CANADA
DEPARTMENT OF MINES AND RESOURCES
HON. T. A. CRERAR, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

MINES AND GEOLOGY BRANCH
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W. B. TIMM, CHIEF

ANALYSES OF COALS AND OTHER SOLID FUELS—1934 TO 1936

COMPILED BY
J. H. H. Nicolls and C. B. Mohr

Price, 25 cents

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APPENDICES

I. Analyses of Coals and Peats, 1918 to 1925, hitherto unpublished.
II. Analyses of Ash from Coals, Cokes, Peat, and Woods.

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CONTENTS

ANALYSES OF COALS AND OTHER SOLID FUELS
1934 to 1936

The analyses of solid fuels compiled here are those of samples of general interest received during the second half of 1934, the whole of 1935, and up to March 31, 1936. In many cases only such data as were requested by the persons submitting the samples are shown, so that some analyses are incomplete. The analyses are tabulated under the three following group headings:—

(1) Coals and other solid fuels occurring in Canada.

(2) Coal samples submitted by the Department of Pensions and National Health.

(3) Miscellaneous solid fuels.

The first group of fuels (Table I) comprises a number of "mine" and a few "prospect" samples. The "mine" samples were procured from deposits already under development; the "prospect" samples from deposits as yet undeveloped. Many "commercial" samples occur in the first group; each of these is considered to be indicative of the corresponding product as shipped from the mine.

The second group of fuels (Table II) consists entirely of bituminous coals purchased by the Department of Pensions and National Health for use in the heating plants of its various hospitals. These include both Canadian and United States coals. They are all "commercial" samples, and consist principally of "slack" coal. The samples were collected entirely by engineers at the various heating plants concerned, following instructions sent out by the Department of Pensions and National Health after consultation with the staff of the Fuel Research Laboratories. According to the procedure employed in reporting these samples to the Department of Pensions and National Health, only the moisture contents, which may vary with weather conditions, are shown on the "as-received" basis, the remainder of the analyses being reported on the "dry" basis in order to simplify comparisons between the different coal samples.

The third group of fuels (Table III) consists of imported coals, such as are sold by local dealers for heating either private residences or public buildings, or for various industrial purposes. In addition, it includes a number of high-temperature cokes obtained from manufacturers or dealers. These are all "commercial" samples. Finally, the third group contains some processed fuels, including petroleum and low-temperature cokes and various kinds of briquettes.

As a general rule, "mine" and "prospect" samples of coal contain less ash and have higher calorific values than would the corresponding "commercial" samples. This is due to the fact that, in ordinary mining

practice, it is very difficult to exclude impurities as thoroughly as would be done in collecting the small "mine" samples. Therefore, in using the following tables in connexion with the sale or purchase of coal, care should be taken to note whether the samples are "mine" or "commercial" (the latter term including "slack", "run-of-mine", and the various sizes of screened coal), and to judge therefrom whether any particular coal as shipped from the mine could reasonably be expected to have as favourable an analysis as that given in the table. It should also be realized that, generally speaking, "slack" coal will contain more moisture and ash, and have a lower calorific value than the corresponding screened coal, and that "run-of-mine" coal will be intermediate between the two.

It will be apparent to those interested, that the moisture contents of the peats tabulated are often lower than could be expected in peats dried out-of-doors. Very frequently, such samples were received in the laboratory after a period of indoor drying. Similarly, anthracites are likely to lose moisture if allowed to remain indoors, as was the case with some of the samples analysed. Very often, coke samples were received wet, and were oven-dried before grinding; in such cases the moisture contents shown are misleading. The percentages of moisture in cokes may vary from 1 per cent up to as high as 10 per cent, according to the season or kind of storage, whether in the open or under cover.

The following notes explain abbreviations and other terminology in the tables, and may be of assistance in studying them.

(a) Figures in columns "R" refer to fuels as received; and in columns "D" to those dried at 108°C. The analyses of the high-moisture "slack" coals do not include values obtained on a partly dried basis, since this information was not considered to be of any particular interest, although it is obvious that the fuels could not have been ground for analysis without previous drying.

(b) The analyses of certain Alberta coals are shown on a "PAD" (partly air-dried) basis. Such a condition is considered to represent approximately the analysis of delivered coal, there being nearly always loss of moisture in transit from the mine. The percentages of moisture corresponding to those retained by partly air-dried coal were obtained preferably by drying lump coal by spreading it out indoors for 6 hours; failing this procedure, finely crushed coal was exposed to an atmosphere of 97 per cent relative humidity[1] until equilibrium had been established.

(c) The analyses of the same Alberta coals are also tabulated as containing "capacity" or "true" moisture "CM" and free from "mineral-matter", such being the basis of classification tentatively adopted for lower rank coals by the American Society for Testing Materials[2]. Such moisture represents that which would, theoretically, be retained by coal when allowed to come into perfect equilibrium with an atmosphere of 100 per cent relative humidity, and for purposes of calculation it has been assumed that the coal substance and the "mineral-matter" would retain equal percentages of moisture. "Mineral-matter", for the coals under discussion, which contain little sulphur, is obtained by multiplying the determined ash content by 1·1.

[1] Stansfield and Gilbart: Report of Coal Division, A.I.M.E., 1932, p. 125.
[2] A.S.T.M. Standards on Coal and Coke, Designation D 388—36T.

(d) Fuel ratios are obtained by dividing the percentages of fixed carbon by those of volatile matter. It is clear that these ratios would place coals in the same order as do the corresponding fixed-carbon contents, on the dry "mineral-matter" free basis. It is noteworthy that this last basis has been tentatively adopted by the A.S.T.M. for the classification of higher rank coals.

(e) "Coking properties" are descriptions of the buttons obtained by heating one-gramme samples in closed platinum crucibles during the determination of volatile matter. They do not necessarily predict correctly the grade of coke that can be produced commercially. However, they do indicate general coking properties, and serve to differentiate between the non-coking, or poorly coking coals and those that will produce oven coke that will grade as fair or better. The term "agglomerating"[1] is coming into use by the A.S.T.M., as serving as one method for defining the boundaries between bituminous coals and those of higher or lower rank, any button which will support a 500-gramme weight being considered as an "agglomerate".

The analyses reported below were carried out under the supervision of the authors, according to the general directions of the Superintendent of the Fuel Research Laboratories. The samples were prepared for analysis by W. Kritsch, laboratory assistant, who also carried out screen analyses and other physical tests. The chemical analyses were made by C. B. Mohr, R. J. Young, G. E. LeWorthy, C. J. Coleman, J. W. Custeau, A. H. Seaton, C. H. Glaude, F. Bisson, and H. Zumar.

[1] Gilmore, Connell, and Nicolls: Report of Coal Division, A.I.M.E.; 1934; p. 255.

TABLE I

Analyses of Solid Fuels Occurring in Canada

NOVA SCOTIA

—	Dominion Steel and Coal Corporation, Limited, Montreal Coals from the Sydney area													
	Dominion No.2 mine, New Aberdeen, Glace Bay. Phalen seam		Dominion No. 12 mine, New Waterford Harbour or Victoria Seam						Supplied to penitentiary at St. Vincent de Paul, Quebec				Supplied to central heating plant, Department of Public Works, Ottawa, Ontario	
			Splint or durain				Bright coal							
Sample No.	13836		15072		15244**		15138**		13504		15417		13559	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·5	....	1·4	....	1·4	....	2·3	....	4·2	....	5·5	....	4·6	....
Ash..... "	10·6	10·7	8·4	8·5	2·3	2·3	3·2	3·3	6·7	7·1	8·4	8·9	7·9	8·3
Volatile matter... "	31·7	32·2	40·4	41·0	41·8	42·4	38·6	39·5	34·2	35·6	30·9	32·7	31·9	33·4
Fixed carbon..... "	56·2	57·1	49·8	50·5	54·5	55·3	55·9	57·2	54·9	57·3	55·2	58·4	55·6	58·3
Ultimate Analysis—														
Carbon.....per cent	74·8	76·0	78·1	79·3	....	....	80·2	82·0	....	....	....	....	....	....
Hydrogen..... "	5·0	4·9	5·5	5·4	....	....	5·5	5·4	....	....	....	....	....	....
Ash..... "	10·6	10·7	8·4	8·5	....	....	3·2	3·3	....	....	....	....	....	....
Sulphur..... "	4·6	4·7	1·0	1·0	0·5	0·5	0·6	0·6	2·7	2·8	3·2	3·4	2·9	3·0
Nitrogen..... "	1·3	1·4	1·4	1·4	....	....	1·8	1·8	....	....	....	....	....	....
Oxygen..... "	3·7	2·3	5·6	4·4	....	....	8·7	6·9	....	....	....	....	....	....
Forms of Sulphur—														
Sulphate.....per cent*	....		0·5		....		0·0		....		....		....	
Pyritic..... "	....		48·0		....		19·1		....		....		....	
Organic..... "	....		51·5		....		80·9		....		....		....	
Calorific Value—														
Calories per gramme, gross	7,500	7,620	7,800	7,915	8,415	8,535	7,965	8,150	7,540	7,860	7,215	7,635	7,440	7,800
B.T.U. per pound, gross...	13,500	13,710	14,040	14,250	15,150	15,360	14,340	14,670	13,580	14,150	12,980	13,740	13,390	14,040
Fuel ratio.....	1·80		1·25		1·30		1·45		1·60		1·80		1·75	

Coking properties.....	Good	Good	Poor	Good	Good	Good	Good
Softening temperature of ash.....°F.	1980	2700	2465	2300	2150	2040	2085
Apparent specific gravity....	1·36	....	....	....	....	....	....
Weight per cubic foot. pounds	53·2	....	....	....	....	....	....
Screen Analysis—							
On 4" round.....per cent	6·7	....	....	....	....	....	....
3 " to 4 " round.... "	7·2	....	....	....	....	....	....
2 " to 3 " " "	15·8	....	....	....	....	....	....
1½" to 2 " " "	12·7	....	....	....	....	....	....
1 " to 1½" " "	12·1	....	....	....	....	....	....
¾" to 1 " " "	6·9	....	....	....	....	....	....
½" to ¾" " "	8·3	....	....	....	....	....	....
¼" square to ½" round..... "	8·8	....	....	....	....	....	....
⅛" to ¼" square.... "	7·9	....	....	....	....	....	....
Per ⅛" square..... "	13·6	....	....	....	....	....	....
Designation of coal.....	Lump.....	.....	From lumps on 4-inch round-hole screen.		Run-of-mine....	Steam.....	.....
Kind of sample.....	Commercial; 1 ton.	From picking belt.	From commercial consignment..		Commercial; 500 tons.	Commercial; 10 cars.	Commercial.
Taken by.....	Fuel inspector; Canadian National Railways.	Employees of coal company.	Staff of Fuel Research Laboratories.		Departmental employees.....		
Date of sampling.....	Autumn of 1934.	November, 1935	January, 1936...	December, 1935	July 17-27, 1934.	March 21, 1936..	During September, 1934.

*Per cent of total sulphur. **Analysis of ash in appendix to this report.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

——	Dominion Steel and Coal Corporation, Limited, Montreal Coals from the Sydney area, supplied to the Mines Branch Laboratories, Booth street, Ottawa, through the Department of Public Works													
Sample No	13832		13978		14255		15191		15346		13771		13918	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	2·1	....	2·4	....	2·1	....	2·3	....	2·4	....	2·2	....	2·4	....
Ash..... "	9·7	9·9	9·0	9·2	8·0	8·1	9·0	9·3	8·3	8·5	8·5	8·7	7·9	8·1
Volatile matter... "	32·8	33·5	34·7	35·6	34·7	35·5	33·3	34·0	34·0	34·8	32·4	33·1	32·7	33·5
Fixed carbon..... "	55·4	56·6	53·9	55·2	55·2	56·4	55·4	56·7	55·3	56·7	56·9	58·2	57·0	58·4
Ultimate Analysis—														
Sulphur.....per cent	3·2	3·3	3·3	3·4	2·8	2·8	3·3	3·4	3·6	3·7	3·0	3·1	2·9	3·0
Calorific Value—														
Calories per gramme, gross	7,505	7,670	7,355	7,535	7,490	7,655	7,490	7,665	7,595	7,780	7,620	7,795	7,585	7,775
B.T.U. per pound, gross...	13,510	13,800	13,240	13,570	13,480	13,780	13,480	13,800	13,670	14,010	13,720	14,030	13,660	13,990
Fuel ratio	1·70		1·55		1·60		1·65		1·65		1·75		1·75	
Coking properties	Good		Good		Good		Good		Good		Good		Good	
Softening temperature of ash.....°F.	2020		2020		2040		2000		2030		2040		2015	
Screen Analysis—														
On 4" round.....per cent	0·0		2·4		0·0		0·0		0·0		On 1" round 1·8		1·2	
3 " to 4 " round "	0·0		14·4		10·9		0·0		7·4		¾" to 1" " 5·2		4·5	
2 " to 3 " " "	31·3		25·8		26·5		29·5		33·3		½" to ¾" " 13·5		10·7	
1½" to 2 " " "	20·5		17·2		18·2		22·8		24·1		¼" square to ½" round 18·2		18·4	
1 " to 1½" " "	28·1		23·4		26·5		33·4		24·4		⅛" to ¼" square 21·3		23·1	

$\frac{3}{4}$" to 1"	"	"	6·3	6·0	9·3	7·9	4·1	Per $\frac{1}{8}$" square	40·0
$\frac{1}{2}$" to $\frac{3}{4}$"	"	"	4·3	3·6	3·8	2·5	2·1	....	....
Per $\frac{1}{2}$"	"	"	9·5	7·2	4·8	3·9	4·6	....	....

Designation of coal	Steam lump					Slack		
Kind of sample	Commercial							
Taken by	Staff of Fuel Research Laboratories							
Date of sampling	During December, 1934	During February, 1935	During April, 1935	During December, 1935	During February, 1936	During November, 1934	During January, 1935	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

—	Dominion Steel and Coal Corporation, Limited, Montreal Coals from the Sydney area											
	Supplied to the Mines Branch Laboratories, Booth street, Ottawa, through the Department of Public Works								Supplied to the Department of National Defence at Stratford, Ontario		Nova Scotia Steel and Coal Company, Limited, No. 1, Princess mine, Sydney Mines. Main seam	
Sample No	14097		15094		15274		15418		15065		14334	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	7·0	....	5·2	....	7·1	....	6·5	....	3·7	....	2·2	....
Ash..... "	7·7	8·2	7·1	7·5	7·3	7·9	7·7	8·2	9·8	10·1	4·9	5·0
Volatile matter..... "	31·5	33·9	32·2	34·0	31·3	33·7	31·3	33·5	32·5	33·7	38·3	39·1
Fixed carbon..... "	53·8	57·9	55·5	58·5	54·3	58·4	54·5	58·3	54·0	56·2	54·6	55·9
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	....	....	....	....	....	....	78·4	80·1
Hydrogen..... "	....	....	....	....	....	....	....	....	....	....	5·8	5·7
Ash..... "	....	....	....	....	....	....	....	....	....	....	4·9	5·0
Sulphur..... "	2·8	3·0	2·8	2·9	2·6	2·8	2·8	3·0	3·2	3·3	2·2	2·2
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	1·7	1·8
Oxygen..... "	....	....	....	....	....	....	....	....	....	....	7·0	5·2
Calorific Value—												
Calories per gramme, gross.....	7,140	7,680	7,435	7,835	7,135	7,685	7,205	7,710	7,305	7,590	7,825	8,000
B.T.U. per pound, gross.....	12,850	13,820	13,380	14,100	12,850	13,830	12,970	13,880	13,150	13,660	14,080	14,400
Fuel ratio.....	1·70		1·70		1·75		1·75		1·65		1·45	
Coking properties.....	Good		Good		Good		Good		Good		Good	

Softening temperature of ash.....°F.	2020	2000	2050	2040	2025	2020
Apparent specific gravity.....	....	....	....	....	....	1·29
Weight per cubic foot.....pounds	....	....	....	....	....	47·4
Screen Analysis—						
On 1″ round.....per cent	1·7	On 1″ round, 2·0	0·8	1·1	.....	On 4″ round, 8·8
¾″ to 1″ round..... "	4·7	¾″ to 1″ " 5·5	7·1	3·5	.....	3″ to 4″ " 6·3
½″ to ¾″ " ..... "	22·7	½″ to ¾″ " 11·3	11·0	10·6	.....	2″ to 3″ " 11·0
¼″ square to ½″ round..... "	16·9	¼″ to ½″ " 25·1	24·4	23·0	.....	1½″ to 2″ " 10·7
⅛″ to ¼″ square..... "	20·9	⅛″ to ¼″ " 20·6	20·3	21·7	.....	1″ to 1½″ " 21·0
Per ⅛″ square..... "	33·1	1/16″ to ⅛″ " 18·4	19·2	15·2	.....	¾″ to 1″ " 10·9
	.....	Per 1/16″ " 17·1	17·2	24·9	.....	½″ to ¾″ " 10·2
	.....	.....	.....	.....	.....	¼″ sq. to ½″ " 7·6
	.....	.....	.....	.....	.....	⅛″ to ¼″ square, 5·6
	.....	.....	.....	.....	.....	Per ⅛″ " 7·9
Designation of coal.....	Slack.....				Run-of-mine....	Screened lump
Kind of sample.....	Commercial.....					Commercial; 1 ton.
Taken by.....	Staff of Fuel Research Laboratories.....				Departmental employees.	Fuel inspector, Canadian National Railways.
Date of sampling.....	During March, 1935.	During November, 1935.	During January, 1936.	During March, 1936.	November, 1935	April, 1935

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

—	Indian Cove Coal Company, Limited, Tompit mine, Sydney Mines, Sydney area. Indian seam		Bras d'Or Coal Company, Limited, Little Bras d'Or Bridge (Sydney Mines)						Inverness Imperial Coal Company, Limited, No. 1 mine, Inverness, Inverness area. 7-foot seam		Acadia Coal Company, Limited, Dominion Steel and Coal Corporation, Limited, Allan Shaft mine, Stellarton, Pictou area. Foord seam		Intercolonial Coal Company, Limited, Drummond Nos. 1 and 2 mines, Westville, Pictou area. Main and Second seams	
			Colonial No. 1 mine. Collins seam		Supplied to Government building in Montreal, through the Department of Public Works									
Sample No.	13842		13867		15158		14953		14333		13886		13922	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	3·9	....	4·3	....	4·8	....	5·5	....	5·7	....	1·6	....	1·9	....
Ash..... "	14·5	15·0	9·5	9·9	11·6	12·1	15·7	16·6	12·2	12·9	16·9	17·2	16·8	17·2
Volatile matter... "	34·0	35·4	33·7	35·2	32·4	34·0	29·6	31·3	37·5	39·8	28·4	28·9	24·9	25·4
Fixed carbon..... "	47·6	49·6	52·5	54·9	51·2	53·9	49·2	52·1	44·6	47·3	53·1	53·9	56·4	57·4
Ultimate Analysis—														
Carbon.....per cent	64·9	67·5	69·6	72·7	....	....	....	....	62·4	66·2	70·8	71·9	70·0	71·4
Hydrogen..... "	5·0	4·7	4·9	4·7	....	....	....	....	5·2	4·8	4·7	4·6	4·6	4·4
Ash..... "	14·5	15·0	9·5	9·9	....	....	....	....	12·2	12·9	16·9	17·2	16·8	17·2
Sulphur..... "	7·3	7·6	4·9	5·1	4·9	5·2	5·8	6·1	7·8	8·3	0·7	0·7	1·0	1·0
Nitrogen..... "	1·3	1·4	1·4	1·4	....	....	....	....	1·2	1·3	2·0	2·0	1·9	1·9
Oxygen..... "	7·0	3·8	9·7	6·2	....	....	....	....	11·2	6·5	4·9	3·6	5·7	4·1
Calorific Value—														
Calories per gramme, gross	6,590	6,860	7,070	7,385	6,700	7,040	6,190	6,550	6,230	6,610	7,010	7,120	6,880	7,010
B.T.U per pound, gross...	11,860	12,350	12,730	13,300	12,060	12,680	11,150	11,790	11,220	11,900	12,620	12,810	12,390	12,620
Fuel ratio.....	1·40		1·55		1·60		1·65		1·20		1·85		2·25	
Coking properties.....	Fair		Good		Poor		Fair		Fair		Good		Good	

Softening temperature of ash.....°F	2060	2060	2000	2110	2100	2530	2430
Apparent specific gravity...	1·40	1·34	....	....	1·40	1·36	1·40
Weight per cubic foot, pounds	51·4	50·2	....	....	52·6	50·6	50·8
Screen Analysis—							
On 4″ round....per cent	9·4	8·0	....	....	7·0	20·3	11·3
3″ to 4″ " .... "	8·5	5·6	....	....	8·1	13·1	4·5
2″ to 3″ " .... "	16·7	9·6	....	....	16·4	16·8	10·6
1½″ to 2″ " .... "	13·8	7·7	....	....	13·0	11·4	13·3
1″ to 1½″ " .... "	17·9	12·9	....	....	18·0	10·8	24·0
¾″ to 1″ " .... "	10·0	13·5	....	....	10·8	5·9	12·6
½″ to ¾″ " .... "	7·0	18·4	....	....	9·5	6·2	8·5
¼″ square to ½″ round..... "	5·5	11·1	....	....	6·1	5·2	5·1
⅛″ to ¼″ square.... "	4·3	6·0	....	....	4·2	4·1	3·6
Per ⅛″ " .... "	6·9	7·2	....	....	6·9	6·2	6·5
Designation of coal.....	Lump.....		.....	Bituminous culm.	Lump.....		
Kind of sample.....	Commercial; 1 ton.....		Commercial; from 200-ton pile.	.....	Commercial; 1 ton.....		
Taken by.....	Fuel inspector, Canadian National Railways.		Departmental employees.	Mine operators..	Fuel inspector, Canadian National Railways.....		
Date of sampling.....	Autumn of 1934.....		December, 1935.	September, 1935	April, 1935.....	Autumn of 1934.....	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Concluded

—	Cumberland Railway and Coal Company, Limited, Dominion Steel and Coal Corporation, Limited, Springhill, Springhill area						Victoria Coal Company, Limited, New Glasgow; mine at River Hebert, Joggins—Chignecto area						Shore Coal Company, Limited, Joggins, Joggins—Chignecto area	
	No. 2 mine, No. 2 seam		Supplied to penitentiary at Dorchester, New Brunswick				Victoria No. 4 mine, Joggins. Bench seam		Supplied to Naval Service, Department of National Defence, at Halifax, N.S.		Supplied to penitentiary at Dorchester			
Sample No.	13948		14372		15333		13933		15027		15332		14407	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·9	....	3·6	....	2·3	....	2·6	....	2·5	....	2·8	....	5·0	....
Ash..... "	9·7	9·9	5·1	5·3	10·6	10·8	16·8	17·2	19·5	20·0	16·9	17·3	11·8	12·4
Volatile matter... "	30·5	31·1	33·5	34·8	30·4	31·1	36·1	37·1	33·7	34·5	37·1	38·2	37·3	39·3
Fixed carbon..... "	57·9	59·0	57·8	59·9	56·7	58·1	44·5	45·7	44·3	45·5	43·2	44·5	45·9	48·3
Ultimate Analysis—														
Carbon.....per cent	75·8	77·3	....	....	....	....	63·7	65·4	....	....	....	....	....	....
Hydrogen..... "	5·1	4·9	....	....	....	....	4·6	4·5	....	....	....	....	....	....
Ash..... "	9·7	9·9	....	....	....	....	16·8	17·2	....	....	....	....	....	....
Sulphur..... "	1·7	1·7	1·3	1·3	1·4	1·4	6·4	6·6	4·9	5·0	6·3	6·5	6·1	6·5
Nitrogen..... "	1·9	2·0	....	....	....	....	1·9	1·9	....	....	....	....	....	....
Oxygen..... "	5·8	4·2	....	....	....	....	6·6	4·4	....	....	....	....	....	....
Calorific Value—														
Calories per gramme, gross	7,510	7,655	7,575	7,860	7,275	7,450	6,490	6,665	6,205	6,365	6,440	6,625	6,510	6,850
B.T.U. per pound, gross..	13,520	13,780	13,640	14,150	13,100	13,410	11,680	11,990	11,170	11,450	11,590	11,920	11,720	12,330

Fuel ratio	1·90	1·70	1·85	1·25	1·30	1·15	1·25
Coking properties	Good	Good	Good	Fair	Good	Fair	Good
Softening temperature of ash....°F.	2230	2160	2080	1990	2120	1950	2170
Apparent specific gravity	1·35	....	....	1·42	....	....	.....
Weight per cubic foot, pounds	49·5	....	....	53·6	....	....	.....
Screen Analysis—							
On 4" round.....per cent	17·6	....	....	7·7	....	....	.....
3" to 4" " ..... "	5·6	....	....	6·5	....	....	.....
2" to 3" " ..... "	11·3	....	....	10·4	....	....	.....
1½" to 2" " ..... "	12·7	....	....	10·7	....	....	.....
1" to 1½" " ..... "	21·4	....	....	17·7	....	....	.....
¾" to 1" " ..... "	7·6	....	....	13·5	....	....	.....
½" to ¾" " ..... "	6·4	....	....	10·5	....	....	.....
¼" square to ½" round..... "	5·4	....	....	8·0	....	....	.....
⅛" to ¼" square.... "	4·4	....	....	6·2	....	....	.....
Per ⅛" square..... "	7·6	....	....	8·8	....	....	.....
Designation of coal	Lump	.....	Slack	Lump	.....	.....	.....
Kind of sample	Commercial; 1 ton.	Commercial; carload	.....	Commercial; 1 ton.	Commercial....	Commercial; carload	.....
Taken by	Fuel inspector, Canadian National Railways.	Departmental employees	.....	Fuel inspector, Canadian National Railways.	Departmental employees	.....	.....
Date of sampling	Autumn of 1934	May 28, 1935....	February, 1936.	Autumn of 1934	October, 1935...	February, 1936.	June 8, 1935....

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NEW BRUNSWICK

—	Albertite from Albert Mines		Coals from Minto (Grand Lake) area											
			Coal "mined at Newcastle, N.B. district," supplied to the Department of National Defence at St. John, N.B.		"Miramichi" coal, supplied to industrial plant at Dalhousie, N.B.				"Black Diamond, Minto" coal, supplied to Department of Public Works at Summerside, Prince Edward Island				Welton and Henderson, Limited, Black Diamond No. 12 mine, Minto	
Sample No.	15101		13609		14418		14419		15290		15291		13973	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	0·7	....	1·3	....	3·0	....	3·8	....	1·1	....	0·9	....	1·0	....
Ash..... "	0·9	0·9	17·2	17·4	16·4	16·9	20·5	21·3	21·3	21·5	17·5	17·7	19·2	19·3
Volatile matter... "	68·4	68·9	30·7	31·1	30·3	31·3	29·7	30·9	30·4	30·7	31·0	31·3	30·7	31·1
Fixed carbon..... "	30·0	30·2	50·8	51·5	50·3	51·8	46·0	47·8	47·2	47·8	50·6	51·0	49·1	49·6
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	....	....	....	....	....	....	....	....	65·7	66·4
Hydrogen..... "	....	....	....	....	....	....	....	....	....	....	....	....	4·3	4·3
Ash..... "	....	....	....	....	....	....	....	....	....	....	....	....	19·2	19·3
Sulphur..... "	....	....	7·9	8·0	6·5	6·7	5·8	6·0	6·1	6·2	7·1	7·1	7·5	7·5
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	....	....	0·8	0·8
Oxygen..... "	....	....	....	....	....	....	....	....	....	....	....	....	2·5	1·7
Calorific Value—														
Calories per gramme, gross.....	....	....	6,930	7,025	....	....	....	....	6,460	6,535	6,840	6,900	6,725	6,790
B.T.U. per pound, gross..	....	....	12,480	12,640	....	....	....	....	11,630	11,760	12,310	12,420	12,100	12,230
Fuel ratio.....	0·44		1·65		1·65		1·55		1·55		1·65		1·60	

Coking properties	Very small silvery button	Fair	Good	Good	Good	Good	Good
Softening temperature of ash °F.	....	2000	2000	2010	1970	1960	2010
Apparent specific gravity	1·08	....	....	....	....	....	1·47
Weight per cubic foot, pounds	....	....	....	....	....	....	53·5
Screen Analysis—							
On 4″ round per cent	....	....	....	....	....	....	3·3
3″ to 4″ " "	....	....	....	....	....	....	5·2
2″ to 3″ " "	....	....	....	....	....	....	15·4
1½″ to 2″ " "	....	....	....	....	....	....	16·8
1″ to 1½″ " "	....	....	....	....	....	....	21·2
¾″ to 1″ " "	....	....	....	....	....	....	12·7
½″ to ¾″ " "	....	....	....	....	....	....	10·0
¼″ square to ½″ round "	....	....	....	....	....	....	5·8
⅛″ to ¼″ square "	....	....	....	....	....	....	3·8
Per ⅛″ square "	....	....	....	....	....	....	5·8
Designation of coal	....	Bituminous No. 2 slack.	Run-of-mine	Slack	Lump		
Kind of sample	Mine	Commercial; 200 tons.	Commercial; carload				Commercial; 1 ton
Taken by	Private individual.	Departmental employees.	Plant employees		Departmental employees		Fuel inspector, Canadian National Railways.
Date of sampling	Before 1922	October, 1934	June, 1935		Delivered, August, 1935.	Delivered, November, 1935.	Autumn of 1934.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

QUEBEC, ONTARIO, AND SASKATCHEWAN

—	Peat Samples							Coal from six miles south of Assiniboia, Saskatchewan, sec. 10, tp. 7, R. 30 W. 2 mer.
	Bog at Waterville, Que.	Bog previously operated by Department of Mines, Alfred, Ont.	Bog of Stewart Bros., Morewood, Ont.	Caledon Turf (or Peat) Company; bog between Brampton and Orangeville, Ont., on highway No. 7	Gads Hill Peat Works; 8 miles northwest of Stratford, Ont.	Bog of W. B. Brewer, Timmins, Ont.		
Sample No.	14951	14952	14881	14882 14883	14885	14461	14476	13340
Moisture condition	R* D	R D	R D	R D	R D	PAD** D	PAD** D	R D
Proximate Analysis—								
Moisture.....per cent	10·6	17·2	18·9	17·4	13·8	12·3	17·5	43·8 .....
Ash..... "	3·7 4·1	6·7 8·1	3·4 4·2	3·8 4·6	10·5 12·2	4·9 5·7	5·8 7·0	6·6 11·8
Volatile matter..... "	60·1 67·3	53·3 64·4	53·6 66·1	53·9 65·2	53·5 62·1	58·1 66·2	54·2 65·8	23·6 42·0
Fixed carbon..... "	25·6 28·6	22·8 27·5	24·1 29·7	24·9 30·2	22·2 25·7	24·7 28·1	22·5 27·2	26·0 46·2
Ultimate Analysis—								
Sulphur.....per cent	0·2 0·2	0·2 0·2	0·7 0·9	0·2 0·3	0·2 0·2	0·2 0·2	0·2 0·2	0·4 0·7
Nitrogen..... "	1·6 1·8	....	1·9 2·4	2·5 3·1	0·9 1·1	2·0 2·3	....	....
Calorific Value—								
Calories per gramme, gross.....	5,170 5,785	4,405 5,320	4,415 5,445	4,545 5,500	4,740 5,500	4,510 5,140	4,265 5,175	3,235 5,745
B.T.U. per pound, gross.....	9,310 10,410	7,930 9,590	7,950 9,800	8,180 9,900	8,530 9,900	8,120 9,250	7,680 9,310	5,820 10,350
Fuel ratio.....	0·42	0·43	0·45	0·47	0·41	0·42	0·41	1·10
Softening temperature of ash....°F.....		2770	.....	.....	2720	2460	2460	.....
Apparent specific gravity.....	0 49	0 68	0·49	0·57	1·02	.....	0·53	.....

Location in deposit	8 to 10 feet from surface; below peat moss.	Trench south of office building, apparently dug in 1935.					
Taken by	Employee of Mines Branch					Bog operator	Private individual.
Date of sampling	Aug. 23, 1935	Sept., 1935	Summer of 1935				July, 1934

*See note in introduction.

