

Mines Branch Information Circular IC 255

EVALUATION OF CANADIAN COMMERCIAL COALS:

NOVA SCOTIA AND NEW BRUNSWICK - 1969

by

T. E. Tibbetts* and D. J. O'Brien**

ABSTRACT

Physical and chemical analyses of seventy-seven coal samples are reported, representing the eleven operating mines in Nova Scotia and six operating mines in New Brunswick.

The samples were taken and analysed by the Fuels Research Centre during the year 1969. They represent the production on a specified day of the coals as commercially prepared at the mine or the coals as delivered to thermal electric generating stations.

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Direction des mines
Circulaire d'information IC 255

ÉVALUATION DES HOUILLES COMMERCIALES CANADIENNES:
NOUVELLE-ÉCOSSE ET NOUVEAU-BRUNSWICK - 1969

par

T. E. Tibbetts* et D. J. O'Brien**

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RÉSUMÉ

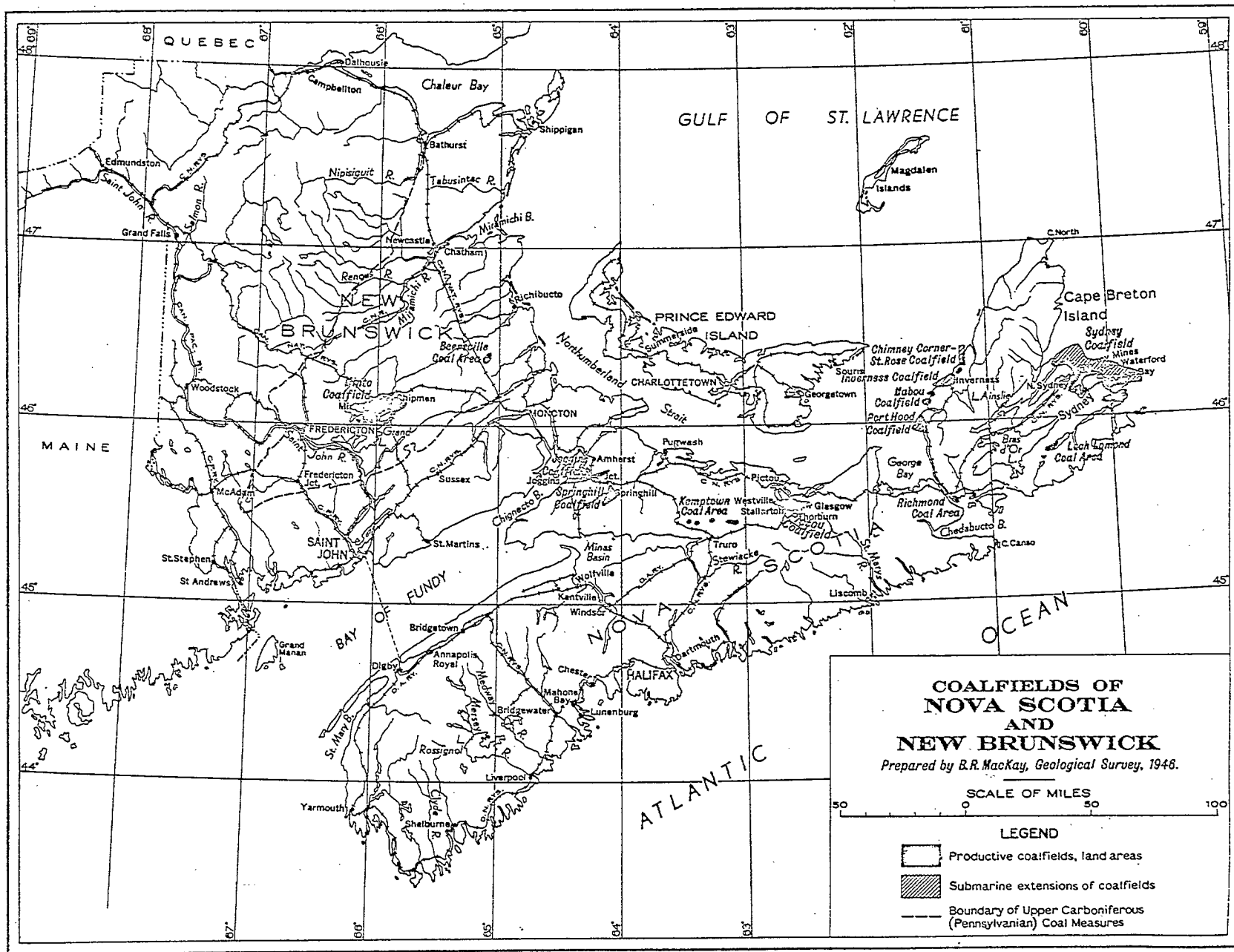
Les auteurs donnent les résultats des analyses chimiques et physiques de 77 échantillons de houille provenant des 11 mines en exploitation en Nouvelle-Ecosse et de six mines du Nouveau-Brunswick.

