Addenda and Errata Sheet, December 15, 1950

COAL DATA SHEETS SHOWING
RECOVERABLE COAL RESERVES IN VIRGINIA
AVAILABLE FOR COMMERCIAL USE AND
SYNTHETIC LIQUID FUEL MANUFACTURE

PREPARED BY PAUL WEIR COMPANY, INCORPORATED
CHICAGO, ILLINOIS

NOVEMBER 15, 1950

mates were made as of Jan. 1, 1950. This date applies to:
(a) Data shown in the "Summary" on page 1.
(b) Data shown in "Summary of Estimated Coal Reserves" on page 8.
(c) Table, "Estimated Recoverable Reserves in Virginia by Counties and Beds" on page 9.
(d) Exhibit No. 1.
(e) Exhibit No. 2, sheets 1 to 12, inclusive.

ysis of Coal referred to herein is average or representa-
on analysis of face samples obtained by standard U. S.
reau of Mines procedure. This note applies to:
(a) Exhibit No. 1.
(b) Exhibit No. 2, sheets 1 to 12, inclusive.

iography. Add at the end of "Sources of Information" on
ge 3 the sentence - A bibliography of other coal data
amined will be found as an exhibit in the report entitled
ne Synthetic Liquid Fuel Potential of Virginia".

ge page 3, line 17, the words "Virginia State University"
read "University of Virginia".

NOTICE

This volume supersedes a similar volume dated July 13, 1950, entitled:

CORPS OF ENGINEERS
DEPARTMENT OF THE ARMY

COAL DATA SHEETS SHOWING
RECOVERABLE COAL RESERVES IN VIRGINIA
AVAILABLE FOR COMMERCIAL USE AND
SYNTHETIC LIQUID FUEL MANUFACTURE

The former volume is null and void, and should be destroyed.

Va
CDS
3
70021

CORPS OF ENGINEERS
DEPARTMENT OF THE ARMY

COAL DATA SHEETS SHOWING RECOVERABLE COAL RESERVES IN VIRGINIA AVAILABLE FOR COMMERCIAL USE AND SYNTHETIC LIQUID FUEL MANUFACTURE

PREPARED BY PAUL WEIR COMPANY, INCORPORATED
CHICAGO, ILLINOIS

NOVEMBER 15, 1950

VA
CDS

2
70021

Contents

Subject	Page
Report:	
Summary	1
Location of Reserves by Counties	2
Part I - Survey Data:	
Sources of Information	3
Survey Methods and Procedure	3
Estimated Recovery of Coal	7
Summary of Estimated Coal Reserves	8
Estimated Recoverable Reserves in Virginia by Counties and Beds (1,000 Tons)	9
Part II - Definitions:	
Definitions of Coal	11
Types of Coal Mining and Related Terms	11
Geological Terms	11
Terms Relating to Classification, and Analysis of Coal	12
Part III - Classification of Coal Reserves:	
Survey Specifications as to Minimum Requirements for Coal	14
U.S. Geological Survey Classification of Coal Reserves	14
Classification of Coal Reserves in Respect to Plant Requirements	16

Exhibits:	Exh.No.
Coal Data Sheets -	
Summary of Coal Reserves, by Counties and Beds	1
Detailed Coal Data Sheets - Quantities of Coal in Place by Coal Beds (Subdivided by Unit Areas and Counties)	2

Sheet No.	Coal Bed	County
1	Eagle	Buchanan
2	Merrimac	Montgomery, Pulaski
3	Eagle	Buchanan
	Hagy	Buchanan
	Lower Banner	Buchanan, Russell
	Kennedy	Buchanan, Tazewell, Russell
	Raven	Buchanan, Tazewell, Russell
4	Jawbone	Buchanan, Tazewell, Russell
	Tiller	Tazewell
	Upper Seaboard	Tazewell
	Middle Seaboard	Tazewell
	Lower Seaboard	Tazewell
	Pocahontas No. 5	Tazewell

VA
CDS
2
70021

Contents

Subject | Exh.No.

Exhibits: (Concluded)

Sheet No.	Coal Bed	County
5	High Splint	Wise
	Morris	Wise
	Pardee	Wise
	Low Splint	Wise
	Taggart	Wise
	Kelly	Wise
	Imboden	Wise
	Clintwood	Buchanan,Dickenson,Wise
6	Eagle	Buchanan
	Dorchester(Glamorgan)	Buchanan, Wise
	Norton	Wise
	Hagy	Buchanan
	Splash Dam	Buchanan, Dickenson
7	Upper Banner	Dickenson, Wise
	Lower Banner	Buchanan, Russell,Dickenson
	Kennedy	Buchanan,Dickenson,Russell
8	Jawbone	Russell
	Jawbone-Tiller(United)	Buchanan, Dickenson
9	High Splint	Wise
	Morris	Wise
	Pardee	Wise
	Low Splint	Wise, Lee
	Taggart	Wise, Lee
	Harlan	Wise
	Kelly	Wise, Lee
10	Imboden	Wise, Lee
	Clintwood	Wise
	Blair	Wise, Lee
	Dorchester(Glamorgan)	Wise
	Norton	Wise
	Splash Dam	Dickenson
	Upper Banner	Russell,Wise,Dickenson
11	Lower Banner	Russell,Dickenson,Wise
	Kennedy	Russell,Dickenson,Wise
	Jawbone	Russell,Wise
12	Pardee	Lee
	Phillips	Lee
	Low Splint	Lee
	Taggart	Lee
	Harlan	Lee
	Upper St. Charles	Lee
	Imboden	Lee
	Clintwood	Lee

Va
CDS
3

70021

Coal Data Sheets Showing Recoverable Coal Reserves in Virginia Available for Commercial Use and Synthetic Liquid Fuels Manufacture

By approval of the Corps of Engineers, Department of the Army, the attached coal data sheets, prepared as part of the Synthetic Liquid Fuel Potential Contract No. W 49-129 eng-137, dated May 3, 1949, are submitted in a form suitable for reference use and distribution to libraries. The following data, from the report on the synthetic liquid fuel potential in Virginia are explanatory of the summary and detailed coal data sheets attached hereto. Additional data including the geology and detailed descriptions of the coal beds in Virginia will be found in that report.

SUMMARY

The total recoverable reserves of coal in Virginia are shown on Exhibit No. 1 and are estimated at 2,133,979,000 tons, which are available for commercial coal requirements and as a base for synthetic liquid fuels manufacture in Virginia, as summarized below:

Classification of Recoverable Coal Reserves in Virginia

Classification	Acres	Tons
Primary Reserves		
Underground Mining:		
Measured	35,302	147,113,000
Indicated	425,503	1,642,764,000
Total Primary Reserves	460,805	1,789,877,000
Secondary Reserves		
Underground Mining:		
Inferred	94,573	344,102,000
Total Recoverable Reserves	555,378	2,133,979,000

VA
CDS
10
70021

Location of Reserves by Counties

The reserves are located in eight counties in the southwestern part of Virginia, as shown below:

Location of Recoverable Coal Reserves in Virginia by Counties

County	Tons
Buchanan	609,788,000
Dickenson	320,156,000
Lee	187,723,000
Montgomery	54,896,000
Pulaski	12,889,000
Russell	169,411,000
Tazewell	158,260,000
Wise	620,856,000
Total	2,133,979,000

The estimates of reserves by counties and coal beds are shown on the detailed coal data sheets comprising pages 1 to 12 of Exhibit No. 2.

VA
CDS
10
70 31

PART I - SURVEY DATA

Sources of Information

After original discovery of coal deposits around 1700 and initial mining around 1750, occasional investigations of coal deposits were carried on by State and Federal agencies, especially as additional coal areas were discovered and explored in the southwestern portion of the field. It was not until 1873, however, when the Pocahontas fields began to be exploited, that detailed geological investigations were undertaken by the State.

In the early 1900's the Virginia Geological Survey, in cooperation with the U.S. Geological Survey, initiated a program of topographic and geological mapping which now has covered all the known coal areas within the State. Publications of the results of these field studies have been supplemented by detailed geologic and topographic maps showing outcrops of the principal coal seams, structure of the coal beds, and other pertinent data.

Additional information on the extent and quality of the coal beds has been obtained from publications of the U.S. Bureau of Mines, the Virginia Coal Operators Association, and Virginia State University. While the above references generally contain the major amount of available information on the coal resources of Virginia, other available publications and reports were examined throughout the survey.

Survey Methods and Procedure

In estimating the coal reserves of Virginia, all pertinent available information was posted on previously prepared base maps with sources of information being appropriately indicated. Each such base map covered an area consisting of one degree of longitude (east-west) and one-half degree of latitude (north-south) on a scale of 1:62,500. A separate print of each base map was generally used for each coal bed within the area, provided sufficient information was available to permit an evaluation of reserves. In some cases, information on two or more beds was posted on the same base map where the areas occupied by reserves of different seams were sufficiently separated to avoid overlapping. Where available, the extents of mined-out areas as shown by mine maps or other information were shown on the appropriate basic map. In other areas where it was evident that mining activities had been in progress for many years in certain beds, the extent of depletion was estimated and indicated on the corresponding base maps by limiting lines.

Va
CDS
3
4a
70021

Having posted all available information on outcrop, depth and thickness of each bed on each base map area, including the extent of underground and/or strip-mine depletion, if present,

the areas underlain by coal in each township for which specific data or any other types of relevant information were available were carefully analyzed and evaluated prior to delineation of classified areas of reserves. The diagram on the opposite page has been prepared to illustrate graphically the results of this section, entitled Survey Methods and Procedure. Individual areas depleted by underground or strip operations were demarcated and eliminated from further measurement by enclosure within a limiting line located sufficiently far outside the outermost extents of the mined-out area to represent the limit of the probable barrier pillars which would be left between the depleted area and subsequent mining operations. Where individual depleted areas approached other depleted areas to such an extent that subsequent mining operations in the intervening areas would not be practical, as in many areas of major depletion by groups of mines located relatively close together, the entire area was demarcated and eliminated from further measurement by a similar limiting line. Since the property lines toward which mining operations in active mines may be expected to proceed were not determined in this survey, it is probable that some portions of such intervening areas thus eliminated may be undergoing current depletion. The amounts of such reserves, which are considered relatively minor in extent, would thus not be included in the total amount of estimated reserves.

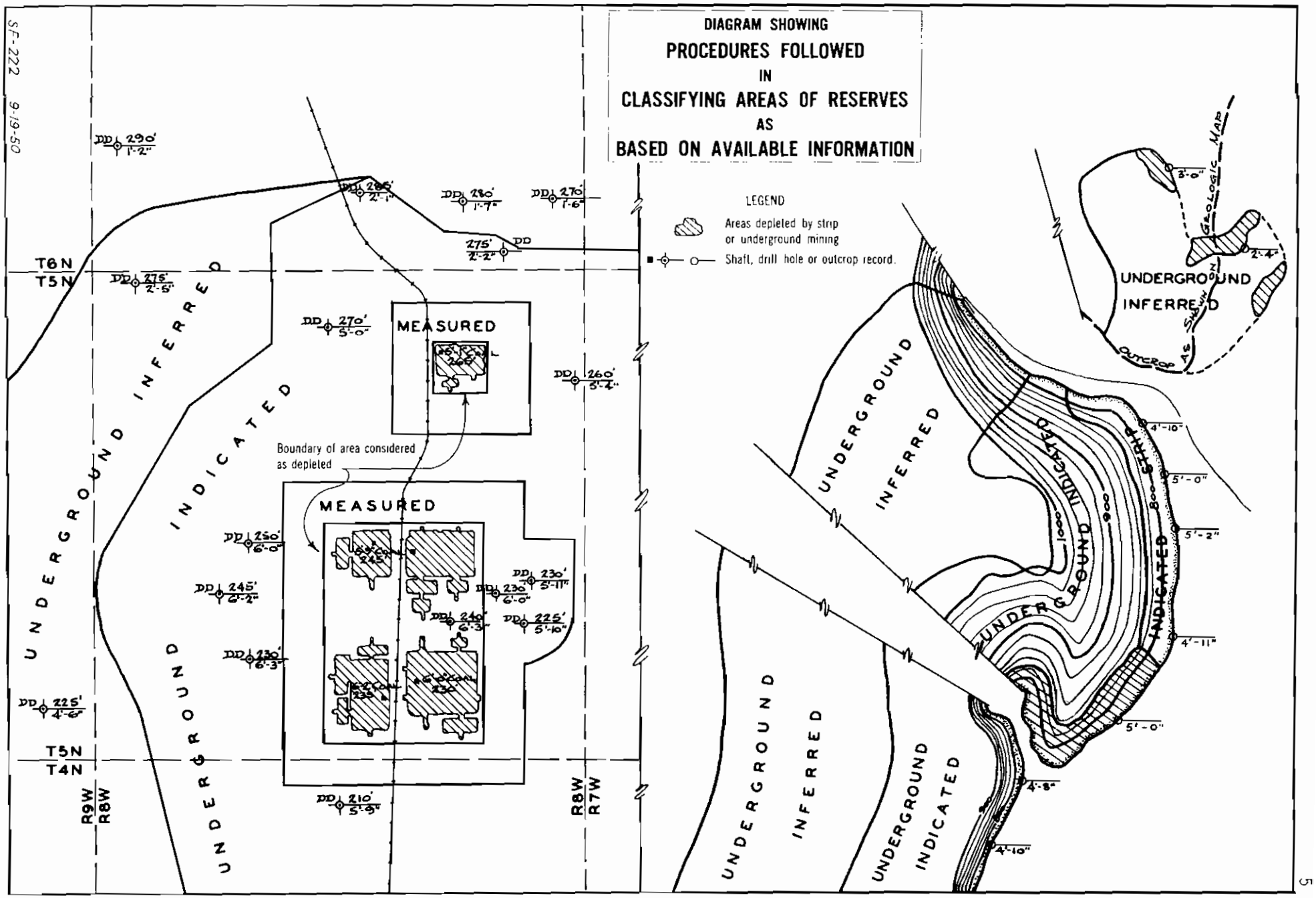
The delineation of measured, indicated, and inferred strippable reserves was based on detailed and individual examination of areas adjacent to the coal bed outcrop in each township containing such outcrop locations. Factors taken into account in estimating the presence and extent of strippable reserves included the distribution, frequency, and reliability of available information, the accuracy of location of the line of outcrop, the character of the slope immediately adjacent to the outcrop and the thickness of cover and width of the potential strippable area as shown by topographic maps, if available, the character of the overburden, if known, and the size, shape, and extent of areas already depleted by stripping or shallow underground operations, if present. In estimating strippable reserves, the amount and character of the available information are relatively much more important than in estimating underground reserves because of the determinative interdependence of factors such as the thickness and continuity of coal bed and the thickness and character of overburden in a relatively small proportion of the general coal-bearing area.