**Partly air-dried indoors, for 13 and 11 days, respectively; original moisture contents 88·5 per cent and 77·4 per cent.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA

—	Coals from at or near East Coulee, Drumheller area											
	East Coulee seam, sec. 28, tp. 27, R. 18 W. 4 mer.				Drumheller seam, sec. 29, tp. 27, R. 18 W. 4 mer.		East Coulee seam, sec. 32, tp. 27, R. 18 W. 4 mer.				Drumheller No. 1, lower seam, sec. 7, tp. 28, R. 18 W. 4 mer.	
Sample No.	13865		13887		13833		13893		13888		13841	
Moisture condition	PAD*	D	PAD*	D	PAD**	D	PAD*	D	PAD*	D	PAD**	D
Proximate Analysis—												
Moisture.....per cent	19·6	....	19·0	....	19·7	....	18·6	....	18·7	....	18·6	....
Ash..... "	6·9	8·5	6·8	8·4	7·0	8·7	7·0	8·6	6·8	8·4	6·8	8·3
Volatile matter..... "	30·0	37·3	30·4	37·5	29·5	36·7	30·2	37·1	30·2	37·1	30·9	38·0
Fixed carbon..... "	43·5	54·2	43·8	54·1	43·8	54·6	44·2	54·3	44·3	54·5	43·7	53·7
Ultimate Analysis—												
Sulphur.....per cent	0·6	0·8	0·5	0·7	0·5	0·6	0·5	0·6	0·4	0·5	0·5	0·6
Calorific Value—												
Calories per gramme, gross.....	5,250	6,535	5,290	6,535	5,215	6,495	5,310	6,525	5,275	6,490	5,410	6,650
B.T.U. per pound, gross.....	9,450	11,760	9,520	11,760	9,930	11,690	9,560	11,750	9,500	11,690	9,740	11,970
Fuel ratio.....	1·45		1·45		1·50		1·45		1·45		1·40	
Softening temperature of ash.....°F.	2050		1910		2000		1900		1960		1925	
Moisture in coal as sampled.....per cent	21·9		21·6		22·6		20·4		21·1		20·2	

"Mineral Matter" (M.M.)—free basis

Moisture condition	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D
Proximate Analysis—												
Moisture.....per cent	19·6	....	20·4	....	19·9	....	20·3	....	19·4	....	18·8	....
Volatile matter..... "	32·3	40·2	32·2	40·4	31·8	39·6	31·9	40·0	32·2	40·0	33·2	41·0
Fixed carbon..... "	48·1	59·8	47·4	59·6	48·3	60·4	47·8	60·0	48·4	60·0	48·0	59·0
Calorific Value—												
B.T.U. per pound, gross.....	10,440	12,980	10,320	12,960	10,360	12,930	10,350	12,980	10,380	12,870	10,700	13,180
Designation of coal.....	Lump; over 4-inch round-hole shaker screen.....								Lump; over 6-inch round-hole shaker screen		Lump; over 2½-inch bar screen	
Kind of sample.....	Commercial.....											
	From conveyer		From delivery chute.....									
Taken by.....	Fuel inspectors of Canadian National Railways.....											
Date of sampling.....	Dec. 3, 1934		Nov. 30		Dec. 3		Nov. 30		Nov. 29		Nov. 29	

Notes *re* moisture conditions of coals:—

PAD*—Coal exposed as lumps, for 6 hours, to indoor humidity and temperature conditions, and therefore partly air-dried.

PAD**—Coal exposed crushed, in vacuo, in atmosphere of 97 per cent relative humidity, at 30°C., which condition represents partial air-drying when compared with the usual air-drying condition of 60 per cent relative humidity.

CM***—Coal containing "capacity" or "true" moisture, namely that retained at 100 per cent relative humidity and 30°C.—This moisture value is obtained, by extrapolation, from values obtained at 97 per cent and lower relative humidities. (*See also* page 2.)

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coals from the Drumheller area													
	From at or near Wayne										From at or near Rosedale			
	No. 1 seam, sec. 12, tp. 28, R. 20 W. 4 mer.		No. 1 seam, sec. 7, tp. 28, R. 19 W. 4 mer.						No. 2 seam, sec. 19, tp. 28, R. 19 W. 4 mer.		No. 1 seam, sec. 27, tp. 28, R. 19 W. 4 mer.		No. 1 seam, sec. 28, tp. 28, R. 19 W. 4 mer.	
Sample No.	13870		13847		13997		13998		13839		13843		13835†	
Moisture condition	PAD*	D	PAD*	D	PAD*	D	PAD*	D	PAD**	D	PAD**	D	PAD**	D
Proximate Analysis—														
Moisture.....per cent	17·5	....	17·2	....	18·0	....	17·5	....	18·4	....	18·6	....	18·3	....
Ash..... "	6·7	8·0	6·8	8·2	5·8	7·1	9·1	11·0	5·4	6·6	5·5	6·8	5·5	6·8
Volatile matter... "	31·7	38·5	31·5	38·0	31·4	38·2	30·5	36·9	30·0	36·7	31·1	38·2	30·2	36·9
Fixed carbon..... "	44·1	53·5	44·5	53·8	44·8	54·7	42·9	52·1	46·2	56·7	44·8	55·0	46·0	56·3
Ultimate Analysis—														
Sulphur.....per cent	0·6	0·7	0·5	0·6	0·5	0·6	0·5	0·6	0·5	0·6	0·5	0·6	0·5	0·6
Calorific Value—														
Calories per gramme, gross	5,630	6,820	5,595	6,750	5,490	6,690	5,355	6,490	5,500	6,740	5,545	6,810	5,505	6,740
B.T.U. per pound, gross...	10,130	12,280	10,070	12,150	9,880	12,050	9,640	11,680	9,900	12,130	9,980	12,260	9,910	12,130
Fuel ratio	1·40		1·40		1·45		1·40		1·55		1·45		1·50	
Softening temperature of ash.....°F.	2055		2040		Fluid at 2075		2160		1970		1950		1985	
Moisture in coal as sampled. ....per cent	18·5		18·8		18·7		18·5		21·1		19·6		19·3	

"Mineral Matter" (M.M.)—free basis

Moisture condition.....	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D
Proximate Analysis—														
Moisture.....per cent	17·7	....	18·2	....	18·9	....	18·1	....	18·6	....	19·1	....	18·4	....
Volatile matter... "	34·0	41·3	33·4	40·9	33·0	40·7	33·4	40·8	31·7	38·9	32·8	40·5	31·9	39·1
Fixed carbon..... "	48·3	58·7	48·4	59·1	48·1	59·3	48·5	59·2	49·7	61·1	48·1	59·5	49·7	60·9
Calorific Value—														
B.T.U. per pound, gross...	11,090	13,480	10,930	13,360	10,600	13,070	10,880	13,290	10,650	13,080	10,720	13,250	10,690	13,100
Designation of coal.....	Lump; over 3-inch round-hole shaker screen		Lump; over 3½-inch round-hole shaker screen		Regular lump; over 3½-inch round-hole shaker screen		Granular lump; over 3½-inch round-hole shaker screen		Lump; over 2½-inch slot shaker screen		Lump; over 4-inch round-hole shaker screen.			
Kind of sample.....	Commercial.....													
	From delivery chute.....				From picking table		From railroad cars		From mine cars		From delivery chute.....			
Taken by.....	Fuel inspectors of Canadian National Railways.....													
Date of sampling.....	November 28, 1934.....				Jan. 30, 1935....		Feb. 6, 1935....		Nov. 27, 1934...		December 1, 1934.....			

Notes *re* moisture conditions of coals—

PAD*—Coal exposed as lumps, for 6 hours, to indoor humidity and temperature conditions, and therefore partly air-dried.

PAD**—Coal exposed crushed, in vacuo, in atmosphere of 97 per cent relative humidity at 30°C., which condition represents partial air-drying when compared with the usual air-drying condition of 60 per cent relative humidity.

CM***—Coal containing "capacity" or "true" moisture, namely that retained at 100 per cent relative humidity and 30°C.—This moisture value is obtained, by extrapolation, from values obtained at 97 per cent and lower relative humidities.

†Ash sample No. 14872, the analysis of which is shown on page 131, was taken from this main sample.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coals from No. 1 seam, at or near Drumheller, Drumheller area													
	From sec. 2, tp. 29, R. 20 W. 4 mer.	From sec. 10, tp. 29, R. 20 W. 4 mer.				From sec. 9, tp. 29, R. 20 W. 4 mer.		From sec. 16, tp. 29, R. 20 W. 4 mer.		From sec. 7, tp. 29, R. 20 W. 4 mer.	
Sample No.	13789	13790		13788		13874		13894		13864		13791	
Moisture condition	PAD**	D	PAD**	D	PAD**	D	PAD*	D	PAD*	D	PAD*	D	PAD**	D
Proximate Analysis—														
Moisture.....per cent	17·7	....	17·5	....	17·5	....	17·2	....	17·4	....	16·7	....	16·8	.....
Ash..... "	5·3	6·4	6·6	8·1	5·5	6·7	7·1	8·5	7·0	8·5	7·2	8·6	5·9	7·1
Volatile matter... "	30·9	37·5	30·7	37·1	31·4	38·0	31·1	37·6	31·2	37·8	31·0	37·3	31·2	37·5
Fixed carbon..... "	46·1	56·1	45·2	54·8	45·6	55·3	44·6	53·9	44·4	53·7	45·1	54·1	46·1	55·4
Ultimate Analysis—														
Sulphur.....per cent	0·4	0·5	0·4	0·5	0·4	0·5	0·4	0·5	0·5	0·5	0·4	0·5	0·4	0·5
Calorific Value—														
Calories per gramme, gross	5,690	6,915	5,575	6,760	5,605	6,790	5,525	6,675	5,505	6,660	5,580	6,700	5,705	6,855
B. T. U. per pound, gross..	10,250	12,450	10,030	21,170	10,090	12,230	9,950	12,010	9,910	11,990	10,040	12,060	10,270	12,340
Fuel ratio	1·50		1·50		1·45		1·45		1·40		1·45		1·50	
Softening temperature of ash.....°F.	2000		2200		2020		2125		2280		2220		2030	
Moisture in coal as sampled, ...per cent	18·4		20·0		19·0		18·5		18·6		19·6		17·5	

"Mineral Matter" (M.M.)—free basis

Moisture condition.....	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D
Proximate Analysis—														
Moisture.....per cent	18·3	....	18·1	....	17·6	....	18·4	....	18·6	....	17·5	....	17·4	....
Volatile matter... "	32·4	39·7	32·7	39·9	33·2	40·3	33·1	40·5	33·1	40·7	33·2	40·2	33·0	39·9
Fixed carbon..... "	49·3	60·3	49·2	60·1	49·2	59·7	48·5	59·5	48·3	59·3	49·3	59·8	49·6	60·1
Calorific Value—														
B. T. U. per pound, gross..	10,940	13,390	10,930	13,350	10,870	13,200	10,820	13,250	10,770	13,240	10,990	13,320	11,070	13,390
Designation of coal.....	Lump; over 3½-inch round-hole shaker screen.		Lump; over 4-inch round-hole shaker screen.		Lump; over 3½-inch round-hole shaker screen.				Lump; over 4-inch round-hole shaker screen.					
Kind of sample.....	Commercial													
	From picking belt.		From picking table.		From mine cars.		From delivery chute.		From screens.		From delivery chute.		From picking table.	
Taken by.....	Fuel inspectors of Canadian National Railways													
Date of sampling.....	Nov. 15, 1934...		Nov. 13.....		Nov. 13.....		Nov. 26.....		Nov. 26.....		Nov. 27.....		Nov. 15.....	

Notes *re* moisture conditions of coals—

PAD* —Coal exposed as lumps, for 6 hours, to indoor humidity and temperature conditions, and therefore partly air-dried.

PAD**—Coal exposed crushed, in vacuo, in atmosphere of 97 per cent relative humidity at 30°C., which condition represents partial air-drying when compared with the usual air-drying condition of 60 per cent relative humidity.

CM***—Coal containing "capacity" or "true" moisture, namely, that retained at 100 per cent relative humidity and 30°C. This moisture value is obtained, by extrapolation, from values obtained at 97 per cent and lower relative humidities.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	From Three Hills, Carbon area, sec. 36, tp. 31, R. 24 W. 4 mer.		From Ardley area, sec. 29, tp. 38, R. 23 W. 4 mer.		From Round Hill, Camrose area, sec. 30, tp. 48, R. 18 W. 4 mer.		Coals from at or near Edmonton, Edmonton area			
							From sec. 30, tp. 52, R. 23 W. 4 mer.		From river lot 40, Edmonton Settlement	
Sample No	13913		13806		13968		13945		13954	
Moisture condition	PAD*	D	PAD**	D	PAD*	D	PAD*	D	PAD*	D
Proximate Analysis—										
Moisture.....per cent	16·7	....	17·7	....	26·2	....	22·8	....	23·6	....
Ash..... "	9·7	11·6	9·1	11·1	5·5	7·5	7·4	9·6	7·5	9·8
Volatile matter..... "	27·7	33·3	27·7	33·6	28·7	38·8	28·4	36·8	28·1	36·8
Fixed carbon..... "	45·9	55·1	45·5	55·3	39·6	53·7	41·4	53·6	40·8	53·4
Ultimate Analysis—										
Carbon.....per cent	....	....	....	....	51·6	70·0	....	....	....	....
Hydrogen..... "	....	....	....	....	6·3	4·5	....	....	....	....
Ash..... "	....	....	....	....	5·5	7·5	....	....	....	....
Sulphur..... "	0·4	0·5	0·3	0·3	0·4	0·6	0·3	0·4	0·4	0·5
Nitrogen..... "	....	....	....	....	1·1	1·4	....	....	....	....
Oxygen..... "	....	....	....	....	35·1	16·0	....	....	....	....
Calorific Value—										
Calories per gramme, gross	5,395	6,470	5,245	6,370	4,845	6,570	4,955	6,415	4,900	6,410
B. T. U. per pound, gross	9,710	11,650	9,440	11,470	8,720	11,820	8,920	11,550	8,820	11,540
Fuel ratio	1·65		1·65		1·40		1·45		1·45	
Softening temperature of ash.....°F.	2250		2090		2245		2045		2080	
Moisture in coal as sampled.....per cent	18·4		20·1		28·4		24·4		26·1	

"Mineral Matter" (M.M.)—free basis

Moisture condition	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D
Proximate Analysis—										
Moisture.....per cent	17·3	....	18·4	....	28·5	....	24·5	....	25·8	....
Volatile matter..... "	30·5	36·8	30·2	37·0	29·7	41·5	30·3	40·1	29·8	40·1
Fixed carbon..... "	52·2	63·2	51·4	63·0	41·8	58·5	45·2	59·9	44·4	59·9
Calorific Value—										
B. T. U. per pound, gross	11,050	13,360	10,650	13,060	9,220	12,890	9,750	12,910	9,600	12,940
Designation of coal	Lump; over 6-inch bar screen.		Lump; over 4-inch bar screen.		Lump; over 2½-inch bar screen.		Lump; over 4-inch round-hole shaker screen.		Lump; over 3-inch bar screen.	
Kind of sample	Commercial									
	From delivery chute.		From delivery chute.		From delivery chute.		From screens and picking table.		From picking table.	
Taken by	Fuel inspectors of Canadian National Railways									
Date of sampling	Dec. 4, 1934		Dec. 4, 1934		Jan. 25, 1935		Jan. 21, 1935		Jan. 23	

Notes *re* moisture conditions of coals—

PAD* —Coal exposed as lumps, for 6 hours, to indoor humidity and temperature conditions, and therefore partly air-dried.

PAD**—Coal exposed crushed, in vacuo, in atmosphere of 97 per cent relative humidity at 30°C., which condition represents partial air-drying when compared with the usual air-drying condition of 60 per cent relative humidity.

CM***—Coal containing "capacity" or "true" moisture, namely, that retained at 100 per cent relative humidity and 30°C. This moisture value is obtained, by extrapolation, from values obtained at 97 per cent and lower relative humidities.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coals from at or near Clover Bar, Edmonton area, tp. 53, R. 23 W. 4 mer.								From Pembina area	
	From section 8				From section 7		From section 17		From Evansburg, sec. 30., tp. 53, R. 7 W. 5 mer.	
Sample No.	13930		14048		13927†		13939		13928	
Moisture condition	PAD*	D	PAD*	D	PAD*	D	PAD*	D	PAD*	D
Proximate Analysis—										
Moisture.....per cent	23·1	....	24·0	....	23·1	....	23·4	....	17·8	....
Ash..... "	7·1	9·2	6·9	9·1	5·7	7·4	7·4	9·6	6·6	8·1
Volatile matter..... "	29·0	37·7	28·4	37·4	28·4	36·9	28·6	37·4	28·2	34·2
Fixed carbon..... "	40·8	53·1	40·7	53·5	42·8	55·7	40·6	53·0	47·4	57·7
Ultimate Analysis—										
Sulphur.....per cent	0·4	0·5	0·4	0·5	0·4	0·5	0·4	0·5	0·2	0·2
Calorific Value—										
Calories per gramme, gross.....	4,945	6,430	4,905	6,455	5,020	6,530	4,880	6,365	5,470	6,650
B.T.U. per pound, gross.....	8,900	11,570	8,830	11,620	9,040	11,750	8,780	11,460	9,840	11,970
Fuel ratio.....	1·40		1·45		1·50		1·40		1·70	
Softening temperature of ash.....°F.	2110		2100		2090		2235		2080	
Moisture in coal as sampled.....per cent	25·1		26·2		26·0		26·8		19·6	

"Mineral Matter" (M.M.)—free basis

Moisture condition	CM***	D	CM***	D	CM***	D	CM***	D	CM***	D
Proximate Analysis—										
Moisture.....per cent	24·8	....	25·1	....	25·3	....	25·1	....	18·7	....
Volatile matter..... "	30·8	41·0	30·3	40·5	29·4	39·4	30·5	40·7	29·8	36·7
Fixed carbon..... "	44·4	59·0	44·6	59·5	45·3	60·6	44·4	59·3	51·5	63·3
Calorific Value—										
B.T.U. per pound, gross	9,680	12,870	9,680	12,920	9,560	12,800	9,600	12,810	10,680	13,140
Designation of coal	Lump; over 4-inch round-hole shaker screen.		Lump.....		Lump; over 4-inch round-hole shaker screen.				Lump; over 6-inch round-hole shaker screen.	
Kind of sample	Commercial.....									
	From loading boom.....				From loading boom.		From delivery chute.		From delivery chute.	
Taken by	Fuel inspectors of Canadian National Railways.....									
Date of sampling	Jan. 15, 1935....		About Mar. 11..		Jan. 15.....		Jan. 16.....		Jan. 2.....	

Notes *re* moisture conditions of coals—

PAD*—Coal exposed as lumps, for 6 hours, to indoor humidity and temperature conditions, and therefore partly air-dried.

CM***—Coal containing "capacity" or "true" moisture, namely that retained at 100 per cent relative humidity and 30°C.—This moisture value is obtained, by extrapolation, from values obtained at 97 per cent and lower relative humidities.

†Ash sample No. 15247, the analysis of which is shown on page 131, was taken from this main sample.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	From 20-foot seam at a depth of 2,900 feet in New Valley well, Turner Valley, sec. 6, tp. 20, R. 2 W. 5 mer.		Bighorn and Saunders Creek Collieries, Limited, Saunders, Saunders area, sec. 24, tp. 40, R. 13 W. 5 mer.		Alexo Coal Company, Limited, Alexo, Saunders area, sec. 27, tp. 40, R. 13 W. 5 mer.			
Sample No	15255		13969		13977*		15028	
Moisture condition	R	D	R	D	R	D	R	D
Proximate Analysis								
Moisture.....per cent	2·6	....	10·4	....	10·1	....	8·8	....
Ash..... "	3·0	3·1	6·7	7·5	6·0	6·7	8·0	8·8
Volatile matter..... "	36·3	37·3	33·6	37·5	33·8	37·6	33·8	37·1
Fixed carbon..... "	58·1	59·6	49·3	55·0	50·1	55·7	49·4	54·1
Ultimate Analysis—								
Carbon.....per cent	....	....	....	....	....	....	65·9	72·2
Hydrogen..... "	....	....	....	....	....	....	5·0	4·4
Ash..... "	....	....	....	....	....	....	8·0	8·8
Sulphur..... "	0·6	0·6	0·4	0·5	0·3	0·3	0·3	0·3
Nitrogen..... "	....	....	....	....	....	....	1·0	1·1
Oxygen..... "	....	....	....	....	....	....	19·8	13·2
Calorific Value—								
Calories per gramme, gross	7,735	7,940	6,285	7,010	6,450	7,180	6,245	6,845
B.T.U. per pound, gross	13,930	14,290	11,310	12,620	11,610	12,920	11,250	12,330
Fuel ratio	1·60		1·45		1·50		1·45	
Coking properties	Good		Agglomerate		Agglomerate		Weak agglomerate	

Softening temperature of ash.....°F.	....	Fluid at 2325	2150	2255
Weight per cubic foot.....pounds	....	....	....	49·5
Screen Analysis—				
On 4″ round.....per cent	....	....	....	23·9
3″ to 4″ " ..... "	....	....	....	14·5
2″ to 3″ " ..... "	....	....	....	17·4
1½″ to 2″ " ..... "	....	....	....	8·7
1″ to 1½″ " ..... "	....	....	....	10·8
¾″ to 1″ " ..... "	....	....	....	7·6
½″ to ¾″ " ..... "	....	....	....	8·8
Per ½″..... "	....	....	....	8·3
Designation of coal.....	.....	Lump; over 2- by 10-inch pear-shaped shaker screen.		"Alexo Empire Lump". Through 8- by 18-inch, over 3- by 12-inch.
Kind of sample.....	Prospect.....	Commercial..... From delivery chute.....		Commercial; 1 ton.
Taken by.....	Operator of well.	Fuel inspector, Canadian National Railways.		Ottawa dealer.
Date of sampling.....	Jan., 1936.....	Jan. 9, 1935.....	Jan. 8, 1935.....	Oct., 1935.....

*Ash sample No. 14946, the analysis of which is shown on page 132, was taken from this main sample.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Concluded

—	Foothills Collieries, Limited, Foothills, Coalspur area, sec. 24, tp. 47, R. 20 W. 5 mer., Val d'Or seam		McLeod River Hard Coal Company, Limited, Mercoal, Coalspur area, sec. 24, tp. 48, R. 22 W. 5 mer., Val d'Or seam		Lakeside Coals Limited, Robb, Coalspur area, "Lakeside No. 2" mine, Val d'Or seam		Bryan Coal Company, Limited, Robb, sec. 12, tp. 49, R. 21 W. 5 mer., Val d'Or seam		Jasper Coal Company, Limited, Drinnan, Prairie Creek area, sec. 19, tp. 51, R. 24 W. 5 mer., Silkstone seam		Canmore Coal Company, Limited, Canmore, Cascade area, sec. 29, tp. 24, R. 10 W. 5 mer.	
Sample No.	13919		13924		13929		13921		13914		13803	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	8·6	....	9·3	....	10·5	....	10·6	....	9·2	....	0·6	....
Ash..... "	8·4	9·2	8·3	9·1	10·2	11·4	9·9	11·1	8·1	8·9	9·8	9·9
Volatile matter..... "	34·3	37·5	35·1	38·7	33·6	37·5	34·0	38·0	35·5	39·1	18·6	18·7
Fixed carbon..... "	48·7	53·3	47·3	52·2	45·7	51·1	45·5	50·9	47·2	52·0	71·0	71·4
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	....	....	....	....	66·4	73·2	81·1	81·6
Hydrogen..... "	....	....	....	....	....	....	....	....	5·4	4·8	4·4	4·4
Ash..... "	....	....	....	....	....	....	....	....	8·1	8·9	9·8	9·9
Sulphur..... "	0·2	0·2	0·2	0·2	0·2	0·2	0·1	0·2	0·3	0·3	0·9	0·9
Nitrogen..... "	....	....	....	....	....	....	....	....	0·9	1·0	1·6	1·6
Oxygen..... "	....	....	....	....	....	....	....	....	18·9	11·8	2·2	1·6
Calorific Value—												
Calories per gramme, gross.....	6,180	6,760	6,250	6,890	5,770	6,450	5,845	6,540	6,370	7,015	7,810	7,860
B.T.U. per pound, gross.....	11,120	12,160	11,250	12,410	10,390	11,610	10,520	11,770	11,460	12,630	14,050	14,140
Fuel ratio.....	1·40		1·35		1·35		1·35		1·35		3·85	
Coking properties.....	Agglomerate		Agglomerate		Non-coking		Agglomerate		Agglomerate		Agglomerate	

Softening temperature of ash.....°F.	2130	2130	2170	2170	2120	2750
Designation of coal.....	Lump; over 4-inch round-hole shaker screen.		Lump; over 2-inch round-hole shaker screen.	Lump; over 6-inch round-hole shaker screen.	Lump; over 4-inch round-hole shaker screen.	Briquettes.....
Kind of sample.....	Commercial.....					Commercial; 1 ton.
	From delivery chute.	From mine cars.	From delivery chute.	From delivery chute.	From loading boom.	
Taken by.....	Fuel inspector, Canadian National Railways.....					Ottawa dealer.
Date of sampling.....	Dec. 19, 1934....	Dec. 17.....	Dec. 21.....	Dec. 21.....	Dec. 21, 1934....	May, 1934.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA

—	The Crow's Nest Pass Coal Company, Limited, Fernie, Crowsnest Pass area													
	Michel colliery, Michel												Coal Creek colliery, Coal Creek, No. 1 east mine	
	B seam				No. 1 seam				No. 3 seam					
Sample No.	13737**		13734*		13739**		13736*		13738**		13735*		13328	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	0·9	....	1·0	....	0·8	....	0·8	....	1·0	....	0·9	....	0·8	....
Ash..... "	13·4	13·5	7·9	8·0	17·0	17·2	11·1	11·2	14·1	14·2	9·6	9·7	8·8	8·8
Volatile matter... "	26·0	26·2	27·2	27·5	23·2	23·3	24·4	24·6	22·7	23·0	23·4	23·6	25·6	25·8
Fixed carbon..... "	59·7	60·3	63·9	64·5	59·0	59·5	63·7	64·2	62·2	62·8	66·1	66·7	64·8	65·4
Ultimate Analysis—														
Sulphur.....per cent	....	....	....	....	....	....	....	....	....	....	....	....	0·4	0·4
Calorific Value—														
Calories per gramme, gross	....	....	....	....	....	....	....	....	....	....	....	....	7,900	7,965
B.T.U. per pound, gross...	....	....	....	....	....	....	....	....	....	....	....	....	14,220	14,340
Fuel ratio.....	2·30		2·35		2·55		2·60		2·75		2·85		2·55	
Coking properties.....	Good		Good		Good		Good		Good		Good		Good	

Softening temperature of ash.....°F.	2195	2280	2700+	3000+	2780	2760	....
Designation of coal.....	Slack.....	Slack, cleaned..	Slack.....	Slack, cleaned..	Slack.....	Slack, cleaned..	Slack.....
Taken by.....	Mine operators.....						
Date of sampling.....	Autumn of 1934.....						July, 1934.....

* Analyses of cokes made from these coals, namely, samples Nos. 13731, 13733, and 13732, are to be found on page 61 of this report.

**Analysis of ash on page 133.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Concluded

—	Lake Kathlyn Anthracite Coal Company, Limited, Lake Kathlyn (Glacier Gulch), via Smithers		Bulkley Valley Coal Mining Company, F. M. Dockrill, Telkwa		Vancouver Island Coals, Limited					
					Western Fuel Corporation of Canada, Limited, Reserve and No. 1 mines, Nanaimo, Nanaimo area		Canadian Collieries (Dunsmuir), Limited, Cumberland			
							Nanaimo-Wellington coal, Nanaimo area		Comox No. 5 coal, Comox area	
Sample No.	13765		14046		14052		14413		14414	
Moisture condition	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—										
Moisture.....per cent	9·6	....	3·6	....	3·1	....	2·6	....	1·5	....
Ash..... "	12·0	13·3	11·3	11·7	12·8	13·2	11·3	11·5	11·3	11·5
Volatile matter..... "	4·1	4·5	27·4	28·4	39·4	40·7	39·3	40·4	32·7	33·2
Fixed carbon..... "	74·3	82·2	57·7	59·9	44·7	46·1	46·8	48·1	54·5	55·3
Ultimate Analysis—										
Carbon.....per cent	76·4	84·5	73·7	76·5	68·3	70·5	....	....	....	....
Hydrogen..... "	1·4	0·4	4·7	4·5	5·2	4·9	....	....	....	....
Ash..... "	12·0	13·3	11·3	11·7	12·8	13·2	....	....	....	....
Sulphur..... "	0·8	0·8	0·8	0·8	1·3	1·4	....	....	....	....
Nitrogen..... "	0·2	0·2	1·1	1·2	1·4	1·4	....	....	....	....
Oxygen..... "	9·2	0·8	8·4	5·3	11·0	8·6	....	....	....	....
Calorific Value—										
Calories per gramme, gross.....	6,025	6,665	7,100	7,360	6,770	6,990	....	....	....	....
B.T.U. per pound, gross.....	10,840	11,990	12,780	13,250	12,190	12,580	....	....	....	....
Fuel ratio.....	18·25		2·10		1·15		1·20		1·65	
Coking properties.....	Non-coking		Fair		Fair		Fair		Good	

Softening temperature of ash.....°F.	2160	2390	2180	2135	2165
Apparent specific gravity.....	1·74	1·39	1·35	....	....
Weight per cubic foot.....pounds	....	47·6	51·9	....	....
Screen Analysis—					
On 4″ round.....per cent	....	61·7	26·5	....	....
3″ to 4″ " ..... "	....	15·6	15·2	....	....
2″ to 3″ " ..... "	....	12·6	20·1	....	....
1½″ to 2″ " ..... "	....	3·5	10·4	....	....
1″ to 1½″ " ..... "	....	2·0	9·2	....	....
¾″ to 1″ " ..... "	....	0·7	4·7	....	....
½″ to ¾″ " ..... "	....	0·6	4·3	....	....
¼″ square to ½″ round..... "	....	0·6	3·1	....	....
⅛″ to ¼″ square..... "	....	0·6	2·4	....	....
Per ⅛″ square..... "	....	2·1	4·1	....	....
Designation of coal.....	.....	Lump.....		.....	
Kind of sample.....	Mine.....	Commercial; 1 ton.....		Commercial.....	
Location in mine.....	Point where main tunnel (from foot of cliff) strikes coal seam.	Bulkley Valley seam.		.....	
Taken by.....	F. A. Kerr, Geological Survey.	Fuel inspector, Canadian National Railways.		Mine operators.....	
Date of sampling.....	Season of 1934	Autumn of 1934.....		June, 1935.....	

TABLE I—Concluded

Analyses of Solid Fuels Occurring in Canada—Concluded

YUKON TERRITORY

—	Tantalus Butte mine													
Sample No.	13717		13718		13719		13720		13721		13722		13723	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	5·4	....	4·5	....	3·7	....	5·6	....	4·2	....	4·4	....	4·4	....
Ash..... "	10·5	11·1	11·5	12·0	9·1	9·5	11·3	12·0	10·0	10·5	11·5	12·0	10·0	10·5
Volatile matter... "	30·7	32·5	30·9	32·4	32·9	34·2	33·7	35·7	32·8	34·2	32·9	34·4	33·4	34·9
Fixed carbon..... "	53·4	56·4	53·1	55·6	54·3	56·3	49·4	52·3	53·0	55·3	51·2	53·6	52·2	54·6
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	....	....	....	....	....	....	69·5	72·8	....	....
Hydrogen..... "	....	....	....	....	....	....	....	....	....	....	4·7	4·4	....	....
Ash..... "	....	....	....	....	....	....	....	....	....	....	11·5	12·0	....	....
Sulphur..... "	0·4	0·4	0·3	0·4	0·4	0·4	0·3	0·4	0·3	0·4	0·4	0·4	0·4	0·4
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	1·0	1·0	....	....
Oxygen..... "	....	....	....	....	....	....	....	....	....	....	12·9	9·4	....	....
Calorific Value—														
Calories per gramme, gross	6,625	7,005	6,660	6,975	6,935	7,200	6,580	6,970	6,805	7,110	6,670	6,975	6,810	7,120
B.T.U. per pound, gross...	11,930	12,610	11,990	12,550	12,480	12,960	11,840	12,550	12,250	12,800	12,000	12,560	12,260	12,820
Fuel ratio	1·75		1·70		1·65		1·45		1·60		1·55		1·55	
Coking properties	Agglomerate		Agglomerate		Agglomerate		Agglomerate		Agglomerate		Agglomerate		Agglomerate	
Softening temperature of ash.....°F	....		....		....		....		2290		2280		2295	

Designation of coal					Hand-screened slack.	
Kind of sample	Mine				Commercial; 5 tons.	Commercial; last 5 tons mined in 1934.
Location in mine	9-foot 4-inch seam; face exposed 1 year.	8-foot 6-inch seam; face exposed 45 days.	8-foot seam; face of main tunnel: face exposed 40 days.	9-foot seam; freshly broken face.		
Taken by	Private individual, Tantalus Butte, for H. S. Bostock, Geological Survey					
Date of sampling	July 11, 1934.					