Les échantillons ont été prélevés et analysés en 1969 par le Centre de recherche sur les combustibles. Ils sont représentatifs de la production journalière de la houille préparée commercialement à la mine ou livrée aux centrales thermiques.

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COAL AREAS AND PRODUCERS

(with approximate production in 1969 in thousands of short tons)

NOVA SCOTIA

Sydney and Inverness Areas

Bras d'Or Coal Co. Ltd. (Four Star Mine) .	103
Cape Breton Development Corporation . . .	2,215
Evans Coal Mines Limited	37

Pictou Area

Drummond Coal Company Limited	45
Thorburn Mining Limited (McBean Mine) . .	127

Springhill and Joggins Areas

River Hebert Coal Company Limited	42
Springhill Coal Mines Limited	52

NEW BRUNSWICK

Minto Area

N.B. Coal Company	246
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Note: All coal mines in New Brunswick are now operated by the N.B. Coal Company for the Grand Lake Development Corporation.

INTRODUCTION

In order to keep in close touch with any change in coal quality and to ensure that such changes are significant and not due to improper sampling techniques, the Fuels Research Centre has had members of the staff collecting samples of commercially prepared coals at the mines in eastern and western Canadian coalfields on a more or less continuing basis since 1954. The project (No. 2-2-9), "Survey of Canadian Commercial Coals", is conducted under the direction of the Coal and Peat Resources Evaluation Section and forms the basis of information on Canadian coals published periodically in the "Analysis Directory of Canadian Coals".

All samples collected under this project are obtained in accordance with recognized reliable specifications and for the most part are representative of the production for one day at the mines. Normal production and preparation procedures are followed at the mine during the sampling period, allowing the samples to be truly representative of the commercially prepared products. In some instances, where it is recognized that more representative samples can be collected, sampling is conducted at thermal electric generating stations; where this is done it is so noted.

The gross samples were crushed and reduced in volume in the field prior to being shipped to Ottawa for analysis. A laboratory with complete sample preparation facilities was opened by the Fuels Research Centre at Glace Bay, Nova Scotia, in 1965. This was subsequently re-established in the Point Edward area, Sydney, Nova Scotia. In New Brunswick the sample preparation facilities of the New Brunswick Electric Power Commission were used for partial preparation of samples collected in the Minto coalfield.

In order to report more accurately the total "as received" moisture of coals sampled in Nova Scotia, the loss of moisture on air drying was determined by standardized procedure at the Point Edward Laboratory prior to sample preparation. In New Brunswick, where significant

time lag was anticipated between the sampling period and sample preparation (crushing and volume reduction), and when practical in reference to particle size, special moisture samples were prepared from the gross sample at the time of sampling.

This publication contains the analyses on the "as received" moisture basis, except as noted below, of all commercial coal samples collected under this project during the year 1969 at mines and delivery points in Nova Scotia and New Brunswick. All analyses were conducted by the Fuels Research Centre, substantially by the Solid Fuels Analysis Laboratory.

As noted above, in some instances special procedures were followed to assure determination of the as-sampled moisture content of the coal. Where applicable this moisture was used in reporting the analysis and is indicated by a plus (+) sign. Analyses of coal samples collected in the Inverness coalfield are reported, because of the lower rank of this coal, on the equilibrium ("in situ") moisture basis. Ash fusion determinations are made in a reducing atmosphere.

