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POTENTIAL MARKETS FOR ILLINOIS
COAL ON THE UPPER MISSISSIPPI
WATERWAY

BY
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POTENTIAL MARKETS FOR ILLINOIS COAL ON THE UPPER MISSISSIPPI WATERWAY

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INTRODUCTION

The purpose of this investigation is to evaluate the usefulness of the Upper Mississippi River as a means of transporting coal from fields in Illinois to markets bordering the upper river in Minnesota, Wisconsin and Iowa. The Mississippi River, when completely canalized above Alton, Illinois, will consist of a 9-foot channel to St. Paul and Minneapolis equipped with locks 600 feet long and 110 feet wide for the transportation of barges past the dams.

This report contains data on the approximate extent of the coal market, the present sources of coal, and the comparative costs of transporting coal from originating fields to the principal market points.

The project to canalize the Mississippi River to a minimum depth of 9 feet between Alton, Illinois, and St. Paul, Minnesota, a distance of 657 miles, will create a highway of transportation which may enable the coal industry of Illinois to take advantage of markets in Minnesota and Wisconsin not hitherto served by the Illinois industry. This possibility depends upon effecting a reduction in freight rates on coal to a level substantially lower than the rail-lake rate from the fields of Pennsylvania, West Virginia, and Eastern Kentucky to the markets of the Upper Mississippi Valley.

There is a coal market, in the counties bordering the Mississippi River (figure 1) in Iowa, Wisconsin, and Minnesota, of approximately 5,000,000 tons of coal distributed as follows:

<i>Use</i>	<i>Amount (Tons)</i>
Manufacturing and mining industries.....	2,200,000
Public utilities	400,000
Domestic heating	2,400,000
Total	5,000,000

The figure for manufacturing and mining represents the amount of coal, coke, and anthracite used by manufacturing and mining industries in 1929 as reported to the Census. (The exact figure as reported was 2,295,667 tons.) The amount of coal used by electric utilities in these counties in 1929 was 434,829 tons. The amount of coal used for heating homes is estimated at 2,400,000 based on an assumption of an average consumption of 1.5 tons per person per year. Detailed consumption data are given in table 1.

