GEOLOGICAL SURVEY OF WYOMING

Geophysical logs, lithologic descriptions, and coal analyses from coal test holes drilled in 1982 in the Salt Wells and Kemmerer areas, Sweetwater and Uinta counties, Wyoming.

by

James M. McClurg, John D. Gardner,
Arthur P. Boresi, and Leon E. Borgman

Open-file Report 83-1

Research sponsored by the U.S. Department of Energy,
Laramie Energy Technology Center, under Grant Number
DE-AS20-81LC10855
in cooperation with the U.S. Department of Interior,
Minerals Management Service

Composed and edited by the Geological Survey of Wyoming
Laramie, Wyoming

1983

GEOLOGICAL SURVEY OF WYOMING

Geophysical logs, lithologic descriptions, and coal analyses from coal test holes drilled in 1982 in the Salt Wells and Kemmerer areas, Sweetwater and Uinta counties, Wyoming.

by

James M. McClurg[1], John D. Gardner[2],
Arthur P. Boresi[2], and Leon E. Borgman[1]

Open-file Report 83-1

The contents contained herein were developed through the use of funds provided by the U.S. Department of Energy, Laramie Energy Technology Center, and by this notice the Energy Center does not agree or disagree with any of the ideas expressed or implied in this report. Similarly the Geological Survey of Wyoming, in publishing this report, assumes no legal liability or responsibility for its contents. Any use of company names, trade names, or product names is for descriptive purposes only and does not imply endorsement by the Department of Energy, the University of Wyoming, and the Geological Survey of Wyoming.

[1] Department of Geology and Geophysics, University of Wyoming

[2] Department of Civil Engineering, University of Wyoming

CONTENTS

ILLUSTRATIONS

TABLES

ACKNOWLEDGMENTS

This project was completed with the help of Gerry Huskey, Casper, Wyoming; C.B. Holloway of the Minerals Management Service, Rock Springs, Wyoming; Jane V. Thomas, Wyoming Analytical Laboratories, Inc., Laramie, Wyoming; and the following University of Wyoming student assistants: Tere DeMoss Andrew, Leslie G. Heard, David A. McElhaney, David E. Nice, William F. Quimby, and Noell M. Sturdevant.

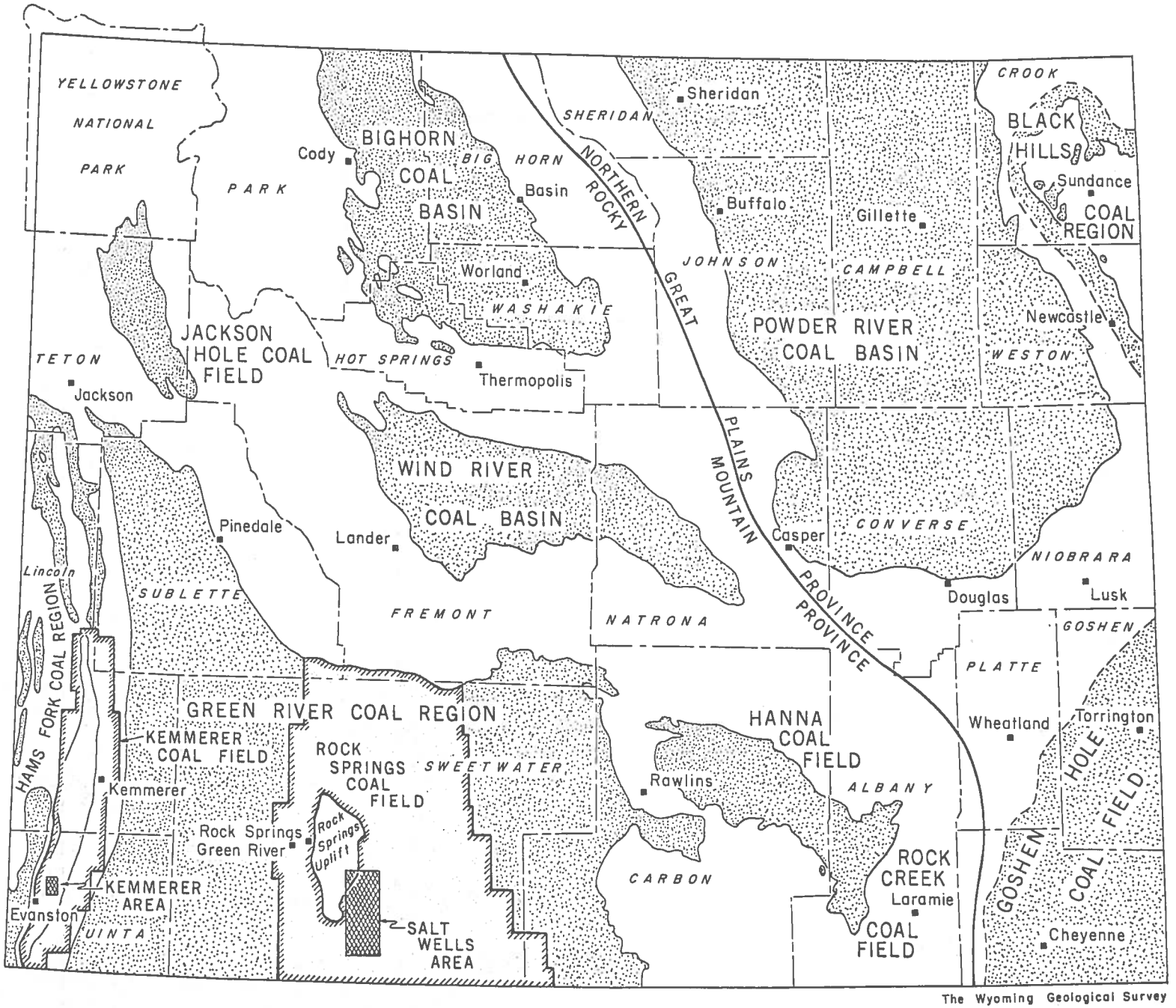
Special thanks are due to the following Laramie Energy Technology Center personnel: Dana Bartke, Contracting Specialist; Dan Youngberg, Geologist; G.F. (Pete) Dana, Division Manager-Resource Characterization and COR for the contract. Special thanks are also due the following personnel of the Department of the Interior, Minerals Management Service: Dwayne E. Hull, John Kennedy, and Jim Taylor.

Richard W. Jones and Suzanne C. Jones of the Geological Survey of Wyoming compiled and prepared the open-file report. Other Geological Survey of Wyoming personnel contributing to the report were Michelle Richardson (typing), Phyllis Ranz (drafting), and Gary B. Glass (review and technical editing).

INTRODUCTION

Forty-one coal test holes were drilled in the Salt Wells area, Sweetwater County, Wyoming from May 10 to June 6, 1982, and ten coal test holes were drilled in the Kemmerer area, Unita County, Wyoming from August 4 to August 16, 1982. Both areas are located in southwestern Wyoming; the Salt Wells area is located in the Rock Springs Coal Field about 20 miles southeast of the town of Rock Springs on the southeastern flank of the Rock Springs uplift, and the Kemmerer area is located about 13 miles northeast of the town of Evanston in the southern part of the Kemmerer coal field (Figure 1). The drilling was done by Gordon Drilling, Inc. of Roundup, Montana under contract with the University of Wyoming. Funding for the project was provided by the Laramie Energy Technology Center, U.S. Department of Energy, through a transfer of funds from the Geological Survey, U.S. Department of Interior. This project supports the Department of Interior's Federal coal leasing program by providing information on coal quality and thickness, and supports the Department of Energy's (Laramie Energy Technology Center) search for commercially suitable underground coal gasification sites.

Preliminary results of the drilling, coring, geophysical logging, and the analytical laboratory work on coal samples from the cores are presented. The drill hole and core hole locations for the project were chosen by the University of Wyoming's Department of Geology and Geophysics and Department of Civil Engineering, in consultation with the Conservation Division, U.S. Geological Survey. The approximate locations of the drill holes and core holes in the Salt Wells and Kemmerer areas are shown in Figures 2 and 3. The specific location of each drill hole and core hole is given in the log heading on the geophysical and lithologic logs. All drill hole locations are described by legal locations (section, township, range) and by distances, in feet, from section lines. Many of the drill holes in the Salt Wells area have also been described by the State Plane Coordinate System as determined by detailed surveys courteously supplied by Rocky Mountain Energy Company. Ground elevations of the holes drilled in the Salt Wells area were surveyed by Rocky Mountain Energy Company and are accurate to within ±0.1 feet. Elevations of the other drill holes were approximated in the field using U.S. Geological Survey topographic quadrangle maps and are accurate to within ±5 feet of elevation.


YELLOWSTONE NATIONAL PARK
PARK
BIGHORN COAL BASIN
BIG HORN
Cody
Basin
Worland
WASHAKIE
HOT SPRINGS
Thermopolis
JACKSON HOLE COAL FIELD
TETON
Jackson
Lincoln
SUBLETTE
Pinedale
WIND RIVER COAL BASIN
Lander
FREMONT
NATRONA
SHERIDAN
NORTHERN ROCKY
GREAT PLAINS
MOUNTAIN PROVINCE
Sheridan
Buffalo
Gillette
JOHNSON
CAMPBELL
POWDER RIVER COAL BASIN
CROOK
BLACK HILLS
Sundance
COAL REGION
Newcastle
WESTON
Casper
CONVERSE
NIOBRARA
Douglas
Lusk
GOSHEN
PLATTE
Wheatland
Torrington
HANNA COAL FIELD
Rawlins
ALBANY
CARBON
ROCK CREEK
Laramie
COAL FIELD
Cheyenne
GOSHEN HOLE COAL FIELD
HAMS FORK COAL REGION
GREEN RIVER COAL REGION
KEMMERER COAL FIELD
Kemmerer
ROCK SPRINGS COAL FIELD
SWEETWATER
Rock Springs
Green River
Rock Springs Uplift
KEMMERER AREA
Evanston
UINTA
SALT WELLS AREA
The Wyoming Geological Survey
1983
Coal-Bearing Area
Coal Field Containing Project Area
Project Areas

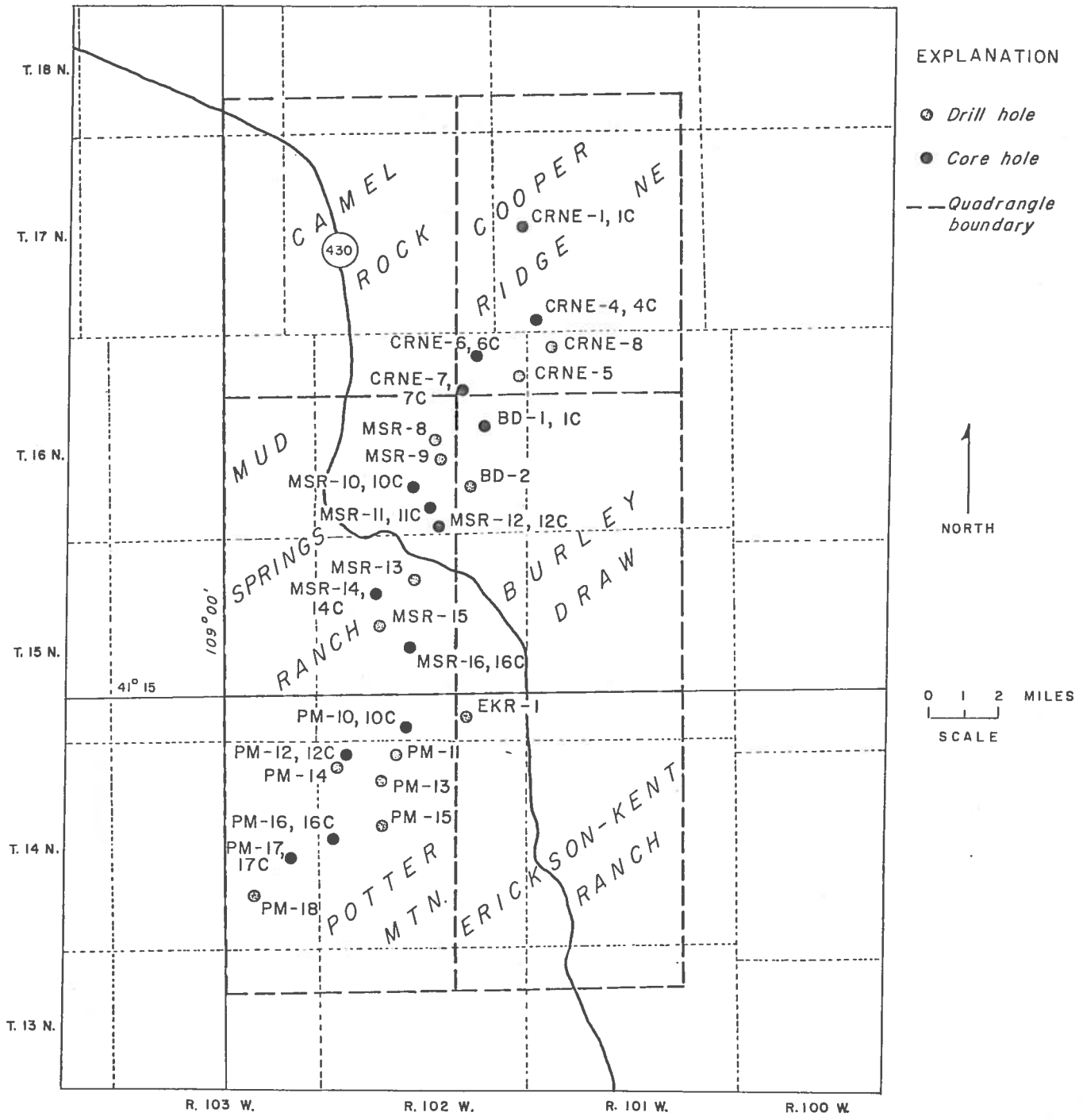


Figure 2. Location map of Salt Wells area drill holes and core holes.

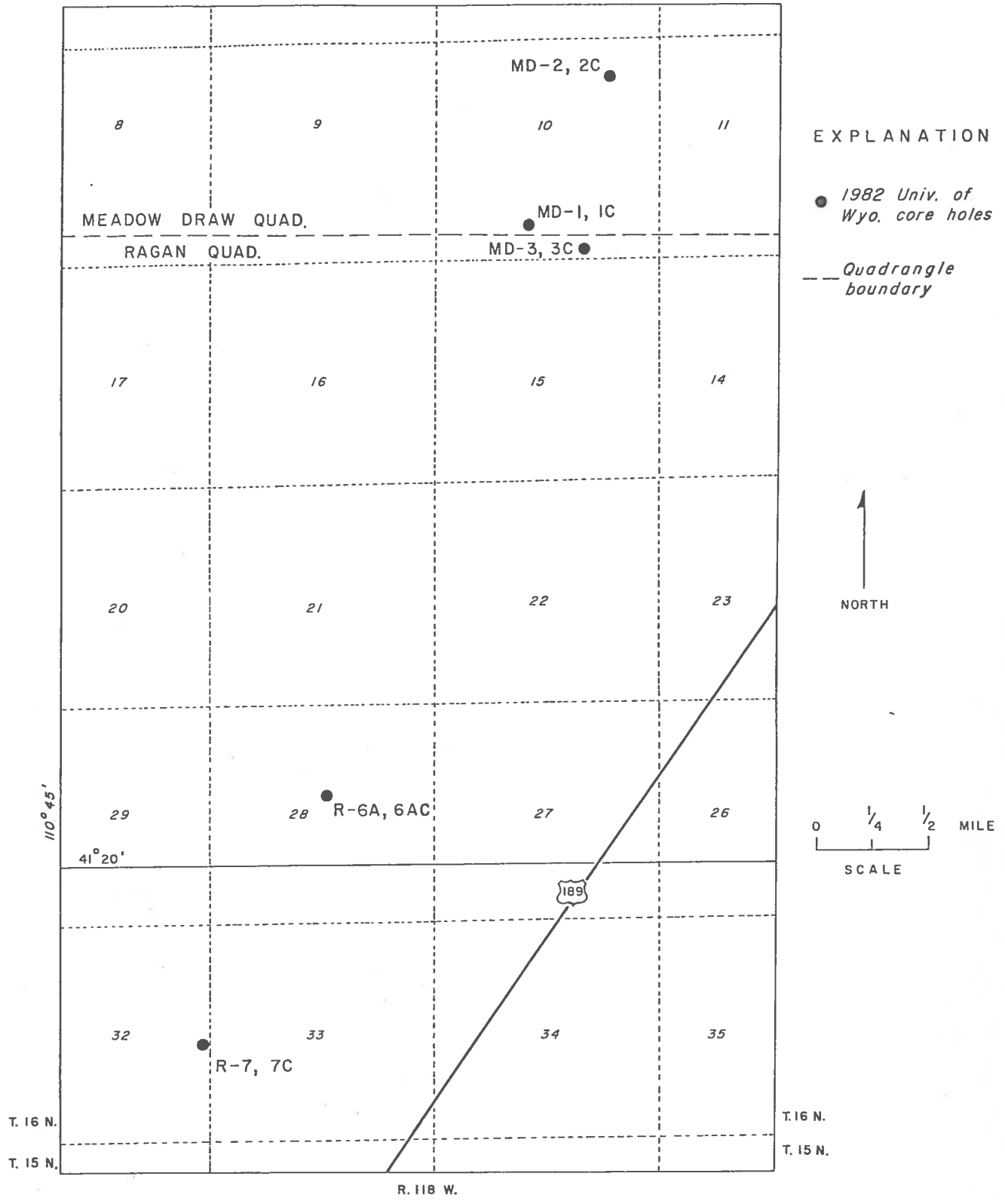


Figure 3. Location map of Kemmerer area core holes

DRILLING, LOGGING, AND CORING PROCEDURES

Conventional rotary drilling equipment was used for all drilling and coring operations. For the first 200 to 300 feet of each hole, air was the primary drilling medium. Below this depth, circulating water, augmented with detergent (foam) where necessary, was used. Depending on the hardness of the rocks encountered, either a blade drilling bit (5 1/8" Kenclaw) or a tricone rock bit (4 3/4" Walker-McDonald or Varrell) was selected. A total of 32 drill holes were drilled in this manner. Immediately after drilling was completed, the drill hole was logged by Reich Geo-Physical, Inc. of Billings, Montana, using a Comprobe #2 geophysical probe. Natural gamma-ray, resistivity, high-resolution gamma-gamma density, and caliper logs were simultaneously recorded in a single run per hole. Dry hole resistivity logs were recorded in the upper parts of drill holes above the fluid level. The original copies of the geophysical logs were photographically reduced to a scale of 1 inch equals 50 feet for convenience in reproducing this report.

Lithologies of drill cuttings from the 32 drill holes that were not cored were sampled on 5-foot intervals and described by a geologist in the field. Later, the lithologic descriptions were adjusted to match the general rock types as interpreted from the geophysical logs. Because this report is preliminary and will be followed by detailed descriptions of cuttings and core samples, the lithologic descriptions presented in this report have been generalized.

A total of 19 core holes were drilled on this project. Each core hole was located adjacent to a previously drilled and logged rotary drill hole. Using the geophysical log of this adjacent rotary drill hole, coring intervals were selected to include, where possible, the five feet of rock above and below the coal bed. After a 4 3/4" hole was drilled with a blade-type drill bit to the top of the first core interval in a drill hole, a core was drilled using a 3 7/8" diamond or carbide core bit with a $3\frac{1}{2}$" outside diameter outer barrel either 10 or 15 feet in length, depending on the thickness of the core interval. Once this uppermost interval was cored, the hole was reamed with the 4 3/4" blade bit and drilling proceeded to the next core interval. As core was removed from the core barrel at the surface, the total thickness of the recovered core was measured, broken into 2-foot sections, wrapped in cylindrical plastic

bags (tubing), and placed into core boxes. After coring of a drill hole was completed, geophysical logs were run in the core hole in the same manner as described above. No lithologic descriptions of the drill cuttings or recovered core from the core holes were made in the field. As a result, only the location of the core intervals within the drill holes and the geophysical logs of the core holes are presented in this report.

CORE SAMPLING AND CHEMICAL ANALYSIS

The coal recovered from the cores was sampled for analysis in two different ways: in increments of one or two feet and as a composite made by physical combination of more than one incremental sample. The composited samples had the following analyses performed on them: proximate and ultimate analyses, heat values, and forms of sulfur (Table 1); fusibility of ash, free-swelling index (FSI), moist, mineral-matter-free heat values (calculated), and apparent rank (Table 2); and major and minor oxides and selected trace elements in ash (Table 3). One hundred forty-three of the incremental samples were analyzed for their proximate and ultimate composition and their heat values (Appendix A). Several incremental samples were also selected for determination of equilibrium moisture, Hardgrove Grindability Index, and percent Na_2O in ash (Appendix A). Table 4 summarizes the Hardgrove Grindability Indices determined for these increments. Because these Grindability Indices were determined for selected increments rather than entire coal beds, they should be used cautiously.

The footages for each increment submitted for analysis were adjusted in this report to correspond with the coal intervals determined from the geophysical logs. Similarly, it was necessary to adjust the thickness of each increment to account for coring losses and the inclusion of noncoaly rock. In most cases, the presence of noncoaly rock in a sampled interval was evidenced by its high ash content, its low heating value, and its character on the geophysical logs. Analyzed increments that contained noncoaly rock have been noted by footnotes in Appendix A.

It should be noted that all the sampled increments were not analyzed at the same time (noted by asterisks in Appendix A). One group of increments was analyzed in July; another group of increments was analyzed in September; and the remaining increments and composited samples were analyzed in November and December. Although all coal was continuously

sealed in plastic tubing, there may have been some moisture loss in the increments not analyzed until November and December. As a check on moisture loss, the average as-received moisture contents for increments analyzed in July and September were compared to moisture contents of increments analyzed at the end of the year. Preliminary evaluation of these average moisture contents suggests that moisture loss in the samples between July and November was relatively minor, the difference being only 0.4 percent for coal samples from the Almond Formation. Not enough data were available to compare moisture contents in the Fort Union Formation coals. Average moisture content of the Adaville Formation coals differed by 1.6 percent from September to November.

Users of the analytical data in this report should note that the composited coal bed analyses presented in Tables 1, 2, and 3 are more indicative of the coals in these two test areas than the analyses of individual increments. The analyses of individual increments, however, provide insight into vertical variations in coal quality that might be expected in coals of the two areas. These vertical variations will prove useful in an economic evaluation of the coals since this type of data indicates the feasibility of selective mining to remove high ash or high sulfur portions of individual coal beds.

In conclusion, it is stressed that there are not enough analyses in this report to fully characterize any individual coal beds, let alone the coal-bearing formations in the two areas. Although such characterization must await additional drilling and analyses, the data in this report do provide insight into the general thickness and quality of the coals in the two areas.

TABLE 1. *PROXIMATE AND ULTIMATE ANALYSES, HEAT VALUES, AND FORMS OF SULFUR OF COAL BEDS FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.*[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)			ULTIMATE ANALYSIS (PERCENT)						SULFUR FORMS (PERCENT)			HEATING VALUE	
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFATE	PYRITIC	ORGANIC	(BTU/POUND)	BASIS[3]
SALT WELLS AREA														
					Core Hole BD-1C (Paleocene Fort Union Formation)									
225.0-233.5(C)[4]	13.3	31.1	45.8	9.8	5.35	59.29	0.81	23.93	0.78	0.02	0.22	0.54	10,130	A
8.5	----	35.8	52.9	11.3	4.46	68.38	0.94	13.98	0.89	0.02	0.25	0.62	11,690	B
8.5	----	40.4	59.6	----	5.03	77.14	1.06	15.76	1.01	0.02	0.28	0.71	13,180	C
					Core Hole CRNE-1C (Upper Cretaceous Almond Formation)									
157.6-161.6(C)	12.9	20.8	33.5	32.8	4.11	41.72	0.60	20.27	0.51	0.02	0.12	0.37	7,000	A
4.0[5]	----	23.9	38.5	37.6	3.07	47.88	0.69	10.14	0.59	0.02	0.14	0.43	8,030	B
3.5	----	38.2	61.8	----	4.92	76.76	1.11	16.27	0.94	0.04	0.23	0.67	12,880	C
					Core Hole CRNE-4C (Paleocene Fort Union Formation)									
232.0-242.0(C)	15.9	31.2	44.7	8.2	5.97	58.93	0.83	25.36	0.73	0.02	0.18	0.53	10,120	A
10.0	----	37.2	53.1	9.7	4.98	70.10	0.98	13.33	0.88	0.02	0.21	0.65	12,040	B
10.0	----	41.2	58.8	----	5.51	77.66	1.09	14.77	0.97	0.02	0.23	0.72	13,330	C
					Core Hole CRNE-7C (Upper Cretaceous Almond Formation)									
311.5-321.0(C)	15.1	31.0	48.4	5.5	5.44	61.28	0.75	26.42	0.56	0.02	0.11	0.43	10,520	A
9.5	----	36.5	57.0	6.5	4.41	72.21	0.89	15.29	0.66	0.02	0.13	0.51	12,390	B
9.5	----	39.1	60.9	----	4.72	77.26	0.95	16.36	0.71	0.02	0.14	0.55	13,260	C
					Core Hole MSR-10C (Upper Cretaceous Almond Formation)									
168.5-172.0(C)	13.0	31.9	50.2	4.9	5.64	64.00	0.88	23.63	0.91	0.03	0.20	0.68	11,140	A
3.5	----	36.7	57.6	5.7	4.81	73.58	1.01	13.88	1.04	0.03	0.23	0.78	12,810	B
3.5	----	38.9	61.1	----	5.10	78.01	1.07	14.71	1.11	0.03	0.24	0.84	13,580	C
					Core Hole MSR-11C (Upper Cretaceous Almond Formation)									
62.0- 66.5(C)	14.1	32.5	43.6	9.8	5.57	59.47	0.69	21.64	2.82	0.12	1.01	1.69	10,270	A
4.5	----	37.8	50.8	11.4	4.65	69.22	0.80	10.62	3.29	0.14	1.18	1.97	11,950	B
4.5	----	42.6	57.4	----	5.25	78.15	0.91	11.98	3.71	0.16	1.33	2.22	13,490	C
					Core Hole MSR-12C (Paleocene Fort Union Formation)									
226.0-232.0(C)	14.6	30.5	46.9	8.0	5.82	60.97	0.78	23.73	0.75	0.01	0.22	0.52	10,430	A
6.0	----	35.8	54.9	9.3	4.91	71.37	0.92	12.62	0.87	0.01	0.26	0.60	12,210	B
6.0	----	39.4	60.6	----	5.41	78.69	1.01	13.93	0.96	0.01	0.29	0.66	13,460	C
					Core Hole MSR-14C (Upper Cretaceous Almond Formation)									
213.0-217.8(C)	10.5	28.5	42.0	19.0	5.30	55.77	0.69	18.16	1.10	0.02	0.34	0.74	9,610	A
4.8[6]	----	31.8	47.0	21.2	4.61	62.31	0.78	9.87	1.23	0.02	0.38	0.83	10,730	B
3.5	----	40.4	59.6	----	5.85	79.08	0.99	12.51	1.57	0.03	0.49	1.05	13,620	C
362.0-367.0(C)	10.9	31.4	51.3	6.4	5.66	64.67	0.90	21.60	0.75	0.02	0.16	0.57	11,380	A
5.0	----	35.3	57.5	7.2	4.98	72.62	1.01	13.34	0.84	0.02	0.18	0.64	12,770	B
5.0	----	38.0	62.0	----	5.37	78.27	1.09	14.36	0.91	0.02	0.20	0.69	13,770	C
422.2-424.0	11.7	33.1	45.2	10.0	5.37	62.36	1.15	19.11	2.06	----	----	----	10,880	A
1.8	----	37.5	51.2	11.3	4.59	70.64	1.30	9.86	2.33	----	----	----	12,320	B
1.8	----	42.2	57.8	----	5.18	79.62	1.47	11.11	2.62	----	----	----	13,890	C
428.7-432.5(WA)[7]	11.9	30.5	46.4	11.2	5.74	60.78	1.20	20.41	0.69	----	----	----	10,570	A
3.8	----	34.7	52.8	12.5	5.02	69.17	1.36	11.16	0.78	----	----	----	12,030	B
4.0	----	39.8	60.2	----	5.75	78.94	1.56	12.85	0.90	----	----	----	13,750	C
					Core Hole MSR-16C (Paleocene Fort Union Formation)									
209.0-214.0(C)	10.9	30.8	47.7	10.6	5.42	62.17	1.01	19.76	1.07	0.02	0.25	0.80	10,860	A
5.0	----	34.6	53.5	11.9	4.71	69.79	1.13	11.31	1.20	0.02	0.28	0.90	12,190	B
5.0	----	39.3	60.7	----	5.34	79.18	1.28	12.84	1.36	0.02	0.32	1.02	13,830	C

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)			ULTIMATE ANALYSIS (PERCENT)						SULFUR FORMS (PERCENT)			HEATING VALUE	
Table 1 continued	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFATE	PYRITIC	ORGANIC	(BTU/POUND)	BASIS[3]
SALT WELLS AREA continued														
Core Hole MSR-16C continued														
248.6-251.0(WA)	12.1	28.0	47.8	12.1	5.28	60.33	0.96	20.60	0.70	----	----	----	10,340	A
2.4	----	31.8	54.4	13.8	4.47	68.67	1.09	11.22	0.79	----	----	----	11,760	B
2.5	----	37.0	63.0	----	5.20	79.53	1.27	13.08	0.92	----	----	----	13,630	C
284.5-286.8	11.2	33.2	46.1	9.5	6.47	63.58	1.15	18.46	0.82	----	----	----	11,020	A
2.3	----	37.3	52.0	10.7	5.88	71.58	1.30	9.61	0.92	----	----	----	12,410	B
2.5	----	41.8	58.2	----	6.58	80.17	1.45	10.77	1.03	----	----	----	13,900	C
Core Hole PM-10C (Upper Cretaceous Almond Formation)														
219.5-229.0(C)	10.2	31.7	53.2	4.9	5.41	68.17	0.74	20.18	0.63	0.01	0.15	0.47	11,870	A
9.5	----	35.3	59.3	5.4	4.75	75.88	0.82	12.43	0.70	0.01	0.17	0.52	13,220	B
9.5	----	37.3	62.7	----	5.03	80.22	0.87	13.14	0.74	0.01	0.18	0.55	13,970	C
266.1-275.0(WA)	10.2	30.7	48.0	11.1	5.85	63.57	1.13	17.85	0.53	----	----	----	11,060	A
9.5	----	34.2	53.6	12.3	5.24	70.89	1.26	9.74	0.59	----	----	----	12,330	B
9.5	----	39.1	61.0	----	6.00	80.78	1.44	11.10	0.65	----	----	----	14,050	C
265.5-275.0(C)	9.6	30.5	48.8	11.1	5.71	63.57	0.88	18.19	0.51	0.01	0.06	0.44	11,120	A
9.5	----	33.7	54.0	12.3	5.13	70.32	0.97	10.70	0.56	0.01	0.06	0.49	12,300	B
9.5	----	38.4	61.6	----	5.85	80.20	1.11	12.20	0.64	0.01	0.07	0.56	14,030	C
Core Hole PM-12C (Upper Cretaceous Almond Formation)														
311.0-319.0(C)	11.8	30.7	53.2	4.3	5.66	67.68	1.07	20.75	0.52	0.01	0.08	0.43	11,760	A
8.0	----	34.8	60.3	4.9	4.91	76.77	1.22	11.61	0.59	0.01	0.09	0.49	13,340	B
8.0	----	36.6	63.4	----	5.17	80.72	1.28	12.21	0.62	0.01	0.09	0.52	14,030	C
358.0-364.0(C)	10.0	31.0	53.6	5.4	5.42	68.22	0.95	19.60	0.44	<0.01	0.04	0.40	11,940	A
6.0	----	34.5	59.5	6.0	4.78	75.84	1.05	11.87	0.49	<0.01	0.04	0.45	13,270	B
6.0	----	36.7	63.3	----	5.08	80.65	1.12	12.62	0.53	<0.01	0.05	0.48	14,110	C
Core Hole PM-16C (Upper Cretaceous Almond Formation)														
141.0-145.5(C)	10.7	30.7	47.6	11.0	5.60	62.63	0.89	19.16	0.73	0.02	0.11	0.60	11,010	A
4.5	----	34.4	53.3	12.3	4.93	70.12	0.99	10.84	0.82	0.02	0.12	0.68	12,330	B
4.5	----	39.2	60.8	----	5.62	79.95	1.13	12.37	0.93	0.02	0.13	0.78	14,060	C
190.0-195.0(C)	12.1	31.0	52.1	4.8	5.51	67.06	0.78	20.44	1.37	0.03	0.27	1.07	11,620	A
5.0	----	35.3	59.2	5.5	4.73	76.28	0.89	11.04	1.56	0.03	0.31	1.22	13,210	B
5.0	----	37.3	62.7	----	5.01	80.72	0.94	11.68	1.65	0.03	0.33	1.29	13,980	C
265.5-267.5	13.3	33.2	51.2	2.3	6.48	67.55	1.30	21.46	0.89	----	----	----	11,830	A
2.0	----	38.3	59.0	2.7	5.76	77.93	1.50	11.11	1.03	----	----	----	13,650	B
2.0	----	39.4	60.0	----	5.92	80.07	1.54	11.41	1.06	----	----	----	14,020	C
316.0-321.5(C)	12.0	31.2	52.7	4.1	5.74	67.74	1.04	20.89	0.48	0.01	0.04	0.43	11,860	A
5.5	----	35.5	59.8	4.7	5.00	76.96	1.18	11.66	0.54	0.01	0.04	0.49	13,470	B
5.5	----	37.2	62.8	----	5.24	80.72	1.23	12.24	0.57	0.01	0.04	0.52	14,130	C
441.0-449.0(C)	11.4	31.0	49.6	8.0	5.77	64.75	0.96	19.97	0.51	<0.01	0.06	0.45	11,380	A
8.0	----	35.0	55.9	9.1	5.07	73.07	1.08	11.12	0.58	<0.01	0.07	0.51	12,840	B
8.0	----	38.5	61.5	----	5.58	80.37	1.19	12.22	0.64	<0.01	0.08	0.56	14,130	C
Core Hole PM-17C (Upper Cretaceous Almond Formation)														
212.0-218.0(C)	12.1	31.0	52.0	4.9	5.64	67.04	1.03	20.85	0.56	0.01	0.08	0.47	11,630	A
6.0	----	35.2	59.3	5.5	4.88	76.23	1.17	11.54	0.63	0.01	0.09	0.53	13,220	B
6.0	----	37.3	62.7	----	5.17	80.71	1.24	12.21	0.67	0.01	0.09	0.57	14,000	C

Table 1 continued

SALT WELLS AREA continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFUR FORMS (PERCENT) SULFATE	PYRITIC	ORGANIC	HEATING VALUE (BTU/POUND)	BASIS[3]
Core Hole PM-17C continued														
343.0-348.0(C)	12.4	30.8	52.3	4.5	5.66	67.17	1.10	21.05	0.51	0.03	0.09	0.39	11,670	A
5.0	----	35.2	59.6	5.2	4.87	76.72	1.26	11.42	0.58	0.03	0.11	0.44	13,330	B
5.0	----	37.1	62.9	----	5.13	80.88	1.32	12.06	0.61	0.03	0.11	0.47	14,060	C
452.2-457.0(WA)	10.9	27.0	39.7	22.5	5.18	53.12	1.06	17.61	0.59	----	----	----	9,250	A
4.8[8]	----	30.5	44.9	24.7	4.47	60.04	1.20	8.93	0.67	----	----	----	10,450	B
5.0	----	41.1	59.0	----	6.03	79.27	1.57	12.29	0.85	----	----	----	13,750	C
KEMMERER AREA														
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
96.0-121.0(C)	22.4	32.2	40.4	5.0	6.24	54.61	0.74	33.23	0.19	<0.01	0.02	0.17	9,410	A
25.0[9]	----	41.5	52.1	6.4	4.82	70.38	0.96	17.17	0.24	<0.01	0.02	0.22	12,120	B
25.0	----	44.4	55.6	----	5.15	75.22	1.02	18.35	0.26	<0.01	0.02	0.24	12,960	C
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-198.0(C)	21.7	32.8	38.5	7.0	6.10	54.01	0.49	31.81	0.54	<0.01	0.09	0.45	9,380	A
23.0[10]	----	41.9	49.1	9.0	4.69	68.99	0.63	15.99	0.70	<0.01	0.12	0.58	11,980	B
39.0	----	46.1	53.9	----	5.15	75.82	0.69	17.58	0.76	<0.01	0.13	0.63	13,160	C
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-473.0(C)	21.3	33.8	40.3	4.6	6.44	56.51	0.70	31.10	0.66	<0.01	0.16	0.50	9,870	A
24.0	----	43.0	51.2	5.8	5.15	71.80	0.88	15.49	0.84	<0.01	0.20	0.64	12,540	B
23.5	----	45.6	54.4	----	5.47	76.25	0.94	16.45	0.89	<0.01	0.21	0.68	13,310	C
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
275.0-281.0(C)	22.9	32.3	40.8	4.0	6.07	55.08	0.86	33.75	0.22	<0.01	0.03	0.19	9,470	A
6.0[11]	----	41.9	52.9	5.2	4.56	71.43	1.11	17.40	0.28	<0.01	0.04	0.24	12,270	B
9.0	----	44.2	55.8	----	4.81	75.36	1.17	18.36	0.30	<0.01	0.04	0.26	12,950	C

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Analyses reported as A, sample as received; B, sample dry; C, sample dry ash-free.

[4] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[5] Upper and lower parts of the sampled interval were probably not coal.

[6] Includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[7] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[8] Lower part of the sampled interval was probably not coal.

[9] Interval sampled includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[10] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet was lost in coring and was not recovered.

[11] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet was lost in coring and was not recovered.

TABLE 2. FUSIBILITY OF ASH, FREE-SWELLING INDEX, MOIST, MINERAL-MATTER-FREE HEAT VALUE, AND APPARENT RANK OF COAL SAMPLES FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[2]	FUSIBILITY OF ASH (TEMPERATURE °F) REDUCING ATMOSPHERE				OXIDIZING ATMOSPHERE				FREE-SWELLING INDEX[3]	MOIST, MINERAL-MATTER-FREE HEAT VALUE (BTU/LB)[4]	APPARENT RANK OF COAL[5]
	INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID			
SALT WELLS AREA											
				Core Hole BD-1C (Paleocene Fort Union Formation)							
225.0-233.5 (C)[6] 8.5/8.5	2220	2250	2340	2440	2200	2250	2310	2420	0	11,340	Subbituminous A
				Core Hole CRNE-1C (Upper Cretaceous Almond Formation)							
157.6-161.6 (C) 4.0[7]/3.5	2410	2440	2470	2590	2440	2510	2550	2800	0	10,850	Subbituminous A
				Core Hole CRNE-4C (Paleocene Fort Union Formation)							
232.0-242.0 (C) 10.0/10.0	2200	2250	2330	2470	2230	2250	2310	2470	0	11,110	Subbituminous A
				Core Hole CRNE-7C (Upper Cretaceous Almond Formation)							
311.5-321.0 (C) 9.5/9.5	2370	2400	2410	2450	2420	2440	2460	2510	0	11,190	Subbituminous A
				Core Hole MSR-10C (Upper Cretaceous Almond Formation)							
168.5-172.0 (C) 3.5/3.5	2240	2280	2330	2420	2250	2280	2320	2430	0	11,780	High Volatile C Bituminous
				Core Hole MSR-11C (Upper Cretaceous Almond Formation)							
62.0- 66.5 (C) 4.5/4.5	2450	2500	2540	2610	2430	2500	2530	2570	0	11,530	High Volatile C Bituminous
				Core Hole MSR-12C (Paleocene Fort Union Formation)							
226.0-232.0 (C) 6.0/6.0	2310	2390	2450	2550	2320	2430	2460	2540	0	11,430	Subbituminous A
				Core Hole MSR-14C (Upper Cretaceous Almond Formation)							
213.0-217.8 (C) 4.8[8]/3.5	2450	2550	2590	2760	2490	2530	2610	2730	0	12,110	High Volatile C Bituminous
362.0-367.0 (C) 5.0/5.0	2290	2340	2410	2480	2290	2360	2440	2560	0	12,240	High Volatile C Bituminous
442.2-424.0 1.8/1.8	----	----	----	----	----	----	----	----	-	12,240	High Volatile C Bituminous
428.7-432.5 (WA)[9] 3.8/4.0	----	----	----	----	----	----	----	----	-	12,040	High Volatile C Bituminous
				Core Hole MSR-16C (Paleocene Fort Union Formation)							
209.0-214.0 (C) 5.0/5.0	2530	2530	2540	2560	2560	2600	2650	2750	0	12,290	High Volatile C Bituminous
248.6-251.0 (WA) 2.4/2.5	----	----	----	----	----	----	----	----	-	11,900	High Volatile C Bituminous
284.5-286.8 2.3/2.5	----	----	----	----	----	----	----	----	-	12,300	High Volatile C Bituminous
				Core Hole PM-10C (Upper Cretaceous Almond Formation)							
219.5-229.0 (C) 9.5/9.5	2240	2270	2290	2370	2260	2300	2320	2340	0	12,550	High Volatile C Bituminous
265.5-275.0 (C) 9.5/9.5	2690	2800	2820	2870	2690	2820	2840	2870	1/2	12,650	High Volatile C Bituminous

TABLE 2 continued
SALT WELLS AREA continued

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[2]	FUSIBILITY OF ASH (TEMPERATURE °F) REDUCING ATMOSPHERE INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	OXIDIZING ATMOSPHERE INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	FREE SWELLING INDEX[3]	MOIST, MINERAL MATTER-FREE HEAT VALUE (BTU/LB)[4]	APPARENT RANK OF COAL[5]
Core Hole PM-12 C (Upper Cretaceous Almond Formation)											
311.0-319.0 (C) 8.0/8.0	2400	2430	2480	2550	2370	2410	2470	2490	1/2	12,340	High Volatile C Bituminous
358.0-364.0 (C) 6.0/6.0	2960	>3000	>3000	>3000	2910	>3000	>3000	>3000	1/2	12,690	High Volatile C Bituminous
Core Hole PM-16C (Upper Cretaceous Almond Formation)											
141.0-145.5 (C) 4.5/4.5	2530	2720	2740	2800	2530	2670	2740	2800	1/2	12,510	High Volatile C Bituminous
190.0-195.0 (C) 5.0/5.0	2400	2500	2550	2620	2420	2460	2520	2580	1/2	12,280	High Volatile C Bituminous
265.5-267.5 2.0/2.0	----	----	----	----	----	----	----	----	-	12,150	High Volatile C Bituminous
316.0-321.5 (C) 5.5/5.5	2360	2380	2400	2440	2390	2440	2520	2600	1/2	12,420	High Volatile C Bituminous
441.0-449.0 (C) 8.0/8.0	2550	2830	2840	2860	2710	2830	2850	2890	1/2	12,470	High Volatile C Bituminous
Core Hole PM-17C (Upper Cretaceous Almond Formation)											
212.0-218.0 (C) 6.0/6.0	2370	2390	2420	2450	2380	2410	2440	2490	1/2	12,290	High Volatile C Bituminous
343.0-348.0 (C) 5.0/5.0	2460	2520	2540	2630	2430	2490	2500	2620	1/2	12,330	High Volatile C Bituminous
452.2-457.0 (WA) 4.8/5.0	----	----	----	----	----	----	----	----	-	12,230	High Volatile C Bituminous
KEMMERER AREA											
Core Hole MD-2C (Upper Cretaceous Adaville Formation)											
96.0-106.2 (C) 10.2/25.0	2230	2250	2280	2530	2200	2230	2250	2500	0	9,960	Subbituminous B
96.0-108.3 (WA) 12.3/25.0	----	----	----	----	----	----	----	----	-	9,910	Subbituminous B
106.2-121.0 (C) 14.8[10]/25.0	2210	2240	2280	2530	2190	2230	2250	2500	0	9,980	Subbituminous B
109.8-121.0 (WA) 13.6/25.0	----	----	----	----	----	----	----	----	-	10,000	Subbituminous B
96.0-121.0 (C) 25.0[10]/25.0	2230	2270	2290	2530	2230	2260	2280	2340	0	9,950	Subbituminous B
Core Hole MD-3C (Upper Cretaceous Adaville Formation)											
175.0-198.0 (C) 23.0[11]/39.0	2360	2400	2450	2640	2360	2410	2540	2530	0	10,150	Subbituminous B
Core Hole R-6AC (Upper Cretaceous Adaville Formation)											
449.0-473.0 (C) 24.0/23.5	2220	2250	2270	2310	2220	2260	2290	2340	0	10,390	Subbituminous B
Core Hole R-7C (Upper Cretaceous Adaville Formation)											
275.0-281.0 (C) 6.0[12]/9.0	2260	2270	2290	2320	2260	2280	2290	2310	0	10,000	Subbituminous B

Table 2 continued

[1] All analytical work by Wyoming Analytical Laboratires, Inc., Laramie, Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Free-Swelling Index determined and reported in accordance with ASTM Standard D-720-67.