The analyses are presented in two sections as follows:

- Section I - Nova Scotia
- Section II - New Brunswick

GLOSSARY OF ABBREVIATED TERMS

sq	-	square hole screen
rd	-	round hole screen
sl	-	slot hole screen
-	-	not determined
N.S.P.C.	-	Nova Scotia Power Commission
N.B.E.P.C.	-	New Brunswick Electric Power Commission
ASTM	-	American Society for Testing and Materials

SECTION I - NOVA SCOTIA

ANALYSES

Mine Operator BRAS D'OR COAL COMPANY LIMITED
 Mine Location Broughton, Cape Breton County, Nova Scotia
 Name of Mine or Coal Four Star

Date Sampled	9-4-69	9-4-69	9-4-69	9-4-69
Weight Sampled (approx.) tons	16	35	80	205
Size: Mine Designation	Lump	Nut	Pea	Fines
Screen Opening in.	+2	2 x 3/4	3/4 x 5/16	5/16 x 0
FRC Laboratory No.	2929-69	2930-69	2931-69	2932-69
Proximate Analysis				
Moisture %	5.5	5.9	7.1	7.8
Ash %	11.3	13.6	9.5	10.8
Volatile Matter %	33.1	32.5	33.1	32.3
Fixed Carbon %	50.1	48.0	50.3	49.1
Sulphur %	5.5	5.7	5.1	5.7
Calorific Value Btu/lb.	12,040	11,600	12,120	11,790
Ash Fusibility				
Initial Temp.°F	1980	1980	1970	1900
Softening Temp: (a) Spherical°F	2050	2050	2050	1950
(b) Hemispherical.°F	2200	2470	2300	2310
Fluid Temp.°F	2360	2470	2300	2310
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	3 1/2	3 1/2	4	3 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous			

Mine Operator BRAS D'OR COAL COMPANY LIMITED
 Mine Location Broughton, Cape Breton County, Nova Scotia
 Name of Mine or Coal Four Star

Date Sampled	30-5-69	23-10-69
Weight Sampled (approx.) tons	220	330

Size: Mine Designation	Mine Run	Mine Run
Screen Opening in.	*	

FRC Laboratory No.	2984-69	3360-69
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Proximate Analysis

Moisture %	7.4	6.7
Ash %	10.0	8.7
Volatile Matter %	32.9	33.5
Fixed Carbon %	49.7	51.1
Sulphur %	5.5	5.2
Calorific Value Btu/lb.	11,930	12,530
Ash Fusibility		
Initial Temp.°F	2100	1800
Softening Temp:(a) Spherical°F	2200	2130
(b) Hemispherical.°F	2340	2220
Fluid Temp.°F	2660+	2320
Grindability Index (Hardgrove)	-	-
Free Swelling Index (ASTM)	-	5 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous	

* Sampled from deliveries to Seaboard Power Plant, N.S.P.C.

Mine Operator	CAPE BRETON DEVELOPMENT CORPORATION
Mine Location	New Waterford, Cape Breton County, Nova Scotia
Name of Mine or Coal	No. 12 Mine

Date Sampled	7-4-69	29-10-69
Weight Sampled (approx.) tons	100	85
Size: Mine Designation	Screened	Screened
Screen Opening in.	+2 sq	+2 sq
FRC Laboratory No.	2922-69	3357-69
Proximate Analysis		
Moisture %	3.1	3.0
Ash %	4.2	4.3
Volatile Matter %	35.9	35.7
Fixed Carbon %	56.8	57.0
Sulphur %	2.2	2.6
Calorific Value Btu/lb.	14,390	14,440
Ash Fusibility		
Initial Temp.°F	1880	2160
Softening Temp:(a) Spherical°F	1980	2310
(b) Hemispherical.°F	2050	2380
Fluid Temp.°F	2340	2550
Grindability Index (Hardgrove)	-	-
Free Swelling Index (ASTM)	8	5
Classification by Rank (ASTM)	High Volatile A Bituminous	

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location New Waterford, Cape Breton County, Nova Scotia
 Name of Mine or Coal No. 12 Mine

