

Bureau of Mines  
Report of Investigations 4893



ESTIMATE OF KNOWN RECOVERABLE RESERVES  
OF COKING COAL IN RALEIGH COUNTY, W. VA.

BY JAMES J. DOWD, ALBERT L. TOENGES,  
R. F. ABERNETHY, AND D. A. REYNOLDS

United States Department of the Interior — June 1952

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UNITED STATES DEPARTMENT OF THE INTERIOR  
Oscar L. Chapman, Secretary  
BUREAU OF MINES  
J. J. Forbes, Director

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June 1952



## FOREWORD

Since its creation by Congress in 1910, The Bureau of Mines has borne a heavy responsibility for technical progress in the mining, preparation, and utilization of our national fuel reserves. Similarly, it has pioneered in scientific studies leading to better health and safety in mining and more efficient conservation of fuel resources.

Conservation means a full but prudent use of the national resources with avoidance of waste. Conservation requires an inventory to determine the extent, availability, and condition of our resources, for without these facts it is impossible for either industry or Government to plan for sustained production and maintenance of the industrial capacity so essential to our peacetime prosperity and wartime survival. This is true particularly of fuels needed for special purposes, such as metallurgical coking coals that must possess certain favorable properties. Heavy use of our limited reserves of good coking coal has resulted in severe depletion and, in some areas, exhaustion of the thickest and best beds.

At the request of the Munitions Board, Department of Defense, the Bureau of Mines made preliminary arrangements early in 1948 for an investigation of known minable reserves of coal that were or could be made suitable for the manufacture of metallurgical coke. In August of that year, actual field work began in the low- and medium-volatile coking coal fields of the Appalachian region, specifically central Pennsylvania and southern West Virginia. As both the economic and technologic factors that determine whether a particular coal can be used for producing metallurgical coke will vary with changing conditions, the investigation was planned to cover three phases:

1. Determination, from available data, of coal reserves with coking properties that occur in beds thick enough and within depths considered economically minable by present methods, together with such additional reserves as may become economically minable under future conditions of improved technology and greater need.
2. Study of the preparation characteristics of the reserves thereby developed to determine (a) which coals are suitable under present standards for producing metallurgical coke either as mined or after beneficiation by conventional preparation methods, and (b) which coals would require special and more intensive treatment in mining, preparation, or both.
3. Study of the carbonizing properties of the reserves thus developed to determine the yield and quality of coke, gas, and chemical products that can be obtained from coals carbonized singly and in blends.

This report is one in a series, by counties, covering in detail the estimated known minable coking-coal reserves determined under the first phase of the investigation. It also includes a general assessment of the carbonizing properties of the most important beds and a table of analyses of typical coals from the county. Publications will be issued later covering in more detail the preparation and carbonization data upon completion of the extensive laboratory work involved in these phases of the survey.

The estimates of coking-coal reserves in these reports were derived from data made available to the Bureau of Mines by coal companies, landowners, Federal, State, and municipal engineers, geologists, land-record officials, and others having authentic records of the occurrence and characteristics of the coal in the respective counties. All of the data were assembled from mine maps, records of core drilling, test pitting and trenching, and related sources of information, for no new core-drilling or geologic exploration was undertaken. Consequently, there are areas covered by these reports wherein the known data now available are inadequate to estimate reserves of measured and indicated coal, as these are defined in the reports. Geologic data also indicate the presence of large reserves of inferred coal in many of these areas, but no estimates of inferred reserves are presented in these reports. As their titles indicate, they include only known, minable reserves of measured and indicated coal and not total estimated reserves of coal. Therefore, any comparison of these and other coal-reserve estimates should be made with this distinction clearly understood.

The percentage recovery shown in these reports is a weighted average, based on the thickness of clean coal, less all partings 3/8-inch or more thick, recovered from the mined-out areas in each bed. Thus, it is an over-all net areal percentage recovery that, in many cases, will be lower than the recovery estimated by operators who eliminate from their calculations coal pillars left at property boundaries, under roads, and elsewhere. It is based on all coal removed since the beginning of mining operations and therefore may vary from that of recent operations in which recovery either has been improved substantially by technologic advances or has declined, owing to flooding or other conditions that make it expedient to leave more coal in the ground. As the estimates are dated and represent a factual record of all past operations in the particular area, the percentage recovery and estimate of minable coal may be adjusted by operators to suit their particular conditions at any given time.

These county reports are being published as rapidly as the available data can be found and analyzed. Later, in cooperation with the Federal Geological Survey, results of these studies will be combined with those from a complete geologic investigation of all coal reserves in the areas considered. Then, reports can be published, by States, giving estimates of total reserves, including the geologically inferred reserves that have been omitted herein.

This investigation was made possible only through the complete cooperation of the coal operators, landowners, and others who have made available to the Bureau their confidential records and data relating to mining operations, drill-core and test-pit operations, etc. This cooperation and assistance is appreciated and is gratefully acknowledged. To protect the confidence of the data from private records, the Bureau of Mines is assembling and publishing the estimates on a county-wide basis only and will not release any supplementary or more detailed information.

This investigation will serve a triple purpose:

1. By providing an inventory of known, minable reserves of coking coal that are or can be made suitable for the manufacture of metallurgical coke.

2. By providing an inventory of known minable reserves of coal with coking properties but unsuited for metallurgical coking-coal use by present standards and techniques because of high sulfur, high ash, or weakly coking properties. When warranted by economic and technologic developments, these reserves later may be adapted to metallurgical use by suitable preparation, blending, carbonizing, or metallurgical techniques.

3. By ascertaining the approximate location and magnitude of areas in which geologic data indicate the presence of inferred reserves but where exploratory work has been too limited to determine measured and indicated reserves. It is in these areas that more intensive exploratory work is needed in the future to complete the coking-coal inventory.

The first of these objectives is of prime importance for the present and immediate future, and the second for the more distant future. Accomplishment of the third objective will be of major aid to both industry and State and Federal agencies in more effectively planning and executing coal exploratory and testing investigations.

RALPH L. BROWN  
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# ESTIMATE OF KNOWN RECOVERABLE RESERVES OF COKING COAL IN RALEIGH COUNTY, W. VA.

by

James J. Dowd,<sup>1/</sup> Albert L. Toenges,<sup>2/</sup> R. F. Abernethy,<sup>3/</sup>  
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## CONTENTS

	<u>Page</u>
Conclusions .....	1
Introduction .....	2
Acknowledgments .....	2
Premises and definition of terms used .....	2
Coal reserves .....	4
Coal beds .....	17
No. 5 Block bed .....	19
Winifrede (Dorothy) bed .....	19
Hernshaw bed .....	21
Alma bed .....	22
Campbell Creek-Peerless bed .....	23
Campbell Creek-No. 2 Gas bed .....	23
Powellton bed .....	24
Eagle bed .....	25
Little Eagle bed .....	26
Lower War Eagle bed .....	27
Gilbert bed .....	27
Sewell bed .....	28
Beckley bed .....	29
Fire Creek bed .....	31
Pocahontas No. 6 bed .....	31
Pocahontas No. 4 bed .....	32
Pocahontas No. 3 bed .....	33
Analyses of Raleigh County coals .....	34
Carbonizing properties of Raleigh County coals .....	34
Appendix .....	37

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TABLES

	<u>Page</u>
1. Reserves in Upper 5 Block bed .....	5
2. Reserves in No. 5 Block bed .....	5
3. Reserves in Stockton Lewiston bed .....	5
4. Reserves in Coalburg bed .....	6
5. Reserves in Winifrede bed .....	6
6. Reserves in Lower Winifrede bed .....	6
7. Reserves in Upper Hernshaw bed .....	7
8. Reserves in Middle Hernshaw bed .....	7
9. Reserves in Lower Hernshaw bed .....	7
10. Reserves in Upper Cedar Grove bed .....	8
11. Reserves in Alma bed .....	8
12. Reserves in Campbell Creek-Peerless bed .....	8
13. Reserves in Campbell Creek-No. 2 Gas bed .....	9
14. Reserves in Upper Powellton bed .....	9
15. Reserves in Powellton bed .....	9
16. Reserves in Upper Eagle bed .....	10
17. Reserves in Eagle bed .....	10
18. Reserves in Little Eagle bed .....	10
19. Reserves in Lower War Eagle bed .....	11
20. Reserves in Gilbert bed .....	11
21. Reserves in Sewell bed .....	11
22. Reserves in Beckley bed .....	12
23. Reserves in Fire Creek bed .....	12
24. Reserves in Pocahontas No. 6 bed .....	13
25. Reserves in Pocahontas No. 4 bed .....	13
26. Reserves in Pocahontas No. 3 bed .....	14
27. Reserves in Pocahontas No. 2 bed .....	14
28. Recapitulation of reserves, Raleigh County, W. Va., January 1, 1949 .....	15
29. Summary of estimates, Raleigh County, W. Va. ....	17
30. Analyses of Raleigh County coals .....	35

ILLUSTRATIONS

<u>Fig.</u>		<u>Follows page</u>
1. Key map of Raleigh County, W. Va. ....		2
2. No. 5 Block bed .....		18
3. Winifrede bed .....		18
4. Hernshaw bed .....		18
5. Alma bed .....		18
6. Campbell Creek-Peerless bed .....		18
7. Campbell Creek-No. 2 Gas bed .....		18
8. Powellton bed .....		18
9. Eagle bed .....		18
10. Little Eagle bed .....		18
11. Lower War Eagle bed .....		18
12. Gilbert bed .....		18
13. Sewell bed .....		18
14. Beckley bed .....		18
15. Fire Creek bed .....		18
16. Pocahontas No. 6 bed .....		18
17. Pocahontas No. 4 bed .....		18
18. Pocahontas No. 3 bed .....		18

## CONCLUSIONS

1. The investigation shows that there are six coal beds of major importance in Raleigh County from the Standpoint of present production - Pocahontas No. 4, Beckley, Pocahontas No. 3, Sewell, Winifrede, and Campbell Creek-No. 2 Gas - and six beds of minor importance - Eagle, No. 5 Block, Powellton, Hernshaw, Fire Creek, and Pocahontas No. 6. The Beckley bed contains the largest remaining known reserve.

2. Known measured and indicated reserves in all beds, based on a minimum thickness of 14 inches and on 1,800 tons per acre-foot of coal in place, are estimated at 2,532 million short tons as of January 1, 1949. Of this total, 2,237 million tons are in beds 28 inches and more thick. Areas in each bed were omitted from the estimate because available data relative to the bed characteristics are insufficient to permit making an estimate that conforms with the definitions of measured and indicated coal adopted for this study. Should future drilling or development prove reserves in these areas, such reserves should be added to the total estimated reserves.

3. Recoverable reserves of coal have been estimated in beds 28 inches and more thick. This thickness is about the minimum now being mined by hand-loading onto conveyors in the Appalachian region. The weighted average percentage of recovery for all beds in Raleigh County, including all mining losses, as determined by this investigation is 57.71. This recovery is based on the percentage of the total thickness of coal (less partings 3/8 inch thick or more) recovered from the mined-out areas in each bed rather than on the percentage of coal recovered from that portion of the bed mined. The highest average percentage of recovery is 71.5 for the Campbell Creek-No. 2 Gas bed in the Bald Knob quadrangle. The lowest is 37.5 percent for the Sewell bed in the Mullens quadrangle. Based on the weighted average percentage of recovery for all beds in Raleigh County, the recoverable reserves are estimated at 1,291 million tons as of January 1, 1949.

4. Raleigh County coals are low-volatile, except those from No. 5 Block, Winifrede, and Powellton beds, which are high-volatile A bituminous; the Eagle bed, which is either a high-volatile A or a medium-volatile coal; and the Sewell bed, which is either a medium- or low-volatile coal.

5. The Raleigh County coals rank among the most strongly coking of the country. The Pocahontas No. 3 bed long has been regarded as the premier low-volatile coking coal of the continent and has been used in Canada and all States east of the Mississippi River that produce metallurgical coke. Owing to the expanding properties of the low-volatile coals, blends with high-volatile coals ordinarily are used for carbonizing in coke ovens.

## INTRODUCTION

The investigation to evaluate the reserves of coking coal is being made by the Bureau of Mines in three parts: (1) To estimate known measured and indicated recoverable reserves of all coking coal; (2) to upgrade marginal coals through effective preparation; and (3) to study carbonizing properties of coals and coal blends not now widely used for metallurgical coke making.

This is the ninth of a series of reports giving results of studies by counties under part (1) of the investigation. (See Appendix.) This report covers Raleigh County, W. Va., which comprises parts of Bald Knob, Eccles, Beckley, Meadow Creek, Mullens, Flattop, and Big Bend quadrangles. (See fig. 1.)

A base map for each bed in each quadrangle was made to the scale 1 inch equals 1,200 feet. Maps of mines, location of drill holes, bed and total coal thickness, and outcrop of the bed were plotted on the maps. With all available data plotted, isopach lines were drawn to limit areas of known unmined reserves in beds 0 to 14 inches thick, 14 to 28 inches thick, 28 to 42 inches thick, and over 42 inches thick. These areas of coal reserves also were divided into "measured" and "indicated" categories. All areas in each thickness range and in each category, mined-out areas, areas excluded from the estimate but which may contain reserves based only on geologic inference, and areas outside of the outcrop were measured by planimeter on the base maps. Estimates of total reserves 14 inches and more thick and maps for individual beds were prepared from these data.

## ACKNOWLEDGMENTS

The information in this report could not have been obtained without the whole-hearted cooperation of the officials of the companies and individual landowners whose property records were studied, and their help and the courtesies extended are gratefully acknowledged. The advice and assistance of the Coal Resources Committees of both the National Bituminous Coal Advisory Council and the American Institute of Mining and Metallurgical Engineers, members of the staffs of the Federal Geological Survey, West Virginia Geological Survey, West Virginia Department of Mines, coal-operator associations, and consulting mining engineers are appreciated. The investigation was under the general supervision of the principal coal-mining engineer, Bituminous Coal Mining Section, Coal Branch, Fuels and Explosives Division, Bureau of Mines, and the cooperation of the staff assigned to this study, particularly John M. Provost and William H. Lavenner, mining engineers, Bureau of Mines, who conducted the field work, is acknowledged.

## PREMISES AND DEFINITIONS OF TERMS USED

An estimate of coal reserves is the opinion of an individual or group of individuals based on certain premises and limitations adopted for that estimate. Therefore, in order to make a comparison between estimates, it is necessary to compare not only the final results but also the premises on which the estimates are based. The definitions "measured" coal and "indicated" coal used in this report have been agreed upon by the Bureau of Mines and the Federal Geological Survey. The premises and definitions of terms follow:

Coking coal. - All bituminous coals in the Appalachian region are potentially coking, and therefore, until the carbonization tests in part (3) of the study have been completed to determine the coking quality of the coals, all known reserves of

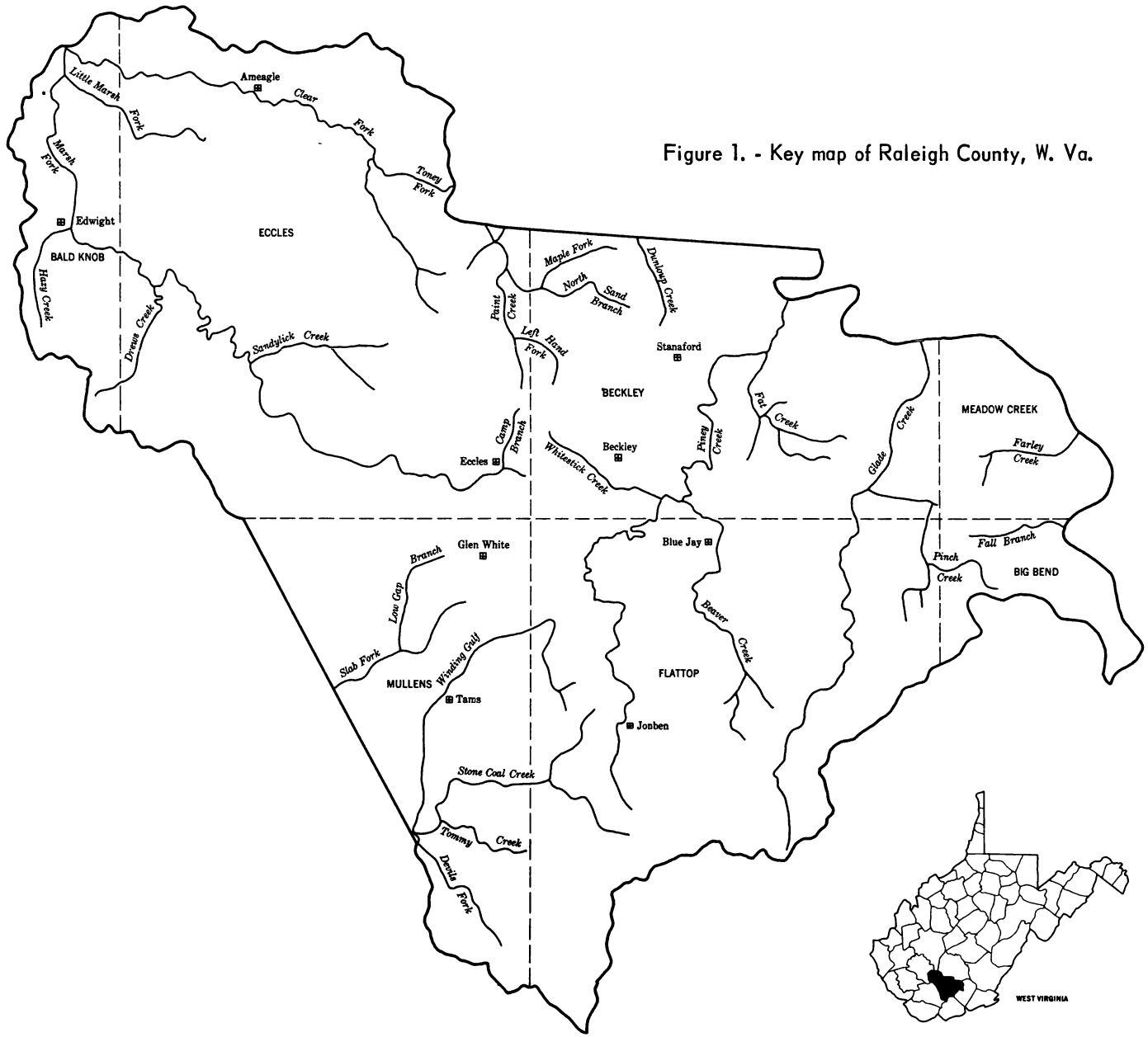


Figure 1. - Key map of Raleigh County, W. Va.





coal in the county are included as coking coal. This should not be construed to mean that all coals included in this report are suitable for the manufacture of metallurgical coke according to present-day standards. However, the general trend is toward the use of lower-quality coals for metallurgical purposes.

Unit area. - The unit area used in estimating reserves is the 5-minute rectangle of the topographic quadrangle. The estimates for the nine 5-minute rectangles of a quadrangle are combined on a county basis.

Bed-thickness range. - Reserves in each coal bed are tabulated in bed-thickness ranges, as follows:

14 to 28 inches

28 to 42 inches

42 inches and more

These measurements represent total bed thickness, including all coal and partings in the bed. If the top or bottom bench of a coal bed is separated from the remainder of the bed by a parting of equal or greater thickness and usually is not mined, such bench and partings are omitted in determining the bed thickness.

Measured coal. - Measured coal is coal for which tonnage is computed from dimensions revealed in outcrops, mine workings, and drill holes. The points of observation and measurement are so closely spaced, and the thickness and extent of the coal are so well-defined that the computed tonnage is judged to be within 20 percent or less of the true tonnage. Although the spacing of the points of observation necessary to demonstrate continuity of coal will vary in different regions according to the habit of the coal beds, the points of observation are, in general, about 1/2 mile apart. The outer limit of a block of measured coal, therefore, shall be about 1/4 mile from the last point of positive information (that is, roughly, one-half the distance between points of observation).

Where no data are available other than measurements along the outcrop, but where the continuity of the outcrop is measured in miles and suggests the presence of coal at great distances in from the outcrop, a smooth line drawn roughly 1/2 mile in from the outcrop shall be used to mark the limit under cover of a block of coal that can also be classed as measured.

Indicated coal. - Indicated coal is coal for which tonnage is computed partly from specific measurements and partly from projection of visible data for a reasonable distance on geologic evidence. In general, the points of observation are about 1 mile apart but may be as much as 1-1/2 miles for beds of known geologic continuity. For example, if drilling on 1/2-mile centers has proved a block of measured coal of fairly uniform thickness and extent, the area of measured coal, according to the judgment of the estimator, is larger than the actual area of drilling by as much as 1/4 mile on all sides. If, from geologic evidence, the bed is believed to have greater continuity, the area of measured coal is surrounded by a belt of indicated coal, which according to the judgment of the appraiser, may be as much as 1-1/2 miles wide.

Where not data are available other than measurements along the outcrops, but where the continuity of the outcrop is measured in miles and suggests the presence

of coal at great distances in from the outcrop, two lines drawn roughly parallel to the outcrop, one 1/2 mile in from the outcrop and one 2 miles in from the outcrop, define a block of coal that may be classed as indicated.

Inferred coal. - As no estimate of reserves has been made from geologic inference alone, inferred coal is not included in this report. This category often contains the largest reserves.

Areas excluded from estimate. - In each bed are areas where coal may be present but for which no estimates of reserves have been made. There are too few or no bed sections from drill holes, mine workings, or coal outcrops in the area on which to base estimates that would qualify under the definitions of "measured" or "indicated" reserves. These areas may contain additional geologically inferred reserves.