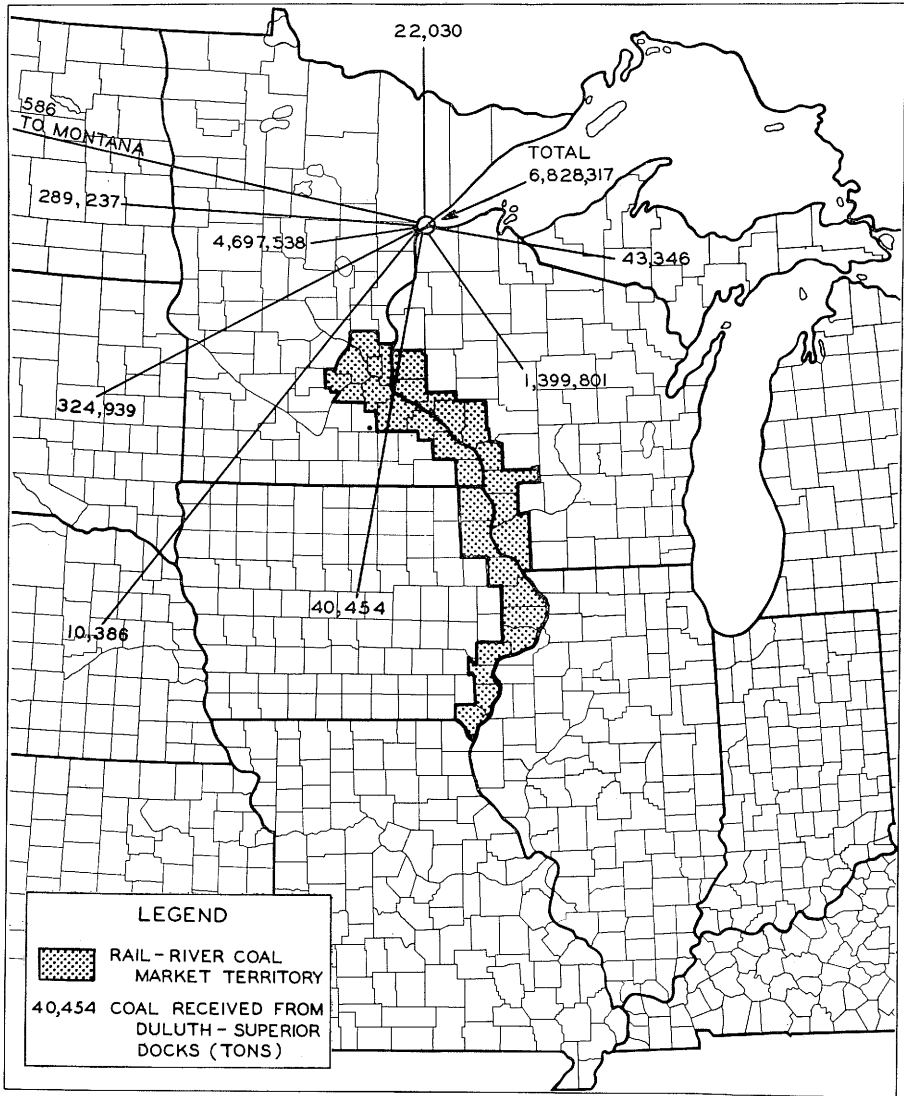


FIGURE 1.—Map showing distribution of coal from Duluth-Superior docks in 1935 (in tons) and rail-river coal market territory.

TABLE 1.—Coal consumed in Mississippi River counties in Minnesota, Wisconsin and Iowa, 1929

(Net tons)

County	Manufacturing*			Mining all types solid fuel†	Public utility°
	Anthracite	Bituminous	Coke		
Iowa—					
Allamakee.....	118	585	54		
Clayton.....	190	7,224	217		
Clinton.....	710	177,758	1,387	2,000	18,179
Des Moines.....	118	50,127	2,614		2,160
Dubuque.....	240	55,375	2,412	1,515	55,972
Jackson.....	244	1,581	504		
Lee.....	345	132,626	17,163		
Louisa.....		491			
Muscatine.....	16	23,457	641	690	1,162
Scott.....	675	190,469	6,719	6,286	
Total.....	2,650	639,693	31,711	10,491	77,473
Minnesota—					
Anoka.....		11,349	32		
Carver.....	31	18,499	568		
Dakota.....	174	139,754	224		
Goodhue.....	675	31,304	3,242		
Hennepin.....	9,000	327,795	52,853	2,652	190,798
Houston.....		1,267	40		
Ramsey.....	2,100	795,729	23,877	1,241	142,339
Scott.....	95	1,160	350		400
Wabasha.....	380	3,877	1,979		
Washington.....	520	30,531	396		
Winona.....	460	46,023	1,554		16,519
Total.....	13,435	1,407,288	85,115	3,893	350,056
Wisconsin—					
Buffalo.....	7	2,756			
Crawford.....	2,840	1,658	33		
Grant.....	7	6,819	55	471	
LaCrosse.....	696	60,730	1,919		7,300
Pepin.....			18		
Pierce.....			35		
St. Croix.....	3	9,776	53		
Trempealeau.....	10	5,324	40		
Vernon.....	190	7,949			
Total.....	3,753	95,012	2,153	471	7,300

* Consumption of fuel and electric energy in manufacturing industries, Manufactures, 1929, Fifteenth Census of the United States, U. S. Department of Commerce, Bureau of the Census.

† Consumption of fuel and electric energy in mining and quarrying industries, Census of Mines and Quarries, 1929, Fifteenth Census of the United States, U. S. Department of Commerce, Bureau of the Census.

° Consumption of fuel by public utility power plants and production of electric power by fuels and by water power in 1929, by counties and by states, Mimeograph release of the U. S. Bureau of Mines.

At the present time the coal market of the Upper Mississippi Valley is dominated by the lake cargo coal. A general view of the sources and distribution of coal may be obtained from an inspection of coal distribution data prepared by the National Bituminous Coal Commission applicable to this area.*

	1937
Receipts of coal at Lake Superior dock.....	9,357,000 tons
All-rail coal shipments to Minnesota from:	
Eastern fields	294,425
Western Kentucky	52,721
Indiana	100,779
Southern and central Illinois.....	491,205
Northern Illinois	65,727

* Distribution of coal shipments, M.C.D. No. 79, April 30, 1938, U. S. Department of the Interior, National Bituminous Coal Commission.

Lake cargo coal shipped to Lake Superior ports is destined to interior points in Wisconsin, Michigan, Minnesota, the Dakotas and minor quantities to states further west. Distribution of coal from Lake Superior ports in 1935 is shown in table 2.