Date Sampled	7-4-69	29-10-69	30-10-69*
Weight Sampled (approx.) tons	390	560	51
Size: Mine Designation	Special Slack	Slack	Slack
Screen Opening in.	2 sq x 0	2 sq x 0	2 sq x 0
FRC Laboratory No.	2923-69	3358-69	3370-69
Proximate Analysis			
Moisture %	4.1	4.6	4.2
Ash %	9.1	6.1	7.7
Volatile Matter %	33.0	34.3	32.9
Fixed Carbon %	53.8	55.0	55.2
Sulphur %	3.3	2.6	2.9
Calorific Value Btu/lb.	13,420	13,880	13,670
Ash Fusibility			
Initial Temp.°F	1900	2160	2050
Softening Temp:(a) Spherical°F	2050	2360	2270
(b) Hemispherical.°F	2300	2550	2430
Fluid Temp.°F	2500	2680	2620
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	8	5	5 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous		

* Sampled from deliveries to the Seaboard Power Plant, N.S.P.C.

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location New Waterford, Cape Breton County, Nova Scotia
 Name of Mine or Coal No. 12 Mine

Date Sampled	7-4-69	30-5-69*	30-10-69*
Weight Sampled (approx.) tons	760	460	800
Size: Mine Designation	Fines	Fines	Fines
Screen Opening in.	1/4 s1 x 0	1/4 s1 x 0	1/4 s1 x 0
FRC Laboratory No.	2924-69	2983-69	3371-69
Proximate Analysis			
Moisture %	4.8	5.0	5.2
Ash %	2.3	6.4	11.5
Volatile Matter %	34.7	34.7	31.3
Fixed Carbon %	58.2	53.9	52.0
Sulphur %	0.9	1.8	2.0
Calorific Value Btu/lb.	14,290	13,560	12,800
Ash Fusibility			
Initial Temp.°F	1910	2210	2140
Softening Temp:(a) Spherical°F	2150	2230	2360
(b) Hemispherical.°F	2300	2620	2560
Fluid Temp.°F	2400	2660+	2600
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	8 1/2	-	5 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous		

* Sampled from deliveries to the Seaboard Power Plant, N.S.P.C.

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Glace Bay, Cape Breton County, Nova Scotia
 Name of Mine or Coal No. 20 Mine

Date Sampled	17-4-69	21-10-69	9-12-69
Weight Sampled (approx.) tons	600	800	820
Size: Mine Designation	Slack	Slack	Slack
Screen Opening in.	1 1/2 sq x 0	1 1/2 sq x 0	1 1/2 sq x 0
FRC Laboratory No.	2925-69	3359-69	2020-70
Proximate Analysis			
Moisture %	4.5	4.8	4.2
Ash %	4.8	5.8	3.8
Volatile Matter, %	37.1	35.5	35.8
Fixed Carbon %	53.6	53.9	56.2
Sulphur %	2.6	3.3	2.8
Calorific Value Btu/lb.	14,010	13,690	14,180
Ash Fusibility			
Initial Temp.°F	1850	1980	2200
Softening Temp:(a) Spherical°F	1900	2070	2270
(b) Hemispherical.°F	2000	2100	2380
Fluid Temp.°F	2290	2330	2710
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	9	6	8
Classification by Rank (ASTM)	High Volatile A Bituminous		

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Glace Bay, Cape Breton County, Nova Scotia
 Name of Mine or Coal No. 26 Mine

Date Sampled	22-4-69	11-12-69	22-4-69	11-12-69
Weight Sampled (approx.) tons	275	250	250	275
Size: Mine Designation	Screened	Screened	Pea	Pea
Screen Opening in.	+ 1 1/4 s1	+ 1 1/4 s1	3/4 x 5/16 s1	3/4 x 5/16 s1
FRC Laboratory No.	2926-69	2011-70	2928-69	2013-69
Proximate Analysis				
Moisture %	4.2	2.9	4.8	4.0
Ash %	4.3	4.8	3.7	3.3
Volatile Matter %	35.0	35.4	33.9	35.3
Fixed Carbon %	56.5	56.9	57.6	57.4
Sulphur %	1.6	2.0	1.1	2.0
Calorific Value Btu/lb.	14,100	14,310	14,050	14,340
Ash Fusibility				
Initial Temp.°F	1820	2240	1990	2150
Softening Temp:(a) Spherical°F	2000	2310	2090	2280
(b) Hemispherical.°F	2250	2350	2310	2320
Fluid Temp.°F	2500	2490	2500	2630
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	8 1/2	6 1/2	8 1/2	8 1/2
Classification by Rank (ASTM)	High Volative A Bituminous			