Overburden. - All known reserves in Raleigh County are under less than 2,000 feet of overburden.

Thickness of coal. - In computing the volume of reserves in each thickness category for each bed, the total thickness of clean coal in the bed section is used. If the top or bottom bench of coal described under definition of "bed-thickness range" usually is not mined, the thickness of the bench is not used to compute the volume of reserves. A weighted average thickness in each thickness category for each 5-minute rectangle of each bed is computed.

Weight of coal. - Estimated coal in place is based on 1,800 short tons per acre-foot.

Percentage of recovery. - The weighted average percentage of recovery is computed for each bed in each quadrangle. The total number of tons of coal produced from each mine is obtained from either the mine operator or the published reports of the West Virginia Department of Mines and Minerals. An estimate is made of the tons of coal originally in place in the mined-out area of each mine. The percentage of recovery for each mine is the ratio of the total number of tons produced from a mine (to January 1, 1949, the date of this estimate) to the total tons originally in place in the mined-out area. The weighted average percentage of recovery for all mines in the same bed in a quadrangle is the percentage of recovery used in calculating recoverable reserves for that bed in the quadrangle.

All coal remaining for any reason within the mined-out area of a mine is considered a loss. No distinction is made between avoidable or unavoidable losses. Included in these losses is some coal considered too thin to mine, also coal that legally is required to be left unmined, such as coal under some highways, railroads, and rivers, coal left to protect gas and oil wells, and coal left in barrier pillars between mines and adjacent to property boundaries.

Recoverable reserves. - The recoverable reserves are estimated tons of unmined coal in beds 28 inches and more thick as of the date of the estimate, multiplied by the percentage of recovery. Twenty-eight inches is about the minimum thickness of coal being mined mechanically (hand-loaded conveyors). Some areas in some of the beds in this county may not be considered economically minable at present because of conditions considered adverse today.

#### COAL RESERVES

Detailed estimates of known measured and indicated reserves of coal in Raleigh County, W. Va., as of January 1, 1949, are given in tables 1 to 27, inclusive. Where separate tabulations are made for one or more splits of a bed, the indications are that both splits are recoverable. Therefore, the sum of the total recoverable tons for each split is the total recoverable reserve for the bed.



RALEIGH COUNTY

TABLE 1. - RESERVES IN UPPER NO. 5 BLOCK BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	27	22,797	-	286	190	96	Measured Indicated	-	-	15	83	81	887	96	970	96	970		615
								Total	-	-	15	83	81	887	96	970	96	970	63.4	615
								Measured Indicated	-	-	15	83	81	887	96	970	96	970		615
								Total	-	-	15	83	81	887	96	970	96	970	63.4	615
Total .....	23,110	27	22,797	-	286	190	96	Total	-	-	15	83	81	887	96	970	96	970	63.4	615

RALEIGH COUNTY

TABLE 2. - RESERVES IN NO. 5 BLOCK BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ....	23,110	703	21,973	-	434	12	422	Measured Indicated	-	-	-	-	422	6,267	422	6,267	422	6,267		3,973
								Total	-	-	-	-	422	6,267	422	6,267	422	6,267	63.40	3,973
Eccles .....	119,003	3,991	114,504	-	508	30	478	Measured Indicated	-	-	-	-	259	3,924	259	3,924	259	3,924		2,374
								Total	-	-	-	-	219	3,318	219	3,318	219	3,318		2,007
								Total	-	-	-	-	478	7,242	478	7,242	478	7,242	60.50	4,381
								Measured Indicated	-	-	-	-	681	10,191	681	10,191	681	10,191		6,347
								Total	-	-	-	-	219	3,318	219	3,318	219	3,318		2,007
Total .....	142,113	4,694	136,477	-	942	42	900	Total	-	-	-	-	900	13,509	900	13,509	900	13,509	61.84	8,354

RALEIGH COUNTY

TABLE 3. - RESERVES IN STOCKTON-LEWISTON BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	1,943	21,124	-	43	-	43	Measured Indicated	-	-	-	-	43	297	43	297	43	297		149
								Total	-	-	-	-	43	297	43	297	43	297	2/50.0	149
Eccles .....	119,003	2,268	115,888	-	847	-	847	Measured Indicated	45	160	-	-	602	5,144	647	5,304	602	5,144		2,572
								Total	-	-	-	-	200	1,710	200	1,710	200	1,710		855
								Total	45	160	-	-	802	6,854	847	7,014	802	6,854	2/50.0	3,427
								Measured Indicated	45	160	-	-	645	5,441	690	5,601	645	5,441		2,721
								Total	-	-	-	-	200	1,710	200	1,710	200	1,710		855
Total .....	142,113	4,211	137,012	-	890	-	890	Total	45	160	-	-	845	7,151	890	7,311	845	7,151	2/50.0	3,576

<sup>1/</sup> No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

<sup>2/</sup> Estimated

RALEIGH COUNTY

TABLE 4. - RESERVES IN COALBURG BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	11,990	10,783	-	337	-	337	Measured Indicated	-	-	-	-	337	3,235	337	3,235	337	3,235		1,613
								Total	-	-	-	-	337	3,235	337	3,235	337	3,235	2/50.0	1,613
Eccles .....	119,003	4,952	113,161	-	890	-	890	Measured Indicated	-	-	890	4,077	-	-	890	4,077	890	4,077		2,023
								Total	-	-	890	4,077	-	-	890	4,077	890	4,077	2/50.0	2,023
								Measured Indicated	-	-	890	4,077	337	3,235	1,227	7,312	1,227	7,312		3,656
								Total	-	-	890	4,077	337	3,235	1,227	7,312	1,227	7,312	2/50.0	3,656
Total .....	142,113	16,942	123,944	-	1,227	-	1,227	Total	-	-	890	4,077	337	3,235	1,227	7,312	1,227	7,312	2/50.0	3,656

RALEIGH COUNTY

TABLE 5. - RESERVES IN WINIFREDE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	1,442	17,590	-	4,078	2,416	1,662	Measured Indicated	-	-	-	-	1,662	15,434	1,662	15,434	1,662	15,434		9,785
								Total	-	-	-	-	1,662	15,434	1,662	15,434	1,662	15,434	63.40	9,785
Eccles .....	119,003	1,153	112,516	-	5,334	2,558	2,776	Measured Indicated	-	-	-	-	2,776	32,753	2,776	32,753	2,776	32,753		19,816
								Total	-	-	-	-	2,776	32,753	2,776	32,753	2,776	32,753	60.50	19,816
								Measured Indicated	-	-	-	-	4,438	48,187	4,438	48,187	4,438	48,187		29,601
								Total	-	-	-	-	4,438	48,187	4,438	48,187	4,438	48,187	61.43	29,601
Total .....	142,113	2,595	130,106	-	9,412	4,974	4,438	Total	-	-	-	-	4,438	48,187	4,438	48,187	4,438	48,187	61.43	29,601

RALEIGH COUNTY

TABLE 6. - RESERVES IN LOWER WINIFREDE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	4,852	17,206	-	1,052	-	1,052	Measured Indicated	-	-	-	-	586	5,298	586	5,298	586	5,298		3,359
								Total	-	-	-	-	1,052	9,631	1,052	9,631	1,052	9,631	63.4	6,106
								Measured Indicated	-	-	-	-	586	5,298	586	5,298	586	5,298		3,359
								Total	-	-	-	-	1,052	9,631	1,052	9,631	1,052	9,631	63.4	6,106
Total .....	23,110	4,852	17,206	-	1,052	-	1,052	Total	-	-	-	-	1,052	9,631	1,052	9,631	1,052	9,631	63.4	6,106

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALEIGH COUNTY

TABLE 7. - RESERVES IN UPPER HERNSHAW BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	20,957	1,340	-	813	-	813	Measured Indicated	-	-	407	2,198	406	2,862	813	5,060	813	5,060		2,783
								Total	-	-	407	2,198	406	2,862	813	5,060	813	5,060	2/55.0	2,783
Eccles .....	119,003	3,021	111,989	-	3,993	-	3,993	Measured Indicated	605	1,906	715	3,121	2,673	20,707	3,993	25,734	3,388	23,828		13,105
								Total	605	1,906	715	3,121	2,673	20,707	3,993	25,734	3,388	23,828	2/55.0	13,105
								Measured Indicated	605	1,906	1,122	5,319	3,079	23,569	4,806	30,794	4,201	28,888		15,888
								Total	605	1,906	1,122	5,319	3,079	23,569	4,806	30,794	4,201	28,888	2/55.0	15,888
Total .....	142,113	23,978	113,329	-	4,806	-	4,806	Total	605	1,906	1,122	5,319	3,079	23,569	4,806	30,794	4,201	28,888	2/55.0	15,888

RALEIGH COUNTY

TABLE 8. - RESERVES IN HERNSHAW BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	5,938	12,649	106	4,417	555	3,862	Measured Indicated	225	734	1,491	8,176	1,790	12,461	3,506	21,371	3,281	20,637		13,497
								Total	581	1,855	1,491	8,176	1,790	12,461	3,862	22,492	3,281	20,637	65.4	13,497
Eccles .....	119,003	11,439	102,606	867	4,091	4	4,087	Measured Indicated	1,669	5,454	1,554	8,049	864	6,113	4,087	19,616	2,418	14,162		9,262
								Total	1,669	5,454	1,554	8,049	864	6,113	4,087	19,616	2,418	14,162	65.4	9,262
								Measured Indicated	1,894	6,188	3,045	16,225	2,654	18,574	7,593	40,987	5,699	34,799		22,759
								Total	1,894	6,188	3,045	16,225	2,654	18,574	7,593	40,987	5,699	34,799	65.4	22,759
Total .....	142,113	17,377	115,255	973	8,508	559	7,949	Total	2,250	7,309	3,045	16,225	2,654	18,574	7,949	42,108	5,699	34,799	65.4	22,759

RALEIGH COUNTY

TABLE 9. - RESERVES IN LOWER HERNSHAW BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	18,762	2,955	-	1,393	427	966	Measured Indicated	426	1,246	540	2,592	-	-	966	3,838	540	2,592		1,296
								Total	426	1,246	540	2,592	-	-	966	3,838	540	2,592	2/50.0	1,296
Eccles .....	119,003	56,090	59,007	1,032	2,874	-	2,874	Measured Indicated	944	3,436	1,235	6,466	695	5,757	2,874	15,659	1,930	12,223		6,112
								Total	944	3,436	1,235	6,466	695	5,757	2,874	15,659	1,930	12,223	2/50.0	6,112
								Measured Indicated	1,370	4,682	1,775	9,058	695	5,757	3,840	19,497	2,470	14,815		7,408
								Total	1,370	4,682	1,775	9,058	695	5,757	3,840	19,497	2,470	14,815	2/50.0	7,408
Total .....	142,113	74,852	61,962	1,032	4,267	427	3,840	Total	1,370	4,682	1,775	9,058	695	5,757	3,840	19,497	2,470	14,815	2/50.0	7,408

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALEIGH COUNTY

TABLE 10. - RESERVES IN UPPER CEDAR GROVE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	11,596	10,374	45	1,095	306	789	Measured Indicated	-	-	568	3,238	221	1,392	789	4,630	789	4,630		2,315
								Total	-	-	568	3,238	221	1,392	789	4,630	789	4,630	2/50.0	2,315
								Measured Indicated	-	-	568	3,238	221	1,392	789	4,630	789	4,630		2,315
								Total	-	-	568	3,238	221	1,392	789	4,630	789	4,630	2/50.0	2,315
<b>Total .....</b>	<b>23,110</b>	<b>11,596</b>	<b>10,374</b>	<b>45</b>	<b>1,095</b>	<b>306</b>	<b>789</b>	<b>Total</b>	<b>-</b>	<b>-</b>	<b>568</b>	<b>3,238</b>	<b>221</b>	<b>1,392</b>	<b>789</b>	<b>4,630</b>	<b>789</b>	<b>4,630</b>	<b>2/50.0</b>	<b>2,315</b>

RALEIGH COUNTY

TABLE 11. - RESERVES IN ALMA BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	13,843	8,398	-	869	-	869	Measured Indicated	-	-	-	-	869	11,144	869	11,144	869	11,144		6,129
								Total	-	-	-	-	869	11,144	869	11,144	869	11,144	2/55.0	6,129
Eccles .....	119,003	18,760	96,591	-	3,652	-	3,652	Measured Indicated	-	-	887	4,674	2,765	25,530	3,652	30,204	3,652	30,204		16,612
								Total	-	-	887	4,674	2,765	25,530	3,652	30,204	3,652	30,204	2/55.0	16,612
								Measured Indicated	-	-	887	4,674	3,634	36,674	4,521	41,348	4,521	41,348		22,741
								Total	-	-	887	4,674	3,634	36,674	4,521	41,348	4,521	41,348	2/55.0	22,741
<b>Total .....</b>	<b>142,113</b>	<b>32,603</b>	<b>104,989</b>	<b>-</b>	<b>4,521</b>	<b>-</b>	<b>4,521</b>	<b>Total</b>	<b>-</b>	<b>-</b>	<b>887</b>	<b>4,674</b>	<b>3,634</b>	<b>36,674</b>	<b>4,521</b>	<b>41,348</b>	<b>4,521</b>	<b>41,348</b>	<b>2/55.0</b>	<b>22,741</b>

RALEIGH COUNTY

TABLE 12. - RESERVES IN CAMPBELL CREEK-PEERLESS BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	14,483	6,684	-	1,943	-	1,943	Measured Indicated	-	-	1,148	4,822	795	5,850	1,943	10,672	1,943	10,672		5,336
								Total	-	-	1,148	4,822	795	5,850	1,943	10,672	1,943	10,672	2/50.0	5,336
Eccles .....	119,003	15,766	93,673	-	9,564	-	9,564	Measured Indicated	169	634	393	2,055	8,781	80,753	9,343	83,442	9,174	82,808		41,404
								Total	169	634	407	2,116	8,988	82,274	9,564	85,024	9,395	84,390	2/50.0	42,195
								Measured Indicated	169	634	1,541	6,877	9,576	86,603	11,286	94,114	11,117	93,480		46,740
								Total	169	634	1,555	6,938	9,783	88,124	11,507	95,696	11,338	95,062	2/50.0	47,531
<b>Total .....</b>	<b>142,113</b>	<b>30,249</b>	<b>100,357</b>	<b>-</b>	<b>11,507</b>	<b>-</b>	<b>11,507</b>	<b>Total</b>	<b>169</b>	<b>634</b>	<b>1,555</b>	<b>6,938</b>	<b>9,783</b>	<b>88,124</b>	<b>11,507</b>	<b>95,696</b>	<b>11,338</b>	<b>95,062</b>	<b>2/50.0</b>	<b>47,531</b>

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALEIGH COUNTY

TABLE 13. - RESERVES IN CAMPBELL CREEK NO. 2 GAS BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	2,674	6,684	106	13,646	381	13,265	Measured Indicated	777	2,447	1,211	6,692	11,277	93,546	13,265	102,685	12,488	100,238		71,670
								Total	777	2,447	1,211	6,692	11,277	93,546	13,265	102,685	12,488	100,238	71.5	71,670
Eccles .....	119,003	6,502	93,661	261	18,579	588	17,991	Measured Indicated	229	894	7,162	36,901	10,600	86,186	17,991	123,981	17,762	123,087		83,084
								Total	229	894	7,162	36,901	10,600	86,186	17,991	123,981	17,762	123,087	67.5	83,084
								Measured Indicated	1,006	3,341	8,373	43,593	21,877	179,732	31,256	226,666	30,250	223,325		154,754
								Total	1,006	3,341	8,373	43,593	21,877	179,732	31,256	226,666	30,250	223,325	69.3	154,754
Total .....	142,113	9,176	100,345	367	32,225	969	31,256	Total	1,006	3,341	8,373	43,593	21,877	179,732	31,256	226,666	30,250	223,325	69.3	154,754

RALEIGH COUNTY

TABLE 14. - RESERVES IN UPPER POWELLTON BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Eccles .....	119,003	1,568	116,299	-	1,136	423	713	Measured Indicated	-	-	359	1,838	273	1,761	632	3,599	632	3,599		2,458
								Total	-	-	440	2,261	273	1,761	713	4,022	713	4,022	68.3	2,747
								Measured Indicated	-	-	359	1,838	273	1,761	632	3,599	632	3,599		2,458
								Total	-	-	440	2,261	273	1,761	713	4,022	713	4,022	68.3	2,747
Total .....	119,003	1,568	116,299	-	1,136	423	713	Total	-	-	440	2,261	273	1,761	713	4,022	713	4,022	68.3	2,747

RALEIGH COUNTY

TABLE 15. - RESERVES IN POWELLTON BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, <sup>1/</sup> acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	9,762	5,960	-	7,388	370	7,018	Measured Indicated	1,909	6,797	3,735	17,805	82	517	5,726	25,119	3,817	18,322		9,692
								Total	1,909	6,797	5,027	23,231	82	517	7,018	30,545	5,109	23,748	52.90	12,562
Eccles .....	119,003	10,616	92,953	147	15,287	492	14,795	Measured Indicated	5,432	20,187	5,058	25,638	1,885	14,548	12,375	60,373	6,943	40,186		27,447
								Total	1,094	3,732	571	2,739	755	4,691	2,420	11,162	1,326	7,430	68.30	32,522
								Measured Indicated	7,341	26,984	8,793	43,443	1,967	15,065	18,101	85,492	10,760	58,508		37,139
								Total	1,094	3,732	1,863	8,165	755	4,691	3,712	16,588	2,618	12,856	63.17	7,945
Total .....	142,113	20,378	98,913	147	22,675	862	21,813	Total	8,435	30,716	10,656	51,608	2,722	19,756	21,813	102,080	13,378	71,364	63.17	45,084

<sup>1/</sup> No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

RALEIGH COUNTY

TABLE 16. - RESERVES IN UPPER EAGLE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	22,785	170	-	155	-	155	Measured Indicated	-	-	-	-	155	953	155	953	155	953		534
								Total	-	-	-	-	155	953	155	953	155	953	56.00	534
Eccles .....	119,003	11,020	92,689	-	15,294	-	15,294	Measured Indicated	870	3,258	8,950	45,807	5,339	39,941	15,159	89,006	14,289	85,748		49,134
								Total	-	-	-	-	135	871	135	871	135	871	57.30	49,633
								Measured Indicated	870	3,258	8,950	45,807	5,494	40,894	15,314	89,959	14,444	86,701		49,668
								Total	-	-	-	-	135	871	135	871	135	871	57.29	50,167
Total .....	142,113	33,805	92,859	-	15,449	-	15,449	Total	870	3,258	8,950	45,807	5,629	41,765	15,449	90,830	14,579	87,572		

RALEIGH COUNTY

TABLE 17. - RESERVES IN EAGLE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Bald Knob ...	23,110	4,459	3,632	-	15,019	2,140	12,879	Measured Indicated	586	2,198	1,567	8,526	10,726	76,713	12,879	87,437	12,293	85,239		47,734
								Total	-	-	-	-	-	-	-	-	-	-	56.00	47,734
Eccles .....	119,003	11,474	82,730	-	24,799	3,035	21,764	Measured Indicated	535	2,167	1,508	7,068	19,721	172,096	21,764	181,331	21,229	179,164		102,661
								Total	-	-	-	-	-	-	-	-	-	-	57.30	102,661
								Measured Indicated	1,121	4,365	3,075	15,594	30,447	248,809	34,643	268,768	33,522	264,403		150,395
								Total	-	-	-	-	-	-	-	-	-	-	56.88	150,395
Total .....	142,113	15,933	86,362	-	39,818	5,175	34,643	Total	1,121	4,365	3,075	15,594	30,447	248,809	34,643	268,768	33,522	264,403		

RALEIGH COUNTY

TABLE 18. - RESERVES IN LITTLE EAGLE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Eccles .....	119,003	33,661	75,822	-	9,520	-	9,520	Measured Indicated	329	790	384	1,901	477	3,578	1,190	6,269	861	5,479		2,740
								Total	-	-	-	-	8,330	53,729	8,330	53,729	8,330	53,729		26,865
								Measured Indicated	329	790	384	1,901	477	3,578	1,190	6,269	861	5,479		2,740
								Total	-	-	-	-	8,330	53,729	8,330	53,729	8,330	53,729	2/50.0	29,605
Total .....	119,003	33,661	75,822	-	9,520	-	9,520	Total	329	790	384	1,901	8,807	57,307	9,520	59,998	9,191	59,208		

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALPH COUNTY

TABLE 19. - RESERVES IN LOWER WAR EAGLE BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons	
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick				
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons			
Bald Knob ...	23,110	-	852	22,258	-	-	-	Measured Indicated	-	-	-	-	-	-	-	-	-	-	-	-	-
								Total	-	-	-	-	-	-	-	-	-	-	-	-	-
Eccles .....	119,003	43,690	67,581	-	7,732	-	7,732	Measured Indicated	1,075	3,785	1,890	9,703	4,767	31,991	7,732	45,479	6,657	41,694	-	-	20,847
								Total	1,075	3,785	1,890	9,703	4,767	31,991	7,732	45,479	6,657	41,694	2/50.0	-	20,847
								Measured Indicated	1,075	3,785	1,890	9,703	4,767	31,991	7,732	45,479	6,657	41,694	-	-	20,847
								Total	1,075	3,785	1,890	9,703	4,767	31,991	7,732	45,479	6,657	41,694	2/50.0	-	20,847
Total .....	142,113	43,690	68,433	22,258	7,732	-	7,732	Total	1,075	3,785	1,890	9,703	4,767	31,991	7,732	45,479	6,657	41,694	2/50.0	-	20,847