[4] Determined by the Parr Formula for moist, mineral-matter-free Btu (ASTM Standard D-338-77).

[5] Rank determination from ASTM Standard D-388-77, Table 1.

[6] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[7] Upper and lower parts of the sampled interval probably not coal.

[8] Includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[9] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[10] Interval includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[11] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet was lost in coring and was not recovered.

[12] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet was lost in coring and was not recovered.

TABLE 3. *MAJOR AND MINOR OXIDES AND SELECTED TRACE ELEMENTS IN ASH OF COMPOSITE COAL SAMPLES FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.*[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[3]	MAJOR AND MINOR OXIDES AS PERCENT OF THE ASH[2]										SELECTED TRACE ELEMENT CONCENTRATIONS OF THE ASH (PARTS PER MILLION)		
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	Mn_3O_4[4]	P_2O_5	SO_3	Barium	Strontium	Zirconium
SALT WELLS AREA														
				Core Hole BD-1C (Paleocene Fort Union Formation)										
225.0-233.5 8.5/8.5	52.68	16.54	6.52	9.47	2.35	2.35	0.66	0.77	0.05	0.13	8.14	1,430	1,410	510
				Core Hole CRNE-1C (Upper Cretaceous Almond Formation)										
157.6-161.6 4.0[5]/3.5	56.68	17.56	7.06	10.12	4.25	0.46	0.60	0.92	0.04	0.13	1.33	4,490	2,510	587
				Core Hole CRNE-4C (Paleocene Fort Union Formation)										
232.0-242.0 10.0/10.0	68.33	14.20	2.24	1.08	1.07	0.53	2.23	0.58	0.03	0.04	9.42	1,820	319	261
				Core Hole CRNE-7C (Upper Cretaceous Almond Formation)										
311.5-321.0 9.5/9.5	39.06	23.29	7.50	12.64	3.68	0.51	0.74	0.91	0.05	0.21	10.22	5,820	4,550	557
				Core Hole MSR-10C (Upper Cretaceous Almond Formation)										
168.5-172.0 3.5/3.5	46.29	19.58	14.31	8.46	2.61	0.29	0.93	0.79	0.05	0.36	5.62	5,180	1,540	362
				Core Hole MSR-11C (Upper Cretaceous Almond Formation)										
62.0-66.5 4.5/4.5	34.73	16.54	38.60	3.10	0.90	0.23	0.54	0.46	0.08	0.95	3.77	349	315	371
				Core Hole MSR-12C (Paleocene Fort Union Formation)										
266.0-232.0 6.0/6.0	59.48	15.78	9.69	4.70	1.43	2.66	0.44	0.84	0.04	0.20	4.54	5,740	924	505
				Core Hole MSR-14C (Upper Cretaceous Almond Formation)										
213.0-217.8 4.8[6]/3.5	68.58	17.11	5.34	2.44	0.79	0.15	1.78	0.57	0.03	0.11	1.15	9,230	804	242
362.0-367.0 5.0/5.0	55.59	17.83	8.83	7.94	0.91	0.18	1.11	0.73	0.10	0.26	5.19	8,000	5,100	259
				Core Hole MSR-16C (Paleocene Fort Union Formation)										
209.0-214.0 5.0/5.0	70.01	16.88	7.58	2.09	0.66	0.10	0.42	0.81	0.03	0.16	1.12	891	225	289
				Core Hole PM-10C (Upper Cretaceous Almond Formation)										
219.5-229.0 9.5/9.5	37.06	18.90	9.61	21.56	5.44	0.52	0.52	0.56	0.06	0.25	4.77	5,400	1,820	202
265.5-275.0 9.5/9.5	64.46	23.89	2.58	2.53	1.58	0.50	1.57	0.74	0.03	0.03	1.87	1,140	847	162
				Core Hole PM-12C (Upper Cretaceous Almond Formation)										
311.0-319.0 8.0/8.0	53.53	23.21	6.16	10.73	0.55	0.21	0.80	0.64	0.05	0.19	3.76	763	863	143
358.0-364.0 6.0/6.0	62.27	29.04	3.40	2.13	0.38	0.79	0.72	0.88	0.03	0.07	0.01	1,290	1,280	254

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[3]	MAJOR AND MINOR OXIDES AS PERCENT OF THE ASH[2]											SELECTED TRACE ELEMENT CONCENTRATIONS OF THE ASH (PARTS PER MILLION)		
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	Mn_3O_4[4]	P_2O_5	SO_3	Barium	Strontium	Zirconium
Table 3 continued														
SALT WELLS AREA continued														
Core Hole PM-16C (Upper Cretaceous Almond Formation)														
141.0-145.5 4.5/4.5	66.66	22.69	4.06	2.34	0.86	0.10	1.69	0.59	0.03	0.08	0.75	556	908	78
190.0-195.0 5.0/5.0	52.81	19.53	18.59	3.21	0.67	0.12	1.42	0.45	0.03	0.34	2.70	661	562	51
316.0-321.5 5.5/5.5	55.41	28.09	4.35	7.66	0.25	1.91	0.35	0.75	0.03	0.22	0.29	4,890	1,910	139
441.0-449.0 8.0/8.0	56.44	28.85	3.39	5.92	0.41	0.96	0.71	0.92	0.03	0.11	1.94	1,160	1,530	532
Core Hole PM-17C (Upper Cretaceous Almond Formation)														
212.0-218.0 6.0/6.0	46.37	26.43	7.18	12.24	1.65	0.12	0.35	0.64	0.07	0.31	3.60	4,250	5,770	470
343.0-348.0 5.0/5.0	59.62	24.72	6.43	5.65	0.45	0.31	0.49	0.93	0.04	0.23	0.50	4,990	825	480
KEMMERER AREA														
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
96.0-106.2 10.2/25.0	49.49	11.46	6.23	17.23	4.55	1.38	0.54	0.55	0.07	0.14	8.12	939	1,150	725
106.2-121.0 14.8[7]/25.0	52.99	8.78	6.00	16.58	4.27	1.36	0.37	0.48	0.06	0.14	8.74	1,140	1,180	257
96.0-121.0 25.0[7]/25.0	51.29	9.96	6.20	17.29	4.52	1.40	0.47	0.51	0.07	0.14	7.89	1,090	1,200	256
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-198.0 23.0[8]/39.0	55.00	16.90	5.66	9.78	1.93	0.18	0.35	0.50	0.06	0.12	9.44	242	238	282
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-473.0 24.0/23.5	39.73	7.24	10.70	18.05	4.03	0.37	0.28	0.39	0.13	0.25	18.69	584	459	225
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
275.0-281.0 6.0[9]/9.0	34.23	11.73	12.03	20.23	8.00	2.23	0.52	0.45	0.04	0.28	9.91	1,350	1,930	196

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming. Metals were determined by inductively coupled argon plasma spectrometry on an Instrumentation Laboratory Plasma 100A spectrometer; sulfur was determined by ASTM Standard Method D-1757.

[2] The major and minor oxides and selected trace elements were normalized to equal 100%. Additional trace elements were not looked for and could be present in the coal sample.

[3] Total coal bed thickness as determined by geophysical logs.

[4] To convert to percent MnO_2, multiply Mn_3O_4 by 1.1398.

[5] Upper and lower parts of the sampled interval were probably not coal.

[6] Sample includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[7] Interval sampled includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[8] This analysis only refers to a composite sample of the upper 23 feet of the coal bed; the lower 16 feet of the coal bed was lost in coring and was not recovered.

[9] This analysis only refers to a composite sample of the upper 6 feet of the coal bed; the lower 3 feet of the coal bed was lost in coring and was not recovered.

TABLE 4. SUMMARY OF HARDGROVE GRINDABILITY INDICES, BY FORMATION, FOR INCREMENTAL SAMPLES OF COAL FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

Age and Formation	Number of Coal Beds Sampled[2]	Number of Samples	Hardgrove Grindability Index[3]	
			Range	Average
Salt Wells Area				
Paleocene Fort Union Formation	4	7	44-57	49
Upper Cretaceous Almond Formation	11	19	10-56	41
Kemmerer Area				
Upper Cretaceous Adaville Formation	3	10	9-60	44

[1] All tests by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming.

[2] Only selected portions (increments) of a particular coal bed were tested.

[3] Determined in accordance with ASTM Standard D 409-71 (Reapproved 1978).

LITHOLOGIC DESCRIPTIONS AND GEOPHYSICAL LOGS

The following abbreviations are used on the headings of the lithologic descriptions and geophysical logs:

Comp. — completed

FSL — from south line

FNL — from north line

FEL — from east line

FWL — from west line

Size, Bit Type: bit diameter in inches; bit types include K-Kenclaw, V-Varrell, WM-Walker McDonald, and C-Christensen 3 7/8" core bit.

CPS/IN — counts per second per inch

T.C. — time constant

H.R. Density — high resolution density

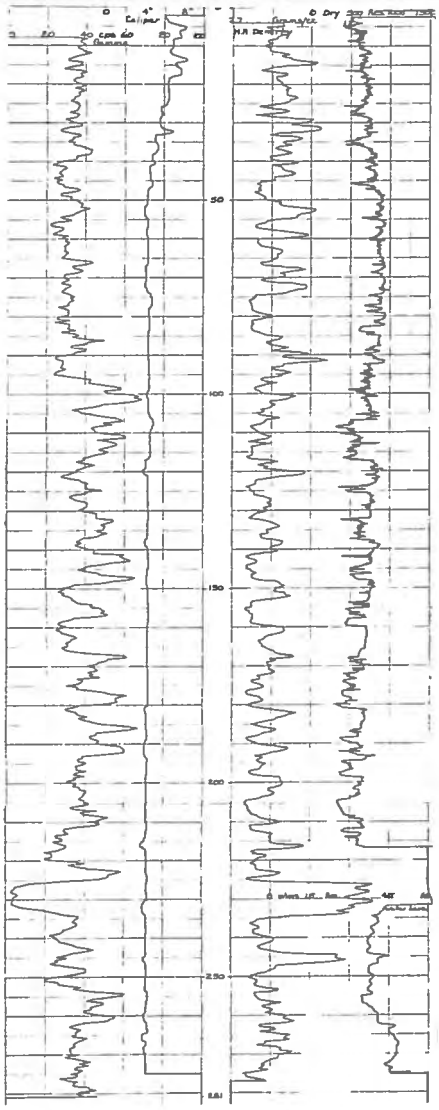
TD — total depth

THE UNIVERSITY OF WYOMING			HOLE NO. BD-1	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Burley Draw		
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 14 T. 16N. R. 102W		FOOTAGE LOCATION: 400' FSL, 300' FEL		
GROUND ELEVATION: 6934.8'	TOTAL DEPTH: 281'	DEPTH TO WATER: 232'		
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 281'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe No. 2		
REMARKS: State Coord. System Loc: 252,754.17 N, 471,446.35 E				

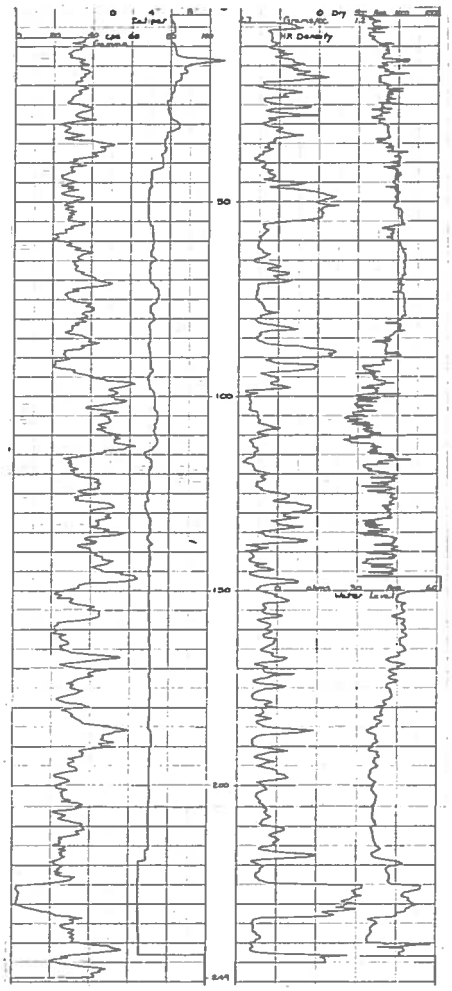
LOGGED DEPTH: 275 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
40	
	Sandstone, brownish-gray
85	Sandstone, light gray
100	
	Shale, medium gray
145	Shale, black, carbonaceous
147	Shale, medium gray
160	Sandstone, light gray
172	Shale, black, carbonaceous
181	Shale, medium gray
190	Sandstone, light gray
205	Sandstone, grayish-brown
217	Shale, dark gray, carbonaceous
226	Coal
235	Shale, dark gray
244	Coal?
247	
	Shale
281TD	



THE UNIVERSITY OF WYOMING			HOLE NO. BD-1C	SHEET 1 OF1
AREA: Salt Wells		QUAD. NAME: Burley Draw		
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 14 T.16N., R.102W.		FOOTAGE LOCATION: 388' FSL, 291'FEL		
GROUND ELEVATION: 6934.9'	TOTAL DEPTH: 251'	DEPTH TO WATER: 150'		
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 221'	CORE FOOTAGE: 30'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 242,742.53 N, 471,455.81E				

CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH:____FT. LOGGING SPEED:____FT./MIN. GAMMA CPS/IN 20 CALIPER 0 4 8 H.R. DENSITY CPS/IN 260 RESISTIVITY 500 OHMS DRY T.C. 2 SCALE T.C. 2 15 OHMS WET	DEPTH (FEET)
	REFER TO BD-1			0
221				50
				100
				150
				200
251	TD			250
				300
				350

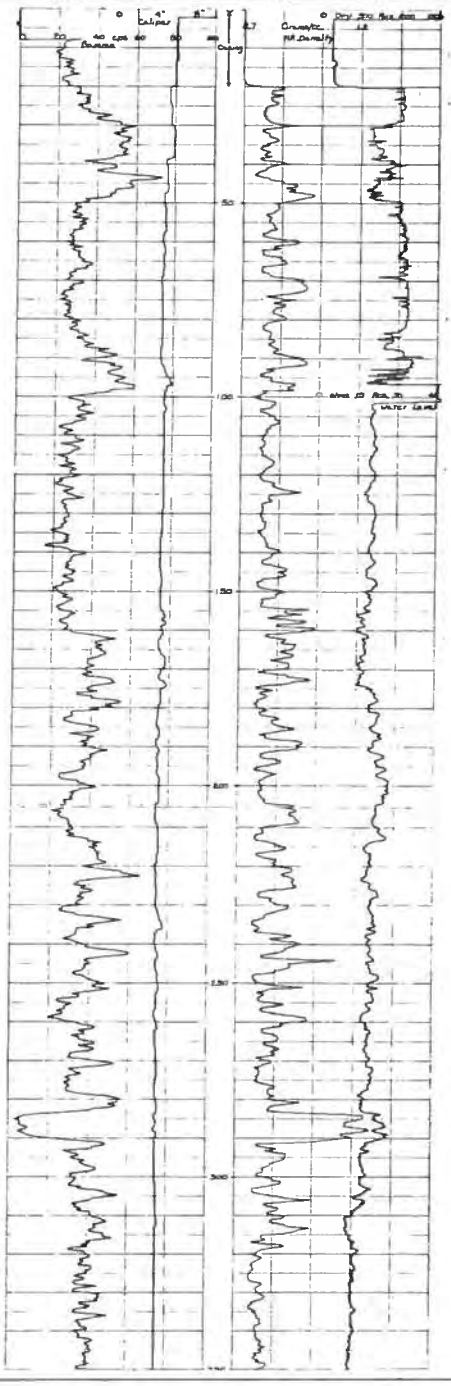
THE UNIVERSITY OF WYOMING			HOLE NO. BD-2	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Burley Draw		
DATE STARTED: 5/13/82	DATE COMP.: 5/14/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NE¼SW¼ SEC. 26 T. 16N., R. 102W.		FOOTAGE LOCATION: 2300' FSL, 1800' FWL		
GROUND ELEVATION: 6876.4'	TOTAL DEPTH: 780'	DEPTH TO WATER: 101'		
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 780'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe No. 2		
REMARKS: State Coord. System Loc: 244,510.99'N, 468,688.01'E				

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
31	
	Shale, light and dark gray
49	
	Sandstone, medium gray
93	
99	Siltstone, light gray
	Sandstone, medium gray
161	
	Sandstone, medium gray
183	
	Siltstone, light gray
214	
	Shale, medium gray
284	
	Coal
291.5	
	Shale, medium gray, silty
315	
	Shale

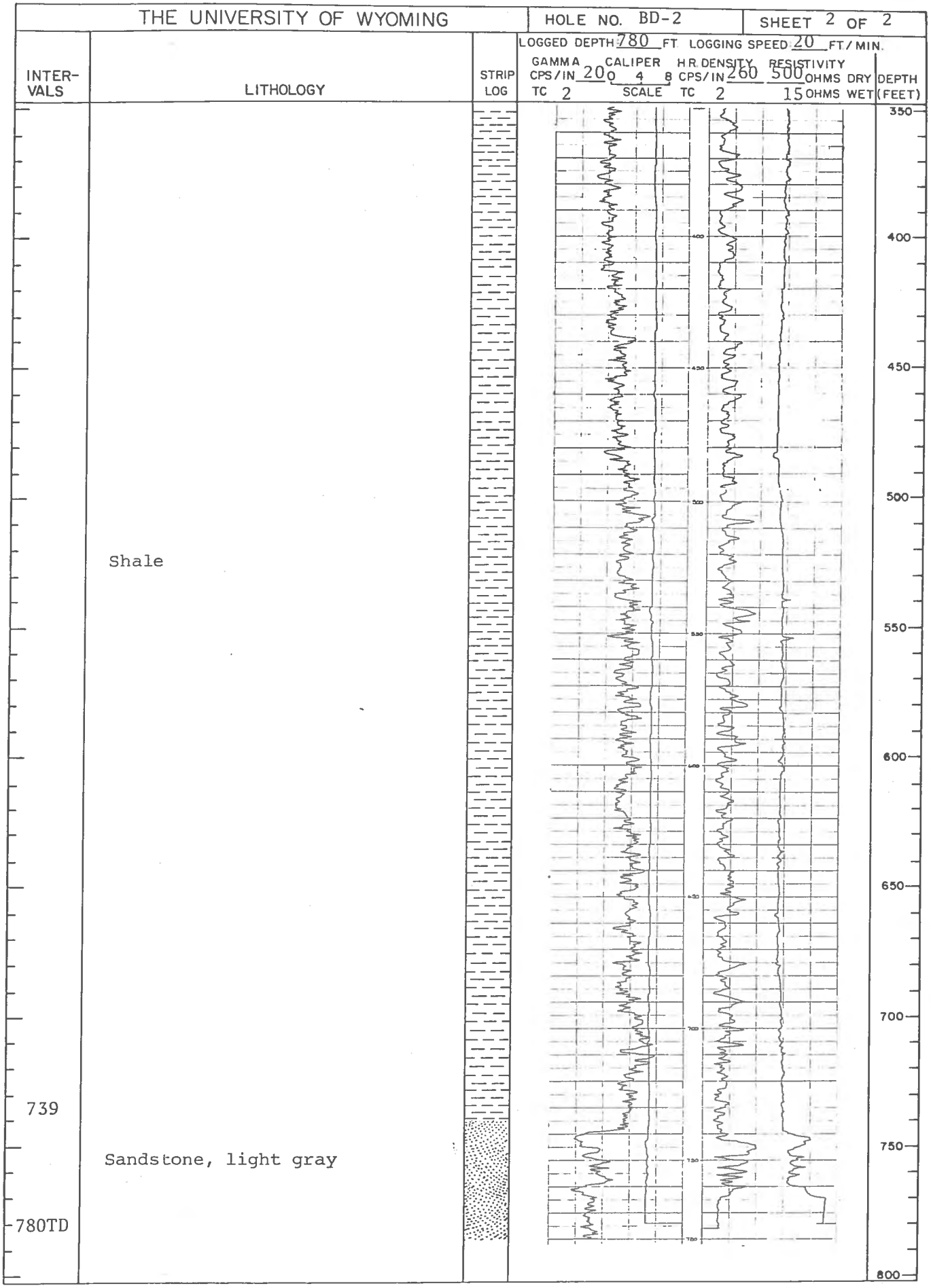
STRIP LOG

LOGGED DEPTH: 780 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET



DEPTH (FEET)


THE UNIVERSITY OF WYOMING
HOLE NO. BD-2
SHEET 2 OF 2
LOGGED DEPTH 780 FT LOGGING SPEED 20 FT/MIN.
INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 20 TC 2
CALIPER 0 4 8 SCALE
H.R. DENSITY CPS/IN 260 500 TC 2
RESISTIVITY OHMS DRY 15 OHMS WET
DEPTH (FEET)
Shale
739
Sandstone, light gray
780TD
350
400
450
500
550
600
650
700
750
800

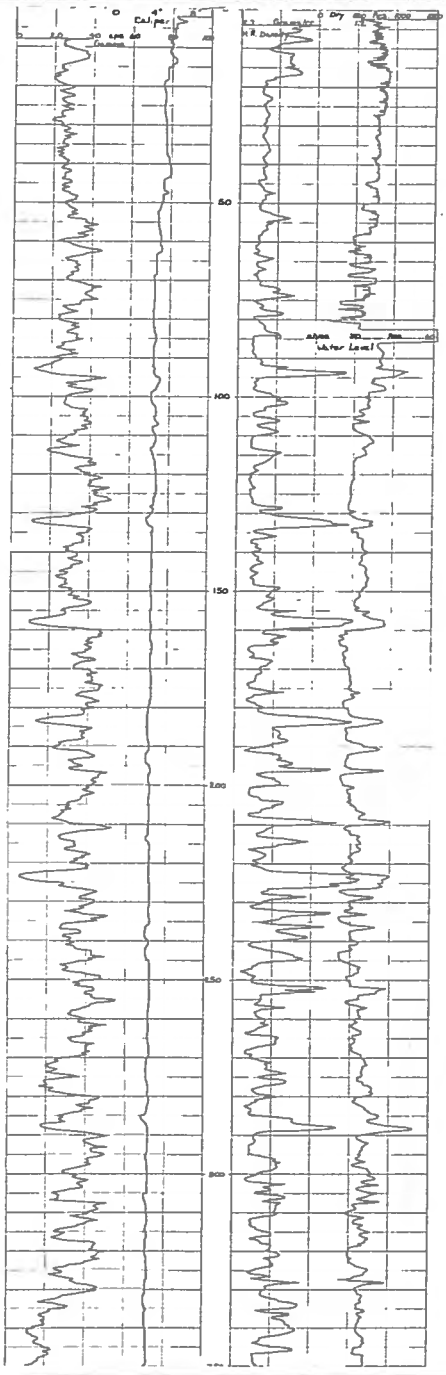
THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-1	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: $SE\frac{1}{4}SE\frac{1}{4}$ SEC. 18 T. 17N., R. 101W		FOOTAGE LOCATION: 200' FSL 200' FEL		
GROUND ELEVATION: 7032.7'	TOTAL DEPTH: 370'	DEPTH TO WATER: 86'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 370'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 283,270.84N, 477,872.91E				

LOGGED DEPTH: 365 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
17	Soil, light brown, sandy
	Sandstone, light brownish-gray
58	Shale, dark brownish-gray
63	Siltstone, light gray
67	
	Siltstone, light gray, and shale, medium gray
93	Coal
95	
	Shale, medium to dark gray
128	Shale, carbonaceous, and coal
131	Coal
134	
	Shale, medium gray
157	Coal
159.5	
	Shale, medium gray
182.5	Coal
184.5	
	Siltstone and shale, medium gray
208	Coal
210	
	Siltstone and shale, medium gray
222	Coal
226	
	Shale, dark gray; thin coals
253.5	
	Shale, dark gray
270	Sandstone, light gray
287	Coal
289	
	Shale, black, carbonaceous, and siltstone, light gray

STRIP LOG

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 500 T.C. 2 15 | RESISTIVITY OHMS DRY OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

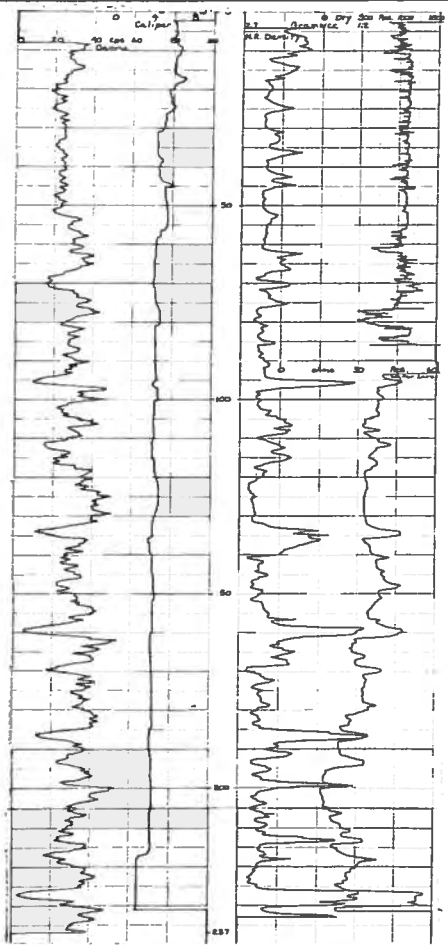
THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-1 | SHEET 2 OF 2

LOGGED DEPTH 365 FT. LOGGING SPEED 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
360TD							350, 400, 450, 500, 550, 600, 650, 700, 750, 800

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-10	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 18 T. 17N., R. 101W		FOOTAGE LOCATION: 179' FSL, 203' FEL		
GROUND ELEVATION: 7032.8'	TOTAL DEPTH: 238'	DEPTH TO WATER: 93'		
SIZE, BIT TYPE: 4 ¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 203'	CORE FOOTAGE: 35'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 283,250.30N 477,870.37E				

LOGGED DEPTH: 237 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
153–168 218–238	Refer to CRNE-1 TD						0, 50, 100, 150, 200, 250, 300, 350

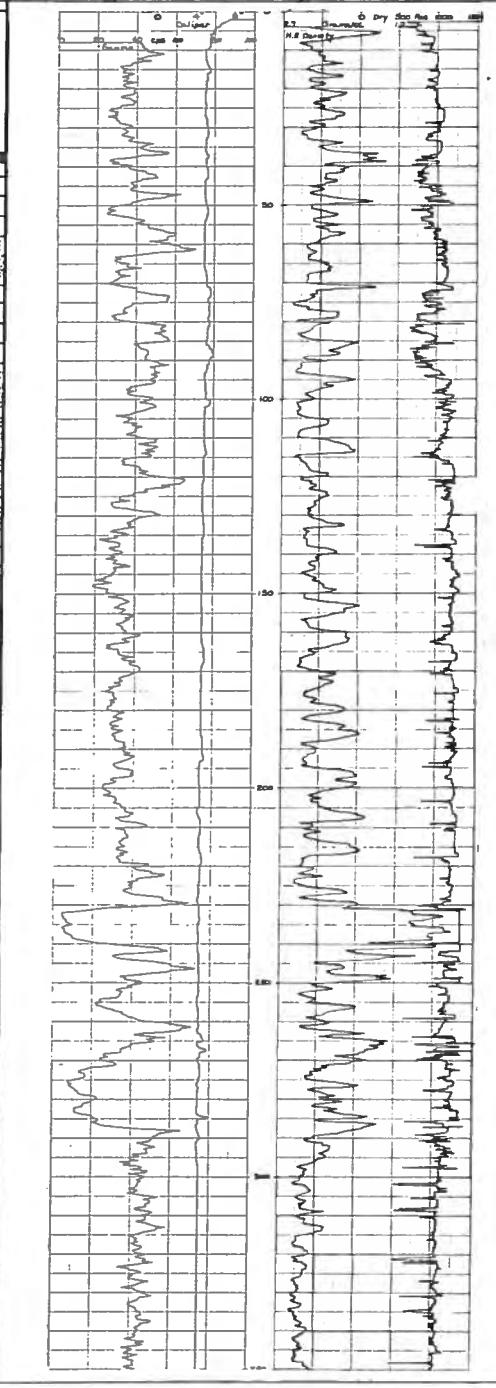
THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-4	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/16/82	DATE COMP.: 5/16/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼SW¼ SEC. 32 T.17N., R.101W		FOOTAGE LOCATION: 1700'FSL, 850'FWL		
GROUND ELEVATION: 7115.1'	TOTAL DEPTH: 800'	DEPTH TO WATER: 800+'		
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 800'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 269,081.36N, 478,848.63E				

LOGGED DEPTH: 761 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
36.5	
39	Coal?
	Shale, brownish-gray
59	
	Sandstone, light gray
70	
	Shale, medium gray
92	
	Sandstone, light gray
220	
	Shale, light gray
231	
	Coal, with shale partings
244	
	Sandstone, light gray
260	
	Shale, dark gray, carbonaceous
271	
	Sandstone, brownish-gray
288	
	Shale

STRIP LOG

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY – OHMS WET



DEPTH (FEET)

0
50
100
150
200
250
300
350

THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-4 | SHEET 2 OF 2

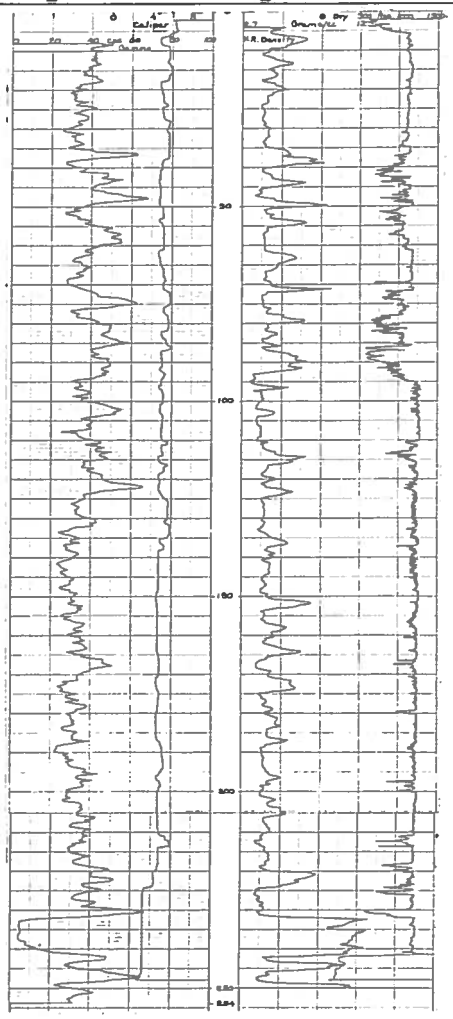
LOGGED DEPTH: 761 FT. LOGGING SPEED: 20 FT./MIN.

INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY – OHMS WET	DEPTH (FEET)
	Shale						350
							400
							450
							500
							550
							600
							650
							700
							750
785	Sandstone, light gray						
800 TD							800

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-4C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼SW¼ SEC. 32 T.17N., R. 101W.		FOOTAGE LOCATION: 1,681'FSL, 859' FWL		
GROUND ELEVATION: 7,115.1'	TOTAL DEPTH: 255'	DEPTH TO WATER: 255+		
SIZE, BIT TYPE: 4¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 225'	CORE FOOTAGE: 30'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 269,062.53N, 478,857.33E				

LOGGED DEPTH: 254 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY – OHMS WET	DEPTH (FEET)
	Refer to CRNE-4						0
							50
							100
							150
							200
225							
							250
255	TD						
							300
							350

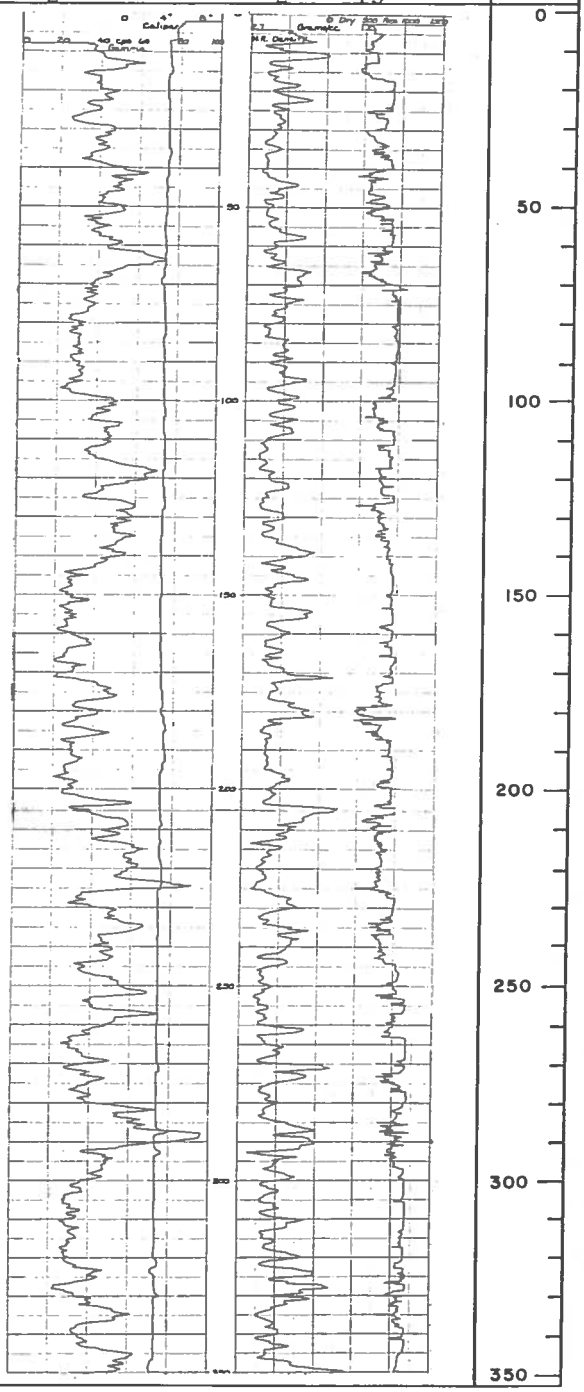


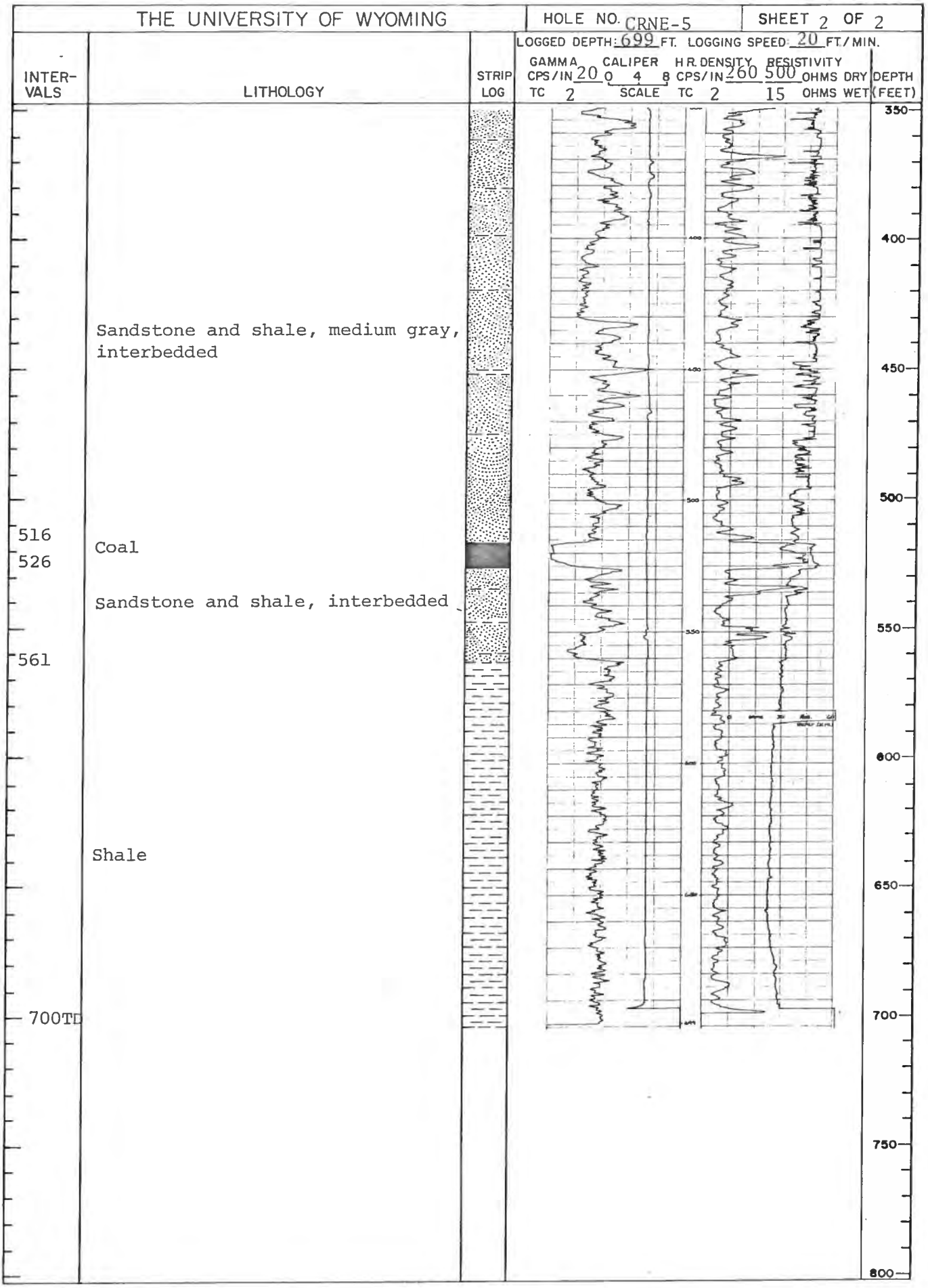
THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-5	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: $SW\frac{1}{4}NE\frac{1}{4}$ SEC. 12 T. 16N., R. 102W.		FOOTAGE LOCATION: 2,000'FNL, 1,800'FEL		
GROUND ELEVATION: 7,291.6'	TOTAL DEPTH: 700'	DEPTH TO WATER: 584'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 700'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 261,299.77N, 475,425.14E				

LOGGED DEPTH: 699 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
36	
	Shale, medium gray
43	
	Sandstone, medium gray
59	
	Shale, medium gray
66	
	Sandstone, medium gray, fine grained
109	
	Sandstone, medium gray, very fine grained
182	
	Shale, medium gray
204	
	Sandstone, medium gray
213	
	Shale, medium gray
226	
	Sandstone, medium gray
231	
	Sandstone, medium gray, and shale, medium gray, interbedded
280	
	Shale, medium gray
292	
	Sandstone and shale, medium gray
300	
	Siltstone, medium gray
317	
	Sandstone, as 109-82
334	
	Sandstone and shale, medium gray, interbedded

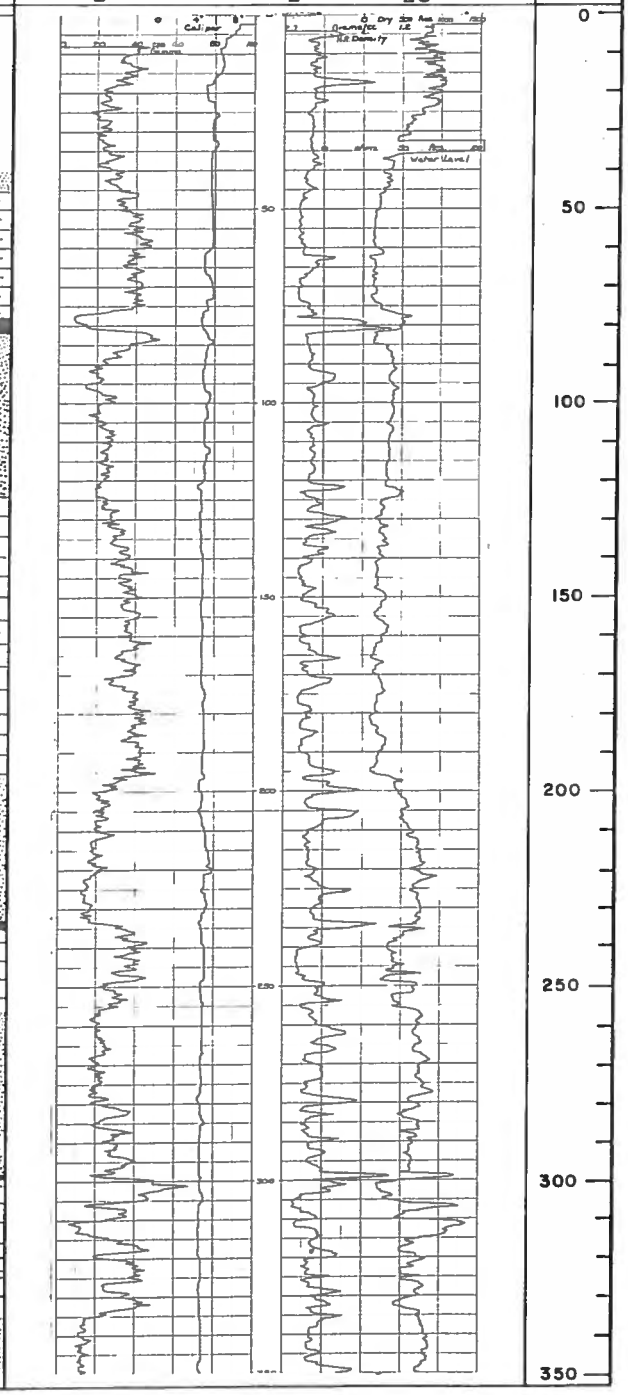



THE UNIVERSITY OF WYOMING
HOLE NO. CRNE-5
SHEET 2 OF 2
LOGGED DEPTH: 699 FT. LOGGING SPEED: 20 FT/MIN.
INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 20 TC 2
CALIPER 0 4 8 SCALE
H.R. DENSITY CPS/IN 260 TC 2
RESISTIVITY 500 15 OHMS DRY OHMS WET
DEPTH (FEET)
Sandstone and shale, medium gray, interbedded
516
Coal
526
Sandstone and shale, interbedded
561
Shale
700TD
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING		HOLE NOCRNE-6	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/14/82	DATE COMP.: 5/14/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: $SE\frac{1}{4}SW\frac{1}{4}$ SEC. 2 T. 16N., R. 102W		FOOTAGE LOCATION: 800'FSL, 2200'FWL	
GROUND ELEVATION: 7,060.4'	TOTAL DEPTH: 390'	DEPTH TO WATER: 35'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 390'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 263,876.88N, 468,980.98E			

LOGGED DEPTH: ~~389~~ FT. LOGGING SPEED: ~~20~~ FT./MIN.