TABLE 2.—Distribution of coal from upper lake ports during 1935*
(Net tons)

Destination	Quantity (tons)	
	All ports	Duluth-Superior
Canada.....	22,030	22,030
Iowa.....	42,766	40,454
Michigan.....	579,526	43,346
Minnesota.....	4,873,084	4,697,538
Montana.....	586	586
Nebraska.....	10,386	10,386
North Dakota.....	301,893	289,237
South Dakota.....	339,266	324,936
Wisconsin.....	1,560,250	1,399,801
Total.....	7,725,714	6,828,317

* Maher Coal Bureau, St. Paul, Minn., and Annual Report, Chief of Engineers, U. S. Army.

Minnesota, in the year 1935, took about 4,900,000 tons or 63 per cent of the coal received at the Lake Superior docks, and 68 per cent of all coal received at Duluth-Superior, the principal coal port. Of this tonnage, it may be assumed that a large portion was distributed in the counties bordering the Mississippi River and included in this survey. Within the area in question

are located the large cities of St. Paul and Minneapolis which include the important manufacturing and public utility industries of the State. These cities are also important railroad terminal points for the fueling of railroad locomotives. Altogether the population of the river border area in Minnesota comprises 40 per cent of the total population of the State. It is not unreasonable to assume that the movement of lake cargo coal into this area may reach as high as 3,000,000 tons yearly. Also, some lake cargo coal from both Lake Michigan and Lake Superior docks probably reaches the border counties of western Wisconsin.

MISSISSIPPI WATERWAY

The Mississippi River from the dam at Alton, Ill., to the dam at St. Paul, is 644.7 miles in length. Between these two points there are 26 dams and locks either completed or in process of construction. These locks have a total lift of 304.1 feet. All locks are 600 feet long and 110 feet wide. The dams are designed to create a series of pools during low river stages. The location of dams and the lift at each is given in table 3. Each dam has a section containing movable gates, which can be raised above extreme flood heights to pass the flow of the river. When water is high the dams will be opened so that at no time will they appreciably increase flood heights. A spillway section is provided over which any flood water in excess of that flowing through the gates can pass. The movable gates are so built that they can be submerged to pass ice and water over the top or raised to pass water under the bottom.

PORTS AND TERMINALS ON THE MISSISSIPPI RIVER

An important element in water transportation is a terminal suitable for the low-cost transfer of freight from railroad to barge or from barge to railroad. Possibility of successful shipment of coal from fields in Illinois to the markets of the Upper Mississippi Valley will be enhanced by careful preliminary surveys of port facilities. At both shipping and receiving end, sites for construction of necessary loading or unloading equipment should be selected after careful consideration of topography and shore line conditions and sources and market outlet of the coal available for this form of transportation.

Generally speaking, terminals for loading coal in barges consists of tipples or conveyor systems emptying into hoppers from which chutes lead to the barge, while terminals for unloading barges usually involve more expensive equipment in the way of cranes and bucket conveyors. If the crane is used the clamshell bucket usually serves as the means for handling the material which is deposited in hoppers. It is then sent to cars or storage, either by

TABLE 3.—Location and lift of Mississippi River dams above the Ohio River*

Dam No.	Location	Miles above Ohio River	Lift (feet)
1	Minneapolis-St. Paul, Minnesota.....	847.6	33.95
2	Hastings, Minnesota.....	815.2	14.15
3	Red Wing, Minnesota.....	796.9	8.0
4	Alma, Wisconsin.....	752.8	7.0
5	Fountain City, Wisconsin.....	738.3	9.0
5A	Winona, Minnesota.....	728.5	5.5
6	Trempealeau, Wisconsin.....	714.3	6.5
7	LaCrosse, Wisconsin.....	702.3	8.0
8	Genoa, Wisconsin.....	679.1	11.0
9	Lynxville, Wisconsin.....	647.9	9.0
10	Guttenberg, Iowa.....	615.1	8.0
11	Dubuque, Iowa.....	583.0	11.0
12	Bellevue, Iowa.....	556.7	9.0
13	Clinton, Iowa.....	522.5	11.0
14	Le Claire, Iowa.....	493.3	11.0
15	Rock Island, Illinois.....	482.9	16.0
16	Muscatine, Iowa.....	457.2	9.0
17	New Boston, Illinois.....	437.1	8.0
18	Burlington, Iowa.....	410.5	9.8
19	Keokuk, Iowa.....	364.2	38.2
20	Canton, Missouri.....	343.2	10.0
21	Quincy, Illinois.....	324.9	10.5
22	Soverton, Missouri.....	301.2	10.5
24	Clarksville, Missouri.....	273.4	15.0
25	Cap au Gris, Missouri.....	241.5	15.0
26	Alton, Illinois.....	202.8	20.0

* Corps of Engineers, U. S. Army, Rock Island District, 1937.

gravity or by means of conveyors, or it may be deposited into cars or storage direct. There are many variations of the procedure and, in considering construction of coal loading or unloading terminals, the needs of each port in terms of annual shipments, storage requirements, and connecting railway facilities must be studied.