An additional factor in estimating areas of strippable reserves is the economic relationship between the costs of recovery of reserves under relatively heavy cover by the stripping method and by underground mining. While the determination of reserves available for the manufacture of synthetic liquid fuels properly precedes any consideration of costs in this survey, it is considered relevant and proper to classify such areas of reserves as primary reserves for underground operation rather than

Va
CDS
4b
70021

SF-222 9-19-50

DIAGRAM SHOWING PROCEDURES FOLLOWED IN CLASSIFYING AREAS OF RESERVES AS BASED ON AVAILABLE INFORMATION



as secondary reserves for strip-mine operation when it is estimated that underground mining will result in more economic recovery than strip mining. The inclusion of this factor in the several determinative criteria enumerated above has been adopted as a portion of the procedure followed in this survey.

Having demarcated and eliminated from further measurement all depleted areas and having delineated any areas of strippable reserves as described above, the remaining areas of reserves adjacent to such depleted and strippable areas and to outcrops, including any portions of the bed disclosed by drill hole or isolated shaft records, were classified by lines defining the various areas of measured, indicated, and inferred underground reserves as warranted by the available information and according to the definitions established in Part II. Distinctions between primary and secondary underground reserves were based on average thickness of bed within each township.

Each classified area of reserves, as thus delineated, was measured by planimeter to determine acreage, this figure then being multiplied by average thickness of bed as developed from the data and by a constant of 1,800 tons per acre-foot, following U.S. Geologic Survey procedure, to determine the number of tons in place. Since the counties in Virginia are not subdivided into civil districts or townships, the data on thickness of coal and cover and on acreage and quantity of reserves were averaged, measured, and then tabulated by 5-minute quadrangles on basic Coal Data Sheets with the information and estimated quantities of reserves in each quad-being grouped by individual beds in each county.

Preliminary analysis of available data on Virginia Coal reserves indicated that consideration of these reserves as raw material for synthetic liquid fuels plant supply could best be conducted on the individual coal beds occurring in each county. While the coal production of Virginia is commonly segregated into four commercial mining districts, these districts do not cover all the areas of potential reserves. Reserves in coal beds not now being commercially mined within such districts would not commonly be recognized as parts of these districts. Brief descriptions of the individual coal-producing districts are attached to this volume as Exhibit No. 3.

Strip mining has become a recent factor in Virginia coal production, increasing from 0.9 percent of total production in 1944 to 7.9 percent in 1948. Information on the 1948 production indicated that approximately 60 percent of the strip-mined output was obtained from 10 operations in Buchanan County, with the remainder being obtained from 8 operations in Russell, Tazewell, and Wise Counties. Except in a relatively few favorable locations, the general topography of Virginia is such that large areas of strippable reserves are not present and large-scale operations can not be readily conducted. This is exemplified by the fact that a

Va
CDS
6
7
8a
70021

total of 52 power shovels and dragline excavators were employed at the 18 operations in 1948, an average of 3 power shovels producing 78,700 tons per year for each operation. The available information in Virginia is insufficient to permit the delineation of strippable areas and, accordingly, no estimates of strippable reserves have been made. It is probable that strippable reserves on a state-wide basis, if present, would represent but a very slight proportion of total reserves.

Under the accepted definitions employed in this survey for delineating areas of measured, indicated, and inferred coal reserves, estimates of measured and indicated classes of reserves are largely based upon positive points of observation at maximum intervals as provided by the respective definitions. Estimates of inferred reserves, however, are based largely upon assumption of extent, continuity, and thickness for which there is regional geologic evidence. While available evidence of continuity and persistence of individual coal beds has thus been taken into account in projecting areas of inferred reserves beyond areas of measured and indicated reserves, the resultant estimates are regarded only as provisional until further evidence from new or hitherto undisclosed exploration becomes available.

The information used in this survey was generally based on data from major sources such as Federal and State publications, railroads, coal trade associations, etc. Neither time nor funds were available to this project for complete collection of all potential information in the hands of private interests. Information from these sources would probably increase the usable information on extent of demonstrated coal reserves above that now available from most publications. As and when such additional information may become available in the future the estimated primary reserves in this survey would probably tend to increase rather than decrease.

Estimated Recovery of Coal

Broad over-all records of percentage of recovery from coal reserves in place in existing underground operations in Virginia are not available. In 1923, the U.S. Bureau of Mines prepared a summary report on "Amount and Nature of Losses in Mining Bituminous Coal in Eastern United States", which was published in 1925 as a portion of the report of the United States Coal Division established in accordance with Public Act No. 347 by Congress on September 22, 1922. This report which covered only the underground mining prevailing at that time found that in 1921 the average amount of coal lost in individual mining operations in Virginia was 20 percent, indicating a recovery of 80 percent.

Va
CDS
8b
9a
70021

In estimating percentage of recovery from reserves in place across broad areas such as those established in this report, the amount of over-all bed losses entailed in future mining operations would normally be considered as exceeding the average percentage of losses involved in present individual operations, assuming that methods of mining were not essentially changed. The causes of such decreases in over-all recovery in broad areas include coal left in barrier pillars between mines, coal left in mined-over areas when individual active operations are abandoned, coal unmined because of undetected local decreases in thickness, quality or continuity, coal left in place under towns, cemeteries, railroads, schools, or other reservations, and coal left in pillars around oil and gas wells, etc.

An additional difficulty in establishing the percentage of recovery that may be expected from the estimated total reserves in place in Virginia is caused by the lack of available information on extents of depletion in many areas of long established or abandoned mining activity. Although estimated areas of depletion in specific beds, based on all available information, were eliminated from mapping and tabulating as reserves, it is probable that additional areas of depletion of some extent are present both in the specific beds thus treated and in other beds which were included in the estimated reserves but for which no indications of depletion were found.

The percentage of recovery from coal reserves in place by underground mining in Virginia, based upon available data, on providing for the possible contingencies cited above, and including a nominal reject loss by mechanical cleaning, is estimated for this report as 60 percent.

Summary of Estimated Coal Reserves

The detailed data presented by 5-minute rectangles on the basic Coal Data Sheets are summarized by counties and beds in Exhibit No. 1. The total recoverable reserves in each bed in each county are recapitulated in the table of Estimated Recoverable Reserves in Virginia by Counties and Beds, on the following page.

Va
CDS
9b
10
'0021

As shown in this table, 29 coal beds named in descending order were found to contain suitable reserves for production of synthetic liquid fuels according to the definitions and procedures established for this survey, with 28 beds occurring in the Southwestern Virginia Field, and one bed occurring in the Valley Coal Fields. These reserves were distributed through six counties in the Southwestern Virginia Field and two counties in the Valley Coal Fields.

Estimated Recoverable Reserves in Virginia by Counties and Beds (1,000 Tons)

Coal Bed	County						Total
	Lee	Wise	Russell	Dickenson	Buchanan	Tazewell	
Southwestern Virginia Field:							
High Splint		12,681					12,681
Morris		17,236					17,236
Pardee	7,389	48,455					55,844
Phillips	2,923						2,923
Low Splint	10,919	21,548					32,467
Taggart	26,614	73,048					99,662
Harlan (Standiford)	29,220	12,520					41,740
Upper St. Charles	6,367						6,367
Kelly	7,603	25,855					33,458
Imboden	77,382	131,913					209,295
Clintwood	7,037	24,375		18,604	24,087		74,103
Eagle					32,947		32,947
Blair	12,269	25,169					37,438
Dorchester		28,783			24,744		53,527
Norton		46,272					46,272
Hagy					70,355		70,355
Splash Dam				40,695	184,531		225,226
Upper Banner		41,950	10,676	138,976			191,602
Lower Banner		18,780	35,449	61,170	47,263		162,662
Kennedy		50,933	51,883	42,896	94,434	1,728	241,874
Raven			7,603		21,995	38,484	68,082
Jawbone		41,338	63,800		101,529	44,301	250,968
Jawbone-Tiller				17,815	7,903		25,718
Tiller						21,035	21,035
Supper Seaboard						10,212	10,212
Middle Seaboard						4,041	4,041
Lower Seaboard						19,589	19,589
Pocahontas No. 5						18,870	18,870
Total	187,723	620,856	169,411	320,156	609,788	158,260	2,066,194

	Montgomery County	Pulaski County	
Valley Coal Fields:			
Merrimac	54,896	12,889	67,785
Total Recoverable Reserves			2,133,979

The distribution of reserves in this number of coal beds illustrates the lack of regional continuity of such beds across appreciable distances. Only one bed, the Kennedy, was found to contain reserves in five of the six counties in the Southwestern Virginia Field. Three beds, the Clintwood, Lower Banner, and Jawbone contained estimated reserves in four counties. The remaining beds were found to contain estimated reserves in three counties or less. The largest amount of reserves estimated to be contained in a single bed were for the Jawbone bed, with approximately 251,000,000 tons. There were only five other beds containing over 100,000,000 tons of estimated reserves, these being, in descending order of magnitude, the Kennedy, the Splash Dam, the Imboden, the Upper Banner, and the Lower Banner beds.

The greatest number of coal beds containing estimated reserves in a single county was in Wise County with 16 beds having suitable reserves of recoverable coal. This county contains the largest amount of total reserves, approximately 621,000,000 tons, in the Southwestern Virginia Field. Buchanan County is estimated to contain 610,000,000 tons in 10 suitable beds, and Dickenson County 320,000,000 tons in 6 suitable beds. The other counties each contain less than 200,000,000 tons of total estimated reserves.

Va
CDS

llb

'0021

PART II - DEFINITIONS

Definitions of Coal

The several kinds of coal are defined as follows:

Coal - A compact stratified mass of metamorphosed plants which have in part suffered arrested decay to a varying degree of completeness.

Anthracite Coal - A slow-burning coal with 86 percent or more of fixed carbon (mineral-matter-free basis).

Bituminous Coal - Coal having less than 86 percent fixed carbon and, if fixed carbon is less than 69 percent, having a heating value of 11,000 or more Btu (moist, mineral-matter-free basis) and either agglomerating or non-weathering.

Subbituminous Coal - Coal having a heating value from 8,300 Btu to 13,000 Btu (moist, mineral-matter-free basis) and which is both weathering and non-agglomerating.

Lignite - A dull brown compact fossil wood having a heating value of less than 8,300 Btu (moist, mineral-matter-free basis).

Culm - The waste or slack of the anthracite mines, consisting of fine coal, more or less pure, and coal dust, and dirt.

Types of Coal Mining and Related Terms

Strip Mining - The method of first removing the overburden so as to expose the coal seam, usually by steam or electric shovels, and then "loading" the coal.

Underground Mining - Applies to coal extracted through underground operations, usually by driving a tunnel or drift, or by sinking a slope or shaft.

Overburden - In strip operations, comprises the soil or surface material, or the geological formation overlying the coal seam.

CDS

Stripping Ratio - The ratio between the thickness of the overburden and the thickness of the underlying coal seam.

8

Overburden Ratio - The ratio between the cubic yards of overburden and the tons of recoverable coal.

70021

Geological Terms

Geological terms in common use include the following:

Bed or Seam - A well marked or homogeneous division of a stratified series, and marked by a more or less well defined divisional plant from its neighbors above and below.

Dip - The angle which a bed makes with the horizontal plane.

Outcrop - The occurrence of any strata of rock or coal at or immediately below the surface of the ground.

Partings - In a coal seam may be either horizontal or vertical, with the horizontal partings usually consisting of sedimentary material, such as clay, shale, slate, or sandstone. Vertical partings commonly may contain calcite, kaolinite, or pyrite with the latter also occurring as horizontal partings or as irregular masses in the coal bed.

Terms Relating to Classification, and Analysis of Coal

Among the terms in general use relating to analysis, classification, and mining of coal are the following:

Raw Coal - Coal as it comes out of the mine not having been subjected to cleaning or any other preparation.

Merchantable Coal - Processed or cleaned coal of a quality acceptable for commercial use, and generally equivalent or superior in analysis to that of a channel sample.

Recoverable Coal - That portion of the total coal in place that can be delivered as merchantable coal, after being mined and (where necessary) washed or otherwise cleaned, primarily to remove ash.

Proximate Analysis - Is an analysis made of coal for the determination of moisture, volatile matter, fixed carbon, and ash.

Ultimate Analysis - Is an analysis made of coal for the determination of sulfur, hydrogen, carbon, nitrogen, oxygen, and ash.