TABLE II

Analyses of Coal Samples Submitted by the Department of Pensions and National Health

DESCRIBED AS "DOMINION", SYDNEY AREA, NOVA SCOTIA COAL

—	Slack; delivered to Camp Hill hospital, Halifax, N.S.														
Sample No.	13295	13545	13727	13775	13846	13923	13992	13993	14145	14260	14391	14481	14728	14897	15025	15054
Moisture (as received) ..... per cent	2·8	3·2	3·5	5·7	6·9	5·5	4·6	3·7	4·0	4·1	3·5	8·1	4·6	3·3	5·0	5·3
Dry Basis—																
Ash ..... per cent	6·8	9·1	8·2	9·7	8·5	10·0	7·7	10·0	8·8	9·6	10·2	10·7	9·1	7·5	7·6	8·7
Volatile matter ..... "	34·0	33·5	33·0	32·4	33·1	32·6	33·7	32·2	33·4	32·2	33·2	32·9	33·7	33·2	34·5	32·6
Fixed carbon ..... "	59·2	57·4	58·8	57·9	58·4	57·4	58·6	57·8	57·8	58·2	56·6	56·4	57·2	59·3	57·9	58·7
Sulphur ..... per cent	2·2	2·4	2·2	3·1	3·0	3·0	2·5	3·0	2·7	3·2	2·9	2·7	2·9	3·5	2·7	3·2
Calories per gramme, gross	7,850	7,675	7,740	7,710	7,750	7,620	7,840	7,595	7,705	7,610	7,605	7,410	7,635	7,870	7,755	7,635
B.T.U. per pound, gross	14,130	13,820	13,930	13,880	13,950	13,710	14,120	13,670	13,870	13,700	13,690	13,340	13,750	14,170	13,960	13,740
Softening temperature of ash ..... °F	1960	2060	2110	2050	2015	2020	2060	2050	2040	2050	2015	2040	2060	2030	2040	2020
Number of tons represented by sample	42	35	71	148	160	232	81	56	212	125	100	50	25	50	107	35
Date of delivery	June 7, 1934	Aug. 29 -31	Oct. 18 -25	Nov. 9 -28	Dec. 15 -27, 1934	Jan. 4 -29, 1935	Feb. 1 -13	Feb. 23	Mar. 7 -23	April 2 -12	May 3 -23	June 14 -22	July 12	Aug. 2 -29	Oct. 6 -14	Oct. 28

—	Slack															
	Delivered to Camp Hill hospital				Delivered to hospital at Ste. Anne de Bellevue, Que.											
Sample No.	15121	15195	15292	15354	13540	13546	13564	13594	13640	13712	13749	13837	13920	13849	13967	14082	14406
Moisture (as received) ..... per cent	5·3	4·5	4·4	4·2	3·8	4·4	3·1	5·2	4·5	3·8	2·9	3·8	4·1	3·6	3·9	3·2	2·7
Dry Basis—																	
Ash ..... per cent	8·8	7·4	9·7	7·6	8·7	8·7	8·7	9·1	9·4	9·2	8·8	8·6	9·3	9·2	9·6	8·5	11·1
Volatile matter ..... "	32·3	34·3	32·8	34·0	32·7	33·3	33·0	32·3	32·8	33·3	33·5	33·0	33·2	32·6	32·4	33·7	31·9
Fixed carbon ..... "	58·9	58·3	57·5	58·4	58·6	58·0	58·3	58·6	57·8	57·5	57·7	58·4	57·5	58·2	58·0	57·8	57·0
Sulphur ..... per cent	3·2	2·1	3·2	2·7	3·3	3·3	3·0	3·4	3·1	3·3	3·3	3·3	3·0	3·4	3·2	3·0	3·1
Calories per gramme, gross	7,645	7,860	7,570	7,785	7,765	7,765	7,770	7,720	7,650	7,750	7,805	7,785	7,700	7,675	7,680	7,720	7,465
B.T.U. per pound, gross	13,760	14,150	13,630	14,020	13,980	13,980	13,990	13,890	13,770	13,950	14,050	14,010	13,860	13,820	13,830	13,900	13,440
Softening temperature of ash ..... °F	2050	2030	2040	2070	1920	2045	2100	2090	2100	2055	2140	1985	2010	1965	2100	2025	1990
Number of tons represented by sample	154	168	237	223	380	386	397	381	374	356	385	381	358	428	401	100	389
Date of delivery	Nov. 6 -28, 1935	Dec. 11 -30, 1935	Jan. 6 -27, 1936	Feb. 4 -28, 1936	Aug. 1 -15, 1934	Aug. 18 -Sept. 1	Aug. 3 -17	Sept. 15 -30	Oct. 8 -20	Oct. 15 -29	Nov. 7 -21	Dec. 1 -10	Dec. 12 -20	Dec. 21 -26, 1934	Feb. 1 -15, 1935	Feb. 18	May 22 -June 5

TABLE II—Continued

Analyses of Coal Samples Submitted by the Department of Pensions and National Health—Continued

DESCRIBED AS "DOMINION", SYDNEY AREA, NOVA SCOTIA COAL

	Slack; delivered to hospital at Ste. Anne de Bellevue, Que.													
Sample No.	14575	14576	14876	14878	14879	14922	14938	15019	15020	15098	15214	15215	15272 15293	15273 15294
Moisture (as received) ..per cent	4·2	4·5	3·8	2·5	4·8	4·4	3·8	3·7	4·4	4·9	3·7	3·1	10·1	9·6
Dry Basis—														
Ash ..per cent	8·4	8·4	9·8	8·8	9·3	10·1	8·5	9·5	8·7	7·6	8·0	8·5	10·9	10·2
Volatile matter .. "	33·1	32·8	32·1	32·9	32·8	33·0	32·8	32·9	33·8	35·9	33·2	33·3	32·8	32·9
Fixed carbon .. "	58·5	58·8	58·1	58·3	57·9	56·9	58·7	57·6	57·5	56·5	58·8	58·2	56·3	56·9
Sulphur ..per cent	3·2	3·3	3·1	3·0	3·1	3·1	3·1	3·1	3·1	2·2	3·0	3·0	3·4	3·2
Calories per gramme, gross	7,700	7,730	7,550	7,685	7,630	7,640	7,760	7,645	7,735	7,705	7,800	7,740	7,520	7,580
B.T.U. per pound, gross	13,860	13,910	13,590	13,840	13,740	13,760	13,970	13,770	13,930	13,870	14,050	13,930	13,530	13,640
Softening temperature of ash ..°F	2060	2070	2040	2030	2040	2045	2030	2030	2025	2020	2020	2010	2030	2020
Number of tons represented by sample	403	387	399	97	374	375	380	399	406	347	461	419	404	138
Date of delivery	June 15 -30, 1935	June 30 -July 11	July 15 -27	July 29 -30	Aug. 6 -17	Aug. 30 -Sept. 14	Sept.14 -20	Sept.25 -Oct.17	Oct. 14 -22	Nov. 1 -18	Dec. 1 --15	Dec.16 1935- Jan. 3, 1936	Jan. 13 -22	Jan. 20 -27

	2-inch nut slack; delivered to Christie Street hospital, Toronto, Ont.															
Sample No.	13770	13834	13850	13926 14144	14002	14051	14147	14357	14447	14923	15018	15064	15140	15245	15276	15310	15379
Moisture (as received) .....per cent	5·5	5·7	6·9	9·0	5·0	6·8	7·5	11·7	4·9	6·8	3·4	6·5	8·8	10·4	9·2	9·9	8·9
Dry Basis—																	
Ash .....per cent	8·7	9·4	9·4	10·3	8·6	8·5	9·1	9·3	8·6	8·5	9·6	8·2	8·9	9·4	9·2	8·9	9·8
Volatile matter ..... "	32·8	33·8	33·4	32·7	34·1	32·4	32·6	33·5	33·9	33·6	32·3	32·9	31·5	31·2	32·7	32·2	32·2
Fixed carbon ..... "	58·5	56·8	57·2	57·0	57·3	59·1	58·3	57·2	57·5	57·9	58·1	58·9	59·6	59·4	58·1	58·9	58·0
Sulphur .....per cent	3·3	2·9	2·9	2·9	2·9	3·4	2·9	2·8	2·7	2·8	3·6	3·6	3·2	3·3	3·6	3·5	3·4
Calories per gramme, gross	7,800	7,680	7,715	7,560	7,700	7,650	7,610	7,540	7,670	7,750	7,635	7,815	7,535	7,560	7,480	7,520	7,550
B.T.U. per pound, gross	14,040	13,740	13,890	13,600	13,860	13,770	13,700	13,580	13,810	13,940	13,750	14,070	13,560	13,620	13,470	13,530	13,590
Softening temperature of ash .....°F	2060	2040	1980	2010	2030	2050	2055	2000	1990	2065	2040	2030	2020	2060	2050	2000	2030
Number of tons represented by sample	530	430	420	540	480	470	485	172	420	293	475	550	437	510	574	450	510
Date of delivery	Nov. 2 -5, 1934	Dec. 6	Dec. 26, 1934	Jan. 21, 1935	Feb. 12	Mar. 5	Mar. 28	May 29	June 26	Sept.17	Oct. 17	Nov. 20	Dec. 12	Dec.30, 1935- Jan. 3, 1936	Jan. 24	Feb. 18	Mar. 13

TABLE II—Continued

Analyses of Coal Samples Submitted by the Department of Pensions and National Health—Continued

—	Described as run-of-mine coal from Newcastle Coal Co., Ltd., Newcastle Bridge, Minto area, N.B.						Described as run-of-mine coal from Welton and Henderson, Ltd., Minto, Minto area				Described as "Coal Creek" slack from the Crowsnest Pass area, B.C.; delivered to Deer Lodge hospital, Winnipeg, Man.							
	Delivered to Lancaster hospital, St. John, N.B.																	
Sample No.	14408	14634	15011	15102 15159	15246	15300 15320	13840	13889	14001	14081	13750	13848	13940	14148	14926	15052	15286	15351
Moisture (as received) ....per cent	1·8	3·6	2·3	5·2	2·0	4·5	1·4	3·2	2·9	2·5	1·9	3·1	1·8	2·0	2·0	1·6	2·6	2·8
Dry Basis—																		
Ash....per cent	16·6	18·8	15·9	18·1	14·9	19·8	21·9	21·9	22·8	21·1	8·2	9·4	8·3	8·7	10·9	10·3	8·1	11·0
Volatile matter.... "	31·8	31·5	32·4	32·0	32·7	31·0	30·2	30·8	30·2	30·5	26·0	25·2	25·9	25·8	26·0	26·5	26·8	26·4
Fixed carbon.... "	51·6	49·7	51·7	49·9	52·4	49·2	47·9	47·3	47·0	48·4	65·8	65·4	65·8	65·5	63·1	63·2	65·1	62·6
Sulphur....per cent	6·7	7·1	6·4	7·4	7·0	7·3	6·3	6·2	7·2	6·4	0·4	0·3	0·3	0·4	0·4	0·3	0·4	0·4
Calories per gramme, gross.	6,890	6,730	7,125	6,900	7,135	6,685	6,595	6,620	6,445	6,640	7,950	7,970	8,110	7,975	7,800	7,860	8,000	7,820
B.T.U. per pound, gross....	12,400	12,120	12,830	12,420	12,840	12,030	11,870	11,910	11,600	11,950	14,310	14,350	14,600	14,360	14,050	14,150	14,400	14,080
Softening temperature of ash....°F.	1950	2000	1990	2005	2020	2010	2010	2015	2050	2000	2125	2370	2420	2415	2430	2380	2400	2300
Number of tons represented by sample....	34	44	48	46	51	53	48	50	47	50	144	146	150	156	97	146	155	143
Date of sampling....	June 7, 1935	July 31	Oct. 16	Dec. 2, 1935	Jan. 8, 1936	Feb. 6, 1936	Dec. 23, 1934	Jan. 15, 1935	Feb. 26	Mar. 21, 1935	Oct. 31-Nov. 2, 1934	Dec. 28-31, 1934	Feb. 1-9, 1935	Mar. 1-31	Sept. 6-11	Oct. 29-30, 1935	Jan. 27-29, 1936	Feb. 26-29

TABLE II—Concluded

Analyses of Coal Samples Submitted by the Department of Pensions and National Health—Concluded

—	Described as "Yatesboro" slack, from Yatesboro, Pennsylvania, U.S.A.; delivered to Christie Street hospital, Toronto, Ont.		Described as ¾-inch nut slack from "Castle Shannon" mine, Coverdale, Allegheny County, Pennsylvania					Described as 2-inch nut and slack from "Champion No. 3" mine, Pittsburgh seam, Library, Pennsylvania					
			Delivered to Westminster hospital, London, Ont.										
Sample No.	13505	13713	13296	13337	13343	13528	13542	14833	14930	14954	14972	15016	15040
Moisture (as received) ..... per cent	5·2	5·7	4·5	4·5	3·0	6·3	4·3	2·3	4·5	3·6	2·9	5·6	4·0
Dry Basis—													
Ash..... per cent	8·0	7·8	10·2	11·4	9·8	11·2	11·3	8·2	8·7	7·5	9·1	9·2	8·4
Volatile matter..... "	32·2	32·0	32·4	32·6	32·5	32·9	33·2	35·9	35·3	35·4	35·7	34·4	34·0
Fixed carbon..... "	59·8	60·2	57·4	56·0	57·7	55·9	55·5	55·9	56·0	57·1	55·2	56·4	57·6
Sulphur..... per cent	2·2	2·1	1·8	2·1	1·8	2·4	2·1	1·7	1·5	1·5	1·8	1·8	1·6
Calories per gramme, gross	7,795	7,895	7,535	7,480	7,575	7,355	7,450	7,670	7,645	7,785	7,575	7,580	7,610
B. T. U. per pound, gross...	14,030	14,210	13,560	13,470	13,640	13,240	13,410	13,810	13,770	14,020	13,640	13,640	13,700
Softening temperature of ash.....°F.	2100	2300	2150	2120	2150	2085	2150	....	....	2230	2200	2205	2200
Number of tons represented by sample.....	400	350	330	326	329	344	330	340	101	346	435	453	427
Date of delivery.....	July 30, 1934	Oct. 11, 1934	June 28-July 3, 1934	July 7-16	July 18-26	Aug. 7-15	Aug. 16-24, 1934	Aug. 3-9, 1935	Sept. 23	Probably about Sept. 26	Oct. 2-9	Oct. 10-19	Oct. 21-30

TABLE III

Analyses of Miscellaneous Solid Fuels

BRITISH ANTHRACITIC COALS

—	Scotch coals				Welsh coals							
Sample No.	15198		15199		13975		15012			14361		15144	
Moisture condition	R	D	R	D	R	D	R	D		R	D	R	D
Proximate Analysis—													
Moisture.....per cent	2·3	....	3·2	....	2·4	....	2·2	....		2·3	....	1·3	....
Ash..... "	5·7	5·8	5·6	5·8	4·4	4·5	5·6	5·7		4·3	4·4	5·1	5·1
Volatile matter.... "	8·1	8·3	8·0	8·3	7·8	8·0	8·8	9·0		7·9	8·1	11·4	11·5
Fixed carbon..... "	83·9	85·9	83·2	85·9	85·4	87·5	83·4	85·3		85·5	87·5	82·2	83·4
Ultimate Analysis—													
Carbon.....per cent	....	....	84·0	86·8	87·3	89·4	....	....		86·8	88·9	....	....
Hydrogen..... "	....	....	3·2	3·0	3·5	3·3	....	....		3·8	3·6	....	....
Ash..... "	....	....	5·6	5·8	4·4	4·5	....	....		4·3	4·4	....	....
Sulphur..... "	....	....	0·8	0·8	1·0	1·0	....	....		0·9	0·9	....	....
Nitrogen..... "	....	....	1·8	1·8	1·2	1·3	....	....		1·2	1·2	....	....
Oxygen..... "	....	....	4·6	1·8	2·6	0·5	....	....		3·0	1·0	....	....
Calorific Value—													
Calories per gramme, gross	....	....	7,645	7,900	7,985	8,180	....	....		3,005	8,190	....	....
B. T. U. per pound, gross..	....	....	13,760	14,220	14,380	14,730	....	....		4,410	14,750	....	....
Fuel ratio	10·35		10·40		10·90		9·50			10·75		7·25	
Coking properties	Non-coking		Non-coking		Non-coking		Non-coking			Non-coking		Tendency to agglomerate	
Softening temperature of ash.....°F.	2760		2750		2395		2340			2370		....	
Apparent specific gravity....	....		....		1·41		....			1·39		....	
Weight per cubic foot, pounds	....		....		48·1		....			48·3		....	
Screen Analysis—													
On $4\frac{3}{8}$" round.....per cent	4·0		0·0		3·8		4·5		On 2" round ..	2·6		....	
$3\frac{1}{4}$" to $4\frac{3}{8}$" " ..... "	7·7		0·0		60·2		16·3		$1\frac{1}{2}$" to 2" " ..	11·3		....	
$2\frac{7}{16}$" to $3\frac{1}{4}$" " ..... "	15·6		0·0		23·4		22·2		1" to $1\frac{1}{2}$" " ..	49·5		....	
$1\frac{5}{8}$" to $2\frac{7}{16}$" " ..... "	33·5		2·3		8·8		21·3		$\frac{3}{4}$" to 1" " ..	23·7		....	
$\frac{13}{16}$" to $1\frac{5}{8}$" " ..... "	37·2		94·6		2·3		21·3		$\frac{1}{2}$" to $\frac{3}{4}$" " ..	7·6		....	
Per $\frac{13}{16}$" " ..... "	2·0		3·1		1·5		14·4		Per $\frac{1}{2}$" " ..	5·3		....	
Designation of coal	Probably cobbles.		Probably nut...		Cobbles				Nut			Probably cobbles.	
Kind of sample	Commercial				Commercial; 1 ton.		Commercial....		Commercial; 1 ton			Commercial.	
Taken by	Ottawa dealers											Private individual.	
Date of sampling	January, 1936				February, 1935..		October, 1935...		May, 1935			December, 1935.	

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

BRITISH ANTHRACITIC COALS—Continued

——	Scotch coal		Welsh coal		Scotch coal				Scotch coal			
Sample No.	15256		15315		15295		15197			13352		13353	
Moisture condition	R	D	R	D	R	D	R	D		R	D	R	D
Proximate Analysis—													
Moisture.....per cent	3·7	....	1·8	....	6·5	....	3·1	....		0·9	....	1·0	....
Ash..... "	7·0	7·3	4·4	4·5	5·9	6·3	8·7	9·0		5·6	5·7	5·2	5·3
Volatile matter.... "	6·8	7·1	8·8	8·9	8·1	8·7	8·5	8·8		12·6	12·7	12·6	12·7
Fixed carbon..... "	82·5	85·6	85·0	86·6	79·5	85·0	79·7	82·2		80·9	81·6	81·2	82·0
Ultimate Analysis—													
Carbon.....per cent	....	....	86·5	88·1	....	....	....	....		....	....	86·0	86·8
Hydrogen..... "	....	....	3·7	3·6	....	....	....	....		....	....	4·0	3·9
Ash..... "	....	....	4·4	4·5	....	....	....	....		....	....	5·2	5·3
Sulphur..... "	0·7	0·7	1·0	1·0	0·8	0·8	....	....		1·1	1·1	1·0	1·0
Nitrogen..... "	....	....	1·4	1·4	....	....	....	....		....	....	1·2	1·3
Oxygen..... "	....	....	3·0	1·4	....	....	....	....		....	....	2·6	1·7
Calorific Value—													
Calories per gramme, gross	7,410*	7,695	8,070	8,220	7,410	7,930	....	....		8,135	8,215	8,155	8,240
B. T. U. per pound, gross..	13,340	13,850	14,530	14,780	13,340	14,270	....	....		14,640	14,780	14,680	14,830
Fuel ratio	12·10		9·75		9·75		9·40			6·40		6·45	
Coking properties	Non-coking		Non-coking		Non-coking		Non-coking			Strong agglomerate		Strong agglomerate	
Softening temperature of ash.....°F.	2930		2385		2710		2410			2470		2490	
Apparent specific gravity....	....		1·39		....		....			....		....	
Weight per cubic foot, pounds	....		44·4		....		....			....		....	
Screen Analysis—													
On $\frac{13}{16}$" round.....per cent	45·2		0·0		19·2		21·6		On $\frac{1}{2}$" sq. per cent	31·6		0·0	
$\frac{9}{16}$" to $\frac{13}{16}$" " ..... "	31·4		45·9		46·2		34·7		$\frac{1}{4}$" to $\frac{1}{2}$" "	59·7		35·9	
$\frac{5}{16}$" to $\frac{9}{16}$" " ..... "	16·1		44·5		28·8		36·4		$\frac{1}{8}$" to $\frac{1}{4}$" "	3·5		43·8	
$\frac{3}{16}$" to $\frac{5}{16}$" " ..... "	3·7		4·3		1·9		2·8		0·065" to $\frac{1}{8}$" "	5·2		14·1	
$\frac{3}{32}$" to $\frac{3}{16}$" " ..... "	0·8		1·3		1·0		1·1		Per 0·065" "			6·2	
Per $\frac{3}{32}$" " ..... "	2·8		4·0		2·9		3·4						
Designation of coal	....		No. 1 buckwheat							....		....	
Kind of sample	Commercial....		Commercial; 1 ton.		Commercial								
	All samples of coal delivered in Ottawa												
Date of sampling	January, 1936...		February, 1936				January, 1936...			August, 1934			

* Calorific value determined six months after sample ground.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

BRITISH ANTHRACITIC COALS—Continued

——	Welsh buckwheat* coals, delivered in Ottawa													
Sample No.....	15048		15015		15267		15265		15268		15264		15266	
Moisture condition.....	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	2·6	....	2·2	....	3·8	....	3·1	....	4·2	....	3·9	....	4·7	....
Ash..... "	7·1	7·3	5·1	5·2	4·6	4·8	3·7	3·8	5·7	5·9	3·3	3·4	4·5	4·7
Volatile matter... "	7·8	8·0	8·3	8·5	7·9	8·2	8·7	9·0	8·5	8·9	8·8	9·1	8·9	9·3
Fixed carbon..... "	82·5	84·7	84·4	86·3	83·7	87·0	84·5	87·2	81·6	85·2	84·0	87·5	81·9	86·0
Ultimate Analysis—														
Sulphur.....per cent	....	....	....	....	0·9	1·0	0·9	0·9	0·9	0·9	0·9	0·9	1·0	1·0
Calorific Value—														
Calories per gramme, gross	....	....	....	....	7,790	8,100	7,965	8,220	7,670	8,005	7,955	8,280	7,790	8,175
B.T.U. per pound, gross...	....	....	....	....	14,030	14,580	14,340	14,800	13,800	14,410	14,320	14,900	14,020	14,720
Fuel ratio.....	10·65		10·15		10·65		9·70		9·60		9·60		9·20	
Coking properties.....	Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking	
Softening temperature of ash.....°F	2400		....		2380		2370		2370		2400		2390	
Weight per cubic foot.pounds	....		....		47·6		46·5		45·9		46·0		45·7	
Screen Analysis—														
On $\frac{9}{16}$" round....per cent	1·0		....		5·6		0·5		3·5		0·2		1·5	
$\frac{5}{16}$" to $\frac{9}{16}$" " .... "	32·6		....		59·3		45·9		82·1		51·3		50·1	
$\frac{3}{16}$" to $\frac{5}{16}$" " .... "	49·5		....		24·3		39·6		9·2		35·3		40·1	
$\frac{3}{32}$" to $\frac{3}{16}$" " .... "	16·9		....		6·3		8·7		1·7		8·2		3·8	
Per $\frac{3}{32}$" round..... "			....		4·5		5·3		3·5		5·0		4·5	

Designation of coal	Nos. 1 and 2 buckwheat.	Buckwheat	Nos. 1 and 2 buckwheat
Kind of sample	Commercial		
Date of sampling	November, 1935	October, 1935	January, 1936

*Analysis of ash from blend of typical Welsh buckwheats is shown on page 134. Blend was made from samples taken from main or bulk samples 15264-8, with the addition of one other buckwheat.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

BRITISH ANTHRACITIC COALS—Concluded

—	Welsh coals													
	Delivered in Ottawa, Ont.								Delivered in Antigonish, N.S.		Delivered in Haileybury, Ont.			
Sample No.	13755		15271		15270		13655		14247		15252		15194	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	2·7	....	2·3	....	1·2	....	1·7	....	1·5	....	0·7	....	4·5	....
Ash..... "	5·6	5·7	7·1	7·3	4·0	4·1	6·5	6·6	4·7	4·8	4·9	5·0	6·6	6·9
Volatile matter... "	....	....	8·1	8·3	8·6	8·7	8·8	8·9	9·6	9·8	8·8	8·8	8·1	8·5
Fixed carbon..... "	....	....	82·5	84·4	86·2	87·2	83·0	84·5	84·2	85·4	85·6	86·2	80·8	84·6
Fuel ratio.....	....		10·20		10·00		9·45		8·75		9·80		10·00	
Coking properties.....	....		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking	
Softening temperature of ash.....°F	2320		....		....		2405		....		....		2340	
Screen Analysis—														
On $\frac{9}{16}$" round....per cent	17·8		13·7		52·6		19·2		....		3·8		1·5	
$\frac{5}{16}$" to $\frac{9}{16}$" " .... "	63·6		55·5		44·4		53·9		....		40·1		32·0	
$\frac{3}{16}$" to $\frac{5}{16}$" " .... "	13·4		8·5		1·7		17·3		....		37·0		40·6	
$\frac{3}{32}$" to $\frac{3}{16}$" " .... "	5·2		4·6		0·4		9·6		....		9·8		12·4	
Per $\frac{3}{32}$" round..... "			17·7		0·9				....		9·3		13·5	
Designation of coal.....	No. 1 buckwheat.....								Probably buckwheat.		Buckwheat.....		Nos. 2 and 3 buckwheat.	
Date of sampling.....	November, 1934		January, 1936.....				October, 1934...		April, 1935.....		January, 1936.....			

—	Delivered in Chapleau, Ont.		Delivered in Ottawa, Ont.		Received through the Department of National Revenue									
Sample No.	13952		13669		13557		13553		13556		13554		13555	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	0·7	....	1·2	....	1·4	....	0·8	....	0·8	....	0·8	....	1·0	....
Ash..... "	6·8	6·8	5·2	5·3	10·4	10·5	8·1	8·2	6·9	6·9	4·5	4·5	3·5	3·5
Volatile matter... "	10·5	10·6	11·9	12·0	10·5	10·7	11·6	11·7	11·8	11·9	12·2	12·3	11·8	12·0
Fixed carbon..... "	82·0	82·6	81·7	82·7	77·7	78·8	79·5	80·1	80·5	81·2	82·5	83·2	83·7	84·5
Fuel ratio	7·80		6·85		7·35		6·85		6·80		6·75		7·05	
Coking properties	Non-coking		Agglomerate		Non-coking		Agglomerate		Agglomerate		Agglomerate		Agglomerate	
Softening temperature of ash.....°F	2320		2415		....		....		....		....		....	
Screen Analysis—														
On $\frac{3}{16}$" round....per cent	19·2		30·4		....		....		....		....		....	
$\frac{5}{16}$" to $\frac{3}{16}$" " .... "	54·2		57·9		....		....		....		....		....	
$\frac{3}{16}$" to $\frac{5}{16}$" " .... "	14·9		9·4		....		....		....		....		....	
Per $\frac{3}{16}$" round..... "	11·7		2·3		....		....		....		....		....	
Designation of coal	No. 1 buckwheat				Fernhill washed peas						Aberdare washed peas.		Aberdare washed grains.	
Date of sampling	February, 1935..		October, 1934...		September, 1934									

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

ANTHRACITIC COALS FROM PENNSYLVANIA, U.S.A.

—	D.L. and W., or "Blue" Anthracite													
Sample No.	13338		13339		13498		13499		13500		13976		14282	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	2·6	....	2·4	....	2·9	....	3·1	....	2·8	....	4·1	....	3·3	....
Ash..... "	10·2	10·5	9·2	9·5	8·0	8·3	9·6	9·9	9·2	9·4	9·0	9·4	8·7	8·9
Volatile matter... "	5·3	5·4	4·8	4·9	5·3	5·5	5·5	5·7	5·2	5·4	5·4	5·6	5·6	5·8
Fixed carbon..... "	81·9	84·1	83·6	85·6	83·8	86·2	81·8	84·4	82·8	85·2	81·5	85·0	82·4	85·3
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	....	....	....	....	82·5	84·8	....	....	....	....
Hydrogen..... "	....	....	....	....	....	....	....	....	2·8	2·6	....	....	....	....
Ash..... "	....	....	....	....	....	....	....	....	9·2	9·4	....	....	....	....
Sulphur..... "	....	....	....	....	....	....	....	....	0·9	0·9	0·8	0·8	0·9	0·9
Nitrogen..... "	....	....	....	....	....	....	....	....	0·9	1·0	....	....	....	....
Oxygen..... "	....	....	....	....	....	....	....	....	3·7	1·3	....	....	....	....
Calorific Value—														
Calories per gramme, gross	....	....	....	....	....	....	....	....	7,360	7,570	7,265	7,570	7,350	7,605
B.T.U. per pound, gross...	....	....	....	....	....	....	....	....	13,250	13,620	13,080	13,630	13,230	13,690
Fuel ratio	15·40		17·55		15·65		14·80		15·70		15·20		14·75	
Softening temperature of ash.....°F	....		....		2880		2830		2865		2870		2830	
Weight per cubic foot, pounds	....		....		....		....		52·4		....		....	
Screen Analysis—														
On $2\frac{7}{16}$" round...per cent	....		....		....		....		6·9		9·2		....	
$1\frac{5}{8}$" to $2\frac{7}{16}$" " ... "	....		....		....		....		78·3		77·0		....	
$\frac{13}{16}$" to $1\frac{5}{8}$" " ... "	....		....		....		....		12·7		12·2		....	
Per $\frac{13}{16}$" round..... "	....		....		....		....		2·1		1·6		....	

Designation of coal	Probably stove	Stove			
Kind of sample	Commercial	Commercial; 3 tons each	6-ton blend of samples 13498 and 13499.	Commercial; 1 ton.	Commercial; 2 tons.
Taken by	Staff of Fuel Research Laboratories.	Ottawa dealers	Staff of F. R. L.	Ottawa dealers.	
Date of sampling	July, 1934	August, 1934	Aug. 13, 1934	Feb. 27, 1935	May 14, 1935

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

ANTHRACITIC COALS FROM PENNSYLVANIA, U.S.A. AND FROM BELGIUM

—	American coals						Belgian coals					
Sample No.	13895		15314		15200		14895		14873		14874	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	3·4	....	5·2	....	1·3	....	1·3	....	1·3	....	1·0	....
Ash..... "	12·4	12·8	9·5	10·0	11·4	11·5	5·6	5·6	4·1	4·2	6·3	6·3
Volatile matter..... "	5·2	5·4	6·1	6·5	8·3	8·4	9·0	9·2	9·2	9·3	9·7	9·8
Fixed carbon..... "	79·0	81·8	79·2	83·5	79·0	80·1	84·1	85·2	85·4	86·5	83·0	83·9
Ultimate Analysis—												
Carbon.....per cent	....	....	78·6	83·0	....	....	....	....	....	....	....	....
Hydrogen..... "	....	....	3·2	2·7	....	....	....	....	....	....	....	....
Ash..... "	....	....	9·5	10·0	....	....	....	....	....	....	....	....
Sulphur..... "	....	....	0·9	1·0	0·8	0·8	0·9	0·9	0·7	0·7	1·1	1·1
Nitrogen..... "	....	....	1·0	1·0	....	....	....	....	....	....	....	....
Oxygen..... "	....	....	6·8	2·3	....	....	....	....	....	....	....	....
Calorific Value—												
Calories per gramme, gross.....	....	....	7,145	7,540	7,320	7,420	8,040	8,145	8,190	8,295	7,890	7,970
B.T.U. per pound, gross.....	....	....	12,860	13,570	13,180	13,350	14,470	14,660	14,740	14,930	14,200	14,350
Fuel ratio.....	15·35		12·95		9·55		9·30		9·25		8·55	
Coking properties.....	Non-coking		Non-coking		Non-coking		All show a slight tendency to agglomerate					
Softening temperature of ash.....°F	....		2480+		2485		2400		2850		2500	
Apparent specific gravity.....	....		1·48		....		....		....		....	
Weight per cubic foot.....pounds	....		48·8		....		....		....		....	
Screen Analysis—												
On $2\frac{7}{16}$" round.....per cent	....		0·0		18·4		0·0		....		0·0	
$1\frac{7}{8}$" to $2\frac{7}{16}$" " ..... "	....		0·0		65·5		0·0		....		0·0	
$1\frac{5}{16}$" to $1\frac{5}{8}$" " ..... "	....		0·0		14·6		40·4		....		0·0	

$\frac{9}{16}$" to $\frac{13}{16}$" "	....	8·9	1·5	41·4	....	31·8
$\frac{5}{16}$" to $\frac{9}{16}$" "	....	78·7		11·1	....	46·4
$\frac{3}{16}$" to $\frac{5}{16}$" "	....	8·6		2·0	....	6·0
$\frac{3}{32}$" to $\frac{3}{16}$" "	....	1·9		5·1	....	15·8
Per $\frac{3}{32}$" round "	....	1·9			....	
Designation of coal	Stove	D. and H., No. 1 buckwheat.	Lykens Valley, "red ash", stove.		Cobbles	Buckwheat.
Kind of sample	Commercial	Commercial; 1 ton.	Commercial			
Taken by	Ottawa dealers			Private individual, Montreal	Importer, Montreal	
Date of sampling	January, 1935	February, 1936	January, 1936	August, 1935		

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

ANTHRACITIC COALS FROM FRENCH INDO-CHINA

Sample No.		14920		14937		14894		14921		15288		15316*	
Moisture condition		R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—													
Moisture	per cent	4·4	....	4·2	....	3·9	....	3·7	....	5·6	....	5·8	....
Ash	"	3·1	3·3	4·4	4·6	5·2	5·3	4·4	4·6	5·2	5·6	5·3	5·7
Volatile matter	"	3·9	4·0	2·9	3·0	3·3	3·5	3·8	3·9	3·7	3·9	3·9	4·2
Fixed carbon	"	88·6	92·7	88·5	92·4	87·6	91·2	88·1	91·5	85·5	90·5	85·0	90·1
Ultimate Analysis—													
Carbon	per cent	....	....	....	....	....	....	88·2	91·6	....	....	84·7	89·8
Hydrogen	"	....	....	....	....	....	....	1·9	1·6	....	....	2·1	1·5
Ash	"	....	....	....	....	....	....	4·4	4·6	....	....	5·3	5·7
Sulphur	"	0·7	0·7	0·5	0·6	0·8	0·8	0·7	0·7	0·7	0·7	0·7	0·7
Nitrogen	"	....	....	....	....	....	....	0·6	0·6	....	....	0·6	0·6
Oxygen	"	....	....	....	....	....	....	4·2	0·9	....	....	6·6	1·7
Calorific Value—													
Calories per gramme, gross		7,430	7,775	7,370	7,695	7,320	7,615	7,450	7,740	7,155	7,575	7,120	7,555
B. T. U. per pound, gross		13,370	14,000	13,270	13,850	13,180	13,710	13,410	13,930	12,880	13,640	12,820	13,600
Fuel ratio		23·00		30·50		26·40		23·40		23·00		21·70	
Softening temperature of ash	°F.	2515		2600		2170		2295		2260		2210	
Apparent specific gravity		....		....		....		....		....		1·69	
Weight per cubic foot	pounds	....		....		....		....		....		58·1	
Screen Analysis—													
On $\frac{1}{16}$" round	per cent	....		....		0·0		0·0		5·7		0·0	
$\frac{2}{16}$" to $\frac{1}{16}$"	"	....		....		32·8		57·8		37·2		22·2	
$\frac{5}{16}$" to $\frac{2}{16}$"	"	....		....		47·2		32·7		45·6		50·0	
$\frac{3}{16}$" to $\frac{5}{16}$"	"	....		....		17·8		7·4		6·2		20·3	
$\frac{3}{32}$" to $\frac{3}{16}$"	"	....		....		2·2		2·1		1·8		4·7	
Per $\frac{3}{32}$"	"	....		....						3·5		2·8	

Designation of coal	Cobbles	Probably cobbles.	Blower	Buckwheat		No. 1 silver buckwheat.
Kind of sample	Commercial					
Taken by	Montreal importer.	Toronto importer.	Toronto dealer.	Montreal importer.	Ottawa dealers	
Date of sampling	September, 1935		August, 1935	September, 1935	February, 1936.	Feb. 15, 1936.