RALPH COUNTY

TABLE 20. - RESERVES IN GILBERT BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons	
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick				
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons			
Eccles .....	119,003	62,199	48,699	2,114	5,991	-	5,991	Measured Indicated	2,344	7,793	2,504	11,775	-	-	4,848	19,568	2,504	11,775	-	-	5,299
								Total	2,344	7,793	3,647	16,747	-	-	5,991	24,540	3,647	16,747	2/45.0	-	7,536
Beckley .....	71,262	536	70,547	-	179	-	179	Measured Indicated	-	-	179	993	-	-	179	993	179	993	-	-	447
								Total	-	-	179	993	-	-	179	993	179	993	2/45.0	-	447
								Measured Indicated	2,344	7,793	2,683	12,768	-	-	5,027	20,561	2,683	12,768	-	-	5,746
								Total	2,344	7,793	3,826	17,740	-	-	6,170	25,533	3,826	17,740	2/45.0	-	7,983
Total .....	190,265	62,735	119,246	2,114	6,170	-	6,170	Total	2,344	7,793	3,826	17,740	-	-	6,170	25,533	3,826	17,740	2/45.0	-	7,983

RALPH COUNTY

TABLE 21. - RESERVES IN SEWELL BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons	
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick				
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons			
Eccles .....	119,003	106,462	107	958	11,476	1,547	9,929	Measured Indicated	2,758	8,074	3,390	16,079	3,781	30,496	9,929	54,649	7,171	46,575	-	-	24,731
								Total	2,758	8,074	3,390	16,079	3,781	30,496	9,929	54,649	7,171	46,575	53.10	-	24,731
Beckley .....	71,262	469	46,307	154	24,332	18,141	6,191	Measured Indicated	518	1,370	2,337	11,217	3,336	23,149	6,191	35,736	5,673	34,366	-	-	19,726
								Total	518	1,370	2,337	11,217	3,336	23,149	6,191	35,736	5,673	34,366	57.40	-	19,726
Mullens .....	54,209	23,005	30,174	59	971	81	890	Measured Indicated	245	772	142	660	503	3,169	890	4,601	645	3,829	-	-	1,436
								Total	245	772	142	660	503	3,169	890	4,601	645	3,829	37.50	-	1,436
Flattop .....	93,047	3,820	85,491	-	3,736	154	3,582	Measured Indicated	402	1,035	196	1,008	1,933	12,600	2,531	14,643	2,129	13,608	-	-	7,770
								Total	402	1,035	196	1,008	2,984	19,065	3,582	21,108	3,180	20,073	57.10	-	11,462
								Measured Indicated	3,923	11,251	6,065	28,964	9,553	69,414	19,541	109,629	15,618	98,378	-	-	53,663
								Total	3,923	11,251	6,065	28,964	10,604	75,879	20,592	116,094	16,669	104,843	54.71	-	57,355
Total .....	337,521	133,756	162,079	1,171	40,515	19,923	20,592	Total	3,923	11,251	6,065	28,964	10,604	75,879	20,592	116,094	16,669	104,843	54.71	-	57,355

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALEIGH COUNTY

TABLE 22. - RESERVES IN BECKLEY BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.					
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Eccles .....	119,003	80,470	-	3,224	35,309	1,787	33,522	Measured Indicated	2,990 3,384	10,398 9,890	7,097 -	38,517 -	13,527 6,524	128,510 41,100	23,614 9,908	177,425 50,990	20,624 6,524	167,027 41,100		83,179 20,468
								Total	6,374	20,288	7,097	38,517	20,051	169,610	33,522	228,415	27,148	208,127	49.80	103,647
Beckley .....	71,262	17,985	20,750	3,731	28,796	5,963	22,833	Measured Indicated	6,857 704	20,364 1,478	8,017 1,074	40,045 4,511	5,908 273	53,263 1,720	20,782 2,051	113,672 7,709	13,925 1,347	93,308 6,231		55,052 3,676
								Total	7,561	21,842	9,091	44,556	6,181	54,983	22,833	121,381	15,272	99,539	59.00	58,728
Mullens .....	54,209	1,267	14,137	3,616	35,189	14,349	20,840	Measured Indicated	4,655 -	15,092 -	8,804 1,633	43,531 7,838	5,748 -	50,083 -	19,207 1,633	108,706 7,838	14,552 1,633	93,614 7,838		55,232 4,624
								Total	4,655	15,092	10,437	51,369	5,748	50,083	20,840	116,544	16,185	101,452	59.00	59,856
Flattop .....	93,047	24,637	49,844	1,254	17,312	7,650	9,662	Measured Indicated	2,519 -	8,323 -	2,381 475	12,004 2,138	4,287 -	31,909 -	9,187 475	52,236 2,138	6,668 475	43,913 2,138		25,909 1,261
								Total	2,519	8,323	2,856	14,142	4,287	31,909	9,662	54,374	7,143	46,051	59.00	27,170
								Measured Indicated	17,021 4,088	54,177 11,368	26,299 3,182	134,097 14,487	29,470 6,797	263,765 42,820	72,790 14,067	452,039 68,675	55,769 9,979	397,862 57,307		219,372 30,029
Total	21,109	65,545	29,481	148,584	36,267	306,585	86,857	520,714	65,748	455,169	54.79	249,401								

RALEIGH COUNTY

TABLE 23. - RESERVES IN FIRE CREEK BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.					
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Beckley .....	71,262	22,255	17,259	7,608	24,140	1,490	22,650	Measured Indicated	9,745 6,961	30,268 16,707	5,353 -	26,105 -	591 -	4,125 -	15,689 6,961	60,498 16,707	5,944 -	30,230 -		16,627 -
								Total	16,706	46,975	5,353	26,105	591	4,125	22,650	77,205	5,944	30,230	2/55.0	16,627
Meadow Creek .	16,595	757	13,485	942	1,411	-	1,411	Measured Indicated	376 -	1,184 -	548 -	2,630 -	487 -	4,091 -	1,411 -	7,905 -	1,035 -	6,721 -		3,697 -
								Total	376	1,184	548	2,630	487	4,091	1,411	7,905	1,035	6,721	2/55.0	3,697
Mullens .....	54,209	38,492	11,301	2,485	1,931	-	1,931	Measured Indicated	1,469 -	4,543 -	462 -	2,841 -	- -	- -	1,931 -	7,384 -	462 -	2,841 -		1,563 -
								Total	1,469	4,543	462	2,841	-	-	1,931	7,384	462	2,841	2/55.0	1,563
Flattop .....	93,047	56,334	27,658	500	8,555	116	8,439	Measured Indicated	1,713 -	4,743 -	2,081 -	10,748 -	4,645 -	34,578 -	8,439 -	50,069 -	6,726 -	45,326 -		24,929 -
								Total	1,713	4,743	2,081	10,748	4,645	34,578	8,439	50,069	6,726	45,326	2/55.0	24,929
								Measured Indicated	13,303 6,961	40,738 16,707	8,444 -	42,324 -	5,723 -	42,794 -	27,470 6,961	125,856 16,707	14,167 -	85,118 -		46,816 -
Total	20,264	57,445	8,444	42,324	5,723	42,794	34,431	142,563	14,167	85,118	2/55.0	46,816								

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated  
4817



RALEIGH COUNTY

TABLE 24. - RESERVES IN POCAHONTAS NO. 6 BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Mullens .....	54,209	36,993	4,517	7,588	5,111	23	5,088	Measured Indicated	1,654 707	4,818 2,227	2,537 -	13,181 -	190 -	1,397 -	4,381 707	19,396 2,227	2,727 -	14,578 -		9,592 -
								Total	2,361	7,045	2,537	13,181	190	1,397	5,088	21,623	2,727	14,578	65.8	9,592
Flattop .....	93,047	86,492	1,906	539	4,110	13	4,097	Measured Indicated	1,897 842	5,701 2,779	936 -	4,133 -	422 -	2,975 -	3,255 842	12,809 2,779	1,358 -	7,108 -		4,677 -
								Total	2,739	8,480	936	4,133	422	2,975	4,097	15,588	1,358	7,108	65.8	4,677
								Measured Indicated	3,551 1,549	10,519 5,006	3,473 -	17,314 -	612 -	4,372 -	7,636 1,549	32,205 5,006	4,085 -	21,686 -		14,269 -
								Total	5,100	15,525	3,473	17,314	612	4,372	9,185	37,211	4,085	21,686	65.8	14,269

RALEIGH COUNTY

TABLE 25. - RESERVES IN POCAHONTAS NO. 4 BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Beckley .....	71,262	68,851	-	1,096	1,315	-	1,315	Measured Indicated	910 -	2,584 -	283 -	1,383 -	122 -	878 -	1,315 -	4,845 -	405 -	2,261 -		1,445 -
								Total	910	2,584	283	1,383	122	878	1,315	4,845	405	2,261	2/63.9	1,445
Mullens .....	54,209	22,866	2,430	2,136	26,777	4,840	21,937	Measured Indicated	2,967 -	9,755 -	14,436 -	74,375 -	4,534 -	27,035 -	21,937 -	111,165 -	18,970 -	101,410 -		64,801 -
								Total	2,967	9,755	14,436	74,375	4,534	27,035	21,937	111,165	18,970	101,410	63.9	64,801
Flattop .....	93,047	64,274	4,611	1,400	22,762	8,076	14,686	Measured Indicated	4,264 -	14,900 -	3,864 -	19,737 -	6,558 -	42,284 -	14,686 -	76,921 -	10,422 -	62,021 -		39,631 -
								Total	4,264	14,900	3,864	19,737	6,558	42,284	14,686	76,921	10,422	62,021	63.9	39,631
								Measured Indicated	8,141 -	27,239 -	18,583 -	95,495 -	11,214 -	70,197 -	37,938 -	192,931 -	29,797 -	165,692 -		105,877 -
								Total	8,141	27,239	18,583	95,495	11,214	70,197	37,938	192,931	29,797	165,692	63.9	105,877

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

RALEIGH COUNTY

TABLE 26. - RESERVES IN POCAHONTAS NO. 3 BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Eccles .....	119,003	116,767	-	491	1,745	-	1,745	Measured Indicated	-	-	123	664	310	18,185	433	18,849	433	18,849		10,367
								Total	-	-	496	2,678	1,249	72,535	1,745	75,213	1,745	75,213	2/55.0	41,367
Beckley .....	71,262	61,464	7,459	-	2,339	-	2,339	Measured Indicated	190	570	359	1,669	212	1,696	761	3,935	571	3,365		1,851
								Total	366	934	1,030	4,790	182	1,201	1,578	6,925	1,212	5,991	2/55.0	3,295
Meadow Creek .	16,595	6,243	9,991	-	361	-	361	Measured Indicated	361	1,083	-	-	-	-	361	1,083	-	-		-
								Total	-	-	-	-	-	-	-	-	-	-	-	-
Mullens .....	54,209	13,223	820	2,240	37,926	9,945	27,981	Measured Indicated	229	721	19,217	95,445	2,853	17,933	22,299	114,099	22,070	113,378		61,451
								Total	-	-	5,682	27,274	-	-	5,682	27,274	5,682	27,274	54.2	14,783
Flattop .....	93,047	63,450	3,087	648	25,862	3,073	22,789	Measured Indicated	5,049	15,905	14,213	70,254	2,993	21,547	22,255	107,706	17,206	91,801		55,907
								Total	-	-	187	898	347	2,759	534	3,657	534	3,657	60.9	2,227
Big Bend .....	22,636	2,005	20,466	-	165	-	165	Measured Indicated	-	-	37	200	128	845	165	1,045	165	1,045		575
								Total	-	-	-	-	-	-	-	-	-	-	2/55.0	-
								Measured Indicated	5,829	18,279	33,949	168,232	6,496	60,206	46,274	246,717	40,445	228,438		130,151
								Total	366	934	7,272	34,976	1,468	58,310	9,106	94,220	8,740	93,286		51,305
Total .....	399,862	286,262	41,823	3,379	68,398	13,018	55,380	Total	6,195	19,213	41,221	203,208	7,964	118,516	55,380	340,937	49,185	321,724	56.4	181,456

RALEIGH COUNTY

TABLE 27. - RESERVES IN POCAHONTAS NO. 2 BED, January 1, 1949

Quadrangle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Area of quadrangle in county, acres	Areas excluded from estimate, 1/ acres	Area outside outcrop, acres	Underlain by coal 0" to 14" thick, acres	Coal over 14" thick, in place originally, acres	Mined out, acres	Coal over 14" thick remaining, acres	Measured Indicated	Estimated coal reserves, in tons of 2,000 lb.						Total reserves, in tons of 2,000 lb.				Percentage recoverable, including all mining losses	Estimated recoverable reserves 28" and more thick, thousands of tons
									14" to 28" thick		28" to 42" thick		Over 42" thick		14" and more thick		28" and more thick			
									Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons	Acres	Thousands of tons		
Mullens .....	54,209	49,631	-	-	4,578	-	4,578	Measured Indicated	-	-	-	-	-	-	-	-	-	-		-
								Total	4,578	17,168	-	-	-	-	4,578	17,168	-	-	-	-
Flattop .....	93,047	88,082	-	-	4,965	6	4,959	Measured Indicated	755	2,831	1,562	7,263	-	-	2,317	10,094	1,562	7,263		3,632
								Total	2,642	10,303	-	-	-	-	2,642	10,303	-	-	2/50.0	-
								Measured Indicated	755	2,831	1,562	7,263	-	-	2,317	10,094	1,562	7,263		3,632
								Total	7,220	27,471	-	-	-	-	7,220	27,471	-	-		-
Total .....	147,256	137,713	-	-	9,543	6	9,537	Total	7,975	30,302	1,562	7,263	-	-	9,537	37,565	1,562	7,263	2/50.0	3,632

1/ No information available from core drilling, mine workings, or coal outcrops on which to base estimates of measured and indicated reserves. These areas may contain additional geologically inferred reserves.

2/ Estimated

Table 28 is a recapitulation by beds in Raleigh County. Reserves in all beds 14 inches and more thick are estimated at 2,532,404,000 short tons as of January 1, 1949. Of this total, 2,237,125,000 short tons are in beds 28 inches and more thick. Recoverable reserves in beds 28 inches and more thick are estimated at 1,290,948,000 tons.

TABLE 28. - Recapitulation of reserves, Raleigh County, W. Va., January 1, 1949

Bed	Thousands of tons		Recoverable <sup>1/</sup>	
	In beds 14 inches and more thick	In beds 28 inches and more thick	Percentage	Thousands of tons
	Upper 5 Block .....	970	970	63.40
5 Block .....	13,509	13,509	61.84	8,354
Stockton Lewiston .....	7,311	7,151	<u>2/</u> 50.00	3,576
Coalburg .....	7,312	7,312	<u>2/</u> 50.00	3,656
Winifrede .....	48,187	48,187	61.43	29,601
Lower Winifrede .....	9,631	9,631	63.40	6,106
Upper Hernshaw .....	30,794	28,888	<u>2/</u> 55.00	15,888
Middle Hernshaw .....	42,108	34,799	65.40	22,759
Lower Hernshaw .....	19,497	14,815	<u>2/</u> 50.00	7,408
Upper Cedar Grove .....	4,630	4,630	<u>2/</u> 50.00	2,315
Alma .....	41,348	41,348	<u>2/</u> 55.00	22,741
Campbell Creek-Peerless ..	95,696	95,062	<u>2/</u> 50.00	47,531
Campbell Creek-No. 2 Gas..	226,666	223,325	69.30	154,764
Upper Powellton .....	4,022	4,022	68.30	2,747
Powellton .....	102,080	71,364	63.17	45,084
Upper Eagle .....	90,830	87,572	57.29	50,167
Eagle .....	268,768	264,403	56.88	150,395
Little Eagle .....	59,998	59,208	<u>2/</u> 50.00	29,605
Lower War Eagle .....	45,479	41,694	<u>2/</u> 50.00	20,847
Gilbert .....	25,533	17,740	<u>2/</u> 45.00	7,983
Sewell .....	116,094	104,843	54.71	57,355
Beckley .....	520,714	455,169	54.79	249,401
Fire Creek .....	142,563	85,118	<u>2/</u> 55.00	46,816
Pocahontas No. 6 .....	37,211	21,686	65.80	14,269
Pocahontas No. 4 .....	192,931	165,692	63.90	105,877
Pocahontas No. 3 .....	340,937	321,724	56.40	181,456
Pocahontas No. 2 .....	37,565	7,263	<u>2/</u> 50.00	3,632
Total .....	2,532,384	2,237,125	57.71	1,290,948

<sup>1/</sup> Based on reserves in beds 28 inches and more thick.

<sup>2/</sup> Estimated.

The weighted average percentage recovery for each bed, or the estimated percentage recovery where no production records are available, is shown in column 19 of tables 1 to 27, inclusive. The highest percentage of recovery is 71.5 for the Campbell Creek-No. 2 Gas bed in the Bald Knob quadrangle. The lowest is 37.5 percent for the Sewell bed in the Mullens quadrangle. The weighted average percentage of recovery, including all mining losses for all beds in the county, is 57.71. Based on this recovery for all beds, the known recoverable reserves 28 inches and more thick in Raleigh County are estimated at 1,290,948,000 short tons as of January 1, 1949.

Krebs and Teets<sup>5/</sup> estimated the original reserves of coal 12 inches and more thick in 1916 for Raleigh County. This estimate was based on 25 cubic feet of coal in place per ton, or 1,742 tons per acre-foot. Reserves were tabulated for each bed by districts, with an average bed thickness given for each bed in each district. As the Krebs and Teets estimate concerned coal originally in place, no information was given as to the acres of coal mined out or the tons of recoverable coal remaining as of the date of the estimate. Thus, no comparison of the two estimates can be made, except in a general way. Table 29 summarizes the two estimates. Comparing the area of any coal bed in the two estimates, it must be remembered that the Bureau of Mines estimate does not include areas in which coal may be present, but the coal cannot be designated as measured or indicated according to the definitions set up for the study. The reserves given in table 29 for any bed are not on a comparable basis, because in the Krebs and Teets estimate the reserves are original before mining whereas in the Bureau of Mines estimate they are the remaining measured and indicated reserves after mining to January 1, 1949. The Annual Report of the Department of Mines, West Virginia, for 1948, shows that the total amount of coal mined in Raleigh County to December 31, 1948, is 451,431,178 tons. Based on the weighted average percentage of recovery of 57.71 for the county, the total production represents 782,241,000 tons of coal originally in place. The Bureau of Mines estimate shows 2,532,384,000 tons of coal 14 inches and more thick remaining. The sum of these two figures, or 3,284,625,000 tons would represent the original reserves in 514,412 acres of coal beds as compared with the estimate by Krebs and Teets of 4,283,367,000 tons in 823,048 acres of coal beds.

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<sup>5/</sup> Krebs, Charles E., and Teets, D. D., Jr., Raleigh County and the Western Portions of Mercer and Summers Counties: West Virginia Geol. Survey County Repts., 1916, 778 pp.

TABLE 29. - Summary of estimates, Raleigh County, W. Va.

Bed	Krebs and Teets - 1916		Bureau of Mines - 1949			
	Original reserves		Coal over 14 inches thick, acres	Mined out, acres	Coal over 14 inches thick remaining, acres	Remaining reserves, 14 inches and more thick, thousands of tons
	Acres	Thousands of tons				
Upper No. 5 Block .....	-	-	286	190	96	970
No. 5 Block .....	2,368	3,613	942	42	900	13,509
Stockton-Lewiston .....	4,480	1,673	890	-	890	7,311
Coalburg .....	-	-	1,227	-	1,227	7,312
Winifrede .....	11,840	15,980	9,412	4,974	4,438	48,187
Lower Winifrede .....	-	-	1,052	-	1,052	9,631
Upper Hernshaw .....	-	-	4,806	-	4,806	30,794
Hernshaw .....	19,840	7,471	8,508	559	7,949	42,108
Lower Hernshaw .....	-	-	4,267	427	3,840	19,497
Upper Cedar Grove .....	33,280	11,999	1,095	306	789	4,630
Alma .....	39,680	252,021	4,521	-	4,521	41,348
Campbell Creek-Peerless .....	-	-	11,507	-	11,507	95,696
Campbell Creek-No. 2 Gas .....	43,200	272,985	32,225	969	31,256	226,666
Upper Powellton .....	-	-	1,136	423	713	4,022
Powellton .....	10,240	55,769	22,675	862	21,813	102,080
Upper Eagle .....	-	-	15,449	-	15,449	90,830
Eagle .....	56,320	441,594	39,818	5,175	34,643	268,768
Little Eagle .....	24,960	138,312	9,520	-	9,520	59,998
Lower War Eagle .....	73,800	293,555	7,732	-	7,732	45,479
Gilbert .....	7,680	30,109	6,170	-	6,170	25,533
Sewell .....	97,280	558,683	40,515	19,923	20,592	116,094
Beckley .....	121,600	880,956	116,606	29,749	86,857	520,714
Fire Creek .....	76,800	334,540	36,037	1,606	34,431	142,563
Pocahontas No. 8 .....	16,000	27,878	-	-	-	-
Pocahontas No. 6 .....	39,680	155,004	9,221	36	9,185	37,211
Pocahontas No. 4 .....	-	-	50,854	12,916	37,938	192,931
Pocahontas No. 3 .....	104,320	622,948	68,398	13,018	55,380	340,937
Pocahontas No. 2 .....	39,680	138,277	9,543	6	9,537	37,565
Total .....	823,048	4,283,367	514,412	91,181	423,231	2,532,384

COAL BEDS

The coal beds and/or splits occurring in Raleigh County in which known recoverable reserves have been estimated are, in descending order:

- Upper 5 Block
- 5 Block
- Stockton Lewiston
- Coalburg
- Winifrede
- Lower Winifrede
- Upper Hernshaw
- Hernshaw
- Lower Hernshaw
- Upper Cedar Grove

Alma  
 Campbell Creek-Peerless  
 Campbell Creek-No. 2 Gas  
 Upper Powellton  
 Powellton  
 Upper Eagle  
 Eagle  
 Little Eagle  
 Lower War Eagle  
 Gilbert  
 Sewell  
 Beckley  
 Fire Creek  
 Pocahontas No. 6  
 Pocahontas No. 4  
 Pocahontas No. 3  
 Pocahontas No. 2

The No. 5 Block is in the Allegheny group, and all other beds are in the underlying Pottsville group, both of the Pennsylvanian period.<sup>6/</sup>

From the standpoint of present production as taken from the 1949 Annual Report of the West Virginia Department of Mines, the following tabulation shows the order of importance of the beds:

<u>Bed</u>	<u>Tons</u>
Pocahontas No. 4 .....	2,348,042
Beckley .....	1,576,293
Pocahontas No. 3 .....	1,506,525
Sewell .....	1,489,208
Winifrede .....	766,537
Campbell Creek-Peerless .....	) 1,587,477
Campbell Creek-No. 2 Gas .....	
Eagle .....	332,030
No. 5 Block .....	228,335
Powellton .....	200,222
<u>Hernshaw</u> .....	134,707

<sup>1/</sup> No separation is made in the State report between production from the Campbell Creek-Peerless and Campbell Creek-No. 2 Gas.

