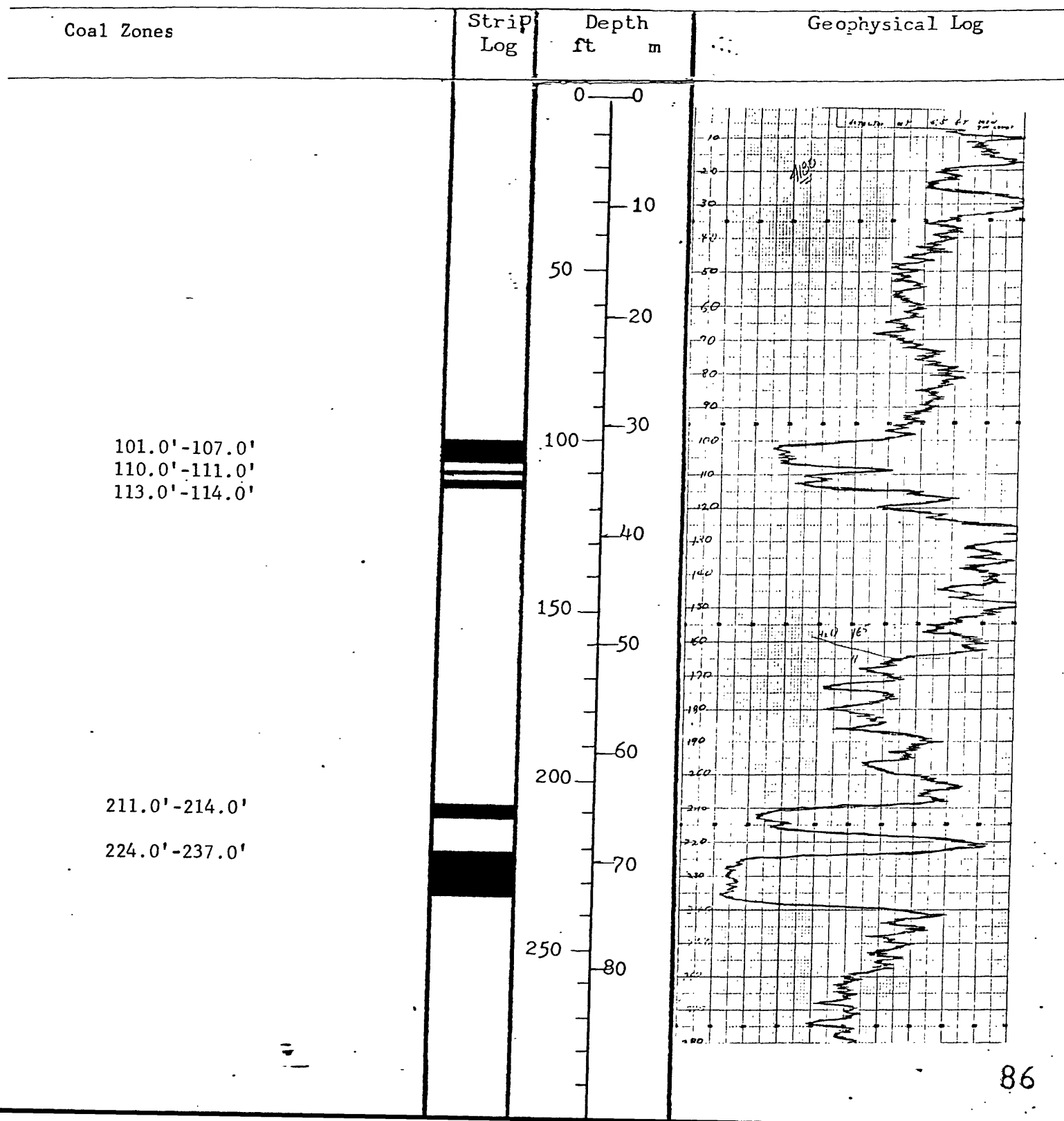
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-42 Surface Elevation 4110'
 Location NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 17, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 88' Date Logged 10/5/77 Log Run By Babcock Fluid level 21'
 Remarks Hole originally designated R. Sorenson 5

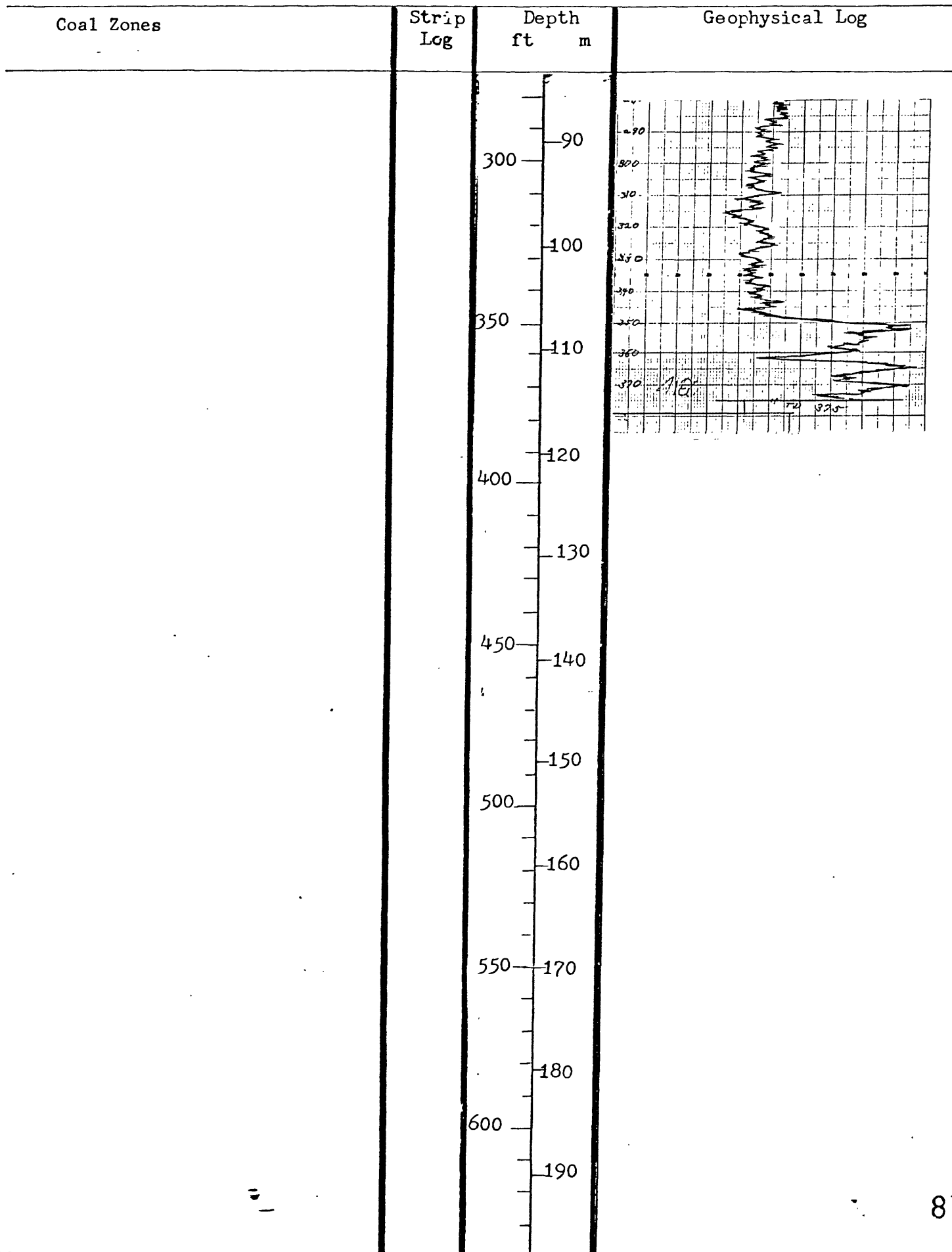


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-43 Surface Elevation 4190'
Location NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 19, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 375' Date Logged 10/4/77 Log Run By Babcock Fluid level 165'
Remarks Hole originally designated R. Sorenson 1; Methane detected

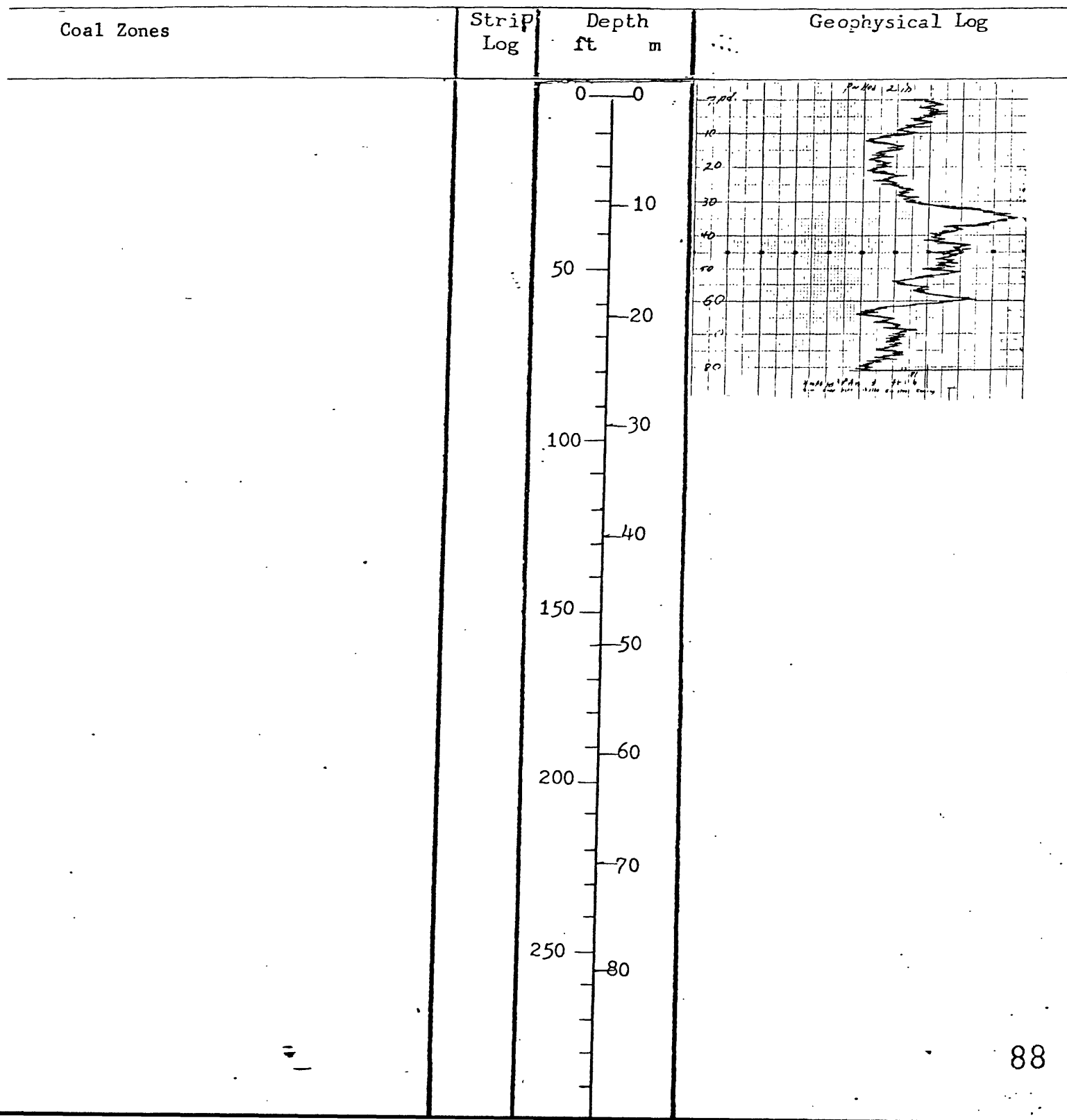


Hole no. 77 BCR-43 (cont.)



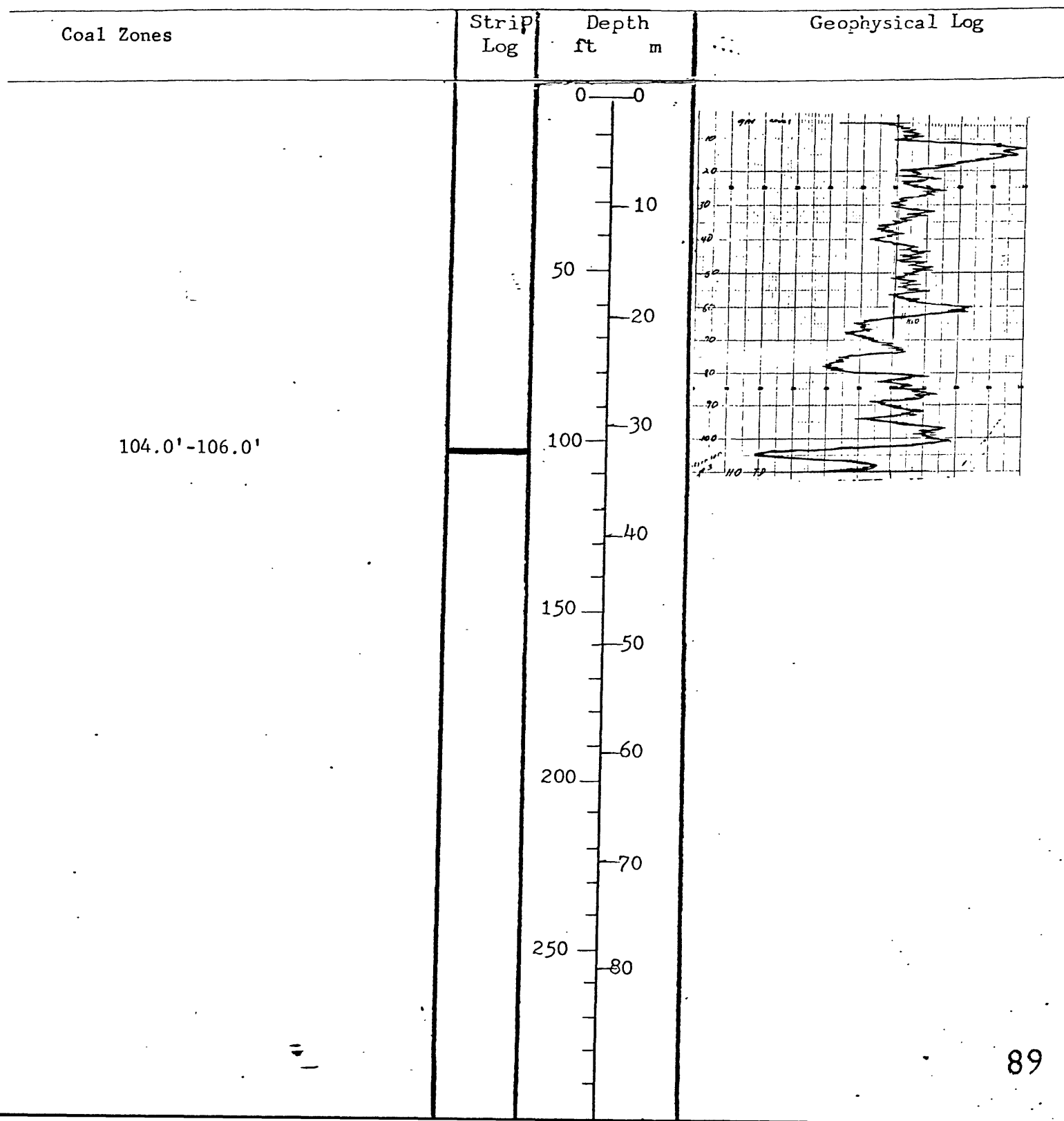
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-44 Surface Elevation 4075'
 Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 90' Date Logged 10/8/77 Log Run By Babcock Fluid level 58'
 Remarks Hole originally designated R. Sorenson 2 water well ; No coal