* Ash sample No. 15626, the analysis of which is shown on prge 134, was taken from this main sample.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

LOW-VOLATILE BITUMINOUS COALS

—	From Rhymney valley, south Wales	"Pocahontas" (from West Virginia), U.S.A.				From Beckley seam, Glen Rogers, West Virginia	From Rockhill mine, Fulton seam, Mount Union, Fulton county, Pennsylvania, U.S.A.	Crown mine, Cambria county, Pennsylvania	"Raven" coal from Cambria county
	Supplied to industrial plant at Montreal, Que.	Supplied to boiler plant at Ottawa, Ont.		Supplied to public building at Fort William, Ont. through the Department of Public Works	Supplied to briquetting plant at Windsor, Ont.	Supplied to Fuel Research Laboratories for briquetting tests	Supplied to Fuel Research Laboratories for house heating tests	Supplied to school buildings at Ottawa	Supplied to Fuel Research Laboratories for smithy tests
Sample No.	14389	15023		15283	13312	13580	14239	{13585 / 13586	15243
Moisture condition	R D	R	D	R D	R D	R D	R D	R D	R D
Proximate Analysis—									
Moisture.....per cent	1·0	1·3	....	1·4	1·0	0·9	0·7	1·6	0·9 ....
Ash..... "	6·7 6·8	3·4	3·4	5·7 5·8	6·9 7·0	7·2 7·2	9·5 9·5	6·8 6·9	9·4 9·5
Volatile matter..... "	16·1 16·3	22·1	22·4	16·5 16·8	16·6 16·8	18·3 18·5	16·0 16·1	20·5 20·8	19·5 19·6
Fixed carbon..... "	76·2 76·9	73·2	74·2	76·4 77·4	75·5 76·2	73·6 74·3	73·8 74·4	71·1 72·3	70·2 70·9
Ultimate Analysis—									
Carbon.....per cent	....	....	....	....	....	....	80·9 81·4	....	....
Hydrogen..... "	....	....	....	....	....	....	4·3 4·4	....	....
Ash..... "	....	....	....	....	....	....	9·5 9·5	....	....
Sulphur..... "	0·8 0·9	0·6	0·6	0·6 0·6	....	1·2 1·2	1·5 1·5	1·8 1·8	2·3 2·3
Nitrogen..... "	....	....	....	....	....	....	1·3 1·3	....	....
Oxygen..... "	....	....	....	....	....	....	2·5 1·9	....	....
Calorific Value—									
Calories per gramme, gross.....	8,035 8,110	8,315	8,425	8,120 8,240	....	....	7,880 7,930	8,080 8,210	....
B.T.U. per pound, gross.....	14,460 14,590	14,970	15,170	14,620 14,830	....	....	14,190 14,280	14,550 14,780	....
Fuel ratio.....	4·70	3·30		4·60	4·55	4·00	4·65	3·50	3·60
Coking properties.....	Good	Good		Good	Good	Good	Good	Good	Good
Softening temperature of ash....°F	2880	2230		2270	2280	2480	2860	2270	2220

Apparent specific gravity	....	....	....	....	....	1·35	....	....
Weight per cubic foot.....pounds	....	....	....	....	....	50·5	....	....
Screen Analysis—								
On 2″ round.....per cent	....	....	....	....	....	26·3	....	....
1½″ to 2″ " ..... "	....	....	....	....	....	22·8	....	....
1″ to 1½″ " ..... "	....	....	....	....	....	18·9	....	....
¾″ to 1″ " ..... "	....	....	....	....	....	5·4	....	....
½″ to ¾″ " ..... "	....	....	....	....	....	4·7	....	....
¼″ square to ½″ round.... "	....	....	....	....	....	5·3	....	....
⅛″ to ¼″ square..... "	....	....	....	....	....	5·5	....	....
Per ⅛″ square..... "	....	....	....	....	....	11·1	....	....
Designation of coal	Duff		Bituminous slack	Slack		2-inch x 4-inch lump.		
Kind of sample	Commercial							
Taken by	Importer	Private individuals.	Departmental employees.	Plant operator	Mine operator	Fuel inspector, Canadian National Railways.	Staffs of buildings.	Ottawa dealer
Date of sampling	June, 1935	October, 1935	January, 1936	July, 1934	September, 1934	April, 1935	September, 1934	January, 1936

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

BITUMINOUS COALS

—	"Consett" coal from Durhamshire, England		"National" coal from West Virginia, U.S.A.				"Mona" coal from West Virginia						"Pittsburgh seam" coal from West Virginia	
	Supplied to industrial plant at Montreal, Que.		Supplied to school buildings at Ottawa, Ont.				Supplied to penitentiary at Kingston, Ont.						Supplied to boiler plant at Ottawa	
Sample No.	14388		13583		13584		13970		13971		14373		15280	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·6	....	2·4	....	1·9	....	4·5	....	1·2	....	2·2	....	4·6	....
Ash..... "	7·0	7·1	8·6	8·8	8·8	8·9	8·5	8·9	8·8	8·9	7·6	7·8	7·3	7·6
Volatile matter... "	29·0	29·5	35·8	36·7	35·8	36·5	33·2	34·8	34·5	35·0	35·8	36·6	35·5	37·3
Fixed carbon..... "	62·4	63·4	53·2	54·5	53·5	54·6	53·8	56·3	55·5	56·1	54·4	55·6	52·6	55·1
Ultimate Analysis—														
Sulphur.....per cent	1·0	1·0	2·5	2·6	2·6	2·7	2·6	2·8	3·0	3·0	1·8	1·8	1·6	1·6
Calorific Value—														
Calories per gramme, gross	7,865	7,995	7,565	7,755	7,535	7,680	7,400	7,750	7,655	7,745	7,580	7,750	....	....
B.T.U. per pound, gross....	14,160	14,390	13,610	13,960	13,560	13,830	13,320	13,950	13,780	13,940	13,640	13,950	....	....
Fuel ratio	2·15		1·50		1·50		1·60		1·60		1·50		1·50	
Coking properties	Good		Good		Good		Good		....		Good		Good	
Softening temperature of ash.....°F.	2575		2070		2060		2135		2130		2170		2210	
Screen Analysis—														
On 1½" round.....per cent	....		....		....		....		....		....		2·1	
1 " to 1½" " ..... "	....		....		....		....		....		....		17·7	

$\frac{3}{4}$" to 1" " ..... "	....	....	....	....	....	....	21·2
$\frac{1}{2}$" to $\frac{3}{4}$" " ..... "	....	....	....	....	....	....	36·3
$\frac{1}{4}$" to $\frac{1}{2}$" " ..... "	....	....	....	....	....	....	15·6
$\frac{1}{8}$" to $\frac{1}{4}$" " ..... "	....	....	....	....	....	....	2·4
$\frac{1}{16}$" to $\frac{1}{8}$" " ..... "	....	....	....	....	....	....	1·5
Per $\frac{1}{16}$" " ..... "	....	....	....	....	....	....	3·2
Designation of coal.....	.....	Stoker size, or $1\frac{1}{2}$-inch lump.	Run-of-mine....	Slack.....	.....	.....	$1\frac{1}{4}$-inch stoker coal.
Kind of sample.....	Commercial.....						
Taken by.....	Importer.....	Staffs of buildings.....		Departmental employees.....			Private individuals.
Date of sampling.....	June, 1935.....	September, 1934.....		February 5, 1935.....		April 30, 1935...	January, 1936.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

BITUMINOUS COALS—Concluded

—	Wilson mine, Pittsburgh seam, Ellsworth, Washington county, Pennsylvania, U.S.A.		Hutchinson mine, Pittsburgh seam, Westmoreland county, Pennsylvania		Pittsburgh coal		Yatesboro No. 5 mine, upper Freeport seam, Armstrong county, Pennsylvania		Adrian mine, lower Freeport seam, Delancey, Jefferson county, Pennsylvania				Mines of Rail and River Coal Company, Pittsburgh No. 8 seam, Belmont county, Ohio, U.S.A.	
	Supplied to industrial plant at Ottawa, Ont.				Supplied to Department of National Defence at Camp Borden, Ont.		Supplied to Fuel Research Laboratories for house heating tests		Supplied to Fuel Research Laboratories for coking tests				Supplied to Fuel Research Laboratories for house heating tests	
Sample No.	14892*		13596		13845		14132		14049		14085		14056	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	2·0	....	1·7	....	5·0	....	1·7	....	0·9	....	1·1	....	2·5	....
Ash..... "	5·2	5·3	7·1	7·2	13·2	13·9	8·7	8·8	5·8	5·9	3·7	3·8	8·0	8·2
Volatile matter... "	36·1	36·8	33·2	33·8	34·9	36·7	32·3	32·9	31·0	31·3	30·4	30·7	40·5	41·6
Fixed carbon..... "	56·7	57·9	58·0	59·0	46·9	49·4	57·3	58·3	62·3	62·8	64·8	65·5	49·0	50·2
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	....	....	77·1	78·5	....	....	....	....	72·3	74·1
Hydrogen..... "	....	....	....	....	....	....	5·2	4·9	....	....	....	....	5·3	5·2
Ash..... "	....	....	....	....	....	....	8·7	8·8	....	....	....	....	8·0	8·2
Sulphur..... "	0·9	0·9	0·7	0·7	2·4	2·5	1·4	1·4	1·5	1·5	0·8	0·9	4·0	4·1
Nitrogen..... "	....	....	....	....	....	....	1·5	1·5	....	....	....	....	1·4	1·4
Oxygen..... "	....	....	....	....	....	....	6·1	4·9	....	....	....	....	9·0	7·0
Calorific Value—														
Calories per gramme, gross	7,880	8,045	....	....	6,780	7,100	7,730	7,870	....	....	8,210	8,300	7,285	7,470
B.T.U. per pound, gross....	14,180	14,480	....	....	12,200	12,780	13,920	14,160	....	....	14,780	14,940	13,110	13,450

Fuel ratio	1·55	1·75	1·35	1·80	2·00	2·15	1·20
Coking properties	Good	Good	Good	Good	Good	Good	Good
Softening temperature of ash....°F.	2795	2970	2420	2650	....	2500	2020
Apparent specific gravity	....	....	....	1·31	....	....	1·33
Weight per cubic foot, pounds	....	....	....	45·6	....	....	46·8
Screen Analysis—							
On 4" round....per cent	0·0	....	....	1·5	....	....	18·5
3" to 4" " "	15·0	....	....	13·7	....	....	17·3
2" to 3" " "	28·6	....	....	36·5	....	....	29·8
1½" to 2" " "	23·9	....	....	24·9	....	....	14·8
1" to 1½" " "		....	....	11·3	....	....	11·5
¾" to 1" " "	8·6	....	....	3·0	....	....	3·2
½" to ¾" " "		....	....	2·5	....	....	1·8
Per ½" " "	23·9	....	....	6·6	....	....	3·1
Designation of coal	2 x 5 egg	Run-of-mine	Bituminous run-of-mine.	Egg	Run-of-mine		Lump.
Kind of sample	Commercial			Commercial; 1 ton.	25-pound samples considered to represent commercial output.		Commercial; 1 ton.
Taken by	Plant operators		Departmental employees.	Fuel inspector, Canadian National Railways.	Mine operators		Fuel inspector, Canadian National Railways.
Date of sampling	August, 1935	September, 1934	January, 1935	March, 1935			

* Analysis of corresponding coke on page 61 of this report.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

COKES

—	"La Salle," Koppers, by-product coke from Montreal, Que.						By-product coke from chamber ovens at Ottawa, Ont.					
Sample No.	13974		13807		13607		14975		15013		13606	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	0·5	....	0·2	....	4·2	....	3·4	....	7·7	....	1·1	....
Ash..... "	7·4	7·4	6·9	6·9	7·2	7·5	9·8	10·2	9·7	10·5	10·7	10·8
Volatile matter..... "	1·1	1·1	0·7	0·7	1·1	1·2	1·2	1·2	1·3	1·4	2·9	2·9
Fixed carbon..... "	91·0	91·5	92·2	92·4	87·5	91·3	85·6	88·6	81·3	88·1	85·3	86·3
Ultimate Analysis—												
Carbon.....per cent	89·7	90·1	....	....	....	....	83·8	86·7	80·3	86·9	....	....
Hydrogen..... "	0·4	0·4	....	....	....	....	0·9	0·6	1·2	0·4	....	....
Ash..... "	7·4	7·4	....	....	....	....	9·8	10·2	9·7	10·5	....	....
Sulphur..... "	0·9	0·9	0·9	0·9	....	....	0·7	0·7	0·7	0·7	0·7	0·7
Nitrogen..... "	1·0	1·0	....	....	....	....	1·3	1·3	1·0	1·1	....	....
Oxygen..... "	0·6	0·2	....	....	....	....	3·5	0·5	7·1	0·4	....	....
Calorific Value—												
Calories per gramme, gross.....	7,040	7,075	7,210	7,225	....	....	6,760	6,990	6,535	7,080	6,915	6,995
B.T.U. per pound, gross.....	12,670	12,730	12,970	13,000	....	....	12,170	12,590	11,760	12,740	12,450	12,590
Softening temperature of ash.....°F.	2530		2465		2485		2780		2770		2840	
Apparent specific gravity.....	0·89		....		....		1·05		1·05		....	
Weight per cubic foot.....pounds	26·1		....		....		32·0		35·8		....	
Screen Analysis—												
On 3" square.....per cent	0·0		....		....		0·3		0·0		0·0	
2 " to 3 " " ..... "	11·1		....		....		12·6		0·0		0·0	
1½" to 2 " " ..... "	72·7		....		....		41·5		0·6		0·0	
1 " to 1½" " ..... "	14·9		....		....		36·0		52·0		0·0	
¾" to 1 " " ..... "	0·7		....		....		6·7		37·2		17·7	
½" to ¾" " ..... "	0·2		....		....		1·6		8·6		53·5	
Per ½" " ..... "	0·4		....		....		1·3		1·6		28·8	
Designation of fuel.....	Stove.....		Stove and nut..		.....		Stove.....		Nut.....		Pea.	
Kind of sample.....	Commercial; 1 ton.		Commercial.....				Commercial; 1 ton.....				Commercial.	
Taken by.....	Ottawa dealers.....				Representative of manufacturer.		Manufacturers.....				Member of staff of Fuel Research Laboratories.	
Date of sampling.....	Feb. 27, 1935...		December, 1934		October, 1934...		October 10, 1935.....				October 19, 1934	

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

COKES—Concluded

—	Cokes made from Pennsylvania, United States coals in a Canadian commercial plant						Crow's Nest Pass Coal Company, Limited, Fernie, British Columbia. Beehive cokes made from Michel coal								Milwaukee coke as imported into Winnipeg, Man.	
	From Wilson Pittsburgh seam coal*		From mixture of equal parts of Wilson and Banning coals		From Banning Pittsburgh seam coal		From B seam cleaned slack†		From No. 1 seam coal		From No. 1 seam cleaned slack†		From No. 3 seam cleaned slack†			
Sample No.	14903		14904		14924		13731**		13534		13733**		13732**		13535	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—																
Moisture.....per cent	4·0	....	8·2	....	2·9	....	0·4	....	2·3	....	0·2	....	0·3	....	1·9	....
Ash..... "	7·3	7·6	8·2	8·9	10·0	10·3	10·3	10·4	9·1	9·3	14·1	14·2	12·0	12·0	7·6	7·7
Volatile matter..... "	2·1	2·2	2·9	3·2	1·8	1·9	2·0	2·0	1·3	1·3	1·0	1·0	1·5	1·5	2·0	2·1
Fixed carbon..... "	86·6	90·2	80·7	87·9	85·3	87·8	87·3	87·6	87·3	89·4	84·7	84·8	86·2	86·5	88·5	90·2
Ultimate Analysis—																
Sulphur.....per cent	0·8	0·8	0·7	0·8	0·7	0·7	....	....	0·3	0·3	....	....	....	....	0·6	0·6
Calorific Value—																
Calories per gramme, gross....	....	....	....	....	6,815	7,020	....	....	....	....	....	....	....	....	....	....
B.T.U. per pound, gross.....	....	....	....	....	12,270	12,640	....	....	....	....	....	....	....	....	....	....
Softening temperature of ash..°F.	....		2630		2670		2335		2890		2700+		2830		2560	
Screen Analysis—																
2 " to 3 " square.....per cent	....		....		33·5		....		....		....		....		....	
1½" to 2 " " ..... "	....		....		52·1		....		....		....		....		....	
1 " to 1½" " ..... "	....		....		13·8		....		....		....		....		....	
Per 1" square..... "	....		....		0·6		....		....		....		....		....	
Designation of fuel	Run-of-oven				Stove										Foundry	
Kind of sample	Commercial															
Taken by	Plant operators															
Date of sampling	September, 1935						Autumn of 1934		August, 1934		Autumn of 1934				August, 1934	

* Analysis of this coal to be found on page 58 of this report.
† Analysis of this coal to be found on page 32 of this report.
** Analysis of ash on page 133.

TABLE III—Continued

Analyses of Miscellaneous Solid Fuels—Continued

—	Petroleum coke				"Disco", low-temperature coke, manufactured by the Carbocite process from Pittsburgh, Pennsylvania, washery fines		"Ricoal", low-temperature coke, manufactured by Illingworth process, at Pontypridd, Wales, from coal from No. 2 mine of the Dominion Steel and Coal Corporation, Limited, at Glace Bay, Nova Scotia				Peat charcoal			
	From Atlantic Refining Company, Philadelphia, Pennsylvania, U.S.A.		From Imperial Oil Company, Sarnia, Ont.				From slack coal		From slack coal cleaned in Baum washer		From Toronto, Ont.		From experimental plant at London, Ont.	
Sample No.	13525		14945		14270		14936		14927		14405		14886	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·9	....	1·0	....	2·4	....	4·1	....	3·6	....	5·0	....	5·8	....
Ash..... "	1·0	1·0	0·6	0·6	9·4	9·6	10·7	11·2	8 7	9·1	18·4	19·3	19·9	21·1
Volatile matter... "	10·3	10·5	9·8	9·9	15·5	15·9	8·4	8·7	9·0	9·3	19·6	20·6	19·0	20·2
Fixed carbon..... "	86·8	88·5	88·6	89·5	72·7	74·5	76·8	80·1	78·7	81·6	57·0	60·1	55·3	58·7
Ultimate Analysis—														
Carbon.....per cent	91·0	92·7	90·3	91·2	....	....	78·2	81·5	79·2	82·2	....	....	....	....
Hydrogen..... "	3·7	3·5	3·7	3·7	....	....	2·6	2·2	2·8	2·4	....	....	....	....
Ash..... "	1·0	1·0	0·6	0·6	....	....	10·7	11·2	8·7	9·1	....	....	....	....
Sulphur..... "	1·6	1·6	1·6	1·6	2·0	2·1	2·3	2·4	2·0	2·1	0·1	0·1	0·2	0·2
Nitrogen..... "	0·7	0·8	1·5	1·5	....	....	1·4	1·5	1·5	1·5	....	....	....	....
Oxygen..... "	2·0	0·4	2·3	1·4	....	....	4·8	1·2	5·8	2·7	....	....	....	....
Calorific Value—														
Calories per gramme, gross	8,440	8,600	8,480	8,565	7,080	7,250	6,915	7,210	7,095	7,360	6,070	6,395	5,625	5,970
B.T.U. per pound, gross...	15,190	15,480	15,260	15,420	12,750	13,050	12,450	12,980	12,770	13,250	10,930	11,510	10,130	10,750
Softening temperature of ash.....°F	1910		2000*		2080		2020		2070		....		2630	

Apparent specific gravity...	....	0·82	....	0·87	0·88	0·77	0·90
Weight per cubic foot, pounds	....	24·8	....	27·3	26·4	25·0	....
Kind of sample.....	Commercial; 5 pounds.	Commercial; 1200 pounds.	Commercial....	.....		.....	.....
Taken by.....	.....	Staff of Fuel Research Laboratories from 1½-ton consignment in October, 1931.	Private individual.	Staff of Fuel Research Laboratories.		Operators of rubber plant.	Employee of Mines Branch.
Date of sampling.....	August, 1934....	September, 1935	April, 1935.....	September, 1935; after 6 years' storage.		June, 1935.....	August, 1935....

*Approximate value.

TABLE III—Concluded

Analyses of Miscellaneous Solid Fuels—Concluded

—	"Mystic" briquettes, made of Welsh anthracite with binder of starch and petroleum pitch, at Charlestown, Massachusetts, U.S.A.		"Ambricoal" briquettes, made of American anthracite		"Nu-Fuel Blox", briquettes made at Toronto, from "Pocahontas" screenings and cement		"Nick's Blox", made at Windsor, Ont., from "Pocahontas" slack and starch		"Wico" briquettes, made at Windsor, from "Pocahontas" slack and starch binder		"Wico" briquettes, made at Windsor, from "Pocahontas" slack and beet molasses binder		"Peco", imported peat briquettes	
	Made by the American Briquette Company													
Sample No.	13349		15045		13711		13311		13523		13524		13503	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·8	....	1·7	....	3·1	....	0·8	....	1·0	....	2·6	....	14·0	....
Ash..... "	10·2	10·4	9·4	9·5	13·0	13·4	6·0	6·1	4·4	4·4	4·1	4·2	4·7	5·5
Volatile matter... "	13·0	13·2	11·7	11·9	17·2	17·8	16·8	16·9	17·7	17·9	20·1	20·6	58·1	67·5
Fixed carbon..... "	75·0	76·4	77·2	78·6	66·7	68·8	76·4	77·0	76·9	77·7	73·2	75·2	23·2	27·0
Ultimate Analysis—														
Carbon.....per cent	....	....	81·6	83·1	....	....	....	....	....	....	....	....	47·6	55·4
Hydrogen..... "	....	....	3·6	3·5	....	....	....	....	....	....	....	....	6·1	5·3
Ash..... "	....	....	9·4	9·5	....	....	....	....	....	....	....	....	4·7	5·5
Sulphur..... "	1·0	1·1	0·7	0·7	0·7	0·7	0·6	0·7	0·6	0·6	0·7	0·7	0·4	0·4
Nitrogen..... "	....	....	1·0	1·0	....	....	....	....	....	....	....	....	1·7	2·0
Oxygen..... "	....	....	3·7	2·2	....	....	....	....	....	....	....	....	39·5	31·4
Calorific Value—														
Calories per gramme, gross	7,470	7,595	7,500	7,630	7,375	7,615	8,125	8,195	8,275	8,355	7,980	8,200	4,365	5,075
B.T.U. per pound, gross...	13,460	13,670	13,500	13,740	13,280	13,710	14,620	14,750	14,890	15,040	14,360	14,760	7,860	9,140
Softening temperature of ash.....°F	2390		2440		1950		....		2680		2315		....	
Weight per cubic foot.pounds	....		43·6		....		....		....		....		....	
Kind of sample	Commercial												Commercial....	
Taken by	Manufacturer...		Ottawa dealer..		Manufacturer									
Date of sampling	July, 1934.....		Nov. 6, 1935....		October, 1934...		July, 1934.....		August, 1934				Summer of 1934.	

APPENDIX I

ANALYSES OF COALS AND PEATS, 1918 TO 1925, HITHERTO UNPUBLISHED

Compilation of fuel analyses carried out by the staff of the Division of Fuels and Fuel Testing was begun in 1918, under the direction of E. Stansfield, and a series of five pamphlets, dealing with Canada from east to west, was published[1]. A revision of one of these, dealing with the fuels of Alberta and the Northwest Territories, was published in 1922. In 1923 a survey of the coals of the Maritime Provinces was made, and the resultant analyses published in the Investigations of Fuels and Fuel Testing for that year[2]. In 1925 the policy of periodically publishing analyses of solid fuels was adopted, and has remained in force since then.

Many analyses made between the years 1918 and 1925, a number of which are of exceptional interest because of their rarity, were never published in full[3]. The present compilation bridges the gap between the years just specified and, in addition, contains a few earlier and later analyses which do not occur in other Mines Branch publications.

The information compiled herewith differs from that in recent publications, in that there are comparatively few analyses of large-scale commercial samples. The coal analyses shown are largely those of samples collected during exploratory work by officers of the Geological Survey, with the addition of samples collected by the staffs of the Lignite Utilization Board of Canada, of the Department of the Interior, and of the Board of Railway Commissioners for Canada. The last specified samples were obtained in order to ascertain whether certain coals would produce sparks when used in locomotives, and thus prove unsuitable for service in forest areas. In addition to the coal analyses, there are shown numerous analyses of samples of peat from bogs in eastern Canada. The exploration of such bogs has been temporarily discontinued.

The first group of analyses (Table I) contains those of many "mine" samples and of a large number of "prospect" samples. The "mine" samples were procured from deposits already under development; the "prospect" samples from deposits as yet undeveloped. A small number of analyses of "commercial" samples will be found in the first group.

The second group (Table II) is notably small, when compared with similar groups of analyses published during the last decade. This is because of the great increase in variety of solid fuels now available in Canada. The group consists of a few analyses of "commercial" coals such as are sold by local dealers for heating or for industrial purposes, and of such low-rank coals as are imported into British Columbia from the State of Washington. In addition, it consists of the analyses of certain processed fuels, resulting largely from experimental carbonization.

[1]Analyses of Canadian Fuels. Compiled by Stansfield and Nicolls. Mines Branch Repts. Nos. 479 to 483 (1918).
[2]Mines Branch, Dept. of Mines, Canada, Invest. Fuels and Fuel Testing, 1924. Rept. No. 618, p. 11.
[3]Some of the analyses reported here are to be found in publications of the Geological Survey.

Figures in columns "R" are the analyses of fuels as received in the laboratory; in columns "AD" those of "air-dried" fuels; and in columns "D" those of fuels dried at 108°C. Most of the analyses are shown upon only two bases, though many of the coals were air-dried in pans in the laboratory, at humidities varying from high to very low, for convenience in handling for analysis. Towards the completion of the series of analyses here tabulated the standard air-drying apparatus[1] was brought into service, and some twelve of the coals, for which three columns of analyses are shown, were dried in it. However, owing to lack of familiarity of manipulation and to defects subsequently remedied in the apparatus, air-drying results are not so reliable as those obtained in later years. Some five of the coals were air-dried in the laboratory at, approximately, 60 per cent relative humidity, and in these cases three columns of analyses are also shown.

Nearly all the peat samples, and the coal samples from the Wainwright and Pakan areas in Alberta, are tabulated with their analyses upon the dry basis only. This has been done because these samples were received at the laboratory in such a dry condition that their analyses, as received, would be not only of no value but probably actually misleading.

A few coals, most of those submitted by the Board of Railway Commissioners, were tested for "coking properties" on a somewhat larger scale than is usual, 50 grammes of crushed coal being heated for some time in a fireclay crucible in a furnace. This was carried out on the assumption that coals which caked or coked would not emit sparks through locomotive smokestacks. Generally speaking, the results of the 1- and 50-gramme tests agree with one another, though the larger-scale tests may give debatable coals a slight advantage.

The "Hoffmann Potash Test"[2] was developed at the Fuel Testing Plant (now Fuel Research Laboratories) from a procedure proposed by Hoffmann of the Canadian Geological Survey. It is used for the classification of coals by rank, being based upon the theory that the lower the rank of a coal the more colour it imparts to a solution of caustic potash.

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[1]Report of Scientific and Industrial Research Council of Alberta, 1923, p. 39.
[2]Mines Branch, Dept. of Mines, Canada, Sum. Rept., 1916, No. 454, pp. 65-68.

TABLE I

Analyses of Solid Fuels Occurring in Canada

NOVA SCOTIA

—	Coal from New Campbellton, Victoria county, Sydney area								Anglo Coal Company, Limited				Whiteside mine, Whiteside, Richmond area	
Sample No.	1364		1365		1366		1496		1716		1804		1970	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	5·3	....	5·2	....	6·3	....	6·1	....	8·3	....	5·7	....	1·3	....
Ash..... "	12·2	12·8	10·2	10·7	9·9	10·6	9·0	9·6	14·1	15·4	6·9	7·3	15·7	15·8
Volatile matter... "	35·2	37·2	35·4	37·4	38·3	40·8	34·8	37·0	34·0	37·1	42·2	44·8	33·5	34·0
Fixed carbon..... "	47·3	50·0	49·2	51·9	45·5	48·6	50·1	53·4	43·6	47·5	45·2	47·9	49·5	50·2
Ultimate Analysis—														
Sulphur.....per cent	6·7	7·1	7·0	7·4	4·5	4·8	6·6	7·0	6·9	7·6	4·7	5·0	8·0	8·1
Calorific Value—														
Calories per gramme, gross	....	....	....	....	....	....	6,720	7,160	5,935	6,475	7,065	7,490	....	....
B. T. U. per pound, gross.	....	....	....	....	....	....	12,090	12,880	10,680	11,650	12,720	13,450	....	....
Fuel ratio	1·35		1·40		1·20		1·45		1·30		1·05		1·50	
Coking properties	Poor		Fair		Fair		Fair		Poor		Fair		Good	
Kind of sample	Mine				Prospect								Mine	
Location in deposit	Pit at surface...		250 feet in from collar of No. 1 tunnel; coal dropped from seam above.		6-foot seam in stream bed.		Anglo mine						100-foot level.	
Taken by	A. O. Hayes, Geological Survey, Ottawa						Mine operator						Received through Dept. of Public Works.	
Date of sampling	Season of 1918						March, 1919		July, 1920		May, 1921		January, 1922.	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

—	Inverness Railway and Coal Company, Inverness, Inverness area											
Sample No.	1659		1660		1791		1982		1320		1321	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	4·8	....	5·0	....	4·6	....	5·1	....	7·4	....	6·1	....
Ash..... "	11·1	11·6	10·1	10·6	10·7	11·2	10·4	11·0	7·3	7·9	16·5	17·5
Volatile matter..... "	38·6	40·6	37·4	39·4	37·6	39·4	37·3	39·2	37·6	40·6	33·6	35·8
Fixed carbon..... "	45·5	47·8	47·5	50·0	47·1	49·4	47·2	49·8	47·7	51·5	43·8	46·7
Ultimate Analysis—												
Sulphur.....per cent	6·3	6·6	5·6	5·9	5·9	6·1	6·7	7·1	5·3	5·7	7·2	7·7
Calorific Value—												
Calories per gramme, gross	6,620	6,960	6,690	7,040	6,660	6,980	6,600	6,950	6,310	6,820	5,575	5,940
B.T.U. per pound, gross	11,920	12,530	12,040	12,670	11,990	12,560	11,880	12,510	11,360	12,270	10,040	10,690
Fuel ratio	1·20		1·25		1·25		1·25		1·25		1·30	
Coking properties	Fair		Fair		Poor		Fair		Agglomerate		Weak agglomerate	
Specific gravity (true)	....		....		....		....		1·43		1·55	
Kind of sample	Mine								Mine or prospect			
Location in deposit	Inverness mine				No. 1 mine (generally known as "Inverness" coal); No. 10 east and west.		No. 1 mine; No. 11 level.		4-foot 9-inch section in middle of 13-foot seam.		18-inch section in middle of 13-foot seam.	
	No. 9 west level		No. 10 west level									
Taken by	Mine operators											
Date of sampling	January, 1920				April, 1921		April, 1922		April, 1918			

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

—	Inverness Railway and Coal Company, Inverness, Inverness area											
Sample No.	1345		1792		1793		1794		1947		2266	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	6·6	....	5·7	....	6·6	....	8·1	....	9·2	....	8·2	....
Ash..... "	13·9	14·9	16·8	17·8	12·0	12·8	8·4	9·1	6·7	7·4	11·3	12·3
Volatile matter..... "	35·3	37·8	33·3	35·3	37·7	40·4	37·5	40·8	38·0	41·8	37·0	40·3
Fixed carbon..... "	44·2	47·3	44·2	46·9	43·7	46·8	46·0	50·1	46·1	50·8	43·5	47·4
Ultimate Analysis—												
Sulphur.....per cent	3·4	3·6	8·7	9·2	7·8	8·4	5·6	6·1	4·8	5·2	6·5	7·1
Calorific Value—												
Calories per gramme, gross	5,910	6,325	5,525	5,855	6,175	6,610	6,310	6,860	6,430	7,080	6,045	6,585
B.T.U. per pound, gross	10,640	11,390	9,940	10,540	11,120	11,900	11,360	12,350	11,570	12,740	10,880	11,850
Fuel ratio	1·25		1·35		1·15		1·25		1·20		1·15	
Coking properties	Agglomerate		Poor		Poor		Agglomerate		Very poor		Poor	
Designation of coal	Slack											
Kind of sample			Prospect						Mine			
Location in deposit			Port Ban seam at outcrop.		4-foot seam at outcrop.				No. 4 mine; 1000-foot level.			
Taken by	Mine operators											
Date of sampling	June, 1918		April, 1921						November, 1921		May, 1923	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Continued