Analysis on Mineral-matter-free Basis (Mm free)

a. Moist - for the determination of Btu content.

b. Dry - for the determination of fixed carbon and Btu content

The as-received condition represents the sample as received at the laboratory and for mine samples approximates closely the condition of the coal in the mine.

CDS
9
2
70021

Moisture-free condition represents the composition and heating value of the dry coal.

Moisture-and-ash-free (Maf) condition approximates the composition and heating value of the dry combustible matter.

Rank - The stage of coalification in the series, such as:

Rank of Coal	Abbreviation
Meta-anthracite	Ma
Anthracite	An
Semi-anthracite	Sa
Low-volatile bituminous	Lvb
Medium-volatile bituminous	Mvb
High-volatile A bituminous	Hvab
High-volatile B bituminous	Hvbb
High-volatile C bituminous	Hvcb
Subbituminous A	Suba
Subbituminous B	Subb
Subbituminous C	Subc
Lignite	Lig

Heating Value - Heat (gross) resulting from combustion of fuel, expressed for coal as Btu per pound and specified "as received", "moist, mineral-matter-free", "moisture and ash free" or "dry".

Btu (British Thermal Unit) - Quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit. Btu determinations may be made on three conditions -

(1) As received
(2) Moisture-free (i.e. dry)
(3) Moisture-and-ash-free (Maf)

Mine Samples are taken from the face of the coal bed by cutting a channel from the roof to the floor. Channel Sample - A sample secured from coal in place in the ground in accordance with procedures specified by the U.S. Bureau of Mines which requires that such sample be obtained by collecting material in a uniform channel extending from roof to floor of bed except that partings of shale, bone, and pyrite 3/8 inch or thicker and lenses or concretions of pyrite or other impurities more than 2 inches in maximum diameter or 1/2 inch in thickness are excluded.

"Tipple" samples ("breaker" samples in the anthracite region) are collected after the coal has received final treatment at the tipple or cleaning plant, or as it is loaded into railroad cars or trucks.

Delivered samples are taken from coal delivered for (Government) use as unloaded from the railroad cars or trucks.

PART III - CLASSIFICATION OF COAL RESERVES

Survey Specifications as to Minimum Requirements for Coal

The minimum requirements for bituminous coal deposits considered in this survey are as follows:

1. Thickness -

   a. For coal to be mined by underground methods - At least 24 inches.

   b. For strip-mined coal - minimum thickness 12 inches.

2. Depth -

   a. Underground-mined Coal - Not more than 1,500 feet below drainage level.

   b. Strip-mined Coal - Not more than 200 feet of overburden.
      (1) Stripping Ratio (for coal mined by stripping) - Not more than 40 to 1 up to 75 feet of overburden, and 8 to 1 for overburden in excess of 75 feet.

   The classification of coal deposits as "strippable" shall be governed by the experience and good judgment of the coal subcontractor as to the economy of that operation.

3. Minimum Recoverable Tonnage (in an area of 3 miles radius) - 30,000,000 tons for underground mining or 5,000,000 tons for stripping.

4. Calorific Value - Not less than 4,500 Btu per pound.

U.S. Geological Survey Classification of Coal Reserves

Tonnages of coal reserves have been computed by U.S. Geological Survey formulas as defined below:

CDS

Measured Coal - Coal for which tonnage is computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes.

11/3 70021

Indicated Coal - Coal for which tonnage is computed partly from specific measurements, and partly from projection of visible data for a reasonable distance on geologic evidence.

Inferred Coal - Coal for which quantitative estimates are based largely on broad knowledge of the geologic character of the bed, or region, and for which there are few, if any measurements.

In an article appearing in "Mining Transaction" Vol. 184, June 1949, Mr. Paul Averitt of the U.S. Geological Survey comments as follows:

Measured Coal. - "..... The points of observation and measurement are so closely spaced, and the thickness and extent of the coal is so well defined that the computed tonnage is judged to be accurate 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, we are assuming that for "measured" coal the points of observation will be, in general, on the order of 1/2 mile apart. The outer limit of a block of "measured" coal, therefore, is of the order of 1/4 mile from the last point of positive information (that is, roughly one half the distance between points of observations).

"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, we feel that a certain amount of coal should be classified as measured. We are proposing, therefore, a smooth line drawn roughly 1/2 mile in from the outcrop, be used to mark the limit under cover of a block of coal that can be classed as 'measured'."

Indicated Coal. - "In general, the points of observation are of the order of 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 up a block of "measured" coal of fairly uniform thickness and extent, the area of "measured" coal as defined above is, according to the judgment of the estimator, 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, this 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 there are no data 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, we propose that two lines drawn roughly parallel to the outcrop, one 1/2 mile in from the outcrop, and one 2 miles in from the outcrop, be used to define a block of coal that may be classed as 'indicated'."

CDS

12
3
70021

Inferred Coal. - "The estimates are based on an assumed continuity, for which there is geologic evidence. In general,

inferred coal lies outside the limits defined for "measured" and "indicated" coal. Where there are only outcrop data on which to base estimates, "inferred" coal is coal lying more than 2 miles in from the outcrop and within limited areas established as I shall describe in a later paragraph."

Classification of Coal Reserves
in Respect to Plant Requirements

Availability of Raw Materials Reserves - From the viewpoint of availability of raw material reserves, the quantity considered sufficient for one or more plants is based upon a recoverable amount sufficient to supply such plant for a period of 40 years of which 20 years' supply is from primary reserves and the additional 20 years' supply is from either primary or secondary reserves.

The classification of coal reserves as primary and secondary is based upon thickness of seam and class of reserve as measured, indicated, or inferred. Thus primary reserves for underground mining include only beds 28 inches or more in thickness which are classed as either measured or indicated. The complete classification for bituminous coal is as follows:

a. Primary Reserves ("Measured" and "Indicated" only)

(1) Underground - At least 28 inches in thickness.

(2) Strip - Minimum thickness of 12 inches. Not more than an average depth of 75 feet of overburden, stripping ratio not to exceed 15 to 1.

b. Secondary Reserves ("Measured", "Indicated", and "Inferred").

CDS

(1) Underground - At least 24 inches in thickness.

13
3
70021

(2) Strip - Minimum thickness of 12 inches. Not more than an average depth of 200 feet of overburden. Stripping ratio not to exceed 40 to 1 up to 75 feet of overburden and 8 to 1 for overburden in excess of 75 feet.

Coal Districts of Virginia

Although widespread areas of the Southwestern Virginia and Valley Field coal provinces are underlain by minable coals of high rank and quality, exploitation of these beds has been confined to certain localities where the combination of thicker, high-quality coal beds, and existing transportation facilities has fostered the growth of a permanent mining industry. Several such mine development areas have become recognized as producing districts, these including the (1) Virginia, (2) Buchanan County, (3) Smokeless, and (4) Valley Coal Fields districts.

The Virginia district is the most important of the coal mining areas and includes mine developments extending from the northern corner of Lee County across southern Wise County into parts of southern Dickenson and central Russell County. In its northernmost extension the district includes the southern part of Tazewell County. This general area has been subdivided into several local districts on the basis of distinctions in the quality of coal products and differences in railroad outlets.

In the northern part, formerly called the Clinch Valley district, the Upper and Lower Banner, Tiller, Jordan, Raven, Kennedy, and Splash Dam beds have provided the major production. In Lee and Wise Counties, a total of 12 beds has been worked with the greatest production coming from the Banner, Blair, Harlan, Low Splint, Dorchester, Imboden, Kennedy, Norton, and Taggart coals.

The coal beds of the Virginia district are high volatile "A" bituminous in rank, and are marketed principally for general industrial and railroad use. In addition, some of the coals from Wise County are noted for their gas and coke-making qualities while certain block-type coals of Lee County have found a wide domestic market.

The Buchanan district includes a well-developed mining area in the southwestern portion of Buchanan County, the Lower Buchanan field, and a relatively new mine development in the central part of the county known as the Upper Buchanan field.

Several beds are mined, but coal from the Clintwood and Cary (Lower Banner) beds make up the bulk of the production. The coal beds of the Lower Buchanan area are classified as high volatile, while those in the central field, also known as the Grundy area, are generally medium to low volatile in rank. These coals have wide application for industrial and railroad fuels and also supply an extensive domestic market.

Va.
CDS
10
70021

The Smokeless district in northern Tazewell County has been developed mainly on continuations of the West Virginia Pocahontas No. 3 and No. 4 coals, but the district also includes a few mine operations in the Jewell (Raven) and Lower Seaboard coal beds.

The Pocahontas coals are low volatile in rank and are in demand as a smokeless fuel and for manufacture of metallurgical coke. The other beds in the area are of high volatile rank.

The Valley district includes portions of the Valley Coal Fields lying in Montgomery, Pulaski, and Wythe Counties. Only two beds, the Merrimac and Langhorne, have been extensively mined. This coal is commonly classified as anthracite, but on the basis of analysis varies from low volatile bituminous to semi-anthracite.

Va
CDS

70021

SYNTHETIC LIQUID FUEL SURVEY

SUMMARY OF RECOVERABLE COAL RESERVES IN VIRGINIA *

BY COUNTIES AND BEDS

Analysis (as received), thickness, dip, cover, rank, B.T.U. and area:

No.	County	Bed	Thickness of Coal (Inches) Max	Min	Ave	Dip of Bed (Degrees) Max	Min	Ave	Thickness of Cover (Feet) Underground Mining Max	Min	Ave	Strip Mining Max	Ave	Rank of Coal	Proximate: Moisture	Volatile Matter	Fixed Carbon	Ash	Ultimate: Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	B.T.U. As Received	Moisture and Ash Free	Area of Unmined Coal (Acres)
1	Montgomery	Merrimac	86	48		50	15		1500	0	950			Sa	2.1	11.7	64.4	21.8	0.5	3.4	68.8	0.9	4.6	11,610	15,250	8,512
2	Pulaski	Merrimac			62	50	15		1500	0	900			Sa	2.4	11.0	64.7	21.9	0.7	3.4	68.7	0.8	4.5	11,550	15,260	2,310
3																										
4	Tazewell	Kennedy			50	**	**				150			Hvab	4.7	30.8	59.4	5.1	1.0	5.4	80.3	1.4	6.8	13,960	15,480	384
5		Raven	46	36					250	150				Mvb	3.2	28.7	62.4	5.7	0.7	5.4	80.6	1.3	6.3	14,300	15,700	10,247
6		Jawbone	46	37					350	250				Hvab	2.1	31.1	55.2	11.6	0.5	4.9	75.2	1.4	6.4	13,260	15,370	12,396
7		Tiller	37	28					300	250				Hvab	2.7	30.9	58.1	8.3	0.6	5.0	77.4	1.4	7.3	13,640	15,320	6,893
8		Upper Seaboard	31	29					300	250				Hvab	3.1	29.0	61.8	6.1	0.6	5.0	80.0	1.4	6.9	14,210	15,660	3,820
9		Middle Seaboard			42						125			Hvab	3.5	29.2	63.3	4.0	1.0					14,430	15,600	1,069
10		Lower Seaboard			49						200			Mvb	3.4	28.1	64.9	3.6	1.1					14,560	15,650	4,442
11		Pocahontas No.5			56						600			Lvb	4.5	18.5	72.0	5.0	0.8					14,270	15,770	3,744
12		Total																								42,995
13																										
14	Buchanan	Clintwood	58	40		**	**		200	50				Hvab	2.0	31.7	60.5	5.8	1.2	5.2	79.9	1.6	6.3	14,280	15,490	5,760
15		Eagle	58	34					225	150				Hvab	3.8	31.8	61.0	3.4	1.3	5.3	80.9	1.5	7.6	14,390	15,510	8,390
16		Dorchester (Glamorgan)	39	30					350	275					No		Analysis					Available				8,685
17		Hagy	38	30					210	150				Mvb	2.1	31.0	59.6	7.3	1.8					14,000	15,450	22,124
18		Splash Dam	50	33					250	175				Mvb	3.4	28.2	61.4	7.0	0.7	5.1	78.3	1.5	7.4	13,810	15,410	54,309
19		Lower Banner	57	42					250	150				Mvb	2.9	21.9	67.5	7.7	1.1	4.9	79.8	1.5	5.0	14,010	15,670	9,810
20		Kennedy	38	30					300	175					No		Analysis					Available				31,212
21		Raven	57	31					450	175				Mvb	2.6	20.8	73.2	3.4	0.5					14,870	15,820	5,734
22		Jawbone-Tiller			54						300			Mvb	2.5	25.5	61.7	10.3	0.7					13,350	15,340	1,626
23		Jawbone	46	30					350	250				Lvb	2.5	19.6	64.6	13.3	0.7					13,160	15,630	28,806
24		Total																								176,456
25																										
26	Dickenson	Clintwood	50	30		**	**				150			Hvab	2.2	34.2	60.4	3.2	0.9					14,590	15,420	4,538
27		Splash Dam	48	35							175			Hvab	1.9	30.7	59.7	7.7	0.9					14,060	15,550	10,687
28		Upper Banner	60	35					225	125				Hvab	2.0	31.7	61.1	5.2	0.8	5.3	80.9	1.6	6.2	14,430	15,560	35,808
29		Lower Banner	50	33					275	225				Hvab	2.4	30.0	57.3	10.3	0.9	5.1	76.4	1.5	5.8	13,560	15,530	18,069
30		Kennedy	55	30					350	175				Mvb	2.6	26.2	61.7	9.5	0.7	4.8	77.6	1.6	3.8	13,640	15,520	11,743
31		Jawbone-Tiller	74	54					325	300				Hvab	2.2	31.9	59.4	6.5	0.5	5.1	79.7	1.0	7.2	14,110	15,450	2,938
32		Total																								83,783
33																										
34	Russell	Upper Banner			60	**	**				200			Hvab	2.6	35.6	54.9	6.9	0.6	5.5	78.1	1.4	7.5	13,920	15,380	1,977
35		Lower Banner	50	32					250	125				Hvab	2.1	35.0	56.9	6.0	0.8	5.3	79.4	1.5	7.0	14,240	15,500	8,706
36		Kennedy	55	33					350	150					No		Analysis					Available				13,736
37		Raven	38	31					250	225				Hvab	1.9	34.7	50.9	12.5	2.2	4.9	72.0	1.4	7.0	12,860	15,020	2,573
38		Jawbone	75	34					375	275					No		Analysis					Available				10,951
39		Total																								37,943
40																										
41	Wise	High Splint	65	45		**	**		250	150				Hvab	2.4	35.4	55.9	6.3	0.8					13,900	15,220	2,541
42		Morris	60	40					270	200					No		Analysis					Available				3,757
43		Pardee	50	48					350	250				Hvab	3.0	34.5	56.1	6.4	0.9	5.3	76.4	1.6	9.4	13,610	15,020	11,034
44		Low Splint	40	24					625	100					No		Analysis					Available				8,609
45		Taggart	48	30					700	250				Hvab	2.2	34.8	60.1	2.9	0.7	5.8	81.4	1.4	7.8	14,620	15,410	20,992
46		Harlan	50	30					200	125					No		Analysis					Available				3,545
47		Kelly	40	32					235	90				Hvab	2.3	33.8	57.4	6.5	0.9	4.9	78.1	1.5	8.1	13,960	15,300	7,968
48		Imboden	65	38					800	125				Hvab	2.3	33.9	57.7	6.1	0.8	6.2	78.3	1.5	8.1	13,950	15,230	26,235
49		Clintwood	45	28					150	125					No		Analysis					Available				7,565
50		Blair	60	36					200	100				Hvab	2.4	32.2	58.4	7.0	0.8	6.3	78.6	1.6	6.7	13,990	15,440	7,047
51		Dorchester (Glamorgan)	40	30					200	150				Hvab	3.0	34.0	57.0	6.0	1.9	5.3	77.8	1.5	7.5	13,910	15,290	8,664
52		Norton	36	33					200	175				Hvab	2.7	31.9	57.8	7.6	1.2	5.3	77.0	1.7	7.2	13,730	15,310	14,411
53		Upper Banner	60	35					226	150				Hvab	2.6	32.9	57.8	6.7	0.6	5.2	78.8	1.6	7.1	13,940	15,370	9,580
54		Lower Banner	52	40					275	200				Hvab	2.4	32.7	54.6	10.3	1.0	5.0	74.7	1.6	7.4	13390	15,330	4,583
55		Kennedy			45				350	150					No		Analysis					Available				12,576
56		Jawbone	75	46					375	200				Hvab	1.5	31.4	49.8	17.3	1.3	4.7	68.9	1.3	6.5	12,190	15,010	7,288
57		Total																								156,395
58																										
59	Lee	Pardee	63	60		**	**				250			Hvab	5.3	32.7	53.2	8.8	0.8	5.1	70.4	1.4	13.5	12,780	14,970	1,351
60		Phillips	45	36					450	400				Hvab	3.7	35.5	52.8	8.0	0.8	6.1	73.1	1.8	11.2	13,020	14,760	838
61		Low Splint	75	40					500	200				Hvab	3.5	35.2	53.2	8.1	1.1	5.2	73.2	1.7	10.7	13,070	14,770	2,439
62		Taggart	48	36					825	200				Hvab	3.5	36.4	57.3	2.8	0.5	5.6	78.7	1.5	10.9	14,000	14,940	7,673
63		Harlan	41	40							350			Hvab	2.9	38.3	50.2	8.6	2.8					13,090	14,780	8,026
64		Upper St. Charles			36						125			Hvab	3.5	34.3	53.3	8.9	0.7					12,940	14,930	1,965
65		Kelly			40						150			Hvab	3.3	35.1	55.1	6.5	0.8	5.4	76.0	1.7	9.6	13,560	14,810	2,112
66		Imboden	60	36					700	200				Hvab	2.7	37.7	54.0	5.6	0.8	5.5	76.4	1.9	9.8	13,600	14,820	18,074
67		Clintwood			35						225			Hvab	3.2	38.5	56.1	2.2	1.7					14,060	14,860	2,234
68		Blair			60				225	100					No		Analysis					Available				2,272
69		Total																								46,984