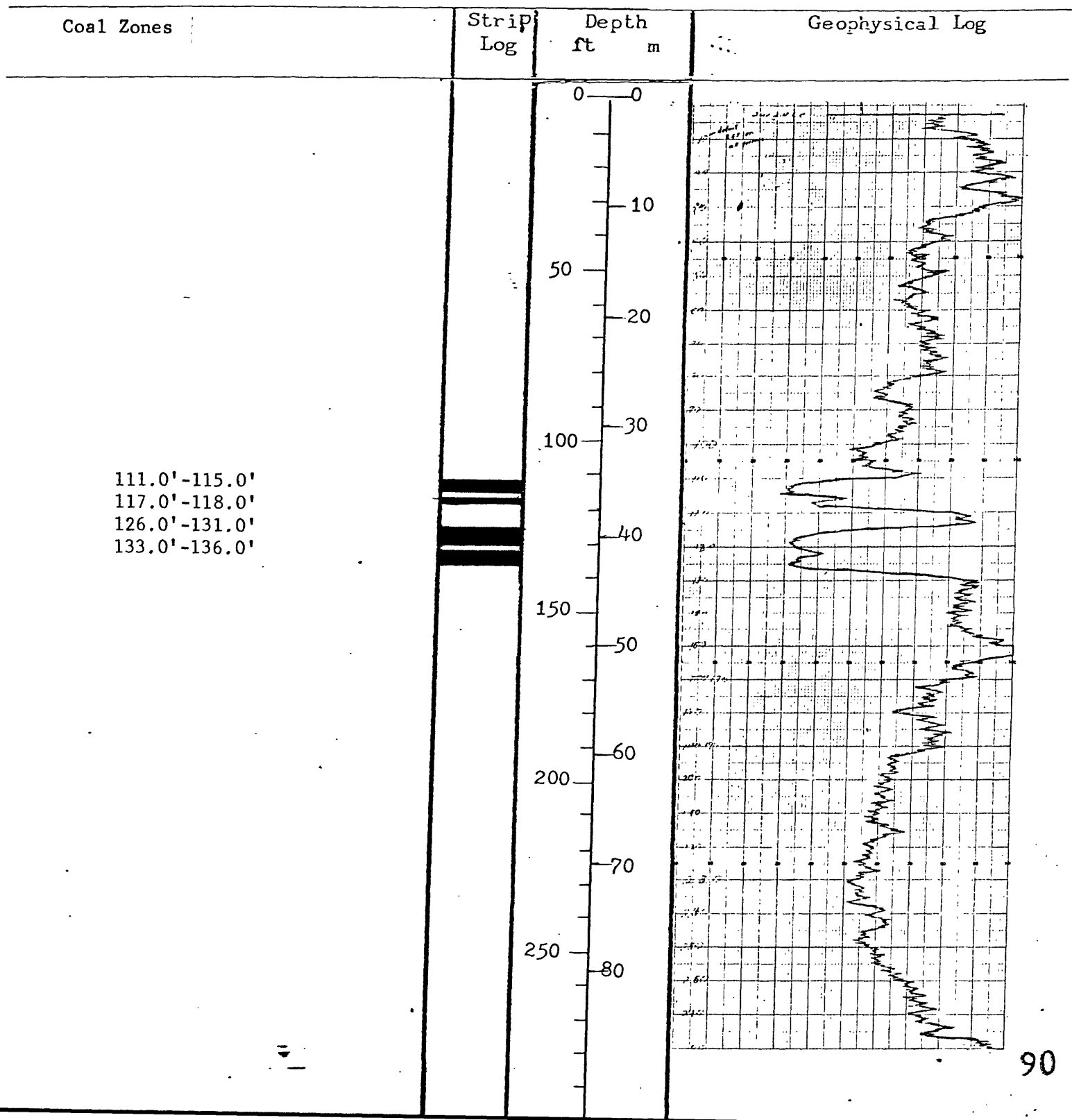
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-45 Surface Elevation 4170'
Location SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 110' Date Logged 10/7/77 Log Run By Babcock Fluid level 64'
Remarks Hole originally designated R. Sorenson 3 water well; Methane detected

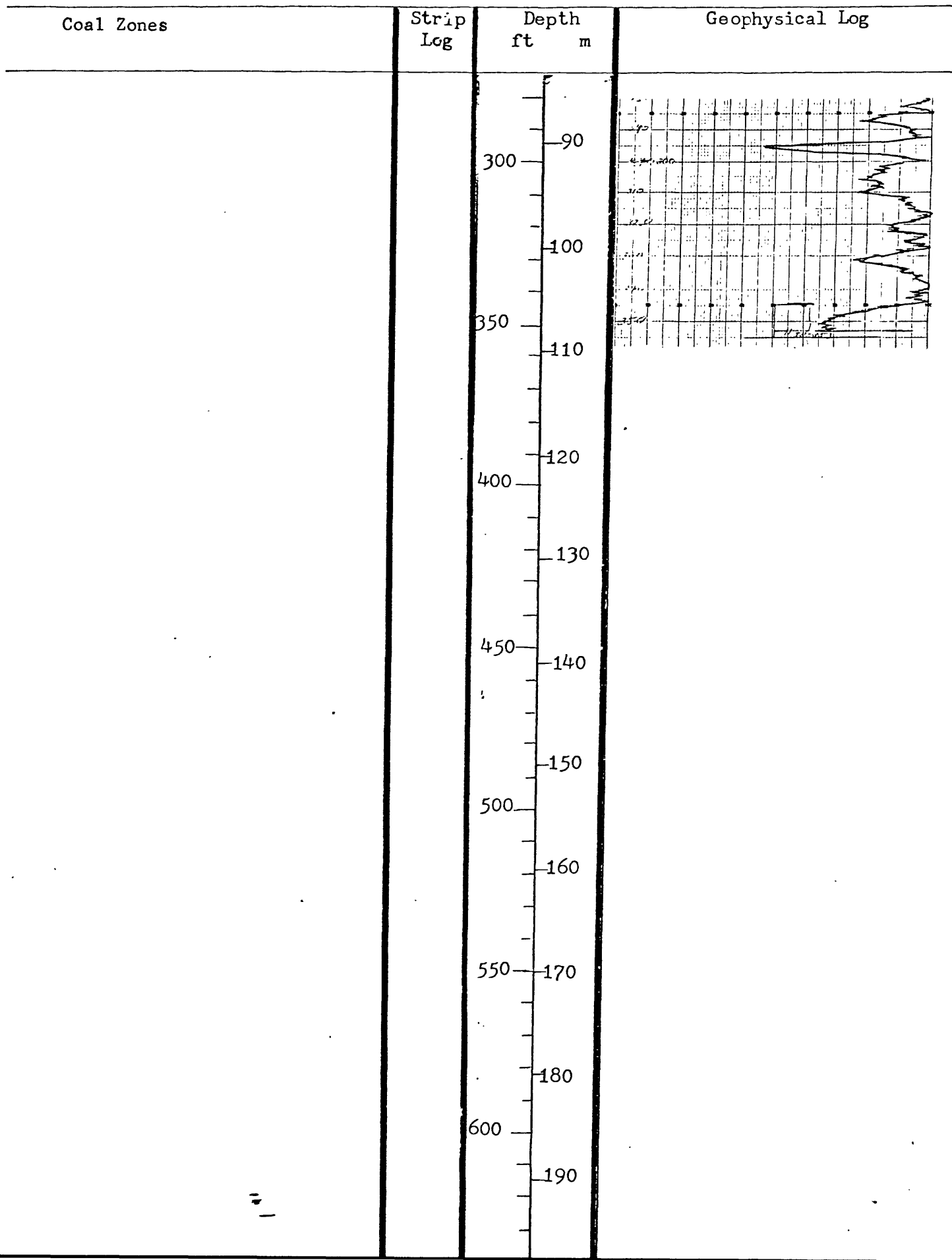


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-46 Surface Elevation 4205'
Location SW $\frac{1}{2}$ SW $\frac{1}{2}$ sec. 21, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 353' Date Logged 10/5/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated R. Sorenson 4 water well

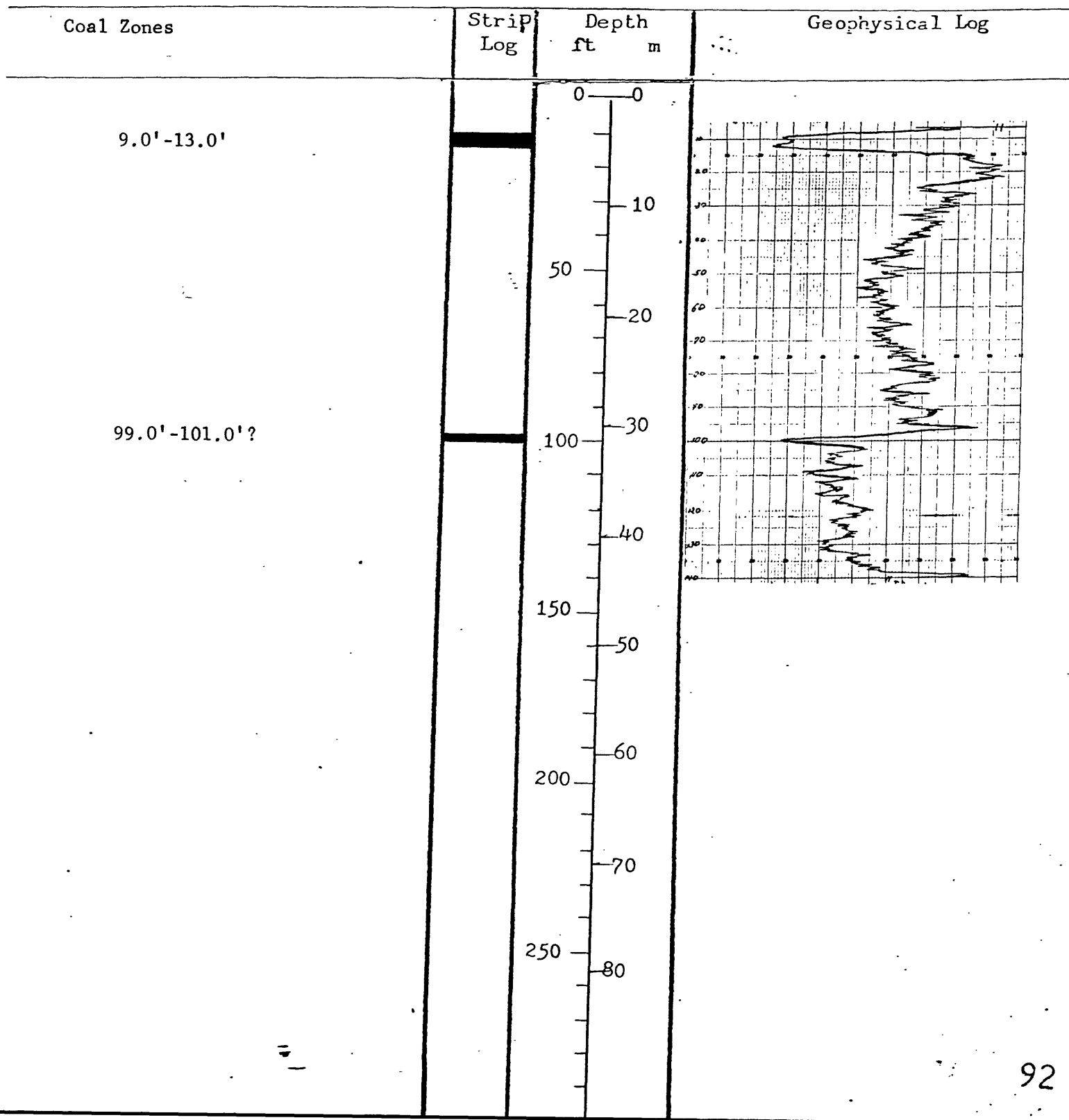


Hole no. 77 BCR-46 (cont.)



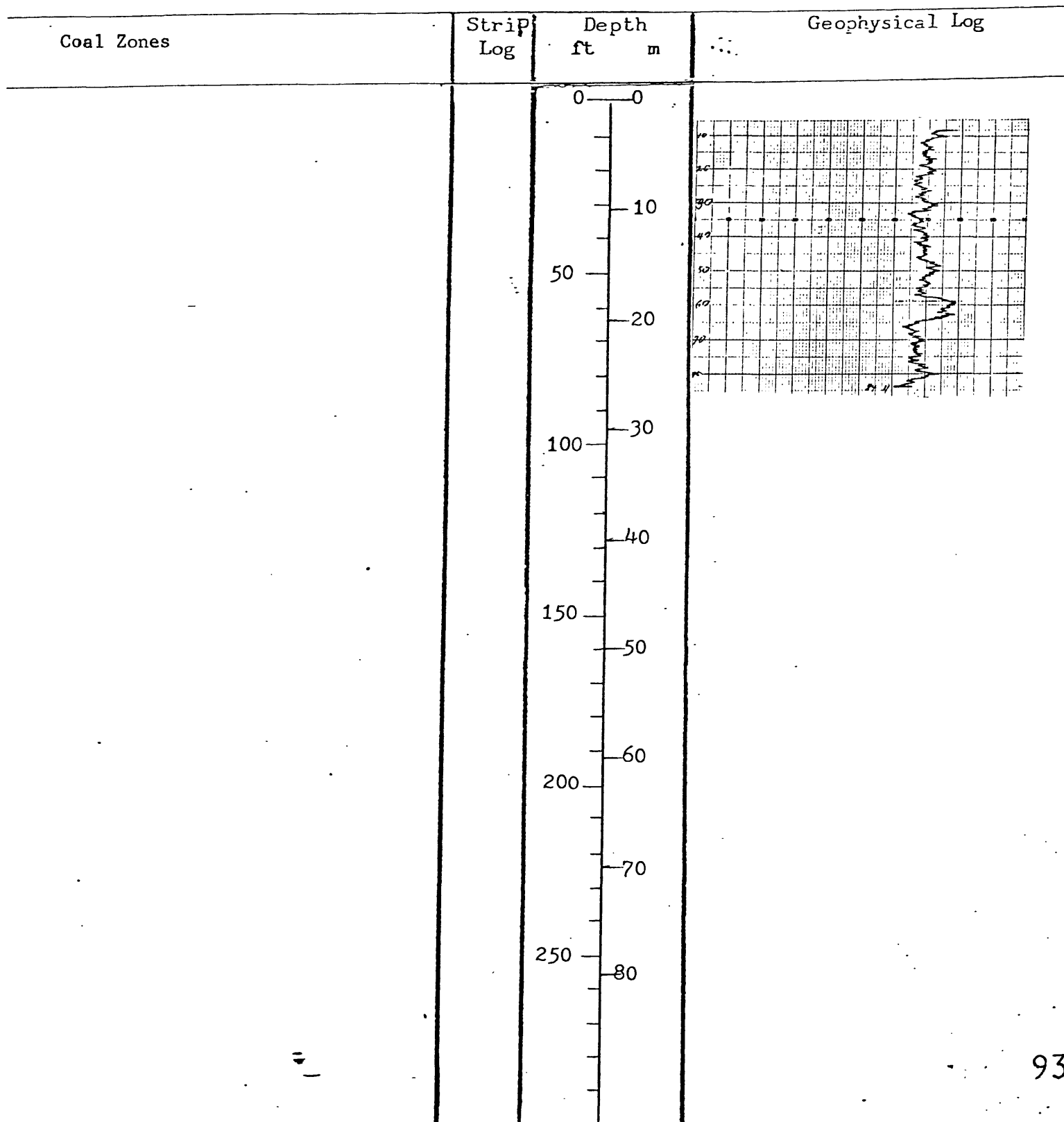
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-47 Surface Elevation 4155'
Location SE $\frac{1}{2}$ NW $\frac{1}{2}$ sec. 22, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 140' Date Logged 10/6/77 Log Run By Babcock Fluid level 98'
Remarks Hole originally designated R. Sorenson 6 water well