POSSIBLE SITES FOR THE DEVELOPMENT OF COAL PORTS

The number and location of coal loading ports on the Mississippi River will depend upon the market that can be developed, the source of the coal, and railroad facilities. There are several points on the river where both physical conditions favorable to port development and railroad connections with coal mining districts exist. A brief description of the principal ports on the river together with freight rates from selected coal mining districts is given below.

PORTS OF CHESTER, ILLINOIS

The most southerly port on the Mississippi River to be considered for the transshipment of coal is located at Chester, Illinois. It has two terminals, a paved wharf and a railroad incline. There are two railroads entering Chester: the Missouri Pacific; and the Missouri Illinois Railroad. All have switches along the river front and the Missouri Pacific has an incline. There is practically no interchange of traffic between river and rail, except sand.

Freight rates on coal from representative districts to Chester areas follow:*

<i>From:</i>	<i>Cents</i>
Belleville	95
Duquoin	95
Tamaroa	95
Southern Illinois	115
Sparta	80
Percy	80

* Letter from Traffic Manager, Illinois Central System.

PORT OF EAST ST. LOUIS

East St. Louis extends from 1 mile above to 2 miles below the Eads Bridge. The city is served by 27 railroads. Harbor lines have been established along the water front and seven terminals are located along the river bank.

Freight rates on coal in carload lots from representative mining districts to East St. Louis are as follows:*

<i>From:</i>	<i>Cents</i>
Belleville	85
Centralia	85
DuQuoin	95
Tamaroa	85
Southern Illinois	110
Mt. Olive	85

* Letter from Traffic Manager, Illinois Central System.

PORT OF ALTON, ILLINOIS

Alton is situated 25 miles north of St. Louis on the channel side of the river making it a favorable location for a river port. The frontage is owned in part by the city and in part by private parties. Dam No. 26 is located immediately above the Illinois-Missouri bridge and provides a still water harbor at Alton for a considerable distance upstream. A coal loading terminal is being constructed above the dam. Alton is served by seven railroads, viz., Alton and Eastern; Chicago and Alton; Chicago, Burlington and Quincy; Chicago, Springfield and St. Louis; C. C. C. and St. L., Missouri, Kansas and Texas; the St. Louis and Alton; and Illinois Terminal Railroad Co.

Freight rates from representative coal mining districts to Alton are as follows:*

<i>From:</i>	<i>Cents</i>
Springfield	85
Belleville	85
Centralia	85
DuQuoin	95
Southern Illinois	110
Mt. Olive	85
Tamaroa	95

* Letter from Traffic Manager, Illinois Central System.

The three ports described above are possible terminals for coal produced in southern and central Illinois and in the Belleville district. For the development of northern Illinois coal fields, conditions do not appear to be as favorable as for the southern fields. Possible river points for the development of coal loading terminals are Rock Island-Moline or East Moline, New Boston and Keithsburg. Both Rock Island and Moline are on the channel side of the river and are provided with facilities for handling sand and gravel.

These two cities are served by the Chicago, Rock Island and Pacific; Chicago, Burlington and Quincy; Chicago, Milwaukee and St. Paul; and the Rock Island Southern (to Rock Island only).

Freight rates on coal in carload lots to these cities from northern Illinois coal fields are as follows:*

<i>From:</i>	<i>Cents</i>
Fulton and Peoria counties.....	125
Victoria (Knox County).....	120

* Letter from Chicago, Rock Island and Pacific Railway Company.

The development of coal loading facilities at either New Boston or Keithsburg is suggested as an alternative to the Rock Island-Moline port in the event that the latter district is too congested for the development of adequate coal handling equipment. New Boston is located above Dam No. 17, a factor which should aid in providing favorable conditions for a port. This point is served by the C. B. & Q. Railroad; Keithsburg is served by the C. B. & Q. Railroad and the Minneapolis and St. Louis Railroad.