On the basis of total tons of known recoverable reserves (column 20 in tables 1 to 27, inclusive), the rank of importance of the first 10 beds is shown by the following tabulation:

<u>Bed</u>	<u>Thousands of tons</u>
Beckley .....	249,401
Eagle and Upper Eagle .....	200,562
Pocahontas No. 3 .....	181,456
Campbell Creek-No. 2 Gas .....	154,754
Pocahontas No. 4 .....	105,877
Sewell .....	57,355
Powellton and Upper Powellton .....	47,831
Campbell Creek-Peerless .....	47,531
Hernshaw (Upper, Middle, and Lower) .....	46,055
Winifrede and Lower Winifrede .....	35,707

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<sup>6/</sup> Krebs, Charles E., and Teets, D. D., Jr., Work cited in footnote 5.

Figure 2. - No. 5 Block bed, Raleigh County, W. Va., January 1, 1949.

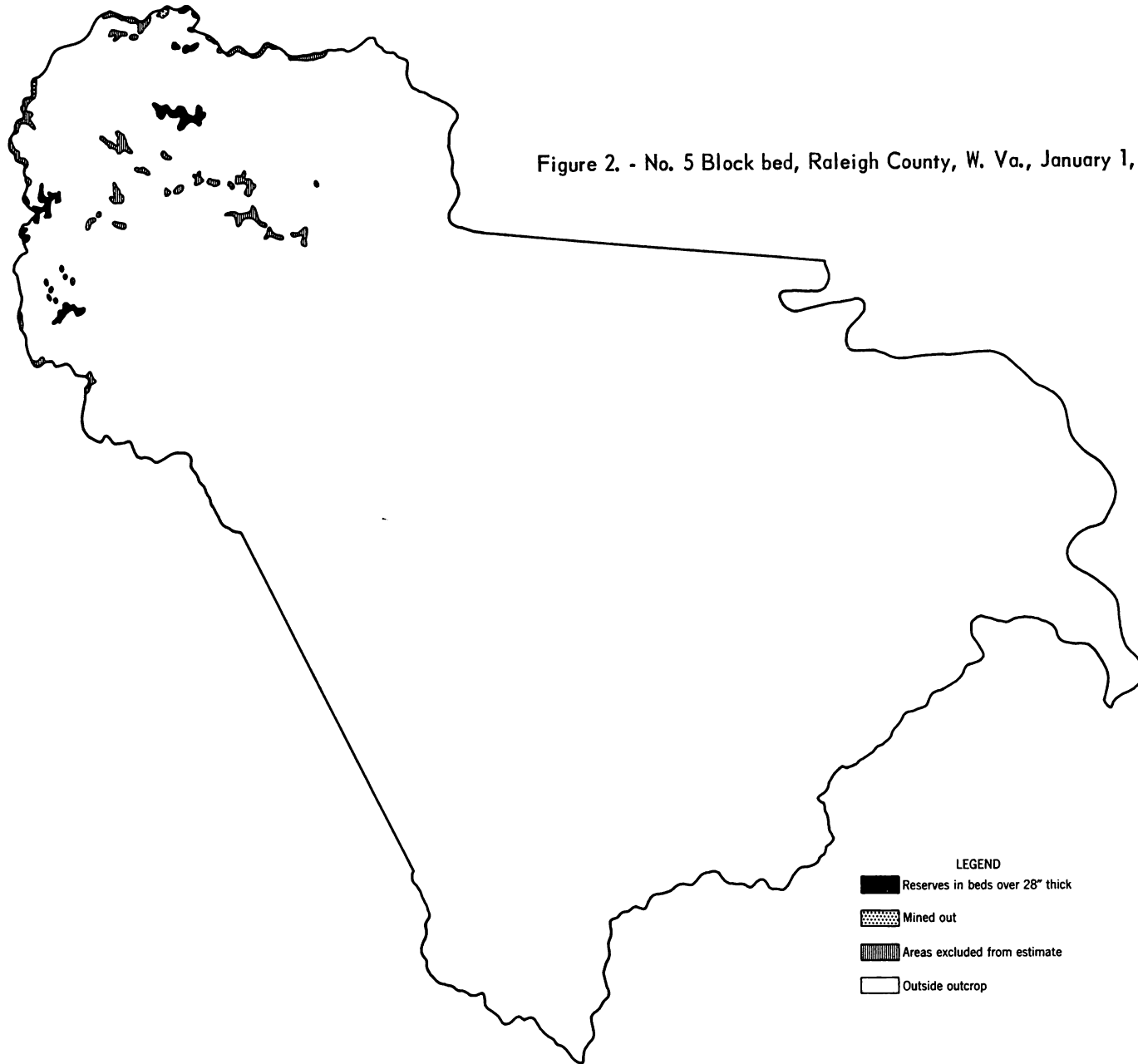






Figure 3. - Winifrede bed, Raleigh County, W. Va., January 1, 1949.

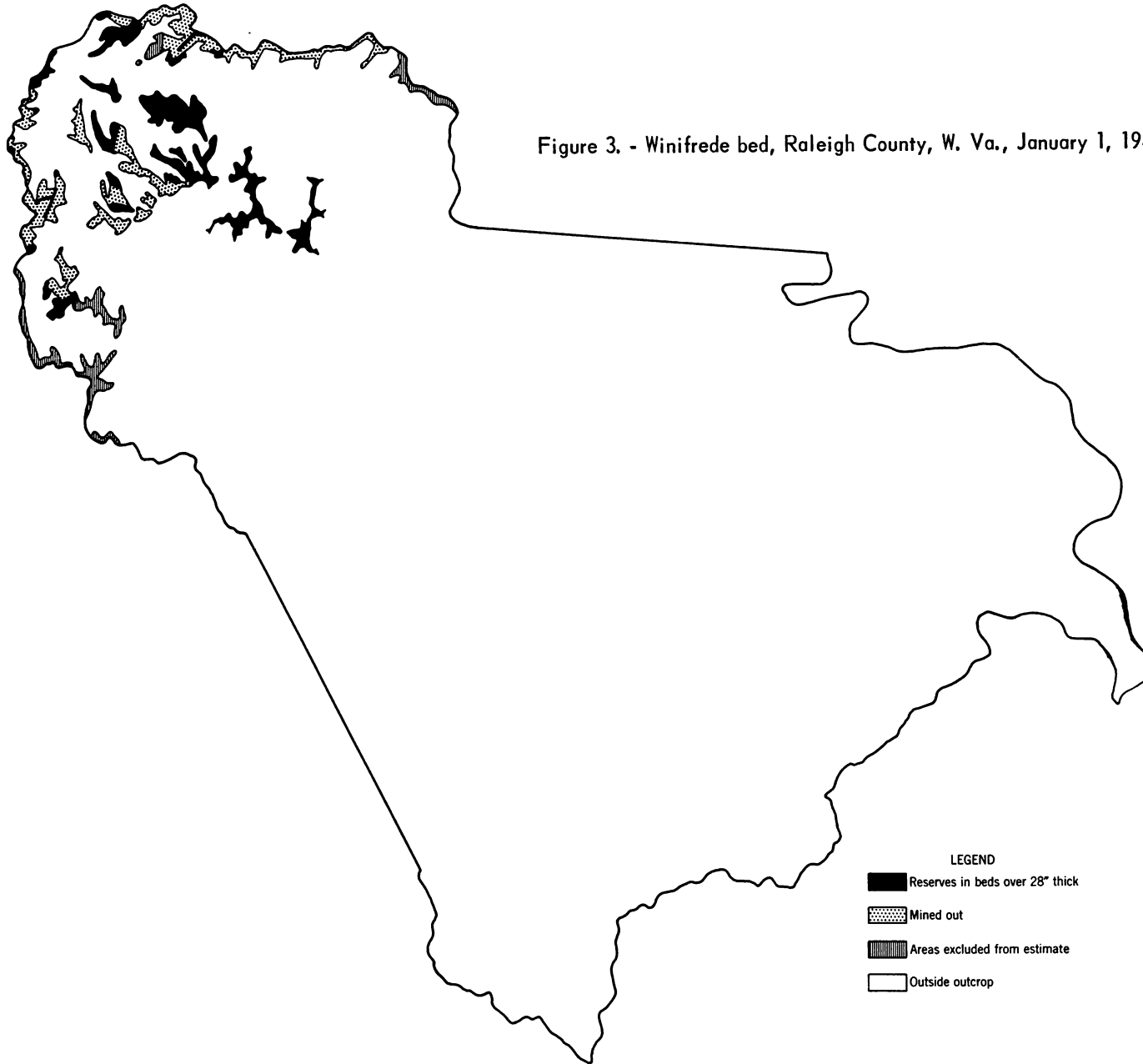




Figure 4. - Hernshaw bed, Raleigh County, W. Va., January 1, 1949.

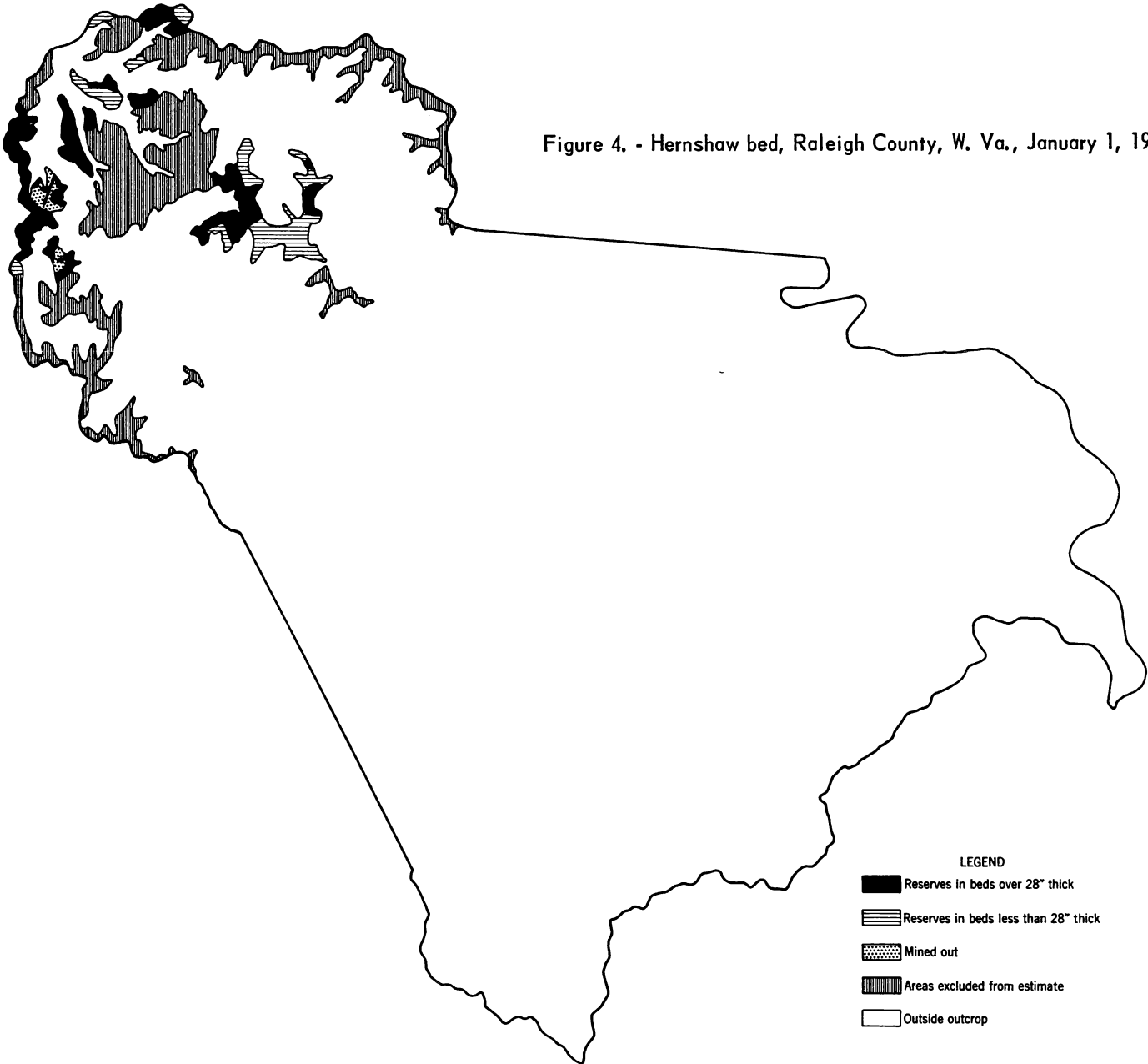
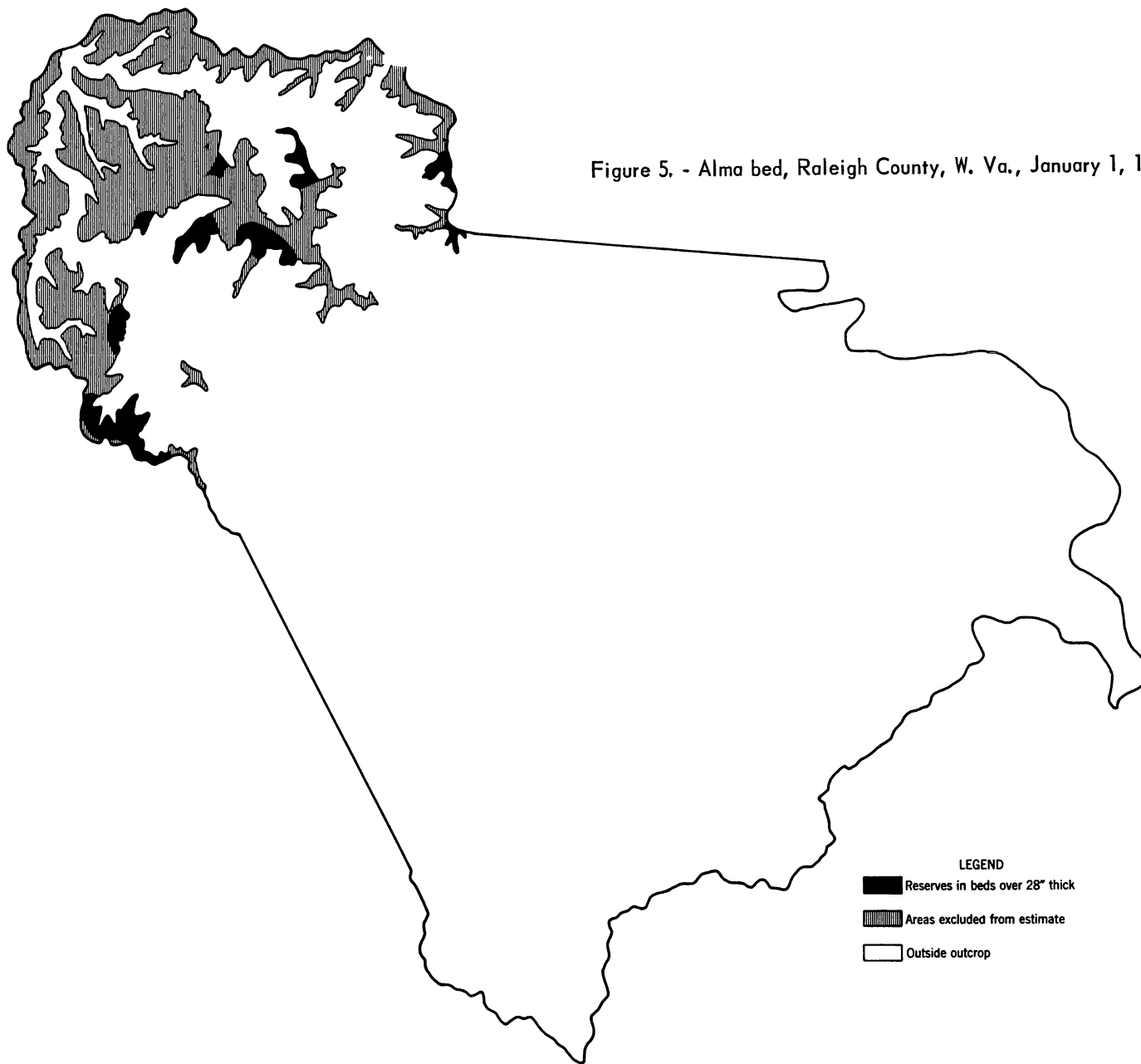




Figure 5. - Alma bed, Raleigh County, W. Va., January 1, 1949.