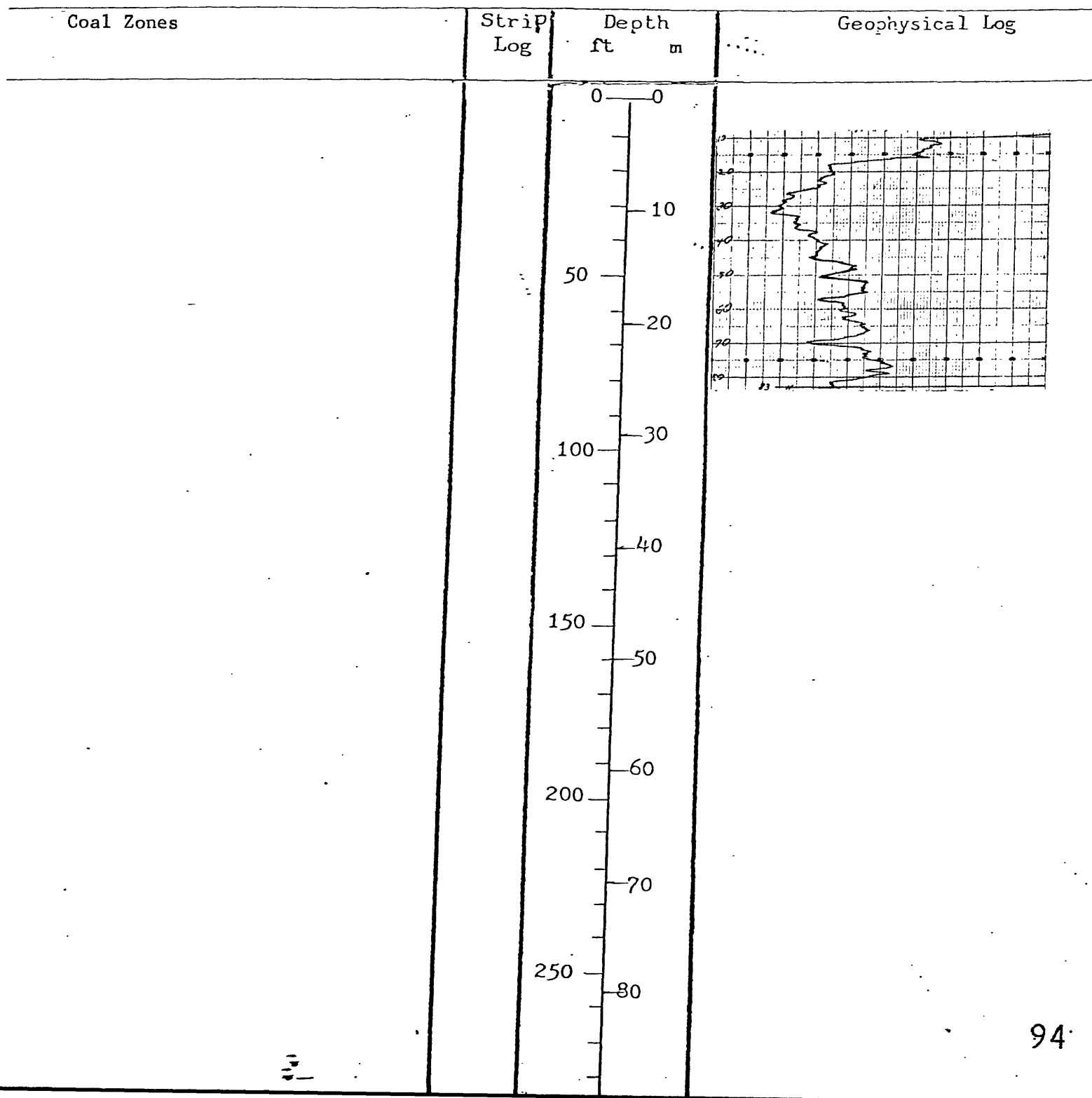
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-48 Surface Elevation 4145'
Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24 , T. 55N , R. 74W , County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 84' Date Logged 10/8/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated D. Oedekoven 1 ; No coal



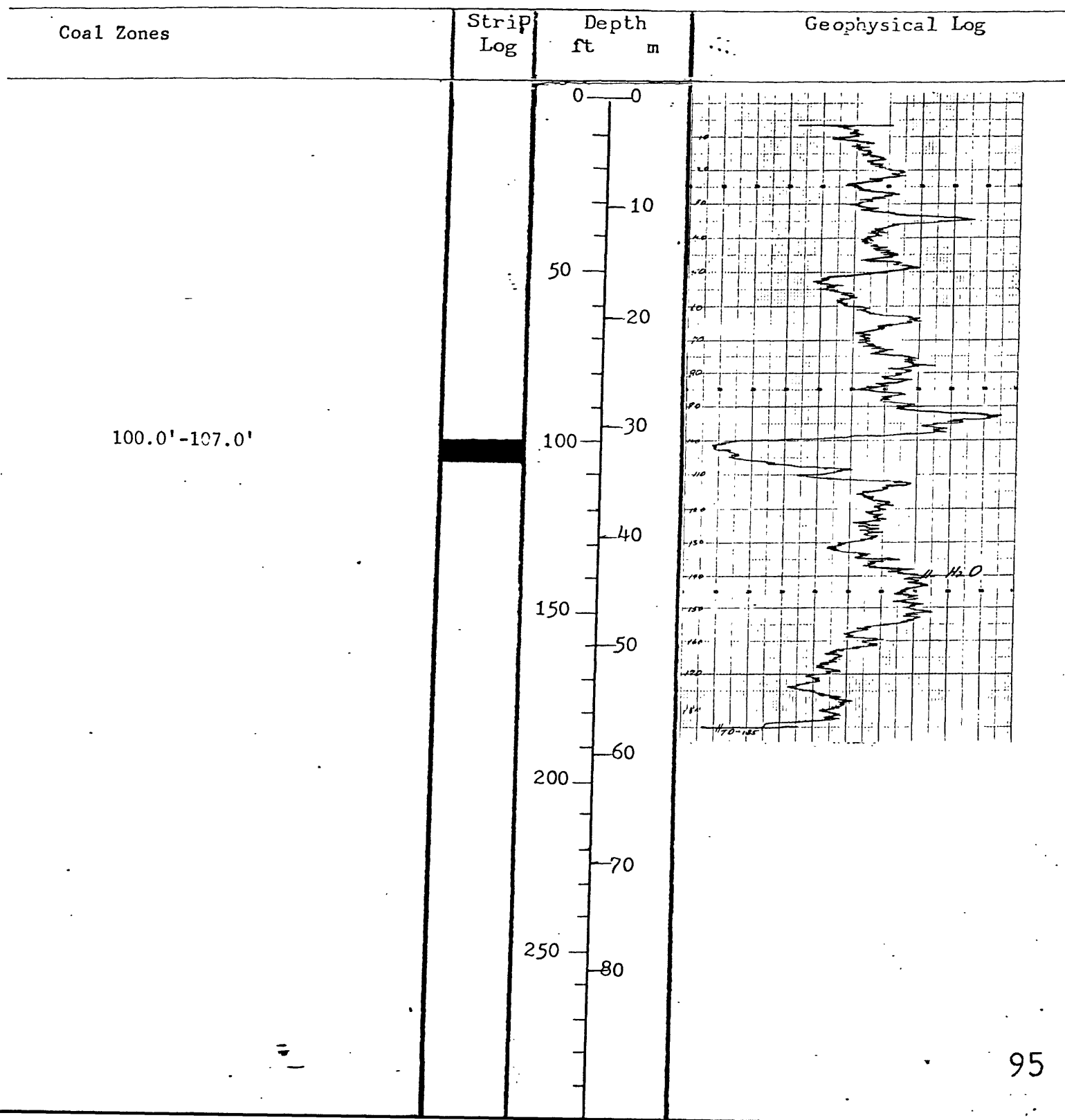
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Gamma Gamma Density

Project Water Well Hole no. 77 BCR-48 Surface Elevation 4145'
Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24 , T. 55N , R. 74W , County Campbell
State Wyoming Nearest Town Recluse Quad Recluse
Log Depth 84' Date Logged 10/8/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated D. Oedekoven 1 ; No coal



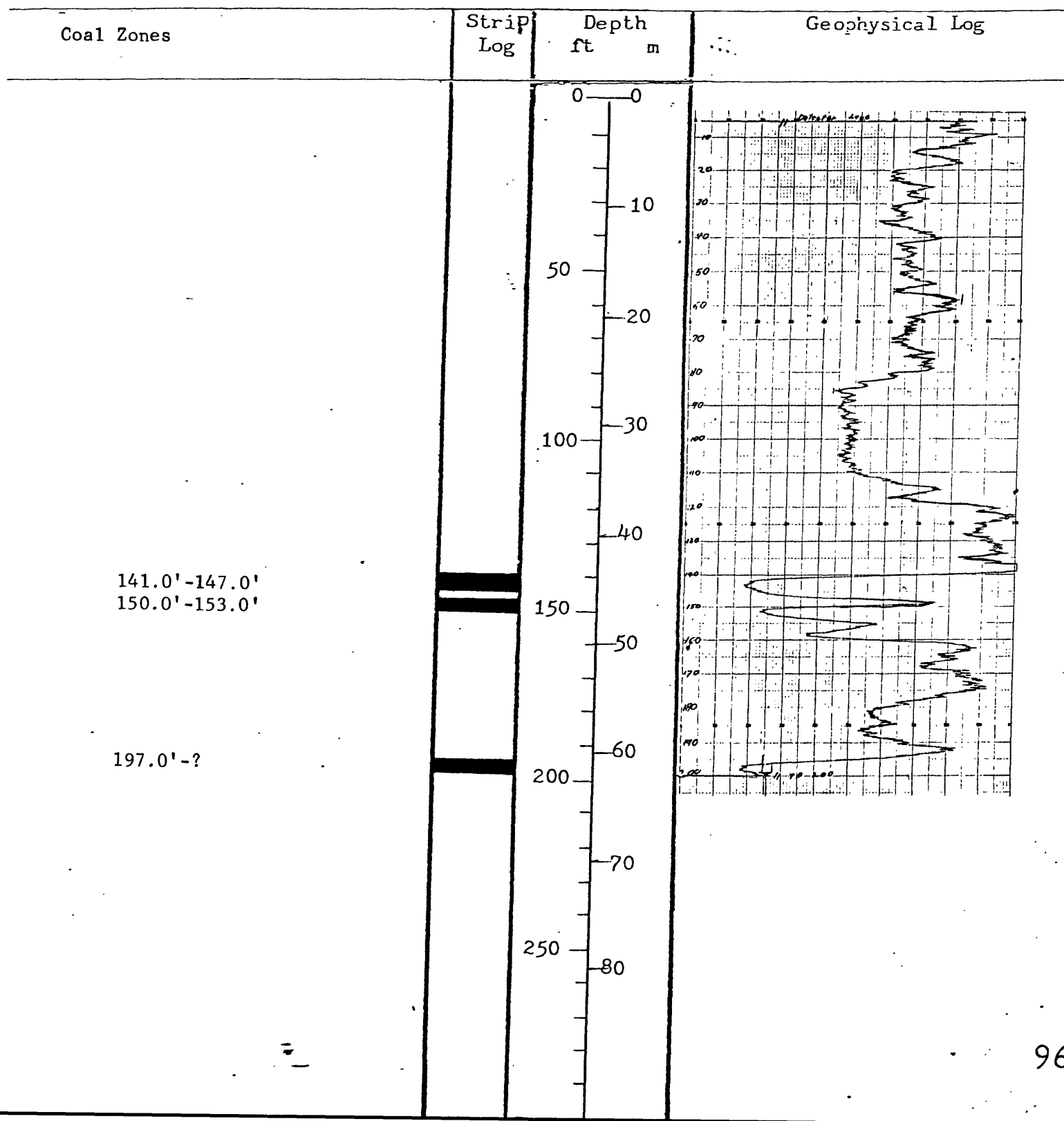
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-49 Surface Elevation 4245'
 Location SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 28, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 185' Date Logged 10/6/77 Log Run By Babcock Fluid level 140'
 Remarks Hole originally designated R. Sorenson 7 water well; Bottom in coal