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Glace Bay, Cape Breton County, Nova Scotia
 Name of Mine or Coal No. 26 Mine

Date Sampled	22-4-69	11-12-69	11-12-69
Weight Sampled (approx.) tons	900	700	550
Size: Mine Designation	Slack	Slack	Slack *
Screen Opening in.	1 1/4 s1 x 0	1 1/4 s1 x 0	1 1/4 s1 x 0
FRC Laboratory No.	2927-69	2012-70	2014-70
Proximate Analysis			
Moisture %	5.1	5.0	4.5
Ash %	7.1	3.1	5.5
Volatile Matter %	33.2	34.4	32.3
Fixed Carbon %	54.6	57.5	57.7
Sulphur %	1.7	1.7	1.1
Calorific Value Btu/lb.	13,370	14,170	13,890
Ash Fusibility			
Initial Temp.°F	1820	2080	2180
Softening Temp: (a) Spherical°F	2060	2240	2510
(b) Hemispherical.°F	2240	2280	2630
Fluid Temp.°F	2460	2620	2680
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	8 1/2	8	9
Classification by Rank (ASTM)	High Volatile A Bituminous		

* Regular slack coal with pea (3/4 x 5/16") removed.

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Sydney Mines, Cape Breton County, Nova Scotia
 Name of Mine or Coal Princess Mine

Date Sampled	15-4-69	15-12-69	15-4-69	15-12-69
Weight Sampled (approx.) tons	295	250	95	182
Size: Mine Designation	Egg	Egg	Nut	Nut
Screen Opening in.	+ 1 3/4 rd	+ 1 3/4 rd	1 3/4 rd x 3/4 sl	1 3/4 rd x 3/4 sl
FRC Laboratory No.	2917-69	2015-70	2918-69	2016-70
Proximate Analysis				
Moisture %	4.4	4.8	4.4	6.5
Ash %	4.8	5.8	6.7	5.0
Volatile Matter %	38.4	37.5	38.0	35.3
Fixed Carbon %	52.4	51.9	50.9	53.2
Sulphur %	2.8	4.0	2.5	2.8
Calorific Value Btu/lb.	13,980	13,760	13,550	13,600
Ash Fusibility				
Initial Temp.°F	2050	2330	1850	2250
Softening Temp: (a) Spherical°F	2150	2420	2000	2280
(b) Hemispherical.°F	2300	2450	2280	2310
Fluid Temp.°F	2400	2580	2400	2730
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	7 1/2	5	8	7
Classification by Rank (ASTM)	High Volatile A Bituminous			

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Sydney Mines, Cape Breton County, Nova Scotia
 Name of Mine or Coal Princess Mine

Date Sampled	15-4-69	15-12-69
Weight Sampled (approx.) tons	120	112
Size: Mine Designation	Pea	Pea
Screen Opening in.	3/4 x 1/4 sl	3/4 x 1/4 sl
FRC Laboratory No.	2920-69	2017-70
Proximate Analysis		
Moisture %	5.7	7.9
Ash %	4.3	4.2
Volatile Matter %	37.9	35.9
Fixed Carbon %	52.1	52.0
Sulphur %	2.5	3.0
Calorific Value Btu/lb.	13,720	13,480
Ash Fusibility		
Initial Temp.°F	1880	2230
Softening Temp:(a) Spherical°F	2000	2270
(b) Hemispherical.°F	2300	2320
Fluid Temp.°F	2400	2680
Grindability Index (Hardgrove)	-	-
Free Swelling Index (ASTM)	7 1/2	7
Classification by Rank (ASTM)	High Volatile A Bituminous	

Mine Operator CAPE BRETON DEVELOPMENT CORPORATION
 Mine Location Sydney Mines, Cape Breton County, Nova Scotia
 Name of Mine or Coal Princess Mine