Quantity of primary reserves (thousands of tons) and quantity of secondary reserves (thousands of tons):

No.	Primary UG Mining Measured Acres	Tons	Primary UG Mining Indicated Acres	Tons	Primary Strip Mining Measured Acres	Tons	Primary Strip Mining Indicated Acres	Tons	Secondary UG Mining Measured Acres	Tons	Secondary UG Mining Indicated Acres	Tons	Secondary UG Mining Inferred Acres	Tons	Secondary Strip Mining Measured Acres	Tons	Secondary Strip Mining Indicated Acres	Tons	Secondary Strip Mining Inferred Acres	Tons
1			8,512	54,896	None		None		None		None				None		None		None	
2			2,310	12,889	"		"		"		"				"		"		"	
3																				
4			384	1,728	"		"		"		"				"		"		"	
5			10,247	38,484	"		"		"		"				"		"		"	
6			9,331	33,477	"		"		"		"		3,065	10,824	"		"		"	
7			3,277	10,912	"		"		"		"		3,616	10,123	"		"		"	
8			3,110	8,359	"		"		"		"		710	1,853	"		"		"	
9			1,069	4,041	"		"		"		"				"		"		"	
10			4,442	19,589	"		"		"		"				"		"		"	
11			2,022	10,191	"		"		"		"		1,722	8,679	"		"		"	
12			33,882	126,781									9,113	31,479						
13																				
14			4,218	18,536	"		"		"		"		1,542	5,551	"		"		"	
15			6,227	24,000	"		"		"		"		2,163	8,947	"		"		"	
16			8,685	24,744	"		"		"		"				"		"		"	
17			17,184	54,852	"		"		"		"		4,940	15,503	"		"		"	
18			45,132	156,765	"		"		"		"		9,177	27,766	"		"		"	
19			9,810	47,263	"		"		"		"				"		"		"	
20			30,290	91,447	"		"		"		"		922	2,987	"		"		"	
21			3,232	11,768	"		"		"		"		2,502	10,227	"		"		"	
22			1,626	7,903	"		"		"		"				"		"		"	
23			23,724	82,481	"		"		"		"		5,082	19,048	"		"		"	
24			150,128	519,759									26,328	90,029						
25																				
26			4,007	16,301	"		"		"		"		531	2,303	"		"		"	
27			8383	30,742	"		"		"		"		2,304	9,953	"		"		"	
28	800	2,880	30,246	118,863	"		"		"		"		4,762	17,233	"		"		"	
29	653	2,351	17,416	58,819	"		"		"		"				"		"		"	
30			10,956	40,771	"		"		"		"		787	2,125	"		"		"	
31			2,298	13,553	"		"		"		"		640	4,262	"		"		"	
32	1453	5,231	73,306	279,049									9,024	35,876						
33																				
34			1,977	10,676	"		"		"		"				"		"		"	
35	781	3031	5,998	24,198	"		"		"		"		1,927	8,220	"		"		"	
36			13,736	51,883	"		"		"		"				"		"		"	
37					"		"		"		"		2,573	7,603	"		"		"	
38	1,126	7,297	5,197	32,055	"		"		"		"		4,628	24,448	"		"		"	
39	1,907	10,328	26,908	118,812									9,128	40,271						
40																				
41	877	3,552	1,664	9,129	"		"		"		"				"		"		"	
42	2,169	10,147	1,588	7,089	"		"		"		"				"		"		"	
43	7,443	32,295	3,591	16,160	"		"		"		"				"		"		"	
44			442	1,519	"		"		"		"		8,167	20,029	"		"		"	
45	2,317	7,718	11,865	41,372	"		"		"		"		6,810	23,958	"		"		"	
46			2,329	8,229	"		"		"		"		1,216	4,291	"		"		"	
47			5,530	18,714	"		"		"		"		2,438	7,141	"		"		"	
48	6,094	32,477	17,549	84,840	"		"		"		"		2,592	14,596	"		"		"	
49			4,915	15,927	"		"		"		"		2,650	8448	"		"		"	
50	2426	7,860	4,621	17,309	"		"		"		"				"		"		"	
51	1267	4,302	7,397	24,481	"		"		"		"				"		"		"	
52	2,636	8,449	9036	28,948	"		"		"		"		2,739	8,875	"		"		"	
53			9,580	41,950	"		"		"		"				"		"		"	
54	896	3,644	3,687	15,136	"		"		"		"				"		"		"	
55	960	3,888	7,424	30,067	"		"		"		"		4,192	16,978	"		"		"	
56			6,111	34,426	"		"		"		"		1,177	6,912	"		"		"	
57	27,085	114,332	97,329	395,296									31,981	111,228						
58																				
59			1351	7,389	"		"		"		"				"		"		"	
60			838	2,923	"		"		"		"				"		"		"	
61			2,439	10,919	"		"		"		"				"		"		"	
62	3,097	10,723	4,576	15,891	"		"		"		"				"		"		"	
63	1696	6,153	6,330	23,067	"		"		"		"				"		"		"	
64			1,965	6,367	"		"		"		"				"		"		"	
65			2,112	7,603	"		"		"		"				"		"		"	
66	64	346	10,400	46,192	"		"		"		"		7,610	30,844	"		"		"	
67			845	2,662	"		"		"		"		1,389	4,375	"		"		"	
68			2,272	12,269	"		"		"		"				"		"		"	
69	4857	17,222	33,128	135,282									8,999	35,219						

SOURCES OF INFORMATION AND OTHER FOOTNOTES: *Based on estimated recovery factors of 60 percent for underground reserves in place.
**Dip rarely exceeds four degrees and averages less than two degrees.

SF 34 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37° 30' LONGITUDE: 81°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: EAGLE

EXHIBIT NO. 2 SHEET-1

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES)			DIP OF BED** (DEGREES)			THICKNESS OF COVER (FEET) UNDERGROUND MINING			THICKNESS OF COVER (FEET) STRIP MINING			RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE				ULTIMATE					B.T.U.		AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING				STRIP MINING				QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING						STRIP MINING						REMARKS	
			MAX	MIN	AVE	MAX	MIN	AVE	MAX	MIN	AVE	MAX	AVE			MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	AS RECEIVED	MOISTURE AND ASH FREE		MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	INFERRED ACRES	INFERRED TONS	MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	INFERRED ACRES	INFERRED TONS		
1	37°30'x 81°55	BUCHANAN			37						200																755			755	4,190																			
2		TOTAL													Hvab	3.1	31.1	61.0	3.4	1.3	5.3	80.1	1.5	7.6	14,390	15,510	755			755	4,190																					
3		Recoverable Reserves																													2,514																			60% Recovery
4																																																				
5																																																				
6																																																				
7																																																				
8																																																				
9																																																				
10																																																				
11																																																				
12																																																				
13																																																				
14																																																				
15																																																				
16																																																				
17																																																				
18																																																				
19																																																				
20																																																				
21																																																				
22																																																				
23																																																				
24																																																				
25																																																				
26																																																				
27																																																				
28																																																				
29																																																				
30																																																				
31																																																				
32																																																				
33																																																				
34																																																				
35																																																				
36																																																				
37																																																				
38																																																				
39																																																				
40																																																				
41																																																				
42																																																				
43																																																				
44																																																				
45																																																				
46																																																				
47																																																				
48																																																				
49																																																				
50																																																				
51																																																				
52																																																				
53																																																				
54																																																				
55																																																				
56																																																				
57																																																				
58																																																				
59																																																				
60																																																				
61																																																				
62																																																				
63																																																				
64																																																				
65																																																				
66																																																				
67																																																				
68																																																				
69																																																				

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 18, THE GEOLOGY AND COAL RESOURCES BUCHANAN COUNTY, 1913.
U.S. BUREAU OF MINES: TECH. PAPER, 656 - ANALYSES OF VIRGINIA COALS, 1944.
BULL. 446 TYPICAL ANALYSES OF COALS OF UNITED STATES, 1942.

** DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 35 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 80°-00'

STATE: VIRGINIA

COAL FIELD: VALLEY FIELDS

COAL SEAM: MERRIMAC

EXHIBIT NO. 2 SHEET-2

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS
1	37°-15' x 80°-20'	MONTGOMERY			48						1000															2,030			2,030	14,976																				
2	15' 25'				36						1000															909			909	11,726																				
3	10' 25'				80						1000															3,117			3,117	37,404																				
4	10' 30'				80						1000															1,856			1,856	22,272																				
5	10' 35'				62						950															550			550	5,115																				
6		TOTAL				50	15							Sa	2.1	11.7	64.4	21.8	0.5	3.6	68.8	0.9	4.6	11,610	15,260	8,512			8,512	91,493																						
7		RECOVERABLE RESERVE																												54,896																				60 % Recovery
8																																																		
9	37°-10' x 80°-35'	PULASKI			62						950															1,632			1,632	15,177																				
10	10' 40'				62						900															678			678	6,305																				
11		TOTAL				50	15							Sa	2.4	11.0	64.7	21.9	0.7	3.4	68.7	0.8	4.5	11,550	15,260	2,310			2,310	21,482																						
12		RECOVERABLE RESERVES																												12,889																				60 % Recovery

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 25 - THE VALLEY COAL FIELDS OF VIRGINIA - 1925
U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSES OF VIRGINIA COALS - 1944
BULL. 446 - TYPICAL ANALYSES OF COALS OF UNITED STATES - 1942

SF 36 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 81°-00

STATE: VIRGINIA

COAL FIELD: VALLEY FIELDS AND SOUTHWESTERN VIRGINIA

COAL SEAM: EAGLE, HAGY, LOWER BANNER, KENNEDY, AND RAVEN

EXHIBIT NO. 2 SHEET- 3

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS
1	EAGLE BED																																															
2	37°-25' x 81°-55'	BUCHANAN			34						225															256			256	1,306																		
3	20' 55'				34						150															115			115	586																		
4		TOTAL												Hvab	3.8	31.8	61.0	3.4	1.3	5.3	80.7	1.5	7.6	14,370	15,510	371			371	1,892																		
5		Recoverable Reserves																												1,135																		60% Recovery
6																																																
7	HAGY BED																																															
8	37°-20' x 81°-55'	BUCHANAN			32						150															486														486	2,333						
9	15' 50'				30						150															461			461	2,075																	
10	18' 55'				32						150															2,291			960	4,608											1,331	6,389					
11		TOTAL												Hvb	2.1	31.0	59.6	7.3	1.8					14,000	15,450	3,238			1,421	6,683											1,817	8,722					
12		Recoverable Reserves																												4,010												5,233					60 Recovery
13																																																
14	LOWER BANNER BED																																															
15	37°-15' x 81°-55'	BUCHANAN			44						250															1,766			1,766	11,656																		
16	10' 55'				57						225															4,710			4,710	41,484																	
17	05' 55'				42						150															640			640	4,032																	
18		TOTAL												Mvb	2.9	21.9	67.5	7.7	1.1	4.9	79.8	1.5	5.0	14,010	15,670	7,116			7,116	57,372																		
19		Recoverable Reserves																												34,423																	60% Recovery
20																																																
21	37°-05' x 81°-55'	RUSSELL			42						150															1,447			1,005	6,332											442	2,785					
22	00' 55'				49						150															1,959			474	3,484											1,485	10,915					
23		TOTAL												Hvab	2.1	35.0	56.9	6.0	0.8	5.3	79.4	1.5	7.0	14,240	15,500	3,406			1,479	9,816											1,927	13,700					
24		Recoverable Reserves																												5,890												8,220					60% Recovery
25																																																
26	KENNEDY BED																																															
27	37°-10' x 81°-50'	BUCHANAN			36						175															922														922	4,979					
28	10' 55'				35						300															5,459			5,459	28,660																	
29	10' 55'				35						225															480			480	2,520																	
30		TOTAL															No Analysis Available									6,861			5,939	31,180											922	4,979					
31		Recoverable Reserves																												18,708												2,987					60% Recovery
32																																																
33	37°-05' x 81°-50'	TAZEWELL			50						150															384			384	2,880																		
34		TOTAL												Hvab	4.7	30.8	57.4	5.1	1.0	5.4	80.3	1.4	6.3	13,760	15,430	384			384	2,880																		
35		Recoverable Reserves																												1,728																	60% Recovery
36																																																
37	37°-05' x 81°-50'	RUSSELL			50						150															525			525	3,938																		
38	05' 55'				35						225															3,757			3,757	19,724																	
39	00' 55'				38						200															3,878			3,878	22,105																	
40		TOTAL															No Analysis Available									8,160			8,160	45,767																		60% Recovery
41		Recoverable Reserves																												27,460																	
42																																																
43	RAVEN BED																																															
44	37°-15' x 81°-45'	BUCHANAN			57						450															1,018														1,018	8,706					
45	10' 45'				46						175															2,054			1,414	9,756											640	4,416					
46	10' 55'				31						250															403			205	953											198	921					
47	05' 50'				42						225															851			851	5,361																	
48	05' 55'				31						250															1,408			762	3,543											646	3,008					
49		TOTAL												Mvb	2.6	20.8	73.2	3.4	0.5					14,370	15,320	5,734			3,232	13,613											2,502	17,045					
50		Recoverable Reserves																												11,768												10,227					60% Recovery
51																																																
52	37°-10' x 81°-45'	TAZEWELL			46						175															2,157			2,157	14,833																		
53	10' 50'				36						250															544			544	2,938																	
54	05' 45'				36						150															1,357			1,357	7,328																	
55	05' 50'				42						225															6,139			6,139	33,991																	
56		TOTAL												Mvb	3.2	28.7	62.4	5.7	0.7	5.4	80.6	1.3	6.3	14,300	15,700	10,247			10,247	64,140																		
57		Recoverable Reserves																												38,484																	60% Recovery
58																																																
59	37°-05' x 81°55'	RUSSELL			31						250															1,709														1,709	7,967					
60	00' 55'				38						225															864														864	4,725					
61		TOTAL												Hvab	1.7	34.7	50.9	12.5	2.2	4.9	72.0	1.4	7.0	12,860	15,020	2,573														2,573	12,692					
62		Recoverable Reserves																												7,603																	60% Recovery
63																																																
64																																																
65																																																
66																																																
67																																																
68																																																
69																																																

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. NO. 18, THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY, 1918.
BULL. NO. 19, THE GEOLOGY AND COAL RESOURCES OF THE COAL-BEARING PORTION OF TAZEWELL COUNTY, 1919.
BULL. NO. 22, THE GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY, 1922.
U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSES OF VIRGINIA COALS, 1944.
BULL. 446 - TYPICAL ANALYSES OF THE COALS OF UNITED STATES, 1942.

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

3F 37 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 81°-00'

STATE: VIRGINIA

COAL FIELD: VALLEY FIELDS AND SOUTHWESTERN VIRGINIA

COAL SEAM: JAWBONE, TILLER, UPPER SEABOARD, MIDDLE SEABOARD, LOWER SEABOARD, POCAHONTAS NO. 5

EXHIBIT NO. 2 SHEET-4

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	JAWBONE BED																																																	1
2	37°-15' x 81°-50'	BUCHANAN			40						300															518		518	3,108																					2
3	15' 55'				30						300															614		614	2,763																					3
4	10' 45'				46						250															2,195		1,734	11,765													461	3,181							4
5	10' 50'				42						350															12,621		8,704	54,835													3,917	24,677							5
6	10' 55'				36						350															4,653		4,141	22,361													512	2,765							6
7	05' 50'				37						275															2,235		2,073	12,246													192	1,123							7
8	05' 55'				34						325															5,920		5,920	30,172																					8
9		TOTAL												Lvb	2.5	19.6	66.6	13.3	0.7					13,160	15,630	28,806		23,724	137,468													5,082	31,746							9
10		Recoverable Reserves																											32,431															19,048							60% Recovery	10
11																																																		11
12	37°-10' x 81°-45'	TAZEWELL			46						250															1,651		1,651	11,372																					12
13	10' 50'				42						350															537		294	1,823													243	1,531							13
14	05' 45'				37						250															2,189		2,189	12,149																					14
15	05' 50'				31						275															8,019		5,197	30,402													2,822	16,509							15
16		TOTAL												Hvab	2.1	31.1	55.2	11.6	0.5	4.9	75.2	1.4	6.4	13,260	15,370	12,396		9,331	55,775													3,065	18,040							16
17		Recoverable Reserves																											33,477															10,824							60% Recovery	17
18																																																		18
19	37°-05' x 81°-50'	RUSSELL			39						275															896		320	1,872													576	3,370							19
20	05' 55'				34						325															1,485		307	1,566													1,178	6,008							20
21		TOTAL														No Analysis Available										2,381		627	3,438													1,754	9,378							21
22		Recoverable Reserves																											2,063															5,627							60% Recovery	22
23																																																		23
24	TILLER BED																																																	24
25	37°-10' x 81°-45'	TAZEWELL			37						300															1,677		1,677	9,307																					25
26	05' 45'				37						275															2,148		1,600	8,880													1,248	6,926							26
27	05' 50'				28						250															2,368																2,368	9,446							27
28		TOTAL												Hvab	2.7	30.9	58.1	8.3	0.4	5.0	77.4	1.4	7.3	13,640	15,320	6,893		3,277	18,137													3,616	16,372							28
29		Recoverable Reserves																											10,912															10,123							60% Recovery	29
30																																																		30
31	UPPER SEABOARD BED																																																	31
32	37°-10' x 81°-45'	TAZEWELL			31						300															1,344		1,344	6,720																					32
33	05' 40'				27						250															2,476		1,766	7,612													710	3,089							33
34		TOTAL												Hvab	3.1	29.0	61.3	6.1	0.6	5.0	80.0	1.4	6.9	14,210	15,660	3,820		3,110	13,732													710	3,089							34
35		Recoverable Reserves																											8,359															1,853							60% Recovery	35
36																																																		36
37	MIDDLE SEABOARD BED																																																	37
38	37°-05' x 81°-40'	TAZEWELL			42						125															1,069		1,069	6,735																					38
39		TOTAL												Hvab	3.5	29.2	63.3	4.0	1.0					14,430	15,600	1,069		1,069	6,735																					39
40		Recoverable Reserves																											4,041																					60% Recovery	40
41																																																		41
42	LOWER SEABOARD BED																																																	42
43	37°-10' x 81°-45'	TAZEWELL			49						200															602		602	4,425																					43
44	05' 45'				49						200															3,840		3,840	23,224																					44
45		TOTAL												Mvab	3.4	28.1	64.9	3.6	1.1					14,560	15,450	4,442		4,442	32,649																					45
46		Recoverable Reserves																											17,587																					60% Recovery	46
47																																																		47
48	POCAHONTAS NO. 5 BED																																																	48
49	37°-10' x 81°-35'	TAZEWELL			56						600															3,744		2,022	16,986													1,722	14,465							49
50		TOTAL												Lvb	4.5	13.5	77.0	5.0	0.3					14,270	15,770	3,744		2,022	16,986													1,722	14,465							50
51		Recoverable Reserves																											10,191															8,679							60% Recovery	51
52																																																		52
53																																																		53
54																																																		54
55																																																		55
56																																																		56
57																																																		57
58																																																		58
59																																																		59
60																																																		60
61																																																		61
62																																																		62
63																																																		63
64																																																		64
65																																																		65
66																																																		66
67																																																		67
68																																																		68
69																																																		69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 18, THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY, 1913.
BULL. 19, THE GEOLOGY AND COAL RESOURCES OF THE COAL BEARING PORTION OF TAZEWELL COUNTY, 1919.
BULL. 22, THE GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY, 1922.
U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSES OF VIRGINIA COALS, 1944.
BULL. 446 - TYPICAL ANALYSES OF COALS OF UNITED STATES, 1942.

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 38 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: HIGH SPLINT, MORRIS, PARDEE, LOW SPLINT TAGGART, KELLY, IMBODEN, & CLINTWOOD

EXHIBIT NO. 2 SHEET-5

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	HIGH SPLINT	BED																																															1
2	37°-00' x 82°-45'	WISE			55						250															576			576	4,752																				2
3	00' 40'				45						250															877	877	3,920																					3
4		TOTAL												Hvab	2.4	35.4	55.9	6.3	0.8					13,900	15,220	1,453	877	5,920	576	4,752																				4
5		Recoverable Reserves																										3,552		2,851																			60 % Recovery	5
6																																																	6
7	MORRIS BED																																																7
8	37°-00' x 82°-45'	WISE			60						270															544			544	4,896																				8
9		TOTAL													NO	ANALYSIS				AVAILABLE						544			544	4,896																				9
10		Recoverable Reserves																												2,938																			60 % Recovery	10
11																																																	11
12	PARDEE BED																																																12
13	37°-00' x 82°-45'	WISE			48						350															4,544	4,544	32,717																					13
14	00' 50'				48						350															2,118	2,118	15,250																					14
15		TOTAL												Hvab	3.0	34.5	56.1	6.4	0.9	5.3	76.4	1.6	9.4	13,610	15,040	6,662	6,662	47,967																					15
16		Recoverable Reserves																										28,780																			60 % Recovery	16
17																																																	17
18	LOW SPLINT	BED																																															18
19	37°-00' x 82°-35'	WISE			30						125															186																							19
20	00' 40'				30						625															3,456																							20
21	00' 45'				30						625															781																							21
22		TOTAL													NO	ANALYSIS				AVAILABLE						4,423																							22
23		Recoverable Reserves																												11,942																			60 % Recovery	23
24																																																	24
25	TAGGART BED																																																25
26	37°-00' x 82°-40'	WISE			30						625															909			909	4,091																				26
27	00 45'				30						625															4,838	960	4,320	2,643	11,894																				27
28		TOTAL												Hvab	2.2	34.8	60.1	2.9	0.7	5.8	81.4	1.4	7.8	14,620	15,410	5,747	960	4,320	3,552	15,985																					28
29		Recoverable Reserves																										2,592		9,591																			60 % Recovery	29
30																														3,335																				30
31	KELLY BED																																																31
32	37°-05' x 82°-30'	WISE			40						90															704			704	4,224																				32
33	05' 35'				40						90															102			102	612																				33
34	00' 35'				40						90															1,210			1,210	7,260																				34
35	00' 40'				40						235															1,856			1,856	11,136																				35
36		TOTAL												Hvab	2.3	33.8	57.4	6.5	0.9	4.9	78.1	1.5	8.1	13,960	15,300	3,872			3,872	23,232																					36
37		Recoverable Reserves																												13,939																			60 % Recovery	37
38																																																	38
39	IMBODEN BED																																																39
40	37°-05' x 82°-30'	WISE			48						125															384			384	2,188																				40
41	05' 35'				38						125															531			531	3,027																				41
42	00' 35'				38						125															243			243	1,385																				42
43	00' 40'				33						275															1,875			1,875	10,688																				43
44		TOTAL												Hvab	2.3	33.9	57.7	6.1	0.8	5.2	78.3	1.5	8.1	13,950	15,230	3,033			3,033	17,288																					44
45		Recoverable Reserves																												10,373																			60 % Recovery	45
46																																																	46
47	CLINTWOOD	BED																																															47
48	37°-20' x 82°-00'	BUCHANAN			58						150															557			557	4,846																				48
49	20' 05'				40						175															3,411			1,869	11,214													1,542	9,252						49
50	20' 10'				55						200															1,267			1,267	10,453																				50
51	15' 00'				56						150															333			333	2,797																				51
52	15' 05'				55					50																192			192	1,584																				52
53		TOTAL												Hvab	2.0	31.7	60.5	5.8	1.2	5.2	79.9	1.6	6.3	14,280	15,490	5,760			4,218	30,894													1,542	9,252						53
54		Recoverable Reserves																												18,536																			60 % Recovery	54
55																														5,551																			55
56																																																	56
57	37°-10' x 82°-25'	DICKENSON			30						150															339																	339	2,543						57
58	10' 30'				50						150															160			160	1,200																				58
59	05' 25'				45						150															621			429	2,896																				59
60	05' 30'				45						150															3,418			3,418	23,072																				60
61		TOTAL												Hvab	2.2	34.2	60.4	3.2	0.9					14,590	15,420	4,538			4,007	27,168													531	3,839						61
62		Recoverable Reserves																												16,301																			60 % Recovery	62
63	37°-05' x 82°-30'	WISE			45						150															1,914			896	6,048																				63
64	05' 35'				30						150															870																	1,018	6,872						64
65	00' 30'				32						125															423			269	1,291													870	3,915						65
66	00' 35'				28						125															1,478			870	3,654													154	739						66
67	℄	TOTAL													NO	ANALYSIS				AVAILABLE						4,685			2,035	10,993													608	2,554						67
68		Recoverable Reserves																												6,596													2,650	14,080						68
69																														8,448																			60 % Recovery	69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 9-THE COAL RESOURCES AND GENERAL GEOLOGY OF THE POUND QUADRANGLE-1914
BULL. 18-THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY-1918
BULL. 21-THE GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY-1921
BULL. 24-THE GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND THE COAL-BEARING PORTIONS OF SCOTT COUNTY-1923
UNPUBLISHED INFORMATION