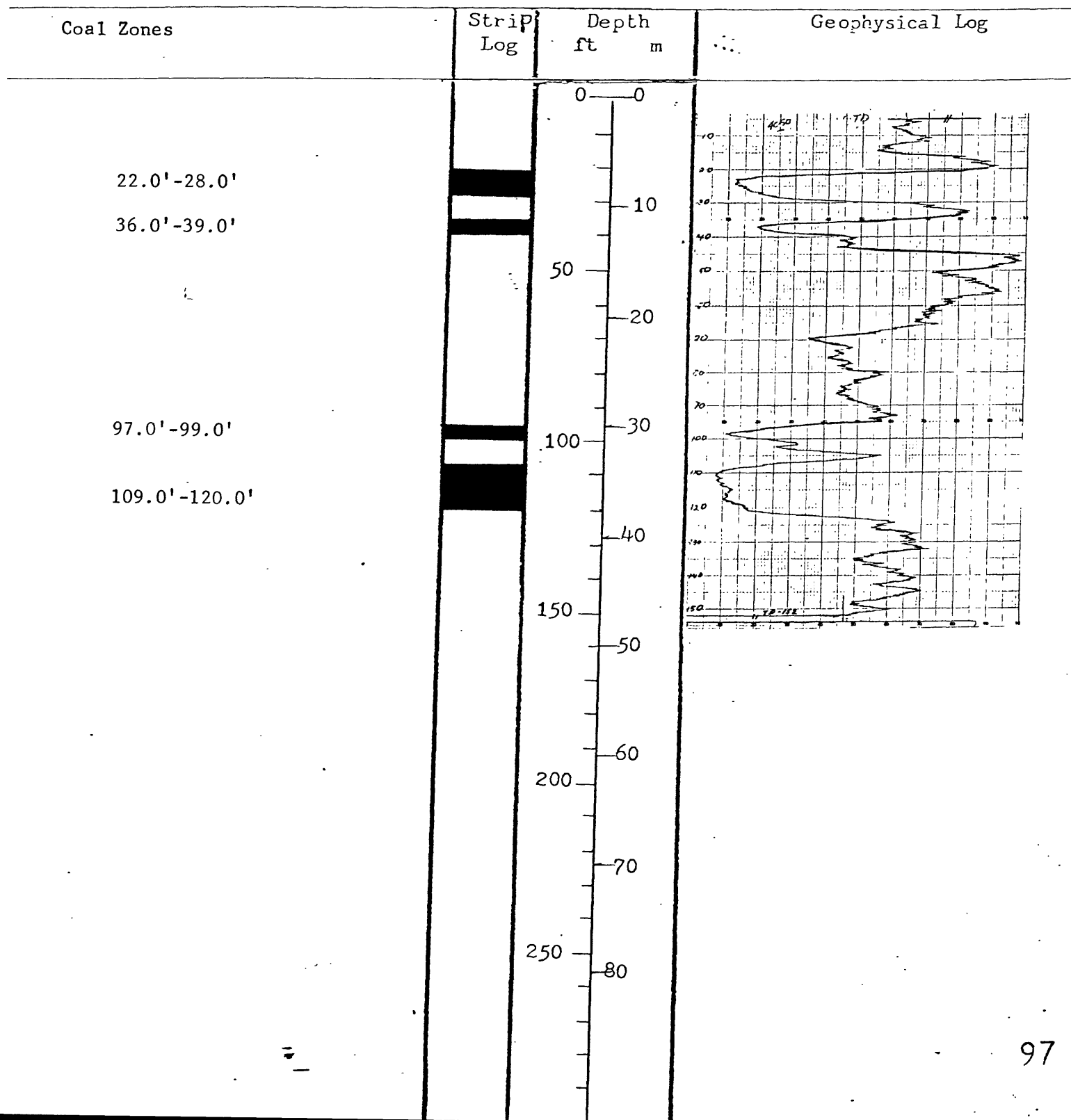
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-50 Surface Elevation 4175'
Location NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, T. 55N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 200' Date Logged 10/16/77 Log Run By Babcock Fluid level 150'
Remarks Hole originally designated Spellman 5 water well; Bottom in coal



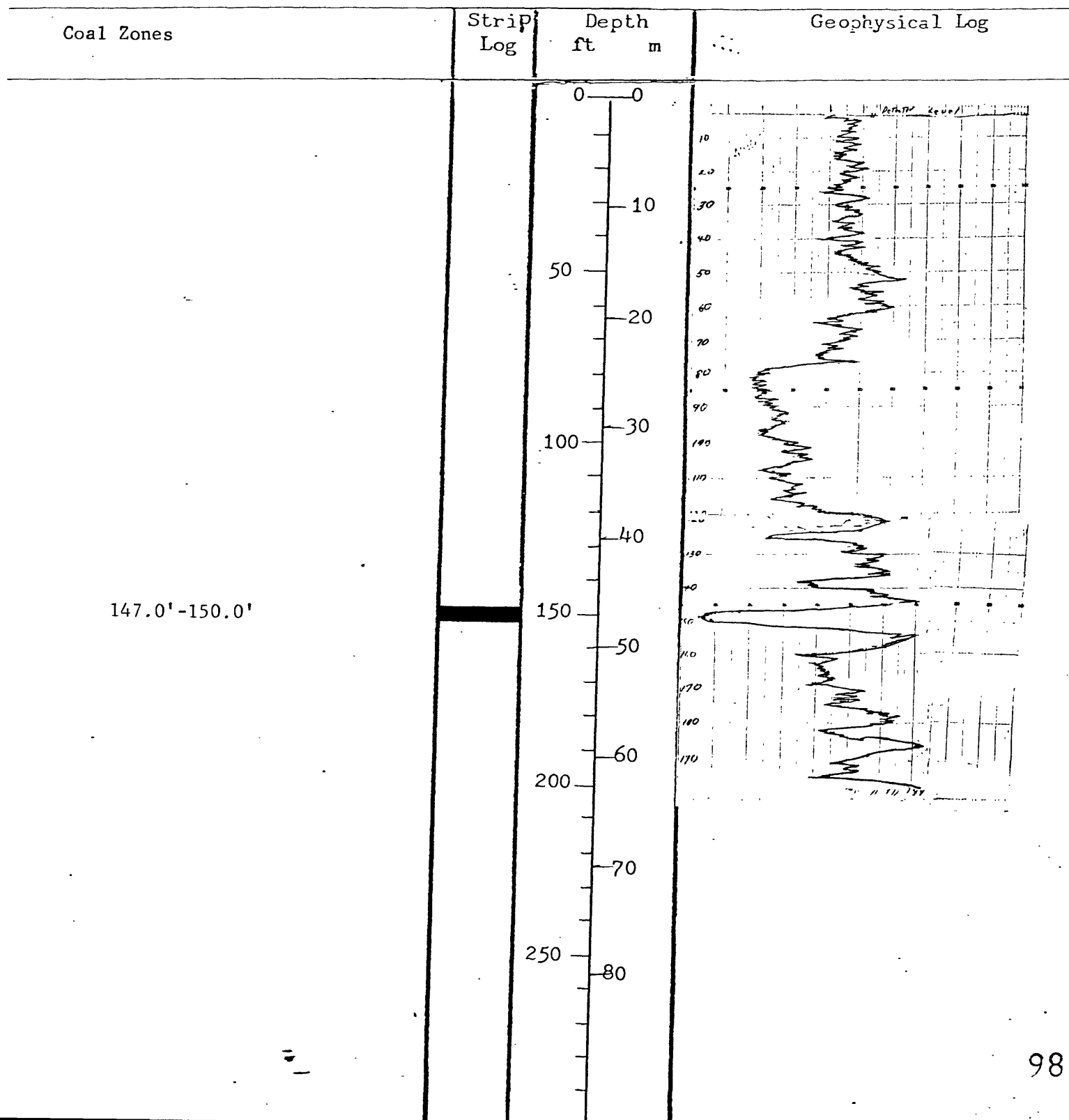
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-51 Surface Elevation 4060'
 Location SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 55N, R. 74W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 152' Date Logged 10/15/77 Log Run By Babcock Fluid level 65'
 Remarks Hole originally designated Spellman 4 water well.



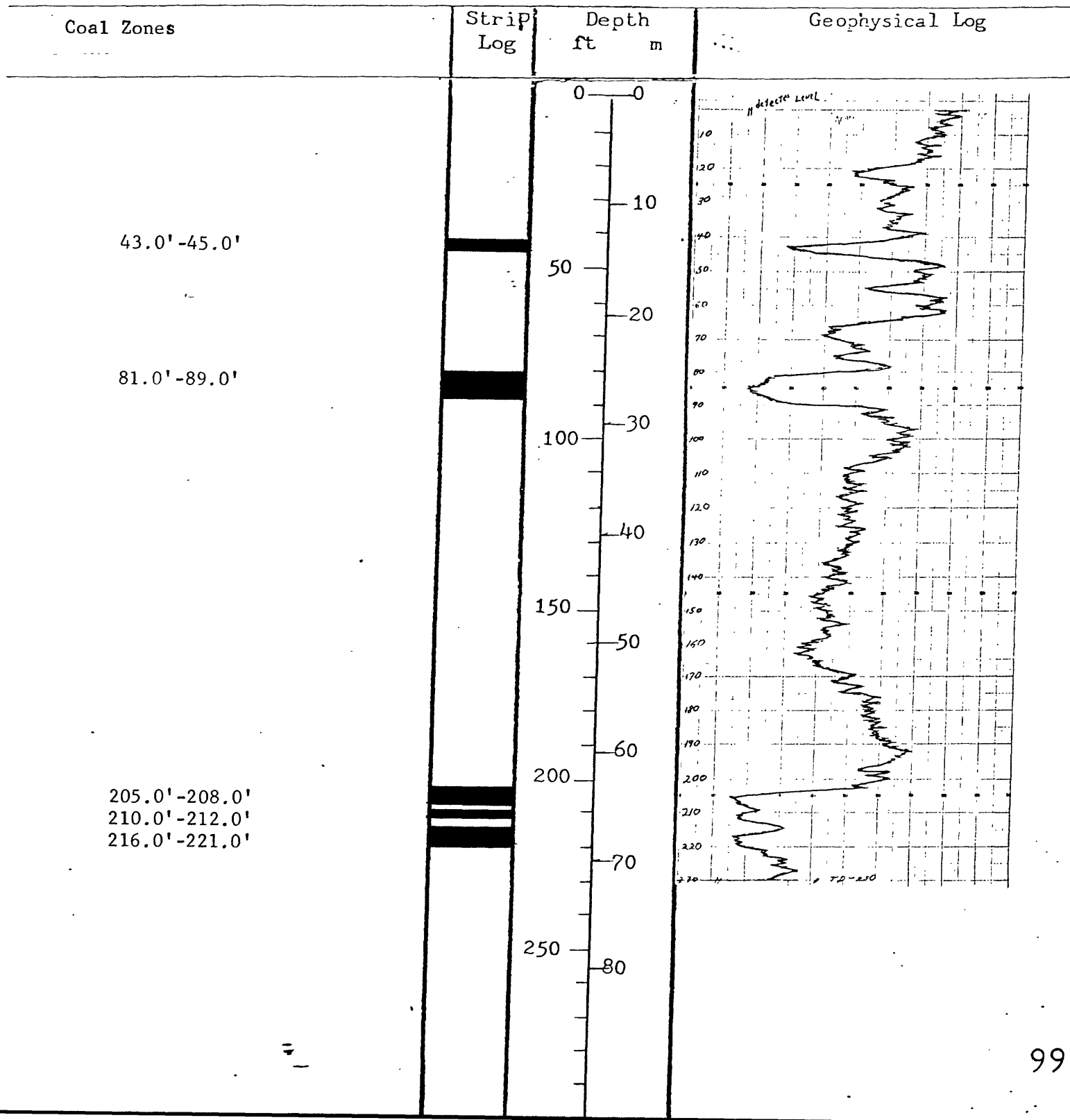
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-52 Surface Elevation 4090'
Location NW 1/4 SE 1/4 sec. 11, T. 54N, R. 75W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 199' Date Logged 10/15/77 Log Run By Babcock Fluid level 127'
Remarks Hole originally designated Spellman 1 water well.; Methane detected



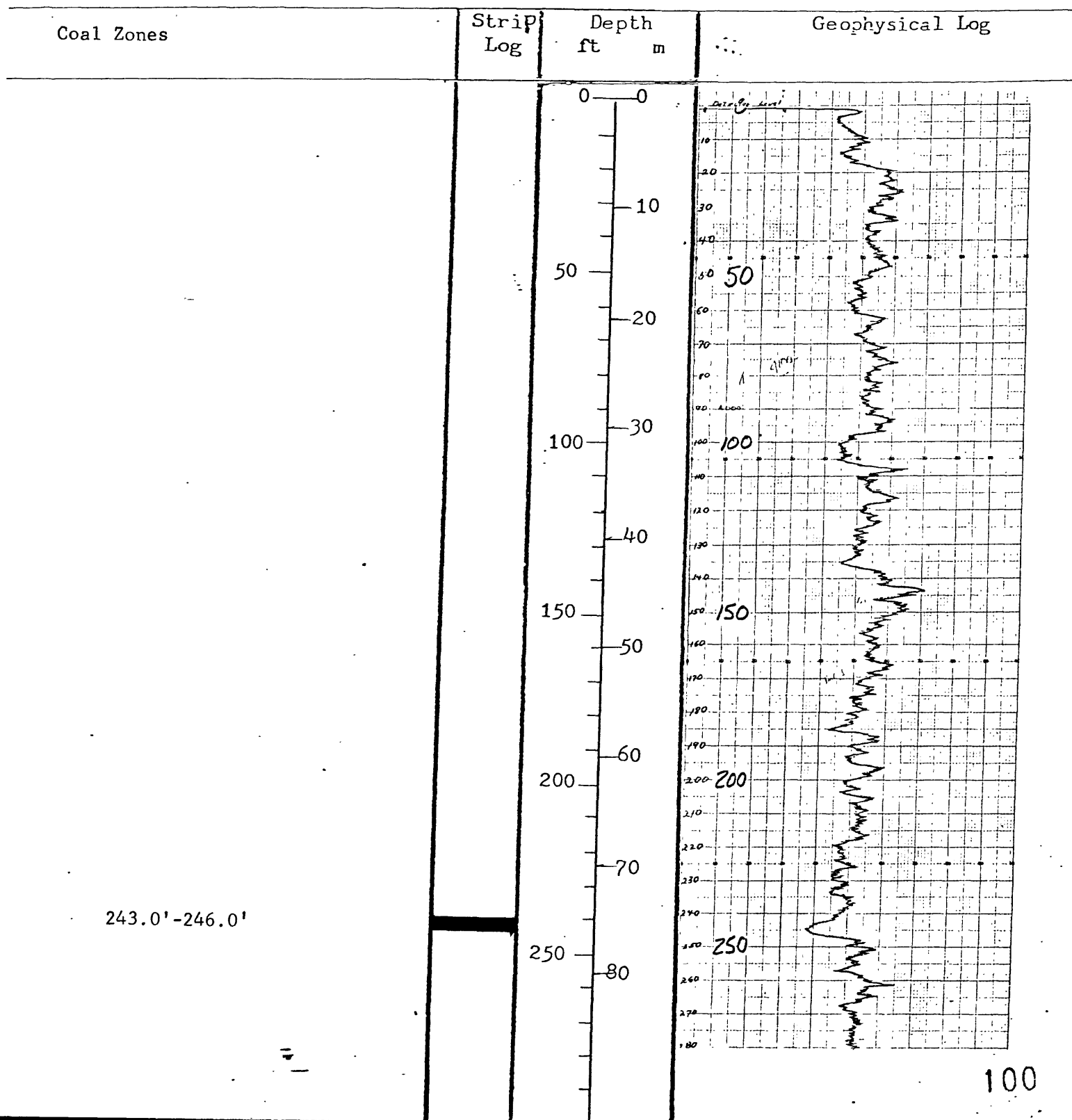
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-53 Surface Elevation 4015'
 Location NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 54N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 230' Date Logged 10/15/77 Log Run By Babcock Fluid level 99'
 Remarks Hole originally designated Spellman 2 water well; Bottom in coal; Methane detected