	Coal from Inverness area																	
	From St. Rose						From Chimney Corner						From Margaree					
Sample No.	1356		1357		1649		1358		1486		1648		1503					
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D				
Proximate Analysis—																		
Moisture.....per cent	5·3	....	5·0	....	4·4	....	9·2	....	8·0	....	8·9	....	8·8	....				
Ash..... "	10·9	11·6	11·6	12·2	12·7	13·3	10·3	11·4	8·1	8·8	8·2	9·0	8·6	9·4				
Volatile matter... "	34·5	36·4	34·4	36·2	36·6	38·3	32·9	36·2	33·2	36·1	34·2	37·5	33·7	37·0				
Fixed carbon..... "	49·3	52·0	49·0	51·6	46·3	48·4	47·6	52·4	50·7	55·1	48·7	53·5	48·9	53·6				
Ultimate Analysis—																		
Sulphur.....per cent	....	....	6·6	7·0	7·2	7·5	....	....	4·5	4·9	4·7	5·2	5·1	5·6				
Calorific Value—																		
Calories per gramme, gross	....	....	....	....	....	....	....	....	6,355	6,915	....	....	6,245	6,850				
B.T.U. per pound, gross...	....	....	....	....	....	....	....	....	11,440	12,450	....	....	11,240	12,330				
Fuel ratio	1·45		1·40		1·25		1·45		1·55		1·45		1·45					
Coking properties	Poor		Poor		Poor		Agglomerate		Agglomerate		Very poor		Agglomerate					
Designation of coal	Average sample										Parting and splintery coal omitted.							
Kind of sample	Mine				Prospect		Mine		Mine or prospect		Mine		Prospect					
Location in deposit	St. Rose mine. Crosscut main slope to back slope, south side.		Main slope; west haulage.		Simpson's No. 3 boring; 8-foot 3-inch seam at depth of 365 feet.		Doucet's mine; 3-foot seam.		3-foot 5-inch seam.		Chimney Corner Coal Company's (Doucet's) mine; 123 feet southwest of main slope.							
Taken by	A. O. Hayes, Geological Survey								Private individual.		A. O. Hayes		Private individual.					
Date of sampling	Season of 1918				Season of 1919		Season of 1918		March, 1919		Season of 1919		April, 1919					

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA—Concluded

—	Peat from Crane Lake bog, Stormont township, Guysborough county		Intercolonial Coal Mining Company, Limited, Westville, Pictou area; delivered to Department of Public Works at Rimouski, Quebec		Coal from a depth of 4 feet at West River, Colchester area		Kemptown coal mine, Kemptown, Colchester area	
Sample No	3011	3012	1819		1805		1363	
Moisture condition	D	D	R	D	R	D	R	D
Proximate Analysis—								
Moisture per cent	....	....	2·4	....	2·2	....	1·0	....
Ash "	10·1	7·4	19·1	19·6	18·0	18·4	15·0	15·1
Volatile matter "	59·9	63·0	25·3	25·9	10·3	10·5	17·5	17·7
Fixed carbon "	30·0	29·6	53·2	54·5	69·5	71·1	66·5	67·2
Ultimate Analysis—								
Sulphur per cent	0·7	0·7	1·2	1·3	5·8	5·9	1·1	1·1
Nitrogen "	1·0	1·2	....	....	....	....	....	....
Calorific Value—								
Calories per gramme, gross	5,200	5,285	6,570	6,735	6,685	6,835	7,175	7,245
B.T.U. per pound, gross	9,360	9,510	11,830	12,120	12,030	12,300	12,910	13,040
Fuel ratio	0·50	0·47	2·10		6·75		3·80	
Coking properties	....	....	Fair		Non-coking		Agglomerate	
Kind of sample	Prospect		Commercial		Prospect		Mine	
Location in mine	....		....		....		Face of tunnel north of fault.	
Taken by	A. Anrep, Geological Survey		Departmental employees.		Private individual.		A. O. Hayes, Geological Survey.	
Date of sampling	Season of 1924		June, 1921		May, 1921		Season of 1918	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NOVA SCOTIA AND PRINCE EDWARD ISLAND

—	Coals from Joggins—Chignecto area, N.S.												Peat from near Dundas, Queens county, P.E.I.
	Emerson Coal Company, Strathcona mine, River Hebert		"Minudie" coal from River Hebert		Coal from Maple Leaf colliery, Joggins						"Fundy" coal from Joggins		
	Delivered to Department of Militia and Defence		Delivered to Canadian National Railways at Moncton, N.B.		—		Delivered to Department of Militia and Defence, at Halifax, N.S.				Delivered to Department of Militia and Defence		
Sample No	1929		1628		1651		1652		1653		1928		1704
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	D
Proximate Analysis—													
Moisture.....per cent	2·4	....	4·1	....	4·4	....	4·6	....	4·8	....	2·9	....	....
Ash..... "	16·5	16·9	20·5	21·4	16·6	17·3	17·2	18·0	16·7	17·6	14·7	15·1	4·4
Volatile matter... "	33·9	34·7	31·6	33·0	32·5	34·0	32·4	34·0	32·4	34·0	34·5	35·6	65·4
Fixed carbon..... "	47·2	48·4	43·8	45·6	46·5	48·7	45·8	48·0	46·1	48·4	47·9	49·3	30·2
Ultimate Analysis—													
Sulphur.....per cent	7·0	7·2	4·9	5·1	6·9	7·2	6·1	6·4	6·3	6·6	6·6	6·8	0·4
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	....	....	0·9
Calorific Value—													
Calories per gramme, gross	6,485	6,640	5,930	6,185	6,265	6,555	6,150	6,450	6,185	6,500	6,585	6,780	4,895
B.T.U. per pound, gross...	11,670	11,960	10,680	11,140	11,280	11,800	11,080	11,610	11,140	11,700	11,860	12,210	8,810
Fuel ratio	1·40		1·40		1·45		1·40		1·40		1·40		0·46
Coking properties	Good		Fair		Fair		Fair		Fair		Good		....
Designation of fuel	.....		Slack		Run-of-mine								.....
Kind of sample	Commercial				Commercial; from car at the mine.		Commercial						Prospect
Location in mine	.....		Victoria seam										.....
Taken by	Departmental employees.		E. S. Malloch, Mines Branch.		J. Blizard, Mines Branch						Departmental employees.		A. Anrep, Geological Survey
Date of sampling	Oct. 3, 1921		Nov. 19, 1919		Jan. 7, 1920		January 8				Oct. 6, 1921		Season of 1919

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NEW BRUNSWICK

—	Peat from "A" bog, about 1 mile west of Gallagher station, Westmoreland county	Midland Coal Company, Limited, Salmon Harbour, Minto area				Grand Lake Coal Company, Minto, Minto area				Minto coal supplied to the Department of Public Works at Ottawa			
Sample No.	1685	1475		1488		1484		1485		1846		2079	
Moisture condition	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—													
Moisture.....per cent	....	1·3	....	1·3	....	1·0	....	0·9	....	5·6	....	5·9	....
Ash..... "	3·2	13·7	13·9	14·1	14·3	13·6	13·7	13·9	14·0	15·9	16·8	15·9	16·9
Volatile matter... "	64·7	33·7	34·1	33·0	33·4	31·6	31·9	30·9	31·2	26·6	28·2	28·1	29·9
Fixed carbon..... "	32·1	51·3	52·0	51·6	52·3	53·8	54·4	54·3	54·8	51·9	55·0	50·1	53·2
Ultimate Analysis—													
Sulphur.....per cent	0·5	7·6	7·7	6·1	6·2	6·0	6·1	6·4	6·5	4·9	5·2	4·7	5·0
Nitrogen..... "	1·1	....	....	....	....	....	....	....	....	....	....	....	....
Calorific Value—													
Calories per gramme, gross	5,510	7,210	7,305	7,215	7,310	7,350	7,425	7,245	7,315	6,505	6,885	6,390	6,790
B.T.U. per pound, gross...	9,920	12,980	13,150	12,990	13,160	13,230	13,370	13,050	13,170	11,710	12,400	11,500	12,220
Fuel ratio	0·50	1·50		1·55		1·70		1·75		1·95		1·80	
Coking properties	....	Fair		Poor		Fair		Fair		Fair		Good	
Designation of fuel	.....	.....		.....		.....		.....		Slack		.....	
Kind of sample	Prospect	.....		.....		.....		.....		Commercial		.....	
Location in deposit	.....	.....		No. 3 mine		No. 1 shaft		No. 2 shaft		.....		.....	
Taken by	A. Anrep, Geological Survey.	Mine operators								.....		Departmental employees.	
Date of sampling	Season of 1918..	January, 1919...		March, 1919.....		March, 1919.....				August, 1921....		Sept. 26, 1922.	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

NEW BRUNSWICK—Concluded

—	Coal from the Minto area supplied to the Department of Public Works at Ottawa				Coal from New Maryland, 8 miles southwest of Fredericton		Peat from Maugerville, Sunbury county, 4 miles southeast of Fredericton	Peat from Miscou island, Gloucester county	
Sample No.	2098		2099		1598		2683	2684	2685
Moisture condition	R	D	R	D	R	D	D	D	D
Proximate Analysis—									
Moisture.....per cent	0·9	....	4·7	....	0·7	....	....	....	....
Ash..... "	14·7	14·8	20·5	21·5	17·9	18·0	15·4	2·8	2·5
Volatile matter..... "	30·4	30·7	28·4	29·8	21·9	22·1	59·5	65·9	68·2
Fixed carbon..... "	54·0	54·5	46·4	48·7	59·5	59·9	25·1	31·3	29·3
Ultimate Analysis—									
Sulphur.....per cent	5·3	5·4	6·1	6·4	8·2	8·2	0·4	0·3	0·2
Nitrogen..... "	....	....	....	....	....	....	1·5	0·9	0·8
Calorific Value—									
Calories per gramme, gross	....	....	....	....	....	....	5,230	5,235	5,105
B.T.U. per pound, gross	....	....	....	....	....	....	9,420	9,420	9,190
Fuel ratio	1·80		1·65		2·70		0·42	0·48	0·43
Coking properties	Good		Fair		Fair		....	....	....
Kind of sample	Commercial				Prospect				
Taken by	Staff of Fuel Research Laboratories.				Submitted by J. G. S. Hudson, Mines Branch.		A. Anrep, Geological Survey		
Date of sampling	Nov. 12, 1922...		Nov. 16, 1922...		Oct. 6, 1919.....		Season of 1923		

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

QUEBEC

—	Peat samples										
	St. Anaclet bog, 7 miles east of Rimouski	L'Ile Verte "B" bog, 2½ miles north-east of Isle Verte	L'Ile Verte "A" bog, 1 mile north of Isle Verte, Temiscouata county		Bog, 1 mile north of St. Arsène, Temiscouata county		Clair bog, approximately 1 mile northwest of St. Charles junction, Bellechasse county			St. Joseph bog, 1 mile northwest of Ville Marie station, Levis county	
Sample No.	1698	1696	1694	1695	1692	1693	1699	1700	1701	1702	1703
Moisture condition	D	D	D	D	D	D	D	D	D	D	D
Proximate Analysis—											
Ash.....per cent	4·6	3·7	4·3	5·5	3·7	4·5	2·0	3·8	3·8	2·6	1·7
Volatile matter..... "	64·6	65·9	64·4	64·2	65·7	64·6	68·6	67·4	67·9	68·3	69·6
Fixed carbon..... "	30·8	30·4	31·3	30·3	30·6	30·9	29·4	28·8	28·3	29·1	28·7
Ultimate Analysis—											
Sulphur.....per cent	0·3	0·4	0·4	0·5	0·4	0·5	0·3	0·3	0·4	0·3	0·4
Nitrogen..... "	1·4	1·0	1·0	1·0	0·8	0·9	0·9	1·5	1·1	1·1	1·1
Calorific Value—											
Calories per gramme, gross	5,050	5,060	5,055	5,060	5,080	5,075	5,000	5,170	5,040	5,140	5,110
B.T.U. per pound, gross	9,090	9,110	9,100	9,110	9,140	9,140	9,000	9,300	9,070	9,250	9,200
Fuel ratio	0·48	0·46	0·49	0·47	0·46	0·48	0·43	0·43	0·42	0·43	0·41
Kind of sample	Prospect										
Taken by	A. Anrep, Geological Survey										
Date of sampling	Season of 1919										

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

QUEBEC—Concluded

—	Peat samples												
	St. Jean bog, 2½ miles north of Breakeyville and 9 miles south of Levis, Levis county		Breakeyville bog, 13 miles south of Levis				Sagamite bog, Stoneham township, 13 miles north of Quebec city	St. Luc bog, 1½ miles north of Champlain station, Champlain county				Bog 4½ miles north of Ste. Thérèse de Blainville, Terrebonne county	
Sample No.	2121	2122	2117	2118	2119	2120	2114	1745	1746	1747	1748	2123	2124
Moisture condition	D	D	D	D	D	D	D	D	D	D	D	D	D
Proximate Analysis—													
Ash.....per cent	2·2	7·8	4·2	5·3	5·3	8·4	18·9	10·1	9·3	7·5	14·8	9·6	10·0
Volatile matter..... "	71·4	68·0	68·6	68·4	67·6	65·4	54·9	62·7	63·6	64·7	59·1	64·4	63·1
Fixed carbon..... "	26·4	24·2	27·2	26·3	27·1	26·2	26·2	27·2	27·1	27·8	26·1	26·0	26·9
Ultimate Analysis—													
Sulphur.....per cent	0·3	0·3	0·3	0·4	0·3	0·5	0·4	0·3	0·2	0·3	0·3	0·3	0·3
Nitrogen..... "	*1·5	*1·3	1·5	1·6	1·5	1·5	1·8	2·2	1·9	2·2	2·1	1·3	1·4
Calorific Value—													
Calories per gramme, gross.....	....	....	5,780	5,705	5,500	5,520	4,780	5,435	5,720	5,760	4,350	5,615	5,695
B.T.U. per pound, gross.....	....	....	10,410	10,270	9,900	9,930	8,590	9,790	10,300	10,360	8,730	10,110	10,250
Fuel ratio.....	0·37	0·36	0·40	0·38	0·40	0·40	0·48	0·43	0·42	0·43	0·44	0·41	0·43
Kind of sample.....	Prospect.....												
Taken by.....	A. Anrep, Geological Survey.....												
Date of sampling.....	Season of 1922.....							Season of 1920.....				Season of 1922....	

*Approximate value.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ONTARIO

—	Peat samples													
	From Harrison's Corners, Stormont county				From bog 3 miles northwest of Harrowsmith junction, Frontenac county				From bog situated south of Verona, in Frontenac and Addington counties			From Clarke township, west Durham county		From Durham county
Sample No.	2718		2741A		1741	1742	1743	1744	1955	1956	1957	2075		2054
Moisture condition	R	D	R	D	D	D	D	D	D	D	D	R	D	D
Proximate Analysis—														
Moisture.....per cent	34·3	....	26·2	....	....	....	....	....	....	....	....	19·6	....	....
Ash..... "	3·1	4·8	14·5	19·7	6·2	6·1	8·1	9·7	17·3	14·8	13·3	8·9	11·1	10·8
Volatile matter..... "	42·2	64·2	....	....	62·7	62·3	62·0	60·4	60·7	61·6	61·6	51·6	64·2	68·7
Fixed carbon..... "	20·4	31·0	....	....	31·1	31·6	29·9	29·9	22·0	23·6	25·1	19·9	24·7	20·5
Ultimate Analysis—														
Sulphur.....per cent	....	....	....	....	0·3	0·3	0·4	0·5	2·3	1·7	1·6	....	....	....
Nitrogen..... "	....	....	....	....	2·0	2·0	1·8	2·1	2·7	2·9	3·1	....	....	....
Calorific Value—														
Calories per gramme, gross	....	....	....	....	4,925	4,875	4,790	4,760	4,570	4,550	4,680	3,970*	4,940*	4,850*
B.T.U. per pound, gross	....	....	....	....	8,870	8,780	8,620	8,570	8,230	8,180	8,420	7,150*	8,890*	8,730*
Fuel ratio	0·48		....		0·49	0·51	0·48	0·49	0·36	0·38	0·41	0·38		0·30
Specific gravity (apparent)	0·52		....		....	....	....	....	....	....	....	....		....
Kind of sample	Prospect													
Taken by	Private individual				A. Anrep, Geological Survey							Private individuals		
Date of sampling	April, 1924		June, 1924		Season of 1920				Season of 1921			September, 1922		Aug., 1922

* Corrected by using a representative value for sulphur content.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ONTARIO—Continued

—	Peat samples											
	From a bog near Bracebridge, Muskoka county	Bog ½ mile northeast of Aberfoyle, Wellington county	Bog 4½ miles northeast of Thedford, Lambton county	Point Pelee bog, 6½ miles southeast of Leamington, Essex county		Maybrook bog, Kerns, and Harley townships, Nipissing county	Drinkwater bog, Matheson township, Nipissing county		Bog, 1 mile west of Nellie Lake station, Nipissing county			
Sample No.	1684	1738	1667	1739	1740	1678	1679	1680	1671	1672	1673	1674
Moisture condition	D	D	D	D	D	D	D	D	D	D	D	D
Proximate Analysis—												
Ash.....per cent	8·9	18·4	21·8	13·8	15·6	9·4	9·4	9·5	6·2	5·9	5·8	7·1
Volatile matter..... "	63·5	56·8	55·1	60·3	57·1	61·1	63·4	62·9	65·3	65·5	66·9	63·4
Fixed carbon..... "	27·6	24·8	23·1	25·9	27·3	29·5	27·2	27·6	28·5	28·6	27·3	29·5
Ultimate Analysis—												
Sulphur.....per cent	0·7	1·0	0·5	0·6	0·9	0·5	0·5	0·5	0·3	0·3	0·3	0·3
Nitrogen..... "	1·9	1·8	2·6	3·3	3·4	1·9	2·2	2·2	1·9	1·9	1·7	1·9
Calorific Value—												
Calories per gramme, gross.....	5,295	4,360	4,140	4,815	4,585	4,755	4,750	4,735	5,145	5,245	5,140	5,030
B.T.U. per pound, gross.....	9,540	7,850	7,450	8,670	8,250	8,560	8,550	8,520	9,260	9,440	9,250	9,050
Fuel ratio.....	0·43	0·44	0·42	0·43	0·47	0·48	0·43	0·44	0·44	0·44	0·41	0·46
Kind of sample.....	Prospect.....											
Taken by.....	A. Anrep, Geological Survey.....											
Date of sampling.....	Season of 1919.	Season of 1920.	Season of 1919.	Season of 1920.....		Season of 1919.....						

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ONTARIO—Concluded

—	Peat samples										
	From bog 1 mile west of Nellie Lake station, Nipissing county			St. John bog, St. John township, Cochrane county	Brower bog, Brower and St. John townships, Cochrane county	Cochrane bog, Lamarche township, Cochrane county	Twin Cities bog, within the limits of Port Arthur and Fort William	William bog, on the western outskirts of Fort William	Arthur bog, 9 miles west of Fort William, directly north of Slate River station and near Rosslyn village		
Sample No.	1675	1676	1677	1681	1682	1683	1963	1964	1960	1961	1962
Moisture condition	D	D	D	D	D	D	D	D	D	D	D
Proximate Analysis—											
Ash ..... per cent	7·7	6·7	7·1	9·5	7·1	5·4	8·6	11·3	15·0	13·5	13·7
Volatile matter ..... "	64·3	63·7	62·9	62·0	64·1	65·5	62·4	63·2	57·0	57·7	58·6
Fixed carbon ..... "	28·0	29·6	30·0	28·5	28·8	29·1	29·0	25·5	28·0	28·8	27·7
Ultimate Analysis—											
Sulphur ..... per cent	0·6	0·5	0·4	0·5	0·4	0·6	0·5	0·4	0·4	0·6	0·6
Nitrogen ..... "	1·9	1·8	1·7	2·0	2·1	1·8	1·5	1·8	1·9	1·7	1·6
Calorific Value—											
Calories per gramme, gross	5,020	5,090	5,045	4,790	5,130	5,020	4,845	4,795	4,485	4,230	4,370
B.T.U. per pound, gross	9,040	9,160	9,080	8,610	9,240	9,040	8,720	8,630	8,070	7,620	7,860
Fuel ratio	0·44	0·46	0·48	0·46	0·45	0·44	0·46	0·41	0·49	0·50	0·47
Kind of sample	Prospect										
Taken by	A. Anrep, Geological Survey										
Date of sampling	Season of 1919						Season of 1921				

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ARCTIC ARCHIPELAGO, MANITOBA, AND SASKATCHEWAN

—	Coal from Hudson Bay Company's mine, on east shore of Salmon river about 4 miles from its mouth, Pond Inlet, Baffin island		Coal from property of H. Powne, Goodlands, Turtle Mountain area, Manitoba; sec. 25, tp. 1, R. 24 W. Prin. mer.						Excelsior Coal Company, Limited, Pinto, Estevan area, Saskatchewan; sec. 30, tp. 1, R. 5 W. 2 mer.				Manitoba and Saskatchewan Coal Company, Limited, Bienfait, Estevan area; sec. 10, tp. 2, R. 6 W. 2 mer.			
Sample No.	2904		1874		1875		1876		1450		1501		1438		1461	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—																
Moisture.....per cent	17·9*	....	34·1	....	30·0	....	31·0	....	35·5	....	33·6	....	35·1	....	32·9	....
Ash..... "	4·8	5·8	7·4	11·2	6·7	9·5	8·5	12·3	5·5	8·5	4·9	7·4	7·0	10·8	12·1	18·0
Volatile matter..... "	22·4	27·3	27·4	41·6	27·0	38·6	26·3	38·1	26·8	41·6	27·4	41·2	25·9	39·9	25·2	37·6
Fixed carbon..... "	54·9	66·9	31·1	47·2	36·3	51·9	34·2	49·6	32·2	49·9	34·1	51·4	32·0	49·3	29·8	44·4
Ultimate Analysis—																
Carbon.....per cent	61·1	74·4	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hydrogen..... "	5·0	3·6	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ash..... "	4·8	5·8	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sulphur..... "	0·4	0·5	0·6	1·0	0·5	0·7	0·5	0·8	0·4	0·6	....	....	0·3	0·5	....	....
Nitrogen..... "	0·5	0·6	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oxygen..... "	28·2	15·1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calorific Value—																
Calories per gramme, gross.....	5,475	6,670	3,605	5,470	4,100	5,855	3,955	5,730	4,060	6,300	....	....	3,925	6,045	....	....
B.T.U. per pound, gross.....	9,860	12,000	6,490	9,840	7,380	10,540	7,120	10,320	7,310	11,340	....	....	7,070	10,880	....	....
Fuel ratio.....	2·45		1·15		1·35		1·30		1·20		1·25		1·25		1·20	
Carbon-hydrogen ratio.....	12·3	20·7	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Coking properties.....	Non-coking		....		....		....		....		Non-coking		....		Non-coking	
Hoffmann potash test.....	4—3		....		....		....		....		....		....		....	

Designation of coal								Slack
Kind of sample	Mine	Prospect			Mine		Mine	Commercial
Location in mine		First 1 foot 6 inches.	Bottom 1 foot 6 inches.		Face of air shaft entry, 75 feet from mine head.		Taylorton seam; from 9-foot seam at bottom of 12-foot seam, 1,000 feet south and 900 feet west of tipple.	
Taken by	Private individuals				A. MacLean, Geologist, for Lignite Utilization Board.	Mine operators	A. MacLean	E. Stansfield, for Lignite Utilization Board.
Date of sampling	During 1923	September, 1921			Autumn of 1918.	April, 1919	Autumn of 1918.	

*This coal was brought from Pond Inlet by the steamer Arctic in the early autumn of 1924. Previous to that it had been stored in a canvas bag, probably for a year, and its lumps were found to have somewhat disintegrated. Therefore its moisture content will not correspond to that of freshly mined coal.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

SASKATCHEWAN

—	The Bienfait mine, Bienfait, Estevan area; sec. 19, tp. 2, R. 6 W. 2 mer.		Duncan Campbell's mine, Roche Percee, Estevan area; sec. 25, tp. 1, R. 7 W. 2 mer.		Wooloomooloo mine of McNeil and Rooks, Estevan, Estevan area; sec. 14, tp. 2, R. 8 W. 2 mer.		T. D. Munro's mine, Estevan; sec. 14, tp. 2, R. 8 W. 2 mer.		Sjodin's mine, Verwood, Willow Bunch area; subdiv. 14, sec. 29, tp. 6, R. 27 W. 2 mer.		
Sample No.	1446		1445		1425		1427		2771		
Moisture condition	R	D	R	D	R	D	R	D	R	AD	D
Proximate Analysis—											
Moisture.....per cent	36·3	....	34·5	....	36·0	....	36·5	....	38·1	25·2	....
Ash..... "	5·2	8·2	5·2	8·0	9·8	15·3	7·5	11·7	10·6	12·8	17·1
Volatile matter..... "	25·1	39·4	27·2	41·5	25·3	39·6	25·5	40·2	26·0	31·5	42·1
Fixed carbon..... "	33·4	52·4	33·1	50·5	28·9	45·1	30·5	48·1	25·3	30·5	40·8
Ultimate Analysis—											
Sulphur.....per cent	0·3	0·5	0·5	0·8	0·9	1·3	0·3	0·5	1·1	1·4	1·8
Calorific Value—											
Calories per gramme, gross	3,925	6,160	4,145	6,325	3,770	5,885	3,720	5,865	3,115	3,765	5,030
B.T.U. per pound, gross	7,070	11,090	7,460	11,390	6,780	10,590	6,700	10,560	5,610	6,780	9,060
Fuel ratio	1·35		1·20		1·15		1·20		0·97		
Coking properties	....		....		....		....		Non-coking		
Kind of sample	Mine										
Location in mine	Taylorton seam; from fresh room 450 feet north and 850 feet west of tipple.		Face of main entry, 300 feet from mine head.		Lower Estevan seam; from room about 65 feet from outcrop.		Upper Estevan seam; from new room 150 feet north and 50 feet east of mine head.		3 feet 9 inches of clean coal from seam.		
Taken by	A. MacLean, Geologist, for Lignite Utilization Board								Mining inspector, Northwest Territories and Yukon Branch.		
Date of sampling	Autumn of 1918								July 6, 1924		

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

SASKATCHEWAN—Concluded

—	"Readlyn" mine operated by Robt. Campkin at Readlyn, Willow Bunch area; east half of sub.div. 9, sec. 28, tp. 7, R. 27 W. 2 mer.			Jos. Lapointe's mine, Willow Bunch; sec. 14, tp. 5, R. 28 W. 2 mer.			David Palmer's mine, near Maxstone; east half of L.S. 4, sec. 21, tp. 6, R. 1 W. 3 mer.			Mine of Ferris and Lackey, East End, Cypress Hills area	
Sample No	2772			2773			2707			1663	
Moisture condition	R	AD	D	R	AD	D	R	AD	D	R	D
Proximate Analysis—											
Moisture.....per cent	36·2	21·4	....	40·0	23·1	....	35·8	23·0	....	36·6	....
Ash..... "	7·6	9·3	11·9	10·6	13·6	17·7	12·8	15·4	20·0	7·8	12·2
Volatile matter..... "	28·7	35·4	45·0	25·6	32·9	42·7	24·4	29·2	38·0	26·8	42·3
Fixed carbon..... "	27·5	33·9	43·1	23·8	30·4	39·6	27·0	32·4	42·0	28·8	45·5
Ultimate Analysis—											
Carbon.....per cent	38·5	47·5	60·3	34·2	43·9	57·0	36·5	43·8	56·9	....	....
Hydrogen..... "	6·6	5·5	4·0	6·6	5·3	3·6	6·2	5·2	3·3	....	....
Ash..... "	7·6	9·3	11·9	10·6	13·6	17·7	12·8	15·4	20·0	....	....
Sulphur..... "	1·4	1·7	2·2	0·5	0·6	0·8	1·7	2·0	2·7	0·4	0·7
Nitrogen..... "	0·5	0·6	0·7	0·5	0·6	0·7	0·4	0·5	0·6	....	....
Oxygen..... "	45·4	35·4	20·9	47·6	36·0	20·2	42·4	33·1	16·5	....	....
Calorific Value—											
Calories per gramme, gross	3,555	4,380	5,570	2,995	3,835	4,990	3,305	3,965	5,150	3,640	5,745
B.T.U. per pound, gross	6,400	7,880	10,020	5,390	6,900	8,980	5,950	7,140	9,270	6,550	10,340
Fuel ratio	0·95			0·93			1·10			1·05	
Carbon-hydrogen ratio	5·9	8·6	15·3	5·2	8·2	15·9	6·0	8·5	17·1	....	....
Coking properties	Non-coking			Non-coking			Non-coking			Non-coking	
Kind of sample	Mine										
Location in deposit	Face of main entry.			Face of main entry.			New north entry; across 6 feet clean coal, upper part of seam.			....	
Taken by	Mining inspector, Northwest Territories and Yukon Branch									Mine operators.	
Date of sampling	July 7, 1924.			July 8.			March 15, 1924.			March, 1920.	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA

—	Coals from Wainwright area		Coals from Pakan area					Majestic Collieries, Ltd., No. 105, Taber; sec. 31, tp. 9, R. 16 W. 4 mer.			Ferguson-McKenzie Coal Co., Ltd., No. 1107, Ryley or Dodds, Tofield area; L.S. 15, sec. 11, tp. 49, R. 18 W. 4 mer.		
	From Battleriver, sec. 19, tp. 46, R. 6 W. 4 mer.	From depth of 110 feet in well of Jas. Bell, south of Irma	From North Saskatchewan river, near Pakan		From North Saskatchewan river, near Limestone creek, near Pakan	From North Saskatchewan river, near Myrtle creek, tp. 58, R. 20							
Sample No.	2937	2938	2932	2933	2934	2930	2931	2747			2631		
Moisture condition	D	D	D	D	D	D	D	R	AD	D	R	AD	D
Proximate Analysis—													
Moisture.....per cent	....	....	....	....	....	....	....	14·5	12·5	....	28·4	19·7	....
Ash..... "	8·0	11·0	6·0	6·6	18·7	8·1	10·4	12·6	12·9	14·8	7·4	8·3	10·3
Volatile matter..... "	40·7	42·7	39·5	39·5	40·8	38·8	38·7	31·1	31·8	36·4	29·1	32·7	40·7
Fixed carbon..... "	51·3	46·3	54·5	53·9	40·5	53·1	50·9	41·8	42·8	48·8	35·1	39·3	49·0
Ultimate Analysis—													
Carbon.....per cent	....	59·8	....	....	....	66·1	....	54·4	55·6	63·5	46·6	52·2	65·0
Hydrogen..... "	....	4·5	....	....	....	4·4	....	5·4	5·3	4·5	6·2	5·6	4·2
Ash..... "	....	11·0	....	....	....	8·1	....	12·6	12·9	14·8	7·4	8·3	10·3
Sulphur..... "	....	0·8	....	....	....	1·1	....	1·1	1·2	1·3	0·5	0·6	0·8
Nitrogen..... "	....	1·2	....	....	....	1·0	....	1·3	1·3	1·5	1·0	1·1	1·3
Oxygen..... "	....	22·7	....	....	....	19·3	....	25·2	23·7	14·4	38·3	32·2	18·4
Calorific Value—													
Calories per gramme, gross	....	5,620	....	....	....	6,105	....	5,210	5,330	6,095	4,480	5,020	6,255
B.T.U. per pound, gross	....	10,120	....	....	....	10,990	....	9,380	9,590	10,970	8,070	9,040	11,260
Fuel ratio	1·25	1·10	1·40	1·35	0·99	1·35	1·30	1·35			1·20		
Carbon-hydrogen ratio	....	13·2	....	....	....	14·8	....	10·0	10·5	14·2	7·5	9·4	15·5
Coking properties	Non-coking	Non-cokiog	Non-coking	Non-coking	Non-coking	Non-coking	Non-coking	Non-coking					
Hoffmann potash test	....	....	....	....	....	....	....	....			2		

Designation of coal		Lump	
Kind of sample	Prospect	Commercial; 6 tons.	Mine
Taken by	G. S. Hume, Geological Survey	Mine operators	Mining inspector, Northwest Territories and Yukon Branch.
Date of sampling	Season of 1924	May 31, 1924; Lab. sample, June 27, 1924.	February, 1924

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Canadian Coal Company, Limited, No. 32, Cardiff, Edmonton area; sec. 24, tp. 55, R. 25 W. 4 mer.			Rose Deer Coal Mining Company, Limited, No. 347, Wayne, Drumheller area; sec. 7, tp. 28, R. 19 W. 4 mer.					Newcastle coal from Drumheller area			Pembina colliery, No. 227, Evansburg, Pembina area; secs. 29 and 30, tp. 53, R. 7 W. 5 mer.	
Sample No.	2745			2257		2746			2953			2744	
Moisture condition	R	AD	D	R	D	R	AD	D	R	AD	D	R	D
Proximate Analysis—													
Moisture per cent	22·3	18·8	....	18·2	....	18·4	16·0	....	18·5	14·8	....	17·5	....
Ash "	8·2	8·6	10·6	8·0	9·8	7·5	7·7	9·2	7·7	8·1	9·5	11·5	13·9
Volatile matter "	30·7	32·1	39·5	33·6	41·0	30·6	31·5	37·4	30·2	31·6	37·1	27·9	33·9
Fixed carbon "	38·8	40·5	49·9	40·2	49·2	43·5	44·8	53·4	43·6	45·5	53·4	43·1	52·2
Ultimate Analysis—													
Carbon per cent	50·3	52·6	64·7	....	....	53·9	55·5	66·1	57·0	59·5	69·8	53·4	64·7
Hydrogen "	5·9	5·7	4·4	....	....	5·7	5·6	4·5	5·8	5·6	4·6	5·3	4·0
Ash "	8·2	8·6	10·6	....	....	7·5	7·7	9·2	7·7	8·1	9·5	11·5	13·9
Sulphur "	0·2	0·2	0·3	....	....	0·5	0·5	0·6	0·4	0·4	0·5	0·2	0·3
Nitrogen "	1·0	1·0	1·3	....	.. .	1·2	1·2	1·4	1·2	1·3	1·5	0·7	0·9
Oxygen "	34·4	31·9	18·7	....	. .	31·2	29·5	18·2	27·9	25·1	14·1	28·9	16·2
Calorific Value—													
Calories per gramme, gross	4,715	4,925	6,060	5,330*	6,720*	5,200	5,350	6,370	5,250	5,485	6,440	4,930	5,975
B.T.U. per pound, gross	8,460	8,860	10,910	9,590*	11,740*	9,360	9,630	11,460	9,450	9,870	11,590	8,870	10,750
Fuel ratio	1·25			1·20		1·40			1·45			1·55	
Carbon-hydrogen ratio	8·6	9·3	14·8	....	....	9·4	9·9	14·6	9·8	10·7	15·2	10·1	16·1
Coking properties	Non-coking			....		Non-coking			Non-coking			Non-coking	
Softening temperature of ash °F	....			2100		....			....			....	