Date Sampled	15-4-69	15-12-69	15-4-69	15-12-69
Weight Sampled (approx.) tons	430	200	450	275
Size: Mine Designation	Coarse Slack	Washed Slack	Fines	Fines
Screen Opening in.	1 3/4 rd x 0	3/4 sl x 0	1/4 sl x 0	1/4 sl x 0
FRC Laboratory No.	2919-69	2018-70	2921-69	2019-70
Proximate Analysis				
Moisture %	5.0	5.6	5.5	5.0
Ash %	4.7	6.6	15.2	8.5
Volatile Matter %	37.2	35.5	32.3	34.7
Fixed Carbon %	53.1	52.3	47.0	51.8
Sulphur %	2.6	3.1	2.8	3.1
Calorific Value Btu/lb.	13,780	13,380	11,900	13,070
Ash Fusibility				
Initial Temp.°F	1850	2120	1890	2230
Softening Temp:(a) Spherical°F	2050	2260	2020	2400
(b) Hemispherical.°F	2140	2420	2250	2550
Fluid Temp.°F	2350	2750	2550	2710
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	8	7	7 1/2	7 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous			

Mine Operator DRUMMOND COAL COMPANY LIMITED - NO. 1 MINE
 Mine Location Westville, Pictou County, Nova Scotia
 Name of Mine or Coal Drummond No. 1, "Drummond"

Date Sampled	11-6-69	11-6-69	11-6-69
Weight Sampled (approx.) tons	15	8	10
Size: Mine Designation	Lump	Nut	Slack
Screen Opening in.	+ 1 1/2 sq	1 1/2 x 3/4 sq	3/4 sq x 0
FRC Laboratory No.	2978-69	2979-69	2980-69
Proximate Analysis			
Moisture %	3.4	3.1	5.1
Ash %	11.0	10.3	10.9
Volatile Matter %	27.9	29.6	27.1
Fixed Carbon %	57.7	57.0	56.9
Sulphur %	1.3	0.7	0.5
Calorific Value Btu/lb.	12,500	12,630	12,230
Ash Fusibility			
Initial Temp.°F	2450	2500	2650+
Softening Temp:(a) Spherical°F	2560	2500	2650+
(b) Hemispherical.°F	2700+	2650+	2650+
Fluid Temp.°F	2700+	2650+	2650+
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	1	1.5	1
Classification by Rank (ASTM)		High Volatile A Bituminous	

Mine Operator DRUMMOND COAL COMPANY LIMITED - NO. 2 MINE
 Mine Location Westville, Pictou County, Nova Scotia
 Name of Mine or Coal Drummond No. 2, "Drummond"

Date Sampled	12-6-69*	12-6-69*
Weight Sampled (approx.) tons	150	70
Size: Mine Designation	Screen	Slack
Screen Opening in.	+ 1 1/2 sq	3/4 sq x 0
FRC Laboratory No.	2981-69	2982-69
Proximate Analysis		
Moisture %	4.6	5.2
Ash %	16.6	20.1
Volatile Matter %	26.4	25.4
Fixed Carbon %	52.4	49.3
Sulphur %	1.2	1.0
Calorific Value Btu/lb.	11,340	10,770
Ash Fusibility		
Initial Temp.°F	2650+	2650+
Softening Temp:(a) Spherical°F	2650+	2650+
(b) Hemispherical.°F	2650+	2650+
Fluid Temp.°F	2650+	2650+
Grindability Index (Hardgrove)	-	-
Free Swelling Index (ASTM)	1	1
Classification by Rank (ASTM)	High Volatile A Bituminous	

* Sampled from deliveries to the Trenton Power Plant, N.S.P.C.