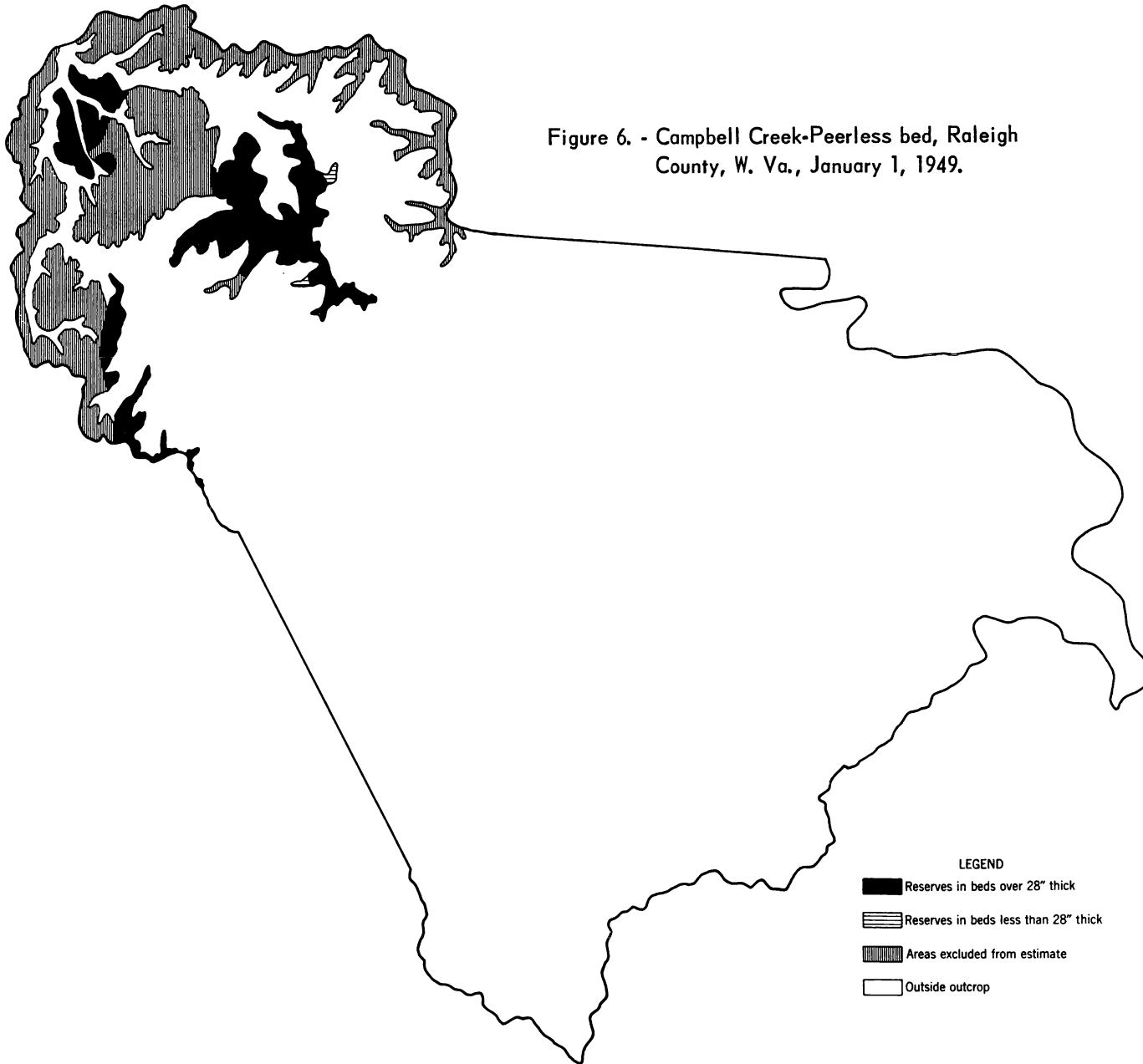
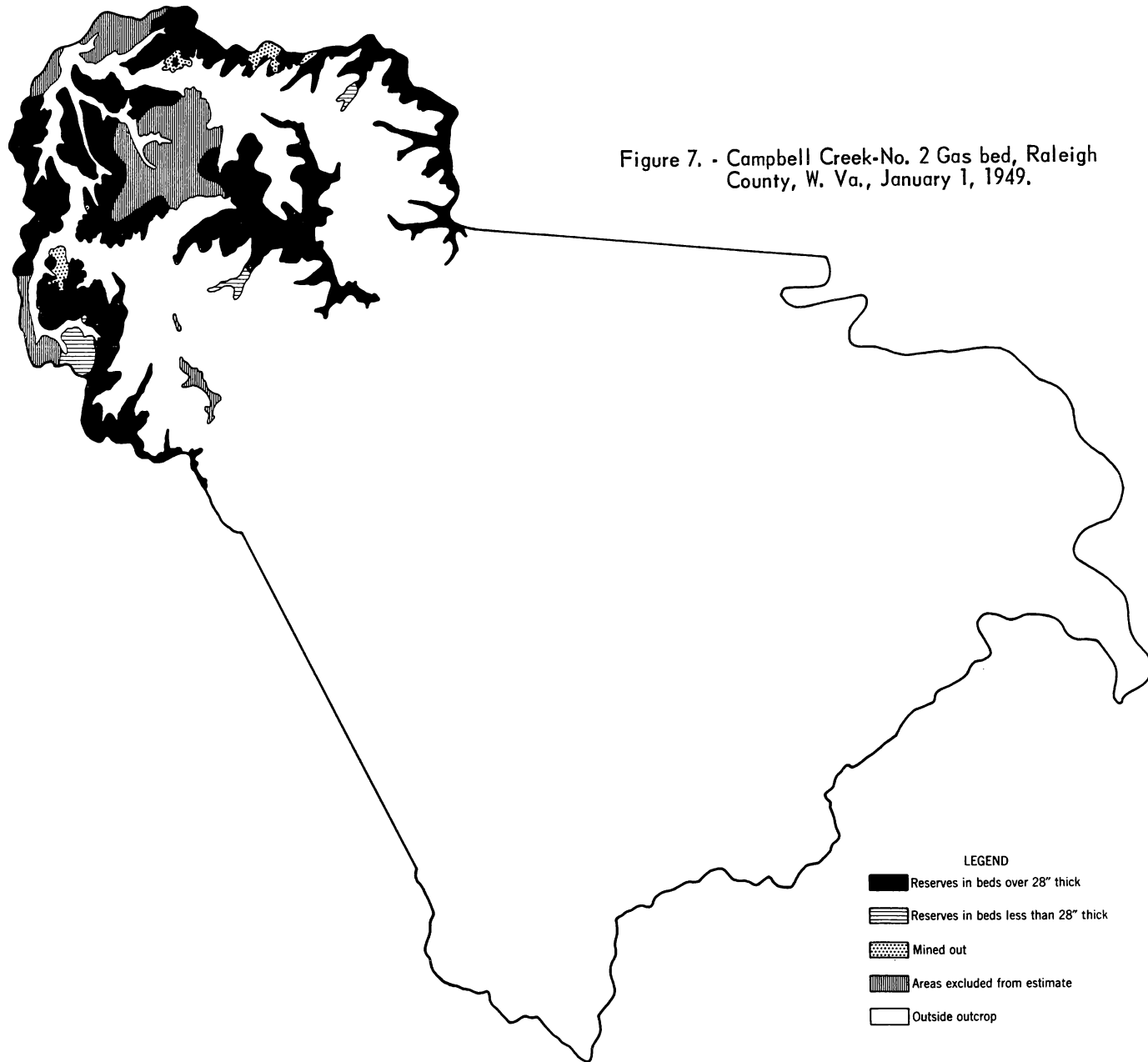






Figure 7. - Campbell Creek-No. 2 Gas bed, Raleigh County, W. Va., January 1, 1949.





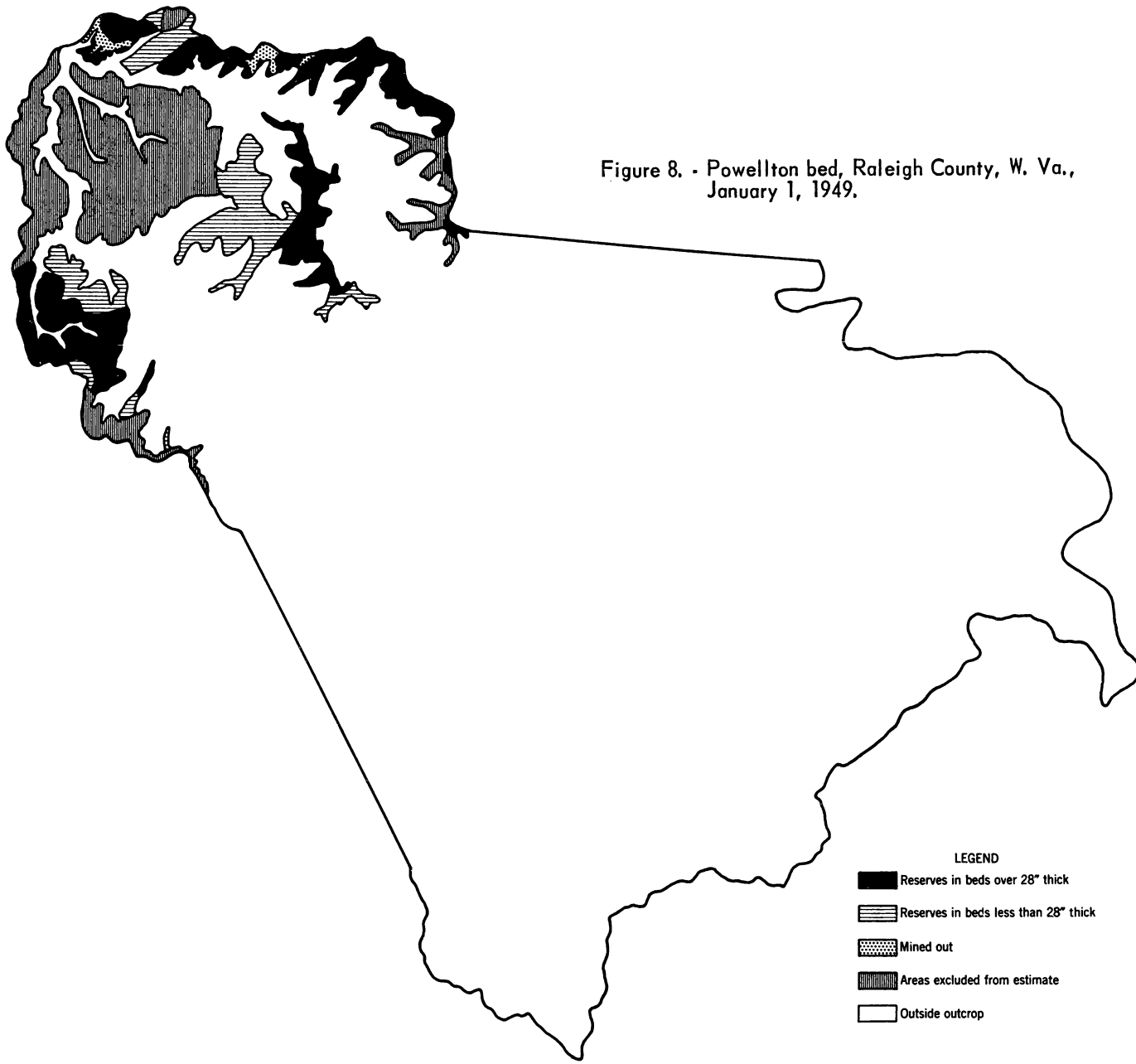
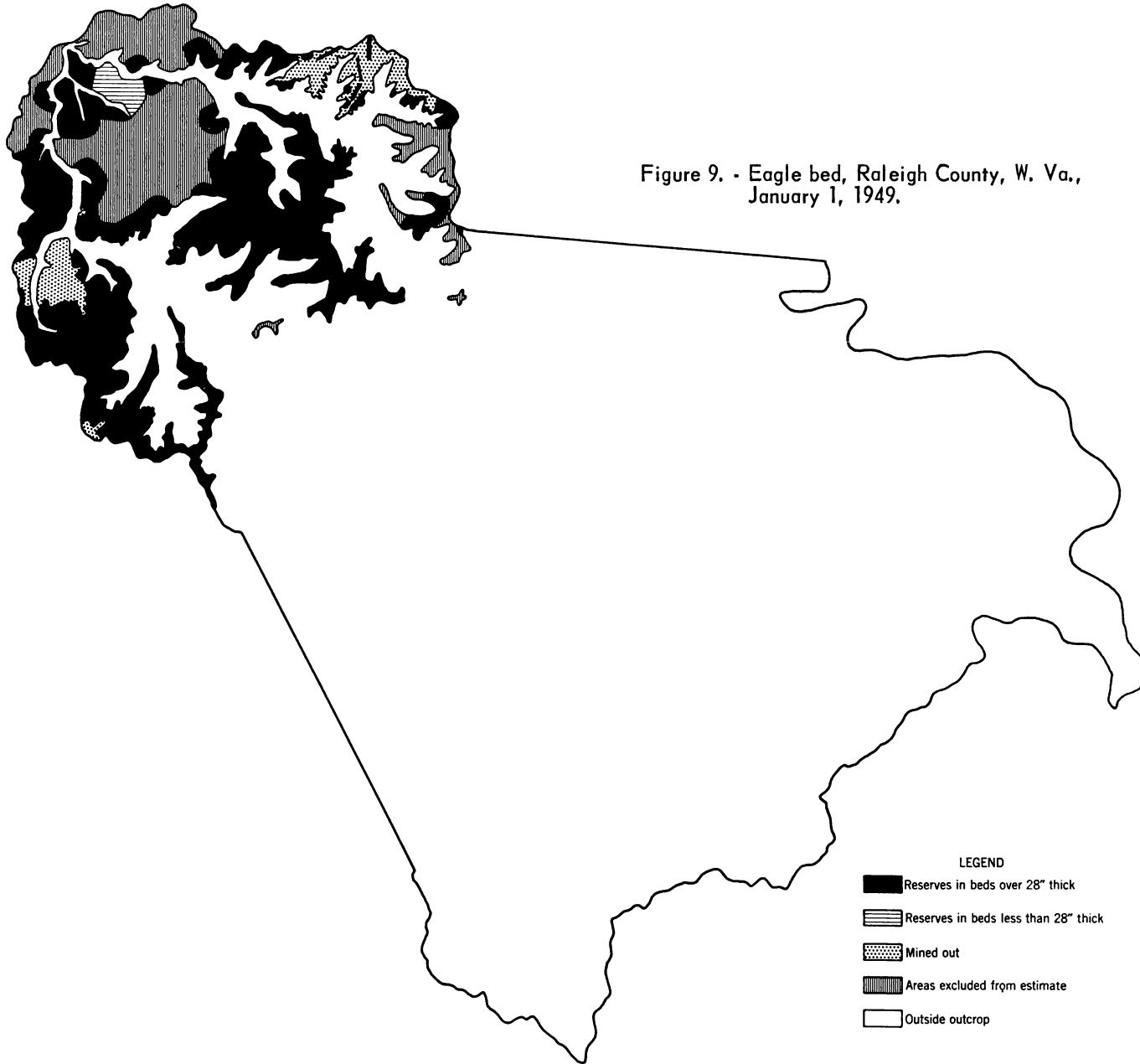


Figure 8. - Powellton bed, Raleigh County, W. Va.,  
January 1, 1949.







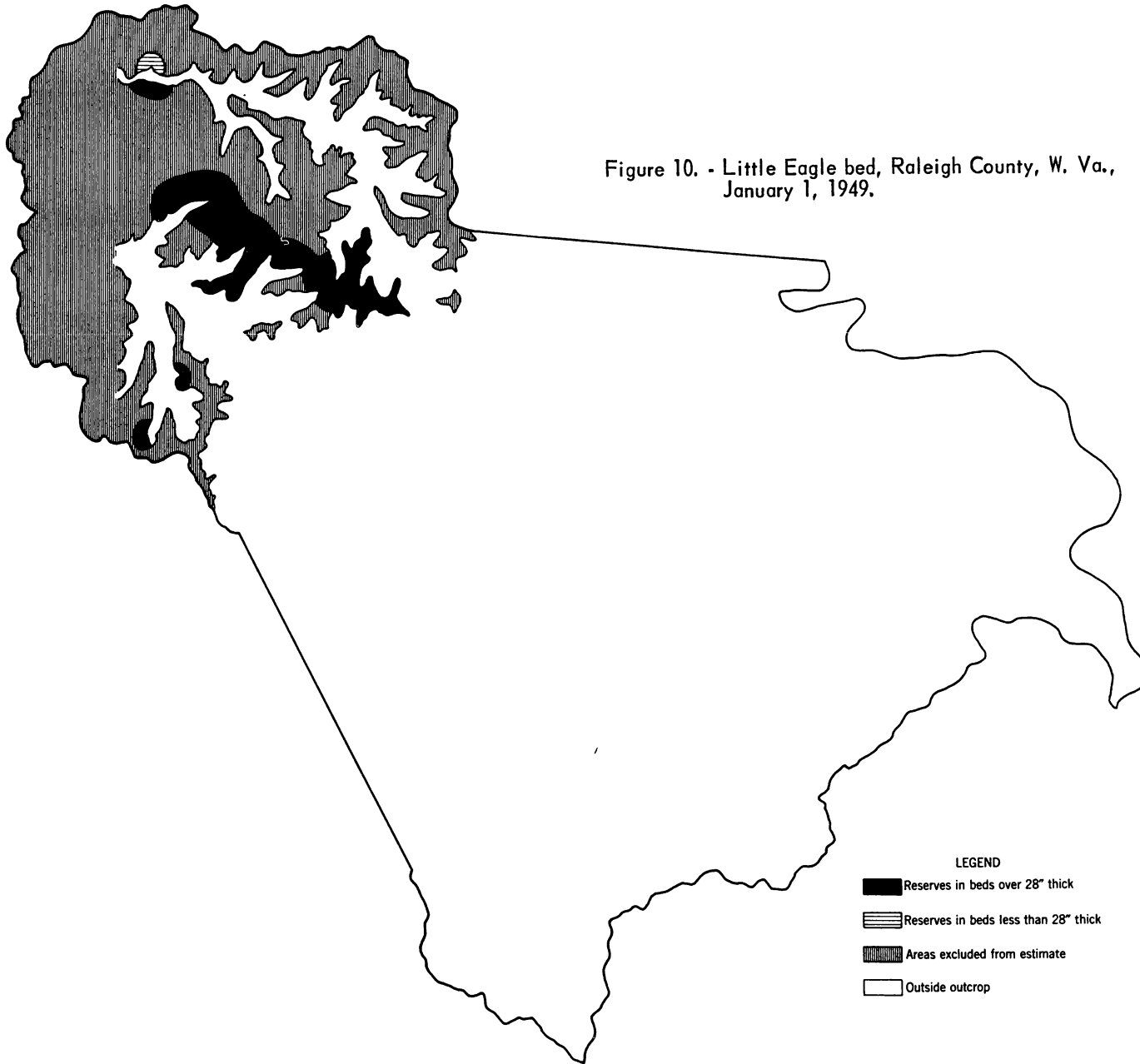






Figure 10. - Little Eagle bed, Raleigh County, W. Va.,  
January 1, 1949.

LEGEND

-  Reserves in beds over 28" thick
-  Reserves in beds less than 28" thick
-  Areas excluded from estimate
-  Outside outcrop





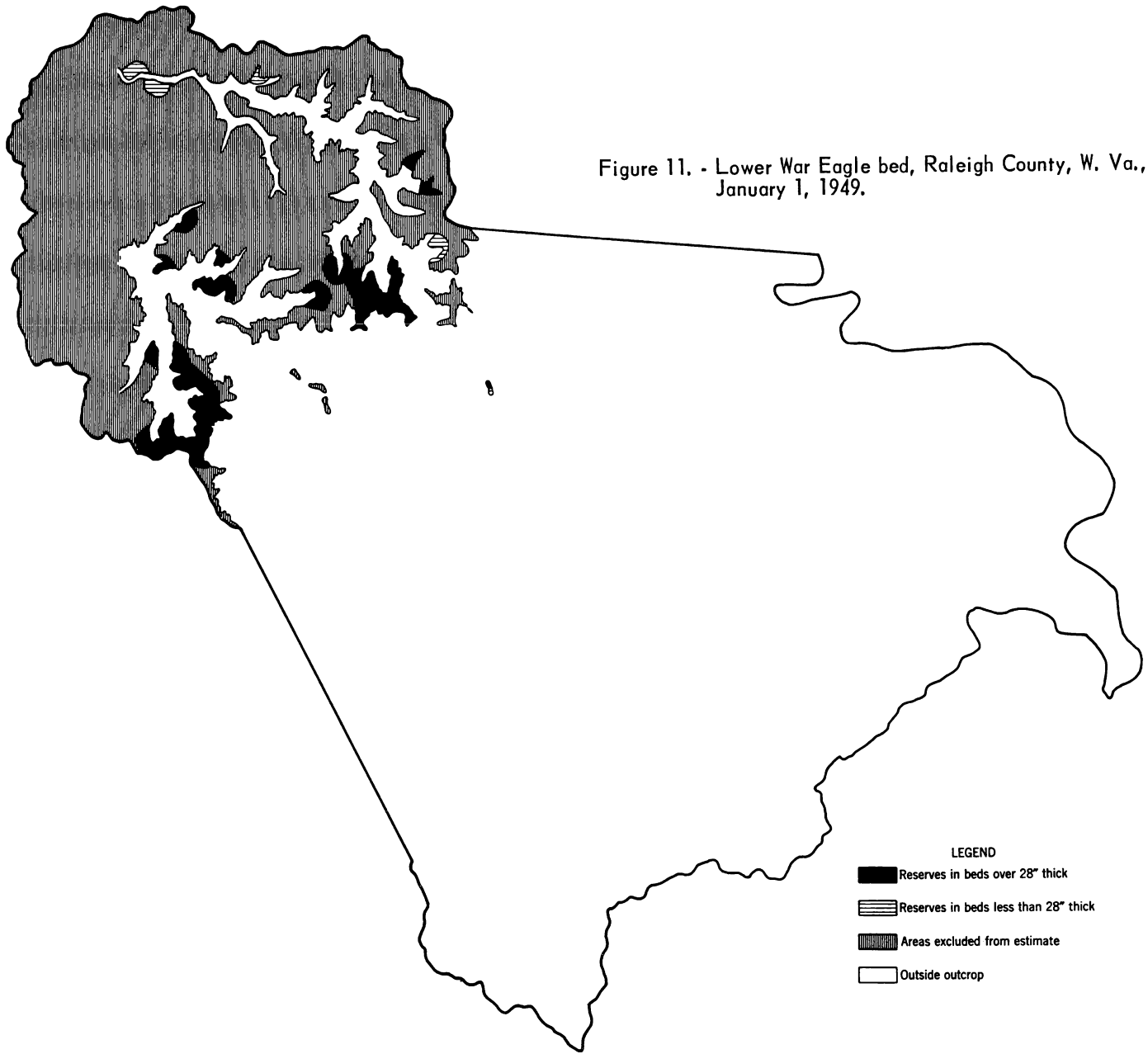




Figure 12. - Gilbert bed, Raleigh County, W. Va.,  
January 1, 1949.