U.S. BUREAU OF MINES: TECH. PAPER 656-ANALYSES OF VIRGINIA COALS-1944
BULL. 446-TYPICAL ANALYSES OF COALS OF UNITED STATES-1942

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 39 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: HAGY AND SPLASH DAM

EXHIBIT NO. 2 SHEET-6

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	EAGLE BED																																																1
2	37°-25' x 82°-00'	BUCHANAN			36						225															2,106			1,498	8,089										608	3,283								2
3	20' 00'				41						175															2,323			1,766	10,861										557	3,426								3
4	15' 00'				50						175															845			845	6,338																		4
5	15' 05'				48						150															205														205	1,476								5
6	15' 10'				48						150															115														115	828								6
7	10' 05'				58						150															1,011			851	7,404										160	1,392								7
8	10' 10'				58						150															659			141	1,227										518	4,507								8
9		TOTAL												Hvab	3.8	31.8	61.0	3.4	1.3	5.3	80.9	1.5	7.6	14,390	15,510	7,264			5,101	33,919										2,163	14,912								9
10		Recoverable Reserves																												20,351											8,947							60% Recovery	10
11																																																	11
12	DORCHESTER (GLAMORGAN) BED																																																12
13	37°-25' x 82°-00'	BUCHANAN			30						350															128			128	576																		13
14	25' 05'				30						350															1,434			1,434	6,453																		14
15	20' 00'				30						350															307			307	1,382																		15
16	20' 05'				30						350															2,752			2,752	12,384																		16
17	10' 25'				39						275															365			365	2,135																		17
18	10' 30'				33						275															589			589	2,916																		18
19	05' 25'				33						275															435			435	2,153																		19
20	05' 30'				33						275															2,675			2,675	13,241																		20
21		TOTAL													NO	ANALYSIS		AVAILABLE.								8,685			8,685	41,240																		21
22		Recoverable Reserves																												24,744																	60% Recovery	22
23																																																	23
24	37°-00' x 82°-30'	WISE			40						150															755			755	4,530																			24
25	00' 35'				40						175															780			780	4,680																			25
26		TOTAL												Hvab	3.0	34.0	57.0	6.0	1.9	5.3	77.8	1.5	7.3	13,910	15,290	1,535			1,535	9,210																				26
27		Recoverable Reserves																												5,526																	60% Recovery	27
28																																																	28
29	NORTON BED																																																	29
30	37°-00' x 82°-35'	WISE			36						200															576			576	3,110																			30
31		TOTAL												Hvab	2.7	31.9	57.8	7.6	1.2	5.3	77.0	1.7	7.2	13,730	15,310	576			576	3,110																				31
32		Recoverable Reserves																												1,866																	60% Recovery	32
33																																																	33
34	HAGY BED																																																	34
35	37°-20' x 82°-10'	BUCHANAN			38						200															1,529			307	1,750										1,222	6,965								35
36	20' 15'				38						200															109			109	621																			36
37	15' 05'				36						210															1,600			1,600	8,640																			37
38	15' 10'				36						200															6,643			5,504	29,722										1,139	6,151								38
39	15' 15'				36						200															1,421			1,421	7,673																			39
40	10' 05'				36						210															3,424			3,424	18,490																			40
41	10' 10'				35						210															4,160			3,398	17,840										762	4,000								41
42		TOTAL												Mvb	2.1	31.0	59.6	7.3	1.8					14,000	15,450	18,886			15,763	84,736										3,123	17,116								42
43		Recoverable Reserves																												50,842											10,270							60% Recovery	43
44																																																		44
45	SPLASH DAM	BED																																																45
46	37°-25' x 82°-00'	BUCHANAN			33						250															1,568			1,568	7,762																			46
47	25' 05'				33						250															1,337			1,139	5,638										198	980								47
48	20' 00'				33						250															6,144			2,624	12,989										3,520	17,424								48
49	20' 05'				35						250															13,869			11,034	57,929										2,835	14,884								49
50	20' 10'				38						250															5,325			5,325	30,353																			50
51	15' 00'				33						250															5,062			2,438	12,068										2,624	12,989								51
52	15' 05'				35						250															9,414			9,414	49,424																			52
53	15' 10				50						225															10,784			10,784	80,880																			53
54	15' 15'				35						175															230			230	1,208																			54
55	10' 05'				35						250															576			576	3,024																			55
56		TOTAL												Mvb	3.4	28.2	61.4	7.0	0.7	5.1	78.3	1.5	7.4	13,810	15,410	54,309			45,132	261,275										9,177	46,277								56
57		Recoverable Reserves																												156,765											27,766							60% Recovery	57
58																																																		58
59	37°-15' x 82°-15'	DICKENSON			35						175															2,054			2,054	10,784																			59
60	10' 15'				38						175															3,411			3,411	19,443																			60
61	00' 15'				48						175															1,280			1,280	9,216																			61
62	00' 20'				48						175															1,638			1,638	11,794																			62
63		TOTAL												Hvab	1.9	30.7	59.7	7.7	0.9					14,060	15,550	8,383			8,383	51,237																				63
64		Recoverable Reserves																												30,742																	60% Recovery	64
65																																																		65
66																																																		66
67																																																		67
68																																																		68
69																																																		69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 18 - THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY - 1918

BULL. 21 - THE GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY - 1921

BULL. 24 - THE GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND THE COAL-BEARING PORTIONS OF SCOTT COUNTY - 1923

U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSES OF VIRGINIA COALS - 1944

BULL. 446 - TYPICAL ANALYSES OF COALS OF UNITED STATES - 1942

UNPUBLISHED INFORMATION

** DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 40 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: UPPER BANNER, LOWER BANNER AND KENNEDY

EXHIBIT NO. 2 SHEET-7

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	UPPER BANNER BED																																																	1
2	37°-10' x 82°-15'	DICKENSON			40						150															237			237	1,422												589	3,534								2
3	10' 20'				40						150															3,904	160	960	3,155	18,930												1,171	7,026								3
4	10' 25'				40						150															1,753			582	3,492												774	4,644								4
5	05' 10'				40						150															966			192	1,152												653	3,918								5
6	05' 15'				40						150															3,430	198	1,188	2,579	15,474												448	2,688								6
7	05' 20'				40						150															6,708	442	2,652	5,818	34,908																					7
8	05' 25'				40						175															2,374			2,374	14,244																					8
9	00' 05'				40						125															230			230	1,380																					9
10	00' 10'				55						175															2,919			2,234	18,431												685	3,596								10
11	00' 15'				35						175															1,607			1,165	6,116												442	3,315								11
12	00' 20'				50						175															2,771			2,771	20,783																					12
13	00' 25'				35						150															3,117			3,117	16,364																					13
14		TOTAL												Hvab	2.0	31.7	61.1	5.2	0.8	5.3	80.9	1.6	6.2	14,430	15,560	30,016	800	4,800	24,454	152,696												4,762	28,721								14
15		Recoverable Reserves																										2,880		91,618													17,233								60% Recovery	15
16																																																		16
17	37°-00' x 82°-25'	WISE			35						150															966			966	5,072																					17
18		TOTAL												Hvab	2.6	32.9	57.8	6.7	0.6	5.2	78.8	1.6	7.1	13,940	15,370	966			966	5,072																					18
19		Recoverable Reserves																												3,043																				60% Recovery	19
20																																																		20
21	LOWER BANNER BED																																																	21
22	37°-15' x 82°-00'	BUCHANAN			47						250															544			544	3,835																					22
23	10' 00'				54						225															1,152			1,152	9,331																					23
24	05' 00'				55						150															998			998	8,234																					24
25		TOTAL												Mvb	2.9	21.9	67.5	7.7	1.1	4.9	79.8	1.5	5.0	14,010	15,670	2,694			2,694	21,400																					25
26		Recoverable Reserves																												12,840																				60% Recovery	26
27																																																		27
28	37°-05' x 82°-00'	RUSSELL			32						150															512			512	2,458																					28
29	00' 00'				36						125															672			672	3,629																					29
30	00' 10'				40						225															929	538	3,228	391	2,346																					30
31		TOTAL												Hvab	2.1	35.0	56.9	6.0	0.8	5.3	79.4	1.5	7.0	14,240	15,500	2,113	538	3,228	1,575	8,433																					31
32		Recoverable Reserves																										1,937		5,060																				60% Recovery	32
33																																																		33
34	37°-05' x 82°-15'	DICKENSON			33						250															506			506	2,505																					34
35	05' 20'				33						275															3,533			3,533	17,488																					35
36	05' 25'				36						275															640			640	3,456																					36
37	00' 10'				40						225															3,335	653	3,918	2,682	16,092																					37
38	00' 15'				40						225															6,656			6,656	39,936																					38
39	00' 20'				33						250															1,952			1,952	9,662																					39
40	00' 25'				37						250															1,005			1,005	5,578																					40
41		TOTAL												Hvab	2.4	30.0	57.3	10.3	0.9	5.1	76.4	1.5	5.8	13,560	15,530	17,627	653	3,918	16,974	94,717																					41
42		Recoverable Reserves																										2,351		56,830																				60% Recovery	42
43																																																		43
44	KENNEDY BED																																																	44
45	37°-10' x 82°-00'	BUCHANAN			35						300															10,637			10,637	53,844																					45
46	10' 05'				30						250															5,324			5,324	23,958																					46
47	05' 00'				33						200															7,110			7,110	35,195																					47
48	05' 05'				31						200															1,011			1,011	4,701																					48
49	00' 00'				38						200															269			269	1,533																					49
50		TOTAL													NO	ANALYSIS	AVAILABLE									24,351			24,351	121,231																					50
51		Recoverable Reserves																												72,739																				60% Recovery	51
52																																																		52
53	37°-10' x 82°-10'	DICKENSON			30						200															787															787	3,542								53
54	05' 10'				53						175															576			576	4,579																					54
55	05' 15'				42						350															2,963			2,963	18,667																					55
56	05' 20'				40						350															2,131			2,131	12,786																					56
57	00' 15'				40						350															2,182			2,182	13,092																					57
58	00' 20'				40						350															3,014			3,014	18,084																					58
59		TOTAL												Mvb	2.6	26.2	61.7	9.5	0.7	4.8	77.6	1.6	5.8	13,640	13,520	11,653			10,866	67,208												787	3,542								59
60		Recoverable Reserves																												40,325													2,125								60% Recovery	60
61																																																		61
62	37°-05' x 82°-00'	RUSSELL			33						200															834			834	4,128																					62
63	00' 00'				38						200															998			998	5,689																					63
64		TOTAL													NO	ANALYSIS	AVAILABLE									1,832			1,832	9,817																					64
65		Recoverable Reserves																												5,890																				60% Recovery	65
66																																																		66
67																																																		67
68																																																		68
69																																																		69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 18-THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY-1918
BULL. 21-THE GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY-1921
BULL. 22-THE GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY-1922
BULL. 24-THE GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND THE COAL BEARING PORTIONS OF SCOTT COUNTY-1923

U.S. BUREAU OF MINES: TECH. PAPER 656-ANALYSES OF VIRGINIA COALS-1944
BULL. 446-TYPICAL ANALYSES OF COALS OF UNITED STATES-1942
UNPUBLISHED INFORMATION