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
40	
45	Sandstone, medium gray
	Shale, medium gray
78	
	Coal
82	
	Sandstone, light gray
124	
	Shale, medium gray
196	
	Sandstone, light gray
233	
	Coal
235	
	Shale, dark gray, carbonaceous
256	
	Sandstone, light gray, as 82-124
298	
299.5	Coal
	Shale, dark gray
333	



THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-6 | SHEET 2 OF 2

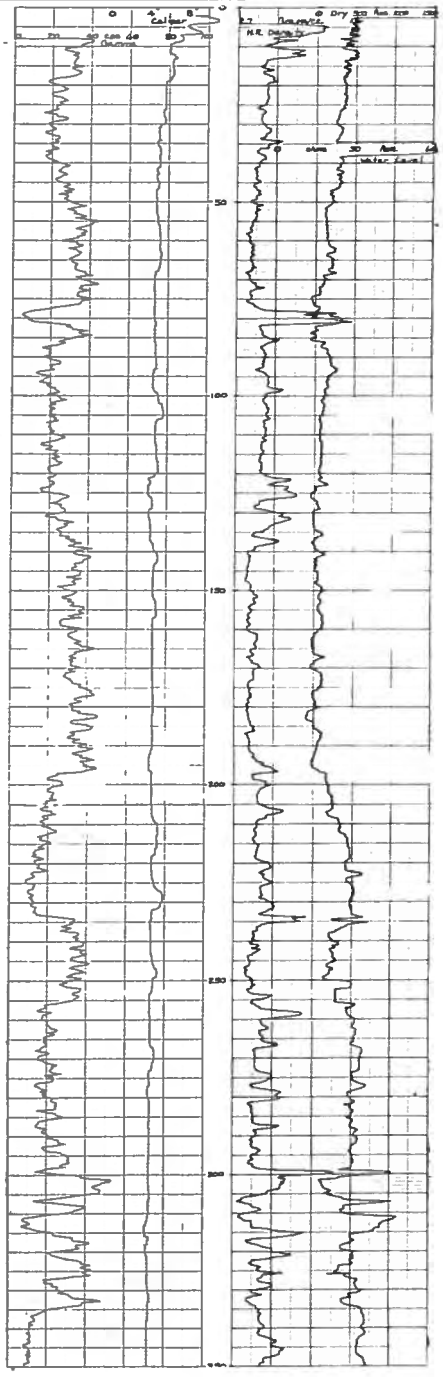
LOGGED DEPTH: 389 FT. LOGGING SPEED: 20 FT/MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
368	Sandstone, medium gray						350
371	Coal						
390TD	Shale, dark gray						400
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-6C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: $SE\frac{1}{4}SW\frac{1}{4}$ SEC. 2 T. 16N., R. 102W.		FOOTAGE LOCATION: 782'FSL, 2,192'FWL		
GROUND ELEVATION: 7,061.0'	TOTAL DEPTH: 385'	DEPTH TO WATER: 35'		
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 329'	CORE FOOTAGE: 56'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 263,858.56N, 468,972.48E				

LOGGED DEPTH: 383 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
72–88 234–244 297–307	Refer to CRNE-6						0, 50, 100, 150, 200, 250, 300, 350



THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-6C | SHEET 2 OF 2

LOGGED DEPTH 383 FT. LOGGING SPEED 20 FT./MIN.

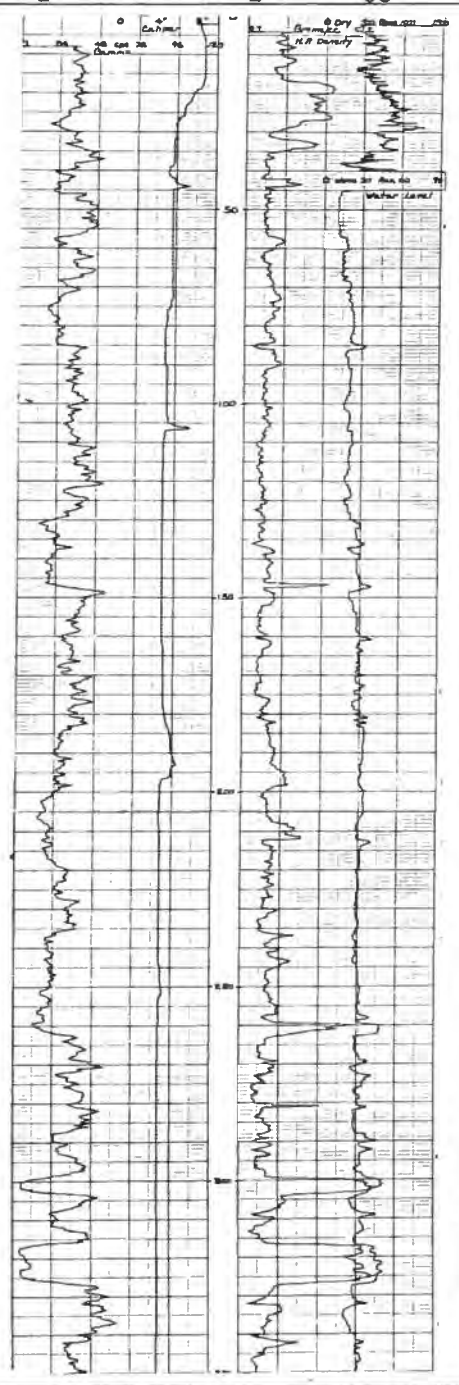
CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 15 OHMS DRY OHMS WET	DEPTH (FEET)
367							350
387	TD						400
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-7	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 6/5/82	DATE COMP.: 6/5/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 10 T. 16N. R. 102W		FOOTAGE LOCATION: 900'FSL, 500'FEL		
GROUND ELEVATION: 7015.2'	TOTAL DEPTH: 400'	DEPTH TO WATER: 45'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 400'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 258,409.70N, 466,272.93E				

LOGGED DEPTH: 396 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 30 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG
0	Soil, light brown, with abundant orange-brown sandstone	
45	Shale, light gray	
60	Sandstone, medium gray	
91	Shale, dark gray	
128	Sandstone, medium gray	
152	Shale, dark gray, carbonaceous	
194	Sandstone, medium gray	
212	Shale, dark gray, carbonaceous	
236	Sandstone, light gray	
259.5	Coal	
262	Shale, dark gray and black, carbonaceous	
299.5	Coal	
304	Sandstone, medium gray	
317	Coal	
327		

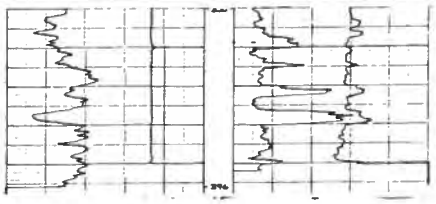


DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-7 | SHEET 2 OF 2

LOGGED DEPTH: 396 FT. LOGGING SPEED: 20 FT./MIN.

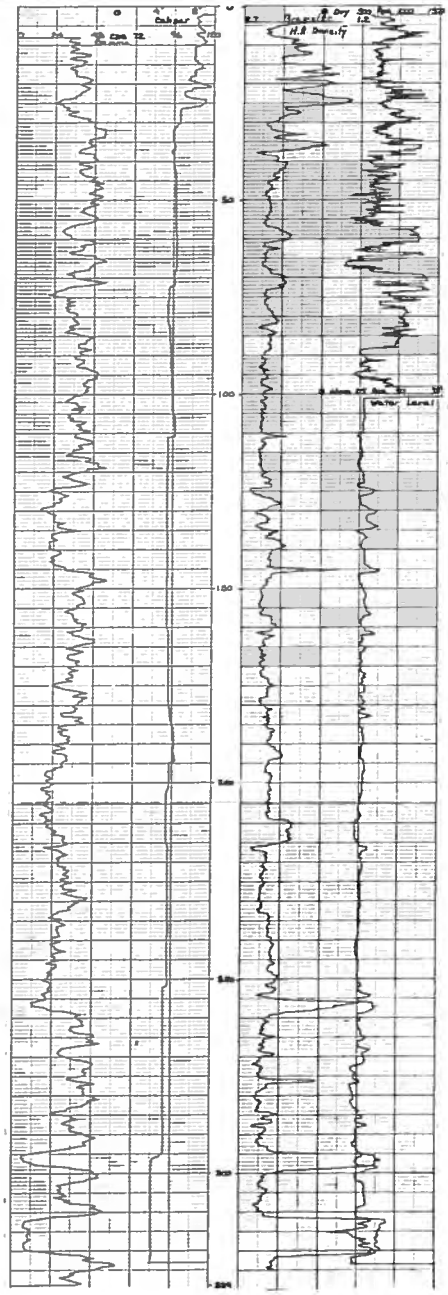
INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
	Sandstone, medium gray						350
370	Coal, shaley						
372.5	Shale, dark gray, carbonaceous						
376.5	Coal, shaley						
380	Shale, dark gray, silty						400
400TD							450
							500
							550
							600
							650
							700
							750
							800



THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-7C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 6/6/82	DATE COMP.: 6/6/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 10 T. 16N R. 102W		FOOTAGE LOCATION: 909' FSL, 512' FEL		
GROUND ELEVATION: 7016.1'	TOTAL DEPTH: 330'	DEPTH TO WATER: 101'		
SIZE, BIT TYPE 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 299'	CORE FOOTAGE: 31'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 258,419.12N, 466,260.88E				

LOGGED DEPTH: 329 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	See CRNE-7						0
							50
							100
							150
							200
							250
299							300
330	TD						350

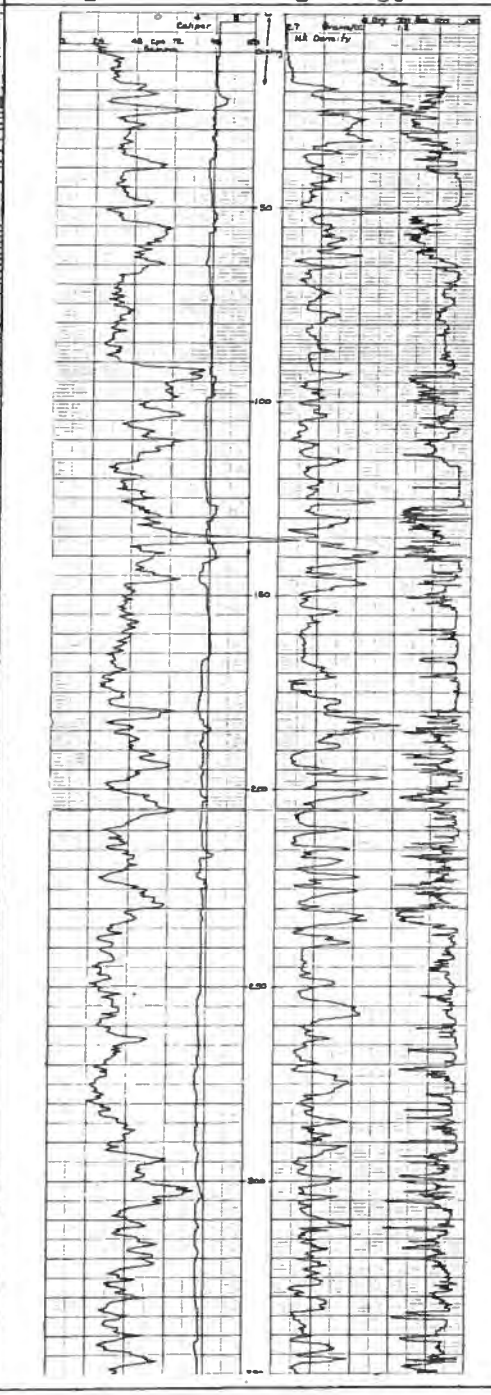


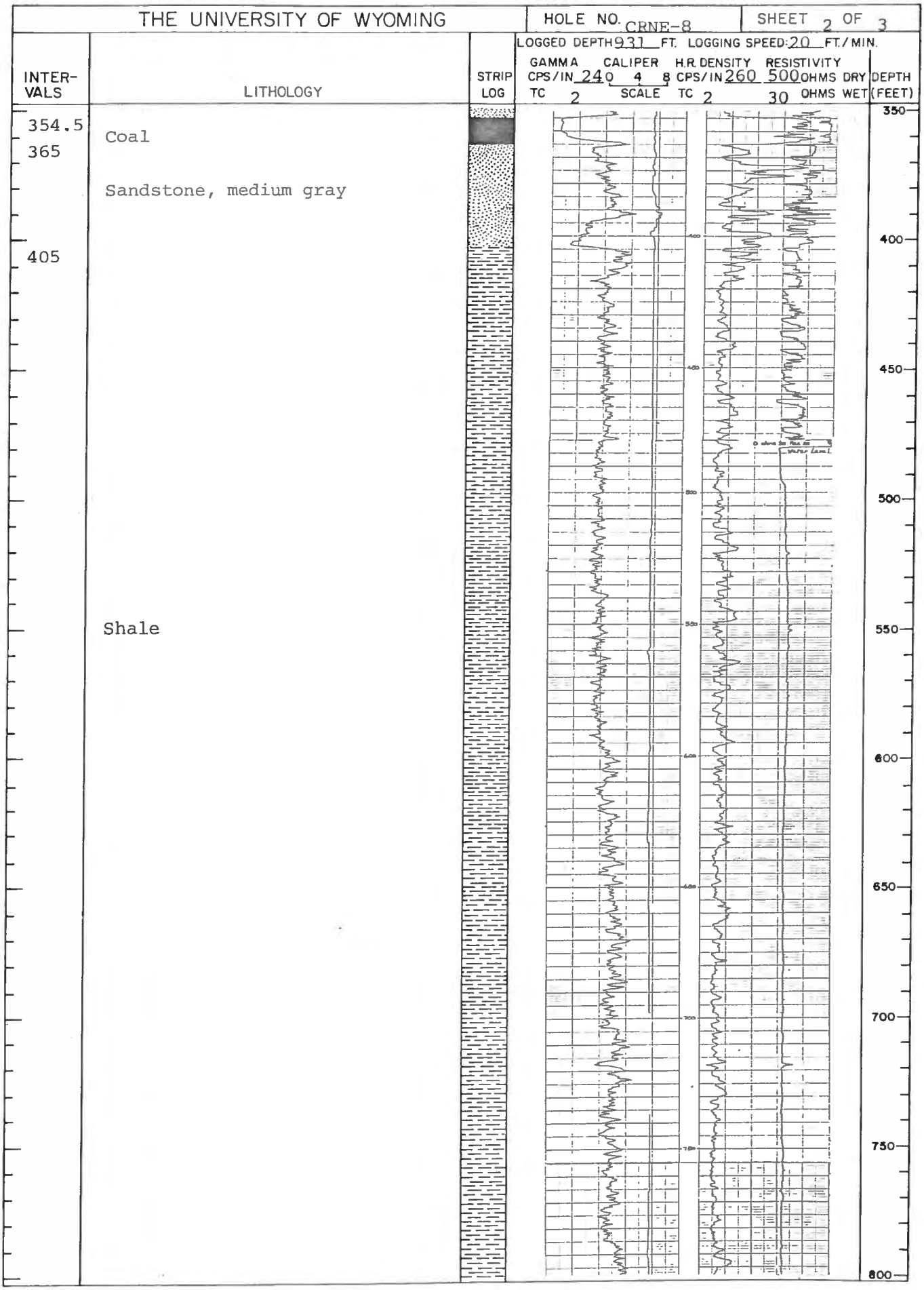
THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-8	SHEET 1 OF 3
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE		
DATE STARTED: 6/5/82	DATE COMP.: 6/6/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼NE¼ SEC. 6 T. 16N R. 101W		FOOTAGE LOCATION: 1100'FNL, 300'FEL		
GROUND ELEVATION: 7190.9'	TOTAL DEPTH: 935'	DEPTH TO WATER: 482'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 935'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 266,159.74N, 477,732.61E				

LOGGED DEPTH: 931 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
	Sandstone, orange-brown
22	
24.5	Coal
	Shale, dark gray and black
40	
	Sandstone, orange-brown
55	
	Shale, light gray
67	
	Sandstone, orange-brown
92	
105	Shale, light gray
	Sandstone, light gray
133	
138	Shale, medium gray
149	Sandstone, light gray
	Shale, medium gray-green
168	
	Sandstone, light gray
190	
194	Shale, light grey
205	Sandstone, light gray
210	Sandstone, dark gray
	Sandstone, light gray
225	
	Shale, light gray
240	
	Sandstone, light gray
293	
	Shale, medium gray
327	
	Sandstone, medium gray

STRIP LOG




THE UNIVERSITY OF WYOMING
HOLE NO. CRNE-8
SHEET 2 OF 3
LOGGED DEPTH 931 FT. LOGGING SPEED: 20 FT./MIN.
INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 240
CALIPER 0 4 8
H.R. DENSITY CPS/IN 260 500
RESISTIVITY OHMS DRY
TC 2
SCALE
TC 2
30 OHMS WET
DEPTH (FEET)
354.5
365
405
Coal
Sandstone, medium gray
Shale
350
400
450
500
550
600
650
700
750
800

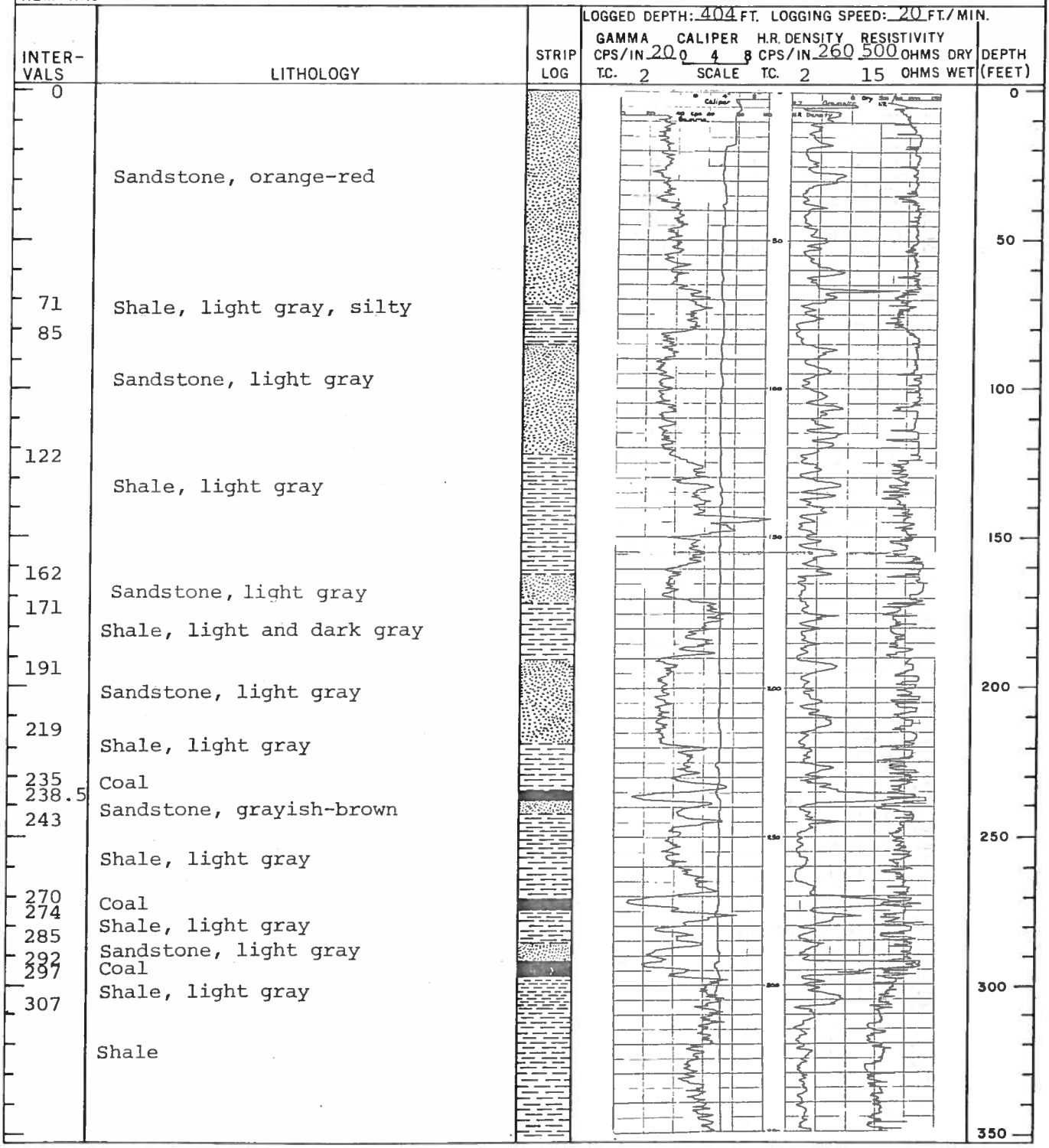
THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-8 | SHEET 3 OF 3

LOGGED DEPTH: 931 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
	Shale						800
							850
892							
	Sandstone						900
931TD							
							950
							1000
							1050
							1100
							1150
							1200
							1250

THE UNIVERSITY OF WYOMING			HOLE NO. EKR-1	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Erickson-Kent Ranch		
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼NW¼ SEC. 35 T. 15N., R. 102W.		FOOTAGE LOCATION: 1500' FNL, 1100' FWL		
GROUND ELEVATION: 7210'	TOTAL DEPTH: 405'	DEPTH TO WATER: 376'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 405'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

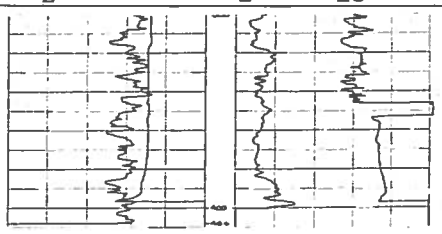
INTERVALS	LITHOLOGY
0	
	Sandstone, orange-red
71	Shale, light gray, silty
85	
	Sandstone, light gray
122	
	Shale, light gray
162	
	Sandstone, light gray
171	
	Shale, light and dark gray
191	
	Sandstone, light gray
219	
	Shale, light gray
235	Coal
238.5	
	Sandstone, grayish-brown
243	
	Shale, light gray
270	Coal
274	
	Shale, light gray
285	
	Sandstone, light gray
292	
297	Coal
	Shale, light gray
307	
	Shale



THE UNIVERSITY OF WYOMING | HOLE NO. EKR-1 | SHEET 2 OF 2

LOGGED DEPTH: 404 FT. LOGGING SPEED: 20 FT/MIN.

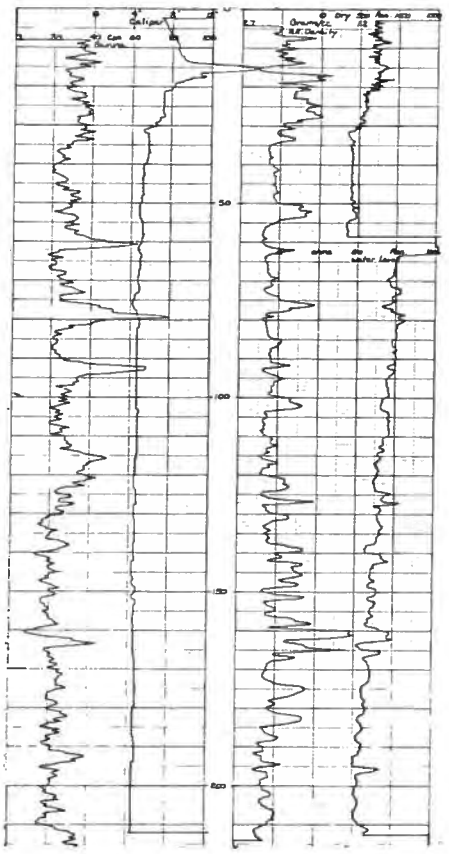
INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 TC 2	RESISTIVITY OHMS DRY 15 OHMS WET	DEPTH (FEET)
404TD	Shale						350, 400, 450, 500, 550, 600, 650, 700, 750, 800



THE UNIVERSITY OF WYOMING		HOLE NO. MSR-8	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼ SEC. 22 T. 16N., R. 102W		FOOTAGE LOCATION: 700' FNL, 1,600' FWL	
GROUND ELEVATION: 6,959.9'	TOTAL DEPTH: 220'	DEPTH TO WATER: 63'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 220'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc. 251,734.42N, 463,478.41E			

LOGGED DEPTH: 218 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
0		
	Soil, brownish-gray, sandy	
31		
	Conglomerate, orange-brown	
93		
	Sandstone, medium gray	
115		
	Shale, dark gray, carbonaceous	
126		
127	Coal?	
	Sandstone, medium gray	
159.5		
165.5	Coal with shale partings	
	Sandstone, medium gray	
220TD		



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-9	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼SE¼ SEC. 22 T. 16N., R. 102W		FOOTAGE LOCATION: 600' FSL, 2,600' FWL		
GROUND ELEVATION: 6,884.5'	TOTAL DEPTH: 540'	DEPTH TO WATER: 53'		
SIZE, BIT TYPE: 4-3/4W	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 540'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 247,592.49N, 463,881.96E				

LOGGED DEPTH: 550 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 T.C. 2	RESISTIVITY 25 OHMS DRY OHMS WET	DEPTH (FEET)
0 5	Soil, brown, sandy						0
	Sandstone, light brown						
36	Shale, light brown						50
41	Sandstone, light brown,						
57	Coal						
61.5	Sandstone, light gray						
91							100
	Shale, dark gray, carbonaceous						
133	Shale, black, carbonaceous						150
138	Sandstone, brownish-gray						
152							200
	Sandstone, medium gray, fine grained, subrounded, well sorted, quartzose						250
307							300
	Shale, medium gray						
321	Coal						
324.5							350

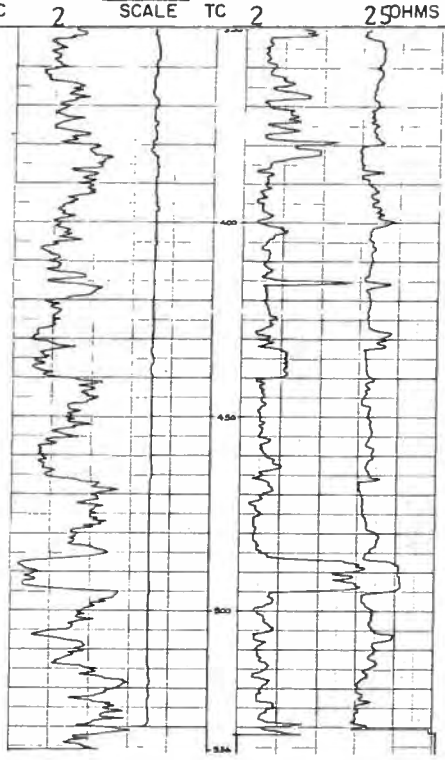
THE UNIVERSITY OF WYOMING | HOLE NO. MSR-9 | SHEET 2 OF 2

LOGGED DEPTH: 536 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
	Sandstone, medium gray
379	Coal?
380	Shale, medium gray
384	Sandstone, medium gray
415	Coal
416	Sandstone, medium gray
487	Coal
495	Sandstone, medium gray
540TD	

STRIP LOG

GAMMA CPS/IN 20 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

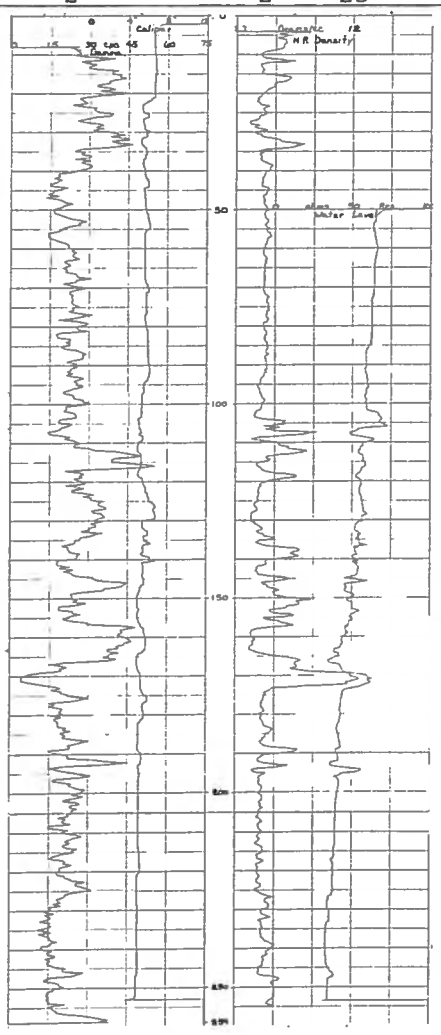
THE UNIVERSITY OF WYOMING			HOLE NO. MSR-10	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/10/82	DATE COMP.: 5/12/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NE¼SE¼ SEC. 28 T. 16N., R. 102W.		FOOTAGE LOCATION: 1900' FSL, 600' FEL		
GROUND ELEVATION: 6,890.4'	TOTAL DEPTH: 260'	DEPTH TO WATER: 50'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 260'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 244,075.51N, 460,932.78E				

LOGGED DEPTH: 259 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Sandstone, pale orange-gray
15	
	Siltstone, pale orange-brown
34	
	Sandstone, pale orange-white
106	
	Sandstone, light gray
165	Shale, gray
169	Coal
173	
	Sandstone, medium gray
259TD	

STRIP LOG

GAMMA CPS/IN 15 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

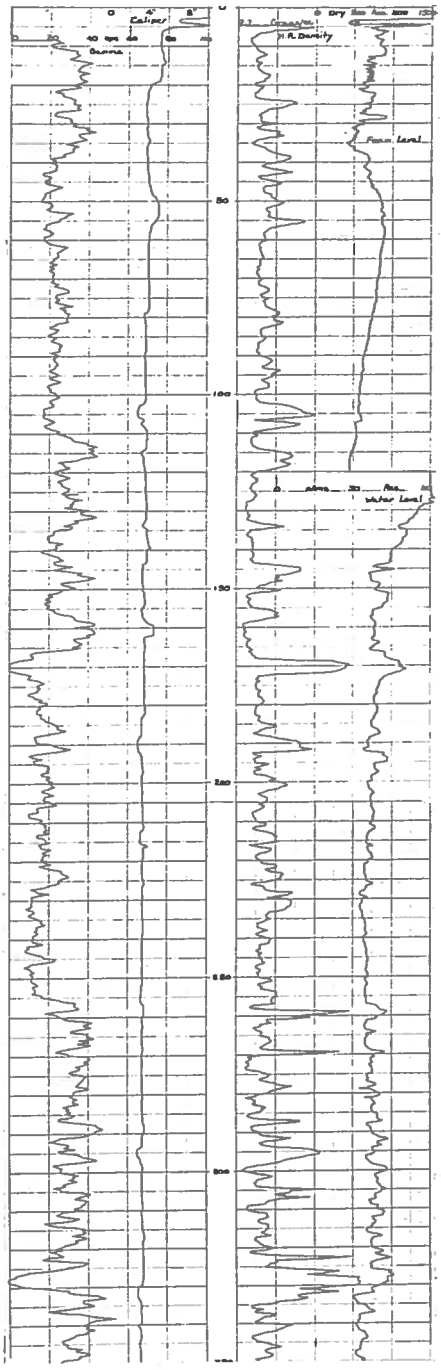
THE UNIVERSITY OF WYOMING			HOLE NO. MSR-10C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/18/82	DATE COMP.: 5/18/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NE¼SE¼ SEC. 28 T. 16N. R. 102W.		FOOTAGE LOCATION: 1,892'FSL, 612'FEL		
GROUND ELEVATION: 6,891.9'	TOTAL DEPTH: 360'	DEPTH TO WATER: 50'		
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 344'	CORE FOOTAGE: 16'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 244,067.05N, 460,920.40E				

CORED INTERVALS	LITHOLOGY
	Refer to MSR-10 for lithologic description to 259. Description of lithology from cuttings for 259-358.
163 179	Cored Interval
259	Coal
261 269	Shale
270	Coal
	Shale, dark gray
322 323	Coal
	Shale, dark gray
326 334	Coal with shale partings
	Shale, dark gray, carbonaceous

STRIP LOG

LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. MSR-10C | SHEET 2 OF 2

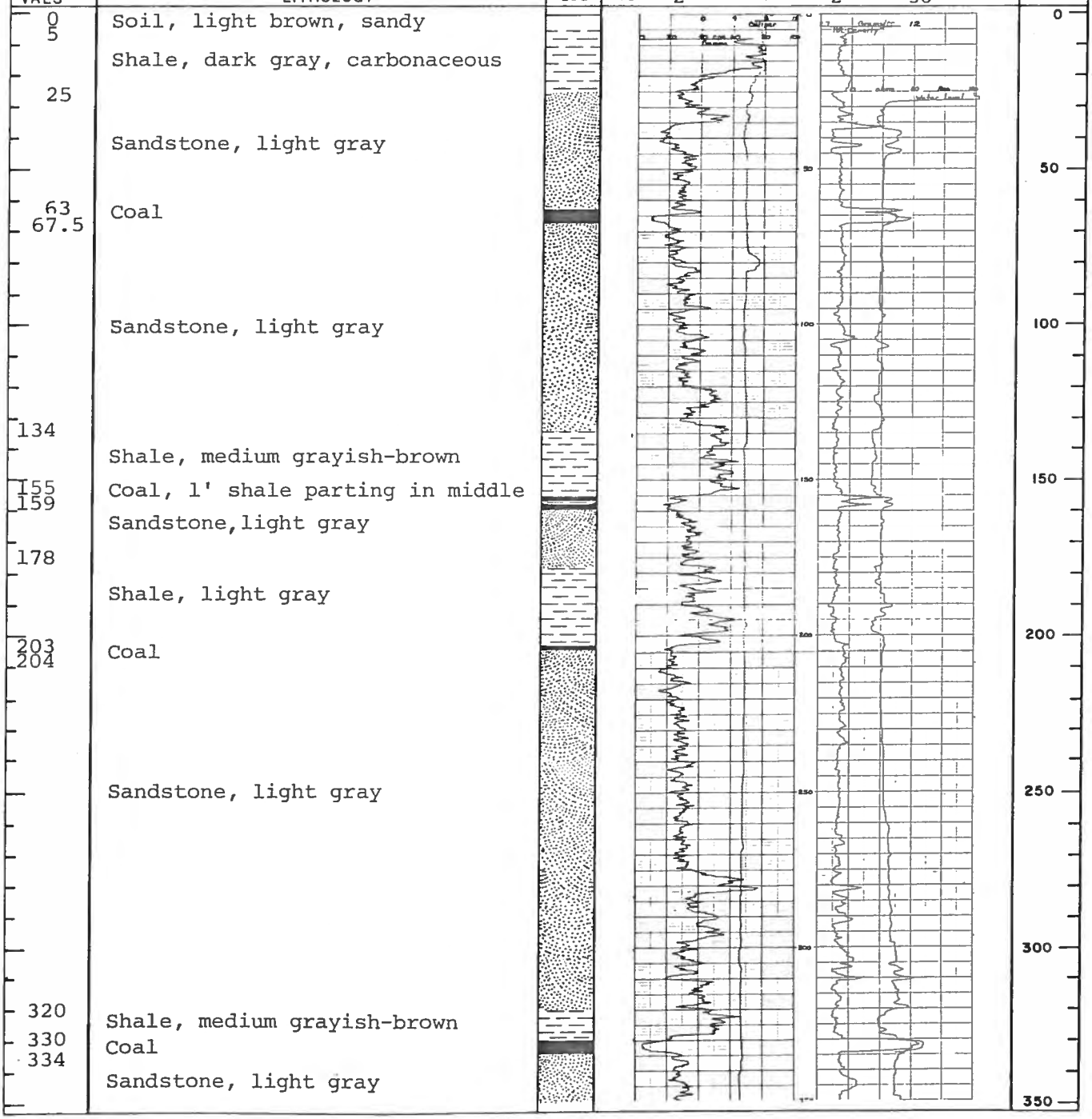
LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 200 TC 2	CALIPER 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
358TD							350
							400
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-11	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/10/82	DATE COMP.: 5/10/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼NW¼ SEC. 34 T. 16N., R. 102W.		FOOTAGE LOCATION: 600' FNL, 800' FWL		
GROUND ELEVATION: 6,807.6'	TOTAL DEPTH: 360'	DEPTH TO WATER: 38'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 360'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 241,307.89N, 461,956.36E				

LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
5	Shale, dark gray, carbonaceous
25	
	Sandstone, light gray
63	Coal
67.5	
	Sandstone, light gray
134	
	Shale, medium grayish-brown
155	Coal, 1' shale parting in middle
159	Sandstone, light gray
178	
	Shale, light gray
203	Coal
204	
	Sandstone, light gray
320	Shale, medium grayish-brown
330	Coal
334	Sandstone, light gray



THE UNIVERSITY OF WYOMING	HOLE NO. MSR-11	SHEET 2 OF 2

LOGGED DEPTH: 358 FT LOGGING SPEED: 20 FT/MIN.

GAMMA CPS/IN 200 CALIPER 4 8 H.R. DENSITY CPS/IN 260 RESISTIVITY 500 OHMS DRY

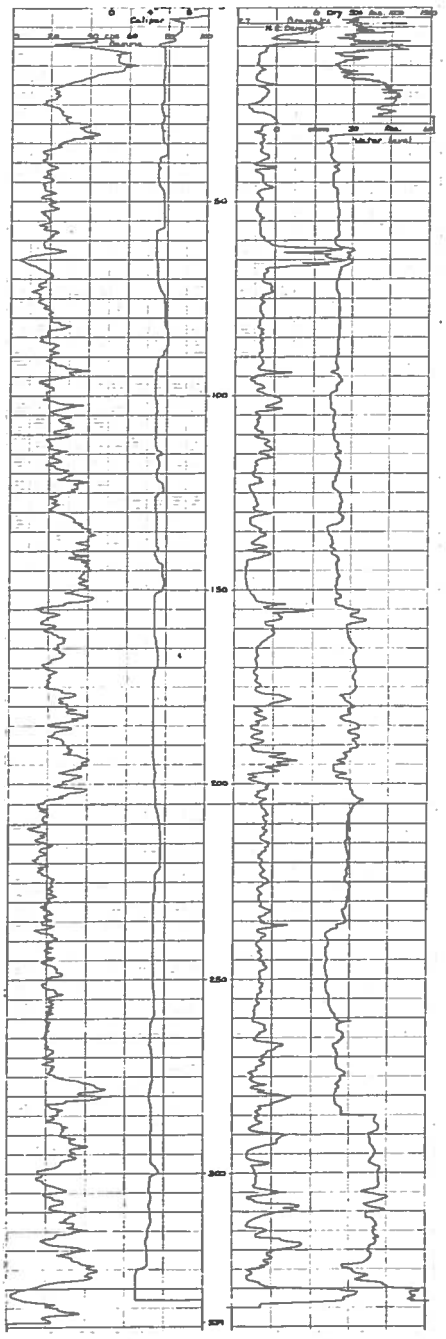
TC 2 SCALE TC 2 30 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
352 360TD	Shale, medium grayish-brown		350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-11C	SHEET 1 OF 1
AREA: Salt Wells			QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82		COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼	SEC. 34 T. 16N. R. 102W.		FOOTAGE LOCATION: 616'FNL, 810'FWL	
GROUND ELEVATION: 6,807.6'	TOTAL DEPTH: 340'		DEPTH TO WATER: 33'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill		ROTARY FOOTAGE: 301'	CORE FOOTAGE: 39'
DRILLED BY: Gordon Drilling			GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey			GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 241,291.92N, 461,946.07E				

LOGGED DEPTH: 359 FT. LOGGING SPEED: 20 FT./MIN.