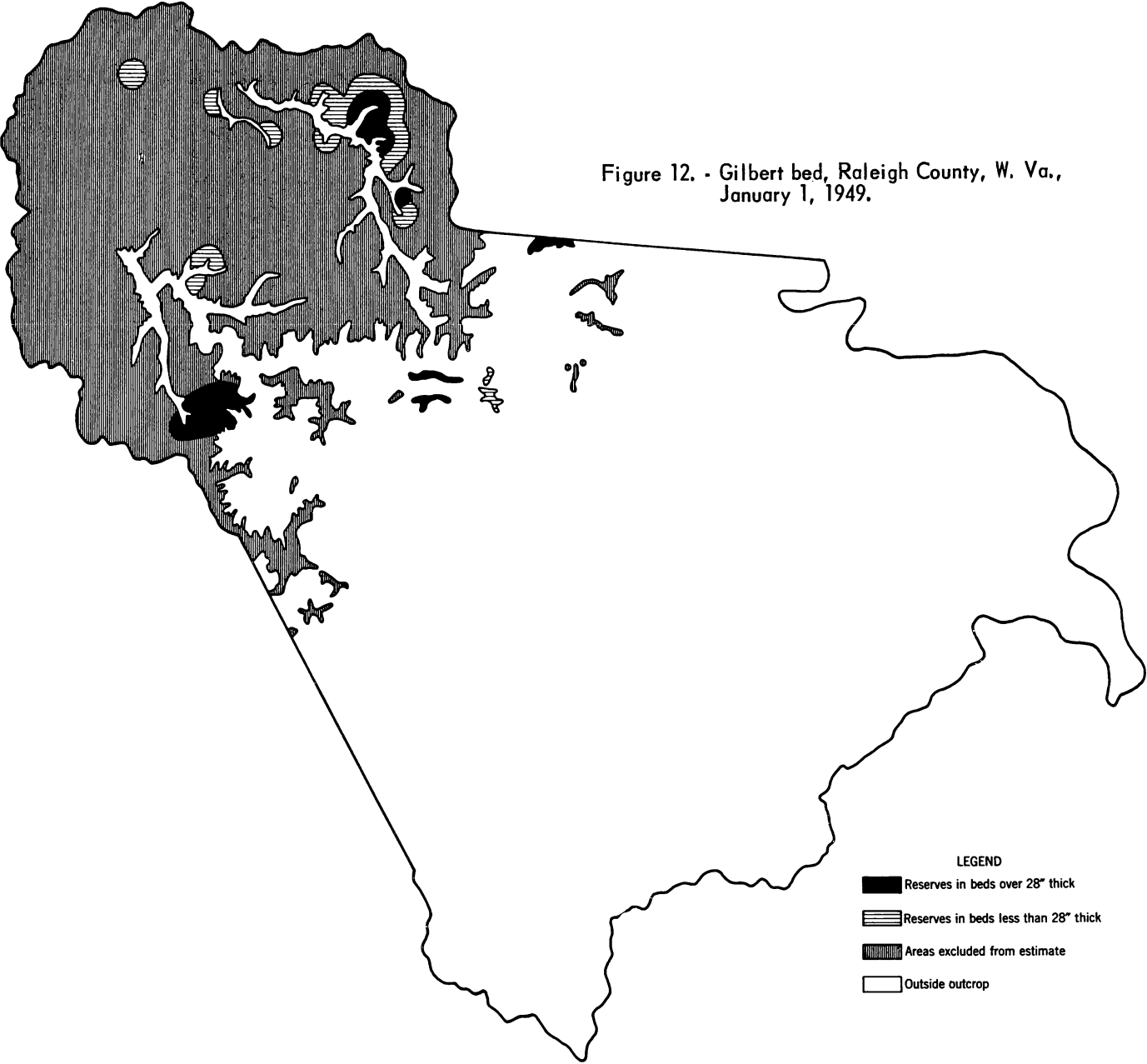




Figure 13. - Sewell bed, Raleigh County, W. Va.,  
January 1, 1949.

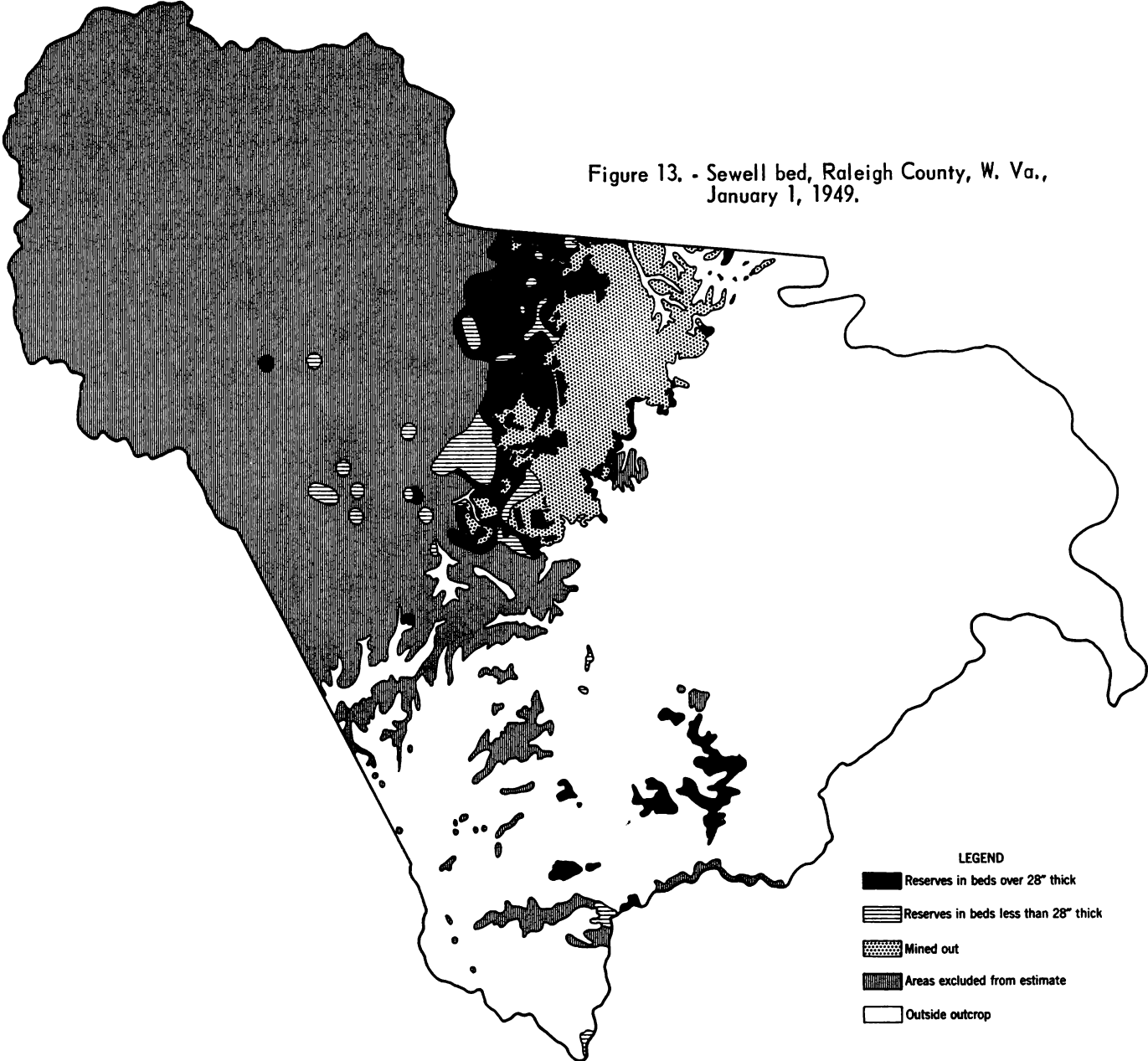




Figure 14. - Beckley bed, Raleigh County, W. Va.,  
January 1, 1949.

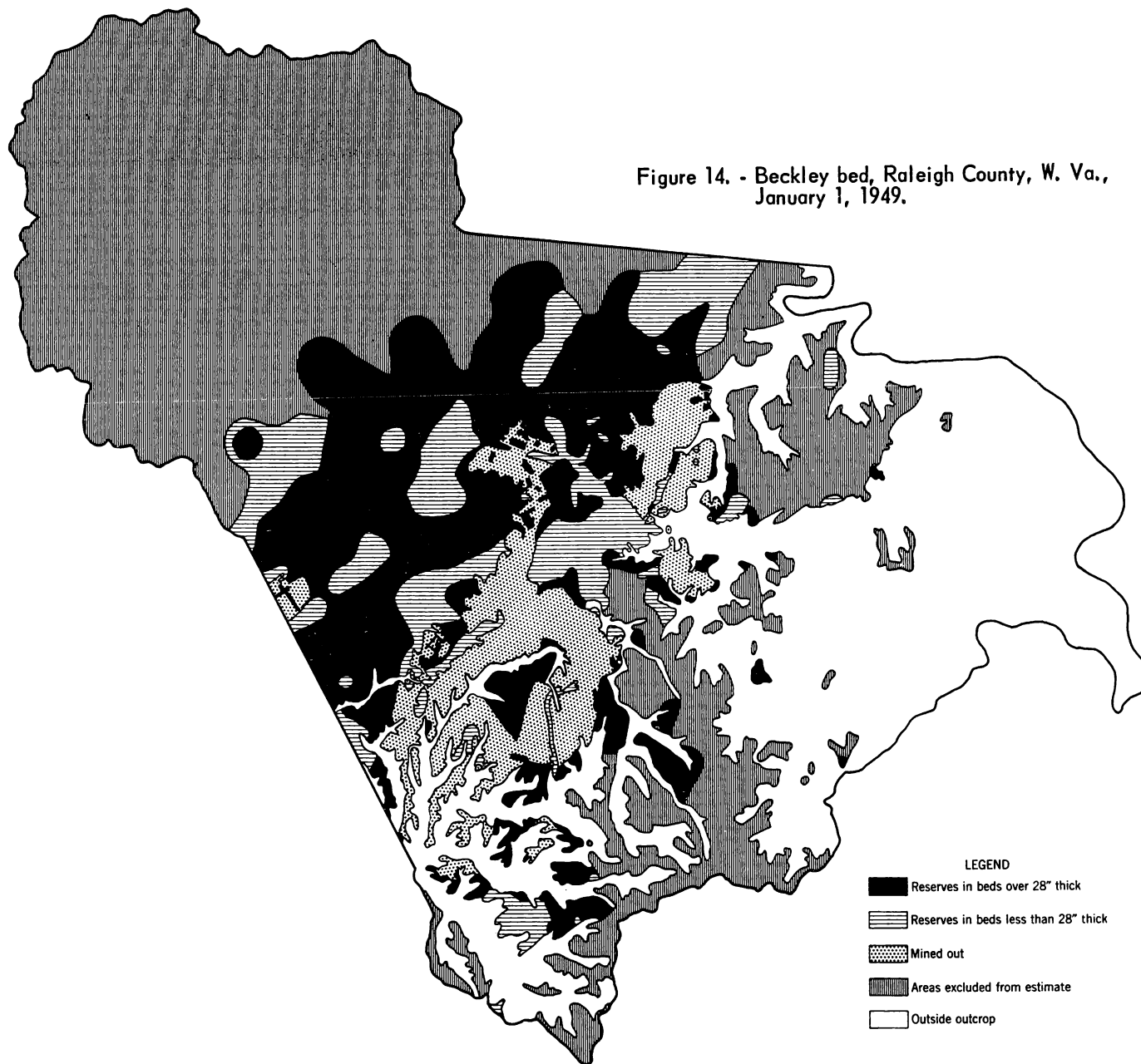






Figure 15. - Fire Creek bed, Raleigh County, W. Va.,  
January 1, 1949.

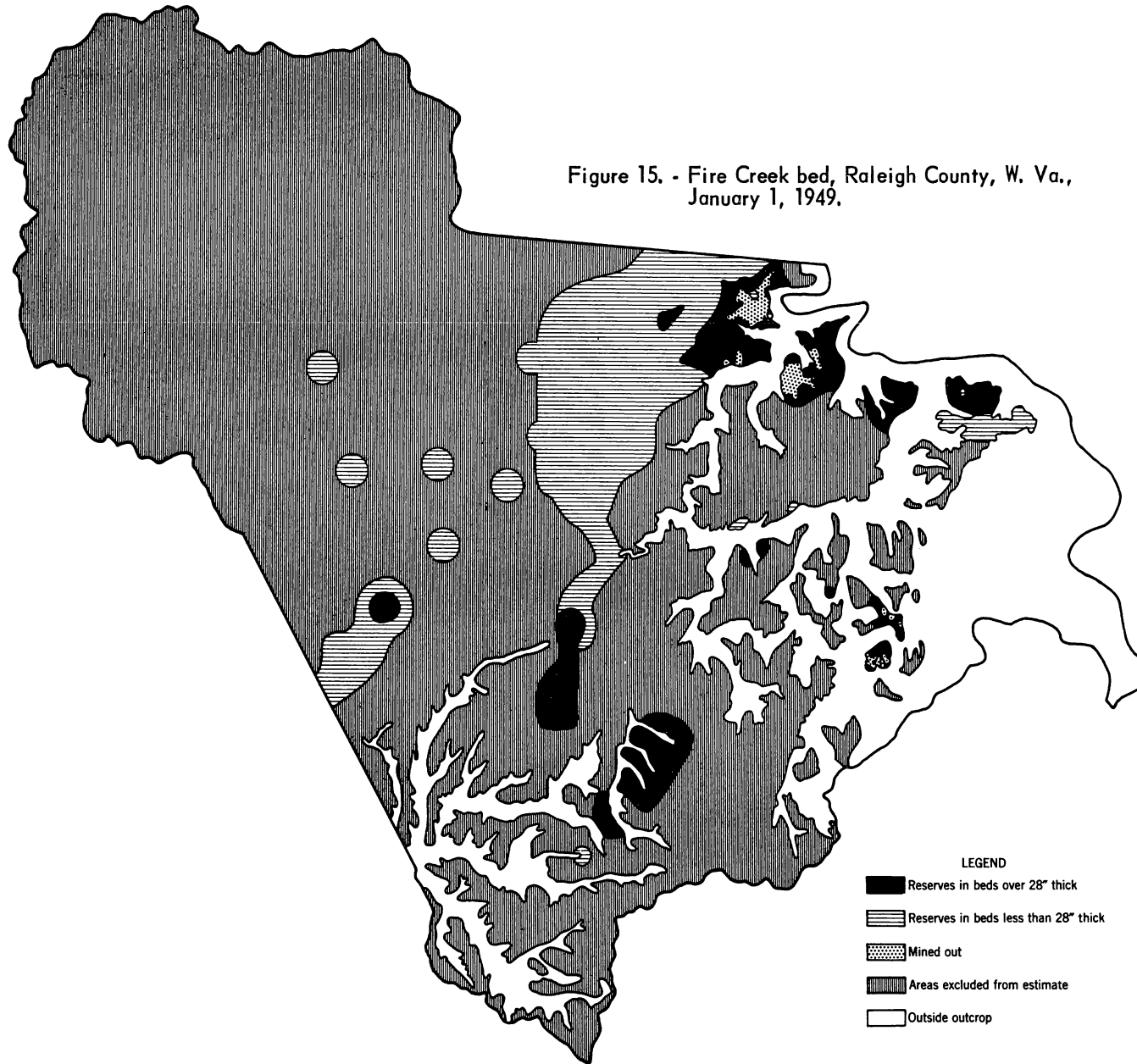




Figure 16. - Pocahontas No. 6 bed, Raleigh County, W. Va.,  
January 1, 1949.

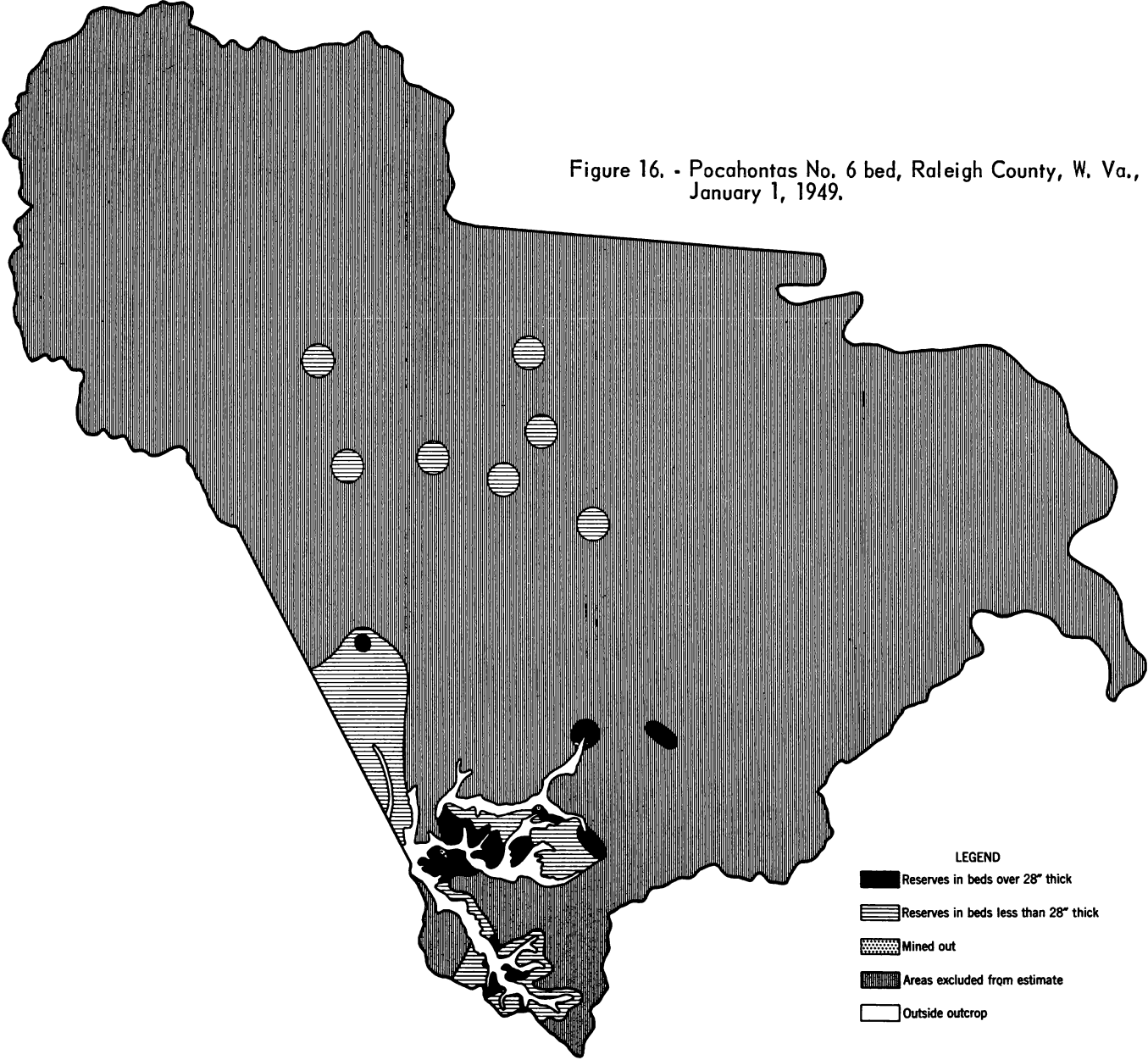




Figure 17. - Pocahontas No. 4 bed, Raleigh County, W. Va.,  
January 1, 1949.

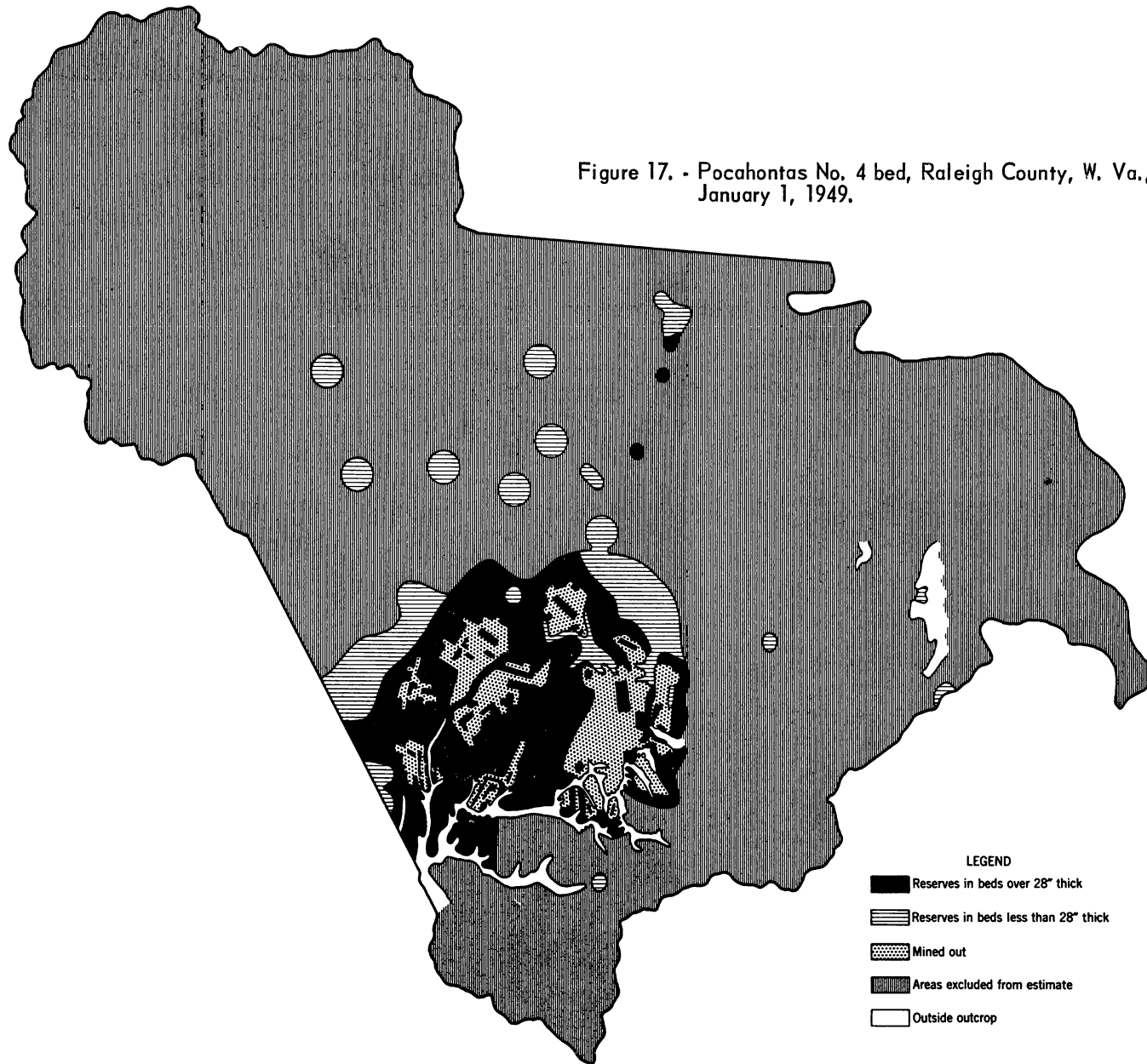
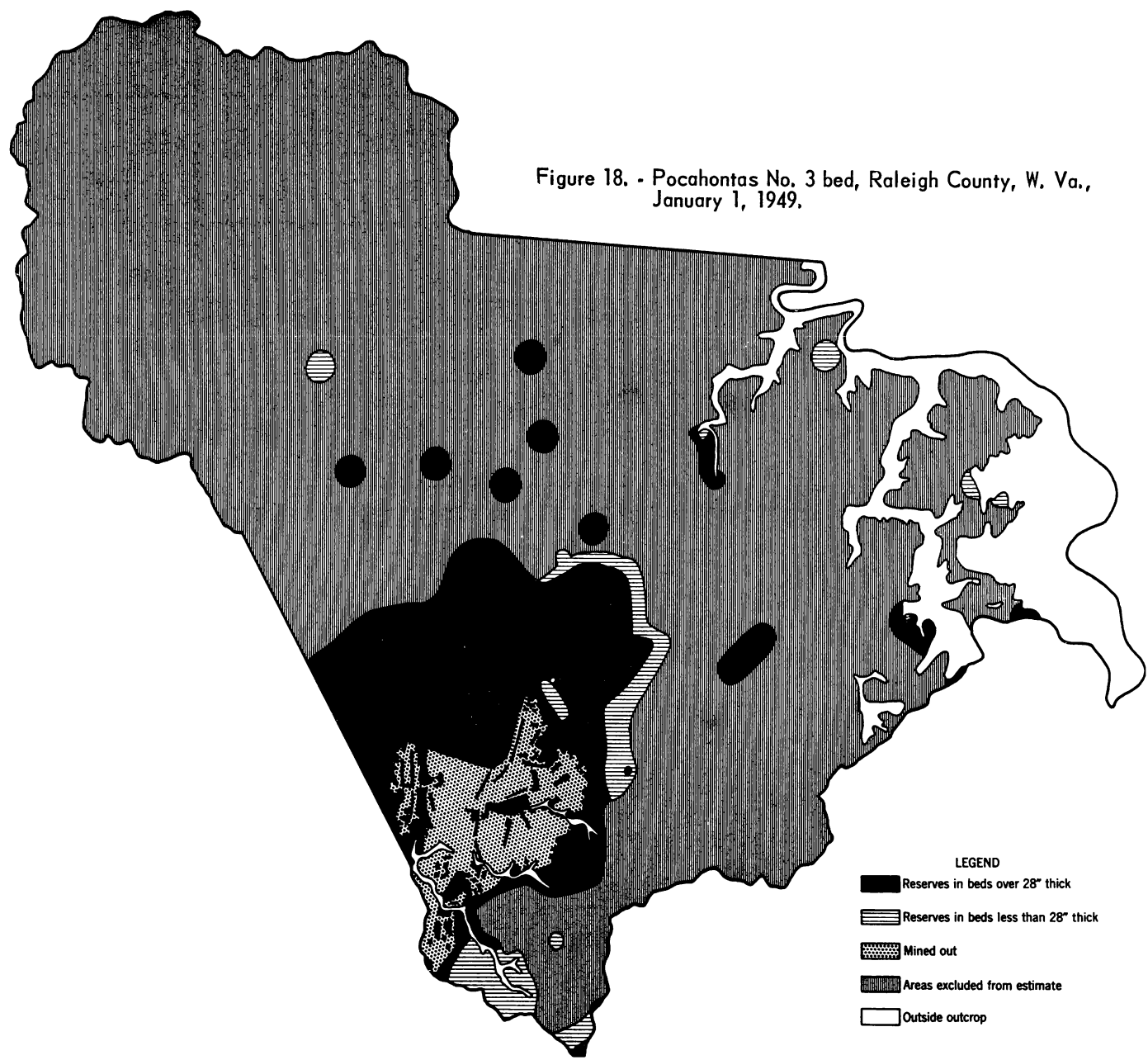