Designation of coal	Stove			Stove and nut	Egg
Kind of sample	Commercial; 6 tons.	Commercial; carload.	Commercial; 6 tons.	Commercial; 12 tons.	Commercial; 6 tons.
Location in deposit		Lower, or No. 1 Drumheller, seam		Upper, or No. 5 Drumheller, seam.	
Taken by	Mine operators	Mine operators		Coal dealer, Drumheller.	Coal dealer, Calgary.
Date of sampling	May 6, 1924. Lab. sample June 27, 1924.	March, 1923	May 2, 1924. Lab. sample June 27, 1924.	Nov. 27, 1924. Lab. sample Dec. 12, 1924.	May 9, 1924. Lab. sample June 27, 1924.

*Corrected for an assumed value of 0·4 per cent of sulphur.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Saunders Creek Collieries, Limited, No. 388, Saunders, Saunders area; tp. 40, R's 12 and 13 W. 5 mer.				Alexo Coal Company, Limited, No. 852, Alexo, Saunders area; sec. 27, tp. 40, R. 15 W. 5 mer.		Harlech Coal Company, Limited, No. 823, Harlech, Saunders area; sec. 10, tp. 41, R. 14 W. 5 mer.					
Sample No.	2034		2035		2036		2032		2033		2256	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	7·5	....	8·3	....	7·6	....	10·1	....	6·5	....	7·9	....
Ash..... "	4·9	5·3	5·3	5·8	5·2	5·6	7·9	8·8	12·2	13·0	7·3	7·9
Volatile matter..... "	34·2	36·9	33·0	35·9	33·9	36·7	32·0	35·6	30·2	32·3	33·2	36·0
Fixed carbon..... "	53·4	57·8	53·4	58·3	53·3	57·7	50·0	55·6	51·1	54·7	51·6	56·1
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	67·8	73·3	62·5	69·5	....	....	....	....
Hydrogen..... "	....	....	....	....	4·9	4·4	4·7	4·0	....	....	....	....
Ash..... "	....	....	....	....	5·2	5·6	7·9	8·8	....	....	....	....
Sulphur..... "	....	....	....	....	0·3	0·4	0·4	0·4	....	....	....	....
Nitrogen..... "	....	....	....	....	1·1	1·1	0·9	1·0	....	....	....	....
Oxygen..... "	....	....	....	....	20·7	15·2	23·6	16·3	....	....	....	....
Calorific Value—												
Calories per gramme, gross.....	....	....	....	....	6,495	7,025	....	....	....	....	6,480*	7,040*
B.T.U. per pound, gross.....	....	....	....	....	11,690	12,640	....	....	....	....	11,670*	12,670*
Fuel ratio.....	1·55		1·60		1·55		1·55		1·70		1·55	
Carbon-hydrogen ratio.....	....	....	....	....	13·9	16·9	13·2	17·4	....	....	....	....
Coking properties—												
1 gramme of coal.....	Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		....	
50 grammes of coal.....	Some indication of fusion.		Some indication of fusion.		Some indication of fusion.		No indication of fusion.		No indication of fusion.		Some indication of fusion (80 grammes).	

Kind of sample	Mine				Prospect	Commercial; carload.
Location in deposit	Main gangway	First, left off fourth incline.	Face of No. 2 level west, rooms 8, 10 and 12; face of No. 2 level east, rooms 4 and 6; main slope, 500 feet.	No. 2 seam; 2 feet 4 inches of coal.	Big showing of outcrop coal on No. 3 creek.	.....
Taken by	Employees of Board of Railway Commissioners for Canada					Mine operators..
Date of sampling	June 20, 1922			June 17, 1922		March, 1923....

*Corrected for an assumed value of 0·4 per cent of sulphur.

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Brookdale Collieries, Limited, No. 833, Lovettville, Coalspur area; sec. 16, tp. 47, R. 19 W. 5 mer.		Blackstone Coal, Limited, No. 829, near Lovettville; secs. 19 and 20, tp. 47, R. 19 W. 5 mer.				Foothills Collieries, Limited, No. 771, Foothills, Coalspur area; sec. 24, tp. 47, R. 20 W. 5 mer.		Coal Valley Mining Company, Limited, No. 1002, Coal Valley, Coalspur area; secs. 25 and 26, tp. 47, R. 20 W. 5 mer.			
Sample No	2014		2015		2016		1912		2013		2727	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	8·0	....	8·9	....	8·2	....	7·5	....	7·3	....	6·2	....
Ash..... "	12·9	14·0	10·2	11·2	16·6	18·1	8·7	9·4	13·0	14·0	9·4	10·1
Volatile matter..... "	34·5	37·5	32·0	35·1	31·1	33·9	35·2	38·0	34·1	36·7	33·2	35·4
Fixed carbon..... "	44·6	48·5	48·9	53·7	44·1	48·0	48·6	52·6	45·6	49·3	51·2	54·5
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	....	....	65·6	71·0	....	....	66·1	70·5
Hydrogen..... "	....	....	....	....	....	....	4·9	4·4	....	....	4·7	4·2
Ash..... "	....	....	....	....	....	....	8·7	9·4	....	....	9·4	10·1
Sulphur..... "	....	....	0·2	0·2	....	....	0·2	0·2	0·2	0·3	0·2	0·3
Nitrogen..... "	....	....	....	....	....	....	1·0	1·0	....	....	0·6	0·6
Oxygen..... "	....	....	....	....	....	....	19·6	14·0	....	....	19·0	14·3
Calorific Value—												
Calories per gramme, gross	....	....	5,965	6,545	....	....	6,180	6,680	5,835	6,295	6,320	6,740
B.T.U. per pound, gross	....	....	10,730	11,780	....	....	11,130	12,030	10,500	11,330	11,380	12,130
Fuel ratio	1·30		1·55		1·40		1·40		1·35		1·55	
Carbon-hydrogen ratio	....	....	....	....	....	....	13·3	16·1	....	....	14·2	16·7
Coking properties—												
1 gramme of coal	Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking	
50 grammes of coal	No indication of fusion		....		....		....		No indication of coking		....	

Designation of coal						Lump
Kind of sample	Mine					
Location in deposit	9-foot seam; lower workings.	No. 6 mine; 25-foot seam.	No. 1 mine; 8¾-foot seam.		60 to 70 feet above track level; 151 feet from foot-wall to hanging-wall.	
Taken by	Employees of Board of Railway Commissioners					Mine operators
Date of sampling	June, 1922			October, 1921	June, 1922	April, 1924

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Sterling Collieries Company, Limited, No. 769, Sterco, Coalspur area; sec. 35, tp. 47, R. 20 W. 5 mer.				Yellowhead Coal Company, Coalspur, mileage 37, Alberta coal branch, G.T.P. Ry.		McLeod River Hard Coal Company, Limited, No. 846, Mercoal, Coalspur area; sec. 25, tp. 48, R. 22 W. 5 mer.				Alberta Standard Coal Company, Limited, No. 775, Coalspur; sec. 14, tp. 49, R. 21 W. 5 mer.		Balkan Coal Company, Limited, Minehead mine, Coalspur; sec. 14, tp. 49, R. 21, W. 5 mer.	
Sample No.	2007		2917		2008		1952		2621		1953		2009	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	5·4	....	6·5	....	6·2	....	6·3	....	7·9	....	7·5	....	9·5	....
Ash..... "	8·1	8·6	13·2	14·1	6·7	7·2	6·9	7·3	8·0	8·6	10·2	11·1	11·3	12·5
Volatile matter... "	32·0	33·8	32·8	35·1	37·4	39·9	36·2	38·6	34·5	37·5	34·0	36·7	33·0	36·5
Fixed carbon..... "	54·5	57·6	47·5	50·8	49·7	52·9	50·6	54·1	49·6	53·9	43·3	52·2	46·2	51·0
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	....	....	68·4	73·1	65·3	70·8	64·3	69·5	....	....
Hydrogen..... "	....	....	....	....	....	....	5·0	4·6	4·9	4·4	4·9	4·4	....	....
Ash..... "	....	....	....	....	....	....	6·9	7·3	8·0	8·6	10·2	11·1	....	....
Sulphur..... "	0·3	0·3	0·2	0·3	....	....	0·2	0·2	0·2	0·3	0·2	0·2	0·2	0·2
Nitrogen..... "	....	....	....	....	....	....	1·0	1·1	0·7	0·8	0·9	1·0	....	....
Oxygen..... "	....	....	....	....	....	....	18·5	13·7	20·9	15·1	19·5	13·8	....	....
Calorific Value—														
Calories per gramme, gross.....	6,815	7,200	6,035	6,460	....	....	6,505	6,940	6,265	6,800	6,015	6,505	5,640	6,230
B.T.U. per pound, gross...	12,260	12,960	10,870	11,620	....	....	11,710	12,490	12,280	12,240	10,820	11,710	10,160	11,220
Fuel ratio.....	1·70		1·45		1·35		1·40		1·45		1·40		1·40	
Carbon-hydrogen ratio.....	....	....	....	....	....	....	13·7	16·0	13·3	16·3	13·2	15·9	....	....
Coking properties—														
1 gramme of coal.....	Very poor		Non-coking		Agglomerate		Non-coking		....		Non-coking		Non-coking	
50 grammes of coal.....	Poor to fair		....		Poor coke		....		....		....		Non-coking	

Designation of coal		Run-of-mine; picked sample.					
Kind of sample	Mine		Mine			Mine	Commercial; from loaded cars during shut-down of mine.
Location in deposit	Open pit; 60-foot seam above track level.		No. 1, 10-foot, seam; face of main entry.				
Taken by	Employee of Board of Railway Commissioners.	B. R. MacKay, Geological Survey.	Employees of Board of Railway Commissioners.		Mine operators	Employees of Board of Railway Commissioners.	
Date of sampling	June, 1922	Season of 1924	June, 1922	November, 1921	January, 1924	November, 1921	June, 1922

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal from mine of S. Drocuit on Red Willow creek, Halcourt, Halcourt area; L.S. 1, sec. 21, tp. 70, R. 10 W. 6 mer.			From mine of C. E. Richardson, Halcourt; L.S. 5, sec. 25, tp. 70, R. 11 W. 6 mer.			From Clairmont, Sexsmith area		From north of McMurray, sec. 17, tp. 91, R. 9 W. 4 mer.		
Sample No.	2480			2481			2097		2784		
Moisture condition	R	AD	D	R	AD	D	R	D	R	AD	D
Proximate Analysis—											
Moisture.....per cent	11·8	11·0	....	12·2	11·2	....	20·5	....	16·2	14·5	....
Ash..... "	6·5	6·6	7·4	4·3	4·3	4·9	4·1	5·2	7·9	8·0	9·4
Volatile matter..... "	33·1	33·4	37·5	33·8	34·2	38·5	31·4	39·5	36·2	37·0	43·2
Fixed carbon..... "	48·6	49·0	55·1	49·7	50·3	56·6	44·0	55·3	39·7	40·5	47·4
Ultimate Analysis—											
Carbon.....per cent	....	....	....	....	....	....	....	....	55·0	56·1	65·6
Hydrogen..... "	....	....	....	....	....	....	....	....	5·9	5·8	4·9
Ash..... "	....	....	....	....	....	....	....	....	7·9	8·0	9·4
Sulphur..... "	0·4	0·4	0·4	0·4	0·4	0·4	0·6	0·7	0·7	0·7	0·8
Nitrogen..... "	....	....	....	....	....	....	....	....	0·9	1·0	1·1
Oxygen..... "	....	....	....	....	....	....	....	....	29·6	28·4	18·2
Calorific Value—											
Calories per gramme, gross.....	6,320	6,370	7,160	6,485	6,560	7,380	5,835	7,340	5,205	5,310	6,205
B.T.U. per pound, gross.....	11,370	11,470	12,890	11,670	11,800	13,290	10,500	13,210	9,370	9,560	11,170
Fuel ratio.....		1·45			1·45			1·40		1·10	
Carbon-hydrogen ratio.....	....	....	....	....	....	....	....	....	9·3	9·7	13·4
Coking properties.....	Weak agglomerate			Weak agglomerate			Non-coking		Non-coking		
Kind of sample.....	Mine						Prospect				
Location in deposit.....	.....			South rib of southeast entry			6-foot 3-inch seam at a depth of 155 feet in bore hole.		.....		
Taken by.....	Mining inspector, Northwest Territories and Yukon Branch.						Sent by D. B. Dowling, Geological Survey.		S. C. Ells, Mines Branch..		
Date of sampling.....	August 29, 1923.....			August 27.....			Season of 1922.....		Season of 1924.....		

33842—7½

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal claims of Allan and Johnston, Sheep creek, Pekisko area				P. Burns' coal mine, south branch of Sheep creek, Highwood area; tp. 19, R. 7 W. 5 mer.							
	Sec. 36, tp. 19, R. 5 W. 5 mer.		Tp. 19, R. 6 W. 5 mer.									
Sample No.	2531		2532		1923		1924		1925		2526	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture per cent	2·6	....	0·4	....	0·4	....	0·4	....	0·5	....	0·5	....
Ash "	7·9	8·2	13·0	13·1	4·4	4·4	13·9	13·9	15·4	15·5	11·8	11·9
Volatile matter "	21·8	22·3	16·7	16·8	16·4	16·5	14·7	14·7	13·4	13·5	14·8	14·9
Fixed carbon "	67·7	69·5	69·9	70·1	78·8	79·1	71·0	71·4	70·7	71·0	72·9	73·2
Ultimate Analysis—												
Carbon per cent	....	....	....	....	86·7	87·0	78·6	78·9	76·7	77·1	....	....
Hydrogen "	....	....	....	....	4·5	4·4	4·0	4·0	3·8	3·7	....	....
Ash "	....	....	....	....	4·4	4·4	13·9	13·9	15·4	15·5	....	....
Sulphur "	0·8	0·8	1·6	1·6	0·9	1·0	0·9	0·9	0·4	0·4	1·0	1·0
Nitrogen "	....	....	....	....	1·4	1·4	1·2	1·2	1·1	1·1	....	....
Oxygen "	....	....	....	....	2·1	1·8	1·4	1·1	2·6	2·2	....	....
Calorific Value—												
Calories per gramme, gross	6,900	7,090	7,400	7,435	8,295	8,330	7,360	7,390	7,180	7,215	7,535	7,570
B.T.U. per pound, gross	12,420	12,760	13,320	13,380	14,930	14,990	13,250	13,300	12,920	12,990	13,560	13,620
Fuel ratio	3·10		4·20		4·80		4·85		5·25		4·90	
Carbon-hydrogen ratio	....	....	....	....	19·4	19·6	19·7	19·9	20·4	20·7	....	....
Coking properties	Non-coking		Fair		Poor		Agglomerate		Non-coking		Non-coking	
Kind of sample	Prospect				Mine							
Location in deposit	7-foot seam; clean, lump coal.		10-foot seam; clean, crushed coal.		12-foot seam; 2,200 feet in from tunnel entrance; selected sample.		12-foot seam; 2,200 feet in from tunnel entrance.		15-foot seam; Sharp creek.		5-foot 4-inch seam; clean, lump coal.	
Taken by	J. R. Marshall, Geological Survey											
Date of sampling	Season of 1923				Season of 1921						Season of 1923	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	P. Burns' coal mine, Highwood area; tp. 19, R. 7 W. 5 mer.				Coal from Pocaterra creek, Kananaskis district, Highwood area							
					From tp. 19, R. 8 W. 5 mer.		From Mackay and Dippie claims, tp. 19, R. 8 W. 5 mer.					
Sample No	2528		2530		1926		2533		2534		2535	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	0·4	....	0·3	....	0·6	....	0·6	....	1·2	....	2·5	....
Ash..... "	11·3	11·3	13·0	13·0	6·0	6·0	19·4	19·5	8·7	8·8	13·0	13·4
Volatile matter..... "	15·5	15·6	12·6	12·6	17·1	17·2	15·5	15·6	15·5	15·7	17·3	17·7
Fixed carbon..... "	72·8	73·1	74·1	74·4	76·3	76·8	64·5	64·9	74·6	75·5	67·2	68·9
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	85·2	85·7	....	....	....	....	....	....
Hydrogen..... "	....	....	....	....	4·6	4·6	....	....	....	....	....	....
Ash..... "	....	....	....	....	6·0	6·0	....	....	....	....	....	....
Sulphur..... "	1·0	1·0	0·6	0·6	0·6	0·6	0·6	0·6	0·6	0·6	0·6	0·6
Nitrogen..... "	....	....	....	....	1·6	1·6	....	....	....	....	....	....
Oxygen..... "	....	....	....	....	2·0	1·5	....	....	....	....	....	....
Calorific Value—												
Calories per gramme, gross	7,540	7,570	7,295	7,315	8,065	8,110	6,785	6,820	7,535	7,620	6,590	6,755
B.T.U. per pound, gross	13,570	13,620	13,130	13,170	14,520	14,600	12,210	12,280	13,560	13,720	11,860	12,160
Fuel ratio	4·70		5·90		4·45		4·15		4·80		3·90	
Carbon-hydrogen ratio	....	....	....	....	18·5	18·7	....	....	....	....	....	....
Coking properties	Non-coking		Non-coking		Agglomerate		Non-coking		Non-coking		Non-coking	
Kind of sample	Mine				Prospect							
Location in deposit	11-foot 5-inch seam; clean, solid coal.		Upper portion of Rickerts seam; 9 feet of solid lump.		9-foot seam		West seam; coal 16 feet, shale 2 feet, coal 3 feet; clean, solid coal.		Big Twins seam; lower 13 feet; clean, solid, lump coal.		Grizzly Bear seam; upper 7 feet; solid, lump coal.	
Taken by	J. R. Marshall, Geological Survey											
Date of sampling	Season of 1923				Season of 1921		Season of 1923					

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal from Mackay and Dippie claims, Pocaterra creek, Highwood area; tp. 19, R. 8 W. 5 mer.		From Ings claim, Evans-Thomas (Porcupine) creek, Cascade area; tp. 21, R. 8 W. 5 mer.				From Kananaskis river, 3 miles south of Ribbon creek, southeast of Banff, Cascade area; sec. 22, tp. 22, R. 9 W. 5 mer.		From Ribbon creek, Kananaskis river, Cascade area; sec. 3, tp. 23, R. 9 W. 5 mer.	
Sample No.	2536		2537		2538		2539		2896		2897	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	2·3	....	1·4	....	1·4	....	2·0	....	0·7	....	1·7	....
Ash..... "	8·2	8·4	15·7	15·9	10·6	10·8	9·5	9·7	16·3	16·4	12·6	12·8
Volatile matter..... "	17·1	17·5	14·3	14·5	18·2	18·4	17·3	17·7	16·1	16·2	12·6	12·8
Fixed carbon..... "	72·4	74·1	68·6	69·6	69·8	70·8	71·2	72·6	66·9	67·4	73·1	74·4
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	....	....	....	....	....	....	77·0	78·4
Hydrogen..... "	....	....	....	....	....	....	....	....	....	....	3·7	3·5
Ash..... "	....	....	....	....	....	....	....	....	....	....	12·6	12·8
Sulphur..... "	0·7	0·7	0·8	0·8	0·6	0·6	1·0	1·0	1·2	1·2	0·5	0·5
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	1·2	1·2
Oxygen..... "	....	....	....	....	....	....	....	....	....	....	5·0	3·6
Calorific Value—												
Calories per gramme, gross	7,065	7,230	6,765	6,860	7,120	7,220	7,110	7,255	7,145	7,200	7,220	7,345
B.T.U. per pound, gross	12,720	13,010	12,180	12,350	12,820	13,000	12,800	13,060	12,860	12,960	12,990	13,220
Fuel ratio	4·20		4·80		3·85		4·10		4·15		5·80	
Carbon-hydrogen ratio	....	....	....	....	....	....	....	....	....	....	21·0	22·1
Coking properties	Non-coking		Non-coking		Non-coking		Non-coking		Fair		Fair	
Kind of sample	Prospect											
Location in deposit	Grizzly Bear seam; lower 2 feet 4 inches; clean, lump coal.		Three Buffaloes seam; upper 5 feet; firm, compact, clean coal.		Grass root sample from 10-foot 8-inch seam.		Grass root sample from 12-foot seam.		5-foot seam		14-foot seam	
Taken by	J. R. Marshall, Geological Survey								James McEvoy, Geologist, for Dominion Fuel Board.			
Date of sampling	Season of 1923								Season of 1924			

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal samples from south and east of Canmore, Cascade area															
	From Wind Mountain creek; sec. 7, tp. 24, R. 9 W. 5 mer.								From Cairnes gulley; sec. 12, tp. 24, R. 10 W. 5 mer.							
Sample No.	2421		2418		2419		2420		2413		2414		2415		2416	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—																
Moisture.....per cent	7·4	....	6·5	....	7·5	....	4·0	....	4·6	....	7·2	....	6·7	....	6·0	....
Ash..... "	9·2	9·9	18·7	20·0	15·4	16·6	12·7	13·3	11·4	12·0	8·3	9·0	11·3	12·1	13·1	14·0
Volatile matter..... "	10·2	11·0	9·6	10·3	9·3	10·1	11·0	11·4	12·2	12·7	10·2	11·0	9·4	10·1	11·3	11·9
Fixed carbon..... "	73·2	79·1	65·2	69·7	67·8	73·3	72·3	75·3	71·8	75·3	74·3	80·0	72·6	77·8	69·6	74·1
Ultimate Analysis—																
Sulphur.....per cent	0·8	0·9	0·6	0·7	0·6	0·7	0·9	0·9	0·8	0·8	0·7	0·8	0·8	0·8	0·9	1·0
Calorific Value—																
Calories per gramme, gross.....	7,090	7,655	6,210	6,645	6,510	7,035	7,110	7,405	7,000	7,340	7,195	7,750	7,080	7,590	6,670	7,095
B.T.U. per pound, gross.....	12,760	13,770	11,180	11,960	11,710	12,660	12,790	13,330	12,600	13,210	12,940	13,950	12,740	13,660	12,010	12,780
Fuel ratio.....	7·15		6·75		7·30		6·60		5·90		7·30		7·70		6·20	
Coking properties.....	Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking	
Kind of sample.....	Prospect.															
Location in deposit.....	3-foot seam, first or lowest on creek: half of channel sample.		Upper, 45½-inch, bench of second seam up creek; two half-channel samples.				Lower, 23-inch, bench of second seam.		4-foot 6-inch seam; the first below Marsh seams.		Upper half of 7-foot 2-inch seam, 6 feet below last sample.		Lower half of same 7-foot 2-inch seam.		Joe, 6-foot 2-inch seam, 75 feet below last.	
Taken by.....	D. B. Dowling, Geological Survey.															
Date of sampling.....	Season of 1923.															

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal samples from south and east of Canmore, Cascade area; sec. 11, tp. 24, R. 10 W. 5 mer.															
Sample No.	2417		2409		2410		2411		2408		2405		2406		2407	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—																
Moisture.....per cent	6·0	....	4·3	....	3·9	....	3·7	....	4·5	....	8·4	....	7·3	....	6·0	....
Ash..... "	9·7	10·3	11·7	12·2	4·1	4·2	12·0	12·5	7·3	7·7	12·9	14·1	10·1	10·9	5·8	6·2
Volatile matter..... "	13·2	14·1	11·8	12·3	13·5	14·0	12·9	13·4	13·1	13·7	16·2	17·7	14·0	15·1	14·1	15·0
Fixed carbon..... "	71·1	75·6	72·2	75·5	78·5	81·8	71·4	74·1	75·1	78·6	62·5	68·2	68·6	74·0	74·1	78·8
Ultimate Analysis—																
Sulphur.....per cent	0·7	0·7	1·1	1·2	0·8	0·9	1·1	1·2	0·9	1·0	0·7	0·8	0·7	0·8	0·8	0·8
Calorific Value—																
Calories per gramme, gross.....	6,860	7,295	7,045	7,365	7,690	8,005	7,130	7,405	7,260	7,600	6,345	6,930	6,935	7,480	7,190	7,650
B.T.U. per pound, gross.....	12,350	13,130	12,680	13,260	13,840	14,410	12,830	13,330	13,070	13,680	11,420	12,470	12,480	13,470	12,940	13,770
Fuel ratio.....	5·35		6·10		5·80		5·55		5·75		3·85		4·90		5·25	
Coking properties.....	Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking	
Kind of sample.....	Prospect															
Location in deposit.....	Seam No. 5, 7-foot 3-inch; lower tunnel.		Marsh seam; upper tunnel; 6-foot 11-inch coal.		Marsh seam; lower tunnel, upper bench; 26-inch coal.		Marsh seam; middle bench; 18-inch coal.		Upper Marsh seam, lower, 6-foot 10-inch, portion; 75 feet above Marsh seam.		Smith creek seam No. 3; upper, 41-inch, bench.		Smith creek; bottom, 48-inch, bench.		Smith creek seam No. 4, 8-foot seam.	
Taken by.....	D. B. Dowling, Geological Survey															
Date of sampling.....	Season of 1923															

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Brazeau Collieries, Limited, No. 256, Nordegg, Nordegg area; sec. 22, tp. 40, R. 15 W. 5 mer.				Cadomin Coal Company, Limited, No. 693, Cadomin, Mountain Park area; tp. 47, R. 23 W. 5 mer.		Luscar Collieries, Limited, No. 905, Luscar, Mountain Park area; sec. 23, tp. 47, R. 24, W. 5 mer.							
Sample No	2037		2038		2916		1983A		2012		2065		2915	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	1·2	....	1·4	....	1·0	....	0·8	....	0·9	....	1·0	....	0·6	....
Ash..... "	7·6	7·7	7·3	7·4	12·7	12·8	6·8	6·9	15·1	15·2	14·4	14·5	16·0	16·1
Volatile matter... "	17·3	17·5	17·0	17·3	26·8	27·1	24·8	25·0	21·1	21·3	21·2	21·4	19·6	19·7
Fixed carbon..... "	73·9	74·8	74·3	75·3	59·5	60·1	67·6	68·1	62·9	63·5	63·4	64·1	63·8	64·2
Ultimate Analysis—														
Carbon.....per cent	....	....	....	....	75·4	76·2	....	....	....	....	....	....	74·1	74·6
Hydrogen..... "	....	....	....	....	4·7	4·6	....	....	....	....	....	....	4·2	4·1
Ash..... "	....	....	....	....	12·7	12·8	....	....	....	....	....	....	16·0	16·1
Sulphur..... "	....	....	....	....	0·3	0·3	0·3	0·3	....	....	....	....	0·3	0·3
Nitrogen..... "	....	....	....	....	1·0	1·0	....	....	....	....	....	....	1·0	1·0
Oxygen..... "	....	....	....	....	5·9	5·1	....	....	....	....	....	....	4·4	3·9
Calorific Value—														
Calories per gramme, gross	....	....	....	....	7,330	7,400	7,970	8,035	....	....	....	....	7,185	7,230
B.T.U. per pound, gross...	....	....	....	....	13,190	13,320	14,340	14,460	....	....	....	....	12,930	13,010
Fuel ratio	4·25		4·35		2·20		2·70		3·00		3·00		3·25	
Carbon-hydrogen ratio	....	....	....	....	16·2	16·5	....	....	....	....	....	....	17·8	18·1
Coking properties—														
1 gramme of coal.....	Good		Good		....		Good; large lump		Poor		Fair to good		....	

50 grammes of coal.....	Good; large lump	Good; large lump	....	....	Fair; but soft	Good	....
Designation of coal.....	.....		Run-of-mine....	.....	.....	.....	Partings or bone discarded.
Kind of sample.....	Mine.....		Commercial; from 1000-ton pile.	.....	Mine.....	Mine and tipple.	Mine.....
Location in deposit.....	No. 3 mine; face of No. 5 level.	No. 2 mine; face of No. 2 counter level.	.....	.....	9-foot seam; west entry.	From west and east No. 2 entries; also from loaded cars.	Jewel mine; face of workings,1,400 feet from mine mouth; across 37-foot seam.
Taken by.....	Employees of Board of Railway Commissioners for Canada.		B. R. MacKay, Geological Survey.	Employees of Board of Railway Commissioners...			B. R. MacKay.
Date of sampling.....	June 17, 1922.....		Season of 1924..	May, 1922.....	June, 1922.....	August, 1922....	Season of 1924...

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal from Gregg river (south branch of McLeod river) 500 feet below mouth of Tepee creek; Mountain Park area; sec. 23, tp. 48, R. 24 W. 5 mer.	Blue Diamond Coal Company, Limited, No. 429, Brulé Mines, Brulé area; sec. 16, tp. 50, R. 27 W. 5 mer.												Solomon Creek Coal Company, Limited, No. 832, near Brulé Mines; sec. 31, tp. 50, R. 27 W. 5 mer.	
Sample No.	2914			1999		2001		2069		1998		2000		2002		2003	
Moisture condition	R	AD	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—																	
Moisture.....per cent	7·5	6·7	....	1·0	....	0·9	....	0·7	....	0·9	....	0·9	....	0·6	....	0·9	....
Ash..... "	7·2	7·3	7·8	12·1	12·2	15·1	15·2	17·1	17·2	11·4	11·5	12·3	12·5	7·3	7·3	13·7	13·8
Volatile matter..... "	34·9	35·2	37·7	17·7	17·9	17·4	17·6	17·5	17·6	17·9	18·1	18·0	18·1	19·4	19·5	21·7	21·9
Fixed carbon..... "	50·4	50·8	54·5	69·2	69·9	66·6	67·2	64·7	65·2	69·8	70·4	68·8	69·4	72·7	73·2	63·7	64·3
Ultimate Analysis—																	
Carbon.....per cent	66·3	66·9	71·7	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hydrogen..... "	5·1	5·0	4·6	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ash..... "	7·2	7·3	7·8	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sulphur..... "	0·3	0·3	0·3	....	....	....	....	....	....	....	....	....	....	....	....	0·8	0·8
Nitrogen..... "	0·9	0·9	1·0	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oxygen..... "	20·2	19·6	14·6	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calorific Value—																	
Calories per gramme, gross	6,355	6,410	6,870	....	....	....	....	....	....	....	....	....	....	....	....	7,250	7,320
B.T.U. per pound, gross	11,440	11,540	12,370	....	....	....	....	....	....	....	....	....	....	....	....	13,050	13,180
Fuel ratio		1·45		3·90		3·85		3·70		3·90		3·85		3·75		2·95	
Carbon-hydrogen ratio	13·1	13·4	15·7	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Coking properties—																	
1 gramme of coal	Non-coking			Poor to fair		Poor		Fair		Fair		Fair to good		Good		Good	
50 grammes of coal	....			Fair		Fair		Good		Poor to fair		Fair to good		Fair		Fair to good	
Kind of sample	Prospect			Mine				Tipple; from 6 cars.		Mine							
Location in deposit	5-foot seam; surface sample.			No. 3 south; counter to main level.		No. 3 south; main entry, right.		Face of No. 2 south; main slope.		Face of No. 2 south slope.		No. 1 level off No. 2 south slope.				No. 2 mine; 8-foot seam, at a depth of 380 feet.	
Taken by	B. R. MacKay, Geological Survey.			Employees of Board of Railway Commissioners for Canada													
Date of sampling	Season of 1924.			June, 1922.				August, 1922.		June, 1922.							