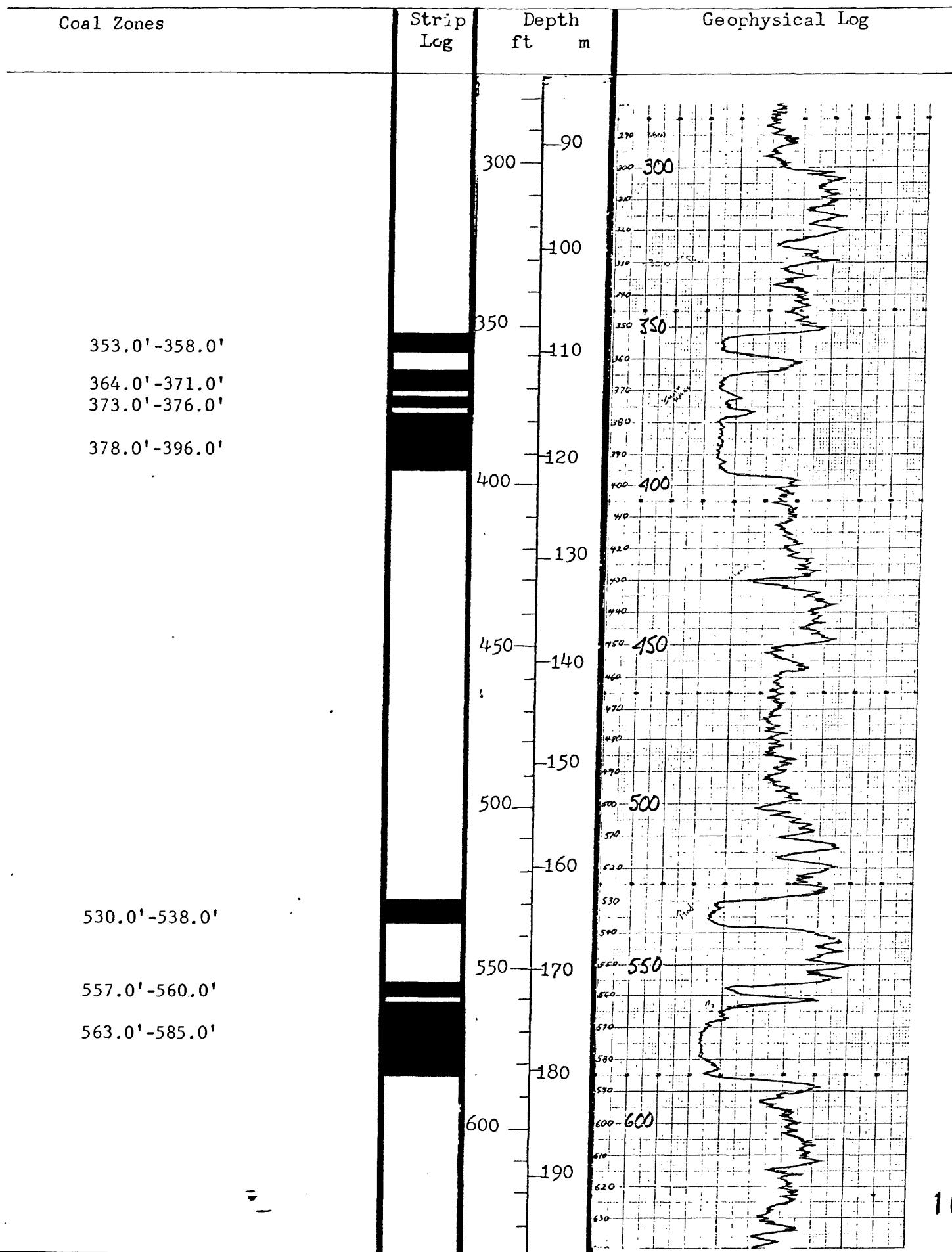


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-54 Surface Elevation 4090'
 Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 14, T. 54N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 950' Date Logged 10/15/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated VanSike 14-1 ; Methane detected

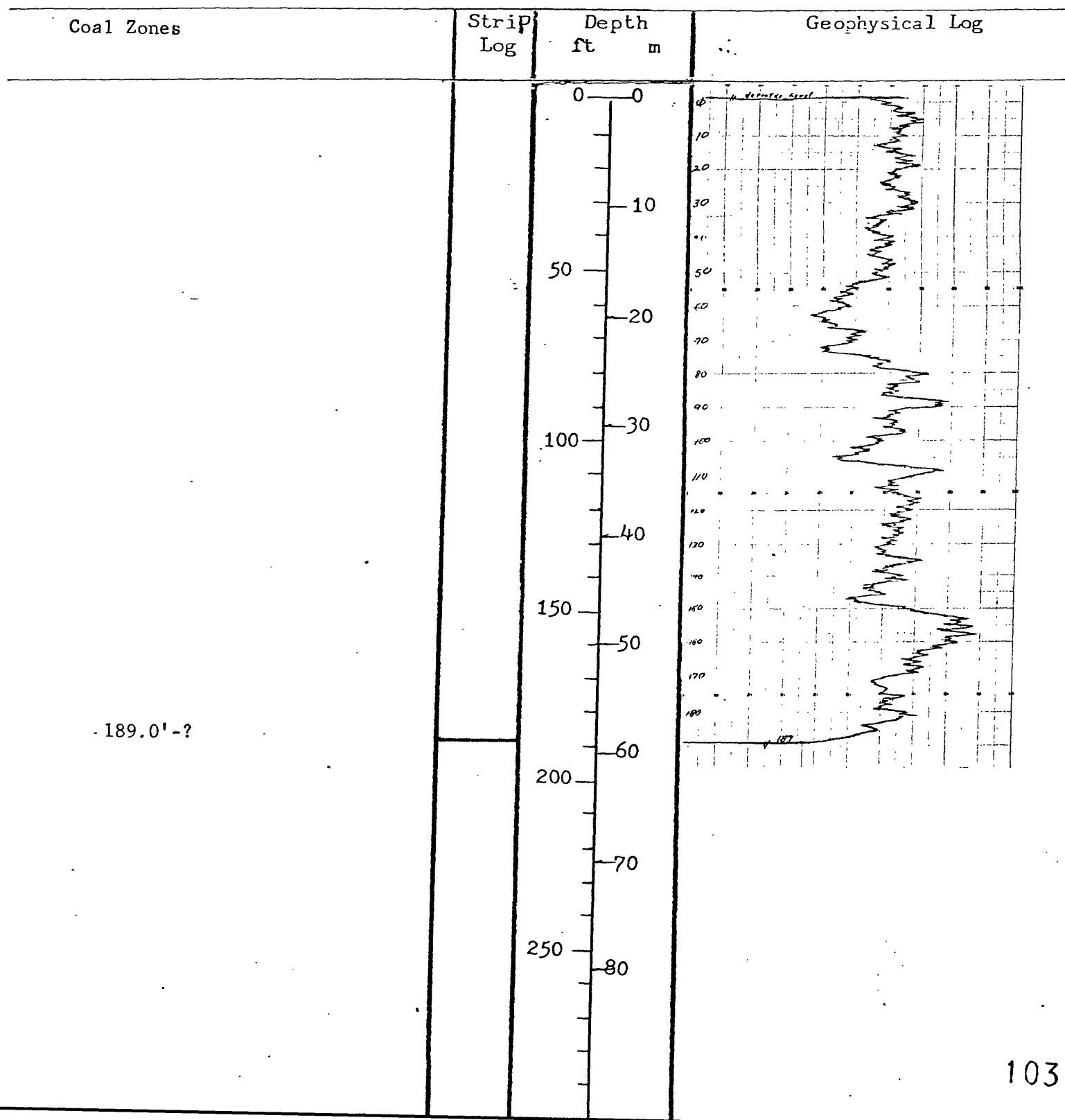


Hole no. 77 BCR-54 (cont.)

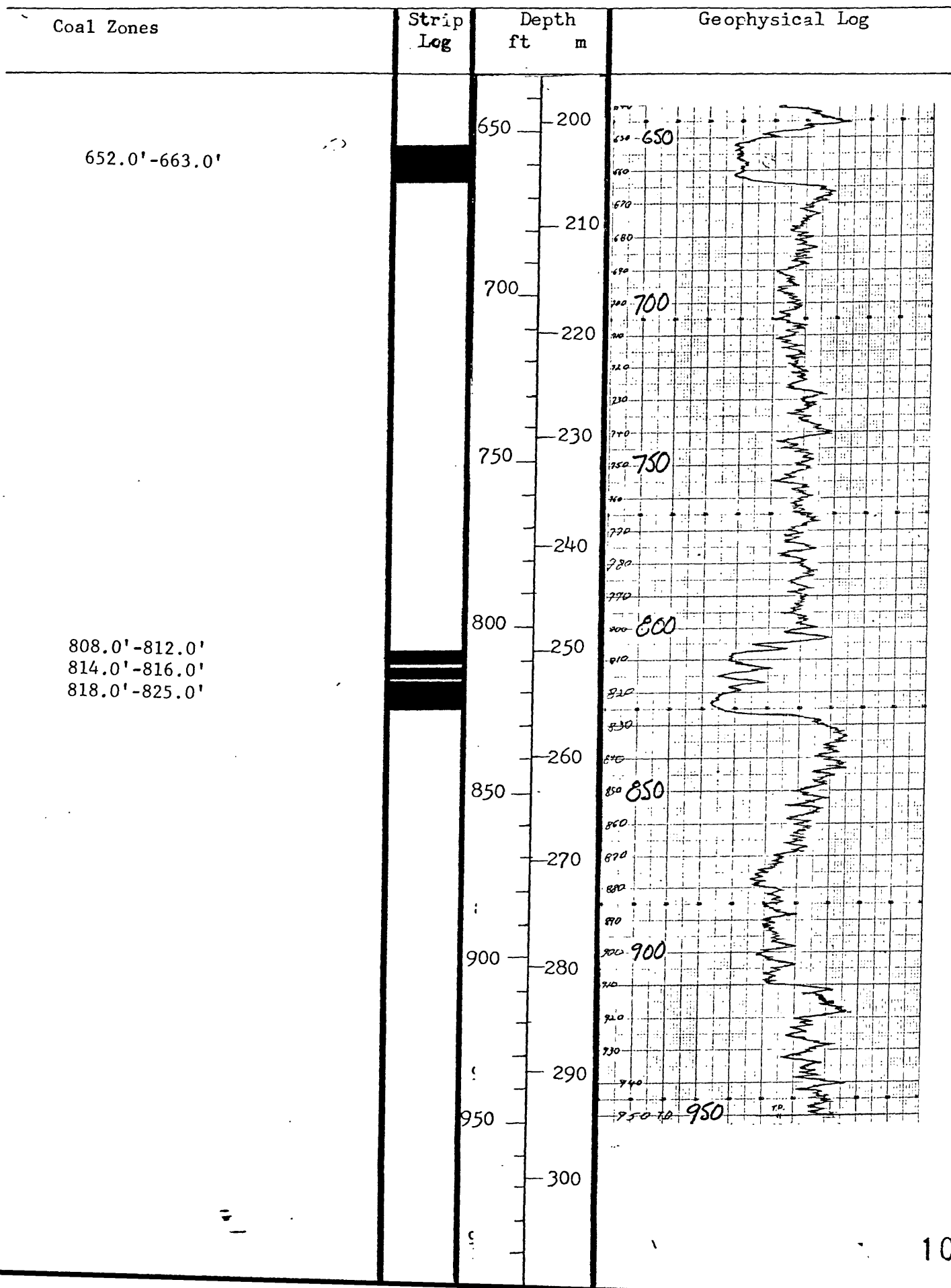


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-55 Surface Elevation 4160'
Location SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 14, T. 54N, R. 75W, County Campbell
State Wyoming Nearest Town Recluse Quad Spotted Horse
Log Depth 189' Date Logged _____ Log Run By Babcock Fluid level ---
Remarks Hole originally designated Spellman 3 water well; Bottom in coal

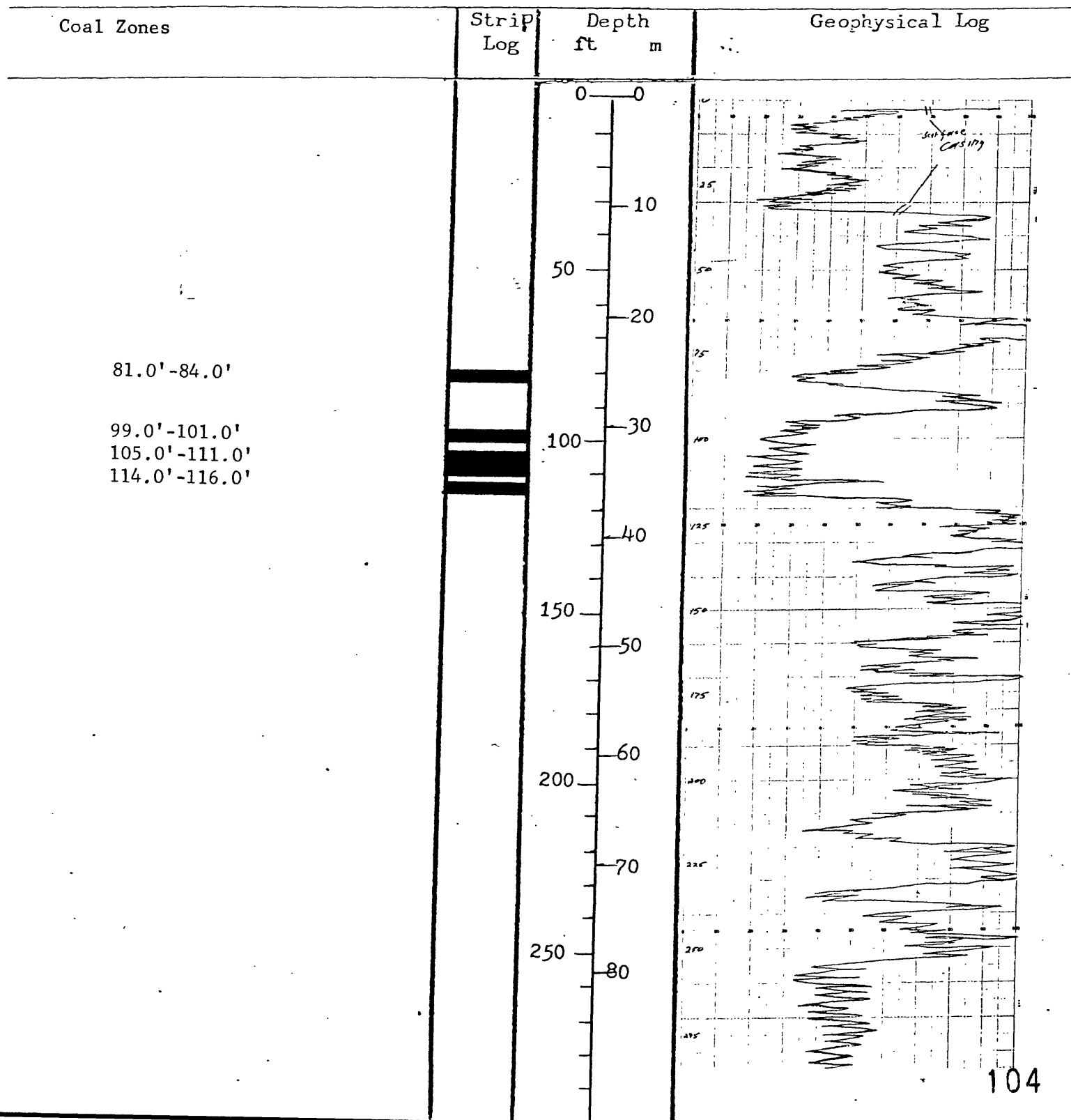


Hole no. 77 BCR-54 (cont.)