RECEIVING PORTS

The points on the Mississippi River which may be considered as potential markets for river-borne coal are: the Minneapolis-St. Paul district, Winona Minnesota, La Crosse, Wisconsin, and possibly important points in Iowa, such as Dubuque, Clinton, Davenport, Burlington, and Keokuk. In the case of the Iowa cities, it may develop in the course of a transportation analysis that an all-rail haul from Illinois coal fields is more economical than a rail-river haul.

Among these potential markets the Minneapolis-St. Paul area is by far the most important, the market in Winona and adjacent territory is less so, but more important than La Crosse, Wisconsin, which is a smaller community with a less productive hinterland than Winona. River ports in Iowa are important coal consumers but are favorably situated with respect to all rail haul.

PRESENT FACILITIES

Minneapolis.—A municipal terminal owned by the city of Minneapolis and operated by the Inland Waterways Corporation is located just downstream from the Washington Avenue Bridge. There is a concrete wall 1,082 feet long, and 3 feet wide on top with a vertical face on the river side. The equipment consists of a locomotive crane, wharf barge, escalator and warehouse. Direct rail-to-water connections are available with the Minneapolis and St. Louis Railway Company.

St. Paul.—This city is equipped with several docks that might be made available for handling of coal, among them the Ford Motor Company terminal below the Twin Lock and Dam. This dock is available for public use but has no rail connections and no mechanical appliances for handling freight. The Municipal dock, owned by the city of St. Paul, is located at the foot of Market Street. It is 800 feet long and is connected by a double track with a spur line with the tracks of the Chicago, Milwaukee, and St. Paul Railway. It is provided with a locomotive crane.

Winona, Minnesota.—The city has a masonry quay wall, adjacent to the business section, having a frontage of 1,150 feet and a depth of 200 feet. Switching tracks of the Chicago and Northwestern Railway are about 100 feet back of the quay wall.

La Crosse, Wisconsin.—At this city there is a paved embankment having a dockage front of about 1,500 feet, adjacent to the business section. Direct rail and water connections are available by the lines of the Chicago, Milwaukee and St. Paul Railway. No mechanical devices for handling freight are available.

UNLOADING FACILITIES AND EQUIPMENT

A survey of existing facilities for the development of coal traffic indicates that ample dock space is available in the principal cities of the Upper Mississippi River coal market area, but that coal handling equipment and coal storage yards must be provided. The type of coal handling equipment and the size of storage yards will be determined by forecasts concerning the probable growth of river-borne coal traffic.

FREIGHT RATES TO THE UPPER MISSISSIPPI VALLEY

Coal is shipped to the Upper Mississippi Valley by rail and water over the Great Lakes from mining districts in Ohio, Pennsylvania, West Virginia, Virginia and Kentucky, and by all-rail haul from these same fields, and also from shipments from Illinois, Indiana, and Western Kentucky. In table 4 is given the transportation cost from principal supplying fields to St. Paul and Minneapolis by the several routes of transportation, and the difference between these rates and deliveries to the port of Alton from Illinois fields. In column 1 is given the base rate effective before March 15, 1937. In column 2 is given the present rates which include the temporary increase granted by the Interstate Commerce Commission effective until December 31, 1938, unless cancelled, changed, or extended before that date. In column 3 are given differences between the freight rate from several southwestern Illinois mining districts to Alton (85 cents) and the rate from Appalachian fields to St. Paul and Minneapolis. In column 4 the difference between the rate from southern Illinois to Alton (\$1.10) and the rate from Appalachian fields to St. Paul and Minneapolis is given.

The differences shown in columns 3 and 4 represent amounts considerably in excess of the cost of river transport from Alton to St. Paul and Minneapolis. This excess, less the river rate, may be sufficiently large to absorb the differences in mine prices of coal between Appalachian and Illinois fields and the price differential due to differences in the quality of the coal. If, for example, the river rate per ton of coal is \$1.50, there is a differential of 140.5 cents in favor of coal from the Belleville district in comparison with coal from Massilon, Ohio, or a difference of ~~\$2.25~~ ^{3.35} over coal from the Cumberland-Piedmont district of West Virginia.

RAIL-RIVER COAL TRADE AND SEASONAL PRODUCTION TRENDS

In view of the fact that water shipments to the northwest are made in a comparatively short season beginning about the 1st of April and ending approximately on the 15th of November, the coal mining districts supplying this market have enjoyed a summer activity which is not characteristic of mining districts dependent upon all-rail traffic for their market outlets. The monthly trend of production in southern West Virginia and eastern Kentucky fields, both of which are important contributors to the lake cargo trade, show a smaller monthly deviation from the average production than does either Illinois, or the coal industry as a whole. The monthly fluctuation in production in each of these states and in the United States is shown in table 7 and portrayed graphically in figure 2.