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Continued

—	Coal from Thoreau creek, Hay river, Brulé area; sec. 27, tp. 52, R. 4 W. 6 mer.	Coals from Smoky River area							
		From 2½ miles up Teare creek; sec. 34, tp. 56, R. 7 W. 6 mer.		From west of Smoky river, opposite to Sulphur river; sec. 24, tp. 56, R. 9 W. 6 mer.		From west of Smoky river, sec. 8, tp. 58, R. 8 W. 6 mer.		From Smoky and Muskeg rivers; sec. 14, tp. 58, R. 8 W. 6 mer.	
						From old Hoppé leases			
Sample No	2885	2893		2886		2892		2894	
Moisture condition	R	R	D	R	D	R	D	R	D
Proximate Analysis—									
Moisture.....per cent	4·8	2·9	....	5·5	....	1·4	....	1·4	....
Ash..... "	14·0	8·9	9·2	6·7	7·1	5·5	5·6	8·8	8·9
Volatile matter..... "	25·7	24·0	24·8	26·3	27·8	19·3	19·6	19·3	19·6
Fixed carbon..... "	55·5	64·2	66·0	61·5	65·1	73·8	74·8	70·5	71·5
Ultimate Analysis—									
Carbon.....per cent	66·3	75·8	78·1	....	....	....	....	79·4	80·6
Hydrogen..... "	4·2	4·6	4·4	....	....	....	....	4·2	4·1
Ash..... "	14·0	8·9	9·2	....	....	.....	....	8·8	8·9
Sulphur..... "	0·3	0·4	0·4	0·3	0·3	0·3	0·4	0·4	0·4
Nitrogen..... "	0·9	1·1	1·1	....	....	.....	....	1·1	1·1
Oxygen..... "	14·3	9·2	6·8	....	....	....	....	6·1	4·9
Calorific Value—									
Calories per gramme, gross	6,225	7,275	7,490	6,635	7,025	8,060	8,180	7,620	7,725
B.T.U. per pound, gross	11,200	13,090	13,480	11,940	12,640	14,510	14,720	13,710	13,910
Fuel ratio	2·15	2·65		2·35		3·80		3·65	
Carbon-hydrogen ratio	15·8	16·6	17·8	....	....	....	....	18·8	19·5
Coking properties	Non-coking	Poor		Non-coking		Non-coking		Poor	
Kind of sample	Prospect								
Location in deposit	37-foot seam					13-foot seam		5-foot 6-inch seam.	
Taken by	James McEvoy, Geologist, for Dominion Fuel Board								
Date of sampling	Season of 1924								

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

ALBERTA—Concluded

—	Coals from Smoky River area											
	From Smoky and Muskeg rivers; sec. 14, tp. 58, R. 8 W. 6 mer.		From west of Smoky river; sec. 15, tp. 58, R. 8 W. 6 mer.		Meyer's claim, Sheep river; sec. 4, tp. 58, R. 9 W. 6 mer.				Campbell claim, Sheep river; sec. 22, tp. 58, R. 9 W. 6 mer.			
	From old Hoppé leases											
Sample No.	2895		2891		2889		2890		2887		2888	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	3·1	....	2·4	....	2·1	....	4·0	....	1·5	....	1·4	....
Ash..... "	7·9	8·1	11·9	12·2	4·6	4·7	18·7	19·5	5·4	5·5	5·0	5·1
Volatile matter..... "	20·8	21·5	19·0	19·5	18·5	18·9	17·2	17·9	17·0	17·2	17·4	17·6
Fixed carbon..... "	68·2	70·4	66·7	68·3	74·8	76·4	60·1	62·6	76·1	77·3	76·2	77·3
Ultimate Analysis—												
Carbon.....per cent	....	....	....	....	82·4	84·2	....	....	83·8	85·0	....	....
Hydrogen..... "	....	....	....	....	4·3	4·1	....	....	4·2	4·1	....	....
Ash..... "	....	....	....	....	4·6	4·7	....	....	5·4	5·5	....	....
Sulphur..... "	0·3	0·3	0·3	0·3	0·5	0·5	0·5	0·5	0·4	0·4	0·5	0·5
Nitrogen..... "	....	....	....	....	1·0	1·1	....	....	1·0	1·1	....	....
Oxygen..... "	....	....	....	....	7·2	5·4	....	....	5·2	3·9	....	....
Calorific Value—												
Calories per gramme, gross	7,350	7,580	7,070	7,245	7,830	8,000	6,070	6,320	7,945	8,070	8,035	8,140
B.T.U. per pound, gross	13,230	13,650	12,730	13,040	14,090	14,390	10,930	11,370	14,300	14,520	14,460	14,660
Fuel ratio	3·30		3·50		4·05		3·50		4·45		4·35	
Carbon-hydrogen ratio	....	....	....	....	19·3	20·4	....	....	19·8	20·7	....	....

Coking properties	Weak agglomerate	Weak agglomerate	Weak agglomerate	Weak agglomerate	Non-coking	Non-coking
Kind of sample	Prospect					
Location in deposit	9-foot seam	18-foot seam	14-foot seam	4-foot seam	Upper, 10½ feet.	Lower, 3½ feet.
Taken by	James McEvoy, Geologist, for Dominion Fuel Board					
Date of sampling	Season of 1924					

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA

—	From property of Northern Coal and Coke Company, north side of Aldridge creek, upper Elk River valley, Elk River (Crowsnest) area	Coal samples from the Peace River area									
		Mined by Neil Gething, Hudson's Hope		From the vicinity of Pine pass		From Carbon creek, entering Peace river a few miles west of Rocky Mountain canyon		From lot 1032, Gething creek, Rocky Mountain portage		From main Gething creek, Peace River canyon	
Sample No.	1724	2479		1654		2520		1664		2223	2222
Moisture condition	R D	R	D	R	D	R	D	R	D	R D	R D
Proximate Analysis—											
Moisture.....per cent	1·2	2·7	....	0·9	....	1·9	....	1·9	....	1·1	1·1 ....
Ash..... "	8·2 8·3	5·0	5·2	9·0	9·1	5·1	5·2	1·8	1·8	5·5 5·5	3·3 3·4
Volatile matter... "	26·6 26·9	22·0	22·6	16·0	16·1	23·3	23·8	18·2	18·6	24·0 24·3	23·8 24·0
Fixed carbon..... "	64·0 64·8	70·3	72·2	74·1	74·8	69·7	71·0	78·1	79·6	69·4 70·2	71·8 72·6
Ultimate Analysis—											
Sulphur.....per cent	....	0·8	0·8	0·6	0·6	0·7	0·7	....	....	....	....
Calorific Value—											
Calories per gramme, gross	....	7,975	8,200	7,785	7,850	7,760	7,910	....	....	....	....
B.T.U. per pound, gross...	....	14,350	14,760	14,010	14,140	13,970	14,240	....	....	....	....
Fuel ratio	2·40	3·20		4·65		3·00		4·25		2·90	3·00
Coking properties	Good	Fair		Agglomerate		Weak agglomerate		Agglomerate		Very poor	Non-coking

Designation of coal		Blacksmith coal; stored in open 1 year prior to shipment from mine.					
Kind of sample	Prospect	Commercial; from pile at Peace River, Alberta.	Prospect				
Location in deposit	12-foot seam				5-foot seam	Falls seam	
						Top 8 inches	Middle 11 inches
Taken by	J. R. Marshall, Geological Survey.	Mining inspector, Northwest Territories and Yukon Branch.	Private individuals			F. H. McLearn, Geological Survey.	
Date of sampling	Season of 1920	August or September, 1923.	Received January 12, 1920.	October, 1923	Received April 14, 1920.	Season of 1922	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from the Peace River canyon, Peace River area																					
	From main Gething creek				From Gething creek				From junction of main and north branches, Gething creek		From north branch of Gething creek		From Johnson creek									
Sample No	2221		2224		2227		2226		2225		2228		2198		2199		2201					
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D				
Proximate Analysis—																						
Moisture.....per cent	0·9	....	1·6	....	0·8	....	0·9	....	1·0	....	1·0	....	0·6	....	0·9	....	1·2	....				
Ash..... "	2·3	2·4	8·4	8·5	2·7	2·7	2·7	2·7	3·5	3·5	8·5	8·5	4·1	4·1	7·4	7·5	10·6	10·8				
Volatile matter... "	25·9	26·1	26·0	26·4	18·9	19·1	19·3	19·5	25·2	25·5	24·5	24·8	19·0	19·1	20·6	20·8	24·1	24·4				
Fixed carbon..... "	70·9	71·5	64·0	65·1	77·6	78·2	77·1	77·8	70·3	71·0	66·0	66·7	76·3	76·8	71·1	71·7	64·1	64·8				
Ultimate Analysis—																						
Sulphur.....per cent	....	....	0·5	0·5	0·8	0·8	0·9	0·9	....	....	0·7	0·7	....	....	0·7	0·7	....	....				
Calorific Value—																						
Calories per gramme, gross	....	....	7,420	7,540	8,100	8,175	8,100	8,175	....	....	7,675	7,750	....	....	7,675	7,740	....	....				
B.T.U. per pound, gross...	....	....	13,360	13,570	14,580	14,720	14,580	14,720	....	....	13,820	13,950	....	....	13,820	13,930	....	....				
Fuel ratio	2·75		2·45		4·10		4·00		2·80		2·70		4·00		3·45		2·65					
Coking properties	Very poor		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Very poor					
Kind of sample	Prospect																					
Location in deposit	Falls seam; bottom 15 inches.		Trojan seam....		Galloway seam..... Upper 1 foot 6 inches.		Lower 2 feet 6 inches.		2-foot 5-inch seam.		Trojan seam....		2-foot 10-inch seam.		4-foot 1-inch seam.		Trojan seam; middle 1-foot 7-inch and 2-foot 2-inch benches					
Taken by	F. H. McLearn, Geological Survey																					
Date of sampling	Season of 1922																					

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from the Peace River canyon, Peace River area																	
	From Johnson creek		From Moosebar creek				From Mogul creek				From Earle narrows				From Contact point			
											South side		North side					
Sample No.	2202		2203		2204		2229		2230		2210		2211		2232			
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D		
Proximate Analysis—																		
Moisture.....per cent	0·7	....	1·0	....	2·4	....	2·7	....	1·2	....	1·4	....	2·0	....	0·7	....		
Ash..... "	6·1	6·1	10·4	10·5	3·5	3·6	10·5	10·8	4·6	4·7	4·2	4·3	3·5	3·5	16·1	16·2		
Volatile matter..... "	28·6	28·8	17·8	18·0	21·1	21·6	24·3	25·0	22·9	23·2	22·7	23·0	21·7	22·2	24·8	25·0		
Fixed carbon..... "	64·6	65·1	70·8	71·5	73·0	74·8	62·5	64·2	71·3	72·1	71·7	72·7	72·8	74·3	58·4	58·8		
Ultimate Analysis—																		
Carbon.....per cent	....	....	....	....	....	....	....	....	82·0	83·0	....	....	....	....	....	....		
Hydrogen..... "	....	....	....	....	....	....	....	....	4·4	4·3	....	....	....	....	....	....		
Ash..... "	....	....	....	....	....	....	....	....	4·6	4·7	....	....	....	....	....	....		
Sulphur..... "	....	....	....	....	....	....	....	....	0·9	0·9	0·9	0·9	....	....	....	....		
Nitrogen..... "	....	....	....	....	....	....	....	....	1·0	1·0	....	....	....	....	....	....		
Oxygen..... "	....	....	....	....	....	....	....	....	7·1	6·1	....	....	....	....	....	....		
Calorific Value—																		
Calories per gramme, gross.....	....	....	....	....	....	....	....	....	....	....	7,900	8,010	....	....	....	....		
B.T.U. per pound, gross.....	....	....	....	....	....	....	....	....	....	....	14,230	14,420	....	....	....	....		
Fuel ratio.....	2·25		4·00		3·45		2·55		3·10		3·15		3·35		2·35			
Carbon-hydrogen ratio.....	....	....	....	....	....	....	....	....	18·6	19·1	....	....	....	....	....	....		
Coking properties.....	Good		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Non-coking		Agglomerate			
Kind of sample.....	Prospect																	
Location in deposit.....	Trojan seam; bottom 1 foot 3 inches exposed coal.		9½-foot seam, below 2nd falls		Milligan seam..		Little Mogul seam.		Mogul seam.....				Milligan seam..		Trojan seam; upper half.			
Taken by.....	F. H. McLearn, Geological Survey																	
Date of sampling.....	Season of 1922																	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from the Peace River canyon, Peace River area																	
	From Contact point		From north bank of Peace river, above No. 1 mine		From No. 1 mine													
Sample No.	2233		2205		2214		2213		2212		2217		2216		2215			
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D		
Proximate Analysis—																		
Moisture.....per cent	0·6	....	0·7	....	0·7	....	0·6	....	0·7	....	0·7	....	0·8	....	0·7	....		
Ash..... "	11·2	11·2	3·1	3·1	5·3	5·3	2·9	2·9	6·5	6·5	6·1	6·1	2·6	2·7	2·4	2·5		
Volatile matter..... "	26·8	27·0	19·3	19·4	19·6	19·7	19·5	19·6	22·5	22·7	18·7	18·8	19·2	19·3	22·9	23·0		
Fixed carbon..... "	61·4	61·8	76·9	77·5	74·4	75·0	77·0	77·5	70·3	70·8	74·5	75·1	77·4	78·0	74·0	74·5		
Ultimate Analysis—																		
Sulphur.....per cent	....	....	....	....	0·7	0·7	0·7	0·7	0·8	0·8	0·6	0·6	0·7	0·7	0·7	0·7		
Calorific Value—																		
Calories per gramme, gross.....	....	....	....	....	8,015	8,070	8,300	8,350	8,025	8,080	7,970	8,030	8,315	8,380	8,390	8,450		
B.T.U. per pound, gross.....	....	....	....	....	14,430	14,530	14,940	15,030	14,450	14,550	14,350	14,460	14,960	15,090	15,110	15,220		
Fuel ratio.....	2·30		4·00		3·80		3·95		3·10		4·00		4·05		3·25			
Coking properties.....	Good		Non-coking		Non-coking		Agglomerate		Good		Agglomerate		Agglomerate		Good			
Kind of sample.....	Prospect.....				Mine.....													
Location in deposit.....	Trojan seam; lower half.		Index seam; 1-foot 10-inch and 11-inch benches		Mine seam; 35 feet from portal..... Top 3 feet 2 inches.		Middle 1 foot 11 inches.		Bottom 8 inches		Mine seam; junction of east crosscut and main haulage. Top 3 feet.....		Middle 1 foot 9 inches.		Bottom 9 inches			
Taken by.....	F. H. McLearn, Geological Survey.....																	
Date of sampling.....	Season of 1922.....																	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from the Peace River canyon, Peace River area																	
	Presumably from No. 1 mine								From No. 1 mine								From below No. 1 mine	
Sample No.	2209		2208		2207		2206		2220		2219		2218		2231			
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D		
Proximate Analysis—																		
Moisture.....per cent	0·6	....	0·7	....	0·8	....	0·5	....	0·6	....	0·6	....	0·6	....	0·7	....		
Ash..... "	2·6	2·6	2·1	2·1	3·3	3·4	3·4	3·4	4·1	4·1	2·5	2·6	2·4	2·4	5·6	5·6		
Volatile matter..... "	18·9	19·0	24·6	24·8	20·4	20·5	23·7	23·8	20·1	20·3	19·9	20·0	24·8	24·9	18·8	19·0		
Fixed carbon..... "	77·9	78·4	72·6	73·1	75·5	76·1	72·4	72·8	75·2	75·6	77·0	77·4	72·2	72·7	74·9	75·4		
Ultimate Analysis—																		
Carbon.....per cent	....	....	....	....	....	....	....	....	84·6	85·2	....	....	....	....	....	....		
Hydrogen..... "	....	....	....	....	....	....	....	....	4·1	4·1	....	....	....	....	....	....		
Ash..... "	....	....	....	....	....	....	....	....	4·1	4·1	....	....	....	....	....	....		
Sulphur..... "	....	....	....	....	....	....	....	....	0·7	0·7	....	....	....	....	0·8	0·8		
Nitrogen..... "	....	....	....	....	....	....	....	....	1·0	1·0	....	....	....	....	....	....		
Oxygen..... "	....	....	....	....	....	....	....	....	5·5	4·9	....	....	....	....	....	....		
Calorific Value—																		
Calories per gramme, gross.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8,015	8,075		
B.T.U. per pound, gross.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14,430	14,530		
Fuel ratio.....	4·10		2·95		3·70		3·05		3·75		3·85		2·90		3·95			
Carbon-hydrogen ratio.....	....	....	....	....	....	....	....	....	20·7	21·0	....	....	....	....	....	....		
Coking properties.....	Non-coking		Good		Very poor		Good		Agglomerate		Non-coking		Good		Agglomerate			
Kind of sample.....	Mine.....																Prospect.....	
Location in deposit.....	Mine seam, at entrance to west crosscut.				Mine seam; 300 feet west of west crosscut.				Mine seam; west end of main haulage.....								Riverside seam.	
	Top 4 feet 6 inches.		Bottom 11 inches.		Top 5 feet.....		Bottom 9 inches		Top 2 feet 8 inches.		Middle 1 foot 10 inches.		Bottom 9 inches					
Taken by.....	F. H. McLearn, Geological Survey.....																	
Date of sampling.....	Season of 1922.....																	

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from Chu Chua on the North Thompson river				Princeton Coal and Land Company, Princeton, Princeton area						Peat from Lulu island, near Vancouver and New Westminster
Sample No	1868		1869		2489			2490			1733
Moisture condition	R	D	R	D	R	AD	D	R	AD	D	D
Proximate Analysis—											
Moisture per cent	3·6	....	4·0	....	18·3	18·0	....	16·8	16·6	....	....
Ash "	13·8	14·3	22·1	23·0	6·5	6·6	8·0	7·4	7·4	8·9	6·6
Volatile matter "	37·9	39·3	37·9	39·5	32·6	32·7	39·9	32·9	33·0	39·6	64·3
Fixed carbon "	44·7	46·4	36·0	37·5	42·6	42·7	52·1	42·9	43·0	51·5	29·1
Ultimate Analysis—											
Carbon per cent	....	....	....	....	55·3	55·5	67·7	....	....	....	....
Hydrogen "	....	....	....	....	5·7	5·7	4·5	....	....	....	....
Ash "	....	....	....	....	6·5	6·6	8·0	....	....	....	....
Sulphur "	0·7	0·7	0·8	0·8	0·6	0·6	0·7	0·6	0·6	0·7	0·2
Nitrogen "	....	....	....	....	1·5	1·5	1·9	....	....	....	....
Oxygen "	....	....	....	....	30·4	30·1	17·2	....	....	....	....
Calorific Value—											
Calories per gramme, gross	6,690	6,935	5,990	6,235	5,450	5,470	6,675	5,465	5,475	6,565	4,835
B.T.U. per pound, gross	12,040	12,490	10,780	11,230	9,810	9,850	12,010	9,830	9,850	11,820	8,710
Fuel ratio	1·20		0·95		1·30			1·30			0·45
Carbon-hydrogen ratio	....	....	....	....	9·7	9·8	15·1	....	....	....	....
Coking properties	Fair		Poor		Non-coking			Non-coking			....
Kind of sample	Prospect				Mine						Prospect
Location in deposit	....				No. 1 mine			No. 2 mine			....
Taken by	W. L. Uglow, Geological Survey				Mine operators						Private individual.
Date of sampling	Season of 1921				September 5, 1923						Feb. 1, 1921

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Western Fuel Corporation of Canada, Limited, Reserve mine, south of Nanaimo, Nanaimo area		Nanoose Wellington Collieries, Limited, Wellington, Nanaimo area						Coal samples from Tsable river, near Union Bay, Comox area			
Sample No.	2800		1897		1898		1899		1905		1909	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	2·6	....	3·5	....	3·6	....	3·7	....	1·3	....	1·2	....
Ash..... "	12·7	13·0	14·7	15·2	11·6	12·0	11·0	11·4	15·0	15·1	13·6	13·8
Volatile matter..... "	40·0	41·1	39·0	40·4	40·8	42·4	41·6	43·2	32·0	32·5	32·6	33·0
Fixed carbon..... "	44·7	45·9	42·8	44·4	44·0	45·6	43·7	45·4	51·7	52·4	52·6	53·2
Ultimate Analysis—												
Carbon.....per cent	68·8	70·7	64·9	67·3	68·1	70·7	68·8	71·4	69·7	70·7	72·2	73·0
Hydrogen..... "	5·3	5·2	5·1	4·9	5·3	5·1	5·3	5·1	4·6	4·6	5·0	4·9
Ash..... "	12·7	13·0	14·7	15·2	11·6	12·0	11·0	11·4	15·0	15·1	13·6	13·8
Sulphur..... "	1·6	1·6	1·1	1·1	1·0	1·0	1·0	1·0	0·5	0·5	3·6	3·6
Nitrogen..... "	1·2	1·2	1·1	1·1	0·8	0·8	1·3	1·4	0·9	0·9	1·2	1·2
Oxygen..... "	10·4	8·3	13·1	10·4	13·2	10·4	12·6	9·7	9·3	8·2	4·4	3·5
Calorific Value—												
Calories per gramme, gross	6,940	7,130	6,455	6,690	6,725	6,980	6,740	7,000	6,720	6,815	7,155	7,240
B.T.U. per pound, gross	12,490	12,830	11,620	12,040	12,100	12,560	12,140	12,600	12,100	12,260	12,880	13,030
Fuel ratio	1·10		1·10		1·10		1·05		1·60		1·60	
Carbon-hydrogen ratio	13·0	13·7	12·8	13·8	12·8	13·8	12·9	14·0	15·0	15·5	14·4	14·8
Coking properties	Fair		Agglomerate		Agglomerate		Agglomerate		Good		Fair	
Designation of coal	.....		Washed nut.....		Washed pea....		Screened lump..		.....		.....	
Kind of sample	Mine.....		Commercial.....						Prospect.....			
Location in deposit	.....		.....		Lantzville mine.....				South fork, 5 miles south of Union Bay.		No. 3 prospect; top bench.	
Taken by	Provincial mine inspector.		J. D. MacKenzie, Geological Survey.....									
Date of sampling	September, 1924		Season, 1921.....									

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from Tsable river, near Union Bay, Comox area								From No. 4 mine, Cumberland, Comox area			
Sample No.	1910		1911		1906		1907		2108		2109	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	1·3	....	1·5	....	2·7	....	1·4	....	0·6	....	0·6	....
Ash..... "	9·0	9·1	13·1	13·3	12·0	12·4	11·3	11·5	11·0	11·0	12·1	12·1
Volatile matter..... "	31·6	32·0	30·6	31·0	30·4	31·2	30·3	30·7	32·1	32·3	30·0	30·2
Fixed carbon..... "	58·1	58·9	54·8	55·7	54·9	56·4	57·0	57·8	56·3	56·7	57·3	57·7
Ultimate Analysis—												
Carbon.....per cent	76·8	77·8	72·5	73·6	70·3	72·2	74·8	75·8	....	....	....	....
Hydrogen..... "	5·1	5·0	4·9	4·8	4·7	4·5	5·0	4·9	....	....	....	....
Ash..... "	9·0	9·1	13·1	13·3	12·0	12·4	11·3	11·5	....	....	....	....
Sulphur..... "	0·8	0·8	1·1	1·1	2·0	2·1	0·7	0·8	1·2	1·2	0·9	0·9
Nitrogen..... "	1·1	1·2	1·1	1·1	1·1	1·1	1·1	1·1	....	....	....	....
Oxygen..... "	7·2	6·1	7·3	6·1	9·9	7·7	7·1	5·9	....	....	....	....
Calorific Value—												
Calories per gramme, gross.....	7,500	7,600	7,175	7,285	6,835	7,025	7,365	7,470	7,310	7,350	7,315	7,370
B.T.U. per pound, gross.....	13,500	13,680	12,920	13,120	12,310	12,650	13,260	13,440	13,150	13,230	13,170	13,260
Fuel ratio.....	1·85		1·80		1·80		1·90		1·75		1·90	
Carbon-hydrogen ratio.....	15·1	15·6	14·8	15·2	15·0	16·0	15·0	15·5	....	....	....	....
Coking properties.....	Good		Good		Agglomerate		Good		Good		Good	
Kind of sample.....	Prospect.....								.....			
Location in deposit.....	No. 3 prospect.....				No. 4 prospect.....				.....			
	Middle bench...		Lower bench....		Top bench.....		Middle bench...		.....			
Taken by.....	J. D. MacKenzie, Geological Survey.....											
Date of sampling.....	Season of 1921.....								Season of 1922.....			

TABLE I—Continued

Analyses of Solid Fuels Occurring in Canada—Continued

BRITISH COLUMBIA—Continued

—	Coal samples from the Comox area													
	From No. 4 mine, Cumberland				From No. 5 mine, Cumberland				From Hamilton lake, 3 miles west of Cumberland					
Sample No.	2110		2111		2106		2107		1900		1901		1902	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—														
Moisture.....per cent	0·8	....	0·9	....	0·7	....	0·6	....	1·5	....	1·4	....	2·1	....
Ash..... "	13·9	14·0	19·5	19·7	14·1	14·2	16·5	16·6	17·5	17·7	15·2	15·5	7·1	7·3
Volatile matter... "	28·6	28·8	28·5	28·8	35·7	35·9	33·1	33·3	31·8	32·3	31·2	31·6	31·0	31·6
Fixed carbon..... "	56·7	57·2	51·1	51·5	49·5	49·9	49·8	50·1	49·2	50·0	52·2	52·9	59·8	61·1
Ultimate Analysis—														
Carbon.....per cent	72·7	73·3	....	....	71·6	72·1	....	....	68·5	69·6	70·2	71·2	77·6	79·3
Hydrogen..... "	4·7	4·6	....	....	4·9	4·8	....	....	4·8	4·7	4·8	4·7	5·1	4·9
Ash..... "	13·9	14·0	....	....	14·1	14·2	....	....	17·5	17·7	15·2	15·5	7·1	7·3
Sulphur..... "	0·6	0·6	0·5	0·5	3·1	3·1	3·5	3·6	2·6	2·7	2·2	2·2	0·8	0·8
Nitrogen..... "	1·3	1·3	....	....	1·4	1·5	....	....	1·0	1·0	1·1	1·1	1·2	1·2
Oxygen..... "	6·8	6·2	....	....	4·9	4·3	....	....	5·6	4·3	6·5	5·3	8·2	6·5
Calorific Value—														
Calories per gramme, gross	7,080	7,135	6,540	6,600	7,155	7,205	6,910	6,955	6,765	6,870	6,940	7,040	7,585	7,745
B.T.U. per pound, gross...	12,740	12,840	11,770	11,880	12,880	12,970	12,440	12,520	12,180	12,370	12,490	12,670	13,660	13,940
Fuel ratio	2·00		1·80		1·40		1·50		1·55		1·65		1·95	
Carbon-hydrogen ratio	15·6	15·9	....	....	14·7	15·0	....	....	14·2	14·7	14·5	15·0	15·3	16·0
Coking properties	Good		Good		Good		Good		Good		Good		Good	
Kind of sample									Prospect					
Location in deposit									Upper seam		Middle seam: Upper bench		Middle seam: Lower bench	
Taken by	J. D. MacKenzie, Geological Survey													
Date of sampling	Season of 1922								Season of 1921					

TABLE I—Concluded

Analyses of Solid Fuels Occurring in Canada—Concluded

BRITISH COLUMBIA—Concluded

—	Coal samples from the Comox area											
	From Hamilton lake, 3 miles west of Cumberland		From Quinsam river				From Iron river				From Chute creek	
Sample No.	1903		2100		2101		2102		2103		2104	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	1·7	....	2·4	....	2·7	....	3·4	....	3·4	....	2·7	....
Ash..... "	8·2	8·4	12·5	12·8	12·9	13·2	14·9	15·4	19·7	20·3	8·0	8·2
Volatile matter..... "	31·2	31·7	37·7	38·6	38·5	39·6	32·2	33·3	29·8	30·9	39·7	40·8
Fixed carbon..... "	58·9	59·9	47·4	48·6	45·9	47·2	49·5	51·3	47·1	48·8	49·6	51·0
Ultimate Analysis—												
Carbon.....per cent	77·3	78·6	....	....	....	....	....	....	....	....	....	....
Hydrogen..... "	5·0	4·9	....	....	....	....	....	....	....	....	....	....
Ash..... "	8·2	8·4	....	....	....	....	....	....	....	....	....	....
Sulphur..... "	0·9	0·9	3·7	3·7	2·8	2·9	0·7	0·8	0·5	0·6	1·5	1·5
Nitrogen..... "	1·3	1·3	....	....	....	....	....	....	....	....	....	....
Oxygen..... "	7·3	5·9	....	....	....	....	....	....	....	....	....	....
Calorific Value—												
Calories per gramme, gross	7,605	7,740	6,635	6,795	6,590	6,770	6,225	6,445	6,810	6,015	7,050	7,245
B.T.U. per pound, gross	13,690	13,930	11,940	12,230	11,860	12,190	11,210	11,600	10,460	10,830	12,690	13,050
Fuel ratio	1·90		1·25		1·20		1·55		1·60		1·25	
Carbon-hydrogen ratio	15·5	16·1	....	....	....	....	....	....	....	....	....	....
Coking properties	Good		Very poor		Very poor		Non-coking		Non-coking		Poor	
Kind of sample	Prospect											
Location in deposit	Lower seam		Outcrop samples									
Taken by	J. D. MacKenzie, Geological Survey											
Date of sampling	Season of 1921		Season of 1922									

TABLE II

Analyses of Miscellaneous Solid Fuels

—	Low-volatile bituminous coal from Wales		"Lily Keystone" Pennsylvania, U.S.A., blacksmith coal		Reynoldsville section, Clearfield, Pennsylvania, steam coal		Keystone Coal and Coke Company, "Pennsylvania ¾ lump"		"Pennsylvania domestic cannel"		Coal from Bellingham, Washington, United States		
Sample No.	2086		750		1472		2074		2125		2521		
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	AD	D
Proximate Analysis—													
Moisture....per cent	0·9	....	0·9	....	7·7	....	2·6	....	2·8	....	6·1	6·1	....
Ash.... "	11·5	11·6	6·9	7·0	10·0	10·8	9·7	10·0	14·1	14·5	10·5	10·5	11·2
Volatile matter.... "	17·3	17·4	15·6	15·7	32·9	35·7	33·4	34·3	35·6	36·6	41·5	41·5	44·2
Fixed carbon.... "	70·3	71·0	76·6	77·3	49·4	53·5	54·3	55·7	47·5	48·9	41·9	41·9	44·6
Ultimate Analysis—													
Sulphur....per cent	....	....	0·7	0·7	2·6	2·8	2·8	2·9	....	....	0·3	0·3	0·3
Calorific Value—													
Calories per gramme, gross....	....	....	7,955	8,035	....	....	7,495	7,695	....	....	6,265	6,265	6,670
B.T.U. per pound, gross....	....	....	14,320	14,460	....	....	13,490	13,850	....	....	11,270	11,270	12,000
Fuel ratio	4·05		4·95		1·50		1·60		1·35		1·00		
Coking properties	Fair		Good, very much swollen		Good		Good		Good		Non-coking		
Screen Analysis (round and square screen openings)..per cent	On 1½″ (round)=11·7, 1½″ to 1″=4·9, 1″ to ¾″=4·5, ¾″ to ½″=6·0, ½″ to 0·263″ (square)=8·3, 0·263″ to 0·185″=7·0, 0·185″ to 0·063″=24·3, per 0·063″=33·3.		....		....		....		....		....		
Kind of sample	Commercial; carload.		Commercial				Commercial; ½ ton.		Commercial				
Taken by	Staff of Fuel Research Laboratories.		Ottawa dealers						Staff of Fuel Research Laboratories.		Employees of Department of Customs.		
Date of sampling	Oct. 5, 1922		June, 1916		February, 1919		September, 1922		Nov. 18, 1922		October, 1923		

TABLE II—Continued

Analyses of Miscellaneous Solid Fuels—Continued

—	"Newcastle" coal from the Pacific Coast Coal Company of Seattle, Washington, United States				Coal samples from Costa Rica, Central America				Anthracite briquettes from Lehigh Coal and Navigation Company, Pennsylvania, United States		Sawdust briquettes from Havana, Cuba	
Sample No.	2640		2724		989		990		2055		2267	
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D
Proximate Analysis—												
Moisture.....per cent	8·5*	....	9·9*	....	3·1	....	8·4	....	4·0	....	6·3	....
Ash..... "	14·6	16·0	14·6	16·2	5·1	5·2	10·6	11·6	15·2	15·8	16·0	17·1
Volatile matter..... "	36·4	39·7	34·4	38·2	42·8	44·2	41·3	45·1	9·0	9·4	52·1	55·6
Fixed carbon..... "	40·5	44·3	41·1	45·6	49·0	50·6	39·7	43·3	71·8	74·8	25·6	27·3
Ultimate Analysis—												
Sulphur.....per cent	0·6	0·7	....	....	1·1	1·1	4·4	4·8	....	....	0·6	0·7
Calorific Value—												
Calories per gramme, gross.....	5,835	6,380	5,650‡	6,275‡	7,710	7,960	6,080	6,640	6,495†	6,765†	4,025	4,295
B.T.U. per pound, gross.....	10,500	11,480	10,170	11,300	13,880	14,330	10,940	11,950	11,690	12,180	7,250	7,730
Fuel ratio.....	1·10		1·20		1·15		0·96		....		....	
Coking properties.....	....		Non-coking		Fair		Non-coking		....		Tendency to agglomerate	
Hoffmann potash test.....	....		....		6–5		3–4		....		....	
Specific gravity (apparent).....	....		....		....		....		....		0·82	

Designation of fuel	Nut	Buckwheat			
Kind of sample	Commercial			Commercial	
Taken by	Employees of Department of Customs and Excise		Private individual; sent in by Deputy Minister of Mines	Ottawa coal dealers' committee.	Private individual
Date of sampling	February, 1924	April, 1924	April 17, 1917	August, 1922	June 5, 1923

* Both these samples gained in weight when exposed to an atmosphere of 60 per cent relative humidity.
‡ Calorific value adjusted by assuming a sulphur content corresponding to that of sample No. 2640.
† Calorific value adjusted by assuming a sulphur content corresponding to that of typical Pennsylvania anthracite.