Figure 18. - Pocahontas No. 3 bed, Raleigh County, W. Va.,  
January 1, 1949.







Coal beds, other than those for which estimates have been prepared, occur in the county; but insufficient data are available to allow estimates of reserves to be made.

Maps have been prepared for the No. 5 Block, Winifrede, Hernshaw, Alma, Campbell Creek-Peerless, Campbell Creek-No. 2 Gas, Powellton, Eagle, Little Eagle, Lower War Eagle, Gilbert, Sewell, Beckley, Fire Creek, Pocahontas No. 6, Pocahontas No. 4, and Pocahontas No. 3 beds. (See figs. 2 to 18, inclusive.) Maps of the other beds were not prepared because too little information regarding the thickness and extent of the beds is available.

The characteristics of the mapped coal beds are shown by bed sections taken from diamond-drill logs, mine maps, and outcrop data furnished by owners and lessees of the coal. Some outcrop bed sections are taken from published reports of the West Virginia Geological Survey. All of the bed sections given are within the areas of recoverable reserves 28 inches and more thick (black areas on the maps). They have been selected to show bed characteristics throughout the areas and to indicate the irregularity of the beds.

Descriptions of the coal beds that have been mapped and the selected bed sections follow.

No. 5 Block Bed

(See fig. 2 and tables 1 and 2.)

The No. 5 Block is the highest bed stratigraphically that has been mapped in Raleigh County. It usually is thick and occurs as a multiple bed with thick partings. Reserves reported for the Upper No. 5 Block bed probably are reserves for the top bench of the No. 5 Block. However, the maps showing the mined-out areas adjacent to the west county line in the northwest part of the county designate the bed as the Upper No. 5 Block. Remaining recoverable reserves are in the northwest part of the county. Sections of the bed in the area of reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	26	COAL .....	50
Parting .....	16	Parting .....	6
COAL .....	51	COAL .....	38
Parting .....	5	Parting .....	3
COAL .....	<u>10</u>	COAL .....	<u>14</u>
Thickness .....	108	Thickness .....	111
 COAL .....	 12		
Parting .....	35		
COAL .....	<u>53</u>		
Thickness .....	100		

Winifrede (Dorothy) Bed

(See fig. 3 and tables 5 and 6.)

The Winifrede bed occurs high in the hills in the northwest part of the county. It is multibedded and frequently is 10 feet thick and more. Prospect openings in

the outcrop show that the bed splits. The interval between coal benches resulting from the splitting is as much as 9 feet. Sections of the bed in areas of recoverable reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	18	COAL .....	15
Parting .....	2	Parting .....	1
COAL .....	<u>42</u>	COAL .....	<u>25</u>
Thickness .....	62	Thickness .....	41
COAL .....	7	COAL .....	14
Parting .....	1	Parting .....	16
COAL .....	22	COAL .....	22
Parting .....	2	Parting .....	1
COAL .....	<u>38</u>	COAL .....	<u>15</u>
Thickness .....	70	Thickness .....	68
COAL .....	16	COAL .....	18
Parting .....	8	Parting .....	1
COAL .....	29	COAL .....	54
Parting .....	2	Parting .....	2
COAL .....	22	COAL .....	<u>16</u>
Parting .....	1	Thickness, upper bench .....	91
COAL .....	5	 	
Parting .....	2	Interval - 2-1/2 feet	
COAL .....	20	COAL .....	2
Parting .....	2	Parting .....	9
COAL .....	<u>37</u>	COAL .....	8
Thickness .....	<u>144</u>	Parting .....	4
 		COAL .....	35
COAL .....	16	Parting .....	1
Parting .....	8	COAL .....	4
COAL .....	7	Thickness .....	63
Parting .....	1	 	
COAL .....	17	COAL .....	14
Parting .....	1	Parting .....	22
COAL .....	<u>19</u>	COAL .....	6
Thickness, upper bench ....	<u>69</u>	Parting .....	1
 		COAL .....	15
Interval - 9 feet		Parting .....	5
 		COAL .....	<u>52</u>
COAL .....	13	Thickness .....	115
Parting .....	1		
COAL .....	<u>27</u>		
Thickness, lower bench ....	<u>41</u>		

Hernshaw Bed

(See fig. 4 and tables 7, 8, and 9.)

The Hernshaw bed is a split bed in Raleigh County. Data have been obtained on three splits, designated Upper Hernshaw, Hernshaw (middle split), and Lower Hernshaw. As all three splits do not always occur in each prospect opening or drill hole, some of the data may have been tabulated incorrectly. However, the sum of the reserves for all three splits should probably be considered as a unit. The middle split only has been mapped. Reserves in the bed are in the northwest part of the county.

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	46	COAL .....	20
Parting .....	3	Parting .....	2
COAL .....	<u>1</u>	COAL .....	<u>21</u>
Thickness, upper bench ....	50	Thickness, upper bench .....	<u>43</u>
Interval - 15 feet		Interval - 7-1/2 feet	
COAL .....	11	COAL .....	27
Parting .....	1	Parting .....	13
COAL .....	6	COAL .....	<u>22</u>
Parting .....	1	Thickness, middle bench .....	<u>62</u>
COAL .....	14	Interval - 22-1/2 feet	
Parting .....	1	COAL .....	<u>36</u>
COAL .....	<u>27</u>	Thickness, lower bench .....	<u>36</u>
Thickness, middle bench ...	61	Interval - 24 feet	
Interval - 24 feet		COAL .....	<u>15</u>
COAL .....	<u>15</u>	Thickness, lower bench ....	<u>15</u>
COAL .....	17	COAL .....	12
Parting .....	8	Parting .....	1
COAL .....	<u>34</u>	COAL .....	<u>26</u>
Thickness, upper bench ....	59	Thickness, upper bench .....	39
Interval - 48 feet		Interval - 27 feet	
COAL .....	42	COAL .....	13
Parting .....	1	Parting .....	38
COAL .....	<u>10</u>	COAL .....	11
Thickness, middle bench ...	53	Parting .....	4
Interval - 4 feet		COAL .....	<u>22</u>
COAL .....	6	Thickness, middle bench .....	<u>88</u>
Parting .....	20	Interval - 36 feet	
COAL .....	<u>19</u>	COAL .....	45
Thickness, lower bench ....	<u>45</u>	Thickness, lower bench .....	<u>45</u>

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
No Upper Hernshaw.		COAL .....	8
		Parting .....	8
COAL .....	18	COAL .....	<u>16</u>
Parting .....	2	Thickness, upper bench .....	32
COAL .....	<u>18</u>		
Thickness, middle bench .....	38	Interval - 46 feet	
Interval - 18 feet		COAL .....	39
		Parting .....	2
COAL .....	18	COAL .....	<u>5</u>
Parting .....	1	Thickness, middle bench .....	46
COAL .....	<u>15</u>		
Thickness, lower bench .....	34	Interval - 8 feet	
		COAL .....	<u>12</u>
COAL .....	15	Thickness, lower bench .....	12
Parting .....	2		
COAL .....	10		
Parting .....	9		
COAL .....	10		
Parting .....	2		
COAL .....	<u>19</u>		
Thickness, upper bench .....	67		
Interval - 64 feet			
COAL .....	36		
Parting .....	3		
COAL .....	15		
Parting .....	5		
COAL .....	<u>9</u>		
Thickness, middle bench .....	68		

No Lower Hernshaw.

Alma Bed

(See fig. 5 and table 11.)

The Alma bed usually occurs as a multiple bed, with one or more partings ranging from 1 to 28 inches thick. The known recoverable reserves are in the northwest part of the county. Sections of the bed in areas of reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	31	COAL .....	32
Parting .....	1	Parting .....	18
COAL .....	<u>5</u>	COAL .....	26
Thickness .....	37	Parting .....	4
		COAL .....	17
COAL .....	26	Parting .....	2
Parting .....	28	COAL .....	<u>37</u>
COAL .....	<u>33</u>	Thickness .....	136
Thickness .....	87		

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	30	COAL .....	26
Parting .....	8	Parting .....	4
COAL .....	16	COAL .....	17
Parting .....	2	Parting .....	3
COAL .....	<u>6</u>	COAL .....	<u>16</u>
Thickness .....	62	Thickness .....	66

Campbell Creek-Peerless Bed

(See fig. 6 and table 12.)

The Campbell Creek-Peerless bed has been confused in the past with the Campbell Creek-No. 2 Gas bed<sup>7/</sup> because it occurs in close proximity to the latter. The beds have been mined together. In the area of reserves in the northwest part of the county, some of the bed sections given may be actually the Campbell Creek-Peerless and the Campbell Creek-No. 2 Gas; although, the source of the information shows the sections to be of the Campbell Creek-Peerless. Sections of the bed follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	35	COAL .....	<u>27</u>
Parting .....	2	Thickness, upper bench .....	27
COAL .....	<u>2</u>		
Thickness .....	39	Interval - 15-1/2 feet	
COAL .....	31	COAL .....	42
Parting .....	15	Parting .....	1
COAL .....	<u>36</u>	COAL .....	11
Thickness .....	82	Parting .....	2
COAL .....	21	COAL .....	<u>10</u>
Parting .....	18	Thickness, lower bench .....	66
COAL .....	4	COAL .....	30
Parting .....	2	Parting .....	7
COAL .....	33	COAL .....	<u>25</u>
Parting .....	48	Thickness .....	62
COAL .....	<u>24</u>		
Thickness .....	150		

Campbell Creek-No. 2 Gas Bed

(See fig. 7 and table 13.)

The Campbell Creek-No. 2 Gas bed usually occurs as a multiple bed. The close proximity to the Campbell Creek-Peerless bed above it and the upper bench of the Powellton bed below, frequently causes the beds to be identified erroneously. Sections of the bed in the area of reserves follow:

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<sup>7/</sup> Headlee, A. J., and Nolting, John P., Jr., Characteristics of Movable Coals of West Virginia: West Virginia Geol. Survey, vol. 13, 1940, p. 86.

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	42	COAL .....	31
Parting .....	8	Parting .....	2
COAL .....	4	COAL .....	4
Thickness .....	54	Thickness .....	37
COAL .....	31	COAL .....	52
Thickness .....	31	Thickness .....	52
COAL .....	33	COAL .....	1
Parting .....	6	Parting .....	1
COAL .....	10	COAL .....	43
Thickness .....	49	Parting .....	2
COAL .....	42	COAL .....	4
Thickness .....	42	Thickness .....	51

Powellton Bed

(See fig. 8 and tables 14 and 15.)

The Powellton occurs both as a single and multiple bed. Reserves of this coal are in the northwest part of the county. Between Clear Creek and the north county line, the bed usually is multibedded. When the bed is thick, generally the partings are also thick. Two sections in this area show an interval of about 2 feet between the Powellton and the No. 2 Gas beds. Sections of the bed in the areas of reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	32	COAL .....	37
Thickness .....	32	Thickness .....	37
COAL .....	38	COAL .....	42
Thickness .....	38	Thickness .....	42
COAL .....	26	COAL .....	29
Parting .....	9	Parting .....	3
COAL .....	6	COAL .....	5
Thickness .....	41	Thickness .....	37
COAL .....	26	COAL .....	6
Parting .....	3	Parting .....	4
COAL .....	10	COAL .....	28
Thickness .....	39	Thickness .....	38
COAL .....	52	COAL .....	22
Parting .....	7	Parting .....	1
COAL .....	11	COAL .....	10
Thickness .....	70	Thickness .....	33

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	21	COAL .....	15
Parting .....	1	Parting .....	14
COAL .....	26	COAL .....	22
Parting .....	2	Parting .....	6
COAL .....	2	COAL .....	<u>37</u>
Parting .....	2	Thickness .....	94
COAL .....	<u>5</u>		
Thickness, No. 2 Gas.....	59	COAL .....	51
		Parting .....	2
Interval - 20 inches		COAL .....	<u>4</u>
		Thickness, No. 2 Gas .....	57
COAL .....	40		
Thickness, Powellton .....	40	Interval - 25 inches	
COAL .....	18	COAL .....	<u>36</u>
Parting .....	3	Thickness, Powellton .....	36
COAL .....	<u>12</u>		
Thickness .....	33		

Eagle Bed

(See fig. 9 and tables 16 and 17.)

The Eagle bed is a multiple bed in Raleigh County. All of the known reserves of Eagle coal are in the northwest part of the county. In the eastern and southern parts of the area of reserves, the bed splits, and the upper split is known locally as the Upper Eagle bed. Sections of the bed in areas of reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	9	COAL .....	9
Parting .....	2	Parting .....	4
COAL .....	<u>27</u>	COAL .....	<u>40</u>
Thickness .....	38	Thickness .....	53
COAL .....	8	COAL .....	44
Parting .....	1	Thickness .....	44
COAL .....	2		
Parting .....	2	Laminated coal .....	8
COAL .....	<u>28</u>	Parting .....	3
Thickness .....	41	COAL .....	<u>48</u>
		Thickness .....	59
Laminated coal .....	10		
Parting .....	3	COAL .....	25
COAL .....	<u>47</u>	Parting .....	7
Thickness .....	60	COAL .....	<u>34</u>
		Thickness .....	66
COAL .....	6		
Parting .....	1	COAL .....	24
COAL .....	14	Parting .....	2
Parting .....	1	COAL .....	41
COAL .....	<u>30</u>	Parting .....	1
Thickness .....	52	COAL .....	8
		Thickness .....	<u>76</u>

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>27</u>	COAL .....	11
Thickness, upper bench .....	27	Parting .....	2
Interval - 11 feet		COAL .....	13
COAL .....	20	Parting .....	1
Parting .....	1	COAL .....	<u>15</u>
COAL .....	<u>29</u>	Thickness, upper bench .....	42
Thickness, lower bench .....	50	Interval - 4 feet	
COAL .....	9	COAL .....	12
Parting .....	2	Parting .....	1
COAL .....	<u>28</u>	COAL .....	<u>2</u>
Thickness, upper bench .....	39	Thickness, lower bench .....	15
Interval - 6 feet		COAL .....	6
COAL .....	<u>16</u>	Parting .....	1
Thickness, lower bench .....	16	COAL .....	4
COAL .....	5	Parting .....	2
Parting .....	5	COAL .....	19
COAL .....	11	Parting .....	3
Parting .....	3	COAL .....	3
COAL .....	1	Parting .....	10
Parting .....	3	COAL .....	21
COAL .....	<u>27</u>	Parting .....	1
Thickness, upper bench .....	55	COAL .....	<u>17</u>
Interval - 12 feet		Thickness .....	87
COAL .....	<u>50</u>		
Thickness, lower bench .....	50		

Little Eagle Bed

(See fig. 10 and table 18.)

The Little Eagle bed underlies the Eagle bed; and, although it has not been mined, outcrop openings indicate recoverable reserves in the central part of the northwest part of the county. Sections of the bed in areas of known recoverable reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	4	COAL .....	5
Parting .....	1	Parting .....	3
COAL .....	<u>36</u>	COAL .....	27
Thickness .....	41	Parting .....	1
		COAL .....	<u>16</u>
		Thickness .....	52



<u>Material</u>	<u>Inches</u>
COAL .....	47
Thickness .....	47
COAL .....	25
Parting .....	5
COAL .....	15
Thickness .....	45

Lower War Eagle Bed

(See fig. 11 and table 19.)

The Lower War Eagle bed is usually a multiple bed and varies widely in thickness. Where the bed is thick, the partings also are thick. Sections of the bed in the area of known recoverable reserves in the northwestern part of the county follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	9	COAL .....	35
Parting .....	27	Parting .....	13
COAL .....	9	COAL .....	12
Parting .....	1	Thickness .....	60
COAL .....	20	COAL .....	9
Parting .....	24	Parting .....	4
COAL .....	10	COAL .....	13
Thickness .....	100	Parting .....	1
COAL .....	8	COAL .....	8
Parting .....	2	Parting .....	4
COAL .....	20	COAL .....	9
Thickness .....	36	Thickness .....	48
COAL .....	32	COAL .....	10
Thickness .....	32	Parting .....	2
COAL .....	7	COAL .....	3
Parting .....	3	Parting .....	6
COAL .....	5	COAL .....	21
Parting .....	5	Parting .....	7
COAL .....	6	COAL .....	4
Parting .....	7	Thickness .....	53
COAL .....	21		
Thickness .....	54		

Gilbert Bed

(See fig. 12 and table 20.)

The Gilbert bed has small areas of recoverable reserves in the northwest part of the county. The bed is split into two or more benches with partings as much as 12 inches thick separating the benches. Sections of the bed in areas of recoverable reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	16	COAL .....	14
Parting .....	1	Parting .....	10
COAL .....	19	COAL .....	10
Thickness .....	36	Thickness .....	34
COAL .....	15	COAL .....	2
Parting .....	12	Bone .....	1
COAL .....	3	COAL .....	3
Parting .....	1	Parting .....	5
COAL .....	3	COAL .....	13
Thickness .....	34	Parting .....	1
		COAL .....	20
		Thickness .....	45

Sewell Bed

(See fig. 13 and table 21.)

The Sewell is one of the important beds in Raleigh County from the standpoint of production and quality of the coal. Large areas in the western part of the county have been excluded from the estimates of known reserves because sufficient drill-hole data giving bed thickness are not available. The bed almost always is multibedded, with one or more partings ranging in thickness from a fraction of an inch to 29 inches or more. Sections of the bed in areas of reserves follow:

North-Central Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	28	COAL .....	10
Parting .....	8	Parting .....	22
COAL .....	18	COAL .....	24
Bone .....	2	Thickness .....	56
COAL .....	6		
Thickness .....	62	COAL .....	36
		Thickness .....	36
COAL .....	10	COAL .....	14
Parting .....	16	Parting .....	17
COAL .....	5	COAL .....	48
Bone .....	6	Thickness .....	79
COAL .....	37		
Bone .....	1	COAL .....	8
COAL .....	6	Parting .....	2
Thickness .....	81	COAL .....	41
		Thickness .....	51
COAL .....	55		
Parting .....	2	COAL .....	37
COAL .....	2	Parting .....	10
Thickness .....	59	COAL .....	7
		Thickness .....	54

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	4	COAL .....	6
Parting .....	8	Parting .....	8
COAL .....	<u>34</u>	COAL .....	<u>22</u>
Thickness .....	46	Thickness .....	36
COAL .....	18		
Parting .....	29		
COAL .....	<u>26</u>		
Thickness .....	73		

South-Central Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	26	COAL .....	22
Parting .....	19	Parting .....	6
COAL .....	<u>13</u>	COAL .....	<u>24</u>
Thickness .....	58	Thickness .....	52
COAL .....	<u>36</u>		
Thickness .....	36		

Beckley Bed

(See fig. 14 and table 22.)