TABLE 4.—Rates on bituminous coal from selected coal mining districts to St. Paul and Minneapolis, Minnesota, and differentials between Alton and St. Paul—Minneapolis.

(Cents per short tons)

Field of Origin	Base rate*		Revised Nov. 15, 1937†	Difference, Belleville, Springfield, Mt. Olive, Centralia, (85 cents)	Difference, Southern Illinois (110 cents)
LAKE CARGO COAL:					
Ohio and Pennsylvania—					
Massilon.....	358		375.5	290.5	265.5
Ohio Number 8.....	373		390.5	305.5	280.5
Pittsburgh, Pa.-W. Virginia.....	376		393.5	308.5	283.5
Connellsville.....	384		401.5	316.5	291.5
West Virginia—					
Fairmont.....	396		413.5	328.5	303.5
Kanawha.....	413		428.5	343.5	318.5
Pocahontas-Tug River.....	426		443.5	358.5	333.5
ALL-RAIL RATES:					
Ohio—					
Ohio Number 8.....	505		520	435	410
Massilon.....	480		495	410	385
Middle.....	495		510	425	400
Pennsylvania—					
Connellsville.....	540		555	470	445
West Virginia—					
Cumberland-Piedmont and Gauley.....	555		570	485	460
Meyersdale.....	555		570	485	460
Roaring Creek and Upshur.....	540		555	470	445
East Kentucky—					
Hazard.....	540		555	470	445
Illinois—					
Herrin, Holidaysboro.....	Lump 375	Slack 316	Lump 390	Slack 331	
Cutler.....	365	306	380	321	
Belleville.....	380	306	380	321	
Mt. Olive.....	360	286	360	301	
Eldorado.....	390	316	390	331	

* Rates in effect previous to Nov. 15, 1937, in cents per short ton. Includes rate from producing field to lower lake ports plus 8 cents loading charge, 40 cents for lake haul and \$1.82 for rail haul from Duluth-Superior docks to St. Paul and Minneapolis. Tariff authorities: Baltimore and Ohio R. R. Tariff I. C. C. C. and C. 2654; Louisville and Nashville R. R. I. C. C. A-16265; Missouri Pacific R. R. Co. I. C. C. A-7988; Louisville and Nashville R. R. I. C. C. 16155.

† Rates in effect beginning Nov. 15, 1937, and continuing until Dec. 31, 1938. Includes rates from producing fields to lower lake ports plus 8 cents loading charge, 40 cents for lake haul and \$1.89½ for rail haul from Duluth-Superior to St. Paul and Minneapolis. Communications to the author from: Missouri Pacific Railroad Co., Freight Traffic Dept.; Baltimore and Ohio Railroad, Coal Traffic Dept.; Northern Pacific Railroad, Freight Traffic Dept.; and the Pennsylvania Railroad, Traffic Dept.

ILLINOIS COAL ON THE UPPER MISSISSIPPI WATERWAY

TABLE 5.—Rates on bituminous coal from selected coal mining districts in Illinois to river ports at Alton, East St. Louis, and Chester, Ill.*
(Cents per short ton)

Field of origin	Alton	E. St. Louis	Chester
Springfield.....	85
Belleville.....	85	85	95
Centralia.....	85	85
DuQuoin.....	95	95	95
Southern Illinois.....	110	85	115
Mt. Olive.....	85	110
Tamaroa.....	95	85

* Letter from Traffic Manager, Illinois Central System.