TABLE II—Concluded

Analyses of Miscellaneous Solid Fuels—Concluded

—	Petroleum coke as manufactured in oil refinery		Briquettes made at Hebron, North Dakota, United States, from lignite carbonized at Bienfait, Saskatchewan, by the Lignite Utilization Board of Canada		Connelsville metallugrical foundry coke		Coke made from West Virginia bituminous coal by the Caracristi, lead-bath, low-temperature process		"Fuelite" coke, made from non-coking coal from Nottingham-shire, England, and steam coal from Wales		Fuel product from S. Pick of London, England		Yallourn (Morwell) brown lignite from the state of Victoria, Australia		
Sample No.	2603		2616		2258		2263		2272		2587		3586		
Moisture condition	R	D	R	D	R	D	R	D	R	D	R	D	R	AD	D
Proximate Analysis—															
Moisture.....per cent	0·8	....	14·1	....	0·8	....	1·6	....	1·3	....	0·5	....	64·9	22·6	....
Ash..... "	1·2	1·2	10·9	12·7	12·6	12·7	9·8	10·0	4·9	5·0	10·7	10·8	1·1	2·5	3·2
Volatile matter... "	9·0	9·1	23·4	27·2	2·1	2·1	14·3	14·5	10·8	10·9	1·0	1·0	18·3	40·3	52·1
Fixed carbon..... "	89·0	89·7	51·6	60·1	84·5	85·2	74·3	75·5	83·0	84·1	87·8	88·2	15·7	34·6	44·7
Ultimate Analysis—															
Carbon.....per cent	....	....	....	....	....	....	....	....	....	....	....	....	23·3	51·3	66·2
Hydrogen..... "	....	....	....	....	....	....	....	....	....	....	....	....	8·8	5·9	4·4
Ash..... "	....	....	....	....	....	....	....	....	....	....	....	....	1·1	2·5	3·2
Sulphur..... "	1·3	1·3	....	....	2·0	2·1	0·8	0·9	1·1	1·1	1·1	1·1	0·1	0·2	0·3
Nitrogen..... "	....	....	....	....	....	....	....	....	....	....	....	....	0·2	0·4	0·5
Oxygen..... "	....	....	....	....	....	....	....	....	....	....	....	....	66·5	39·7	25·4
Calorific Value—															
Calories per gramme, gross	8,555	8,625	5,550*	6,455*	6,105	6,150	7,040	7,155	7,890	7,990	6,960	6,990	2,135	4,700	6,075
B.T.U. per pound, gross...	15,400	15,530	9,990	11,620	10,990	11,070	12,670	12,880	14,200	14,390	12,520	12,590	3,840	8,460	10,930
Fuel ratio.....	....		2·20		....		5·20		....		....		0·86		
Carbon-hydrogen ratio.....	....	....	....	....	....	....	....	....	....	....	....	....	2·7	8·7	15·3
Hoffmann potash test.....	....		....		....		....		....		....		1		

Softening temperature of ash.....°F.	....	2050	....	....	....	....	....
Weight per cubic foot, pounds	....	....	35	....	....	....	....
Kind of sample.....	Commercial....	Carload.....	Commercial....	.....	.....	.....	.....
Taken by.....	Ottawa dealer..	.....	Ottawa dealer..	.....	.....	Received through Dominion Fuel Board.	Received through State Electricity Commission, Melbourne.
Date of sampling.....	December, 1923	January, 1924...	March, 1923....	May, 1923.....	June, 1923.....	November, 1923	During 1925.....

* Calorific value adjusted by assuming a sulphur content of 1 per cent.

APPENDIX II

ANALYSES OF ASH FROM COALS, COKES, PEAT, AND WOODS

The earlier tests of solid fuels carried out by the Department of Mines were based almost entirely upon a procedure known as "chemical analysis". The increase in varieties of fuels used, and in the types of heating and power installations, have latterly caused a demand for physical tests, some of them on a large scale, to supplement the information previously obtained. Such tests have included fusion point of ash (F.P.A.) determinations, in order to supply information as to the probability of the formation of clinker in fuel beds. It is believed that the addition of the analysis of the ash may, in some cases, render the information even more valuable.

Consequently, in the following tables analyses of ash residues obtained from solid fuels, have been compiled, largely of those from Nova Scotia coals which have been examined in some detail during the past few years. In addition, analyses of ash samples from coals from other parts of Canada extending as far west as Vancouver island, which have been obtained at intervals during a period of about 20 years are included. Finally, there are shown analyses of ashes from Welsh and Indo-China anthracites, and of those from typical hard and soft woods. Wherever available, ash fusion temperatures have been included, in order to enhance the value of the information tabulated.

The earlier analyses were carried out by the staff of the Division of Fuels and Fuel Testing. Most of the analyses of the past 10 years were made by members of the staff of the Chemical Division of the Mines Branch.

TABLE I

Analyses of Ash Samples

—	From a blend of coal from different parts of Dominion No. 24 colliery, Emery seam, Glace Bay, Sydney area, Nova Scotia; probably during March, 1935					From coal from the tipple of Dominion No. 11 colliery, Emery seam, Glace Bay; July 14, 1923	From a blend of coal from different parts of Dominion No. 10 colliery, Emery seam, Reserve, Sydney area; probably during May, 1934				
Sample No.	14187	14189	14190	14191	14186	2354	13244	13245	13246	13247	13248
Silica.....per cent	39·7	47·4	35·7	39·4	29·4	49·7	42·7	43·1	44·0	37·2	36·2
Ferric oxide..... "	30·0	20·8	30·6	30·5	29·4		22·8	22·5	25·5	19·4	18·6
Alumina..... "	21·3	23·9	18·5	19·0	20·1		22·6	22·3	22·2	20·3	21·2
Manganous oxide..... "	0·16	0·07	0·28	0·19	0·46	48·5	....	....	....	....	....
Titanium dioxide..... "	1·1	1·3	0·81	0·94	0·43		1·1	0·92	1·2	0·73	0·56
Phosphorus pentoxide..... "	0·09	0·13	0·11	0·09	0·15		0·04	0·05	0·08	0·08	0·08
Calcium oxide (lime)..... "	1·9	0·73	3·7	2·6	7·0	1·5	3·3	4·1	1·8	7·5	8·3
Magnesium oxide..... "	0·82	0·72	1·3	0·96	1·8	....	1·6	1·6	1·0	2·7	2·9
Sodium oxide..... "	2·9	2·6	2·5	1·9	2·4	....	1·0	1·0	0·84	0·72	0·58
Potassium oxide..... "	1·1	1·5	1·3	1·5	1·1	....	1·9	2·6	2·2	2·8	2·9
Sulphur trioxide..... "	1·2	0·56	5·1	2·6	7·8	....	4·0	3·3	1·6	9·2	8·8
Fusibility—											
Initial deformation temperature.....°F	1990	2060	1960	1965	1960	2085	2050	2060	1970	2090	2035
Softening temperature.....°F	2105	2185	2060	2055	2130	2230	2150	2160	2150	2170	2155
Fluid temperature.....°F	2150	2465	2140	2455	2200	2390	2200	2260	2270	2250	2250
Designation of coal.....	Through 4-inch, round screen.	¼- to ¾-inch, round.	Through ¾-inch, round.	Through 1¼-inch, round.	Through 48-mesh (0·0116-inch), square.	Over 1¼-inch screen and picking belt.	Run-of-mine.	Through 4-inch, round.	¼-inch, round, to ½-inch, square.	Through ½-inch, square.	Through 1¼-inch, round.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	Dominion No. 4 colliery, Phalen seam, Glace Bay					Dominion No. 2 colliery, Phalen seam, Glace Bay					
	From coal from the tipple; July 14, 1923	From a blend of coal from east sections of colliery; probably during January, 1934				From coal from the tipple; July 17, 1923	From channel sample across seam; September, 1929	From coal described as representative of the output of the colliery; probably during June, 1933			
Sample No.	2349	12694	12695	12696	12697	2360	11747	12155	12156	12157	12158
Silica.....per cent	21·4	21·2	24·2	14·3	18·6	26·0	21·6	29·1	30·0	26·9	28·4
Ferric oxide..... "	45·8	44·5	39·6	33·6	47·8		52·0	36·7	38·4	25·3	35·2
Alumina..... "	13·3	11·2	20·9	8·0	8·7	56·7	9·2	15·9	17·2	15·3	16·9
Phosphorus pentoxide..... "	....	0·09	0·07	0·06	0·09		0·17	0·12	0·15	0·12	0·15
Calcium oxide (lime)..... "	9·1	10·2	6·9	18·8	10·3	10·6	8·0	6·8	5·4	13·7	8·1
Magnesium oxide..... "	1·9	0·93	0·81	1·1	0·42	....	0·74	1·0	1·0	1·0	1·0
Sodium and potassium oxides..... "	....	1·5	1·4	1·6	1·7	....	1·4	3·2	2·6	2·8	3·4
Sulphur trioxide..... "	....	11·4	7·7	22·9	13·0	....	6·8	7·6	6·0	15·2	8·7
Fusibility—											
Initial deformation temperature.....°F	1940	1880	1950	2070	1980	1940	1835	2000	2025	1950	2080
Softening temperature.....°F	1985	2085	2085	2300	2190	1985	1910	2100	2130	2020	2135
Fluid temperature.....°F	2075	2170	2200	2400	2300	2110	2000	2250	2250	2075	2280
Designation of coal.....	Unscreened coal, over picking belt.	Through 4-inch, round screen.	4-inch, round, to ¼-inch, square.	Through ¼-inch, square.	Through 1½-inch, round.	Unscreened coal, over picking belt.	.....	Through 4-inch, round.	4-inch, round to, ¼-inch, square.	Through ¼-inch, square.	Through 1½-inch, round.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	Dominion No. 1 B colliery, Phalen seam, Glace Bay, Sydney area, Nova Scotia										
	From samples taken across 7-foot seam; July 3-9, 1928							From a blend of coal from different parts of the colliery; probably during February, 1933			
Sample No.	5136	5140	5145	5147	5149	5154	5156	11632	12027	11663	11635
Silica.....per cent	23·0	15·1	39·0	49·5	31·3	22·2	26·4	19·3	23·5	14·5	24·7
Ferric oxide..... "	41·8	31·0	27·2	15·8	27·3	43·1	50·0	41·0	45·6	29·5	48·6
Alumina..... "	15·0	9·7	27·9	30·5	20·7	12·3	15·7	11·7	12·2	9·1	13·9
Phosphorus pentoxide..... "	....	0·05	....	0·05	....	....	1·1	0·16	....	0·16	0·20
Calcium oxide (lime)..... "	10·0	19·6	2·7	2·1	8·1	10·1	4·3	12·7	8·6	20·0	5·8
Magnesium oxide..... "	0·67	0·71	0·34	1·2	1·4	0·69	0·64	0·72	0·78	0·84	0·76
Sodium and potassium oxides..... "	1·4	2·2	2·1	0·90	3·5	1·8	1·1	....	1·9	....	....
Sulphur trioxide..... "	9·9	22·6	2·3	1·2	9·7	11·3	0·97	12·9	8·4	24·2	6·8
Fusibility—											
Initial deformation temperature.....°F	2000	2080	2040	2345	1820	1790	1900	1890	1800	1950	1740
Softening temperature.....°F	2050	2260	2195	2470	1915	1890	1995	1975	2020	2030	1860
Fluid temperature.....°F	2075	2330	2370	2575	2010	2005	2095	2010	2180	2135	2095
Designation of coal.....	Complete channel sample.	6-inch section, 10½ inches from roof.	3¾-inch section, 33 inches from roof.	4¼-inch section, 41¼ inches from roof.	5-inch section, 27 inches from floor	5¼-inch section, 7 inches from floor	Bottom 2½ inches of seam.	Composite of all sizes through 4-inch round screen.	4-inch, round, to ¼-inch, square.	Through ¼-inch, square.	1½-inch to ¾-inch, round.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From a blend of coal representative of the output of Dominion No. 16 colliery, Phalen (Lingan) seam, New Waterford, Sydney area; probably during October, 1934							From commercial samples of "Dominion" coal				
Sample No	13672	13687	13688	13689	13690	13680	13685	2383	2384	11610	11609	11615
Silica.....per cent	31·4	26·6	29·6	19·0	24·9	23·1	13·1	29·2	32·9	31·0	28·4	29·1
Ferric oxide..... "	38·3	41·6	43·3	37·4	42·0	45·9	28·4	31·3	41·6	35·2	34·7	31·0
Alumina..... "	15·6	14·6	15·2	12·1	14·7	13·1	9·4	18·2	16·3	16·3	15·9	18·0
Manganous oxide..... "		0·03	0·03	0·18	0·09	0·04	0·23	....	....			
Titanium dioxide..... "	0·72	0·49	0·72	0·36	0·50	0·55	0·21	....	....			
Phosphorus pentoxide..... "	0·65	0·34	0·12	0·35	0·51	0·28	0·26	....	....	0·16	0·20	0·20
Calcium oxide (lime)..... "	5·0	5·9	4·6	12·7	7·0	6·6	19·7	8·5	5·5	7·0	7·3	6·9
Magnesium oxide..... "	0·66	0·35	0·52	0·45	0·21	0·42	0·75	2·0	2·1	1·2	1·0	1·1
Sodium oxide..... "	1·6	3·6	0·97	1·3	1·2	1·1	2·7	....	....	....	....	....
Potassium oxide..... "	1·1	0·72	0·61	0·55	0·84	0·49	0·24	....	....	....	....	....
Sulphur trioxide..... "	4·4	6·1	4·1	15·4	7·8	8·1	24·9	....	....	7·6	9·1	8·0
Fusibility—												
Initial deformation temperature.....°F	1950	1905	1945	1940	1925	1935	2095	2000	2020	1780	1775	1850
Softening temperature.....°F	2055	2015	2065	2040	2055	2050	2165	2100	2100	1865	1875	1940
Fluid temperature.....°F	2120	2055	2155	2160	2155	2085	2210	2175	2280	2060	2030	2080
Designation of coal.....	On 4-inch round, screen.	Through 4-inch, round.	4-inch, round, to ⅜-inch, square.	Through ⅜-inch, square.	Through 1½-inch round.	½- to 0·065-inch (10-mesh), square.	Through 0·0058-inch (100-mesh), square.	Slack; from day's run at Sydney coke ovens, Aug. 13, 1923.	Corresponding slack, but cleaned in Baum washer.	2-inch nut slack, supplied to Christie St. hospital, Toronto, 1933.	¾-inch nut slack, supplied to Parliament Buildings, Toronto, 1933.	¾-inch nut slack, supplied to Westminster hospital, London, Ont., 1933.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From channel sample across Harbour seam, Dominion No. 9 colliery, Glace Bay, Sydney area, Nova Scotia; probably in April, 1930	Dominion No. 12 colliery, Harbour (Victoria) seam, New Waterford, Sydney area						
		From coal from tipple; July 16, 1923	From a blend of coal representative of colliery output; probably during August, 1934					
							Splint or durain	Bright coal
Sample No.	11752	2356	13367	13368	13369	13370	13371	15244	15138
Silica.....per cent	28·2	20·5	26·7	27·1	25·4	19·4	21·3	58·7	9·8
Ferric oxide..... "	43·7	49·0	38·2	39·7	46·4	33·9	41·2	11·7	61·2
Alumina..... "	15·3	23·3	17·3	16·7	17·0	13·9	15·1	20·9*	6·3
Manganous oxide..... "	....	....	....	....	....	....	....		1·9
Titanium dioxide..... "	....	....	0·60	0·62	0·60	0·25	0·43	3·4	2·6
Phosphorus pentoxide..... "	0·08	....	0·24	0·23	0·22	0·19	0·25	....*	0·12
Calcium oxide (lime)..... "	5·9	6·1	5·1	5·6	3·4	12·9	8·1	1·4	4·9
Magnesium oxide..... "	0·82	....	1·6	1·7	1·5	1·8	1·9	0·65	2·9
Sodium oxide..... "	1·2	....	2·9	1·0	1·0	1·8	1·3	....	1·0
Potassium oxide..... "		....	0·83	0·85	0·88	0·73	0·68	....	0·15
Sulphur trioxide..... "	4·9	....	6·4	6·4	3·6	15·2	9·7	1·2	8·7
Fusibility—									
Initial deformation temperature.....°F.	1865	1950	1910	1950	1950	1890	1850	2340	2120
Softening temperature.....°F.	2000	2040	2025	2005	2045	2045	2035	2465	2300
Fluid temperature.....°F.	2150	2120	2200	2165	2200	2200	2210	2550	2390
Designation of coal.....	.....	Unscreened coal, over picking belt.	Run-of-mine.	Through 4-inch, round, screen.	4-inch, round, to ⅛-inch, square.	Through ⅛-inch, square.	Through 1½-inch, round.	From lumps on 4-inch round.....	

* Phosphorus pentoxide included with alumina.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	Princess, No. 1 (Dominion) colliery, Harbour (Main) seam, Sydney Mines, Sydney area								Florence, No. 3 (Dominion) colliery, Harbour (Main) seam, Florence, Sydney area					
	From coal from tipple; July 13, 1923	From a blend of coal representative of the colliery output; probably in July, 1935						From specially washed coal; during 1931	From a blend of coal representative of the colliery output; probably in July, 1935					
Sample No.	2342	14805	14807	14808	14806	14810	14804	14246	14847	14849	14850	14848	14852	14846
Silica.....per cent	42·3	26·5	28·2	23·9	30·7	22·5	17·9	26·4	27·2	24·9	26·4	27·2	22·1	16·0
Ferric oxide..... "	51·8	40·8	41·8	40·2	39·6	33·5	25·7	36·3	39·6	43·5	30·0	32·1	24·9	23·4
Alumina..... "		14·4	16·9	15·3	16·2	15·2	9·2	18·1	14·7	16·0	15·6	25·7	13·9	9·8
Manganous oxide..... "		0·42	0·33	0·51	0·38	0·49	0·44	0·20	0·18	0·21	0·22	0·16	0·44	0·58
Titanium dioxide..... "		0·82	0·75	0·42	0·79	0·38	0·02	0·88	0·83	0·76	0·63	0·61	0·43	0·26
Phosphorus pentoxide.... "		0·16	0·22	0·31	0·33	0·23	0·24	0·45	0·07	0·07	0·12	0·16	0·12	0·11
Calcium oxide (lime).....	3·6	3·8	2·7	6·0	1·8	9·8	17·1	6·8	6·7	4·1	8·3	3·7	16·9	22·9
Magnesium oxide..... "	.....	1·3	0·99	1·5	1·3	1·7	1·3	0·96	0·84	0·63	1·4	0·83	1·2	1·1
Sodium oxide..... "	.....	4·8	3·9	2·8	3·2	2·4	3·6	4·2	2·0	4·6	5·7	4·6	5·0	1·5
Potassium oxide..... "	.....	0·79	0·88	0·89	0·99	0·84	0·46	0·50	0·76	0·56	0·78	0·81	0·88	0·42
Sulphur trioxide..... "	.....	6·6	3·6	7·9	4·3	12·4	23·8	4·9	7·8	4·9	10·4	4·5	13·6	24·4
Fusibility—														
Initial deformation temperature.....°F.	2055	1950	1960	1890	1970	1830	2040	.....	1970	1980	1960	2010	1960	2160
Softening temperature.....°F.	2175	2040	2070	2060	2040	1930	2150	.....	2040	2100	2085	2100	2070	2270
Fluid temperature.....°F.	2325	2150	2230	2300	2150	2060	2180	.....	2150	2220	2190	2220	2215	2355
Designation of coal.....	Unscreened coal, over picking belt.	Through 4-inch, round, screen.	4- to ¾-inch, round.	Through ¾-inch, round.	4-inch, round, to ½-inch, square.	Through ½-inch, square.	Through 0·0116-inch (48-mesh), square.	Slack....	Through 4-inch, round.	4- to ¾-inch, round.	Through ¾-inch, round.	4-inch round, to ⅜-inch, square.	Through ½-inch, square.	Through 0·0116-inch (48-mesh), square.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From coal from the tipple of Drummond colliery, Intercolonial Coal Company, Limited, Nos. 1 and 2 seams, Westville, Pictou area, Nova Scotia; July 6, 1923	From coal from the tipple of Albion colliery, Acadia Coal Company, Limited,* Acadia No. 1, Foord, Cage, and Third seams, Stellarton, Pictou area; July 6, 1923	No. 2 mine, Cumberland Railway and Coal Company, Limited,* Springhill, Springhill area, Nova Scotia										
			No. 2 seam						No. 1 seam				
			From coal from the tipple; July 3, 1923	From a blend of coal from different representative parts of seam; probably during December, 1935					From a blend of coal from different representative parts of seam; probably during December, 1935				
Sample No.	2328 2329	2330	2317	15165	15167	15168	15170	15156	15217	15219	15220	15222	15212
Silica.....per cent	54·1	50·9	54·6	41·7	45·6	38·0	39·1	31·5	40·9	42·0	40·2	37·9	26·4
Ferric oxide..... "	....	....	....	12·3	10·4	9·4	10·8	9·7	21·5	21·2	20·3	16·3	17·9
Alumina..... "	....	....	....	16·9	19·0	16·8	16·7	14·0	19·1	22·0	18·6	19·5	11·7
Manganous oxide..... "	36·5	41·3	38·6	0·08	0·07	0·04	0·06	0·10	0·07	0·05	0·09	0·11	0·17
Titanium dioxide..... "	....	....	....	0·87	1·1	0·95	0·72	0·69	1·0	1·2	0·98	0·95	0·65
Phosphorus pentoxide..... "	....	....	....	0·14	0·08	0·24	0·10	0·12	0·25	0·27	0·31	0·23	0·16
Calcium oxide (lime)..... "	7·1	5·1	5·8	11·1	10·3	13·8	12·7	17·0	6·3	5·2	7·8	10·4	17·4
Magnesium oxide..... "	....	....	....	1·7	1·7	1·4	1·6	1·7	0·98	0·92	1·2	1·0	0·71
Sodium oxide..... "	....	....	....	2·1	1·7	2·7	2·2	4·5	2·1	1·4	0·65	1·0	2·5
Potassium oxide..... "	....	....	....	1·2	1·2	2·3	1·5	1·1	1·3	1·4	2·0	1·8	0·99
Sulphur trioxide..... "	....	....	....	11·8	9·1	14·1	14·0	19·3	6·2	4·4	7·8	10·3	21·1
Fusibility—													
Initial deformation temperature.....°F	2230	2110	2185	2040	2120	2060	2040	1890	2030	2030	1950	1970	1965
Softening temperature.....°F	2280	2255	2325	2160	2260	2140	2160	2030	2130	2160	2040	2080	2050
Fluid temperature.....°F	2415	2325	....	2210	2320	2200	2250	2060	2180	2260	2120	2200	2075
Designation of coal.....	Unscreened coal, over picking belt.	Unscreened coal, over picking belt.	Over ¾-inch screen, and picking belt.	Thr'gh 4-inch, round, screen.	4- to ¾-inch, round.	Thr'gh ¾-inch, round.	Thr'gh ½-inch, square.	Thr'gh 0·0116-inch (48-mesh), square.	Thr'gh 4-inch, round.	4- to ¾-inch, round.	Thr'gh ¾-inch, round.	Thr'gh ½-inch, square.	Thr'gh 0·0116-inch (48-mesh), square.

*These two companies subsidiary to the Dominion Coal Company, Limited.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From coal from the tipple of Beech Grove mine, Maple Leaf colliery, Maritime Coal, Railway and Power Company, Limited, Old Joggins seam, River Hebert, Joggins-Chignecto area, Nova Scotia; June 30, 1923	From coal from Avon Coal Company, Limited, Newcastle Creek, Minto area, New Brunswick		From coal from Rothwell mine of W. Benton Evans, Minto (south)			From coal from The Minto Coal Company, Limited, Minto (north)			From coal from the tipple of No. 7 shaft, Miramichi Lumber Company, Limited, Minto (north); June 27, 1923
		From Winter-port mine; probably during April, 1930	From New Zion mine; probably during April, 1930	From the tipple of No. 10 shaft; June 27, 1923	From No. B 1 shaft; autumn of 1926	Probably during April, 1930	From No. 2 B shaft; June 27, 1923	From carload shipped to Hamil-ton, Ont.; February, 1924	Probably during April, 1930	
Sample No.	2311	7040	7039	2300	4030	7038	2295	2642	7037	2292
Silica.....per cent	36·9	31·4	40·3	30·3	32·9	29·0	38·3	37·2	32·6	39·9
Ferric oxide.....“	51·7	44·2	38·4	....	44·9	44·9	....	35·9	44·8	....
Alumina.....“		11·6	14·2	69·8	11·4	13·0	59·3	19·5	11·5	63·2
Titanium dioxide.....“		0·72	0·88	....	0·84	0·58	....	....	0·80	....
Phosphorus pentoxide.....“	....	1·5	0·64	....	1·3	1·4	....	....	1·7	....
Calcium oxide (lime).....“	7·8	6·0	2·0	4·4	3·6	4·6	3·4	3·3	4·3	2·1
Magnesium oxide.....“	....	0·75	0·82	....	0·32	1·4	....	2·1	0·44	....
Sodium oxide.....“	....	0·14	0·40	....	0·08	0·54	....	....	0·52	....
Potassium oxide.....“	....	0·80	1·5	....	1·4	1·1	....	....	1·1	....
Sulphur trioxide.....“	....	4·2	1·2	....	3·5	3·7	....	....	2·9	....
Fusibility—										
Initial deformation temperature.....°F	2040	1930	1945	2020	1910	1960	2010	....	1930	1995
Softening temperature.....°F	2085	1975	1980	2075	1930	1975	2050	2080	1950	2030
Fluid temperature.....°F	2120	2045	2050	2120	1950	2010	2145	....	1970	2140
Designation of coal	Run-of-mine	.....	.....	Over $\frac{3}{8}$-inch screen.	.....	.....	Over $\frac{3}{4}$-inch screen.	.....	.....	Over $\frac{3}{8}$-inch screen.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From peat from bog at Alfred, Ont.		From lignite from lower seam of Onakawana deposit, Abitibi river, northern Ontario; late in autumn of 1931	From lignite from Woodend mine, Willow Bunch—Wood Mountain area, Sask.; sec. 3, tp. 11, R. 28 W. 2 mer.; July 5, 1924	From coal from No. 1 seam, Rosedale, Drumheller area, Alberta, sec. 28, tp. 28, R. 19 W. 4 mer.; Dec. 1, 1934	From a coal from the Drumheller area			From coal from Clover Bar, Edmonton area, Alberta, sec. 7, tp. 53, R. 23 W. 4 mer.; Jan. 15, 1935
	Season of 1925	Season of 1928				From coarse coal; 85% with 13% ash	From fine coal; 15% with 24·6% ash	Average sample of ash; calculated composition	
Sample No.	3354 3508	15104	15213	2770	14872	....	....	....	15247
Silica.....per cent	27·4	23·2	10·8	55·0	38·0	56·1	59·5	56·7	29·7
Ferric oxide..... "	8·9	10·3	21·5	9·9	6·7	4·4	4·0	4·3	8·0
Alumina..... "	11·3	6·7	9·3	20·7	16·9	24·4	21·0	23·9	17·3
Manganous oxide..... "	....	0·06	0·05	....	0·02	....	....	....	0·00
Titanium dioxide..... "	....	0·41	0·40	....	0·34	....	....	....	0·34
Phosphorus pentoxide..... "	....	1·3	0·06	....	1·4	....	....	....	2·9
Calcium oxide (lime)..... "	26·7	35·8	20·5	8·2	12·8	7·2	4·9	6·8	18·3
Magnesium oxide..... "	18·2	12·0	5·0	3·7	1·8	....	....	....	0·12
Sodium oxide..... "	....	1·2	4·3	....	8·1	....	....	....	10·2
Potassium oxide..... "	....	0·19	0·16	....	0·15	....	....	....	0·47
Sulphur trioxide..... "	....	9·2	28·3	....	13·4	....	....	....	12·6
Fusibility—									
Initial deformation temperature...°F	2110*	....	....	....	1910*	....	....	....	2040*
Softening temperature.....°F	2410*	....	....	....	1985*	....	....	....	2090*
Fluid temperature.....°F	2500*	....	....	....	2080*	....	....	....	2110*
Designation of coal.....	.....				Lump; over 4-inch, round-hole shaker screen.	.....			Lump; over 4-inch, round-hole shaker screen.

*Approximate values.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	From coal from Alexo mine, Alexo, Saunders area, Alberta, sec. 27, tp. 40, R. 13 W. 5 mer.; Jan. 8, 1935	From coal from No. 1 seam, Bellevue mine, West Canadian Collieries, Limited, Bellevue, Crowsnest Pass area, Alberta, sec. 29, tp. 7, R. 3 W. 4 mer.; November, 1914	From coal from No. 1 or Shaft seam, Frank, Crowsnest Pass area, sec. 36, tp. 7, R. 3 W. 4 mer.; November, 1914	From coke made with coal from International, Denison mine, Coleman, Crowsnest Pass area; autumn of 1934	From coal from The Canmore Coal Company, Limited, Canmore, Cascade area, Alberta, sec. 29, tp. 24, R. 10 W. 5 mer.; May, 1934	From coal from No. 3 seam, The Georgetown, Collieries, Limited, Canmore, secs. 1 and 6, tp. 25, R's 10 and 11 W. 5 mer.; November, 1913	From coal from Miette mine, Jasper Park Collieries, Limited, Pocahontas, Brulé area, Alberta, sec. 18, tp. 49, R. 28 W. 5 mer.; December, 1914
Sample No.	14946	727	726	13740	15067	728	725
Silica.....per cent	34·0	52·5	59·8	51·2	60·4	54·3	61·1
Ferric oxide..... "	11·1	4·3	2·7	9·7	3·2	8·1	2·3
Alumina..... "	15·8	33·2	31·6	25·9	26·9	29·1	29·6
Manganous oxide..... "	0·02	....	....	....	0·00	....	....
Titanium dioxide..... "	0·35	1·3	1·4	....	1·1	1·0	2·5
Phosphorus pentoxide..... "	0·82	....	....	....	1·6	....	....
Calcium oxide (lime)..... "	20·5	5·5	2·4	3·5	3·6	2·5	2·7
Magnesium oxide..... "	1·1	1·5	0·90	0·90	0·02	1·3	0·35
Sodium oxide..... "	3·1	0·71	0·24	....	1·5	0·92	0·33
Potassium oxide..... "	0·49	0·42	0·13	....	0·79	1·7	0·31
Sulphur trioxide..... "	12·2	....	....	....	1·3	....	....
Fusibility—							
Initial deformation temperature.....°F	2129*	....	....	2700°+	....	....	....
Softening temperature.....°F	2150*	....	....	2700°+	....	....	....
Fluid temperature.....°F	2170*	....	....	2700°+	....	....	....
Designation of coal.....	Lump; over 2- x 10-inch, pear-shaped shaker screen	Run-of-mine..	Run-of-mine..	.....	Domestic lump	.....	

*Approximate values.

TABLE I—Continued

Analyses of Ash Samples—Continued

—	The Crow's Nest Pass Coal Company, Limited, Fernie; Michel colliery, Michel, Crowsnest Pass area, British Columbia						
	From coal from a shipment of 20 cars; January, 1931	From unwashed coal from B seam; autumn of 1934	From beehive coke made from washed coal from B seam; autumn of 1934	From unwashed coal from No. 1 seam; autumn of 1934	From beehive coke made from washed coal from No. 1 seam; autumn of 1934	From unwashed coal from No. 3 seam; autumn of 1934	From beehive coke made from washed coal from No. 3 seam; autumn of 1934
Sample No.	14908	13737	13731	13739	13733	13738	13732
Silica.....per cent	43·9	49·2	49·2	55·0	55·4	55·9	53·2
Ferric oxide..... "	25·6	13·3	16·6	3·7	7·2	8·6	5·3
Alumina..... "	13·2	25·7	19·2	35·1	26·5	26·6	30·0
Manganous oxide..... "	0·14	....	....	....	....	....	....
Titanium dioxide..... "	1·1	....	....	....	....	....	....
Phosphorus pentoxide..... "	2·2	....	....	....	....	....	....
Calcium oxide (lime)..... "	4·6	3·6	5·0	1·6	2·0	1·7	2·3
Magnesium oxide..... "	0·96	....	1·1	....	....	....	....
Sodium oxide..... "	6·1	....	....	....	....	....	....
Potassium oxide..... "	0·85	....	....	....	....	....	....
Sulphur trioxide..... "	1·7	....	....	....	....	....	....
Fusibility—							
Initial deformation temperature.....°F	....	2040	2120	2700+	2700+	2500	2680
Softening temperature.....°F	....	2195	2335	2700+	2700+	2780	2830
Fluid temperature.....°F	....	2320	2515	2700+	2700+	2835	2870
Designation of coal.....	Run-of-mine..	Slack.....	Washed slack.	Slack.....	Washed slack.	Slack.....	Washed slack.

TABLE I—Concluded

Analyses of Ash Samples—Concluded

—	From coal from No. 2 south mine, Middlesboro Collieries, Limited, Merritt, Nicola area, British Columbia; December, 1933	From a shipment of coal from No. 4 mine, Canadian Collieries (Dunsmuir), Limited, Cumberland, Comox area, British Columbia; September, 1932	From a blend of coal made from samples of Welsh anthracite, as supplied to Fuel Research Laboratories, for house-heating tests; winter and spring of 1936	From a sample of anthracite coal from French Indo-China; supplied under conditions similar to those of previous sample	From a blend made from samples of hard maple wood; as supplied to Fuel Research Laboratories, for house-heating tests; summer of 1933	From a blend made from samples of wood from pine slabs and edgings; supplied under conditions similar to those of previous sample
Sample No.	15143	15060	....	15626	12261	12262
Silica.....per cent	48·0	38·1	39·0	49·3	1·9	12·3
Ferric oxide..... "	6·8	7·2	12·2	15·7	0·53	3·6
Alumina..... "	36·8	26·8	31·7	27·2	1·6	7·1
Manganous oxide..... "	0·00	0·03	0·06	0·07	....	....
Titanium dioxide..... "	1·2	1·8	0·89	0·87	....	....
Phosphorus pentoxide..... "	1·5	0·98	1·7	0·18	1·3	2·6
Calcium oxide (lime)..... "	2·7	12·8	5·0	1·5	45·4	33·3
Magnesium oxide..... "	0·10	0·08	0·56	0·27	3·6	6·4
Sodium oxide..... "	0·89	0·38	1·3	0·34	0·48	1·2
Potassium oxide..... "	0·91	0·57	1·5	2·8	12·2	11·1
Sulphur trioxide..... "	0·75	11·2	5·7	1·5	1·9	2·9
Carbon dioxide..... "	....	....	....	....	30·9	18·5
Unburnt carbon, etc..... "	....	....	....	....	1·1	1·9
Fusibility—						
Initial deformation temperature.....°F	....	2355**	2210	2070	2700+	2700+
Softening temperature.....°F	....	2410**	2375	2190	2700+	2700+
Fluid temperature.....°F	....	....	2575	2420	2700+	2700+
Designation of coal.....	Lump.....	Pea.....	Nos. 1 and 2 buckwheat.	No. 1 silver buckwheat.	.....	

**Approximate values.

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