The Beckley is the most important bed in Raleigh County from the standpoint of production and largest remaining known recoverable reserve. Usually this bed occurs multibedded, with intervals between benches ranging from a few inches to 30 feet in thickness. Sections of the bed in areas of known recoverable reserves follow:

Northwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	10	COAL .....	34
Parting .....	2	Parting .....	5
COAL .....	<u>40</u>	COAL .....	12
Thickness .....	52	Parting .....	1
COAL .....	7	COAL .....	<u>11</u>
Parting .....	10	Thickness, upper bench .....	63
COAL .....	<u>34</u>	Interval - 54 inches	
Thickness .....	51	COAL .....	51
COAL .....	<u>39</u>	Parting .....	8
Thickness .....	39	COAL .....	<u>15</u>
COAL .....	8	Thickness, lower bench .....	74
Parting .....	13	COAL .....	<u>31</u>
COAL .....	<u>36</u>	Thickness .....	31
Thickness .....	57		

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	27	COAL .....	1
Parting .....	1	Parting .....	3
COAL .....	1	COAL .....	16
Parting .....	2	Parting .....	1
COAL .....	<u>35</u>	COAL .....	<u>17</u>
Thickness .....	66	Thickness .....	38
COAL .....	27	COAL .....	26
Parting .....	1	Parting .....	3
COAL .....	<u>28</u>	COAL .....	<u>20</u>
Thickness .....	56	Thickness .....	49
COAL .....	31		
Parting .....	24		
COAL .....	<u>49</u>		
Thickness .....	104		

Southwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	48	COAL .....	8
Parting .....	5	Parting .....	1
COAL .....	<u>24</u>	COAL .....	<u>14</u>
Thickness .....	77	Thickness, upper bench .....	22
COAL .....	8	Interval - 30 feet	
Parting .....	18		
COAL .....	<u>26</u>	COAL .....	12
Thickness .....	52	Parting .....	2
COAL .....	52	COAL .....	<u>20</u>
Parting .....	20	Thickness, lower bench .....	34
COAL .....	<u>44</u>		
Thickness .....	116		

Southeast Part of County

No detailed bed sections are available in this part of the county. However, the following generalized bed sections are given:

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>31</u>	COAL .....	50
Thickness .....	31	Parting .....	<u>7</u>
COAL .....	36	Thickness .....	57
Parting .....	<u>6</u>	COAL .....	67
Thickness .....	42	Five partings .....	<u>86</u>
COAL .....	63	Thickness .....	153
Four partings .....	<u>40</u>	COAL .....	70
Thickness .....	103	Five partings .....	<u>34</u>
		Thickness .....	104

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	52	COAL .....	19
Two partings .....	<u>30</u>	Two partings .....	<u>14</u>
Thickness .....	82	Thickness .....	33
COAL .....	51		
Two partings .....	<u>28</u>		
Thickness .....	79		

Fire Creek Bed

(See fig. 15 and table 23.)

The Fire Creek bed occurs either as a single or a multiple bed in Raleigh County. Sections of the bed in areas of known reserves follow:

North Half of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>37</u>	COAL .....	7
Thickness .....	37	Bone .....	10
		COAL .....	<u>34</u>
COAL .....	<u>43</u>	Thickness .....	51
Thickness .....	43		
		COAL .....	<u>60</u>
COAL .....	<u>28</u>	Thickness .....	60
Thickness .....	28		

South Half of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	31	COAL .....	23
Parting .....	7	Parting .....	25
COAL .....	<u>32</u>	COAL .....	<u>32</u>
Thickness .....	70	Thickness .....	80
COAL .....	27		
Parting .....	17		
COAL .....	<u>24</u>		
Thickness .....	68		

Pocahontas No. 6 Bed

(See fig. 16 and table 24.)

The Pocahontas No. 6 bed occurs either as a single or multiple bed in the southwest part of the county. Known recoverable reserves range from 28 to 40 inches in thickness. Sections of the bed in areas of recoverable reserves follow:

Southwest Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>28</u>	COAL .....	<u>39</u>
Thickness .....	28	Thickness .....	39

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	3	COAL .....	16
Parting .....	2	Parting .....	5
COAL .....	<u>34</u>	COAL .....	<u>19</u>
Thickness .....	39	Thickness .....	40

Pocahontas No. 4 Bed

(See fig. 17 and table 25.)

The Pocahontas No. 4 bed usually occurs as a multiple bed, with some partings as much as 22 inches thick. Known reserves in the bed are in the south-central part of the county, although a few drill holes in the north part of the county indicate the presence of minable coal. Sections of the bed in the area of reserves follow:

South-Central Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	26	COAL .....	23
Parting .....	1	Parting .....	6
COAL .....	<u>12</u>	COAL .....	<u>14</u>
Thickness .....	39	Thickness .....	43
COAL .....	18	COAL .....	5
Parting .....	18	Parting .....	2
COAL .....	12	COAL .....	<u>30</u>
Parting .....	8	Thickness .....	37
COAL .....	<u>12</u>	COAL .....	49
Thickness .....	<u>68</u>	Thickness .....	49
COAL .....	16	COAL .....	14
Parting .....	20	Parting .....	14
COAL .....	3	COAL .....	<u>17</u>
Parting .....	2	Thickness .....	45
COAL .....	<u>26</u>	COAL .....	16
Thickness .....	67	Parting .....	4
COAL .....	19	COAL .....	<u>20</u>
Parting .....	1	Thickness .....	40
COAL .....	<u>16</u>	COAL .....	22
Thickness .....	36	Parting .....	2
COAL .....	26	COAL .....	<u>18</u>
Parting .....	1	Thickness .....	42
COAL .....	12	COAL .....	27
Parting .....	3	Parting .....	2
COAL .....	4	COAL .....	16
Thickness .....	<u>46</u>	Parting .....	2
COAL .....	28	COAL .....	<u>2</u>
Parting .....	1	Thickness .....	49
COAL .....	<u>17</u>		
Thickness .....	46		

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	14	COAL .....	15
Parting .....	22	Parting .....	4
COAL .....	<u>28</u>	COAL .....	21
Thickness .....	64	Parting .....	2
		COAL .....	<u>1</u>
		Thickness .....	43

Pocahontas No. 3 Bed

(See fig. 18 and table 26.)

The Pocahontas No. 3 bed is the most important bed of the Pocahontas group from the standpoint of production and remaining recoverable reserves. Future drilling in areas shown on the map as excluded from the estimate because of insufficient data will unquestionably prove additional reserves, which should be added to the totals shown in table 26. Sections of the bed in areas of known recoverable reserves follow:

North Part of County

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>36</u>	COAL .....	42
Thickness .....	36	Thickness .....	42
COAL .....	37	COAL .....	18
Parting .....	13	Parting .....	2
COAL .....	<u>28</u>	COAL .....	<u>74</u>
Thickness .....	78	Thickness .....	94
COAL .....	7	COAL .....	13
Parting .....	2	Parting .....	3
COAL .....	<u>27</u>	COAL .....	23
Thickness .....	36	Parting .....	2
COAL .....	5	COAL .....	<u>2</u>
Parting .....	7	Thickness .....	43
COAL .....	<u>28</u>	COAL .....	2
Thickness .....	40	Parting .....	1
COAL .....	48	COAL .....	40
Thickness .....	48	Thickness .....	43
COAL .....	3	COAL .....	2
Parting .....	2	Bone .....	2
COAL .....	<u>48</u>	COAL .....	10
Thickness .....	53	Bone .....	4
COAL .....	4	COAL .....	<u>21</u>
Parting .....	6	Thickness .....	39
COAL .....	<u>35</u>	COAL .....	36
Thickness .....	45	Thickness .....	36

<u>Material</u>	<u>Inches</u>	<u>Material</u>	<u>Inches</u>
COAL .....	<u>31</u>	COAL .....	<u>54</u>
Thickness .....	31	Thickness .....	54
COAL .....	<u>30</u>	COAL .....	7
Thickness .....	30	Bone .....	4
COAL .....	7	COAL .....	<u>28</u>
Bone .....	4	Thickness .....	<u>39</u>
COAL .....	<u>23</u>		
Thickness .....	34		

#### ANALYSES OF RALEIGH COUNTY COALS

The chemical analyses in table 30 are arranged stratigraphically for the major coal-producing beds. Most of the analyses are of composite samples made by combining three or more mine samples to obtain a mine average. The analyses of tipple samples represent run-of-mine coal without any preparation. Generally, the quality of coal indicated by analysis of a mine sample is higher than that shown by a tipple sample. The coal classified according to rank<sup>8/</sup> falls into the low-volatile bituminous group, except the No. 5 Block bed coal near Montcoal and the Winifrede and Powellton coals, which are in the high-volatile A bituminous group. The Eagle coal is medium-volatile and also high-volatile A bituminous.

The analyses are arranged alphabetically according to towns for each bed and have, for the most part, been published in Technical Paper 626, Analyses of West Virginia Coals. Other analyses have been published in Bulletin 446, Typical Analyses of Coals of the United States.<sup>9/</sup> Those published for the first time in this report are indicated by footnote 2 in column 3 of table 30.

#### CARBONIZING PROPERTIES OF RALEIGH COUNTY COALS

The coals of Raleigh County, W. Va., rank among the most strongly coking coals of this country. The Pocahontas No. 3, Beckley, Sewell, Eagle, and Fire Creek beds have earned most favorable reputations as coking coals in commercial ovens producing blast furnace and foundry cokes. Virtually all beds in this county yield high-rank medium- or low-volatile coals which expand during carbonization. Because their expansion might damage coke-oven walls, these coals are blended with high-volatile coking coals, which yield inferior coke when carbonized singly. Generally, operators carbonize blends containing 15 to 25 percent low-volatile coal, although larger proportions are used in certain oven types or in blends containing highly contracting high-volatile coals.

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<sup>8/</sup> American Society for Testing Materials, Standard Specifications for Classification of Coals by Rank (A.S.T.M. Designation: D 388-38, A.S.A. M20.1-1938): A.S.T.M. Standards, 1939, pt. III, pp. 1-6.

<sup>9/</sup> Fieldner, A. C., Rice W. E., and Moran, H. E., Typical Analyses of Coals of the United States: Bureau of Mines Bull. 446, 1942, p. 44.



TABLE 30. - Analyses of Raleigh County coals, percent

Location	Bed	Kind of sample <sup>1/</sup>	As-received Moist.	Dry basis				
				Vol.	F.C.	Ash	Sul.	B.t.u.
1	2	3	4	5	6	7	8	9
Montcoal	No. 5 Block	M <sup>2/</sup>	2.8	33.5	57.2	9.3	0.8	13,680
-	Winifrede	D <sup>3/</sup>	2.7	33.0	58.0	6.3	.6	14,010
-	Powellton	T <sup>3/</sup>	3.4	34.5	57.9	4.2	1.4	14,400
-	Eagle	D <sup>3/</sup>	2.1	29.0	64.6	4.3	.7	14,570
Beckley	Sewell	T <sup>2/</sup>	4.1	21.1	73.6	5.3	.8	14,890
Crab Orchard	do.	M	2.2	20.4	74.9	4.7	1.1	14,940
Lanark	do.	T <sup>2/</sup>	3.2	22.1	73.9	4.0	.8	15,030
Lester	do.	M	3.3	19.5	75.7	4.8	1.0	14,830
Mabscott	do.	T <sup>2/</sup>	3.3	19.3	73.5	7.2	1.0	14,540
Oswald	do.	M	2.7	22.0	74.0	4.0	1.0	15,030
Skelton	do.	M	3.1	20.8	76.2	3.0	.7	15,260
Sprague	do.	M	2.5	20.6	77.1	2.3	.8	15,350
Stanaford	do.	M	2.8	22.4	74.7	2.9	1.3	15,180
Tamroy	do.	M	3.5	22.2	75.7	2.1	.6	15,340
Viacova	do.	M	1.9	17.4	69.5	13.1	.6	13,420
Abney	Beckley	M	2.5	17.7	78.6	3.7	1.0	15,090
Affinity	do.	M	2.5	18.0	77.6	4.4	.5	15,060
Besoco	do.	M	1.9	18.7	78.4	2.9	.6	15,220
Big Stick	do.	M	2.7	17.6	78.3	4.1	.6	15,130
East Gulf	do.	M	2.9	17.5	79.6	2.9	.5	15,190
Eccles	do.	M	1.8	18.7	74.7	6.6	.8	14,370
Helen	do.	M	2.5	17.8	78.8	3.4	.6	15,200
Hotcoal	do.	M	2.3	17.2	77.7	5.1	.9	14,850
Killarney	do.	M	3.1	18.0	77.1	4.9	.8	14,940
Pemberton	do.	M	2.7	18.4	76.0	5.6	.7	14,790
Princewick	do.	M	2.7	18.7	78.0	3.3	.6	15,190
Rhodell	do.	M	2.5	17.7	76.6	5.7	.8	14,770
Slab Fork	do.	M	3.3	18.0	78.6	3.4	.5	15,210
Winding Gulf	do.	M	2.3	17.9	78.3	3.8	.4	15,180
Fireco	Fire Creek	M	2.5	17.0	79.2	3.8	.8	15,150
Jonben	do.	T <sup>2/</sup>	2.4	16.5	76.6	6.9	.9	14,640
Lego	do.	M	1.6	17.0	77.5	5.5	.9	14,800
Terry	do.	M	2.2	20.0	74.0	6.0	.8	14,690
Lillybrook	Pocahontas No. 6	M	1.9	17.1	78.1	4.8	1.0	14,890
Affinity	Pocahontas No. 4	M <sup>2/</sup>	1.6	16.7	77.5	5.8	.9	14,750
Slab Fork	do.	T <sup>2/</sup>	2.1	16.5	78.3	5.2	.7	14,870
Amigo	Pocahontas No. 3	M	2.7	17.7	77.1	5.2	1.0	14,900
Do.	do.	T <sup>2/</sup>	2.4	16.4	72.6	11.0	.8	13,990
Besoco	do.	M	2.6	16.4	79.5	4.1	.7	14,760
Helen	do.	M	2.7	16.0	80.6	3.4	.9	15,180
Lego	do.	M	2.9	15.8	79.7	4.5	.8	14,900
Rhodell	do.	M	2.1	16.7	78.6	4.7	.9	14,890

1/ M = mine sample; T = tippie sample; D = delivered sample.

2/ Analysis published for first time in this report.

3/ Published in Bull. 446.

Pocahontas No. 3 has long been regarded as the premier low-volatile coking coal of this continent; it has been transported from southern West Virginia to all States east of the Mississippi River producing metallurgical coke and to Canada. This bed is so important to the coking industry that concern has been expressed over the fact that extensive mining has seriously depleted its reserves.<sup>10/</sup> Pocahontas No. 4 is an excellent low-volatile coking coal,<sup>11/</sup> although it has not been used widely in the manufacture of coke.

Beckley is a noted low-volatile steam, coking, and domestic coal because it generally contains little ash and sulfur, and its ash fuses at high temperatures. This bed promises to assume major importance in the carbonization industry because its reserves are larger than those of other low-volatile coking coals. Pilot-scale carbonization of representative samples representing the Beckley bed in Raleigh County have shown that it blends with Pittsburgh-bed coal yield strong coke.<sup>12/</sup> Beckley coal from adjoining Wyoming County coked satisfactorily in commercial ovens when blended with high-volatile A, Kentucky, Elkhorn-bed coal, and the resulting coke proved to be of metallurgical grade in full-scale blast furnace practice.<sup>13/</sup> The investigators conducting these tests recommend that a maximum of 20 percent Beckley coal be used because blends containing higher proportions might expand enough to damage oven walls.

The Sewell bed increases in rank as it extends southward from Tucker County across the State through McDowell County. In Raleigh County, most Sewell coal is of low-volatile bituminous rank, although much of it is low in that classification; the bed yields medium-volatile coal in some areas within the county. A sample from the central part of the county, which ranked as low-volatile bituminous, coked satisfactorily in pilot-scale tests when blended with 70- and 80-percent Pittsburgh-bed coal.<sup>14/</sup> In comparison with Pocahontas No. 3 and Beckley coals, larger proportions of Sewell may be required in coke-oven blends because it usually ranks lower.

The Fire Creek bed has been carbonized, either singly in beehives or as blends with high-volatile coals in ovens, for many years. Its rank and carbonizing properties resemble those of Pocahontas No. 3; it is blended for carbonization, therefore, in similar proportions. Pilot-scale tests have shown that a blend of Fire Creek coal from this county with Pittsburgh coal yielded strong coke.<sup>15/</sup>

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<sup>10/</sup> Isenberg, N., and Jackman, Harold W., Investigation of the Beckley Seam Coal Blended with Wheelwright Coal for Use in the Production of Metallurgical Coke: Inland Steel Co., East Chicago, Ind., 1945, 199 pp.

<sup>11/</sup> Fieldner, A. C., Davis, J. D., Reynolds, D. A., Schmidt, L. D., Brewer, R. E., Sprunk, G. C., and Holmes, C. R., Carbonizing Properties and Petrographic Composition of Pocahontas No. 3 Bed Coal from Buckeye No. 3 Mine, Wyoming County, W. Va., and of Pocahontas No. 4 Bed Coal from No. 4 Mine, Raleigh County, W. Va.: Bureau of Mines Tech. Paper 604, 1940, 65 pp.

<sup>12/</sup> Davis, J. D., Reynolds, D. A., Brewer, R. E., Wolfson, D. E., Ode, W. H., and Birge, G. W., Carbonizing Properties of Beckley Bed Coal from Stanaford No. 1 Mine, Mount Hope, Raleigh County, W. Va.: Bureau of Mines Tech. Paper 712, 1949, 38 pp.

<sup>13/</sup> Isenberg, N., and Jackman, Harold W., Work cited in footnote 10.

<sup>14/</sup> Fieldner, A. C., and Davis, J. D., Gas-, Coke-, and Byproduct-Making Properties of American Coals and Their Determination: Bureau of Mines Mon. 5, 1934, 164 pp.

<sup>15/</sup> Davis, J. D., Reynolds, D. A., Brewer, R. E., Wolfson, D. E., Naugle, B. W., and Birge, G. W., Carbonizing Properties, Pocahontas No. 6, Davy Sewell, and Fire Creek Coals from West Virginia, and Upper and Lower Kittanning and Upper and Lower Freeport Coals from Pennsylvania: Bureau of Mines Bull. 496, 1950, 42 pp.

The Eagle, Powellton, Winifrede (Dorothy), No. 2 Gas, and Alma beds generally rank lower than the coals listed above; in other counties where they are mined extensively, most rank high in the high-volatile A group or are medium-volatile coals. They may be used to produce metallurgical coke if blended properly. Eagle and Powellton coals from nearby counties are highly regarded as coking coals.

#### APPENDIX

Completed reports giving results of studies by counties under part (1) of the investigation follow:

DOWD, JAMES J., TURNBULL, LOUIS A., TOENGES, ALBERT L., COOPER, H. M., ABERNETHY, R. F., REYNOLDS, D. A., and FRASER, THOMAS. Estimate of Known Recoverable Reserves of Coking Coal in Cambria County, Pa. Bureau of Mines Rept. of Investigations 4734, 1950, 25 pp.

DOWD, JAMES J., TURNBULL, LOUIS A., TOENGES, ALBERT L., COOPER, H. M., ABERNETHY, R. F., REYNOLDS, D. A., and CRENTZ, WILLIAM A. Estimate of Known Recoverable Reserves of Coking Coal in Indiana County, Pa. Bureau of Mines Rept. of Investigations 4757, 1950, 22 pp.

DOWD, JAMES J., TURNBULL, LOUIS A., TOENGES, ALBERT L., ABERNETHY, R. F., and REYNOLDS, D. A. Estimate of Known Recoverable Reserves of Coking Coal in Pike County, Ky. Bureau of Mines Rept. of Investigations 4792, 1951, 34 pp.

\_\_\_\_\_. Estimate of Known Recoverable Reserves of Coking Coal in Armstrong County, Pa. Bureau of Mines Rept. of Investigations 4801, 1951, 20 pp.

\_\_\_\_\_. Estimate of Known Recoverable Reserves of Coking Coal in Westmoreland County, Pa. Bureau of Mines Rept. of Investigations 4803, 1951, 16 pp.

\_\_\_\_\_. Estimate of Known Recoverable Reserves of Coking Coal in Fayette County, Pa. Bureau of Mines Rept. of Investigations 4807, 1951, 19 pp.

\_\_\_\_\_. Estimate of Known Recoverable Reserves of Coking Coal in Floyd County, Ky. Bureau of Mines Rept. of Investigations 4813, 1951, 16 pp.

DOWD, JAMES J., TOENGES, ALBERT L., ABERNETHY, R. F., and REYNOLDS, D. A. Estimate of Known Recoverable Reserves of Coking Coal in Jefferson County, Pa. Bureau of Mines Rept. of Investigations 4840, 1952, 18 pp.