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 41 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 37°-00' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: JAWBONE AND JAWBONE-TILLER

EXHIBIT NO. 2 SHEET-6

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES)			DIP OF BED** (DEGREES)			THICKNESS OF COVER (FEET) UNDERGROUND MINING			THICKNESS OF COVER (FEET) STRIP MINING			RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE: MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE: SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	B.T.U. MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED		UNDERGROUND MINING INDICATED		STRIP MINING MEASURED		STRIP MINING INDICATED		QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED		UNDERGROUND MINING INDICATED		UNDERGROUND MINING INFERRED		STRIP MINING MEASURED		STRIP MINING INDICATED		STRIP MINING INFERRED		REMARKS	
			MAX	MIN	AVE	MAX	MIN	AVE	MAX	MIN	AVE	MAX	AVE															ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS	ACRES	TONS						
1	JAWBONE BED																																																			1
2	37°-00'×82°-05'	RUSSELL			72						375																128			128	1,382										1,101	11,891										2
3	00' 10'				72						375																2003			902	9742																					3
4		TOTAL														NO ANALYSIS AVAILABLE											2,131			1,030	11,124										1,101	11,891										4
5		Recoverable Reserves																													6,674											7,135									60% Recovery	5
6																																																					6
7	JAWBONE-TILLER (UNITED)																																																				7
8	37°-00'×82°-05'	BUCHANAN			54						300																1,626			1,626	13,171																					8
9		TOTAL													Hvab	2.5	25.5	61.7	10.3	0.7					13,350	15,340	1,626			1,626	13,171																						9
10		Recoverable Reserves																													7,903																				60% Recovery	10
11																																																					11
12	37°-00'×82°-05'	DICKENSON			54						300																973			973	7,881																					12
13	00' 10'				74						325																1,965			1,325	14,708										640	7,104										13
14		TOTAL													Hvab	2.2	31.9	59.4	6.5	0.5	5.1	78.7	1.0	7.2	14,110	13,450	2,938			2,298	22,589										640	7,104										14
15		Recoverable Reserves																													13,553											4,262									60% Recovery	15
16																																																					16
17																																																					17
18																																																					18
19																																																					19
20																																																					20
21																																																					21
22																																																					22
23																																																					23
24																																																					24
25																																																					25
26																																																					26
27																																																					27
28																																																					28
29																																																					29
30																																																					30
31																																																					31
32																																																					32
33																																																					33
34																																																					34
35																																																					35
36																																																					36
37																																																					37
38																																																					38
39																																																					39
40																																																					40
41																																																					41
42																																																					42
43																																																					43
44																																																					44
45																																																					45
46																																																					46
47																																																					47
48																																																					48
49																																																					49
50																																																					50
51																																																					51
52																																																					52
53																																																					53
54																																																					54
55																																																					55
56																																																					56
57																																																					57
58																																																					58
59																																																					59
60																																																					60
61																																																					61
62																																																					62
63																																																					63
64																																																					64
65																																																					65
66																																																					66
67																																																					67
68																																																					68
69																																																					69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 18- THE GEOLOGY AND COAL RESOURCES OF BUCHANAN COUNTY-1918
BULL. 21- THE GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY-1921
BULL. 22- THE GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY-1922
U.S. BUREAU OF MINES: TECH. PAPER 636-ANALYSES OF VIRGINIA COALS-1944
BULL. 446-TYPICAL ANALYSES OF COALS OF UNITED STATES-1942

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

5F 42 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 36°-30' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: HIGH SPLINT; MORRIS; PARDEE; LOW SPLINT; TAGGART; HARLAN; KELLY

EXHIBIT NO. 2 SHEET-9

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	HIGH SPLINT	BED																																																1
2	36°-55'x82°-50'	WISE			65						150															896			896	8,736																				2
3	50' 50'				60						150															192			192	1,728																				3
4		TOTAL												Hvab	2.6	35.4	55.9	6.3	0.8					13,900	15,220	1088			1088	10,464																				4
5		RECOVERABLE RESERVES																												6,278																			60% Recovery	5
6																																																		6
7	MORRIS	BED																																																7
8	36°-55'-82°-50'	WISE			40						200															1,696	870	5220	826	4,956																				8
9	55' 45'				60						200															1,517	1,249	11,991	218	1,962																				9
10		TOTAL													No		ANALYSIS				AVAILABLE					3,213	2,169	16,911	1044	6,918																				10
11		RECOVERABLE RESERVES																										10,147		4,151																			60% Recovery	11
12																																																		12
13	PARDEE	BED																																																13
14	36°-50'x82°-45'	WISE			50						250															1,901			1,901	14,253																				14
15	50' 50'				50						325															2,471	731	5,858	1,690	12,675																				15
16		TOTAL												Hvab	3.0	34.5	56.1	6.4	0.9	5.3	76.4	1.6	9.4	13,610	15,020	4,372	731	5,858	3,591	26,928																				16
17		RECOVERABLE RESERVES																										3515		16,160																			60% Recovery	17
18																																																		18
19	LOW SPLINT	BED																																																19
20	36°-55'x82°-40'	WISE			24						100															339																339	1,220							20
21	55' 45'				24						550															96																96	346							21
22	55 50'				24						550															3,309																3,309	11,912							22
23	50' 50'				40						325															442			442	2,532																				23
24		TOTAL													No		ANALYSIS				AVAILABLE					4,186			442	2,532													3,744	13,478							24
25		RECOVERABLE RESERVES																												1,519														8,087						60% Recovery	25
26																																																		26
27	36°-50'x82°-50'	LEE			40						325															666			666	3,996																				27
28	50' 55'				75						200															576			576	6,480																				28
29		TOTAL												Hvab	3.0	35.2	53.2	8.1	1.1	5.2	73.2	1.7	10.7	13,070	14,770	1,242			1,242	10,476																				29
30		RECOVERABLE RESERVES																												6,286																			60% Recovery	30
31																																																		31
32	TAGGART	BED																																																32
33	36°-55'x82°-40'	WISE			43						250															1,133	890	5741	243	1,567																				33
34	55 45'				40						500															6899	467	2302	3,411	20,466												3021	18,126							34
35	55' 50'				42						700															5,230			2,999	19,266												2,331	15,000							35
36	50' 50'				48						450															1,933			1,760	12,672												173	1,246							36
37		TOTAL												Hvab	2.2	34.8	60.1	2.9	0.7	5.9	81.4	1.4	7.8	14,620	15,410	15,245	1357	8543	8,813	52,961												5,578	34,372							37
38		RECOVERABLE RESERVES																										5,126		31,781														20,623						60% Recovery	38
39																																																		39
40	36°-50'x82°-50'	LEE			43						450															731	429	3,089	352	2,534																				40
41	50' 55'				38						450															2,797	179	1,020	2,618	14,923																				41
42	45' 55'				38						825															77			77	439																				42
43		TOTAL												Hvab	3.5	36.4	57.3	2.8	0.5	5.6	78.7	1.5	10.9	14,000	14,940	3,655	608	4,109	3,047	17,896																				43
44		RECOVERABLE RESERVES																										2,465		10,738																			60% Recovery	44
45																																																		45
46	HARLAN	BED																																																46
47	36°-55'x82°-45'	WISE			34						200															134																134	683							47
48	55' 50'				34						200															141																141	719							48
49	50' 50'				50						200															1,248			742	5,565												506	3,792							49
50	50' 55'				50						125															1,350			915	4,118												435	1,958							50
51	45' 55'				40						150															672			672	4,032																				51
52		TOTAL													No		ANALYSIS				AVAILABLE					3,545			2,829	13,715												1216	7,152							52
53		RECOVERABLE RESERVES																												8,229														4,291						60% Recovery	53
54																																																		54
55	KELLY	BED																																																55
56	36°-55'x82°-40'	WISE			32						125															2,348			1,658	7,958												1,190	5,712							56
57	55' 45'				32						150															806																806	3,869							57
58	50' 45'				35						150															442																442	2,321							58
59		TOTAL												Hvab	2.3	33.9	57.4	6.5	0.9	4.9	78.1	1.5	8.1	13,960	15,300	4,096			1,658	7,958												2,438	11,902							59
60		RECOVERABLE RESERVES																												4,775														7,141						60% Recovery	60
61																																																		61
62	36°-50'x82°-50'	LEE			40						150															1,568			1,568	9,408																				62
63	50' 55'				40						150															544			544	3,264																				63
64		TOTAL												Hvab	3.3	35.1	55.1	6.5	0.8	5.4	76.0	1.7	9.6	13,560	14,810	2,112			2,112	12,672																				64
65		RECOVERABLE RESERVES																												7,603																			60% Recovery	65
66																																																		66
67																																																		67
68																																																		68
69																																																		69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 9 - COAL RESOURCES AND GENERAL GEOLOGY OF POUND QUADRANGLE - 1914 ; BULL. 22 - GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY - 1922
BULL. 24 - GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND COAL-BEARING PORTIONS OF SCOTT COUNTY - 1923 ; BULL. 26 - GEOLOGY AND COAL RESOURCES OF COAL-BEARING PORTION OF LEE COUNTY - 1925
U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSES OF VIRGINIA COALS - 1944
BULL. 446 - TYPICAL ANALYSES OF COALS OF UNITED STATES - 1942
UNPUBLISHED INFORMATION

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 43 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 36°-30' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: IMBODEN; CLINTWOOD; BLAIR; DORCHESTER; NORTON; SPLASH DAM; UPPER BANNER

EXHIBIT NO. 2 SHEET-10

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS	
1	IMBODEN BED																																																	1
2	36°-55' x 82°-40'	WISE			44						175															5,709	1,293	3,534	4,416	27,165																					2
3	55' 45'				45						800															9,933	3,131	31,015	5,421	53,757									1,331	12,977											3
4	55' 50'				60						800															4,135	192	1,728	2,682	24,138									1,261	11,349											4
5	50' 45'				60						750															666	378	3,402	258	2,322																					5
6	50' 50'				60						700															2,759	1050	9,450	1,709	15,381																					6
7		TOTAL												Hvab	2.3	33.9	57.7	6.1	0.8	5.2	78.3	1.5	8.1	13,950	15,230	23,202	6,094	54,129	14,516	124,111									2,592	24,336											7
8		RECOVERABLE RESERVES																										32,477		74,467										14,596										60% Recovery	8
9																																																		9
10	36°-50' x 82°-50'	LEE			60						700															4,493	64	576	3,539	31,851									990	8,010											10
11	50' 55'				48						200															6,106			2,157	15,530									3,949	28,433											11
12	45' 55				48						200															2,336			2,336	16,819																					12
13		TOTAL												Hvab	2.7	37.7	54.0	5.6	0.8	5.5	76.4	1.9	9.8	13,600	14,820	12,935	64	576	8,032	64,200									4,839	36,443											13
14		RECOVERABLE RESERVES																										346		38,520										21,866										60% Recovery	14
15																																																		15
16	CLINTWOOD BED																																																	16
17	36°-55' x 82°-35	WISE			36						125															2,880			2,880	15,552																					17
18		TOTAL													No		ANALYSIS				AVAILABLE					2,880			2,880	15,552																					18
19		RECOVERABLE RESERVES																												9,331																				60% Recovery	19
20																																																		20
21	BLAIR BED																																																	21
22	36°-55 x 82°-35'	WISE			36						200															5,965	2,422	13,100	3,539	19,111																					22
23	50' 50'				60						100															1,082			1,082	9,738																					23
24		TOTAL												Hvab	2.4	32.2	58.4	7.0	0.8	5.3	78.6	1.6	6.7	13,990	15,440	7,047	2,422	13,100	4,621	28,849																					24
25		RECOVERABLE RESERVES																										7,860		17,309																				60% Recovery	25
26																																																		26
27	36°-50' x 82°-50'	LEE			60						100															416			416	3,744																					27
28	45' 55'				60						225															1,856			1,856	16,704																					28
29		TOTAL													No		ANALYSIS				AVAILABLE					2,272			2,272	20,448																					29
30		RECOVERABLE RESERVES																												12,269																				60% Recovery	30
31																																																		31
32	DORCHESTER BED (GLAMORGAN)																																																	32
33	36°-55' x 82°-35'	WISE			40						150															813			813	4,878																					33
34	55' 40'				40						175															3,641	979	8,874	2,662	15,972																					34
35	55 45'				30						200															2,675	288	1,296	2,887	10,742																					35
36		TOTAL												Hvab	3.0	36.0	57.0	6.0	1.9	5.3	77.8	1.5	7.6	13,910	15,290	7,129	1267	7,170	5,862	31,592																					36
37		RECOVERABLE RESERVES																										4,302		18,955																				60% Recovery	37
38																																																		38
39	NORTON BED																																																	39
40	36°-55' x 82°-30'	WISE			36						175															6,476	531	2,867	3,206	17,312									2,739	14,791											40
41	55' 35'				36						200															5,804	1,766	9,536	4,038	21,805																					41
42	55 40'				33						200															1,555	339	1,678	1,216	6,019																					42
43		TOTAL												Hvab	2.7	31.9	57.8	7.6	1.2	5.3	77.0	1.7	7.2	13,780	15,310	13,835	2,636	14,081	8,460	45,136									2,739	14,791											43
44		RECOVERABLE RESERVES																										8,449		27,082										8,875										60% Recovery	44
45																																																		45
46	SPLASH DAM BED																																																	46
47	36°-55' x 82°-15'	DICKENSON			48						175															749													749	5,393											47
48	55' 20'				48						175															1,555													1,555	11,196											48
49		TOTAL												Hvab	1.9	30.7	59.7	7.7	0.9					14,060	15,550	2,304													2,304	16,589											49
50		RECOVERABLE RESERVES																																						9,953										60% Recovery	50
51																																																		51
52	UPPER BANNER BED																																																	52
53	36°-55' x 82°-10'	RUSSELL			60						200															435			435	3,915																					53
54	55' 15'				60						200															1,542			1,542	13,878																					54
55		TOTAL												Hvab	2.6	35.6	54.9	6.9	0.6	5.5	78.1	1.4	7.5	13,920	15,380	1,977			1,977	17,793																					55
56		RECOVERABLE RESERVES																												10,676																				60% Recovery	56
57																																																		57
58	36°-55' x 82°-15'	WISE			60						200															160			160	1,440																					58
59	55' 20'				50						225															2,944			2,944	22,090																					59
60	55' 25'				50						175															4,262			4,262	31,965																					60
61	55' 30'				50						175															1,248			1,248	9,360																					61
62		TOTAL												Hvab	2.6	32.9	57.8	6.7	0.6	5.2	78.8	1.6	7.1	13,940	15,370	8,614			8,614	64,845																					62
63		RECOVERABLE RESERVES																												38,907																				60% Recovery	63
64																																																		64
65	36°-55' x 82°-15'	DICKENSON			60						200															1,312			1,312	11,808																					65
66	55' 20'				50						225															4,480			4,480	33,600																					66
67		TOTAL												Hvab	2.0	31.7	61.1	5.2	0.8	5.3	80.9	1.6	6.2	14,430	15,560	5,792			5,792	45,408																					67
68		RECOVERABLE RESERVES																												27,245																				60% Recovery	68
69																																																		69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 9-COAL RESOURCES AND GENERAL GEOLOGY OF POUND QUADRANGLE-1914; BULL. 21-GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY-1921