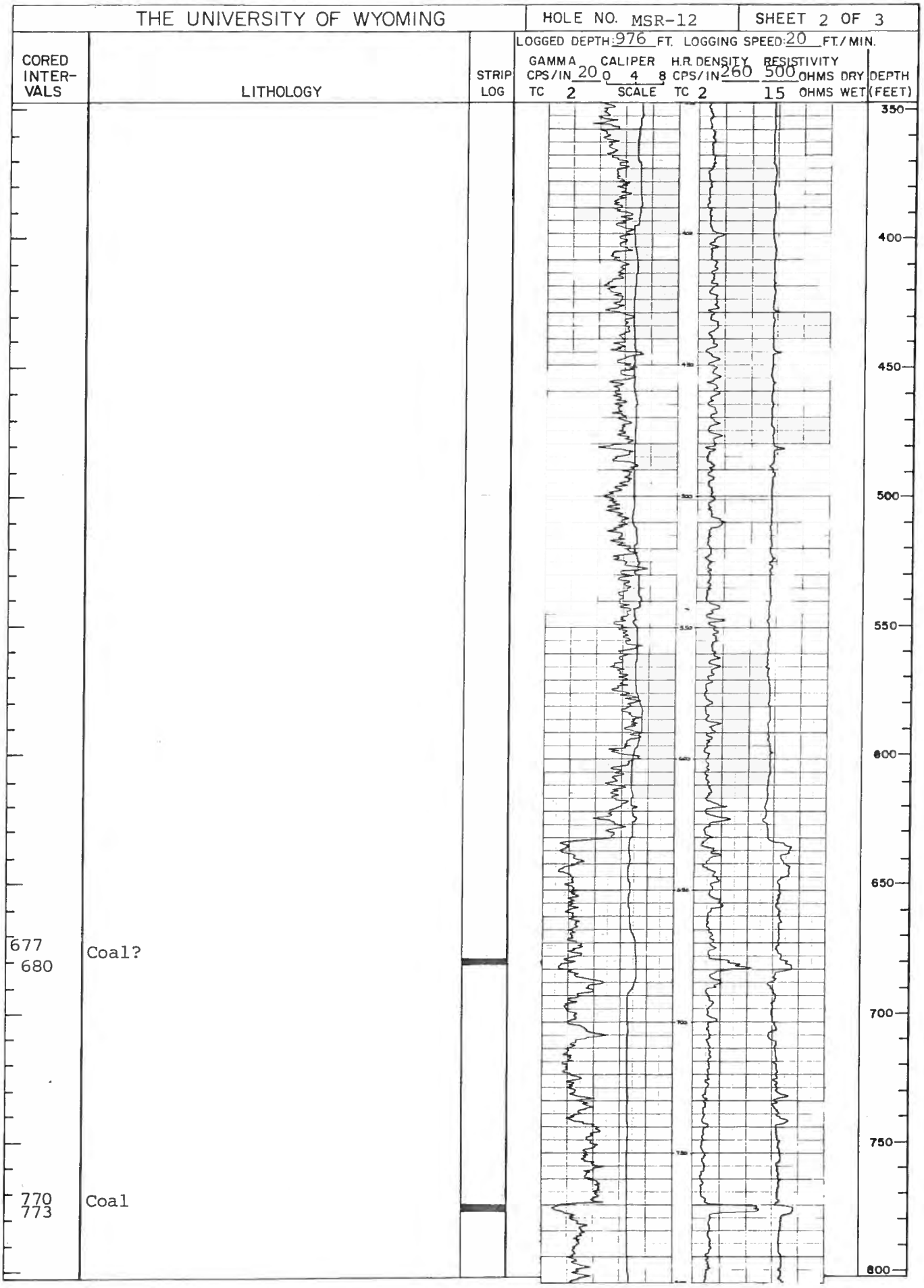
CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 / T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 / T.C. 2	RESISTIVITY 500 OHMS DRY / 15 OHMS WET	DEPTH (FEET)
58–72	Refer to MSR-11						0
152–162							50
325–340	TD						100
							150
							200
							250
							300
							350



THE UNIVERSITY OF WYOMING			HOLE NO. MSR-12	SHEET 1 OF 3
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/12/82	DATE COMP.: 5/12/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼SE¼ SEC. 34 T. 16N., R. 102W.		FOOTAGE LOCATION: 250' FSL, 1200' FWL		
GROUND ELEVATION: 6,868.4'	TOTAL DEPTH: 980'	DEPTH TO WATER: 105'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 980'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 236,638.79N, 464,622.90E				

LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.

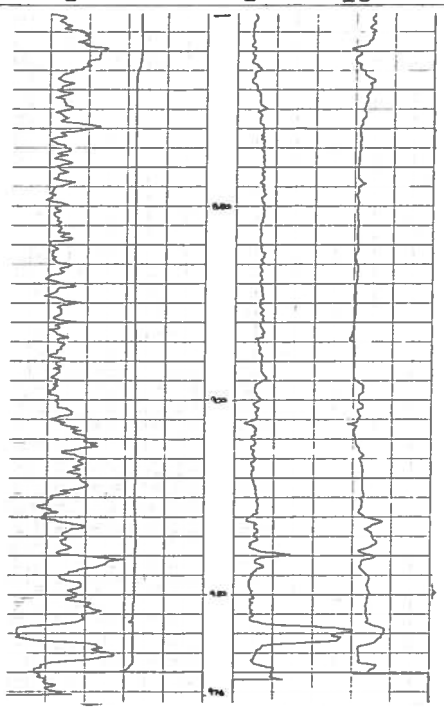
INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	No Lithology Log available, samples raked out by reclamation crew.						0
227 234	Coal						50
271 273	Coal						100
							150
							200
							250
							300
							350


THE UNIVERSITY OF WYOMING
HOLE NO. MSR-12
SHEET 2 OF 3
LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.
CORED INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 20 TC 2
CALIPER 0 4 8 SCALE
H.R. DENSITY CPS/IN 260 TC 2
RESISTIVITY 500 OHMS DRY 15 OHMS WET
DEPTH (FEET)
350
400
450
500
550
600
650
700
750
800
677
680
Coal?
770
773
Coal

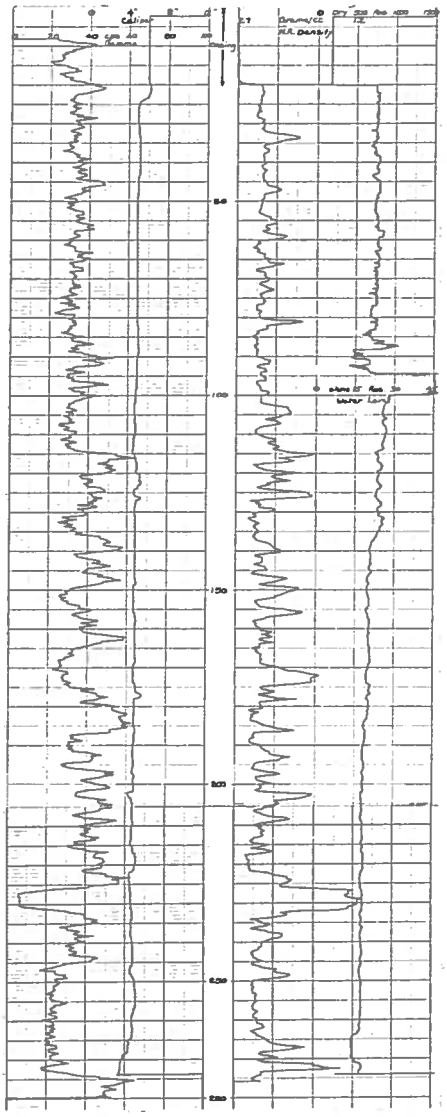
THE UNIVERSITY OF WYOMING | HOLE NO. MSR-12 | SHEET 3 OF 3

LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 200 TC 2	CALIPER 4 SCALE 8	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
958 962.5 980TD	Coal						800 850 900 950 1000 1050 1100 1150 1200 1250



THE UNIVERSITY OF WYOMING			HOLE NO. MSR-12C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼SE¼ SEC. 34 T. 16N. R. 102W		FOOTAGE LOCATION: 262'FSL, 1,189FWL		
GROUND ELEVATION: 6,868.9'	TOTAL DEPTH: 280'	DEPTH TO WATER: 100'		
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 256'	CORE FOOTAGE: 24'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 236,651.16N, 464,611.98E				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 280 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 20 T.C. 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 260 T.C. 2 — RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to MSR-12			0
222				50
236				100
				150
				200
270				250
280	TD			300
				350

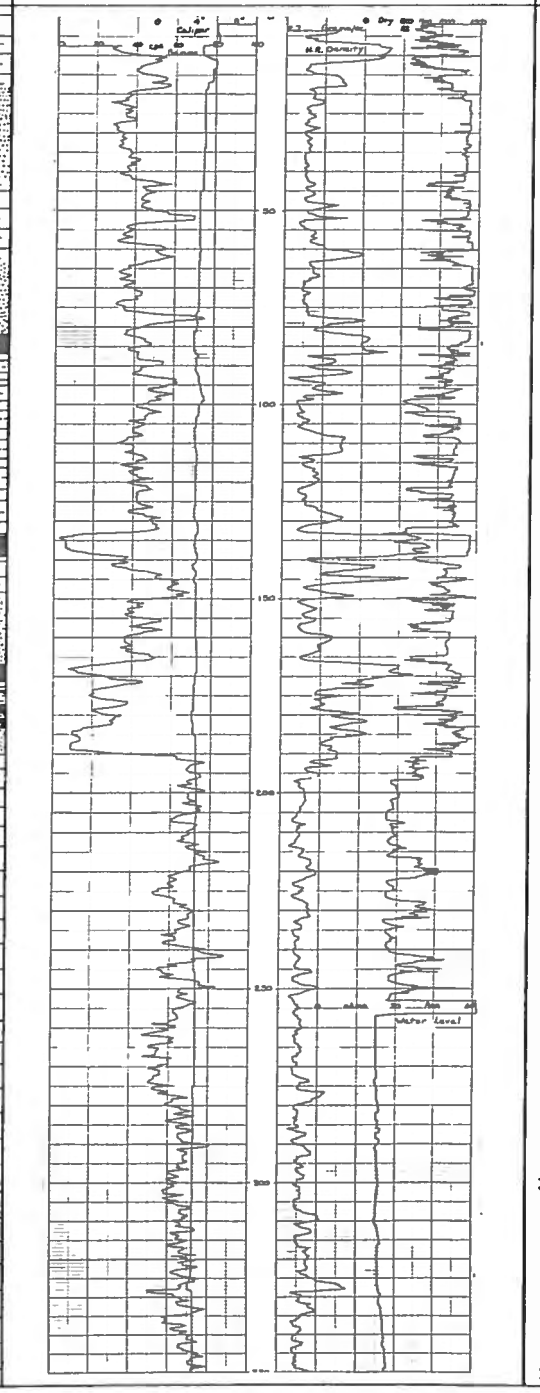
THE UNIVERSITY OF WYOMING			HOLE NO. MSR-13	SHEET 1 OF 2
AREA: Salt Wells			QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82		COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 9 T. 15N., R. 102W			FOOTAGE LOCATION: 900' FNL, 1200' FEL	
GROUND ELEVATION: 6910'	TOTAL DEPTH: 460'		DEPTH TO WATER: 256'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill		ROTARY FOOTAGE: 460'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling			GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey			GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:				

INTERVALS	LITHOLOGY
0	Soil, brown, sandy
5	Shale, pale greenish-brown
18	
	Sandstone, orange-brown
42	
	Shale, pale grayish-green
63	
	Sandstone, whitish-brown
78	Sandstone, light gray
81	
87	Coal
	Shale, light gray, silty
133	Coal
139.5	Shale, light gray
150	Sandstone, light gray
166	Coal
171	Shale with coal stringers
183	
	Shale

LOGGED DEPTH: 459 FT. LOGGING SPEED: 20 FT./MIN.

STRIP LOG

GAMMA CPS/IN. 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN. 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET



DEPTH (FEET)

0
50
100
150
200
250
300
350

THE UNIVERSITY OF WYOMING | HOLE NO. MSR-13 | SHEET 2 OF 2

LOGGED DEPTH: 459 FT. LOGGING SPEED 20 FT./MIN.

GAMMA CPS/IN 20 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

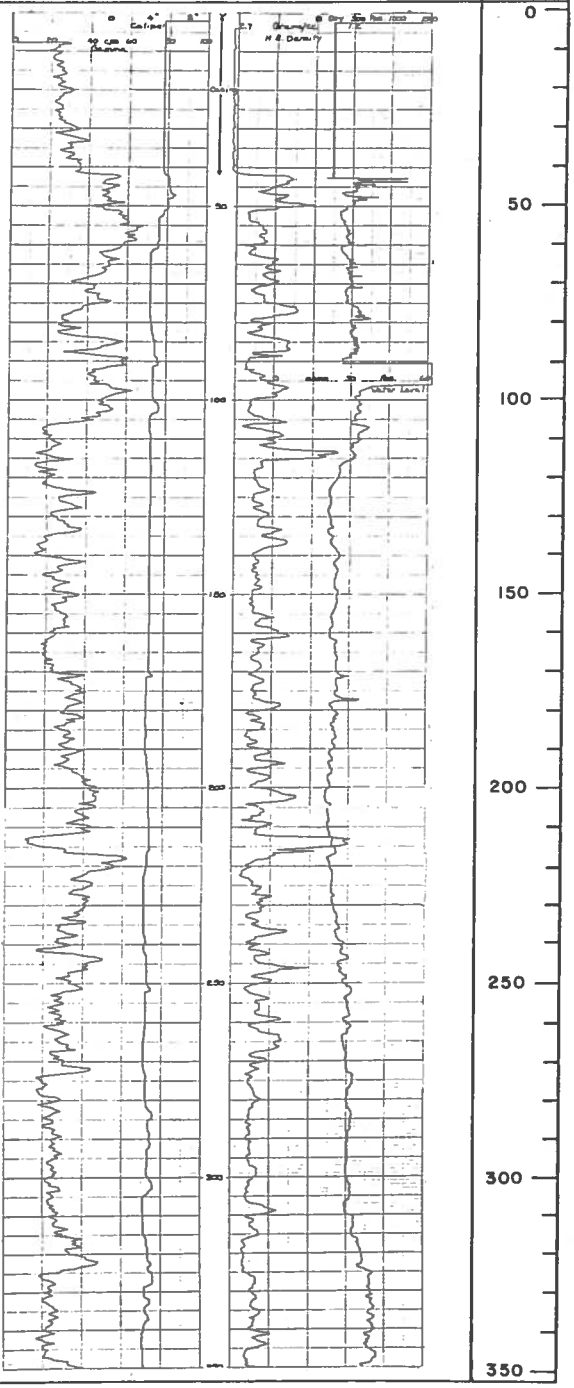
INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
	Shale		350
400			400
	Sandstone, medium gray		
438			
	Shale, medium gray		450
450	Sandstone, medium gray		
460TD			500
			550
			600
			650
			700
			750
			800

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-14	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 8 T. 15N R. 102W		FOOTAGE LOCATION: 400'FSL, 750'FEL	
GROUND ELEVATION: 6900'	TOTAL DEPTH: 680'	DEPTH TO WATER: 96'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 680'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 679 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Shale, dark gray-brown
20	
25	Shale, light gray-brown
	Shale
106	
	Sandstone, light gray
113	
115	Coal
	Sandstone, light gray
170	
	Shale, medium gray, silty
212	
	Coal
216.5	
	Shale, medium gray, silty
238	
	Shale, black
242	
	Sandstone, light gray
307	
	Conglomerate
310	
	Sandstone, light gray
349	



THE UNIVERSITY OF WYOMING | HOLE NO. MSR-14 | SHEET 2 OF 2

LOGGED DEPTH: 679 FT. LOGGING SPEED: 20 FT./MIN.

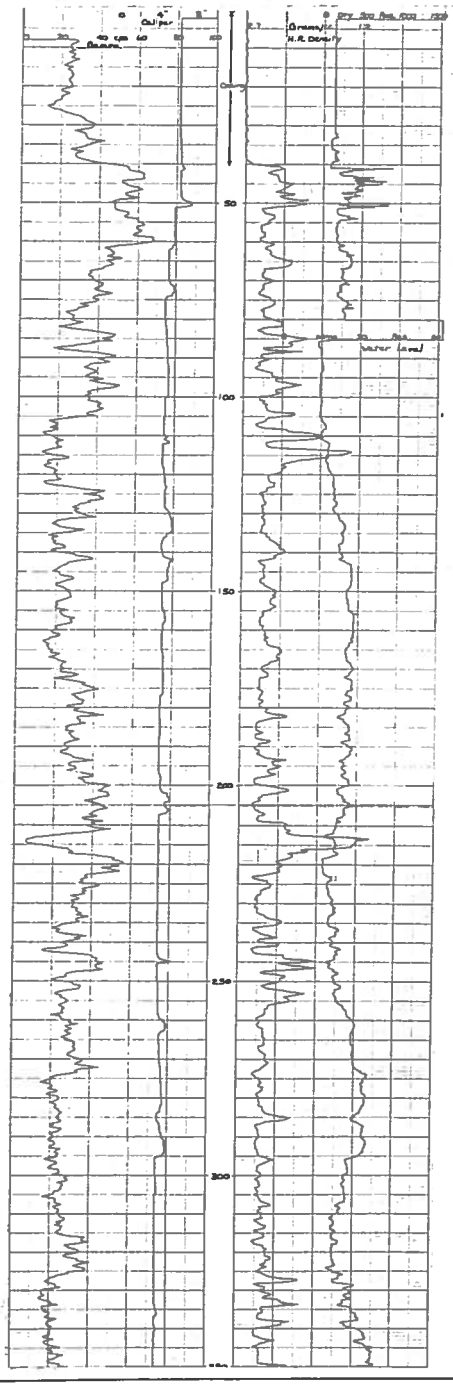
GAMMA CPS/IN 200 TC 2 | CALIPER 4 SCALE 8 | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
355	Shale, black carbonaceous
357	Coal
362	Shale, black, carbonaceous
366	Coal
	Sandstone, light gray
421	Coal
423	Shale, dark gray to black
428	Coal
432	Shale, dark gray; shale, black, carbonaceous
464.5	Coal
466.5	Shale, dark gray; shale, black, carbonaceous; and thin coals, interbedded
524	Sandstone, light gray
538	Coal
540.5	Sandstone, light gray
578	Coal with dark gray shale partings
586	Sandstone, light gray
612	Coal
613.5	Shale, medium gray
654	Sandstone, light gray
671	Shale, black, carbonaceous
674	Shale, dark gray
680TD	

STRIP LOG

DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

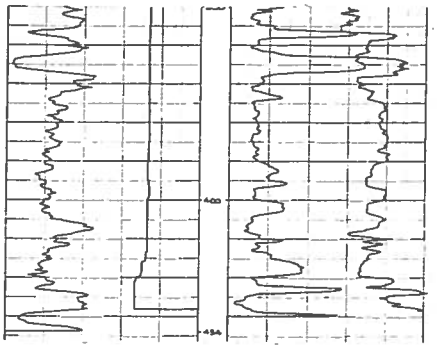
THE UNIVERSITY OF WYOMING			HOLE NO. MSR-14C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/20/82	DATE COMP.: 5/20/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 8 T. 15N R. 102W.		FOOTAGE LOCATION: 400' FSL, 750' FEL		
GROUND ELEVATION: 6900'	TOTAL DEPTH: 435'	DEPTH TO WATER: 85'		
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 385'	CORE FOOTAGE: 50'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 434 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 20 T.C. 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 260 T.C. 2 — RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
208 222	Refer to MSR-14			0 50 100 150 200 250 300 350

THE UNIVERSITY OF WYOMING	HOLE NO. MSR-14C	SHEET 2 OF 2

LOGGED DEPTH 434 FT. LOGGING SPEED 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 TC 2	RESISTIVITY OHMS DRY 15 OHMS WET	DEPTH (FEET)
351 – 372							
420 – 435	TD						



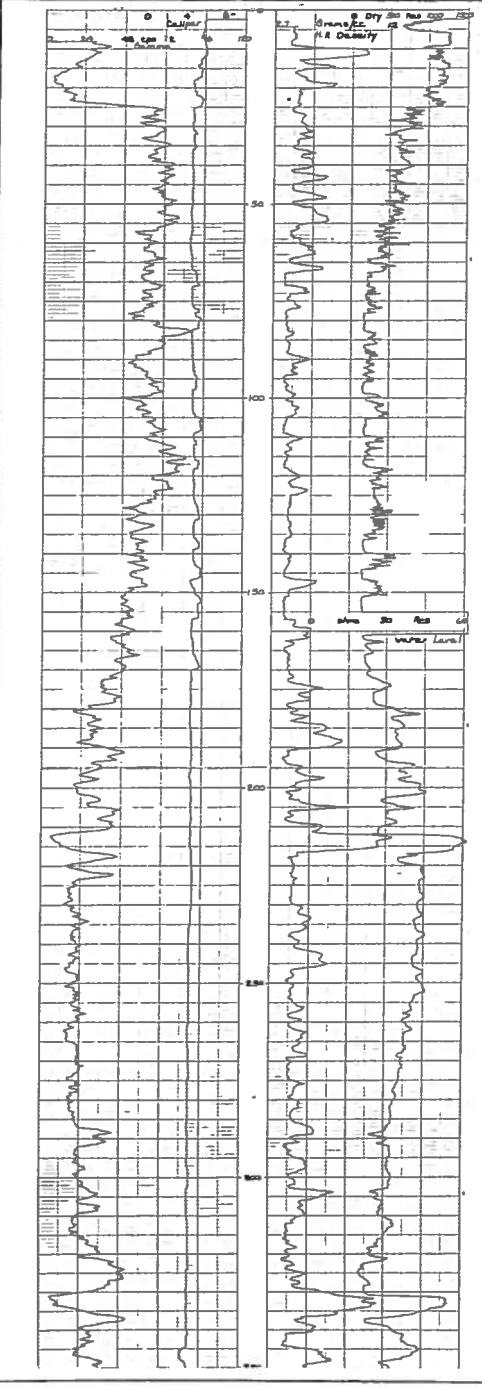
350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-15	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 5/25/82	DATE COMP.: 5/25/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NE¼SE¼ SEC. 17 T. 15N. R. 102W		FOOTAGE LOCATION: 2200'FSL, 800'FEL		
GROUND ELEVATION: 6970'	TOTAL DEPTH: 440'	DEPTH TO WATER: 161'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 440'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

LOGGED DEPTH: 440 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 500 T.C. 2 | RESISTIVITY OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	Shale, light gray, silty
5	Sandstone, brownish-orange
10	Coal?
15	Sandstone, grayish-brown
20	
	Shale
173	
	Sandstone
212	Coal
216	
	Sandstone, medium gray
310	
	Shale, dark gray
331	Coal
336	Shale, dark gray
345	Sandstone, medium gray



THE UNIVERSITY OF WYOMING | HOLE NO. MSR-15 | SHEET 2 OF 2

LOGGED DEPTH: 440 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 240 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
352	Shale, dark gray		350
366	Coal		
368			
	Sandstone, medium gray		400
440TD			450
			500
			550
			600
			650
			700
			750
			800

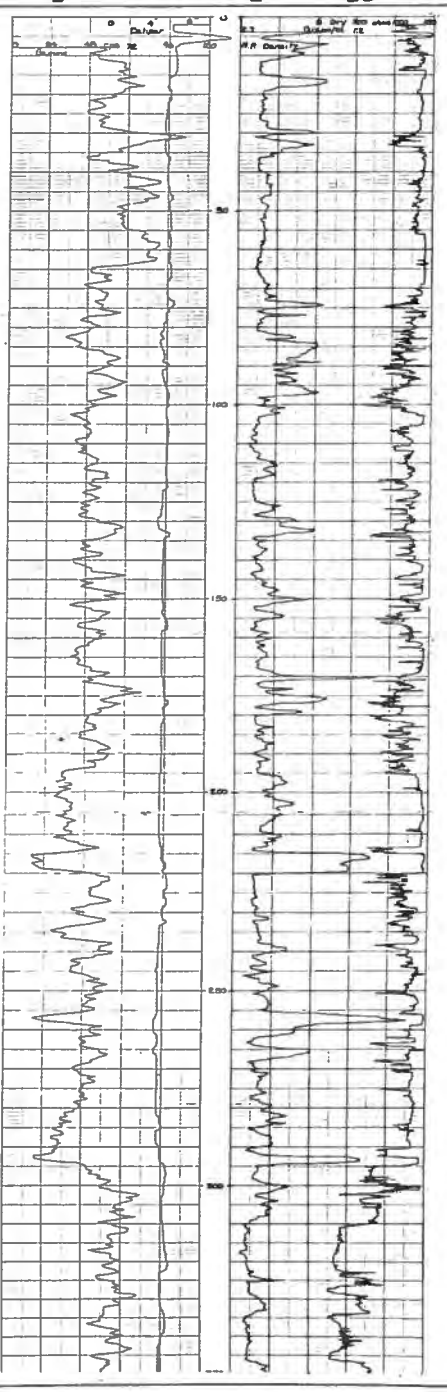
THE UNIVERSITY OF WYOMING		HOLE NO. MSR-16	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/31/82	DATE COMP.: 5/31/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 21 T. 15N. R. 102W.		FOOTAGE LOCATION: 150'FSL, 300'FEL	
GROUND ELEVATION: 7300'	TOTAL DEPTH: 740'	DEPTH TO WATER: 423'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

INTERVALS	LITHOLOGY
0	
	Sandstone, orange-brown
73	
77	Coal, with 2' sandstone parting
82	Shale, medium gray
98	Sandstone, medium gray
	Shale, medium gray to black
114	Sandstone, medium gray
119	Shale, medium gray to black
126	
134	Sandstone, medium gray
147	Shale, medium gray to black
155	Sandstone, medium gray
	Shale, medium gray to black
170	Coal
171	
180	Shale, dark gray
195	Shale, medium gray-green
	Sandstone, medium gray
215	
220	Coal
	Shale, medium gray-green
256	
258	Coal
265	Shale, medium gray-green
	Sandstone, medium gray
292.5	
294	Coal
308	Sandstone, brownish-gray
	Shale

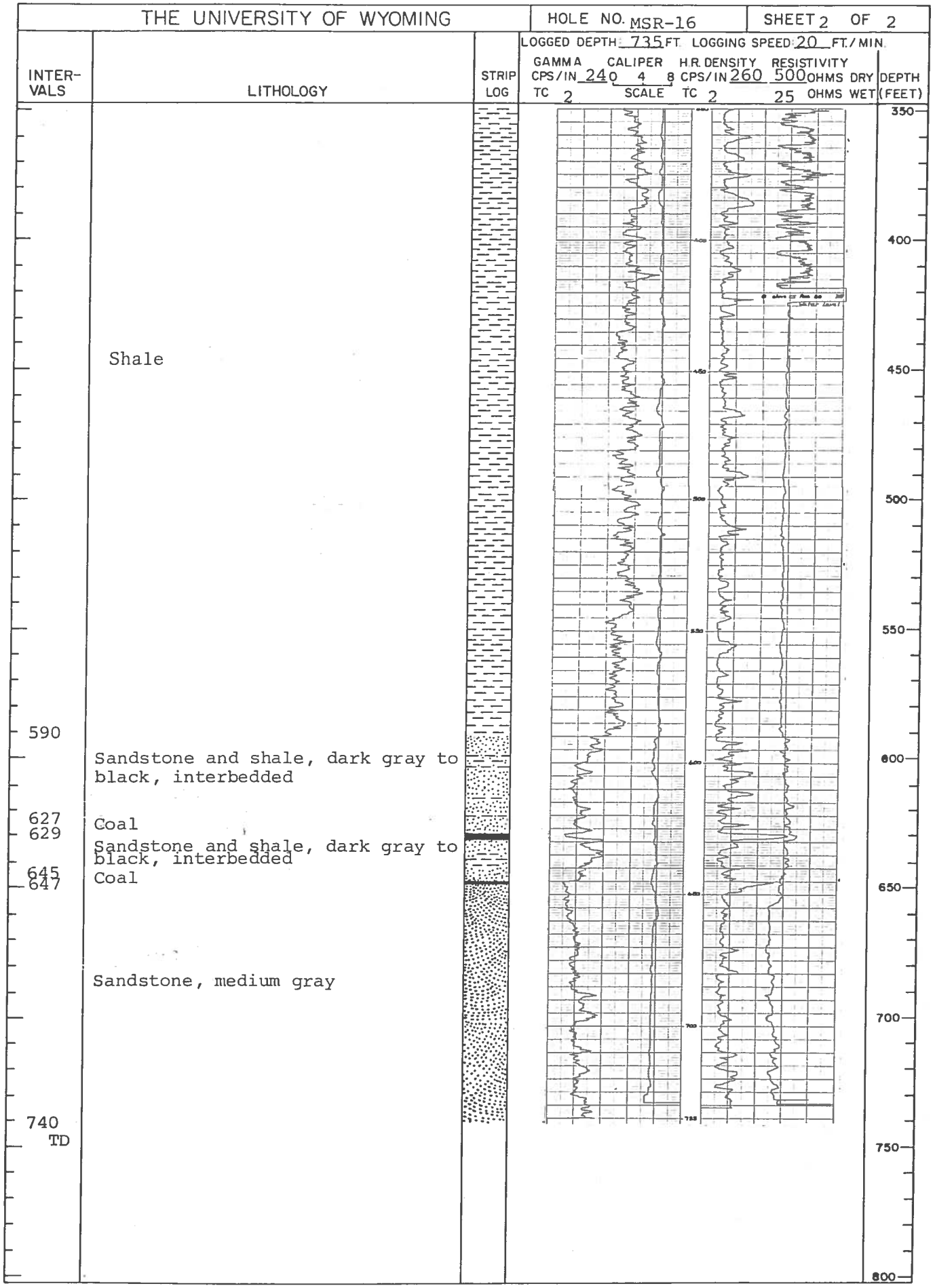
STRIP LOG

LOGGED DEPTH: 735 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 TC. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



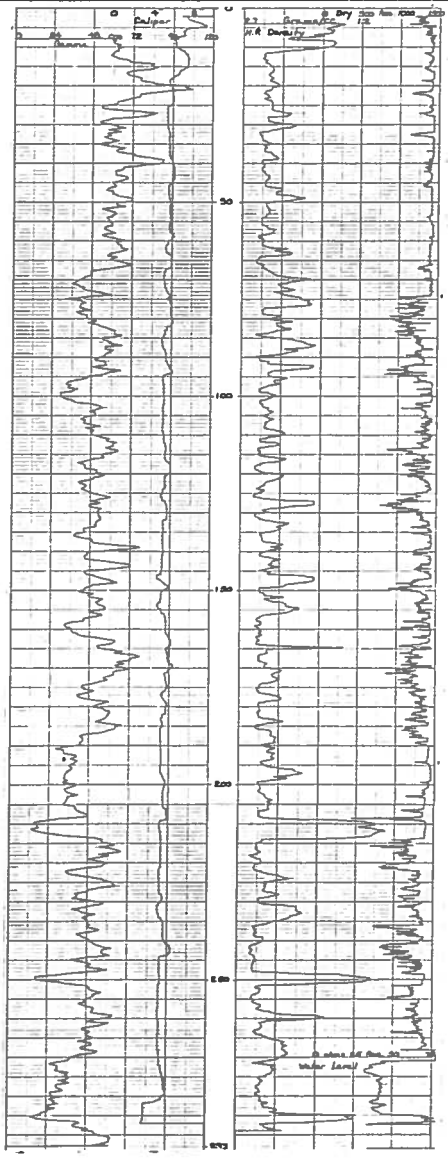
DEPTH (FEET)


THE UNIVERSITY OF WYOMING
HOLE NO. MSR-16
SHEET 2 OF 2
LOGGED DEPTH: 735 FT. LOGGING SPEED: 20 FT./MIN.
GAMMA CPS/IN 240 TC 2
CALIPER 0 4 8 SCALE
H.R. DENSITY CPS/IN 260 TC 2
RESISTIVITY 500 OHMS DRY 25 OHMS WET
INTER-VALS
LITHOLOGY
STRIP LOG
DEPTH (FEET)
Shale
590
Sandstone and shale, dark gray to black, interbedded
627
Coal
629
Sandstone and shale, dark gray to black, interbedded
645
Coal
647
Sandstone, medium gray
740
TD
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING			HOLE NO MSR-16C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch		
DATE STARTED: 6/1/82	DATE COMP.: 6/1/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 21 T. 15N R. 102W		FOOTAGE LOCATION: 125' FSL, 310' EWL		
GROUND ELEVATION: 7300'	TOTAL DEPTH: 295'	DEPTH TO WATER: 271'		
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 252'	CORE FOOTAGE: 43'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

LOGGED DEPTH: 293 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 T.C. 2	RESISTIVITY 25 OHMS DRY OHMS WET	DEPTH (FEET)
210.3 – 225.3	Refer to MSR-16						0
245 – 261							50
283 – 295	TD						100
							150
							200
							250
							300
							350



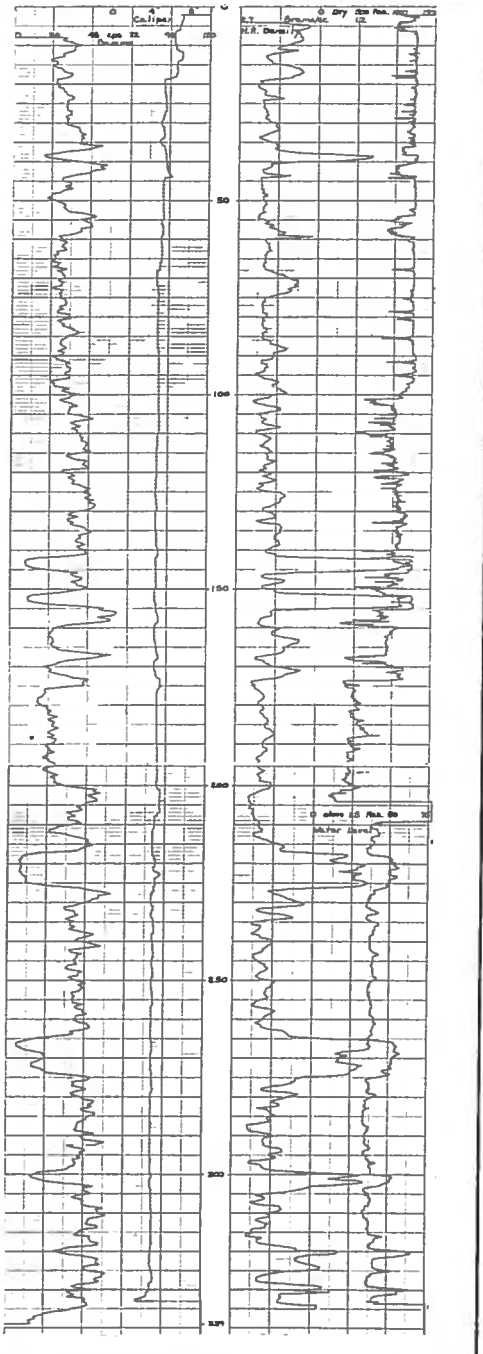
THE UNIVERSITY OF WYOMING		HOLE NO. PM-10	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/26/82	DATE COMP.: 5/27/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SW¼ SEC. 33 T. 15N R. 102W		FOOTAGE LOCATION: 1400'FSL, 2640'FEL	
GROUND ELEVATION: 7145'	TOTAL DEPTH: 340'	DEPTH TO WATER: 209'	
SIZE, BIT TYPE: 5-1/8L	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 340'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

INTERVALS	LITHOLOGY
0	Shale, gray-brown, sandy
10	
15	Sandstone, medium gray
	Sandstone, orange-brown
35	Sandstone, dark gray
38	
40	Coal
	Sandstone, medium gray
55	
60	Shale, gray-black, carbonaceous
	Sandstone, orange-brown
90	
	Sandstone, medium gray
142	Coal
146	
151.5	Shale, dark gray
155	Coal
	Sandstone, medium gray
202	
	Shale, black, carbonaceous
217	
226.5	Coal
	Shale, dark gray
265	
	Coal
275	
	Shale, dark gray
299	Coal
303	
	Shale, dark gray
319.5	Coal, with shale parting
325	
328.5	Shale, dark gray
331	Coal
	Shale, dark gray

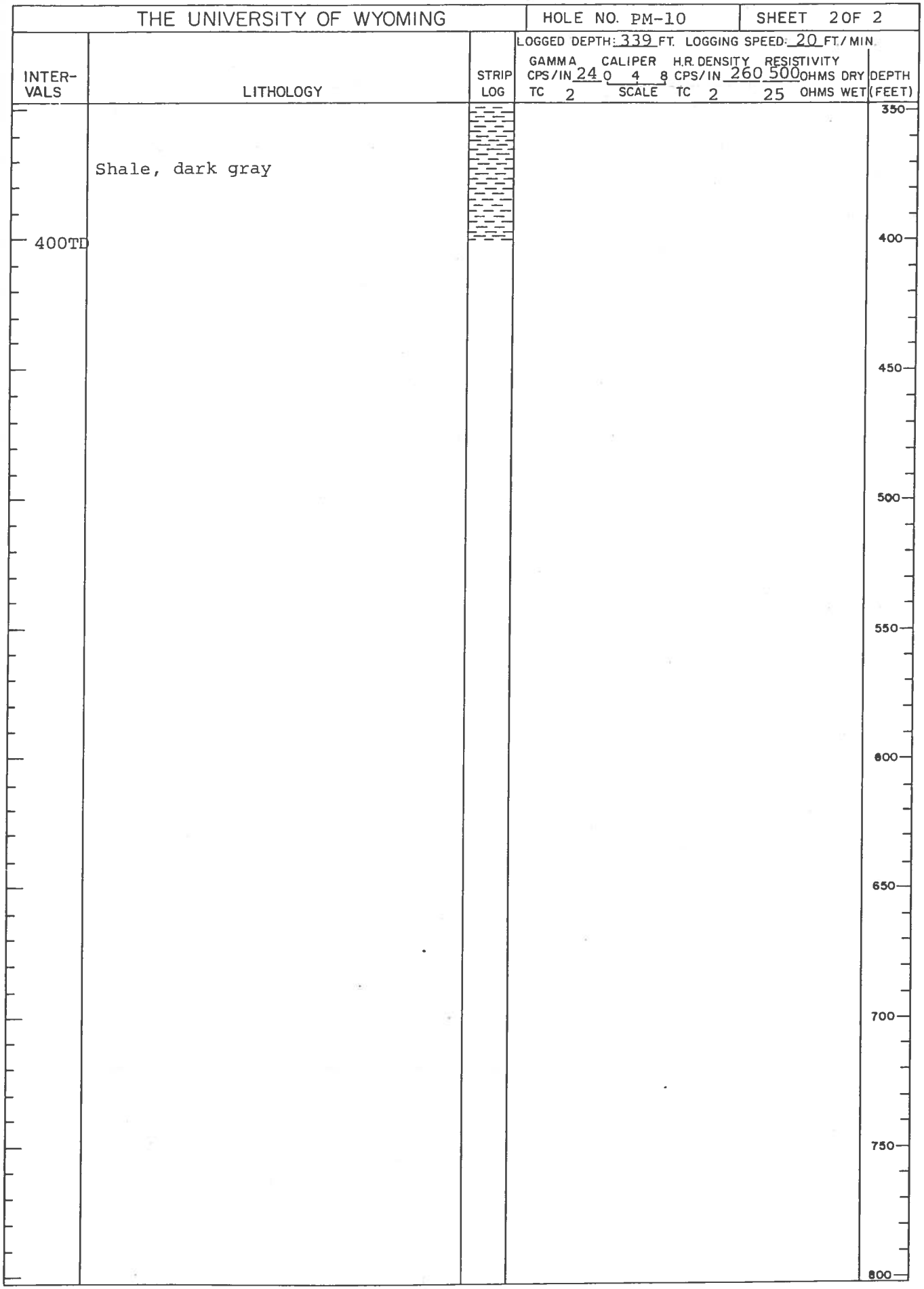
STRIP LOG

LOGGED DEPTH: 339 FT. LOGGING SPEED: 20 FT./MIN.