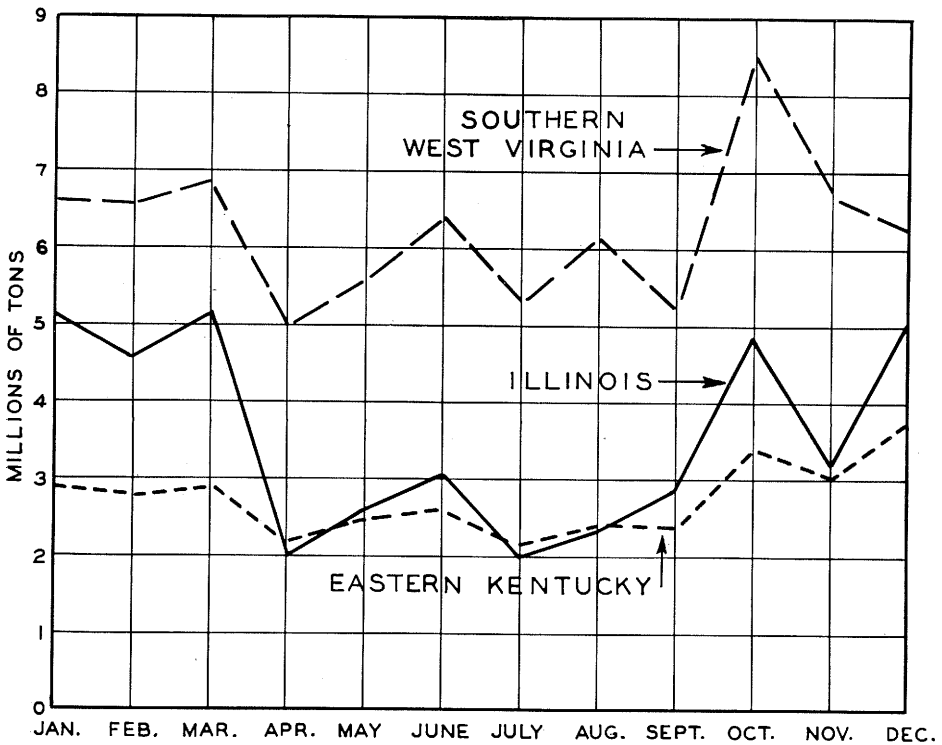


FIGURE 2.—Production of coal, by months in Illinois, southern West Virginia and Eastern Kentucky, in 1935.

The development of a market for Illinois coal in the Upper Mississippi River market area, which is its natural market, would not only widen the market outlet, but would provide summer activity for this additional tonnage created by this market and to that extent modify the extreme seasonal fluctuations of production that are characteristic of the coal mining in this State.

TABLE 6.—Industrial Census*

County	Number of establishments	Horse-power	Wage earners	Wages	Value of Product (thousands)
Iowa—					
Allamakee.....	22	328	89	74,723	1,314
Clayton.....	42	1,156	343	401,727	3,750
Clinton.....	83	16,421	3,285	4,047,030	27,106
Des Moines.....	76	9,949	3,498	4,163,912	17,244
Dubuque.....	122	16,622	5,446	5,991,782	34,257
Jackson.....	33	993	167	171,946	2,125
Lee.....	89	23,411	3,483	4,046,634	33,053
Louisa.....	8	248	153	106,369	434
Muscatine.....	84	6,456	2,872	2,578,037	14,259
Scott.....	190	33,758	6,334	8,202,291	50,825
Minnesota—					
Anoka.....	23	4,097	877	1,076,907	10,162
Carver.....	36	3,481	299	299,329	3,410
Dakota.....	32	20,475	4,320	5,544,749	126,063
Goodhue.....	75	8,452	1,440	1,596,097	20,908
Hennepin.....	1,258	181,028	36,731	47,119,501	371,579
Houston.....	18	262	38	48,282	1,306
Ramsey.....	668	106,844	24,097	31,798,139	212,187
Scott.....	14	954	165	211,755	1,681
Wabasha.....	24	1,560	290	360,668	7,654
Washington.....	36	7,588	1,790	2,228,353	27,771
Winona.....	81	10,425	2,048	2,321,328	23,720
Wisconsin—					
Buffalo.....	24	608	86	98,221	2,258
Crawford.....	51	1,430	397	384,985	2,924
Grant.....	95	1,271	281	307,000	4,684
La Crosse.....	117	12,095	5,742	6,131,457	27,704
Pepin.....	10	373	94	87,700	1,974
Pierce.....	26	446	136	156,567	2,566
St. Croix.....	49	3,312	544	717,087	6,139
Trempealeau.....	31	1,461	134	135,720	4,432
Vernon.....	45	1,241	122	127,758	4,525

* Manufacturing Market Statistics, Domestic Commerce Series, No. 67, U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1932.