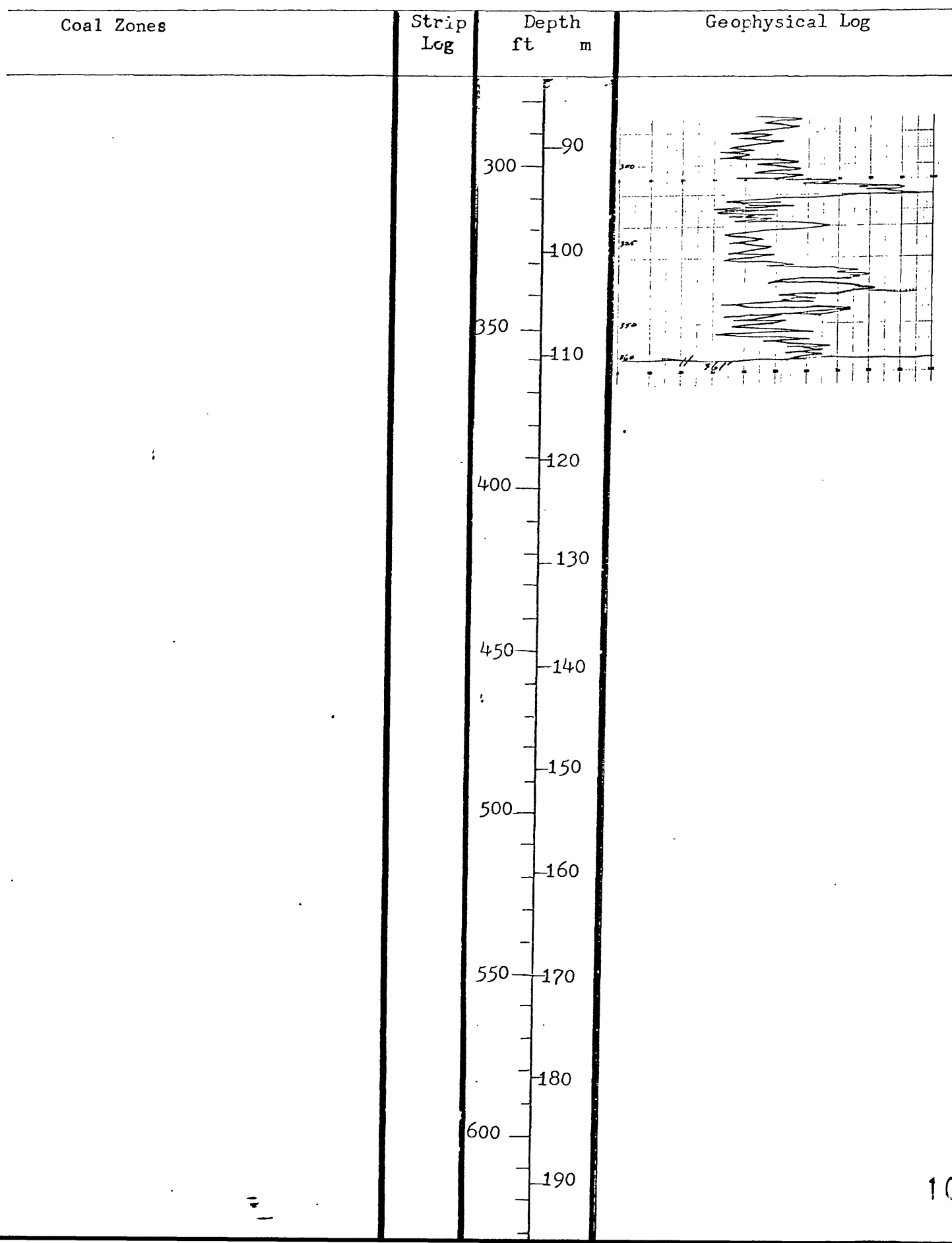


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-60 Surface Elevation 4170'
 Location SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 6, T. 51N, R. 71W, County Campbell
 State Wyoming Nearest Town Gillette Quad Moyer Springs
 Log Depth 361' Date Logged 9/16/77 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated Mader water well

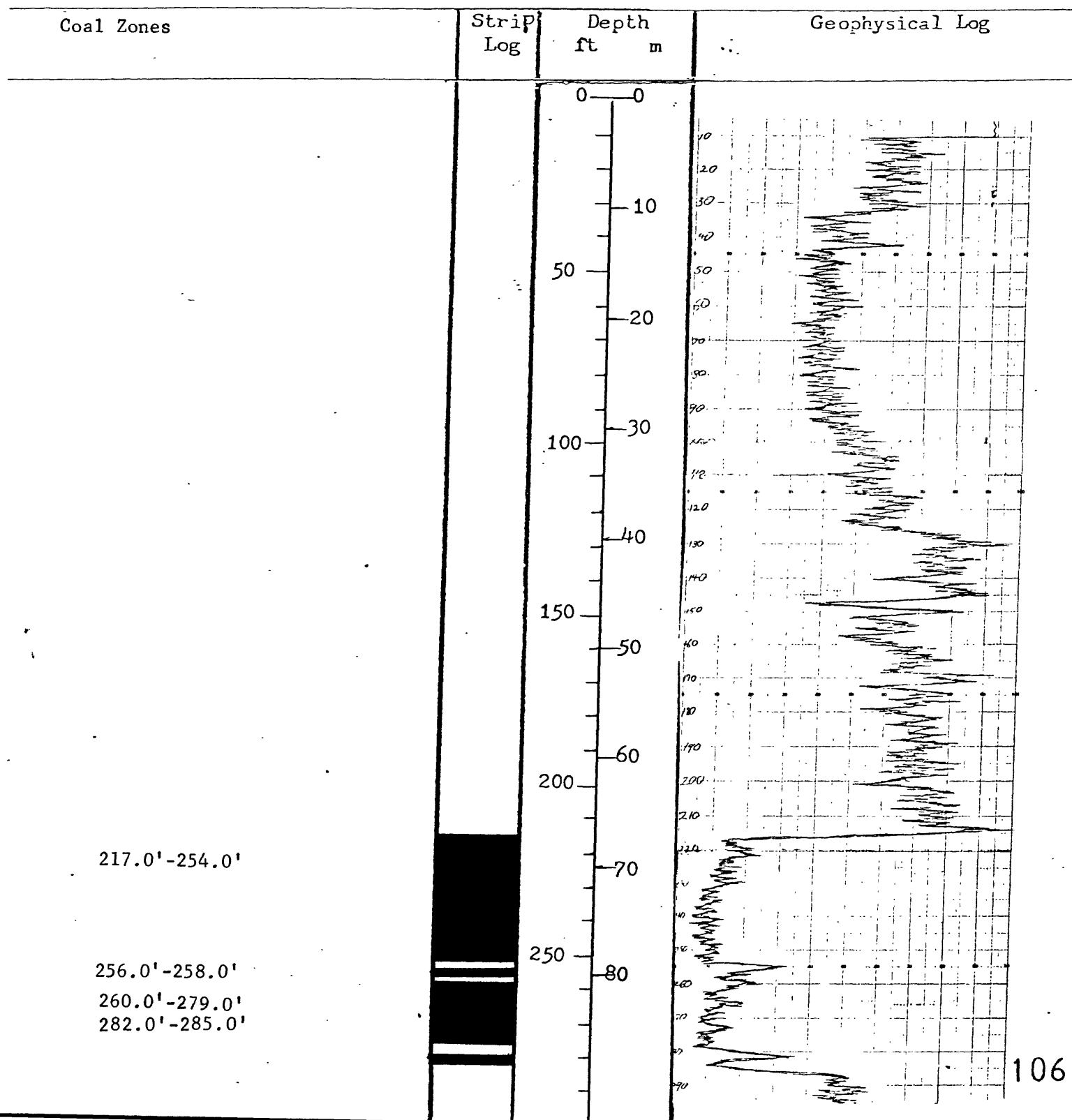


Hole no. 77 BCR-60 (cont.)

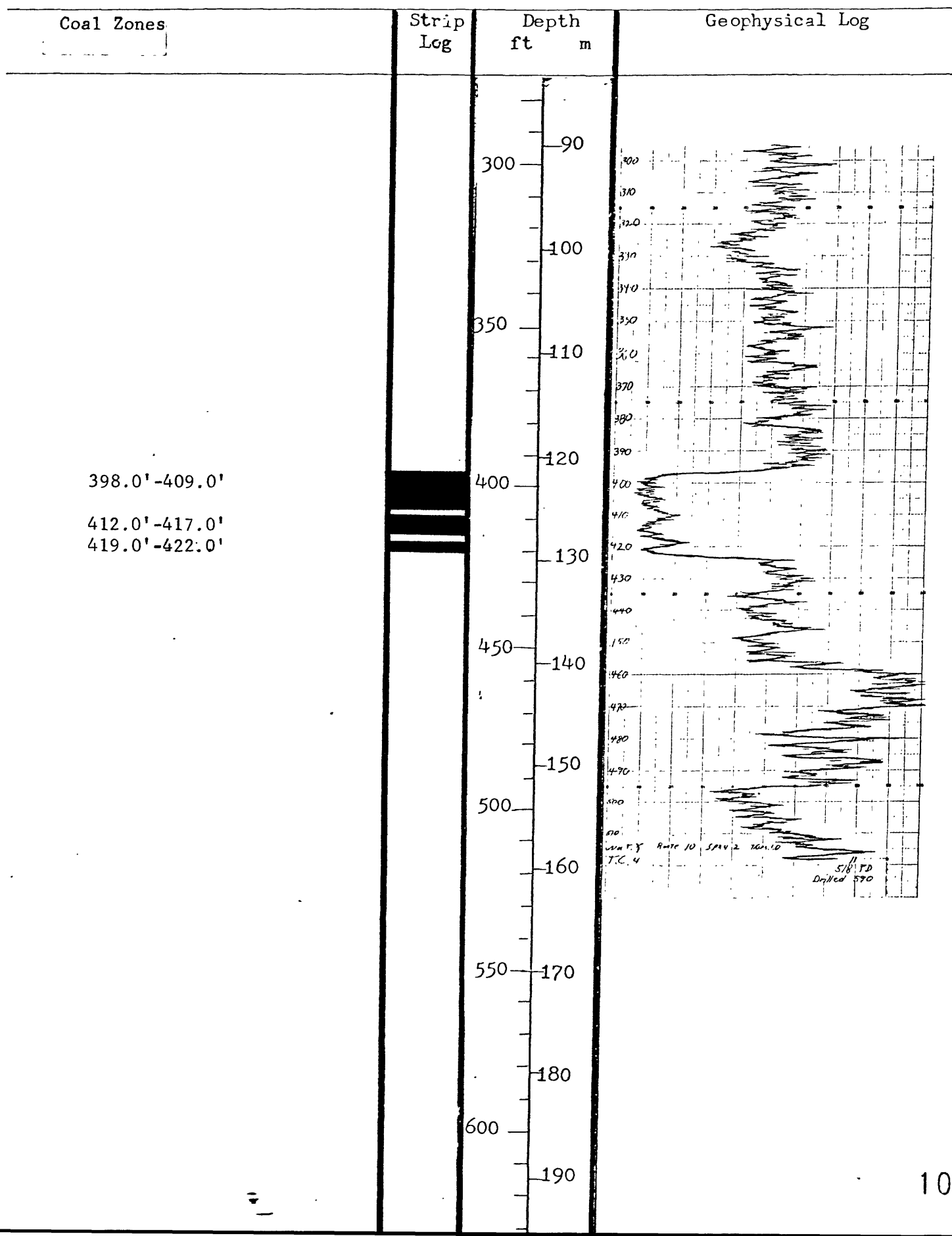


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-61 Surface Elevation 4445'
Location SE $\frac{1}{2}$ NW $\frac{1}{2}$ sec. 9, T. 50N, R. 72W, County Campbell
State Wyoming Nearest Town Gillette Quad Gillette West
Log Depth 518' Date Logged 9/16/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Murphy 1 water well ; Methane detected

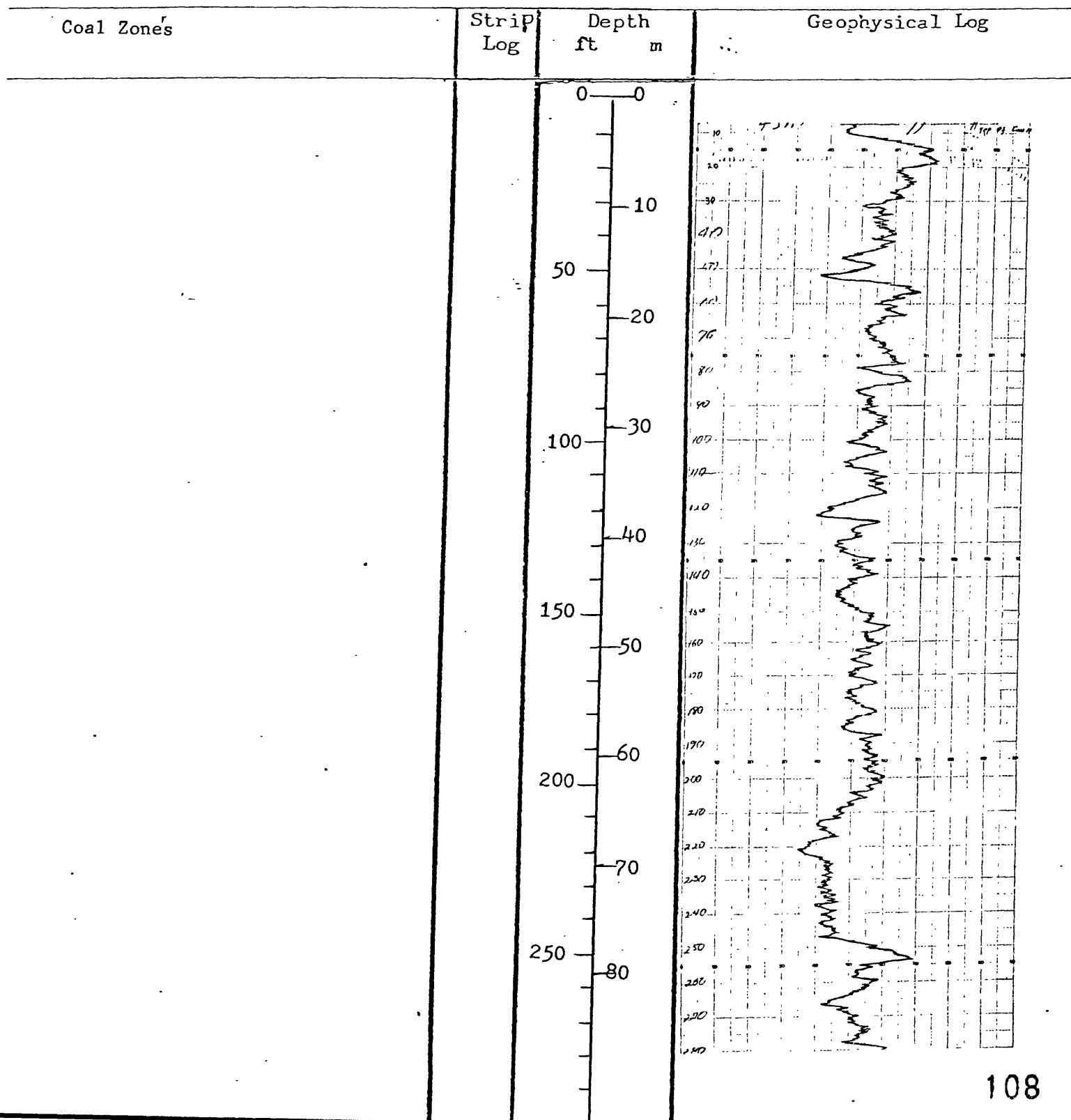


Hole no. 77 BCR-61 (cont.)