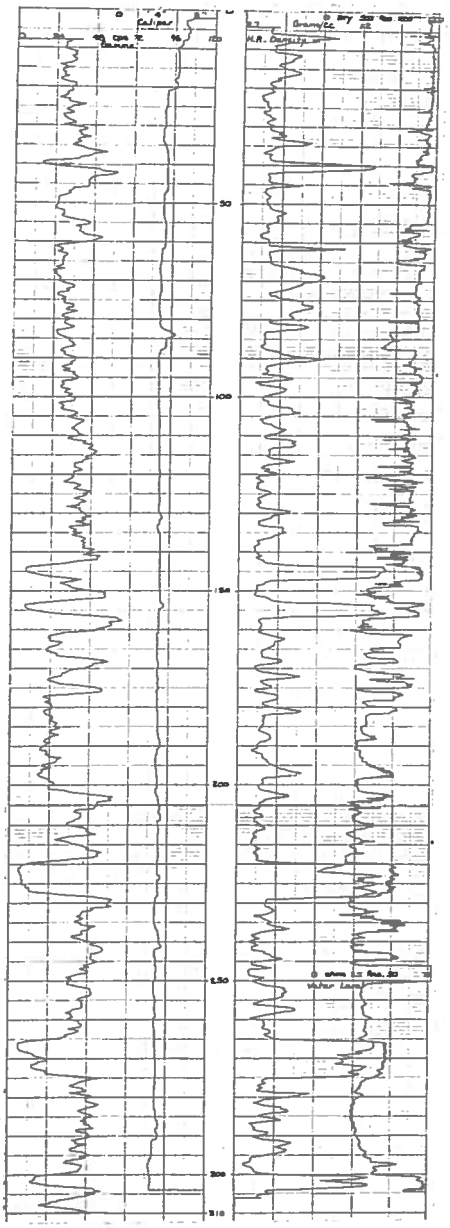
GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350


THE UNIVERSITY OF WYOMING
HOLE NO. PM-10
SHEET 2OF 2
LOGGED DEPTH: 339 FT. LOGGING SPEED: 20 FT./MIN.
INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 24 0 4 8 CALIPER
TC 2 SCALE
H.R. DENSITY CPS/IN 260 500
TC 2 25
RESISTIVITY OHMS DRY OHMS WET
DEPTH (FEET)
Shale, dark gray
400TD
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING			HOLE NO PM-10C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 5/28/82	DATE COMP.: 5/28/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NE¼SW¼ SEC. 33 T. 15N R. 102W		FOOTAGE LOCATION: 1400'FSL, 2640'FEL		
GROUND ELEVATION: 7145'	TOTAL DEPTH: 312'	DEPTH TO WATER: 246'		
SIZE, BIT TYPE: 4 ¾" K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 233.7	CORE FOOTAGE: 78.3'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

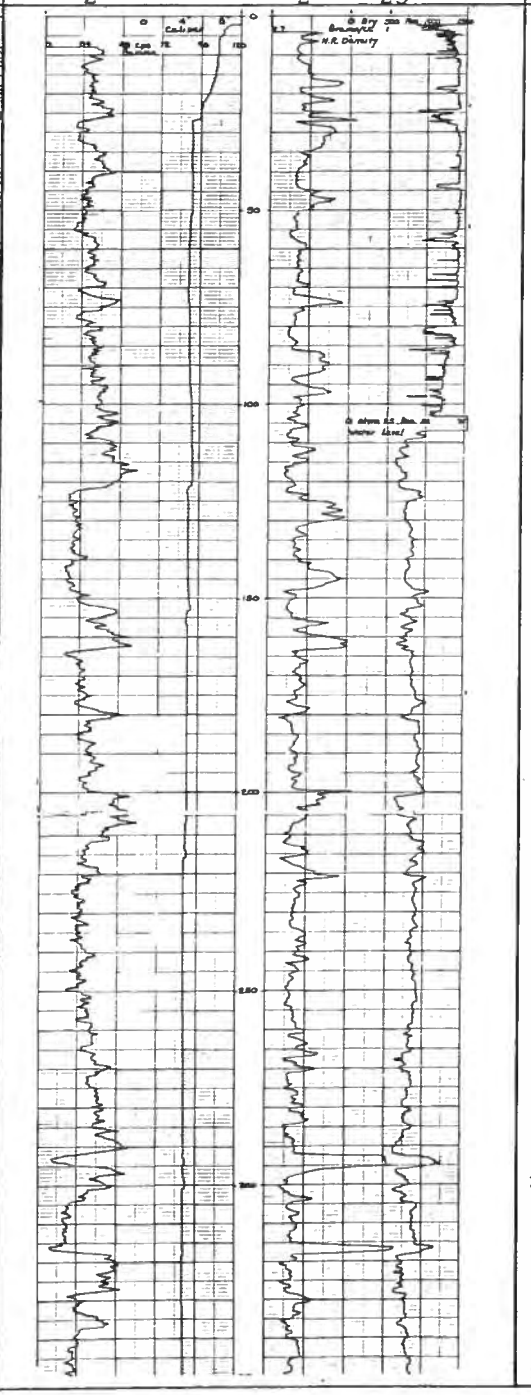
CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 310 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 24 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 T.C. 2 RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Refer to PM-10			0
140				50
160				100
215				150
236.5				200
262				250
282.8				300
297				
312	TD			350

THE UNIVERSITY OF WYOMING			HOLE NO. PM-11	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 5/28/82	DATE COMP.: 5/29/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼NW¼ SEC. 4 T. 14N R. 102W		FOOTAGE LOCATION: 1800'FNL, 700'FWL		
GROUND ELEVATION: 7210'	TOTAL DEPTH: 520'	DEPTH TO WATER: 107'		
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 520'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

LOGGED DEPTH: 516 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN T.C. 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 260 T.C. 2 — RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	
5	Soil, light brown, sandy
	Sandstone, orange-gray
24.5	
27	Coal?
	Sandstone, medium gray
45	
50	Sandstone, orange-brown
	Sandstone, medium gray and shale, dark gray, interbedded
98	
	Shale, dark gray
125	
	Sandstone, medium gray
152	
163	Shale, dark gray-black
	Sandstone, medium gray
200	
	Shale, gray to black
220	
	Sandstone
292	
296	Coal
303	Shale, dark gray, carbonaceous
315.5	Sandstone, light gray
318	Coal
	Sandstone, light gray and shale, dark gray, interbedded



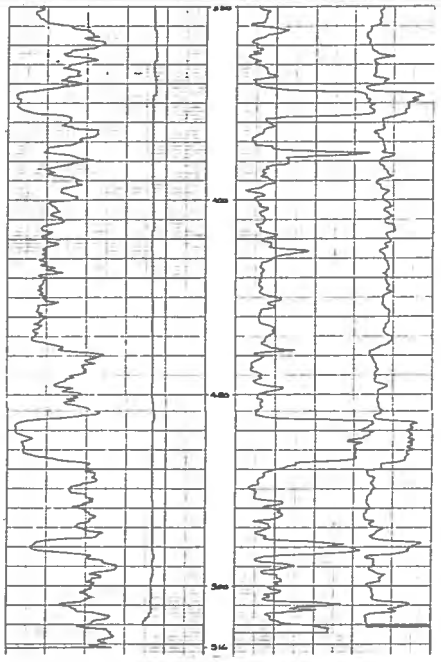
THE UNIVERSITY OF WYOMING | HOLE NO. PM-11 | SHEET 2 OF 2

LOGGED DEPTH 516 FT. LOGGING SPEED 20 FT/MIN.

GAMMA CPS/IN 240 TC 2 | CALIPER 4 SCALE 8 | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
372	
378.5	Coal
387.5	Shale and siltstone
388.5	Coal
400	Shale, dark gray and siltstone, light gray
439	Sandstone, light gray
457	Shale, dark gray, carbonaceous
468	Coal
488	Shale, dark gray, carbonaceous
492	Coal
504	Sandstone and shale, interbedded
507	coal, with shale parting near base.
520TD	Sandstone, light gray and shale, dark gray, carbonaceous, interbedded.

STRIP LOG



DEPTH (FEET)

350
400
450
500
550
600
650
700
750
800

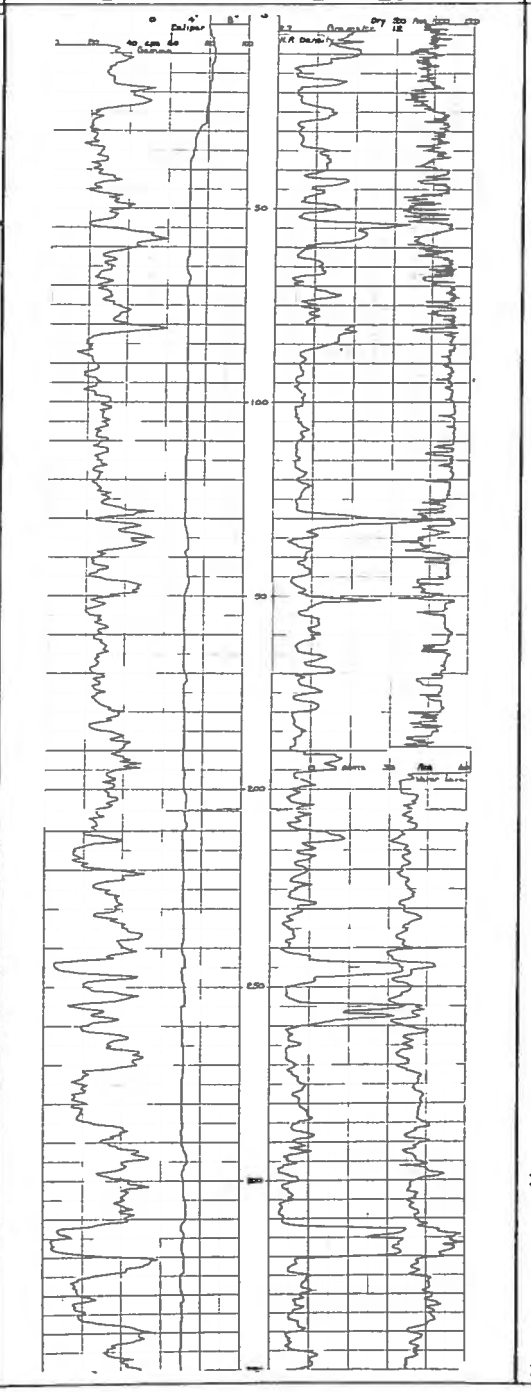
THE UNIVERSITY OF WYOMING		HOLE NO. PM-12	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/20/82	DATE COMP.: 5/20/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 6 T. 14N R. 102W		FOOTAGE LOCATION: 1800'FNL, 2300'FEL	
GROUND ELEVATION: 7390'	TOTAL DEPTH: 520'	DEPTH TO WATER: 196'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 520'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 518 FT. LOGGING SPEED: ___ FT./MIN.

INTERVALS	LITHOLOGY
	No lithology log available, samples washed out by core hole drilling
53.5 55	Coal
129 132	Coal
243.5 247.5	Coal
254 258	Coal, with parting in middle
312 320	Coal, with parting between 314 and 315

STRIP LOG

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET



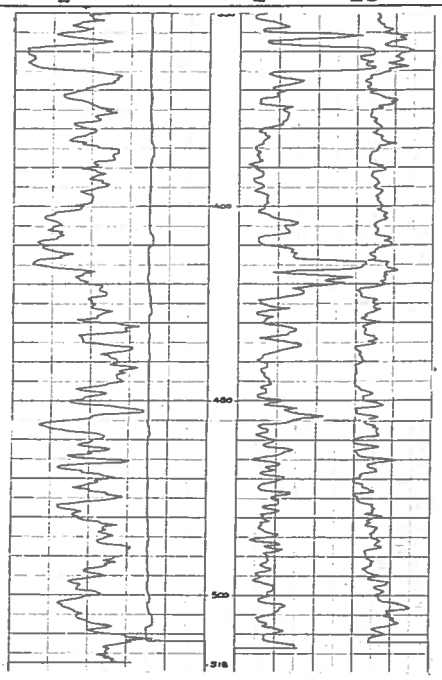
DEPTH (FEET)

THE UNIVERSITY OF WYOMING | HOLE NO. PM-12 | SHEET 2 OF 2

LOGGED DEPTH: 518 FT. LOGGING SPEED: ____ FT./MIN.

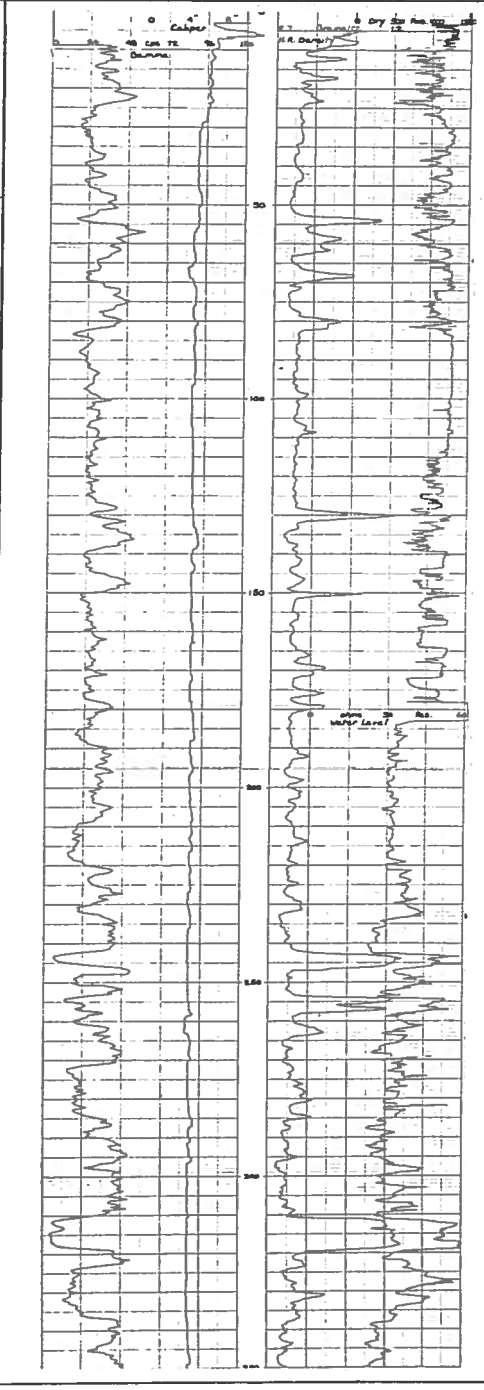
GAMMA CPS/IN 20 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG
355	Coal	
357		
358.5	Coal	
365		
414	Coal	
416.5		
417.5	Coal	
421		
520TD		



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

THE UNIVERSITY OF WYOMING		HOLE NO. PM-12C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/26/82	DATE COMP.: 5/26/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 6 T. 14N. R. 102W		FOOTAGE LOCATION: 1800'FNL, 2300'FEL	
GROUND ELEVATION: 7390'	TOTAL DEPTH: 425.6'	DEPTH TO WATER: 183'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 341.7'	CORE FOOTAGE: 83.9'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 423 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 24 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 500 T.C. 2 RESISTIVITY 15 OHMS DRY OHMS WET	DEPTH (FEET)
	Refer to PM-12			0 50 100 150 200 250 300 350
238 – 263.4				
305 – 324				

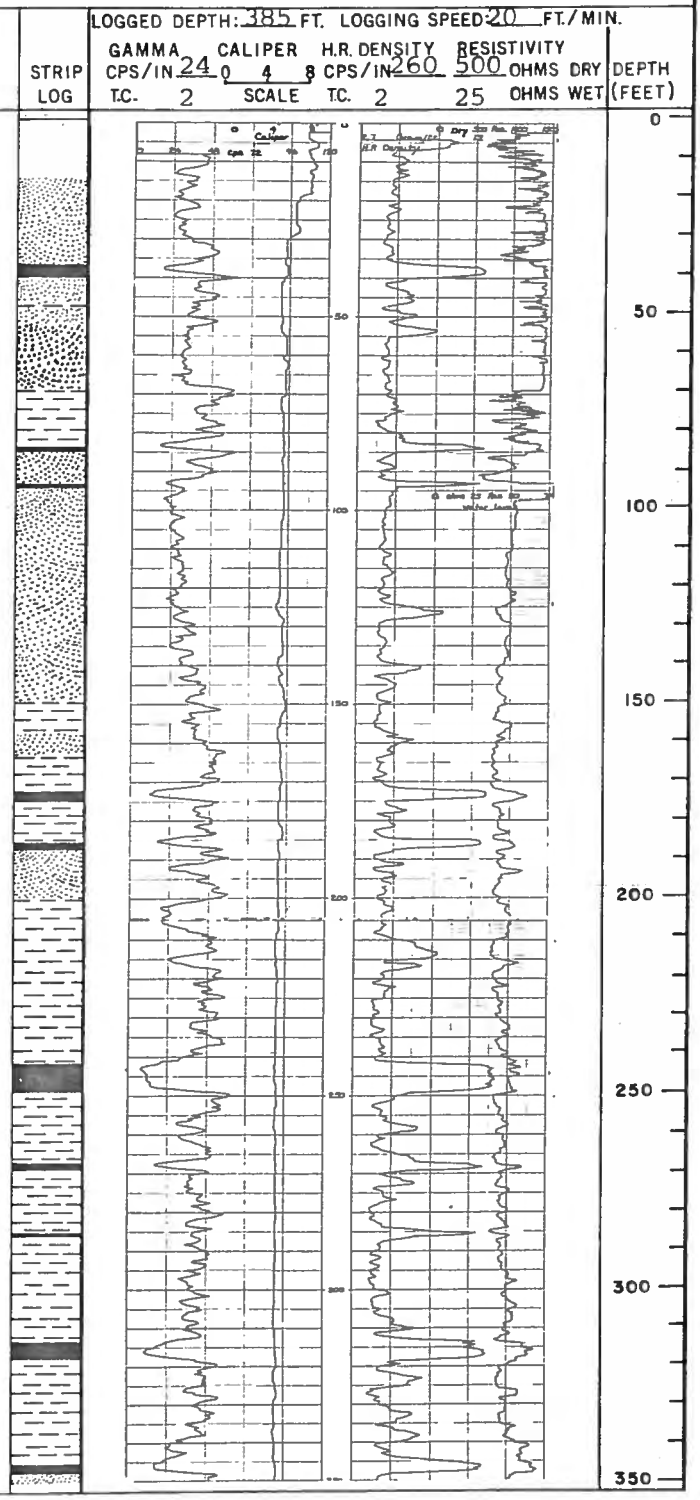
THE UNIVERSITY OF WYOMING	HOLE NO. PM-12C	SHEET 2 OF 2

LOGGED DEPTH: 423 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 TC 2	RESISTIVITY OHMS DRY 15 OHMS WET	DEPTH (FEET)
350							350
374							
410							400
425	TD						
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING		HOLE NO. PM-13	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/29/82	DATE COMP.: 5/29/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼NE¼ SEC. 8 T. 14N. R. 102W.		FOOTAGE LOCATION: 200'FNL, 800'FEL	
GROUND ELEVATION: 7270'	TOTAL DEPTH: 400'	DEPTH TO WATER: 97'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 400'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
14	Sandstone, orange-brown
37	Coal
40	Sandstone and shale, interbedded
52	Sandstone, medium gray
68	Shale, light gray
83	Coal
85	
92.5	Sandstone, medium gray
94	Coal
	Sandstone, medium gray
149	Shale, medium gray
157	Sandstone, medium gray-brown
163	Shale, black, carbonaceous
172	Coal
175	Shale, dark gray
185	Coal
187	Sandstone, medium gray
200	Shale, black, carbonaceous
241.5	Coal
249	Shale, light gray to black
267	Coal
269	Shale, light gray to black
285	Coal
286	Shale, light gray to black
313	Coal
318	Shale, light gray to black
345	Coal
348	

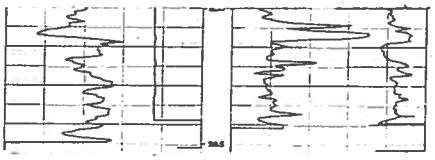


THE UNIVERSITY OF WYOMING | HOLE NO. PM-13 | SHEET 2 OF 2

LOGGED DEPTH 385 FT. LOGGING SPEED 20 FT./MIN.

GAMMA CPS/IN 240 TC 2 | CALIPER 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
354 358	Sandstone, medium gray Coal with shale parting		350
	Shale, black, carbonaceous		400
400TD			450
			500
			550
			600
			650
			700
			750
			800



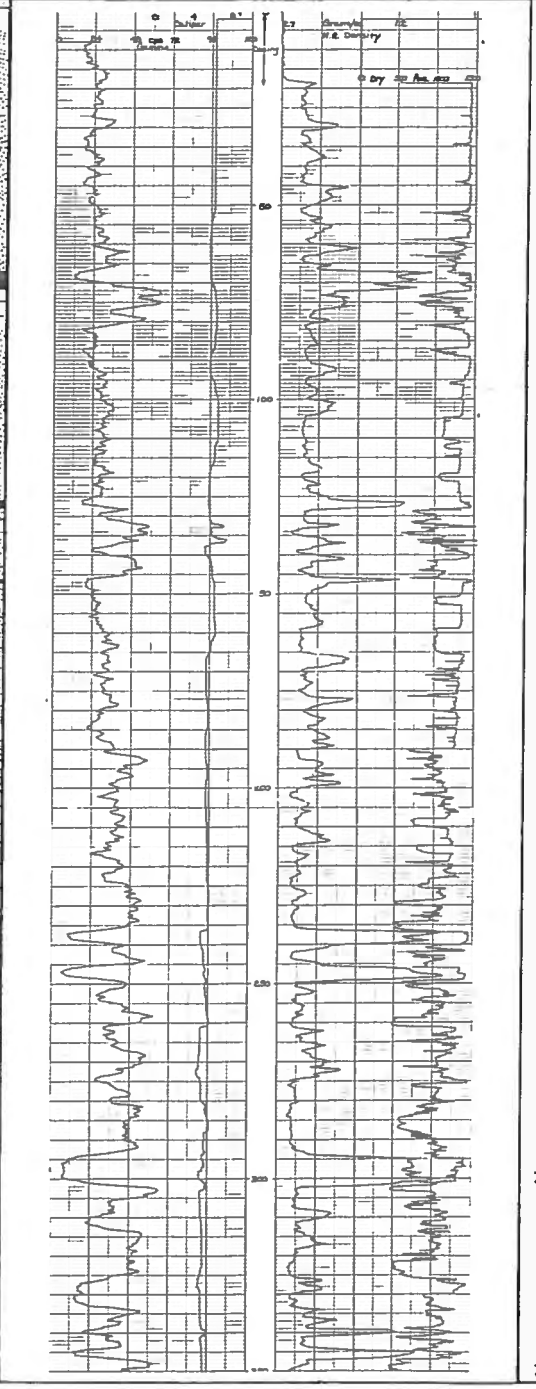
THE UNIVERSITY OF WYOMING			HOLE NO. PM-14	SHEET 1 OF 3
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 5/25/82	DATE COMP.: 5/30/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼SE¼ SEC. 6 T. 14N. R. 102W.		FOOTAGE LOCATION: 1800'FSL, 2300'FEL		
GROUND ELEVATION: 7470'	TOTAL DEPTH: 1000'	DEPTH TO WATER: 495'		
SIZE, BIT TYPE: 5-1/8K,V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 1,000'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drillings		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

INTERVALS	LITHOLOGY
0	
5	Soil, light brown, sandy
	Sandstone, light orange-brown
67	Coal, with shaley parting
72	Shale, dark gray-brown
81	
	Sandstone, light gray
126	
128	Coal
132	Sandstone, dark gray
146	Sandstone and shale, dark gray
147	Coal?
	Sandstone, light gray
191	
201	Shale, light gray, and silty
	Shale, dark gray
236.5	
240	Coal
246	Shale, medium gray
249	Coal
262	Shale, medium gray
274	Sandstone, light gray
	Shale, dark gray
294.5	
302	Coal
	Shale, light to dark gray
327	Sandstone, light gray
336	Shale, dark gray
339	Coal
341	Shale, dark gray
345	Coal
347	

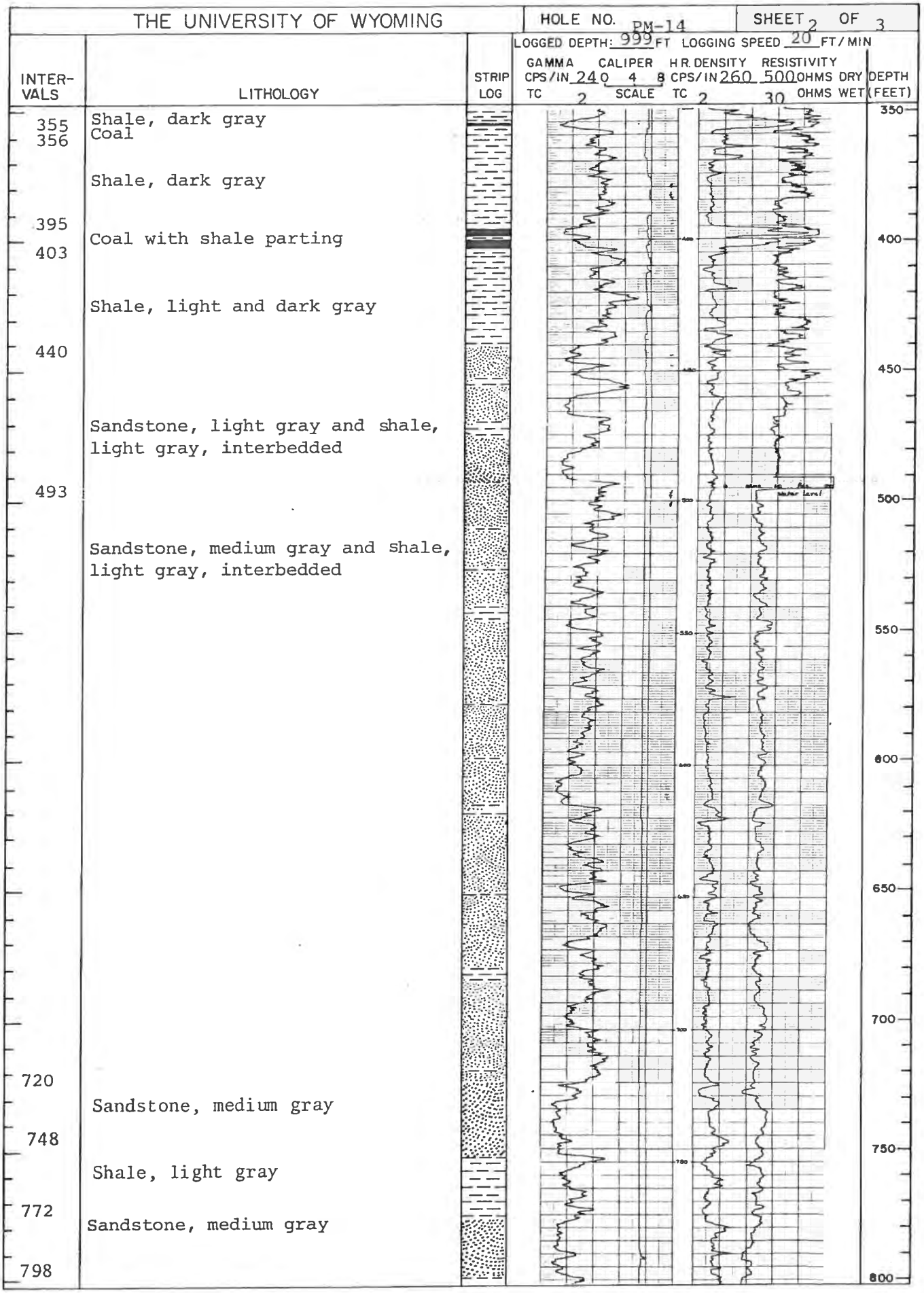
STRIP LOG

LOGGED DEPTH: 999 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 30 OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350


THE UNIVERSITY OF WYOMING
HOLE NO. PM-14
SHEET 2 OF 3
LOGGED DEPTH: 999 FT LOGGING SPEED 20 FT/MIN
INTER-VALS
LITHOLOGY
STRIP LOG
GAMMA CPS/IN 240
CALIPER 0 4 8
H R. DENSITY CPS/IN 260
RESISTIVITY 500 OHMS DRY
TC 2
SCALE
TC 2
30 OHMS WET
DEPTH (FEET)
355
356
Shale, dark gray
Coal
Shale, dark gray
395
403
Coal with shale parting
Shale, light and dark gray
440
Sandstone, light gray and shale, light gray, interbedded
493
Sandstone, medium gray and shale, light gray, interbedded
720
Sandstone, medium gray
748
Shale, light gray
772
Sandstone, medium gray
798
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING

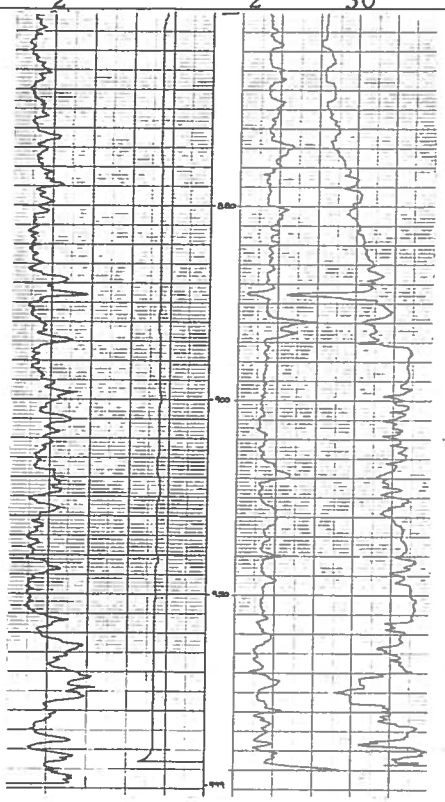
HOLE NO. PM-14 | SHEET 3 OF 3

LOGGED DEPTH: 999 FT. LOGGING SPEED: 20 FT/MIN.

GAMMA CPS/IN 240 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 | RESISTIVITY 500 OHMS DRY 30 OHMS WET

TC 2 | TC 2

INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
	Shale, light gray		800
833			850
	Sandstone, medium gray		900
			950
1000 TD			1000
			1050
			1100
			1150
			1200
			1250



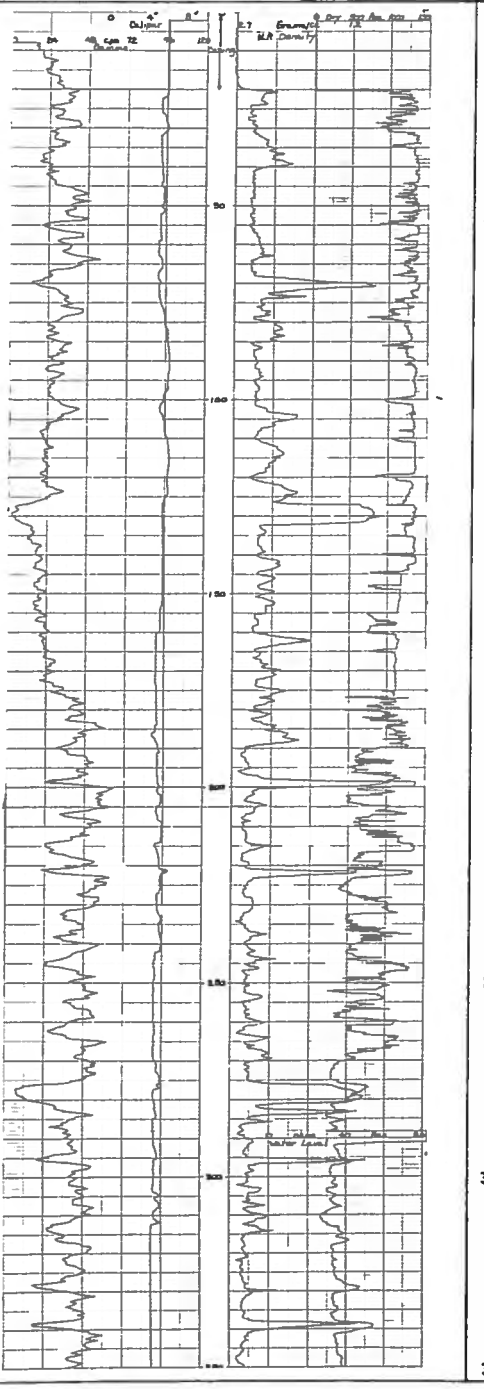
THE UNIVERSITY OF WYOMING		HOLE NO. PM-15	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 6/2/82	DATE COMP.: 6/3/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 17 T. 14N. R. 102W		FOOTAGE LOCATION: 2500'FNL, 900'FEL	
GROUND ELEVATION: 7510'	TOTAL DEPTH: 740'	DEPTH TO WATER: 291'	
SIZE, BIT TYPE: 5-1/8K ,V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

INTERVALS	LITHOLOGY
0	Sandstone, orange-brown
16	Shale, dark gray, silty
23	Sandstone, orange-brown
40	Sandstone, medium gray
69	Coal?
71.5	Shale, dark gray-brown
85	Sandstone, medium gray
127	Coal
132	Sandstone, light gray
189	Shale, dark gray
198.5	Coal
200	Shale, dark gray
221	Coal
223	Shale, medium to dark gray, banded
276	Coal
281	Coal and shale, dark gray
286	Shale, dark gray
295	Coal
296.5	Shale, dark gray
338	Coal
340	

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

STRIP LOG

GAMMA CPS/IN 24 T.C. 0 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 20 OHMS WET



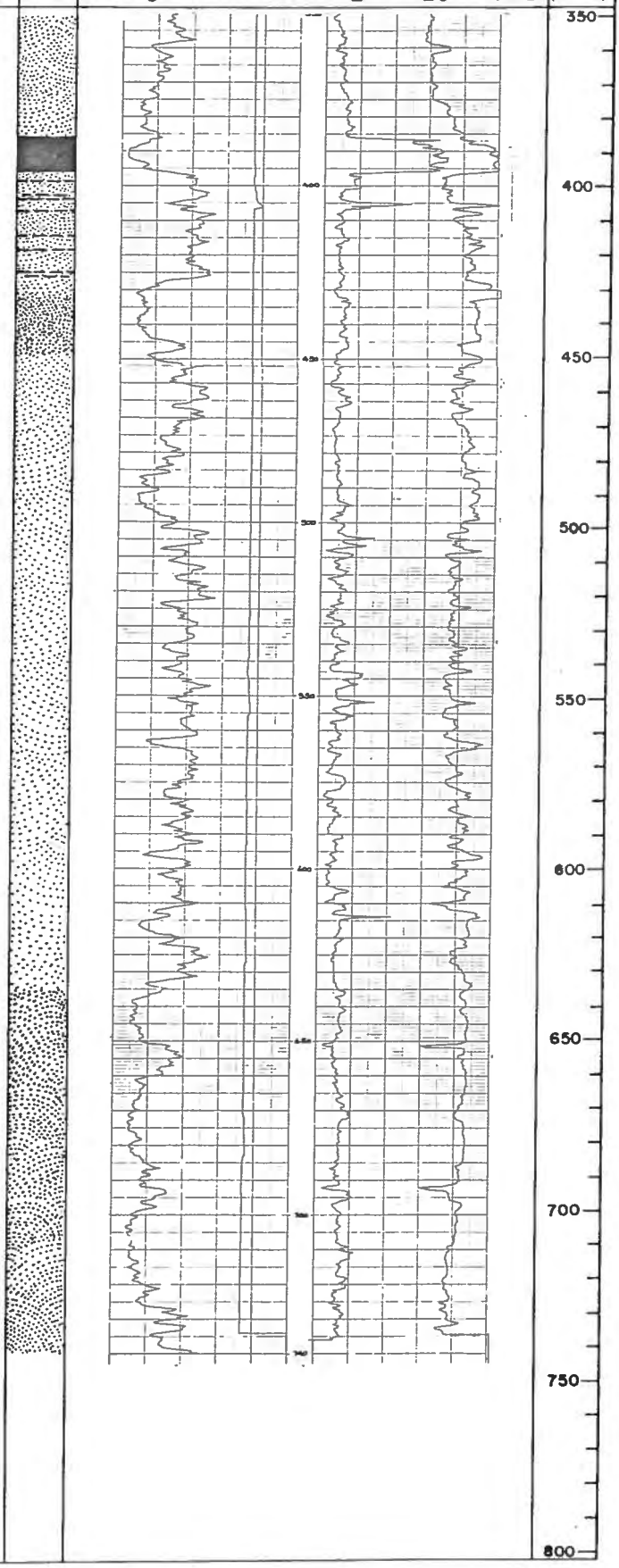
DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. PM-15 | SHEET 2 OF 2

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 TC 0 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY
	Sandstone, light brownish-gray
386.5	Coal
396	
	Sandstone, light gray and shale, interbedded
427	
	Sandstone, light gray
448	
	Sandstone, medium gray
635	
	Sandstone, light gray
740TD	



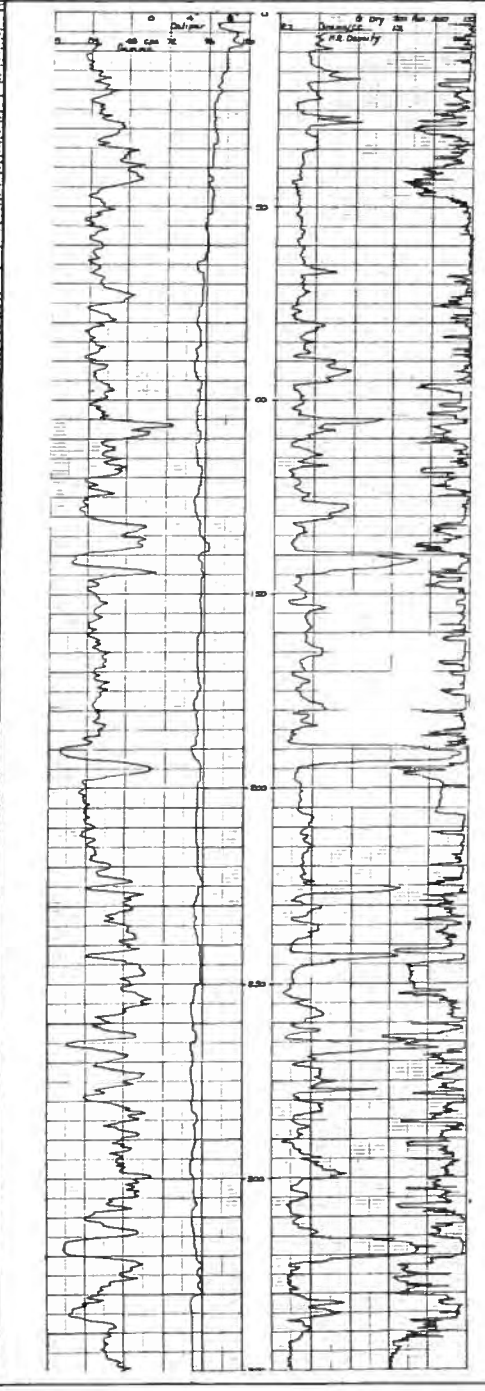
THE UNIVERSITY OF WYOMING		HOLE NO. PM-16	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/30/82	DATE COMP.: 5/31/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 18 T. 14N. R. 102W.		FOOTAGE LOCATION: 300' FSL, 2300' FWL	
GROUND ELEVATION: 7750'	TOTAL DEPTH: 580'	DEPTH TO WATER: 500'	
SIZE, BIT TYPE: 5-1/8K, WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 580'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

INTERVALS	LITHOLOGY
0	
5	Soil, orange-brown, sandy
18	Sandstone, orange-brown
27	Shale, dark gray
	Sandstone, brownish-gray
42	
	Sandstone, pale orange-brown
80	
95	Sandstone, medium gray
105	Shale, dark gray
117	Sandstone, medium gray
127	Shale, black, carbonaceous
131	Sandstone, medium gray
139	Shale, black, carbonaceous
144	Coal
	Sandstone, medium gray
189	
193	Coal
208	Sandstone, medium gray
	Shale, dark gray, carbonaceous
225	
227	Coal
	Sandstone, medium gray, and shale,
242	dark gray, carbonaceous
244	Coal
	Shale, dark gray, carbonaceous
265	
267.5	Coal
	Shale, dark gray, carbonaceous
316	
321	Coal
	Sandstone, dark gray
342	

STRIP LOG

LOGGED DEPTH: 556 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



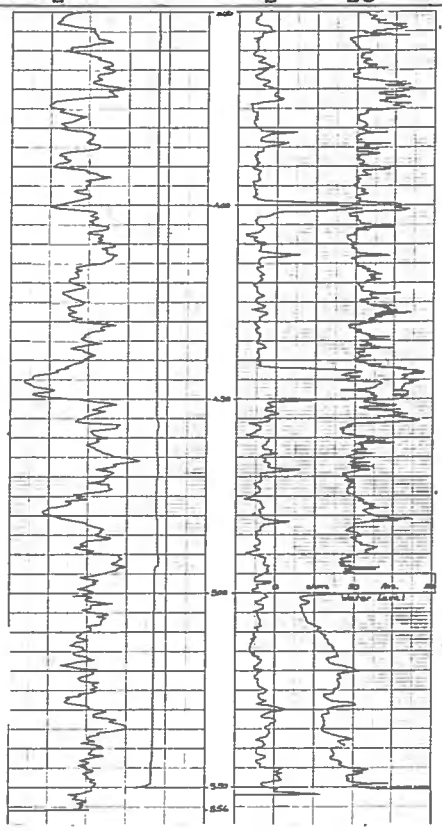
DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. PM-16 | SHEET 2 OF 2

LOGGED DEPTH 556 FT. LOGGING SPEED 20 FT/MIN.