TABLE 7.—Monthly production of coal, in 1935, in southern West Virginia, eastern Kentucky, Illinois, and the United States, and index of production for each month* *In thousands of net tons.*
(Monthly average = 100)

Month	Southern West Virginia	Index	Eastern Kentucky	Index	Illinois	Index	U. S.	Index
January.....	6,614	105	2,925	107	5,174	139	37,019	120
February.....	6,467	103	2,887	106	4,677	126	35,149	113
March.....	6,962	111	2,945	107	5,191	140	38,970	125
April.....	5,001	80	2,200	81	2,051	55	22,134	71
May.....	5,620	88	2,528	93	2,607	70	26,955	83
June.....	6,458	103	2,663	98	3,114	83	30,260	97
July.....	5,323	85	2,228	82	2,027	55	22,511	72
August.....	6,183	98	2,494	92	2,465	66	26,322	84
September.....	5,200	83	2,461	91	2,955	79	25,321	81
October.....	8,591	136	3,493	128	4,885	131	38,120	123
November.....	6,715	107	3,023	111	4,247	114	33,747	108
December.....	6,329	101	2,776	102	5,132	138	35,805	115
Total.....	75,463		32,627		44,525		372,373	
Average.....	6,288		2,719		3,710		31,031	

* Minerals Yearbook, 1937, U. S. Department of the Interior, Bureau of Mines.

TABLE 8.—Population of Upper Mississippi River Counties*

Iowa		Minnesota		Wisconsin	
County	Population	County	Population	County	Population
Allamakee....	16,328	Anoka.....	18,415	Buffalo.....	15,330
Clayton.....	24,559	Carver.....	16,936	Crawford.....	16,781
Clinton.....	44,377	Dakota.....	34,592	Grant.....	38,469
Des Moines...	38,162	Goodhue....	31,317	La Crosse....	54,455
Dubuque.....	61,214	Hennepin....	517,785	Pepin.....	7,450
Jackson.....	18,481	Houston.....	13,845	Pierce.....	21,043
Lee.....	41,268	Ramsey.....	286,721	St. Croix.....	25,455
Louisa.....	11,575	Scott.....	14,116	Trempealeau...	23,910
Muscatine....	29,385	Wabasha....	17,613	Vernon.....	28,537
Scott.....	77,332	Washington...	24,753		
		Winona.....	35,144		
	362,681		1,011,237		231,430
State total....	2,470,939		2,563,953		2,912,439

* Fifteenth Census of the United States, Population, Volume 1, pp. 362, 363, 545, 546, 1182 and 1183.

TABLE 9.—Distribution of coal from upper lake ports during 1935*
(Short tons)

Distributing ports	Canada	Illinois	Iowa	Michigan	Minnesota	Montana	Nebraska	North Dakota	South Dakota	Wisconsin	Total
Lake Superior ports:											
Two Harbors, Minn.	22,030		40,454	43,346	72,104	586	10,386	289,237	324,939	1,399,801	72,104
Duluth-Superior, Minn.-Wis.					4,697,538					250	6,828,317
Bayfield, Wis.			2,312	30,977	103,442			12,656	10,254	160,199	319,840
Ashland, Wis.				27,457							27,457
Ontonagon, Mich.				229,875							229,875
Keewauw Waterway, Mich.				2,500							2,500
Baraga, Mich.				7,064							7,064
L'Anse, Mich.				189,264							189,264
Marquette, Mich.				49,043							49,043
Munising, Mich.											
Total.....	22,030		42,766	579,526	4,873,084	586	10,386	301,893	335,193	1,560,250	7,725,714
Lake Michigan ports:											
Port Inland, Mich.				1,713							1,713
Manistique, Mich.				20,308							20,308
Escanaba, Mich.				198,168							229,427
Menominee Harbor, Mich.-Wis.				95,335	300					211,236	306,871
Green Bay, Wis.	1,040		8,781	1,442	15,969				87	1,179,510	1,206,829
Sturgeon Bay, Wis.										17,674	17,674
Algoma, Wis.										3,456	3,456
Kewaunee, Wis.										3,500	3,500
Two Rivers, Wis.										30,493	30,493
Manitowoc, Wis.		430	4,309		431					279,293	284,053
Sheboygan, Wis.			10,959	29	646				173	355,104	367,341
Port Washington, Wis.										70,880	70,880
Milwaukee, Wis.		9,557	18,044	2,762	16,688		107	834	3,813	3,207,446	3,259,251
Recline, Wis.										250,163	250,163
Kenosha, Wis.										17,832	17,832
Total.....		11,027	42,093	319,757	34,034		107	834	4,073	5,659,846	6,071,791
Grand total.....	22,030	11,027	84,859	899,283	4,907,138	586	10,493	302,727	339,266	7,220,096	13,797,505

* Maher Coal Bureau, St. Paul, Minn., and Annual Report, Chief of Engineers, U. S. Army Transportation Series No. 1, 1937.