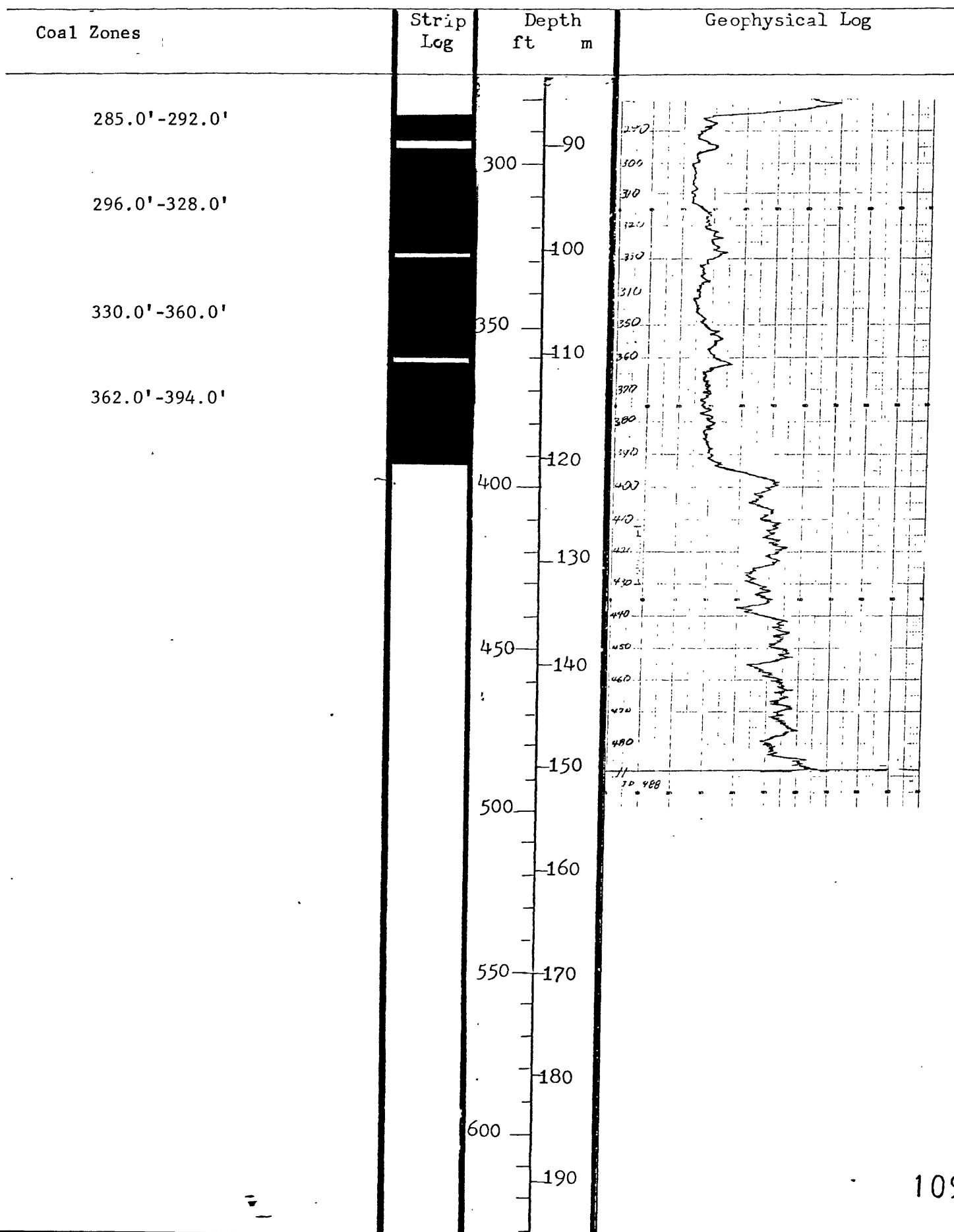


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-62 Surface Elevation 4455'
Location NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 14 , T. 50N , R. 72W , County Campbell
State Wyoming Nearest Town Gillette Quad Gillette East
Log Depth 478' Date Logged 8/17/77 Log Run By Babcock Fluid level ---
Remarks Hole originally designated Osborn 1 water well

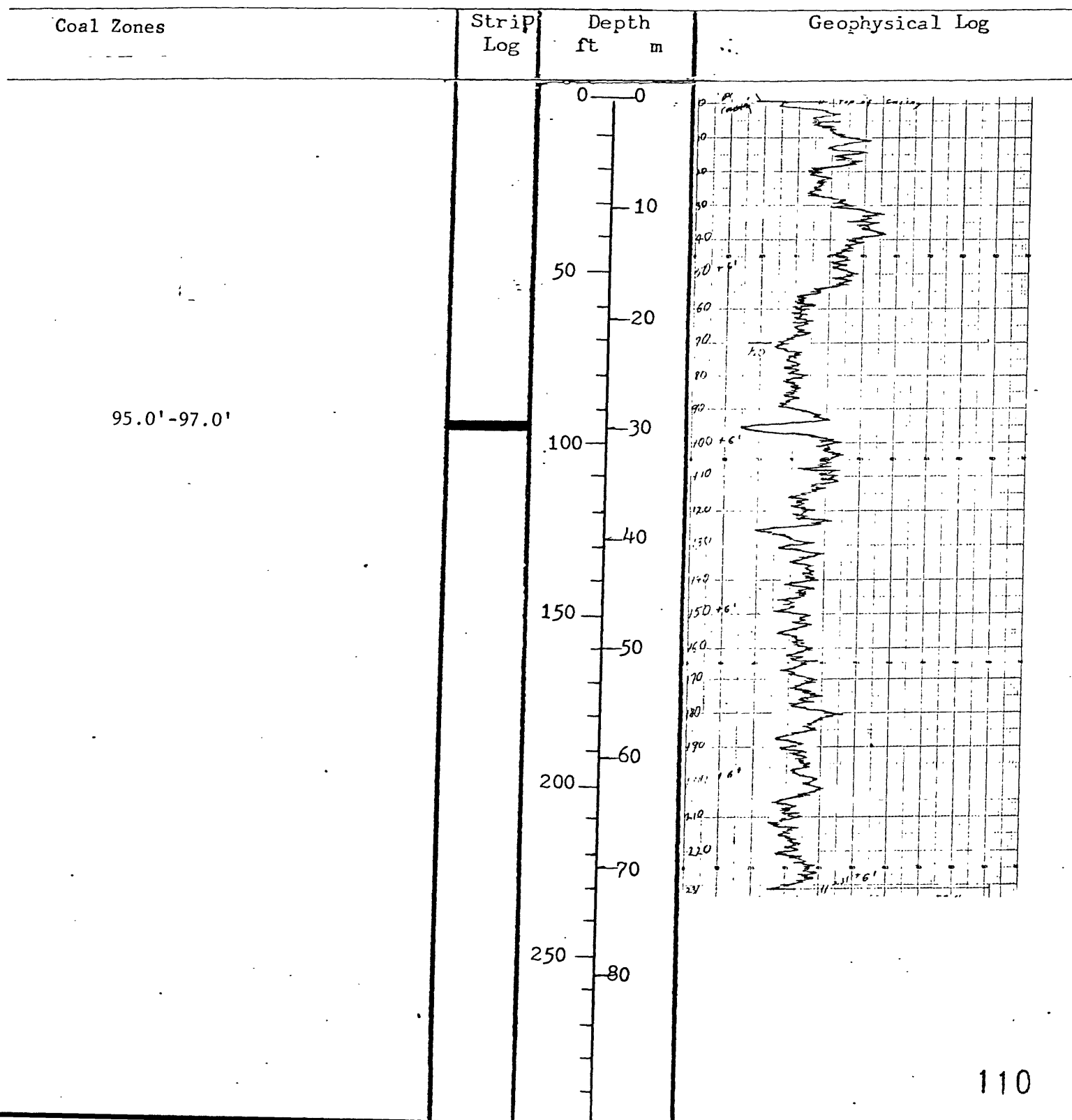


Hole no. 77 BCR-62 (cont.)



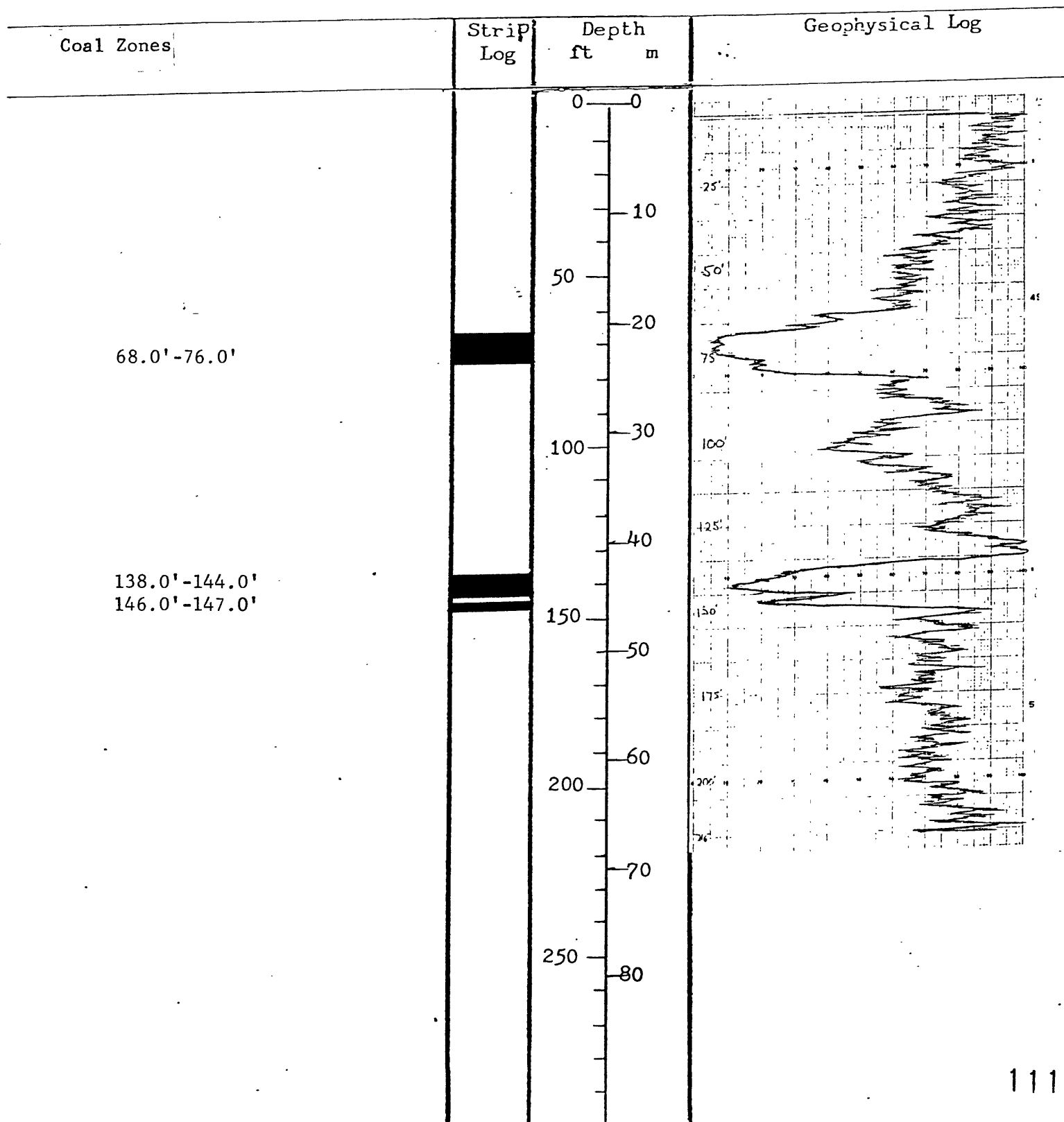
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 77 BCR-63 Surface Elevation 4430'
 Location NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 50N, R. 72W, County Campbell
 State Wyoming Nearest Town Gillette Quad Gillette East
 Log Depth 237' Date Logged 8/31/77 Log Run By Babcock Fluid level 76'
 Remarks Hole originally designated Osborn 2 water well.



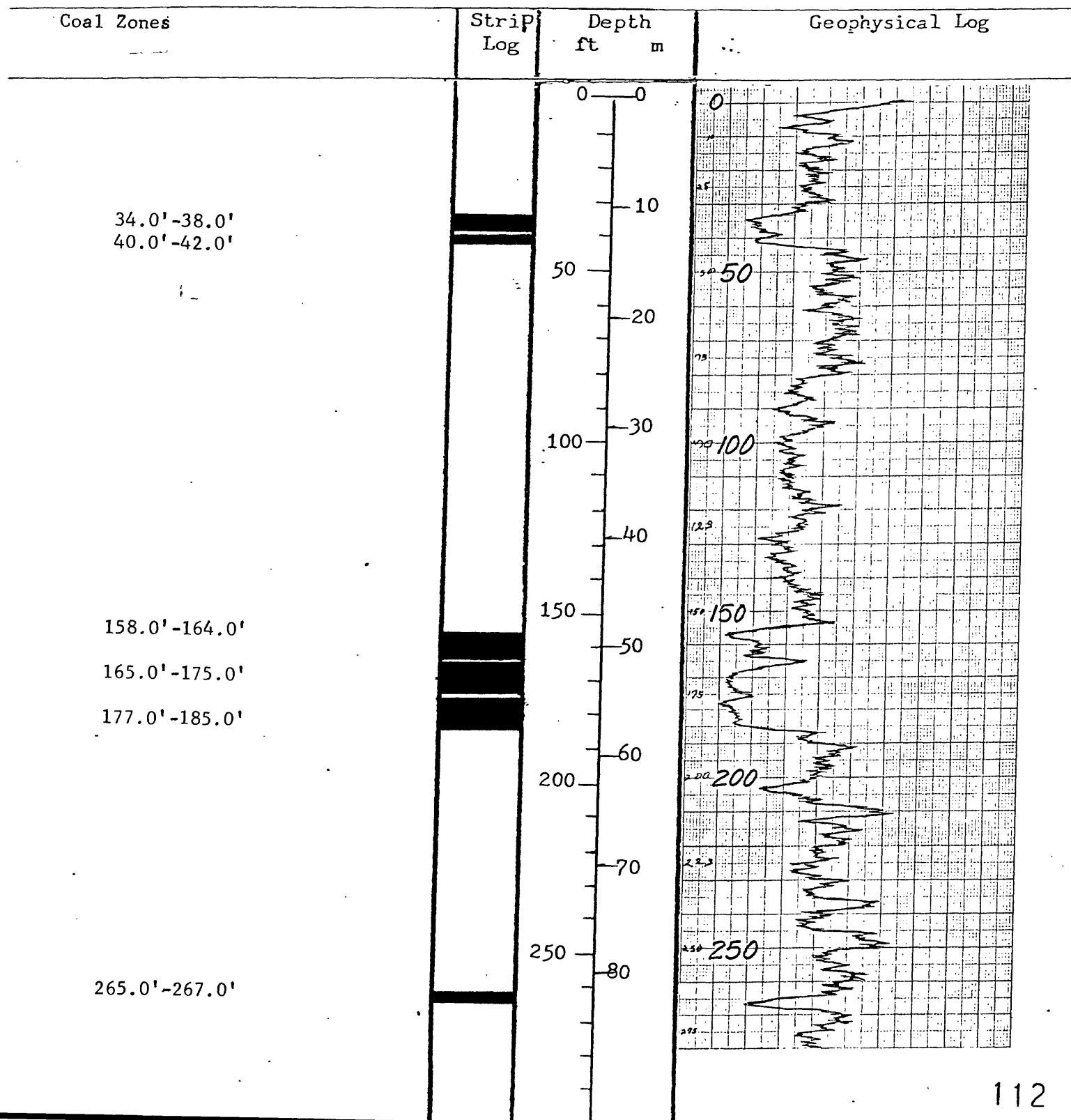
U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 78 BCR-1 Surface Elevation 3888'
Location NW 1/4 NE 1/4 sec. 11, T. 56N, R. 74W, County Campbell
State Wyoming Nearest Town Recluse Quad Homestead Draw SW
Log Depth 216' Date Logged 9/13/78 Log Run By Babcock Fluid level 53.6'
Remarks Hole originally designated TR water well; Methane detected