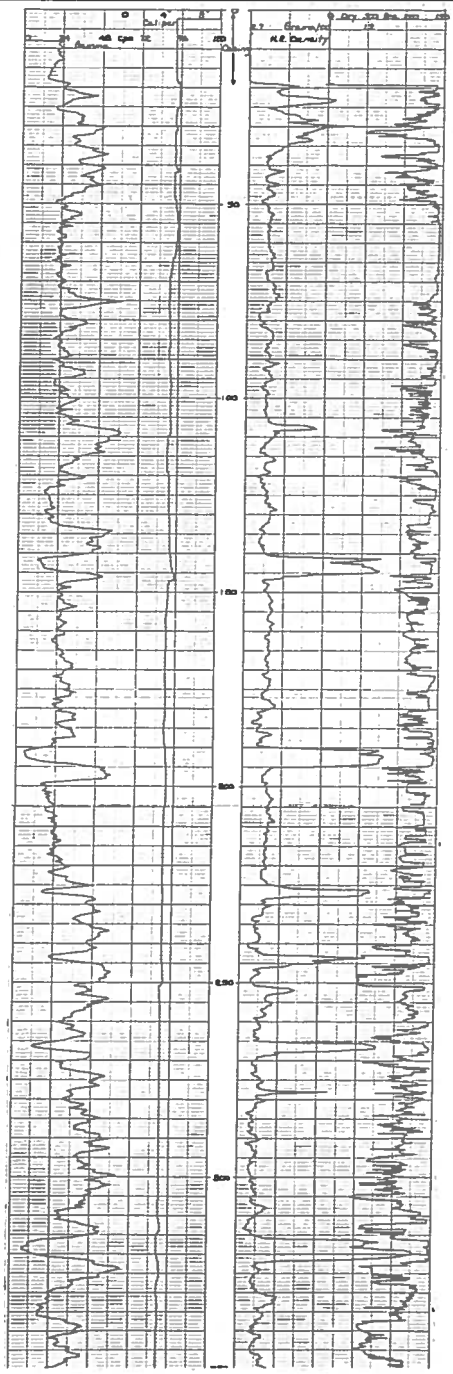
GAMMA CPS/IN 24 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG
	Shale, dark gray, carbonaceous	
399 402	Coal	
	Shale, dark gray, carbonaceous	
442 450	Coal	
	Shale, dark gray, carbonaceous	
529	Sandstone	
545		
	Shale, medium to dark gray, carbonaceous	
580 TD		



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

THE UNIVERSITY OF WYOMING			HOLE NO. PM-16C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 6/2/82	DATE COMP.: 6/2/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SW¼ SEC. 18 T.14N R. 102W		FOOTAGE LOCATION: 300'FSL, 2300'FWL		
GROUND ELEVATION: 7750'	TOTAL DEPTH: 455'	DEPTH TO WATER: 413'		
SIZE, BIT TYPE: 4 ¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 399.7'	CORE FOOTAGE: 55.3'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 453 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 24 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 T.C. 2 RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
137–147 187–197 263–273 316–326	Refer to PM-16			0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. PM-16C | SHEET 2 OF 2

LOGGED DEPTH: 453 FT. LOGGING SPEED: 20 FT/MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
440							350
455.3 TD							400
							450
							500
							550
							600
							650
							700
							750
							800

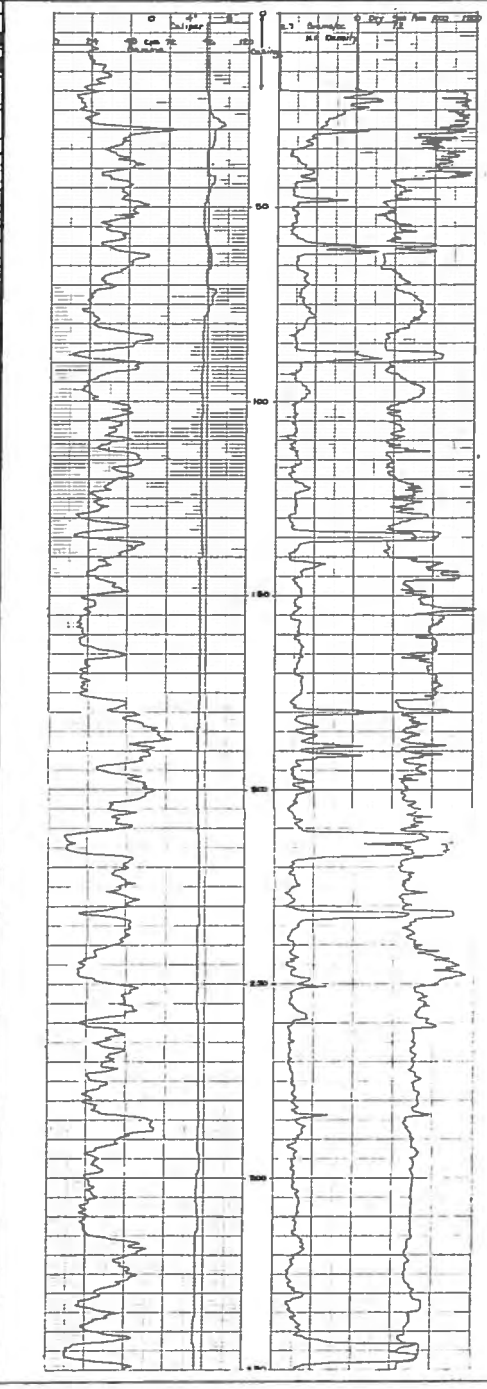
THE UNIVERSITY OF WYOMING			HOLE NO. PM-17	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 6/2/82	DATE COMP.: 6/3/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼NW¼ SEC. 24 T. 14N R. 103W.		FOOTAGE LOCATION: 2200'FNL, 100'FWL		
GROUND ELEVATION: 7870'	TOTAL DEPTH: 500'	DEPTH TO WATER: 382'		
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 500'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: Lost circulation at 100' and drilled blind to TD				

INTERVALS	LITHOLOGY
0	Soil, gray-brown, shaley
5	Coal
8	Shale, medium gray
11	
15	Coal?
19	Shale, light gray
24	Sandstone, pale gray
	Shale, dark gray, carbonaceous
40	
	Shale, medium gray
67	
	Sandstone, pale orange
82	Shale, black, carbonaceous
87	Coal
90	
93	Shale, black, carbonaceous
100	Sandstone, medium gray
133.5	Coal
136	
	— N O S A M P L E S —
211	Coal
217.5	
231	Coal
233	
343	Coal
348	

STRIP LOG

LOGGED DEPTH: 498 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 TC. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 500 TC. 2 | RESISTIVITY 25 OHMS DRY OHMS WET

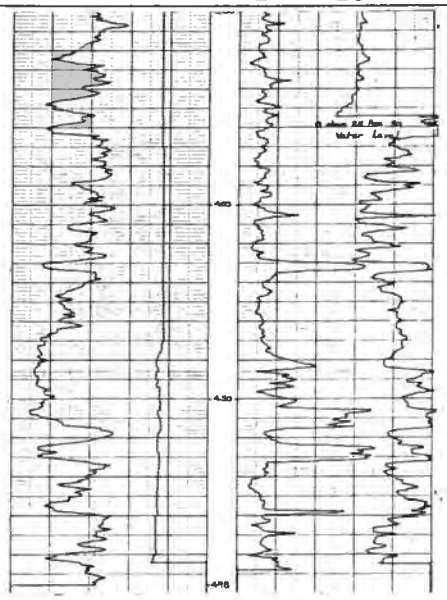


DEPTH (FEET)

THE UNIVERSITY OF WYOMING | HOLE NO. PM-17 | SHEET 2 OF 2

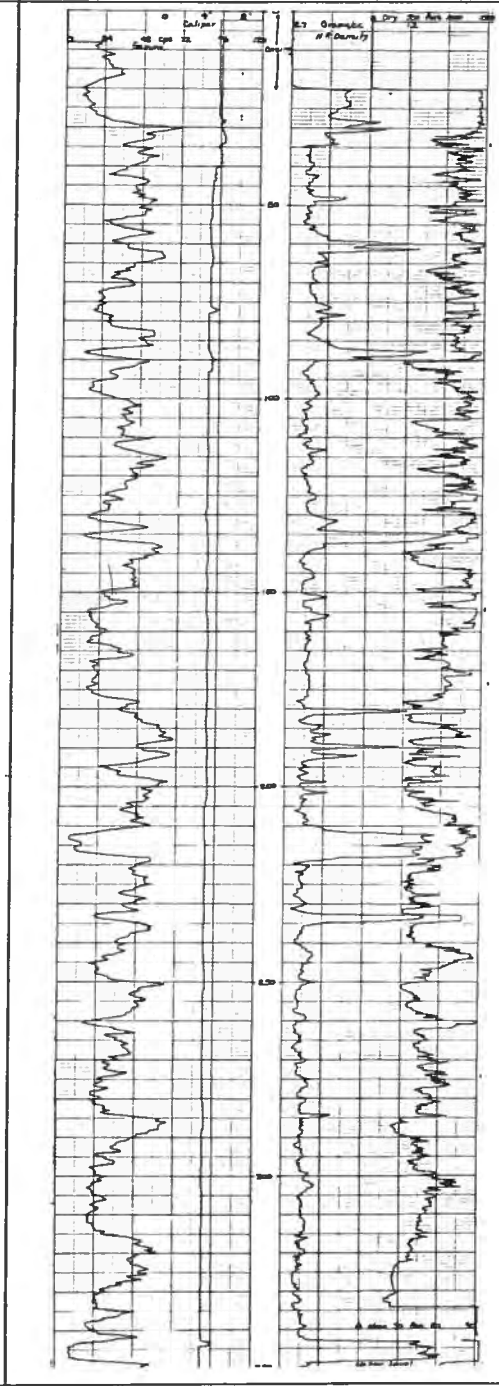
LOGGED DEPTH: 498 FT LOGGING SPEED 20 FT./MIN

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
415 417	Coal						
452.5 457.5	Coal						
462 466	Coal						
478.5 479.5	Coal						
500TD							



350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING			HOLE NO. PM-17C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 6/4/82	DATE COMP.: 6/4/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼NW¼ SEC. 24 T. 14N R. 103W		FOOTAGE LOCATION: 2200'FNL, 100'FWL		
GROUND ELEVATION: 7870'	TOTAL DEPTH: 473'		DEPTH TO WATER: 359'	
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 410'	CORE FOOTAGE: 63'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 472 FT. LOGGING SPEED 20 FT./MIN. GAMMA CPS/IN 24 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 T.C. 2 RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
130 141 207 221 338	Refer to PM-17			0 50 100 150 200 250 300 350

THE UNIVERSITY OF WYOMING | HOLE NO. PM-17C | SHEET 2 OF 2

LOGGED DEPTH: 472 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 TC 2	CALIPER 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 TC 2	RESISTIVITY OHMS DRY 30 OHMS WET	DEPTH (FEET)
351							350
							400
448							450
473	TD						500
							550
							600
							650
							700
							750
							800

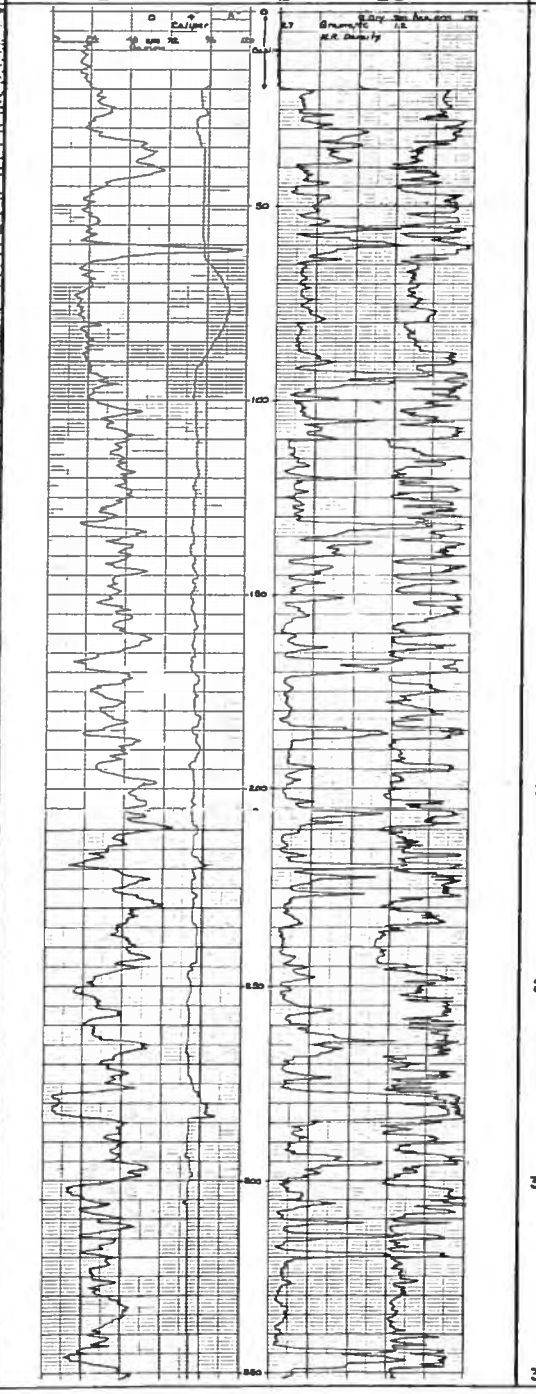
THE UNIVERSITY OF WYOMING			HOLE NO. PM-18	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 6/4/82	DATE COMP.: 6/5/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: NW¼SW¼ SEC. 26 T. 14N R. 103W		FOOTAGE LOCATION: 2600' FSL, 100' FWL		
GROUND ELEVATION: 7630'	TOTAL DEPTH: 740'	DEPTH TO WATER: 615'		
SIZE, BIT TYPE: 5-1/8K,V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS:				

INTERVALS	LITHOLOGY
0	
	Sandstone, light orange-brown
20	
	Sandstone, orange-white
30	
	Shale, dark gray
40	
	Sandstone, orange-white
55	
57	Coal
64	Shale, black, carbonaceous
	Sandstone, orange-brown
93	
97	Coal
	Shale, dark gray, carbonaceous
132	
133	Coal
	Shale, dark gray
167	Coal
170	Shale, dark gray and black
184	
187	Coal
	Shale, dark gray and black
205	
208	Coal with shale parting
	Shale, dark gray and black
218.5	
220	Coal
	Shale, dark gray and black
242	
249	Sandstone, medium gray
	Shale, dark gray and black
278	
284	Coal
293	Shale, medium gray, silty
	Shale, black, carbonaceous, and coal, interbedded
320	
	Sandstone, medium-dark gray
344	
349	Coal with shale partings

STRIP LOG

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING

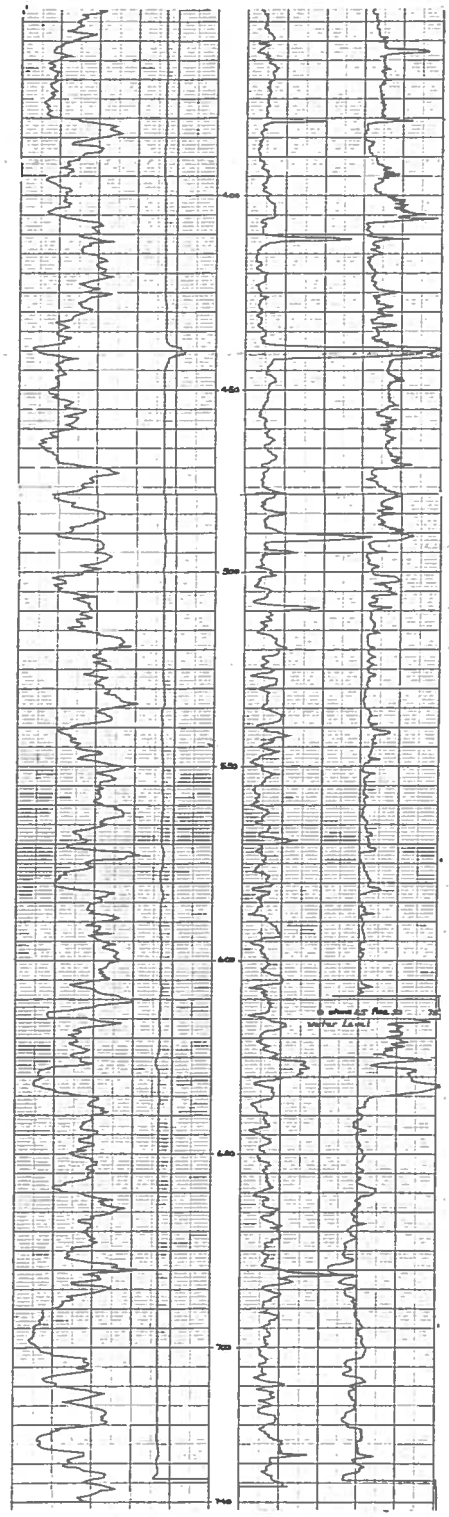
HOLE NO. PM-18

SHEET 2 OF 2

LOGGED DEPTH: 740 FT. LOGGING SPEED 20 FT/MIN.

GAMMA CPS/IN 24 TC 2 | CALIPER 0 4 8 SCALE | H.R DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
	Sandstone, dark brownish-gray
380	Coal?
381	
393	Sandstone, brownish-gray
	Sandstone, medium gray
411	Coal?
412	
	Sandstone, medium gray
439	
442	
	Sandstone and shale, interbedded
490	Coal
492	Sandstone, dark brownish-gray
510	
	Sandstone, medium gray
550	
	Shale, black
570	
	Sandstone, medium gray with abundant shale stringers
681	
	Sandstone, medium gray
740	
TD	



DEPTH (FEET)

350
400
450
500
550
600
650
700
750
800

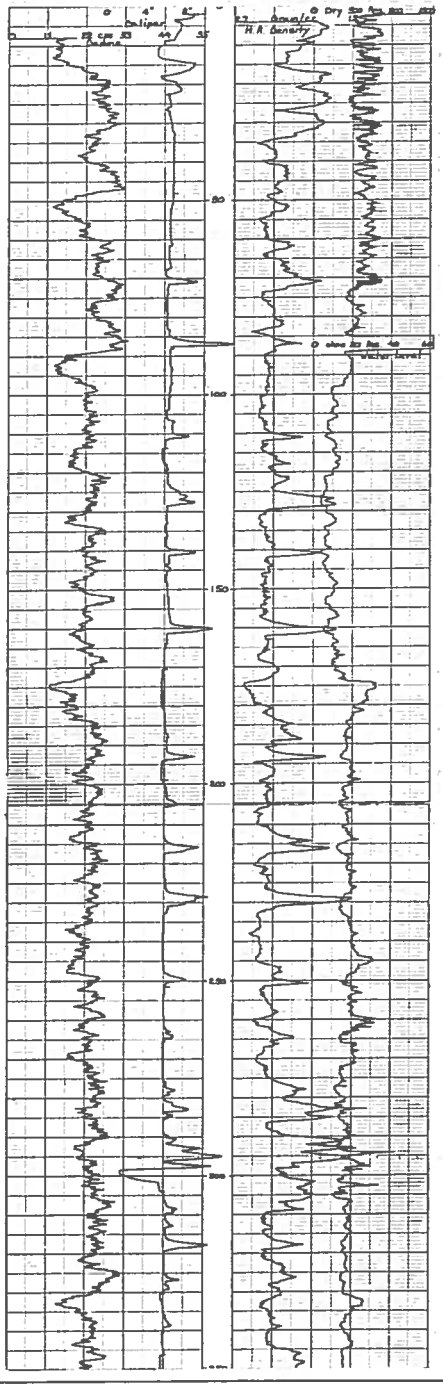
THE UNIVERSITY OF WYOMING		HOLE NO. MD-1	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/3/82	DATE COMP.: 8/4/82	COUNTY: Unita	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 10 T. 16N., R. 118W.		FOOTAGE LOCATION: 880'FSL, 2150'FWL	
GROUND ELEVATION: 6885'	TOTAL DEPTH: 740'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

INTERVALS	LITHOLOGY
0 5	Soil, light brown, sandy
	Shale, dark brown
21	
30	Sandstone, light brown
	Shale, medium gray-green, interbedded with 1' to 4' stringers of siltstone, medium gray

LOGGED DEPTH: 619 FT. LOGGING SPEED: 20 FT./MIN.

STRIP LOG

GAMMA CPS/IN 11 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 117 T.C. 2 | RESISTIVITY 500 OHMS DRY 20 OHMS WET



DEPTH (FEET)

0 50 100 150 200 250 300 350

THE UNIVERSITY OF WYOMING

HOLE NO. MD-1

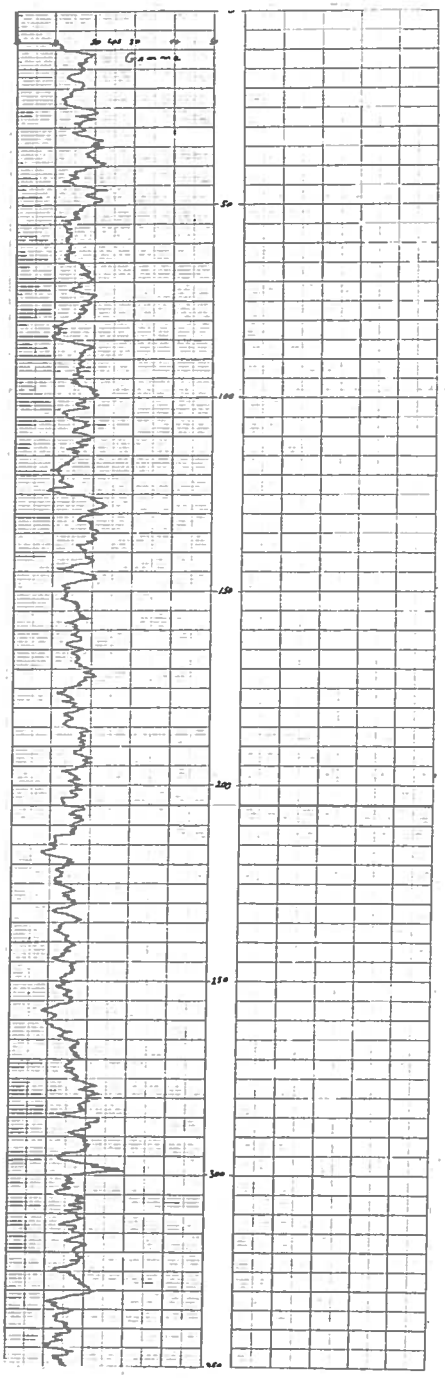
SHEET 2 OF 2

LOGGED DEPTH 619 FT LOGGING SPEED 20 FT./MIN

GAMMA CPS/IN 11 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 117 TC 2 | RESISTIVITY 500 OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
383 388	Coal		350
	Shale, dark gray		400
441	Coal		450
461			500
	Shale, dark gray, interbedded with stringers of siltstone, medium gray		550
			600
			650
			700
745TD			750
			800

THE UNIVERSITY OF WYOMING			HOLE NO. MD-1C	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Meadow Draw		
DATE STARTED: 8/5/82	DATE COMP.: 8/5/82	COUNTY Uinta	STATE: Wyoming	
LOCATION: SE¼SW¼ SEC. 10 T. 16N R. 118W		FOOTAGE LOCATION: 880'FSL, 2150'FWL		
GROUND ELEVATION: 6885'	TOTAL DEPTH: 475'	DEPTH TO WATER: 90'		
SIZE, BIT TYPE 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 444.5'	CORE FOOTAGE: 30.5'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1		
REMARKS:				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 465 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 100 T.C. 2 CALIPER 4 8 SCALE H.R. DENSITY CPS/IN ==== RESISTIVITY T.C. ---------- OHMS DRY ==== OHMS WET	DEPTH (FEET)
	Refer to MD-1			0 50 100 150 200 250 300 350

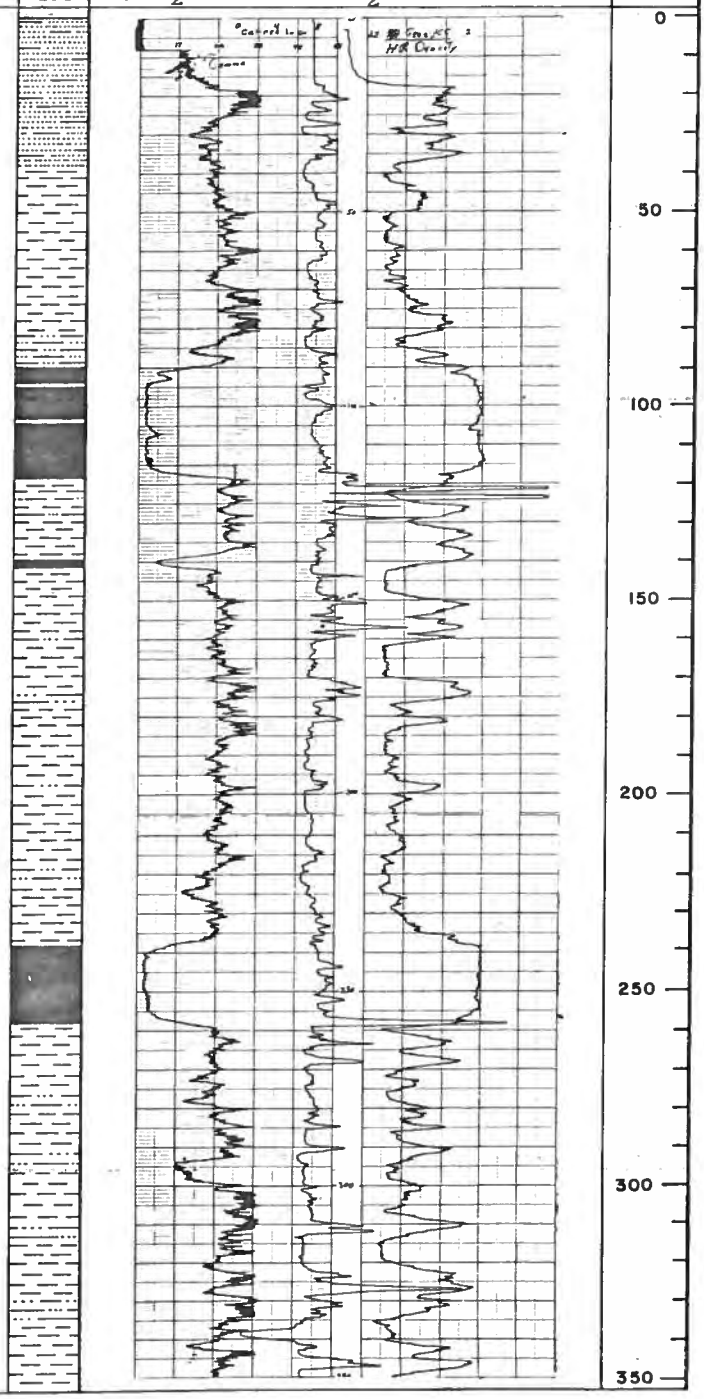
THE UNIVERSITY OF WYOMING | HOLE NO. MD-1C | SHEET 2 OF 2

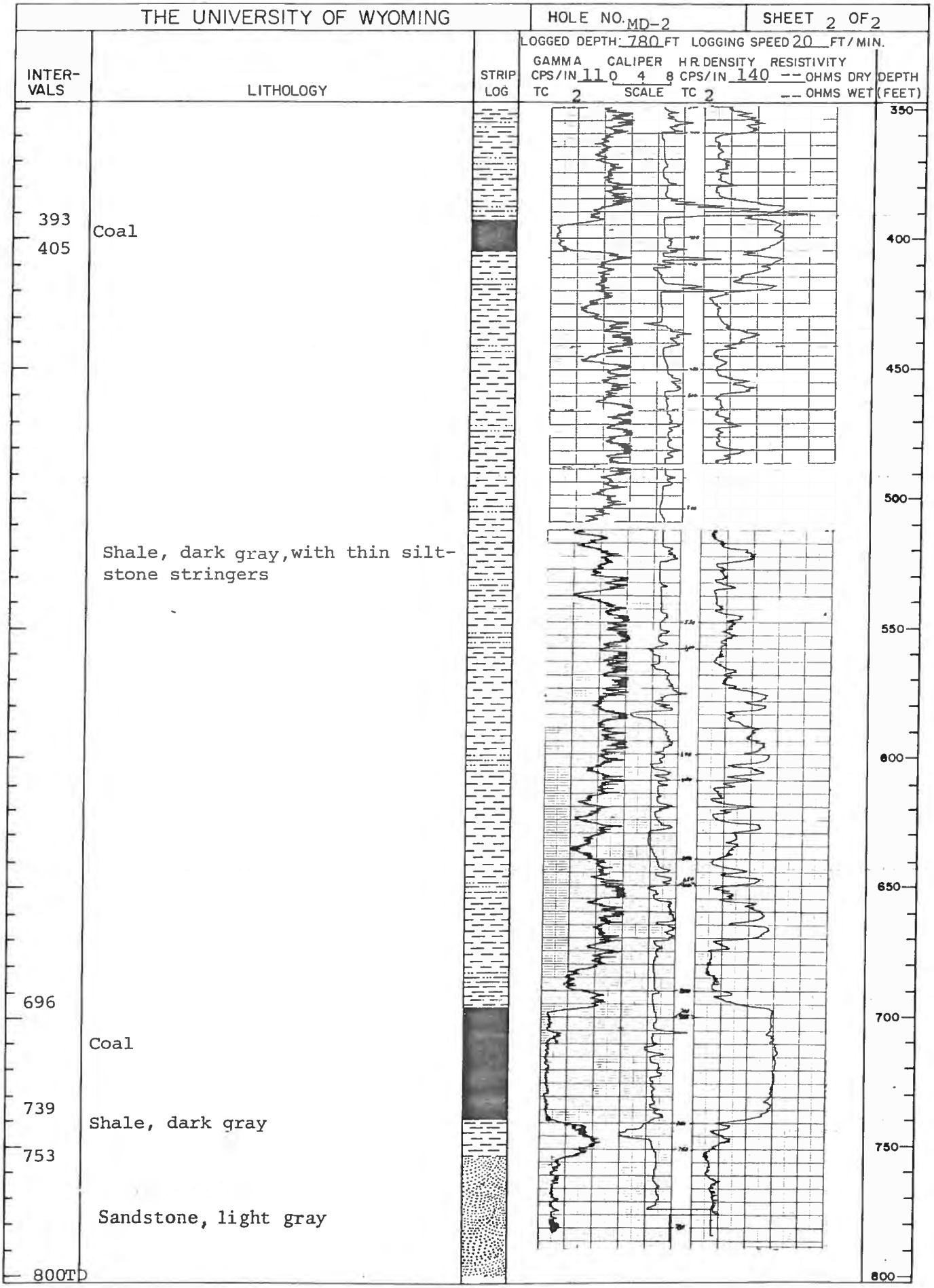
LOGGED DEPTH 465 FT. LOGGING SPEED 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 10 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN ------- TC -------	RESISTIVITY OHMS DRY ------- OHMS WET -------	DEPTH (FEET)
378							350
393							400
435							450
465.5 TD							500
							550
							600
							650
							700
							750
							800

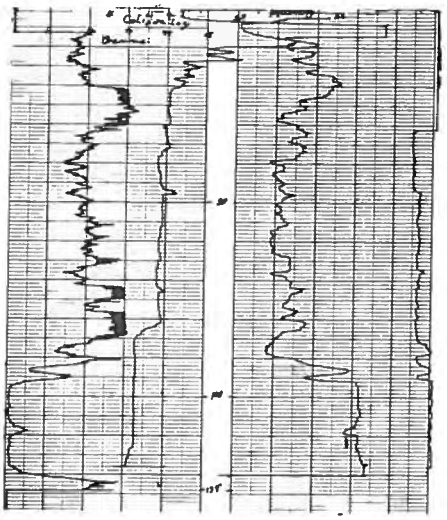
THE UNIVERSITY OF WYOMING		HOLE NO. MD-2	SHEET 1 OF 2
AREA Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/6/82	DATE COMP.: 8/7/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼NE¼ SEC 10 T. 16N R. 118W		FOOTAGE LOCATION: 900' FNL, 1200 FEL	
GROUND ELEVATION: 6870'	TOTAL DEPTH: 800'		DEPTH TO WATER: 90'
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 800'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

INTERVALS	LITHOLOGY
0	
	Sandstone, pale yellow, silty
38	
	Shale, medium gray
81	
89.5	Siltstone, dark gray
	Coal, with 1' to 1½' partings in upper and middle part
117.5	
	Shale, dark gray, with siltstone stringers
139	
	Coal
141.5	
	Shale, dark gray, with siltstone stringers
238	
	Coal
258.5	
	Shale, dark gray, with siltstone stringers




THE UNIVERSITY OF WYOMING
HOLE NO. MD-2
SHEET 2 OF 2
LOGGED DEPTH: 780 FT LOGGING SPEED 20 FT/MIN.
GAMMA CPS/IN 11 TC 2
CALIPER 0 4 8
SCALE
H.R. DENSITY CPS/IN 140 TC 2
RESISTIVITY -- OHMS DRY -- OHMS WET
INTER-VALS
LITHOLOGY
STRIP LOG
DEPTH (FEET)
393
405
Coal
Shale, dark gray, with thin siltstone stringers
696
Coal
739
Shale, dark gray
753
Sandstone, light gray
800TD
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING			HOLE NO. MD-2C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw		
DATE STARTED: 8/11/82	DATE COMP.: 8/11/82	COUNTY: Uinta	STATE: Wyoming	
LOCATION: NE¼NE¼ SEC 10 T. 16N R. 118W		FOOTAGE LOCATION: 900'FNL, 1200'FEL		
GROUND ELEVATION: 6870'	TOTAL DEPTH: 127'	DEPTH TO WATER: 90'		
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 83'	CORE FOOTAGE: 44'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1		
REMARKS:				

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 124 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 11 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 140 T.C. 2 RESISTIVITY ---OHMS DRY ---OHMS WET	DEPTH (FEET)
83	Refer to MD-2			0
127	TD			50
				100
				150
				200
				250
				300
				350

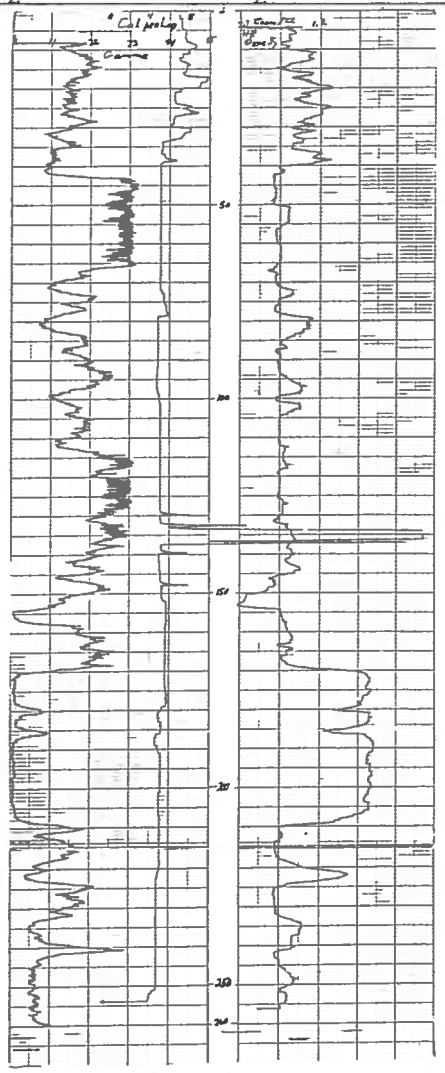
THE UNIVERSITY OF WYOMING		HOLE NO. MD-3	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/11/82	DATE COMP.: 8/11/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼SW¼ SEC. 10 T. 16N R. 118W		FOOTAGE LOCATION: 200'FSL, 1800'FEL	
GROUND ELEVATION: 6815'	TOTAL DEPTH: 260'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 260'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

INTERVALS	LITHOLOGY
0	Shale, orange, silty
20	Sandstone, yellow-orange
35	Siltstone, pale yellow
43	Shale, dark gray
66	Sandstone, light gray
113	Shale, dark gray
140	Sandstone, medium gray
154	Shale, dark gray
169.5	Coal, with 1' parting at 179.5' and 1.5' parting at 185'
209.5	Shale, dark gray, silty
211	Sandstone, light gray
220.5	Coal
224	Sandstone, light gray
260TD	

LOGGED DEPTH: 260 FT. LOGGING SPEED: 20 FT./MIN.

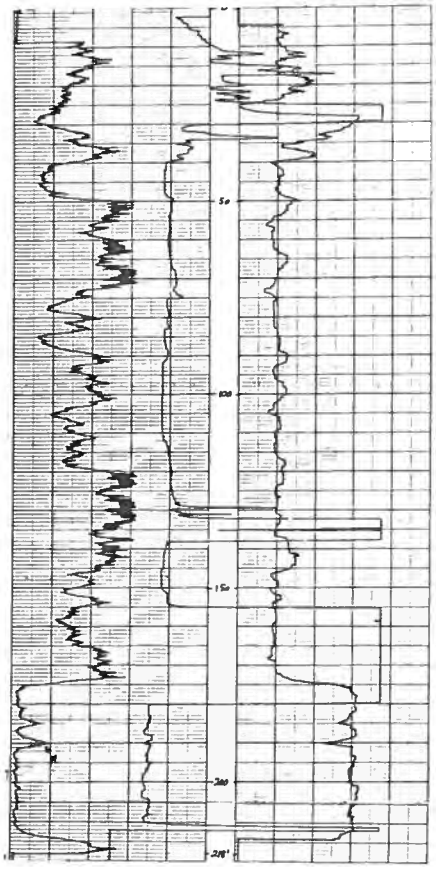
STRIP LOG

GAMMA CPS/IN 11 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 TC 2 | RESISTIVITY ___ OHMS DRY ___ OHMS WET



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING		HOLE NO. MD-3C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/12/82	DATE COMP.: 8/12/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼SE¼ SEC. 10 T. 16N. R. 118W.		FOOTAGE LOCATION: 214'FSL, 1,814'FEL	
GROUND ELEVATION: 6815'	TOTAL DEPTH: 225'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE 4¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 162'	CORE FOOTAGE: 63'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 218 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 11 T.C. 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 140 T.C. 2 — RESISTIVITY --- OHMS DRY -- OHMS WET	DEPTH (FEET)
	Refer to MD-3			0
162				50
				100
				150
				200
225	TD			250
				300
				350

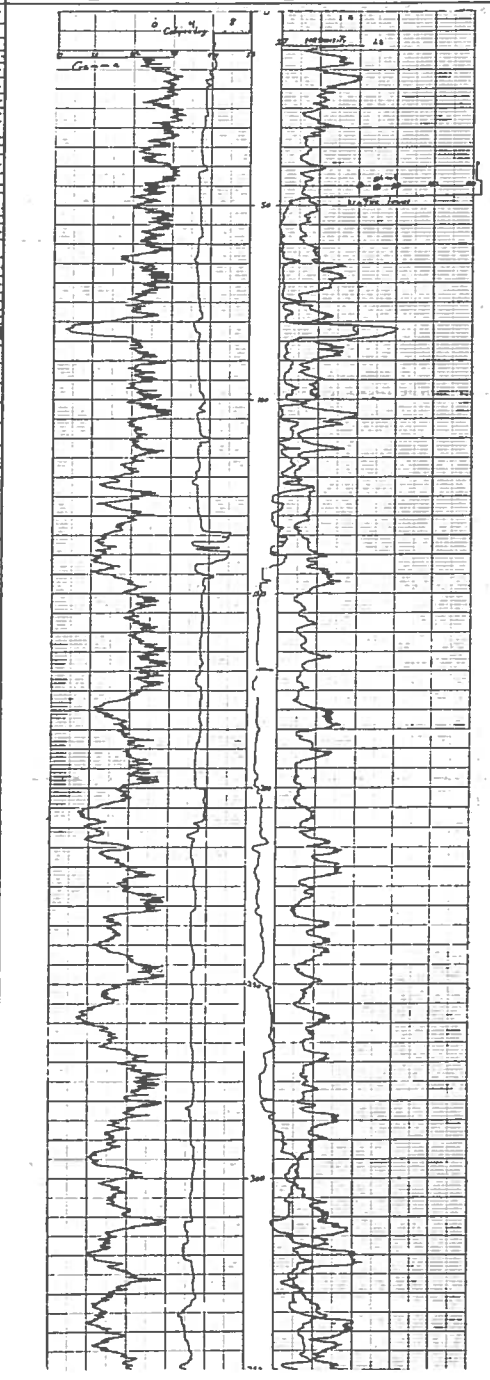
THE UNIVERSITY OF WYOMING			HOLE NO. R-6A	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan		
DATE STARTED: 8/13/82	DATE COMP.: 8/13/82	COUNTY: Uinta	STATE: Wyoming	
LOCATION: SW¼NE¼ SEC. 28 T. 16N R. 118W		FOOTAGE LOCATION: 1950' FNL, 2250' FEL		
GROUND ELEVATION: 6865'	TOTAL DEPTH: 560'		DEPTH TO WATER: 48'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 560'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1		
REMARKS:				

INTERVALS	LITHOLOGY
0	
10	Shale, red-brown
20	Siltstone, orange-brown
	Shale, gray-brown, silty
60	
	Siltstone, light gray-green
81	
84.5	Coal
	Shale, dark gray
205	
	Siltstone, medium gray and shale, dark gray, interbedded
304	
	Shale, dark gray

STRIP LOG

LOGGED DEPTH: 550 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 110 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY -- OHMS DRY -- OHMS WET



DEPTH (FEET)

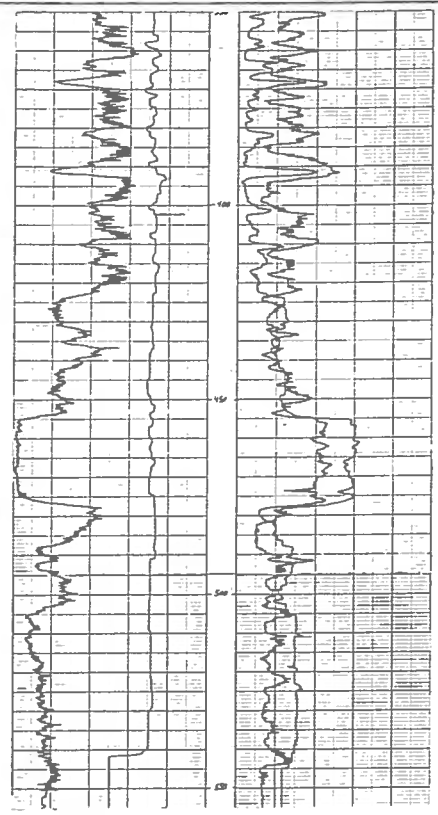
0
50
100
150
200
250
300
350

THE UNIVERSITY OF WYOMING | HOLE NO. R-6A | SHEET 2 OF 2

LOGGED DEPTH: 550 FT. LOGGING SPEED: 20 FT./MIN.