BULL. 22-GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY-1922; BULL. 24-GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND COAL-BEARING PORTIONS OF SCOTT COUNTY-1923

BULL. 26-GEOLOGY AND COAL RESOURCES OF COAL-BEARING PORTION OF LEE COUNTY-1925;

U.S. BUREAU OF MINES; TECH. PAPER 656-ANALYSES OF VIRGINIA COALS-1944; BULL. 446-TYPICAL ANALYSES OF COALS OF UNITED STATES-1942

UNPUBLISHED INFORMATION

**DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 44 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 36°-30' LONGITUDE: 82°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: LOWER BANNER; KENNEDY; JAWBONE

EXHIBIT NO. 2 SHEET-11

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	STRIP MINING MEASURED ACRES	TONS	INDICATED ACRES	TONS	INFERRED ACRES	TONS	REMARKS
1	LOWER BANNER BED																																															
2	36°-55' x 82°-10'	RUSSELL			50							250														1,517	243	1,923	1,274	9,555																		
3	55' 15'				50							250														1,670			1,670	12,525																		
4		TOTAL												Hvab	2.1	35.0	56.9	6.0	0.8	5.3	79.6	1.5	7.0	14,260	15,500	3,187	243	1,823	2,944	22,080																		
5		RECOVERABLE RESERVES																										1,094		13,248																	60% RECOVERY	
6																																																
7	36°-55' x 82°-15'	DICKENSON			50							275														442			442	3,315																		
8		TOTAL												Hvab	2.6	30.0	57.3	10.3	0.9	5.1	76.4	1.0	5.8	13,560	15,530	442			442	3,315																		
9		RECOVERABLE RESERVES																												1,989																	60% RECOVERY	
10																																																
11	36°-55' x 82°-20'	WISE			32							275														653			653	5,093																		
12	55' 25'				40							225														1,012	122	732	890	5,340																		
13	55' 30'				46							200														2,918	774	5,341	2,144	14,794																		
14		TOTAL												Hvab	2.6	32.7	54.0	10.3	1.0	5.0	74.7	1.6	7.6	13,330	15,330	4,583	896	6,073	3,687	25,227																		
15		RECOVERABLE RESERVES																										3,644		15,136																	60% RECOVERY	
16																																																
17	KENNEDY BED																																																
18	36°-55' x 82°-10'	RUSSELL			55							350														736			736	6,072																		
19	55' 15'				55							350														3,008			3,008	24,816																		
20		TOTAL													No	ANALYSIS				AVAILABLE						3,744			3,744	30,888																		
21		RECOVERABLE RESERVES																												18,533																	60% RECOVERY	
22																																																
23	36°-55' x 82°-15'	DICKENSON			55							350														90			90	743																		
24		TOTAL												Hvb	2.6	26.2	61.7	7.5	0.7	4.9	77.6	1.6	5.8	13,640	15,520	90			90	743																		
25		RECOVERABLE RESERVES																												446																	60% RECOVERY	
26																																																
27	36°-55' x 82°-20'	WISE			45							150														2,240			1,472	9,936												768	5,184				
28	55' 25'				45							350														3,640	768	5,184	4,800	32,400											3,072	20,736				
29	55 30'				45							350														1,696	192	1,296	1,152	7,776											352	2,376				
30		TOTAL													No	ANALYSIS				AVAILABLE						12,576	960	6,480	7,424	50,112											4,192	28,296				
31		RECOVERABLE RESERVES																										3,888		30,067													16,978				60% RECOVERY	
32																																																
33	JAWBONE	BED																																															
34	36°-55' x 82°-05'	RUSSELL			72							325														122			122	1,318																		
35	65' 10'				72							325														4,185	1,120	12,161	2,016	21,773											1,043	11,264				
36	55' 15'				75							300														2,132			1,402	15,773											720	8,213				
37		TOTAL													No	ANALYSIS				AVAILABLE						6,439	1,120	12,161	3,540	37,864											1,763	19,477				
38		RECOVERABLE RESERVES																										7,297		23,318													11,686				60% RECOVERY	
39																																																
40	36°-55' x 82°-15'	WISE			75							300														1,644			1,350	15,188											294	3,308				
41	55' 20'				62							375														4,774			3,891	36,186											883	8,212				
42	50' 20'				46							200														870			870	6,003																	
43		TOTAL												Hvab	1.8	31.4	49.3	17.3	1.3	4.7	68.9	1.3	6.5	12,190	15,010	7,288			6,111	57,377											1,177	11,520				
44		RECOVERABLE RESERVES																												34,426													6,912				60% RECOVERY	
45																																																
46																																																
47																																																
48																																																
49																																																
50																																																
51																																																
52																																																
53																																																
54																																																
55																																																
56																																																
57																																																
58																																																
59																																																
60																																																
61																																																
62																																																
63																																																
64																																																
65																																																
66																																																
67																																																
68																																																
69																																																

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOL. SURVEY: BULL. 21- GEOLOGY AND COAL RESOURCES OF DICKENSON COUNTY-1921; BULL. 22-GEOLOGY AND COAL RESOURCES OF RUSSELL COUNTY-1922

BULL. 24-GEOLOGY AND MINERAL RESOURCES OF WISE COUNTY AND COAL-BEARING PORTIONS OF SCOTT COUNTY-1923

U.S. BUREAU OF MINES: TECH. PAPER 656-ANALYSES OF VIRGINIA COALS-1944; BULL. 446-TYPICAL ANALYSES OF COALS OF UNITED STATES-1942

UNPUBLISHED INFORMATION

** DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

3F 45 7-6-50

SYNTHETIC LIQUID FUEL SURVEY

DETAILED COAL DATA SHEETS

SHOWING QUANTITIES OF COAL IN PLACE BY COAL BEDS

(SUBDIVIDED BY TOWNSHIPS AND COUNTIES)

LATITUDE: 36°-30' LONGITUDE: 83°-00'

STATE: VIRGINIA

COAL FIELD: SOUTHWESTERN VIRGINIA

COAL SEAM: PARDEE, PHILLIPS, LOW SPLINT, TAGGART, HARLAN, UPPER ST. CHARLES, IMBODEN & CLINTWOOD

EXHIBIT NO. 2 SHEET-12

	TOWNSHIP OR AREA UNIT	COUNTY	THICKNESS OF COAL (INCHES) MAX	MIN	AVE	DIP OF BED** (DEGREES) MAX	MIN	AVE	THICKNESS OF COVER (FEET) UNDERGROUND MINING MAX	MIN	AVE	STRIP MINING MAX	AVE	RANK OF COAL	ANALYSIS (AS RECEIVED) PROXIMATE MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE SULPHUR	HYDROGEN	CARBON	NITROGEN	OXYGEN	B.T.U. AS RECEIVED	B.T.U. MOISTURE AND ASH FREE	AREA OF UNMINED COAL (ACRES)	QUANTITY OF PRIMARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	STRIP MINING MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	QUANTITY OF SECONDARY RESERVES IN PLACE (THOUSANDS OF TONS) UNDERGROUND MINING MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	INFERRED ACRES	INFERRED TONS	STRIP MINING MEASURED ACRES	MEASURED TONS	INDICATED ACRES	INDICATED TONS	INFERRED ACRES	INFERRED TONS	REMARKS	
1	PARDEE BED																																															1
2	36°-50' x 83°-00'	LEE			60							250														1,005			1,005	9,045																	2
3	45' 05'				63							250														346			346	3,270																	3
4		TOTAL												Hvab	5.3	32.7	55.2	8.8	0.8	5.1	70.4	1.4	13.5	12,780	14,970	1,351			1,351	12,315																	4
5		RECOVERABLE RESERVES																												7,389																60% Recovery	5
6																																																6
7	PHILLIPS BED																																															7
8	36°-50' x 83°-00'	LEE			36							400														582			582	3,142																	8
9	45' 05'				45							450														256			256	1,778																	9
10		TOTAL												Hvab	3.7	35.5	52.8	8.0	0.8	5.1	73.1	1.6	11.2	13,020	14,760	838			838	4,871																	10
11		RECOVERABLE RESERVES																												2,923																60% Recovery	11
12																																																12
13	LOW SPLINT BED																																															13
14	36°-50' x 83°-00'	LEE			45							500														1,197			1,197	7,721																	14
15		TOTAL												Hvab	3.5	35.2	53.2	8.1	1.1	5.2	73.2	1.7	10.7	13,070	14,770	1,197			1,197	7,721																	15
16		RECOVERABLE RESERVES																												4,633																60% Recovery	16
17																																																17
18	TAGGART BED																																															18
19	36°-50' x 83°-00'	LEE			36							625														2,041	1,619	8,743	422	2,279																		19
20	50' 05'				45							200														83	83	555																				20
21	45' 05'				38							600														1,894	787	4,486	1,107	6,310																		21
22		TOTAL												Hvab	3.5	36.4	57.3	2.8	0.5	5.6	78.7	1.5	10.9	14,000	14,940	4,018	2,489	13,764	1,529	8,589																		22
23		RECOVERABLE RESERVES																										8,258		5,153																60% Recovery	23
24																																																24
25	HARLAN BED																																															25
26	36°-45' x 83°-00'	LEE			40							350														4,405	1,171	7,026	3,232	19,392																		26
27	45' 05'				41							350														3,623	525	3,259	3,098	19,053																		27
28		TOTAL												Hvab	2.9	35.3	50.2	8.6	2.8					13,080	14,780	8,028	1,696	10,255	6,330	38,445																		28
29		RECOVERABLE RESERVES																										6,153		23,067																60% Recovery	29
30																																																30
31	UPPER ST. CHARLES BED																																															31
32	36°-45' x 83°-00'	LEE			36							125														1,963			1,963	10,611																		32
33		TOTAL												Hvab	3.5	34.3	55.3	8.9	0.7					12,940	14,930	1,963			1,963	10,611																		33
34		RECOVERABLE RESERVES																												6,367																60% Recovery	34
35																																																35
36	IMBODEN BED																																															36
37	36°-45' x 83°-00'	LEE			36							200														5,139			2,368	12,787							2,771	14,963										37
38		TOTAL												Hvab	2.7	37.7	54.0	5.6	0.8	5.5	76.4	1.9	9.8	13,600	14,820	5,139			2,368	12,787							2,771	14,963										38
39		RECOVERABLE RESERVES																												7,672								8,978										39
40	CLINTWOOD BED																																																40
41	36°-45' x 83°-00'	LEE			35							225														2,234			845	4,436							1,389	7,292										41
42		TOTAL												Hvab	3.8	38.5	56.1	2.8	1.7					14,060	14,860	2,234			845	4,436							1,389	7,292										42
43		RECOVERABLE RESERVES																												2,662								4,375										43
44																																																	44
45																																																	45
46																																																	46
47																																																	47
48																																																	48
49																																																	49
50																																																	50
51																																																	51
52																																																	52
53																																																	53
54																																																	54
55																																																	55
56																																																	56
57																																																	57
58																																																	58
59																																																	59
60																																																	60
61																																																	61
62																																																	62
63																																																	63
64																																																	64
65																																																	65
66																																																	66
67																																																	67
68																																																	68
69																																																	69

SOURCES OF INFORMATION AND OTHER FOOTNOTES: VIRGINIA AND U.S. GEOLOGICAL SURVEY: BULL. 25 - THE VALLEY COAL FIELDS OF VIRGINIA - 1925
BULL. 26 - THE GEOLOGY AND COAL RESOURCES OF THE COAL-BEARING PORTION OF LEE COUNTY - 1925
U.S. BUREAU OF MINES: TECH. PAPER 656 - ANALYSIS OF VIRGINIA COALS - 1944
BULL. 446 - TYPICAL ANALYSIS OF COALS OF UNITED STATES - 1942

** DIP RARELY EXCEEDS FOUR DEGREES AND AVERAGES LESS THAN TWO DEGREES.

SF 46 7-6-50