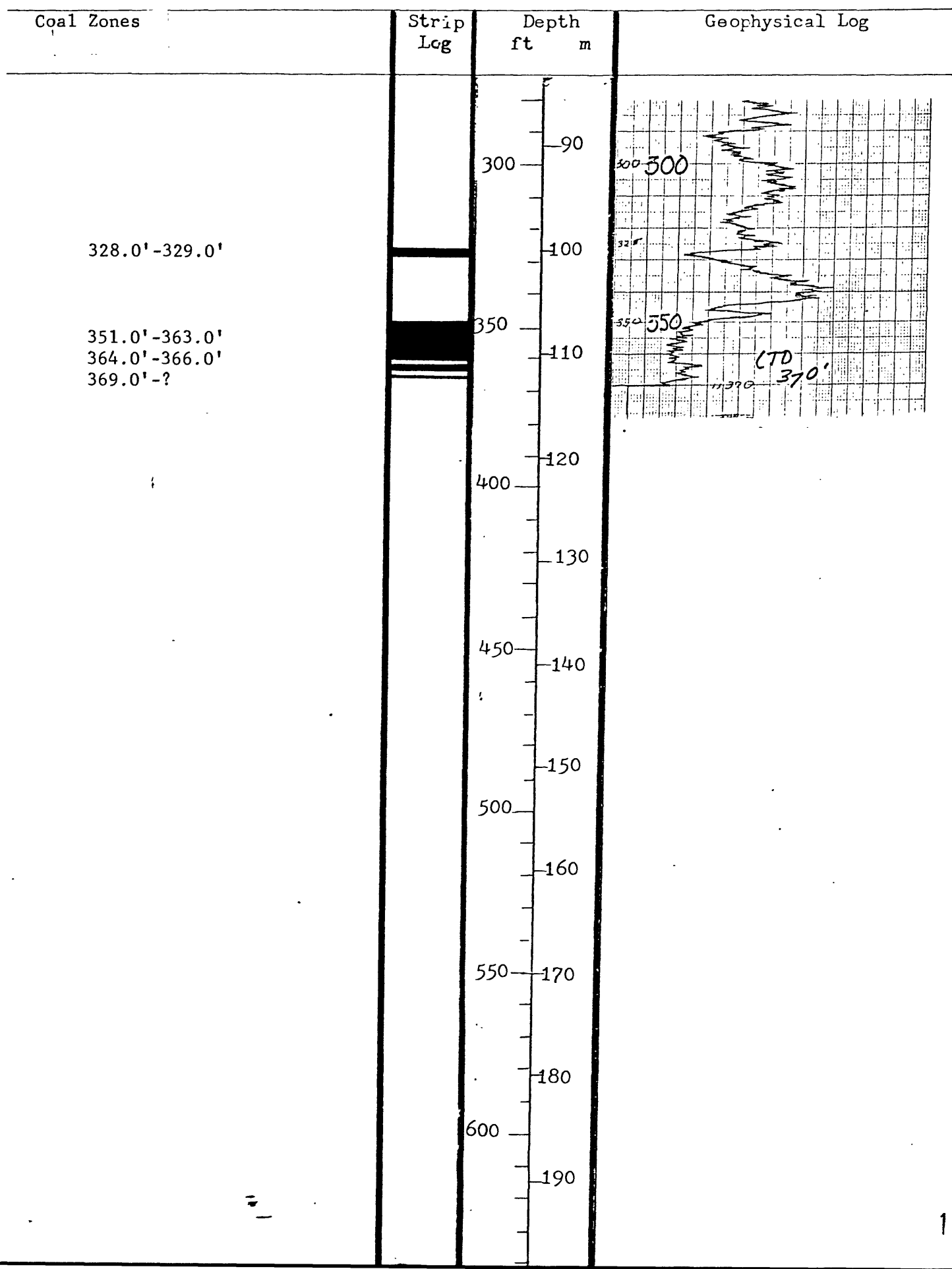


U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 78 BCR-2 Surface Elevation 4022'
 Location SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 25, T. 55N, R. 75W, County Campbell
 State Wyoming Nearest Town Recluse Quad Spotted Horse
 Log Depth 370' Date Logged 10/3/78 Log Run By Babcock Fluid level 155'
 Remarks Hole originally designated Spotted Horse store; Bottom in coal; Methane detected

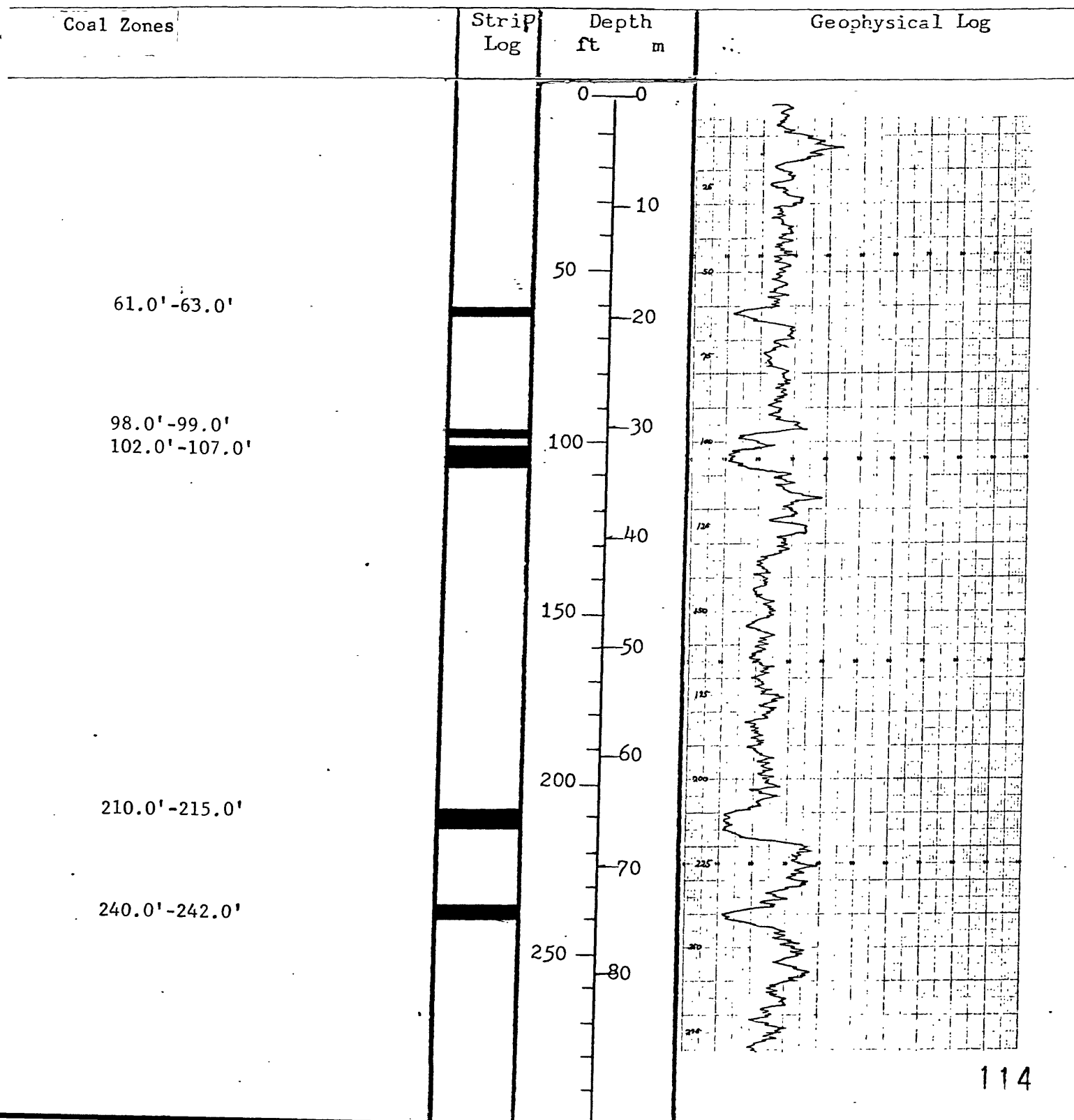


Hole no. 78 BCR-2 (cont.)




U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 78 BCR-3 Surface Elevation 3805'
 Location SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, T. 57N, R. 72W, County Campbell
 State Wyoming Nearest Town Recluse Quad Homestead Draw
 Log Depth 327' Date Logged 10/5/78 Log Run By Babcock Fluid level ---
 Remarks Hole originally designated Music 1 water well

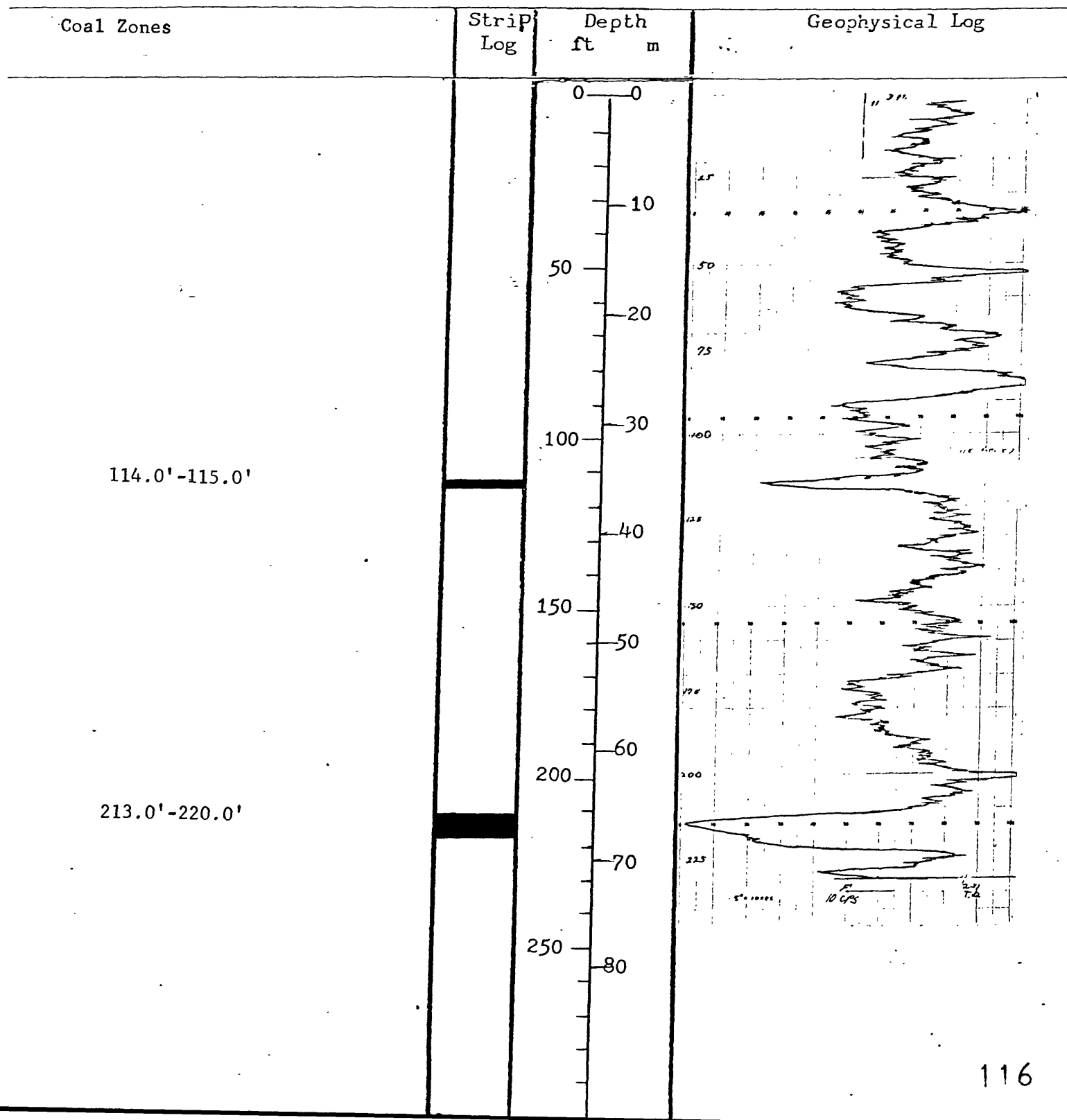


Hole no. 78 BCR-3 (cont.)

| Coal Zones | Strip Log | Depth ft m | Geophysical Log |
|------------|-----------|---|--|
| | | <div data-bbox="786 338 1003 2100"> <div>300</div> <div>90</div> <div>100</div> <div>350</div> <div>110</div> <div>120</div> <div>400</div> <div>130</div> <div>450</div> <div>140</div> <div>150</div> <div>500</div> <div>160</div> <div>550</div> <div>170</div> <div>180</div> <div>600</div> <div>190</div> </div> | <div data-bbox="1003 338 1529 2100">  </div> |

U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 78 BCR-4 Surface Elevation 3826'
Location SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 54N, R. 76W, County Sheridan
State Wyoming Nearest Town Leiter Quad Arvada NE
Log Depth 231' Date Logged 7/27/78 Log Run By Babcock Fluid level 107'
Remarks Hole originally designated Saranyi 1 water well ; Methane detected



U.S. Geological Survey
Geophysical and Lithologic Log
Type Geophysical Log Natural Gamma

Project Water Well Hole no. 78 BCR-5 Surface Elevation 3818'
 Location SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 54N, R. 76W, County Sheridan
 State Wyoming Nearest Town Leiter Quad Arvada NE
 Log Depth 176' Date Logged 7/27/78 Log Run By Babcock Fluid level 13'
 Remarks Hole originally designated Saranyi 2 water well.; Methane detected