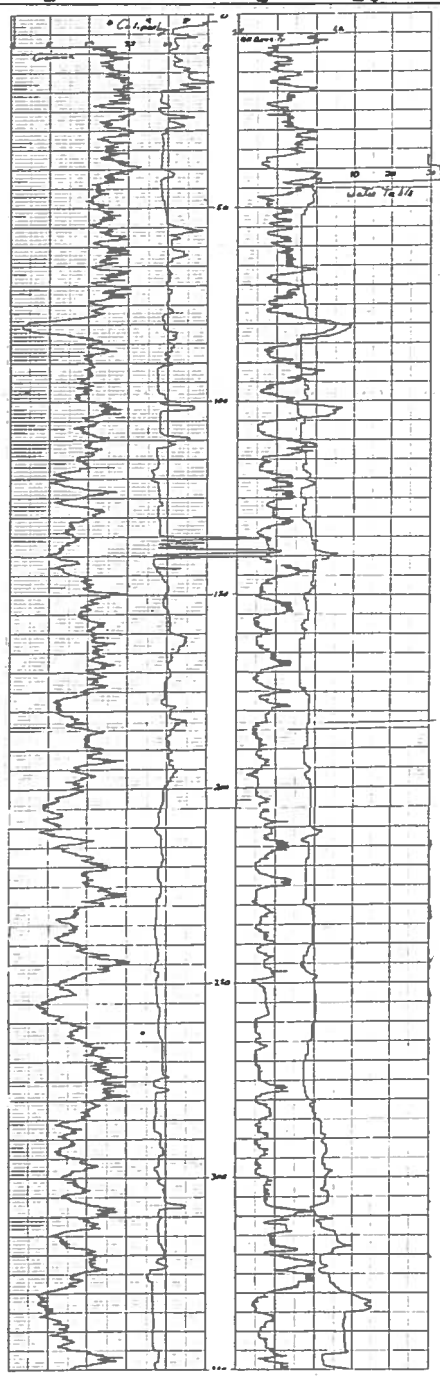
GAMMA CPS/IN 11 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 TC 2 | RESISTIVITY ___ OHMS DRY, ___ OHMS WET

INTERVALS	LITHOLOGY
390	
393	Coal
	Shale, dark gray, silty
420	
	Sandstone, light gray
455	
	Coal
477.5	
	Shale, dark gray
482	
	Siltstone, dark gray
503	
	Sandstone, light gray
560TD	



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

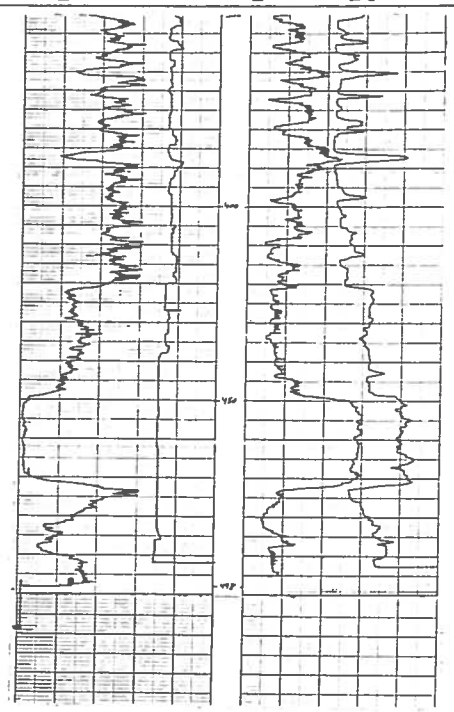
THE UNIVERSITY OF WYOMING		HOLE NO. R-6AC	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/16/82	DATE COMP.: 8/16/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 28 T16N. R. 118W		FOOTAGE LOCATION: 1950' FNL, 2250' FEL	
GROUND ELEVATION: 6865'	TOTAL DEPTH: 500'	DEPTH TO WATER: 48'	
SIZE, BIT TYPE: 4¾" K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 469'	CORE FOOTAGE: 31'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 498 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 11 T.C. 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 140 T.C. 2 RESISTIVITY — OHMS DRY 20 OHMS WET	DEPTH (FEET)
	Refer to R-6A			0 50 100 150 200 250 300 350

THE UNIVERSITY OF WYOMING | HOLE NO. R-6AC | SHEET 2 OF 2

LOGGED DEPTH 498 FT. LOGGING SPEED 20 FT/MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 110 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 140 TC 2	RESISTIVITY -- OHMS DRY 20 OHMS WET	DEPTH (FEET)
445 – 476							350
							400
							450
500 TD							500
							550
							600
							650
							700
							750
							800

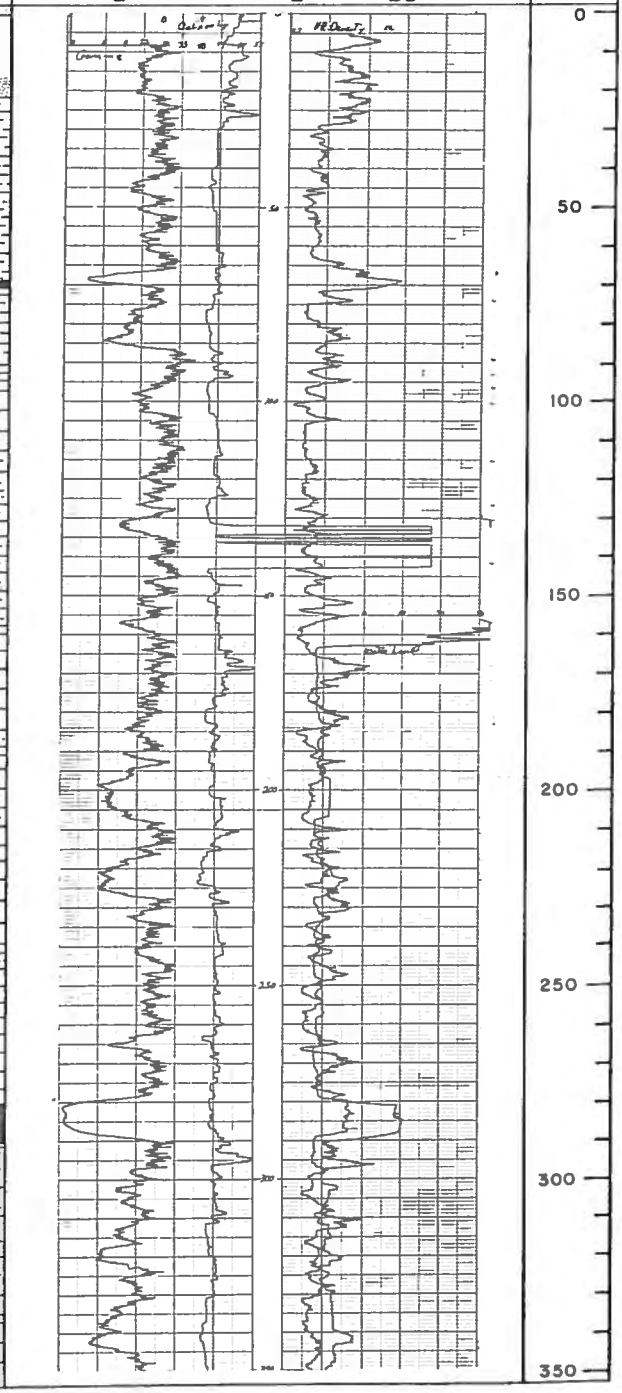


THE UNIVERSITY OF WYOMING		HOLE NO. R-7	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/13/82	DATE COMP.: 8/14/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 32 T. 16N R. 118W		FOOTAGE LOCATION: 2300'FSL, 100'FEL	
GROUND ELEVATION: 6940'	TOTAL DEPTH: 660'	DEPTH TO WATER: 163'	
SIZE, BIT TYPE: 5-1/8K, V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 660'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 660 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 11 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY --- OHMS DRY, 20 OHMS WET

INTERVALS	LITHOLOGY	STRIP LOG
0		
	Soil, medium brown, sandy	
16		
	Sandstone, orange-brown	
21		
28	Shale, dark brown	
	Shale, dark gray, carbonaceous near base	
68.5		
71	Coal	
	Shale, dark gray, and siltstone, medium gray, interbedded	
280		
	Coal	
290		
	Shale, dark gray, and siltstone, medium gray, interbedded	

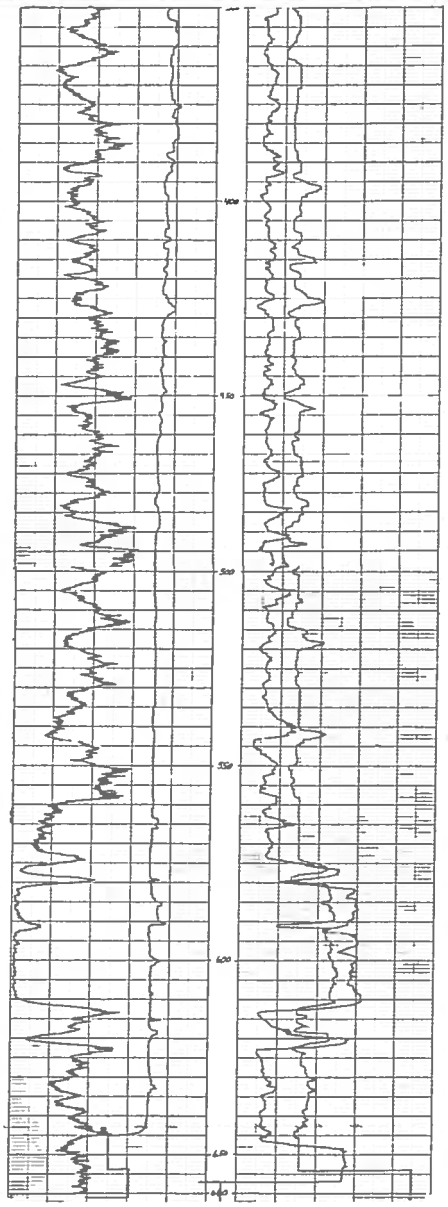


THE UNIVERSITY OF WYOMING | HOLE NO. R-7 | SHEET 2 OF 2

LOGGED DEPTH: 660 FT LOGGING SPEED 20 FT/MIN

GAMMA CPS/IN 11 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 TC 2 | RESISTIVITY -- OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY
575	Coal
579	
580.5	Shale, dark gray, carbonaceous
590.5	Coal
591.5	Shale?
	Coal
611.5	
618.5	Shale, dark gray
621	Coal?
	Sandstone, light gray, fine grained, well rounded, well sorted,
660TD	quartzose, 10% dark minerals.



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

THE UNIVERSITY OF WYOMING		HOLE NO. R-7C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/15/82	DATE COMP.: 8/15/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 32 T. 16N R. 118W		FOOTAGE LOCATION: 2300'FSL, 100'FEL	
GROUND ELEVATION: 6940'	TOTAL DEPTH: 300'	DEPTH TO WATER: 163'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 270.5'	CORE FOOTAGE: 29.5'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

CORED INTERVALS

62
73

270
299.5 TD

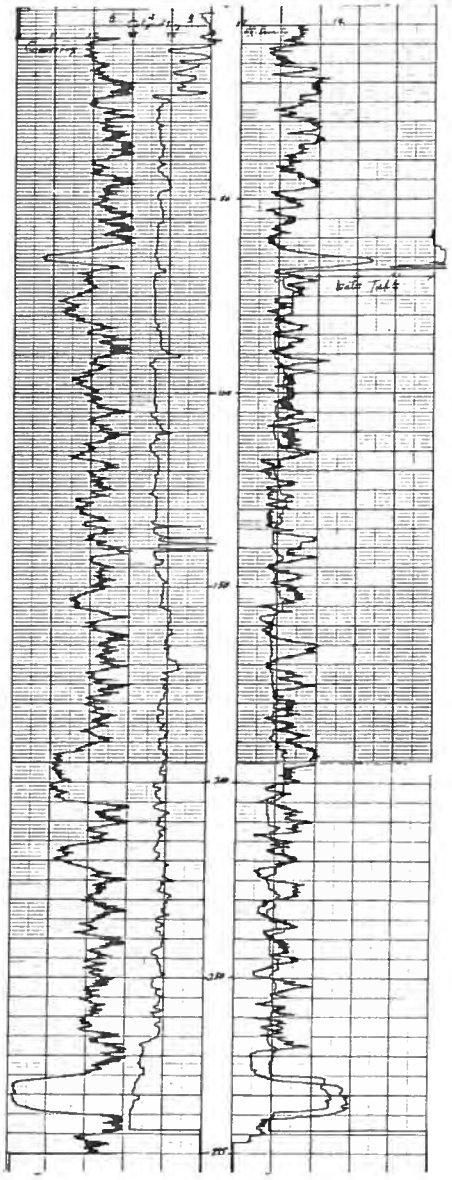
LITHOLOGY

Refer to R-7

STRIP LOG

LOGGED DEPTH: 295 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 11 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY -- OHMS DRY 50 OHMS WET



DEPTH (FEET)

0
50
100
150
200
250
300
350

APPENDIX A. PROXIMATE AND ULTIMATE ANALYSES, HEAT VALUES, EQUILIBRIUM MOISTURES, HARDGROVE GRINDABILITY INDICES AND PERCENT OF SODIUM OXIDE IN ASH FOR INCREMENTAL SAMPLES, COMPOSITE SAMPLES, AND WEIGHTED AVERAGES OF COAL BEDS FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole BD-1C (Paleocene Fort Union Formation)														
225.0-226.0*	13.5	32.4	46.0	8.1	6.79	60.78	1.06	22.42	0.86	10,490	A			
1.0	----	37.5	53.1	9.4	6.10	70.31	1.23	12.00	1.00	12,140	B	----	----	----
8.5	----	41.4	58.6	----	6.73	77.57	1.36	13.24	1.10	13,390	C			
226.0-227.0														
1.0	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	45	----
8.5														
227.0-228.0*	14.8	29.9	45.0	10.3	6.57	57.92	0.99	23.35	0.84	9,820	A			
1.0	----	35.1	52.8	12.1	5.77	67.99	1.16	11.96	0.99	11,520	B	----	----	----
8.5	----	40.0	60.0	----	6.56	77.38	1.32	13.62	1.12	13,110	C			
228.0-228.8														
0.8	NO ANALYSES FOR THIS INTERVAL											----	----	----
8.5														
228.8-229.8*	13.9	31.0	45.1	10.0	6.64	59.05	1.07	22.75	0.49	10,180	A			
1.0	----	36.0	52.4	11.6	5.91	68.61	1.24	12.05	0.57	11,830	B	----	----	----
8.5	----	40.7	59.3	----	6.68	77.63	1.40	13.64	0.65	13,380	C			
229.8-230.6														
0.8	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	46	----
8.5														
230.6-231.6*	15.4	28.7	44.7	11.2	6.50	56.64	0.95	24.18	0.57	9,730	A			
1.0	----	33.9	52.9	13.2	5.65	66.97	1.13	12.37	0.68	11,500	B	----	----	----
8.5	----	39.0	61.0	----	6.51	77.15	1.30	14.26	0.78	13,250	C			
231.6-232.4														
0.8	NO ANALYSES FOR THIS INTERVAL											----	----	----
8.5														
232.4-233.5*	15.3	30.8	42.0	11.9	7.63	55.10	1.09	22.61	1.70	9,610	A			
1.1	----	36.4	49.6	14.0	6.99	65.05	1.28	10.66	2.00	11,350	B	----	----	----
8.5	----	42.3	57.7	----	8.13	75.65	1.49	12.40	2.33	13,200	C			
225.0-233.5 (C)[4] ***	13.3	31.1	45.8	9.8	5.35	59.29	0.81	23.93	0.78	10,130	A			
8.5	----	35.8	52.9	11.3	4.46	68.38	0.94	13.98	0.89	11,690	B	----	----	1.84[5]
8.5	----	40.4	59.6	----	5.03	77.14	1.06	15.76	1.01	13,180	C			
243.0-245.0*	11.5	28.6	24.8	25.1	6.32	48.45	0.77	18.35	1.03	8,420	A			
2.0[6]	----	32.3	39.4	28.3	5.68	54.74	0.87	9.20	1.17	9,520	B	----	----	----
3.0	----	45.1	54.9	----	9.93	76.39	1.22	12.83	1.63	13,280	C			
Core Hole CRNE-1C (Upper Cretaceous Almond Formation)														
157.6-158.5*	7.4	9.0	7.8	75.8	3.55	11.41	0.25	8.43	0.53	1,680	A			
0.9[6]	----	9.7	8.4	81.9	2.93	12.33	0.27	2.01	0.57	1,820	B	----	----	----
3.5	----	53.7	46.3	----	16.21	68.08	1.49	11.07	3.15	10,030	C			
158.5-159.5*	10.7	15.2	20.6	53.5	5.07	26.86	0.49	13.61	0.43	4,560	A			
1.0[6]	----	17.1	22.9	60.0	4.34	30.10	0.55	4.54	0.48	5,100	B	----	----	----
3.5	----	42.6	57.4	----	10.84	75.23	1.39	11.34	1.20	12,760	C			
159.5-161.4*	18.0	29.3	47.8	4.9	6.67	59.51	1.01	27.20	0.65	10,230	A			
1.9	----	35.8	58.3	5.9	5.78	72.62	1.24	13.63	0.79	12,480	B	----	----	----
3.5	----	38.1	61.9	----	6.14	77.21	1.32	14.49	0.84	13,270	C			
161.4-161.6														
0.2[6]	NO ANALYSES FOR THIS INTERVAL											----	----	----
3.5														
157.6-161.4 (WA)[7]	13.5	20.7	31.0	34.8	5.49	39.32	0.69	19.11	0.57	6,680	A			
3.8	----	24.6	37.0	38.4	4.71	46.92	0.83	8.45	0.66	7,970	B	----	----	----
3.5	----	43.1	56.9	----	9.83	74.43	1.38	12.85	1.51	12,330	C			
157.6-161.6 (C) ***	12.9	20.8	33.5	32.8	4.11	41.72	0.60	20.27	0.51	7,000	A			
4.0	----	23.9	38.5	37.6	3.07	47.88	0.69	10.14	0.59	8,030	B	----	----	0.306[8]
3.5	----	38.2	61.8	----	4.92	76.76	1.11	16.27	0.94	12,880	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
APPENDIX A continued														
					Core Hole CRNE-1C continued									
226.0-228.0 *	17.5	28.4	46.5	7.6	6.92	59.09	1.03	24.64	0.70	9,870	A			
2.0	----	34.5	56.3	9.2	6.02	71.63	1.25	11.01	0.85	11,960	B	----	----	
4.0	----	38.0	62.0	----	6.63	78.92	1.38	12.13	0.94	13,180	C			
228.0-229.0														
1.0	NO ANALYSES FOR THIS INTERVAL											----	----	----
4.0														
229.0-230.0 *	16.2	24.5	35.6	23.7	6.45	43.67	0.76	24.99	0.40	7,610	A			
1.0	----	29.2	42.5	28.3	5.53	52.11	0.90	12.68	0.47	9,080	B	----	39	----
4.0	----	40.7	59.3	----	7.72	72.69	1.26	17.67	0.66	12,660	C			
232.0-234.0 *	10.1	16.6	18.3	55.0	4.89	25.29	0.44	13.72	0.65	4,260	A			
2.0[9]	----	18.4	20.4	61.2	4.18	28.14	0.49	5.28	0.72	4,740	B	----	----	0.680[10]
1.0	----	47.5	52.5	----	10.76	72.51	1.27	13.60	1.86	12,210	C			
					Core Hole CRNE-4C (Paleocene Fort Union Formation)									
232.0-232.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
10														
232.2-234.2 *	16.6	32.5	43.2	7.7	7.12	57.90	1.11	25.36	0.77	10,100	A			
2.0	----	38.9	51.8	9.3	6.31	69.45	1.33	12.71	0.92	12,110	B	12.9	----	----
10	----	42.9	57.1	----	6.95	76.56	1.46	14.01	1.02	13,350	C			
234.2-236.1														
1.9	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											13.4	----	----
10														
236.1-238.1 *	16.8	32.2	45.2	5.8	7.30	59.82	1.11	25.32	0.67	10,360	A			
2.0	----	38.7	54.3	7.0	6.52	71.90	1.34	12.49	0.80	12,460	B	13.3	57	----
10	----	41.6	58.4	----	7.00	77.27	1.43	13.44	0.86	13,390	C			
238.1-240.0														
1.9	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL.											12.2	----	----
10														
240.0-242.0 *	16.9	31.6	41.6	9.9	6.79	56.09	1.03	25.19	1.01	9,770	A			
2.0	----	38.0	50.1	11.9	5.90	67.51	1.23	12.24	1.21	11,750	B	13.2	----	----
10	----	43.2	56.8	----	6.70	76.63	1.40	13.89	1.38	13,340	C			
232.0-242.0(C) ***	15.9	31.2	44.7	8.2	5.97	58.93	0.83	25.36	0.73	10,120	A			
10	----	37.2	53.1	9.7	4.98	70.10	0.98	13.33	0.88	12,040	B	----	----	0.428[11]
10	----	41.2	58.8	----	5.51	77.66	1.09	14.77	0.97	13,330	C			
244.0-245.5 *	12.3	29.0	32.8	25.9	5.71	47.10	0.85	19.83	0.60	8,210	A			
1.5[12]	----	33.0	37.5	29.5	4.94	53.71	0.97	10.14	0.69	9,360	B	----	----	0.184
2.0	----	46.9	53.1	----	7.02	76.24	1.38	14.39	0.97	13,290	C			
					Core Hole CRNE-6C (Upper Cretaceous Almond Formation)									
78.0- 78.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
78.5- 80.5 *	15.6	30.9	41.2	12.3	6.17	55.35	0.79	23.61	1.74	9,580	A			
2.0	----	36.6	48.8	14.6	5.24	65.60	0.94	11.54	2.06	11,350	B	----	----	0.174
3.5	----	42.8	57.2	----	6.13	76.84	1.10	13.52	2.41	13,300	C			
80.5- 81.5														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
APPENDIX A continued														
Core Hole CRNE-6C continued														
236.0-238.0*	13.3	29.1	11.6	46.0	5.09	30.08	0.58	17.41	0.81	4,920	A			
2.0[6]	----	33.6	13.3	53.1	4.15	34.71	0.67	6.43	0.93	5,680	B	----	----	0.060
0	----	71.7	28.3	----	8.85	74.02	1.44	13.70	1.99	12,100	C			
298.5-299.1														
0.6	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.5														
299.1-299.9*	12.6	20.0	24.1	43.3	4.35	32.89	0.58	17.99	0.88	5,440	A			
0.8	----	22.9	27.6	49.5	3.37	37.61	0.67	7.82	1.00	6,230	B	----	----	0.143
1.5	----	45.4	54.6	----	6.67	74.52	1.32	15.50	1.99	12,330	C			
299.9-300.0														
0.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.5														
368.5-370.7*	17.7	30.4	40.7	11.2	7.01	55.02	1.00	24.69	1.12	9,400	A			
2.2	----	36.9	49.5	13.6	6.11	66.89	1.22	10.85	1.36	11,430	B	----	----	0.347
2.5	----	42.7	57.3	----	7.06	77.40	1.41	12.56	1.57	13,230	C			
370.7-371.0														
0.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
376.5-378.0*	12.5	19.1	23.8	44.6	3.79	31.57	0.61	18.85	0.59	5,350	A			
1.5[6]	----	21.9	27.1	51.0	2.73	36.10	0.70	8.82	0.67	6,120	B	----	----	0.180
1.0	----	44.6	55.4	----	5.57	73.65	1.43	17.98	1.37	12,480	C			
Core Hole CRNE-7C (Upper Cretaceous Almond Formation)														
311.5-312.4 ***	15.1	32.0	49.5	3.4	5.65	63.43	0.85	25.27	1.40	10,870	A			
0.9	----	37.7	58.3	4.0	4.67	74.69	1.01	13.99	1.64	12,800	B	11.4	52	----
9.5	----	39.3	60.7	----	4.86	77.81	1.05	14.57	1.71	13,330	C			
312.4-314.6 *	15.5	32.2	47.8	4.5	5.89	62.33	1.03	25.61	0.61	10,770	A			
2.2	----	38.1	56.5	5.4	4.92	73.73	1.22	14.04	0.73	12,740	B	11.7	36	----
9.5	----	40.3	59.7	----	5.20	77.91	1.28	14.84	0.77	13,460	C			
314.6-316.5 ***	16.0	30.1	45.5	8.4	5.45	58.17	0.80	26.80	0.35	9,960	A			
1.9	----	35.8	54.2	10.0	4.36	69.23	0.95	15.01	0.42	11,860	B	11.6	42	----
9.5	----	39.8	60.2	----	4.85	76.95	1.06	16.68	0.46	13,180	C			
316.5-318.7 *	16.3	30.8	47.1	5.8	5.73	59.97	1.07	27.07	0.39	10,340	A			
2.2	----	36.8	56.3	6.9	4.67	71.66	1.28	15.02	0.47	12,350	B	12.2	42	----
9.5	----	39.6	60.4	----	5.01	76.97	1.37	16.15	0.50	13,270	C			
318.7-319.4 ***	14.8	31.0	49.0	5.2	5.59	62.45	0.86	25.26	0.69	10,670	A			
0.7	----	36.4	57.6	6.0	4.62	73.32	1.01	14.19	0.81	12,530	B	12.5	44	----
9.5	----	38.7	61.3	----	4.92	78.04	1.08	15.10	0.86	13,330	C			
319.4-321.0 *	17.5	31.3	48.0	3.2	6.00	60.85	1.09	28.30	0.55	10,480	A			
1.6	----	37.9	58.2	3.9	4.90	73.72	1.33	15.50	0.66	12,700	B	14.0	48	----
9.5	----	39.5	60.5	----	5.10	76.70	1.38	16.13	0.69	13,210	C			
311.5-321.0(WA)	16.0	31.2	47.5	5.3	5.73	60.85	0.96	26.54	0.59	10,460	A			
9.5	----	37.1	56.6	6.3	4.69	72.42	1.15	14.70	0.70	12,450	B	12.2	43	----
9.5	----	39.7	60.4	----	5.01	77.32	1.23	15.71	0.74	13,290	C			
311.5-321.0(C) ***	15.1	31.0	48.4	5.5	5.44	61.28	0.75	26.42	0.56	10,520	A			
9.5	----	36.5	57.0	6.5	4.41	72.21	0.89	15.29	0.66	12,390	B	----	----	0.705[13]
9.5	----	39.1	60.9	----	4.72	77.26	0.95	16.36	0.71	13,260	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole MSR-10C (Upper Cretaceous Almond Formation)														
168.5-169.1 0.6 3.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
169.1-171.1 * 2.0 3.5	13.4 ---- ----	32.4 37.4 40.0	48.6 56.1 60.0	5.6 6.5 ----	6.62 5.92 6.33	63.39 73.20 78.31	1.16 1.34 1.43	22.27 11.97 12.81	0.91 1.05 1.12	10,900 12,590 13,470	A B C	----	39	0.272
171.1-172.0 0.9 3.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
168.5-172.0(C) *** 3.5 3.5	13.0 ---- ----	31.9 36.7 38.9	50.2 57.6 61.1	4.9 5.7 ----	5.64 4.81 5.10	64.00 73.58 78.01	0.88 1.01 1.07	23.63 13.88 14.71	0.91 1.04 1.11	11,140 12,810 13,580	A B C	----	----	----
Core Hole MSR-11C (Upper Cretaceous Almond Formation)														
62.0- 63.4 1.4[14] 4.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
63.4- 65.0 * 1.6 4.5	14.1 ---- ----	31.5 36.7 42.9	41.9 48.7 57.1	12.5 14.6 ----	5.44 4.49 5.26	55.76 64.95 76.02	0.93 1.08 1.26	21.33 10.21 11.95	4.04 4.71 5.51	9,710 11,310 13,230	A B C	----	----	----
65.0- 66.5 * 1.5 4.5	15.5 ---- ----	34.4 40.8 44.7	42.7 50.4 55.3	7.4 8.8 ----	6.64 5.80 6.36	60.13 71.17 78.01	0.98 1.15 1.27	22.26 10.06 11.00	2.59 3.06 3.56	10,420 12,340 13,520	A B C	----	----	----
62.0- 66.5(C) *** 4.5 4.5	14.1 ---- ----	32.5 37.8 42.6	43.6 50.8 57.4	9.8 11.4 ----	5.57 4.65 5.25	59.47 69.22 78.15	0.69 0.80 0.91	21.64 10.62 11.98	2.82 3.29 3.71	10,270 11,950 13,490	A B C	----	----	0.202[15]
155.0-155.5 0.5 1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
155.5-156.5 * 1.0[16] 1.0	12.8 ---- ----	24.6 28.1 45.3	29.6 34.1 54.7	33.0 37.8 ----	5.34 4.49 7.22	41.17 47.20 75.94	0.68 0.78 1.26	17.65 7.23 11.64	2.14 2.45 3.94	6,850 7,850 12,630	A B C	----	----	0.102
330.0-330.9 0.9 4.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
330.9-333.0 * 2.1 4.0	14.5 ---- ----	31.7 37.0 39.3	48.9 57.3 60.7	4.9 5.7 ----	6.87 6.13 6.51	63.41 74.19 78.66	1.12 1.31 1.39	22.91 11.70 12.41	0.83 0.98 1.03	10,800 12,630 13,390	A B C	----	----	0.402
333.0-334.0 1.0 4.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
Core Hole MSR-12C (Paleocene Fort Union Formation)														
226.0-226.2 0.2 6.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole MSR-12C continued														
226.2-227.6 *	14.7	32.4	48.7	4.2	6.15	62.96	1.09	24.55	1.05	10,950	A			
1.4	----	37.9	57.2	4.9	5.28	73.82	1.77	13.47	1.23	12,840	B	----	----	----
6.0	----	39.9	60.1	----	5.55	77.65	1.34	14.17	1.29	13,510	C			
227.6-228.3														
0.7	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	48	----
6.0														
228.3-229.7 *	16.8	29.4	48.0	5.8	6.81	60.63	1.06	24.92	0.78	10,310	A			
1.4	----	35.3	57.7	7.0	5.93	72.84	1.27	12.06	0.94	12,390	B	----	50	----
6.0	----	38.0	62.0	----	6.37	78.29	1.36	12.97	1.01	13,310	C			
229.7-230.3														
0.6	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.0														
230.3-231.7 *	16.1	29.3	46.9	7.7	6.12	59.44	0.99	25.00	0.79	10,130	A			
1.4	----	34.9	56.0	9.1	5.15	70.81	1.18	12.78	0.95	12,070	B	----	----	----
6.0	----	38.4	61.6	----	5.66	72.92	1.31	14.07	1.04	13,280	C			
231.7-232.0														
0.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.0														
226.0-232.0(C) ***	14.6	30.5	46.9	8.0	5.82	60.97	0.78	23.73	0.75	10,430	A			
6.0	----	35.8	54.9	9.3	4.91	71.37	0.92	12.62	0.87	12,210	B	----	----	2.36[17]
6.0	----	39.4	60.6	----	5.41	78.69	1.01	13.93	0.96	13,460	C			
271.0-272.8 *	12.5	27.8	37.6	22.1	5.69	51.07	0.87	19.35	0.95	8,740	A			
1.8	----	31.7	43.1	25.2	4.91	58.36	0.99	9.43	1.09	9,990	B	----	----	0.736
2.0	----	42.4	57.6	----	6.56	78.03	1.32	12.63	1.46	13,360	C			
272.8-273.0														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
Core Hole MSR-14C (Upper Cretaceous Almond Formation)														
213.0-213.8														
0.8	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
213.8-215.8 *	13.1	33.0	48.0	5.9	5.78	64.81	1.16	21.42	0.96	11,190	A			
2.0	----	38.0	55.2	6.8	4.96	74.56	1.33	11.30	1.10	12,870	B	----	----	----
3.5	----	40.7	59.3	----	5.32	79.96	1.43	12.11	1.18	13,810	C			
215.8-217.8 *	9.6	24.2	29.2	37.0	4.16	41.20	0.84	15.90	0.92	7,140	A			
2.0[18]	----	26.8	32.3	40.9	3.42	45.58	0.93	8.14	1.02	7,900	B	----	----	----
3.5	----	45.3	54.7	----	5.78	77.14	1.58	13.77	1.73	13,370	C			
213.0-217.8(C) ***	10.5	28.5	42.0	19.0	5.30	55.77	0.69	18.16	1.10	9,610	A			
4.8	----	31.8	47.0	21.2	4.61	62.31	0.78	9.87	1.23	10,730	B	----	----	0.054[19]
3.5	----	40.4	59.6	----	5.85	79.08	0.99	12.51	1.57	13,620	C			
362.0-363.8 *	12.4	33.1	49.6	4.9	6.07	65.32	1.18	21.50	1.00	11,360	A			
1.8	----	37.8	56.6	5.6	5.34	74.53	1.35	12.02	1.14	12,960	B	----	----	----
5.0	----	40.0	60.0	----	5.66	78.97	1.43	12.73	1.21	13,740	C			
363.8-365.6 *	12.5	33.6	50.3	3.6	6.06	66.28	1.19	22.27	0.55	11,750	A			
1.8	----	38.3	57.5	4.2	5.33	75.72	1.36	12.79	0.63	13,420	B	----	42	----
5.0	----	40.0	60.0	----	5.56	79.02	1.42	13.34	0.66	14,000	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole MSR-14C continued														
365.6-367.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.4														
5.0														
362.0-367.0(C) ***	10.9	31.4	51.3	6.4	5.66	64.67	0.90	21.60	0.75	11,380	A			
5.0	----	35.3	57.5	7.2	4.98	72.62	1.01	13.34	0.84	12,770	B	----	----	0.173[20]
5.0	----	38.0	62.0	----	5.37	78.27	1.09	14.36	0.91	13,770	C			
422.2-424.0 *	11.7	33.1	45.2	10.0	5.37	62.36	1.15	19.11	2.06	10,880	A			
1.8	----	37.5	51.2	11.3	4.59	70.64	1.30	9.86	2.33	12,320	B	----	----	0.116
1.8	----	42.2	57.8	----	5.18	79.62	1.47	11.11	2.62	13,890	C			
428.5-428.7														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
428.7-430.6 *	13.3	32.5	51.5	2.7	6.22	66.99	1.32	22.06	0.74	11,570	A			
1.9	----	37.5	59.4	3.1	5.46	77.31	1.52	11.77	0.86	13,350	B	----	----	----
4.0	----	38.7	61.3	----	5.63	79.77	1.57	12.14	0.89	13,780	C			
430.6-432.5 *	10.1	28.0	40.1	21.8	5.15	53.02	1.05	18.35	0.62	9,330	A			
1.9	----	31.2	44.5	24.3	4.47	59.00	1.17	10.40	0.69	10,390	B	----	----	----
4.0	----	41.2	58.8	----	5.90	77.91	1.54	13.74	0.91	13,720	C			
428.7-432.5(WA)	11.9	30.5	46.4	11.2	5.74	60.78	1.20	20.41	0.69	10,570	A			
3.8	----	34.7	52.8	12.5	5.02	69.17	1.36	11.16	0.78	12,030	B	----	----	0.270[21]
4.0	----	39.8	60.2	----	5.75	78.94	1.56	12.85	0.90	13,750	C			
Core Hole MSR-16C (Paleocene Fort Union Formation)														
209.0-210.1 *	13.8	31.7	49.2	5.3	6.22	63.99	1.12	22.37	0.99	11,160	A			
1.1	----	36.7	57.1	6.2	5.42	74.23	1.30	11.74	1.15	12,950	B	----	----	----
5.0	----	39.1	60.9	----	5.78	79.10	1.39	12.51	1.22	13,800	C			
210.1-210.8 ***	8.6	29.9	40.1	21.4	4.82	55.55	0.89	15.96	1.38	9,710	A			
0.7	----	32.7	43.9	23.4	4.23	60.75	0.97	9.14	1.51	10,620	B	----	44	----
5.0	----	42.8	57.2	----	5.52	79.32	1.27	11.92	1.97	13,860	C			
210.8-211.9 *	11.6	30.1	45.4	12.9	5.61	59.72	1.06	20.11	1.07	10,360	A			
1.1	----	34.0	51.4	14.6	4.37	67.57	1.20	11.07	1.21	11,720	B	----	51	----
5.0	----	39.8	60.2	----	5.11	79.10	1.41	12.96	1.42	13,720	C			
211.9-212.8 ***	11.8	32.3	51.7	4.2	5.92	67.04	0.88	20.71	1.26	11,630	A			
0.9	----	36.6	58.7	4.7	5.21	76.02	1.00	11.60	1.42	13,180	B	----	----	----
5.0	----	38.4	61.6	----	5.47	79.81	1.05	12.18	1.49	13,840	C			
212.8-214.0 *	12.2	32.0	48.2	7.6	5.64	63.11	1.09	21.84	0.75	11,080	A			
1.2	----	36.4	55.0	8.6	4.87	71.84	1.24	12.57	0.86	12,610	B	----	----	----
5.0	----	39.9	60.1	----	5.33	78.62	1.36	13.75	0.94	13,800	C			
209.0-214.0(WA)	11.6	31.2	46.8	10.5	5.64	61.80	1.00	20.09	1.11	10,770	A			
5.0	----	35.2	53.1	11.7	4.82	69.97	1.14	11.14	1.25	12,190	B	----	----	----
5.0	----	37.6	60.0	----	5.45	79.23	1.29	12.60	1.44	13,800	C			
209.0-214.0(C) ***	10.9	30.8	47.7	10.6	5.42	62.17	1.01	19.76	1.07	10,860	A			
5.0	----	34.6	53.5	11.9	4.71	69.79	1.13	11.31	1.20	12,190	B	----	----	0.096[22]
5.0	----	39.3	60.7	----	5.34	79.18	1.28	12.84	1.36	13,830	C			
248.5-248.6														
0.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MSR-16C continued														
248.6-249.8*	11.0	27.0	42.5	19.5	5.04	54.07	0.89	19.79	0.71	9,370	A			
1.2	----	30.3	47.8	21.9	4.29	60.74	1.00	11.27	0.80	10,530	B	----	----	----
2.5	----	38.8	61.2	----	5.49	77.78	1.28	14.42	1.03	13,480	C			
249.8-251.0*	12.6	28.5	50.5	8.4	5.40	63.46	1.00	21.00	0.69	10,820	A			
1.2	----	32.6	57.7	9.7	4.56	72.64	1.14	11.20	0.79	12,380	B	----	----	----
2.5	----	36.1	63.9	----	5.05	80.41	1.26	12.41	0.87	13,700	C			
248.6-251.0(WA)	12.1	28.0	47.8	12.1	5.28	60.33	0.96	20.60	0.70	10,340	A			
2.4	----	31.8	54.4	13.8	4.47	68.67	1.09	11.22	0.79	11,760	B	----	----	0.114[23]
2.5	----	37.0	63.0	----	5.20	79.53	1.27	13.08	0.92	13,630	C			
284.5-286.8*	11.2	33.2	46.1	9.5	6.47	63.58	1.15	18.46	0.82	11,020	A			
2.3	----	37.3	52.0	10.7	5.88	71.58	1.30	9.61	0.92	12,410	B	----	----	0.294
2.5	----	41.8	58.2	----	6.58	80.17	1.45	10.77	1.03	13,900	C			
286.8-287.0														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
Core Hole PM-10C (Upper Cretaceous Almond Formation)														
143.5-144.7														
1.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
144.7-146.5*	12.1	33.0	52.3	2.6	6.98	69.42	1.35	18.97	0.65	12,070	A			
1.8	----	37.5	59.5	3.0	6.41	78.95	1.54	9.37	0.74	13,730	B	----	----	0.156
3.5	----	38.7	61.3	----	6.60	81.39	1.59	9.66	0.76	14,160	C			
146.5-147.0														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
153.0-154.4														
1.4	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
154.4-156.5*	14.3	32.9	48.9	3.9	6.51	66.00	1.16	21.69	0.75	11,410	A			
2.1	----	38.4	57.1	4.5	5.73	76.99	1.35	10.53	0.87	13,320	B	----	----	0.202
3.5	----	40.2	59.8	----	6.00	80.64	1.42	11.03	0.91	13,950	C			
219.5-221.0***	10.9	33.5	51.3	4.3	5.59	67.98	1.01	20.32	0.81	11,760	A			
1.5	----	37.7	57.5	4.8	4.90	76.33	1.13	11.91	0.91	13,200	B	9.0	----	----
9.5	----	39.6	60.4	----	5.15	80.19	1.19	12.51	0.96	13,870	C			
221.0-223.2*	10.9	33.3	50.6	5.2	6.49	68.03	1.25	18.46	0.53	11,750	A			
2.2	----	37.4	56.7	5.9	5.91	76.39	1.41	9.80	0.60	13,190	B	7.6	----	----
9.5	----	39.8	60.2	----	6.28	81.16	1.49	10.44	0.63	14,020	C			
223.2-225.4*	11.4	38.8	45.3	4.5	6.55	68.33	1.30	18.53	0.75	11,860	A			
2.2	----	43.7	51.2	5.1	5.96	77.08	1.46	9.54	0.84	13,380	B	7.8	----	----
9.5	----	46.1	53.9	----	6.28	81.24	1.54	10.05	0.89	14,110	C			
225.4-227.7*	10.7	32.6	51.8	4.9	6.33	68.62	1.23	18.40	0.50	11,930	A			
2.3	----	36.5	58.0	5.5	5.75	76.87	1.38	9.93	0.56	13,370	B	7.8	----	----
9.5	----	38.6	61.4	----	6.09	81.36	1.46	10.50	0.59	14,150	C			
227.7-229.0***	12.1	31.4	50.6	5.9	5.60	65.76	1.09	20.83	0.80	11,440	A			
1.3	----	35.7	57.6	6.7	4.83	74.80	1.24	11.48	0.91	13,010	B	9.0	56	----
9.5	----	38.3	61.7	----	5.18	80.20	1.33	12.31	0.98	13,950	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%)	HARDGROVE GRINDABILITY INDEX	PERCENT Na_2O IN ASH
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR			***	***	*
Core Hole PM-10C continued														
219.5-229.0(C) ***	10.2	31.7	53.2	4.9	5.41	68.17	0.74	20.18	0.63	11,870	A			
9.5	----	35.3	59.3	5.4	4.75	75.88	0.82	12.43	0.70	13,220	B	----	----	0.551[24]
9.5	----	37.3	62.7	----	5.03	80.22	0.87	13.14	0.74	13,970	C			
265.5-266.1														
0.6	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
9.5														
266.1-267.8 *	12.4	32.1	53.5	2.0	6.56	69.81	1.26	19.96	0.45	12,130	A			
1.7	----	36.7	61.1	2.2	5.90	79.73	1.44	10.19	0.51	13,850	B	9.1	----	----
9.5	----	37.5	62.5	----	6.03	81.56	1.48	10.41	0.52	14,170	C			
267.8-269.7 ***	8.4	32.5	50.0	9.1	5.56	66.58	1.07	17.21	0.48	11,650	A			
1.9	----	35.5	54.6	9.9	5.04	72.71	1.16	10.62	0.53	12,730	B	6.9	----	----
9.5	----	39.5	60.5	----	5.60	80.74	1.29	11.78	0.59	14,130	C			
269.7-271.4 *	10.6	29.6	45.3	14.5	6.14	60.41	1.16	17.08	0.71	10,460	A			
1.7	----	33.1	50.7	16.2	5.54	67.61	1.30	8.54	0.79	11,710	B	7.9	----	----
9.5	----	39.5	60.5	----	6.62	80.70	1.55	10.19	0.94	13,980	C			
271.4-273.3 ***	10.3	30.4	48.3	11.0	5.28	63.53	1.03	18.71	0.44	11,020	A			
1.9	----	33.8	53.9	12.3	4.60	70.80	1.15	10.69	0.49	12,280	B	8.1	42	----
9.5	----	38.6	61.4	----	5.25	80.70	1.31	12.18	0.56	14,000	C			
273.3-275.0 *	9.3	28.3	41.7	20.7	5.66	56.00	1.12	15.90	0.59	9,770	A			
1.7	----	31.2	45.9	22.9	5.10	61.75	1.23	8.41	0.65	10,770	B	7.4	----	----
9.5	----	40.4	59.6	----	6.61	80.05	1.60	10.90	0.84	13,970	C			
266.1-275.0(WA)	10.2	30.7	48.0	11.1	5.85	63.57	1.13	17.85	0.53	11,060	A			
8.9	----	34.2	53.6	12.3	5.24	70.89	1.26	9.74	0.59	12,330	B	----	----	----
9.5	----	39.1	61.0	----	6.00	80.78	1.44	11.10	0.65	14,050	C			
265.5-275.0(C) ***	9.6	30.5	48.8	11.1	5.71	63.57	0.88	18.19	0.51	11,120	A			
9.5	----	33.7	54.0	12.3	5.13	70.32	0.97	10.70	0.56	12,300	B	----	----	0.324[25]
9.5	----	38.4	61.6	----	5.85	80.20	1.11	12.20	0.64	14,030	C			
300.5-301.5 *	13.3	30.8	51.6	4.3	6.57	67.09	1.26	20.24	0.52	11,700	A			
1.0	----	35.5	59.5	5.0	5.86	72.33	1.45	9.79	0.59	13,490	B	----	----	----
3.5	----	37.4	62.6	----	6.17	81.39	1.52	10.29	0.63	14,200	C			
301.5-303.5 *	12.5	31.7	47.4	8.4	6.11	63.80	1.29	19.82	0.61	11,110	A			
2.0	----	36.3	54.1	9.6	5.39	72.92	1.47	9.96	0.70	12,700	B	----	----	----
3.5	----	40.1	59.9	----	5.96	80.63	1.63	11.01	0.77	14,040	C			
303.5-305.0 *	5.5	16.6	11.7	66.2	3.46	20.62	0.41	8.76	0.53	3,450	A			
1.5[26]	----	17.6	12.4	70.0	3.01	21.81	0.43	4.14	0.57	3,650	B	----	----	0.300[27]
3.5	----	58.6	41.4	----	10.05	72.80	1.44	13.82	1.89	12,190	C			
Core Hole PM-12C (Upper Cretaceous Almond Formation)														
242.5-243.5														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
243.5-246.0 *	12.7	33.3	51.9	2.1	6.36	68.95	1.34	20.63	0.60	12,040	A			
2.5	----	38.1	59.5	2.4	5.66	78.95	1.54	10.74	0.69	13,790	B	----	----	0.170
4.0	----	39.0	61.0	----	5.80	80.91	1.58	11.01	0.70	14,130	C			
246.0-246.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														

APPENDIX A continued

Core Hole PM-12C continued

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
253.5-254.7														
1.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
254.7-256.7*	10.9	26.4	35.8	26.9	5.14	48.93	1.00	17.07	0.97	8,510	A			
2.0	----	29.6	40.2	30.2	4.40	54.93	1.13	8.26	1.09	9,550	B	----	----	0.078
4.5	----	42.5	57.5	----	6.31	78.67	1.61	11.84	1.57	13,680	C			
256.7-258.0														
1.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
311.0-312.0***	13.7	31.5	49.0	5.8	5.38	65.01	0.96	22.11	0.77	11,260	A			
1.0	----	36.5	56.8	6.7	4.45	75.36	1.12	11.48	0.90	13,050	B	----	----	----
8.0	----	39.1	60.9	----	4.77	80.76	1.20	12.31	0.96	13,980	C			
312.0-314.1*	13.8	31.4	48.5	6.3	6.33	65.03	1.29	20.52	0.51	11,230	A			
2.1	----	36.5	56.2	7.3	5.56	75.42	1.50	9.59	0.60	13,020	B	----	----	----
8.0	----	39.4	60.6	----	6.00	81.39	1.62	10.35	0.64	14,050	C			
314.1-316.1***	10.0	32.3	54.3	3.4	5.67	70.14	1.15	19.21	0.40	12,280	A			
2.0	----	35.9	60.3	3.8	5.05	77.98	1.27	11.45	0.44	13,650	B	----	----	----
8.0	----	37.3	62.7	----	5.25	81.07	1.33	11.89	0.46	14,190	C			
316.1-318.3*	12.5	31.8	52.0	3.7	6.20	67.52	1.25	20.80	0.57	11,720	A			
2.2	----	36.4	59.4	4.2	5.48	77.20	1.42	11.07	0.65	13,400	B	----	----	----
8.0	----	38.0	62.0	----	5.72	80.57	1.49	11.55	0.67	13,980	C			
318.3-319.0***	12.3	31.1	55.4	1.2	5.74	70.19	1.02	21.26	0.55	12,140	A			
0.7	----	35.5	63.1	1.4	4.98	80.03	1.16	11.78	0.63	13,840	B	----	----	----
8.0	----	36.0	64.0	----	5.05	81.18	1.17	11.96	0.64	14,040	C			
311.0-319.0(WA)	12.3	31.8	51.2	4.7	5.97	67.20	1.19	20.45	0.53	11,670	A			
8.0	----	36.3	58.4	5.2	5.30	76.65	1.36	10.95	0.61	13,310	B	----	----	----
8.0	----	38.4	61.6	----	5.53	80.97	1.44	11.41	0.64	14,060	C			
311.0-319.0(C)***	11.8	30.7	53.2	4.3	5.66	67.68	1.07	20.75	0.52	11,760	A			
8.0	----	34.8	60.3	4.9	4.91	76.77	1.22	11.61	0.59	13,340	B	----	----	0.172[28]
8.0	----	36.6	63.4	----	5.17	80.72	1.28	12.21	0.62	14,030	C			
358.0-358.9***	9.8	31.7	53.3	5.2	5.51	69.05	0.96	18.84	0.47	12,060	A			
0.9	----	35.2	59.1	5.7	4.89	76.56	1.07	11.23	0.52	13,370	B	----	----	----
6.0	----	37.3	62.7	----	5.19	81.21	1.13	11.92	0.55	14,180	C			
358.9-360.4*	10.0	33.5	53.2	3.3	6.21	69.98	1.45	18.62	0.42	12,250	A			
1.5	----	37.2	59.1	3.7	5.65	77.74	1.61	10.85	0.47	13,610	B	----	----	0.656
6.0	----	38.7	61.3	----	5.87	80.71	1.68	11.26	0.48	14,130	C			
360.4-362.4***	11.0	29.4	50.0	9.6	5.27	63.67	0.79	20.28	0.42	11,120	A			
2.0	----	33.1	56.1	10.8	4.54	71.51	0.88	11.85	0.47	12,480	B	----	----	----
6.0	----	37.1	62.9	----	5.09	80.12	0.99	13.27	0.53	13,990	C			
362.4-364.0*	11.9	32.8	52.7	2.6	6.25	69.43	1.45	19.83	0.47	12,070	A			
1.6	----	37.3	59.8	2.9	5.58	78.81	1.65	10.50	0.54	13,700	B	----	----	0.950
6.0	----	38.4	61.6	----	5.75	81.18	1.70	10.82	0.55	14,110	C			
358.0-364.0(WA)	10.8	31.9	52.1	5.3	5.85	67.82	1.19	19.47	0.44	11,840	A			
6.0	----	35.7	58.4	5.9	5.20	76.01	1.33	11.11	0.50	13,270	B	----	----	----
6.0	----	38.0	63.8	----	5.51	80.72	1.41	11.83	0.52	14,090	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
APPENDIX A continued														
					Core Hole PM-12C continued									
358.0-364.0(C) ***	10.0	31.0	53.6	5.4	5.42	68.22	0.95	19.60	0.44	11,940	A			
6.0	----	34.5	59.5	6.0	4.78	75.84	1.05	11.87	0.49	13,270	B	----	----	----
6.0	----	36.7	63.3	----	5.08	80.65	1.12	12.62	0.53	14,110	C			
413.0-414.5 *	10.4	31.8	48.6	9.2	6.16	64.92	1.26	17.65	0.83	11,330	A			
1.5	----	35.5	54.3	10.2	5.58	72.44	1.40	9.41	0.93	12,640	B	----	----	----
6.5	----	39.6	60.4	----	6.22	80.70	1.56	10.48	1.04	14,080	C			
414.5-416.5 *	10.9	30.7	32.8	24.6	5.28	50.84	0.97	16.66	0.60	8,820	A			
2.0[29]	----	34.4	36.8	28.8	4.56	57.05	1.09	7.85	0.67	9,890	B	----	----	----
6.5	----	48.3	51.7	----	6.41	81.10	1.53	11.02	0.94	13,890	C			
416.5-416.9														
0.4	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.5														
416.9-419.5 *	9.5	25.7	33.7	31.1	5.55	45.62	0.95	16.15	0.61	7,900	A			
2.6[31]	----	28.4	37.2	34.4	4.96	50.39	1.04	8.56	0.67	8,730	B	----	----	0.243[30]
6.5	----	43.3	56.7	----	7.56	76.80	1.59	13.03	1.02	13,300	C			
					Core Hole PM-16C (Upper Cretaceous Almond Formation)									
141.0-141.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
141.5-143.5*	9.6	31.1	45.7	13.6	5.81	61.62	1.15	17.24	0.53	10,740	A			
2.0	----	34.5	50.4	15.1	5.24	68.19	1.27	9.62	0.58	11,880	B	----	----	0.074
4.5	----	40.6	59.4	----	6.17	80.33	1.50	11.31	0.69	13,990	C			
143.5-145.5														
2.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
141.0-145.5 (C)***	10.7	30.7	47.6	11.0	5.60	62.63	0.89	19.16	0.73	11,010	A			
4.5	----	34.4	53.3	12.3	4.93	70.12	0.99	10.84	0.82	12,330	B	----	----	----
4.5	----	39.2	60.8	----	5.62	79.95	1.13	12.37	0.93	14,060	C			
190.0-190.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
5.0														
190.5-192.7 **	14.5	29.5	52.7	3.3	6.04	66.17	1.25	21.22	1.97	11,510	A			
2.2	----	34.6	61.5	3.9	5.17	77.40	1.47	9.75	2.30	13,460	B	----	----	----
5.0	----	36.0	64.0	----	5.38	80.55	1.53	10.14	2.40	14,010	C			
192.7-195.0 **	12.7	31.8	49.1	6.4	5.86	65.19	1.39	20.60	0.55	11,410	A			
2.3	----	36.5	56.2	7.3	5.09	74.68	1.59	10.66	0.63	13,070	B	----	----	----
5.0	----	39.4	60.6	----	5.49	80.60	1.72	11.51	0.68	14,110	C			
190.5-195.0(WA)	13.6	30.7	50.9	4.9	5.95	65.68	1.32	20.91	1.26	11,460	A			
4.5	----	35.6	58.9	5.6	5.13	76.04	1.53	10.21	1.47	13,270	B	----	52	----
5.0	----	37.7	62.3	----	5.44	80.58	1.63	10.83	1.54	14,060	C			
190.0-195.0(C) ***	12.1	31.0	52.1	4.8	5.51	67.06	0.78	20.44	1.37	11,620	A			
5.0	----	35.3	59.2	5.5	4.73	76.28	0.89	11.04	1.56	13,210	B	----	----	----
5.0	----	37.3	62.7	----	5.01	80.72	0.94	11.68	1.65	13,980	C			
265.5-267.5 *	13.3	33.2	51.2	2.3	6.48	67.55	1.30	21.46	0.89	11,830	A			
2.0	----	38.3	59.0	2.7	5.76	77.93	1.50	11.11	1.03	13,650	B	----	----	1.89
2.0	----	39.4	60.0	----	5.92	80.07	1.54	11.41	1.06	14,020	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2 IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
APPENDIX A continued														
					Core Hole PM-16C continued									
316.0-318.3 *	12.3	30.5	51.4	5.8	5.69	63.18	1.35	23.54	0.42	11,570	A			
2.3	----	34.8	58.6	6.6	4.91	72.05	1.55	14.37	0.48	13,190	B	----	35	----
5.5	----	37.2	62.8	----	5.26	77.17	1.65	15.41	0.51	14,130	C			
318.3-320.7 *	13.4	32.4	51.8	2.4	5.98	67.30	1.35	22.44	0.50	11,840	A			
2.4	----	37.4	59.8	2.8	5.17	77.72	1.56	12.17	0.57	13,680	B	----	----	----
5.5	----	38.5	61.5	----	5.32	79.97	1.60	12.52	0.59	14,070	C			
320.7-321.5														
0.8	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
5.5														
316.0-321.5(C)	12.0	31.2	52.7	4.1	5.74	67.74	1.04	20.89	0.48	11,860	A			
5.5	----	35.5	59.8	4.7	5.00	76.96	1.18	11.66	0.54	13,470	B	----	----	1.25^{32}
5.5	----	37.2	62.8	----	5.24	80.72	1.23	12.24	0.57	14,130	C			
441.0-441.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
8.0														
441.2-443.2 *	11.9	30.6	48.9	8.6	5.99	64.19	1.25	19.51	0.49	11,210	A			
2.0	----	34.7	55.6	9.7	5.29	72.86	1.42	10.15	0.55	12,730	B	----	42	----
8.0	----	38.5	61.5	----	5.86	80.71	1.57	11.25	0.61	14,100	C			
443.2-444.1														
0.9	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	44	----
8.0														
444.1-446.1 *	12.8	31.8	52.8	2.6	6.98	68.23	1.30	20.34	0.52	12,010	A			
2.0	----	36.5	60.5	3.0	5.36	78.29	1.49	10.24	0.60	13,780	B	----	44	----
8.0	----	37.7	62.3	----	5.56	80.73	1.54	10.55	0.62	14,210	C			
446.1-447.0														
0.9	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
8.0														
447.0-449.0 *	12.7	29.6	49.0	8.7	6.66	63.70	1.20	19.25	0.47	11,110	A			
2.0	----	33.9	56.1	10.0	6.00	73.00	1.37	9.09	0.54	12,730	B	----	----	----
8.0	----	37.6	62.4	----	6.66	81.11	1.52	10.12	0.59	14,140	C			
441.0-449.0(C) ***	11.4	31.0	49.6	8.0	5.77	64.75	0.96	19.97	0.51	11,380	A			
8.0	----	35.0	55.9	9.1	5.07	73.07	1.08	11.12	0.58	12,840	B	----	----	0.768^{33}
8.0	----	38.5	61.5	----	5.58	80.37	1.19	12.22	0.64	14,130	C			
					Core Hole PM-17C (Upper Cretaceous Almond Formation)									
134.5-134.9														
0.4	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
134.9-136.5 *	15.1	31.6	51.8	1.5	6.48	66.78	1.22	23.35	0.63	11,720	A			
1.6	----	37.2	61.0	1.8	5.65	78.63	1.44	11.73	0.74	13,800	B	----	----	0.358
2.5	----	37.9	62.1	----	5.75	80.09	1.46	11.94	0.76	14,060	C			
136.5-137.0														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
212.0-214.0 *	13.4	31.8	51.8	3.0	6.33	67.51	1.27	21.05	0.83	11,770	A			
2.0	----	36.8	59.7	3.5	5.58	77.97	1.47	10.54	0.96	13,590	B	----	34	----
6.0	----	38.1	61.9	----	5.78	80.79	1.52	10.92	0.99	14,080	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
APPENDIX A continued														
					Core Hole PM-17C continued									
214.0-216.0 ***	13.7	29.9	48.4	8.0	5.47	63.34	0.99	21.77	0.43	10,960	A			
2.0	----	34.7	56.0	9.3	4.56	73.44	1.15	11.07	0.50	12,710	B	----	----	----
6.0	----	38.2	61.8	----	5.02	80.95	1.27	12.21	0.55	14,000	C			
216.0-218.0 *	13.0	32.5	51.1	3.4	6.05	67.37	1.34	21.28	0.52	11,810	A			
2.0	----	37.3	58.7	4.0	6.29	77.40	1.54	11.22	0.60	13,560	B	----	----	----
6.0	----	38.8	61.2	----	5.50	80.58	1.60	11.70	0.62	14,120	C			
212.0-218.0(WA)	13.4	31.4	50.4	4.8	5.95	66.07	1.20	21.37	0.59	11,510	A			
6.0	----	36.3	58.1	5.6	5.48	76.27	1.39	10.94	0.69	13,290	B	----	----	----
6.0	----	38.4	61.6	----	5.43	80.77	1.46	11.61	0.72	14,070	C			
212.0-218.0(C) ***	12.1	31.0	52.0	4.9	5.64	67.04	1.03	20.85	0.56	11,630	A			
6.0	----	35.2	59.3	5.5	4.88	76.23	1.17	11.54	0.63	13,220	B	----	----	0.259[34]
6.0	----	37.3	62.7	----	5.17	80.71	1.24	12.21	0.67	14,000	C			
343.0-345.2 *	15.3	30.7	50.1	3.9	6.17	65.43	1.26	22.72	0.55	11,440	A			
2.2	----	36.3	59.1	4.6	5.26	77.22	1.49	10.83	0.64	13,500	B	----	----	----
5.0	----	38.0	62.0	----	5.51	80.92	1.56	11.33	0.68	14,150	C			
345.2-345.8 ***	12.5	31.5	51.4	4.6	5.50	67.16	0.95	21.43	0.33	11,750	A			
0.6	----	36.0	58.7	5.3	4.68	76.78	1.08	11.79	0.38	13,430	B	----	----	----
5.0	----	38.0	62.0	----	4.94	81.07	1.15	12.44	0.40	14,180	C			
345.8-348.0 *	12.9	30.9	51.6	4.6	6.02	66.66	1.34	20.66	0.68	11,590	A			
2.2	----	35.5	59.2	5.3	5.25	76.52	1.54	10.58	0.78	13,300	B	----	10	----
5.0	----	37.4	62.6	----	5.55	80.83	1.62	11.17	0.83	14,050	C			
343.0-348.0(WA)	13.8	30.9	51.0	4.3	5.99	66.27	1.23	21.64	0.56	11,560	A			
5.0	----	35.9	59.1	5.0	5.14	76.85	1.43	10.92	0.64	13,410	B	----	----	----
5.0	----	37.8	62.2	----	5.41	80.91	1.50	11.49	0.68	14,120	C			
343.0-348.0(C) ***	12.4	30.8	52.3	4.5	5.66	67.17	1.10	21.05	0.51	11,670	A			
5.0	----	35.2	59.6	5.2	4.87	76.72	1.26	11.42	0.58	13,330	B	----	----	0.322[35]
5.0	----	37.1	62.9	----	5.13	80.88	1.32	12.06	0.61	14,060	C			
452.0-452.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
5.0														
452.2-454.6 *	13.1	32.2	50.7	4.0	6.18	67.14	1.38	20.49	0.82	11,810	A			
2.4	----	37.0	58.4	4.6	5.43	77.25	1.59	10.19	0.95	13,580	B	----	----	----
5.0	----	38.8	61.2	----	5.69	80.97	1.66	10.69	0.99	14,240	C			
454.6-457.0 *	8.7	21.8	28.6	40.9	4.18	39.10	0.74	14.72	0.36	6,690	A			
2.4	----	23.9	31.3	44.8	3.51	42.83	0.81	7.67	0.39	7,320	B	----	----	----
5.0	----	43.3	56.7	----	6.37	77.56	1.47	13.89	0.71	13,260	C			
452.2-457.0(WA)	10.9	27.0	39.7	22.5	5.18	53.12	1.06	17.61	0.59	9,250	A			
4.8	----	30.5	44.9	24.7	4.47	60.04	1.20	8.93	0.67	10,450	B	----	----	0.066[35]
5.0	----	41.1	59.0	----	6.03	79.27	1.57	12.29	0.85	13,750	C			
462.5-463.2														
0.7	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
463.2-465.7 *	11.4	30.9	49.3	8.4	5.64	65.21	1.16	19.06	0.49	11,280	A			
2.5	----	34.8	55.7	9.5	4.92	73.60	1.31	10.09	0.55	12,730	B	----	----	0.198
3.5	----	38.5	61.5	----	5.44	81.35	1.45	11.15	0.61	14,070	C			

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole PM-17C continued														
465.7-466.0														
0.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
Core Hole MD-1C (Upper Cretaceous Adaville Formation)														
381.0-383.5														
2.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.0														
383.5-385.5 **	19.7	33.2	40.5	6.6	6.36	55.16	1.13	30.48	0.31	9,570	A			
2.0	----	41.4	50.4	8.2	5.18	68.69	1.41	16.16	0.39	11,920	B	----	----	----
6.0	----	45.1	54.9	----	5.64	74.80	1.53	17.61	0.42	12,980	C			
385.5-387.0 **	19.0	31.0	38.2	11.8	5.98	51.73	1.03	29.27	0.23	8,920	A			
1.5	----	38.3	47.2	14.5	4.75	63.90	1.28	15.26	0.28	11,020	B	----	----	----
6.0	----	44.8	55.2	----	5.56	74.77	1.49	17.85	0.33	12,900	C			
439.0-441.0 **	20.4	32.0	40.4	7.2	6.56	54.55	1.03	30.33	0.31	9,450	A			
2.0	----	40.2	50.7	9.1	5.37	68.48	1.29	15.40	0.39	11,870	B	----	----	----
20.0	----	44.2	55.8	----	5.91	75.31	1.42	16.93	0.43	13,050	C			
441.0-443.0 **	23.5	32.1	40.2	4.2	6.86	54.75	0.95	33.07	0.20	9,440	A			
2.0	----	41.9	52.7	5.4	5.53	71.54	1.24	15.98	0.26	12,340	B	----	----	----
20.0	----	44.3	55.7	----	5.85	75.66	1.31	16.90	0.28	13,050	C			
443.0-444.0														
1.0	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
444.0-445.0														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
445.0-447.0 **	19.9	31.4	39.8	8.9	6.68	54.07	0.88	29.32	0.20	9,350	A			
2.0	----	39.1	49.9	11.0	5.57	67.46	1.10	14.58	0.25	11,660	B	----	----	----
20.0	----	44.0	56.0	----	6.26	75.83	1.24	16.39	0.28	13,110	C			
447.0-449.0														
2.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
449.0-451.0 **	21.0	32.5	41.8	4.7	6.75	56.44	1.07	30.83	0.24	9,790	A			
2.0	----	41.1	53.0	5.9	5.57	71.45	1.35	15.41	0.31	12,400	B	----	----	----
20.0	----	43.7	56.3	----	5.92	75.94	1.43	16.39	0.32	13,180	C			
451.0-451.1														
0.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.1														
451.1-451.5														
0.4	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
451.5-453.0														
1.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
453.0-455.0 **	20.3	33.7	41.3	4.7	7.02	56.80	1.15	30.14	0.23	9,920	A			
2.0	----	42.2	52.0	5.8	5.96	71.23	1.44	15.24	0.29	12,440	B	----	----	----
20.0	----	44.9	55.1	----	6.33	75.65	1.53	16.18	0.31	13,210	C			
455.0-456.0														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole MD-1C continued														
456.0-457.5														
1.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
457.5-459.0 **	19.7	33.1	42.8	4.4	6.14	57.83	1.09	30.22	0.33	10,050	A			
1.5	----	41.3	53.2	5.5	4.90	72.01	1.36	15.85	0.41	12,520	B	----	----	----
20.0	----	43.6	56.4	----	4.19	76.17	1.43	16.78	0.43	13,240	C			
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
91.0- 92.8 **	19.5	23.3	19.3	37.9	4.56	30.94	0.54	25.81	0.27	5,280	A			
1.8	----	28.9	24.1	47.0	2.96	38.42	0.68	10.60	0.33	6,550	B	----	----	----
2.0	----	54.5	45.5	----	5.59	72.50	1.27	20.01	0.63	12,370	C			
92.8- 94.0														
1.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
96.0- 98.0 **	23.1	30.7	38.3	7.9	6.16	52.10	0.97	32.53	0.30	9,010	A			
2.0	----	39.9	49.8	10.3	4.65	67.74	1.26	15.63	0.40	11,710	B	17.0	----	----
25.0	----	44.5	55.5	----	5.18	75.53	1.40	17.45	0.44	13,060	C			
98.0- 99.8 ***	22.8	32.9	39.4	4.9	5.97	54.88	0.77	33.19	0.26	9,500	A			
1.8	----	42.6	51.0	6.4	4.43	71.04	1.00	16.81	0.34	12,290	B	18.4	9	----
25.0	----	45.5	54.5	----	4.73	75.88	1.06	17.97	0.36	13,130	C			
99.8-101.8 **	24.8	30.8	39.3	5.1	6.62	52.98	0.86	34.30	0.18	9,120	A			
2.0	----	41.0	52.3	6.7	5.11	70.46	1.14	16.32	0.25	12,130	B	17.8	45	----
25.0	----	44.0	56.0	----	5.48	75.53	1.23	17.50	0.26	13,000	C			
101.8-102.7 ***	22.4	32.8	41.0	3.8	5.94	55.89	0.66	33.52	0.17	9,660	A			
0.9	----	42.2	52.9	4.9	4.42	71.99	0.85	17.61	0.21	12,440	B	17.2	----	----
25.0	----	44.4	55.6	----	4.65	75.71	0.90	18.52	0.22	13,090	C			
102.7-104.7 **	22.4	32.5	40.3	4.8	6.31	54.57	0.93	33.16	0.20	9,460	A			
2.0	----	41.9	51.9	6.2	4.91	70.31	1.19	17.11	0.25	12,190	B	17.6	----	----
25.0	----	44.6	55.4	----	5.23	74.98	1.27	18.25	0.27	13,000	C			
104.7-106.2 ***	23.7	32.8	39.3	4.2	6.19	54.73	0.67	34.05	0.20	9,400	A			
1.5	----	43.0	51.5	5.5	4.64	71.76	0.87	17.00	0.26	12,320	B	18.9	----	----
25.0	----	45.4	54.6	----	4.91	75.91	0.92	17.99	0.27	13,030	C			
96.0-106.2(C) ***	22.7	32.3	39.8	5.2	6.22	54.32	0.71	33.35	0.23	9,396	A			
10.2	----	41.8	51.5	6.7	4.76	70.25	0.92	17.09	0.29	12,110	B	----	----	----
25.0	----	44.8	55.2	----	5.10	75.29	0.98	18.32	0.31	12,980	C			
106.2-108.3 **	21.0	32.8	39.3	6.9	6.38	54.19	0.92	31.41	0.20	9,420	A			
2.1	----	41.5	49.8	8.7	5.10	68.56	1.17	16.19	0.25	11,910	B	----	----	----
25.0	----	45.5	54.5	----	5.59	75.12	1.28	17.74	0.27	13,050	C			
96.0-108.3(WA)	23.2	32.1	39.6	5.1	6.20	54.19	0.81	33.46	0.22	9,360	A			
12.3	----	41.8	51.6	6.4	4.69	70.55	1.05	16.75	0.29	12,180	B	17.8	----	----
25.0	----	44.7	55.3	----	5.03	75.59	1.13	17.95	0.30	13,050	C			
108.3-109.8														
1.5	ROCK PARTING, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
25.0														
109.8-111.1 ***	25.4	31.4	38.2	5.0	6.06	52.99	0.75	34.99	0.17	9,110	A			
1.3	----	42.1	51.1	6.8	4.31	71.04	1.01	16.66	0.22	12,210	B	----	----	----
25.0	----	45.1	54.9	----	4.62	76.19	1.08	17.87	0.24	13,100	C			

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MD-2C continued														
111.1-113.2 **	23.2	31.5	40.5	4.8	6.43	54.40	0.98	33.24	0.15	9,380	A			
2.1	----	41.0	52.8	6.2	4.99	70.86	1.28	16.47	0.20	12,200	B	----	59	----
25.0	----	43.7	56.3	----	5.32	75.54	1.36	17.57	0.21	13,010	C			
113.2-114.2 ***	22.7	32.0	40.9	4.4	6.35	55.08	0.94	33.11	0.15	9,480	A			
1.0	----	41.4	52.9	5.7	4.93	71.29	1.21	16.72	0.20	12,280	B	----	58	----
25.0	----	43.9	56.1	----	5.22	75.56	1.29	17.72	0.21	13,010	C			
114.2-115.1 ***	24.4	31.5	40.3	3.8	6.57	53.85	0.81	34.77	0.16	9,300	A			
0.9	----	41.7	53.2	5.1	5.09	71.19	1.07	17.37	0.21	12,290	B	----	----	----
25.0	----	43.9	56.1	----	5.36	75.00	1.13	18.28	0.23	12,940	C			
115.1-117.6 **	20.9	32.9	41.1	5.1	6.31	55.46	0.99	32.02	0.14	9,570	A			
2.5	----	41.6	52.0	6.4	5.01	70.15	1.25	16.98	0.18	12,100	B	----	----	----
25.0	----	44.4	55.6	----	5.36	74.97	1.34	18.14	0.19	12,940	C			
117.6-118.5***	21.0	33.2	42.1	3.7	6.28	56.62	0.62	32.56	0.17	9,790	A			
0.9	----	42.0	53.3	4.7	4.98	71.69	0.78	17.59	0.21	12,390	B	----	----	----
25.0	----	44.1	55.9	----	5.22	75.26	0.82	18.48	0.22	13,010	C			
118.5-121.0**	22.4	31.7	40.8	5.1	6.37	54.45	1.06	32.81	0.24	9,480	A			
2.5	----	40.8	52.7	6.5	4.99	70.13	1.36	16.68	0.31	12,220	B	----	----	----
25.0	----	43.7	56.3	----	5.34	75.03	1.46	17.84	0.33	13,070	C			
106.2-121.0(C)***	22.2	32.4	40.4	5.0	6.76	54.42	0.79	32.83	0.19	9,440	A			
14.8[37]	----	41.6	52.0	6.4	5.50	69.94	1.02	16.85	0.25	12,130	B	----	----	----
25.0	----	44.5	55.5	----	5.87	74.76	1.09	18.01	0.27	12,970	C			
109.8-121.0(WA)	22.3	32.1	41.6	4.7	6.38	54.91	0.94	32.95	0.17	9,490	A			
13.6	----	41.3	52.7	6.0	4.94	70.72	1.20	16.88	0.22	12,220	B	----	----	----
25.0	----	43.9	56.1	----	5.32	75.21	1.28	17.95	0.25	13,000	C			
96.0-121.0(C)***	22.4	32.2	40.4	5.0	6.24	54.61	0.74	33.23	0.19	9,410	A			
25.0[37]	----	41.5	52.1	6.4	4.82	70.38	0.96	17.17	0.24	12,120	B	----	----	----
25.0	----	44.4	55.6	----	5.15	75.22	1.02	18.35	0.26	12,960	C			
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-177.0 **	22.9	30.9	39.8	6.4	6.35	52.91	0.96	32.31	1.11	9,200	A			
2.0	----	40.1	51.7	8.2	4.91	68.62	1.25	15.52	1.45	11,930	B	----	----	----
39.0	----	43.7	56.3	----	5.35	74.79	1.36	16.92	1.58	13,010	C			
177.0-179.0 **	25.1	32.6	37.7	4.6	6.40	53.62	0.90	34.19	0.29	9,280	A			
2.0	----	43.5	50.4	6.1	4.80	71.59	1.21	15.88	0.38	12,390	B	----	----	----
39.0	----	46.4	53.6	----	5.12	76.27	1.29	16.91	0.41	13,200	C			
179.0-183.0														
4.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
39.0														
183.0-184.0 **	24.2	31.3	37.9	6.6	6.19	52.91	0.87	33.06	0.40	9,150	A			
1.0	----	41.3	50.0	8.7	4.59	69.78	1.15	15.30	0.52	12,070	B	----	----	----
39.0	----	45.3	54.7	----	5.03	76.40	1.26	16.74	0.57	13,220	C			
184.0-185.0														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
39.0														
185.0-187.0 **	20.9	29.5	32.1	17.5	5.65	45.47	0.70	30.32	0.31	7,900	A			
2.0	----	37.3	40.5	22.2	4.18	57.47	0.88	14.90	0.39	9,990	B	----	46[38]	----
39.0	----	47.9	52.1	----	5.38	73.85	1.13	19.14	0.50	12,840	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole MD-3C continued														
187.0-191.0 4.0 39.0	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	54	----
191.0-193.0 ** 2.0 39.0	21.2 ---- ----	35.2 44.6 48.4	37.4 47.6 51.6	6.2 7.8 ----	6.58 5.34 5.79	53.87 68.34 74.13	0.80 1.02 1.10	32.25 17.05 18.50	0.34 0.44 0.48	9,360 11,880 12,880	A B C	----	----	----
193.0-195.0 2.0 39.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
195.0-197.0 ** 2.0 39.0	21.6 ---- ----	33.7 43.0 45.8	40.0 51.0 54.2	4.7 6.0 ----	6.94 5.77 6.14	56.61 72.26 76.85	0.88 1.13 1.20	30.57 14.46 15.37	0.32 0.41 0.44	9,740 12,440 13,220	A B C	----	----	----
197.0-198.0 1.0 39.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
175.0-198.0(C) *** 23.0[39] 39.0	21.7 ---- ----	32.8 41.9 46.1	38.5 49.1 53.9	7.0 9.0 ----	6.10 4.69 5.15	54.01 68.99 75.82	0.49 0.63 0.69	31.81 15.99 17.58	0.54 0.70 0.76	9,380 11,980 13,160	A B C	----	----	----
224.0-225.0 ** 1.0 1.0	21.9 ---- ----	32.2 41.2 45.3	38.8 49.7 54.7	7.1 9.1 ----	6.46 5.13 5.64	54.58 69.90 76.88	0.74 0.95 1.05	29.00 12.22 13.43	2.13 2.72 3.00	9,410 12,050 13,260	A B C	----	----	----
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-451.0 ** 2.0 23.5	21.6 ---- ----	31.9 40.6 44.1	40.4 51.6 55.9	6.1 7.8 ----	6.30 4.96 5.38	54.91 70.03 75.96	0.93 1.18 1.28	31.01 15.08 16.37	0.73 0.94 1.01	9,560 12,200 13,230	A B C	15.7	----	----
451.0-453.0 2.0 23.5	ONLY EQUILIBRIUM MOISTURE AND HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											16.2	50	----
453.0-455.0 ** 2.0 23.5	22.0 ---- ----	32.6 41.7 44.4	40.7 52.3 55.6	4.7 6.0 ----	6.28 4.89 5.21	55.77 71.48 76.06	0.95 1.22 1.30	31.86 15.82 16.82	0.44 0.57 0.61	9,730 12,470 13,270	A B C	15.6	60	----
455.0-457.0 2.0 23.5	ONLY EQUILIBRIUM MOISTURE AND HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											15.6	46	----
457.0-459.0 ** 2.0 23.5	23.9 ---- ----	32.4 42.5 44.9	39.7 52.3 55.1	4.0 5.2 ----	6.59 5.14 5.42	54.76 72.00 75.96	0.87 1.14 1.20	33.59 16.22 17.12	0.22 0.28 0.30	9,610 12,630 13,330	A B C	17.9	11	----
459.0-462.0 3.0 23.5	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											15.3	----	----
462.0-464.0 ** 2.0 23.5	20.4 ---- ----	33.6 42.2 44.7	41.6 52.3 55.3	4.4 5.5 ----	6.45 5.24 5.55	57.52 72.22 76.46	0.90 1.13 1.19	30.25 15.28 16.18	0.47 0.59 0.62	10,080 12,660 13,410	A B C	16.2	----	----
464.0-467.0 3.0 23.5	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											16.5	----	----

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole R-6AC continued														
467.0-469.0 **	21.5	32.9	41.2	4.4	6.42	56.73	0.86	30.43	1.15	9,900	A	16.2	----	----
2.0	----	41.9	52.5	5.6	5.11	72.26	1.10	14.44	1.47	12,610	B			
23.5	----	44.4	55.6	----	5.42	76.56	1.16	15.30	1.56	13,360	C			
469.0-471.0	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											16.3	----	----
2.0														
23.5														
471.0-473.0 **	16.3	23.7	27.4	32.6	4.74	37.70	0.52	22.87	1.54	6,530	A	----	----	----
2.0[9]	----	28.3	32.7	39.0	3.48	45.06	0.62	10.00	1.84	7,800	B			
23.5	----	46.4	53.6	----	5.70	73.87	1.01	16.40	3.02	12,790	C			
449.0-473.0(C) ***	21.3	33.8	40.3	4.6	6.44	56.51	0.70	31.10	0.66	9,870	A	----	----	----
24.0[9]	----	43.0	51.2	5.8	5.15	71.80	0.88	15.49	0.84	12,540	B			
23.5	----	45.6	54.4	----	5.47	76.25	0.94	16.45	0.89	13,310	C			
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
64.0- 66.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
3.5														
66.0- 67.5 **	18.8	31.9	38.3	11.0	6.17	52.07	1.19	29.21	0.33	9,040	A	----	----	----
1.5	----	39.2	47.2	13.6	5.02	64.09	1.47	15.43	0.41	11,130	B			
3.5	----	45.4	54.6	----	5.80	74.16	1.70	17.87	0.47	12,870	C			
275.0-277.0 **	21.6	32.8	41.0	4.6	6.38	55.29	1.19	32.33	0.26	9,600	A	----	----	----
2.0	----	41.9	52.3	5.8	5.06	70.55	1.51	16.73	0.34	12,250	B			
9.0	----	44.5	55.5	----	5.37	74.89	1.61	17.77	0.36	13,010	C			
277.0-278.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.3														
9.0														
278.3-280.3 **	25.1	31.4	40.0	3.5	6.81	53.45	1.06	34.97	0.21	9,260	A	----	----	----
2.0	----	41.9	53.4	4.7	5.35	71.36	1.41	16.93	0.28	12,370	B			
9.0	----	44.0	56.0	----	5.61	74.86	1.48	17.76	0.29	12,980	C			
280.3-281.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.7														
9.0														
281.0-284.0	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.0														
9.0														
275.0-281.0(C) ***	22.9	32.3	40.8	4.0	6.07	55.08	0.86	33.75	0.22	9,470	A	----	----	----
6.0[4,10]	----	41.9	52.9	5.2	4.56	71.43	1.11	17.40	0.28	12,270	B			
9.0	----	44.2	55.8	----	4.81	75.36	1.17	18.36	0.30	12,950	C			

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Analyses reported as A, sample as received; B, sample dry; C, sample dry ash-free.

[4] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[5] Composite of the following intervals: 225.0-226.0, 227.0-228.0, 228.8-229.8, 230.6-231.6, and 232.4-233.5.

[6] Probably interbedded coal and noncoaly rock; interval was not entirely coal.

[7] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[8] Composite of the following intervals: 157.6-158.5, 158.5-159.5, and 159.5-161.4.

[9] Lower part of sampled interval was probably not coal.

[10] Composite of the following intervals: 229.0-230.0 and 232.9-234.0.

[11] Composite of the following intervals: 232.2-234.2, 236.1-238.1, and 240.0-242.0.

[12] Upper 0.5 feet not sampled.

[13] Composite of the following intervals: 312.4-214.6, 216.5-218.7, and 319.4-321.0.

[14] Includes 0.5 feet of noncoaly rock from 62.9-63.4.

[15] Composite of the following intervals: 63.4-65.0 and 65.0-66.5.

[16] Includes 0.5 feet of noncoaly rock at base of sample interval.

[17] Composite of the following intervals: 226.2-227.9, 228.3-229.7, and 230.3-231.7.

[18] Includes 1.3 feet of interbedded thin coals and noncoaly rock in lower part of sampled interval.

[19] Composite of the following intervals: 213.8-215.8 and 215.8-217.8.

[20] Composite of the following intervals: 362.0-363.8 and 363.8-365.6.

[21] Composite of the following intervals: 428.7-430.6 and 430.6-432.6.

[22] Composite of the following intervals: 209.0-210.1 and 210.8-211.9.

[23] Composite of the following intervals: 248.6-249.8 and 249.8-251.0.

[24] Composite of the following intervals: 221.0-223.2, 223.2-225.4, and 225.4-227.7.

[25] Composite of the following intervals: 221.6-267.8, 269.7-271.4, and 273.3-275.0.

[26] Lower 1.0 feet probably noncoaly rocks; interval sampled in not entirely coal.

[27] Composite of the following intervals: 300.5-301.5, 301.5-303.5, and 303.5-305.0.

[28] Composite of the following intervals: 312.0-314.1 and 314.1-316.1.

[29] Includes about 0.5 feet of noncoaly rock in lower part of interval.

[30] Composite of the following intervals: 413.0-414.5, 414.5-416.5, and 416.9-419.5.

[31] Includes about 0.6 feet of noncoaly rock in upper part of interval.

[32] Compostie of the following intervals: 316.0-318.3 and 318.3-320.7.

[33] Compsoite of the following intervals: 441.2-443.2, 444.1-446.1, and 447.0-449.0.

[34] Composite of the following intervals: 212.0-214.0 and 214.0-216.0.

[35] Compsoite of the following intervals: 343.0-345.2 and 345.8-348.0.

[36] Composite of the following intervals: 452.2-454.6 and 454.6-457.0.

[37] Interval includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[38] Compsoite of the following intervals: 183.0-184.0, 184.0-185.0, and 185.0-187.0.

[39] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet of the coal bed was lost in coring and was not recovered.

[40] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet of the coal bed was lost in coring and was not recovered.

* Analysis was completed in July, 1982.

** Analysis was completed in September, 1982.

*** Analysis was completed in November and December, 1982.