Mine Operator EVANS COAL MINES LIMITED
 Mine Location St. Rose, Inverness County, Nova Scotia
 Name of Mine or Coal St. Rose

Date Sampled	15-10-69	15-10-69	15-10-69
Weight Sampled (approx.) tons	23	35	18

Size: Mine Designation	Medium Lump	Egg	Nut
Screen Opening in.	4 x 2	2 x 1	1 x 3/4

FRC Laboratory No.	3339-69	3340-69	3341-69
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Proximate Analysis

Moisture	%	4.9	4.9	4.9
Ash	%	10.1	8.4	10.0
Volatile Matter	%	35.1	36.1	35.4
Fixed Carbon	%	49.9	50.6	49.7
Sulphur	%	6.8	5.6	6.1
Calorific Value	Btu/lb.	12,110	12,430	12,110
Ash Fusibility				
Initial Temp.	°F	2230	2050	2030
Softening Temp: (a) Spherical	°F	2770+	2110	2150
(b) Hemispherical.	°F	2770+	2280	2260
Fluid Temp.	°F	2770+	2380	2400
Grindability Index (Hardgrove)		43	51	52
Free Swelling Index (ASTM)		2 1/2	4 1/2	3
Classification by Rank (ASTM)		High Volatile B Bituminous		

Mine Operator EVANS COAL MINES LIMITED
 Mine Location St. Rose, Inverness County, Nova Scotia
 Name of Mine or Coal St. Rose

Date Sampled	15-10-69	15-10-69
Weight Sampled (approx.) tons	19	38
Size: Mine Designation	Stoker	Fines
Screen Opening in.	3/4 x 1/2	1/2 x 0
FRC Laboratory No.	3343-69	3345-69
Proximate Analysis		
Moisture %	4.9	5.3
Ash %	10.5	10.5
Volatile Matter %	35.0	35.0
Fixed Carbon %	49.6	49.2
Sulphur %	6.3	6.0
Calorific Value Btu/lb.	12,040	11,980
Ash Fusibility		
Initial Temp.°F	2040	2030
Softening Temp:(a) Spherical°F	2190	2210
(b) Hemispherical.°F	2270	2290
Fluid Temp.°F	2380	2370
Grindability Index (Hardgrove)	52	61
Free Swelling Index (ASTM)	4 1/2	3 1/2
Classification by Rank (ASTM)	High Volatile B Bituminous	

Mine Operator RIVER HEBERT COAL COMPANY LIMITED
 Mine Location River Hebert, Cumberland County, Nova Scotia
 Name of Mine or Coal River Hebert

Date Sampled	11-9-69	12-9-69*	11-9-69	12-9-69*
Weight Sampled (approx.) tons	95	80	48	20
Size: Mine Designation	Lump	Lump	Slack	Slack
Screen Opening in.	+1 1/8 sq	+1 1/8 sq	1 1/8 sq x 0	1 1/8 sq x 0
FRC Laboratory No.	3273-69	3271-69	3274-69	3272-69
Proximate Analysis				
Moisture %	1.0	1.2	1.1	1.3
Ash %	10.7	8.9	12.3	10.5
Volatile Matter %	37.6	39.5	35.0	35.9
Fixed Carbon %	50.7	50.4	51.5	52.3
Sulphur %	5.9	4.9	4.4	4.3
Calorific Value Btu/lb.	12,950	13,300	12,770	13,080
Ash Fusibility				
Initial Temp.°F	1950	1960	1910	1800
Softening Temp:(a) Spherical....°F	2140	2200	2150	1980
(b) Hemispherical.°F	2260	2300	2200	2050
Fluid Temp.°F	2300	2420	2350	2110
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	7	7 1/2	7 1/2	7
Classification by Rank (ASTM)	High Volatile A Bituminous			

* Sampled from deliveries to the Maccan Power Plant, N.S.P.C.

Mine Operator SPRINGHILL COAL MINES LIMITED
 Mine Location Springhill, Cumberland County, Nova Scotia
 Name of Mine or Coal Syndicate

Date Sampled	10-9-69	10-9-69	10-9-69
Weight Sampled (approx.) tons	45	33	37
Size: Mine Designation	Lump	Stoker	Fines
Screen Opening in.	6 x 1 1/2 s1	1 1/2 x 3/8 s1	3/8 s1 x 0
FRC Laboratory No.	3275-69	3276-69	3277-69
Proximate Analysis			
Moisture %	1.3	1.6	2.3
Ash %	32.5	23.6	20.8
Volatile Matter %	26.9	28.9	29.4
Fixed Carbon %	39.3	45.9	47.5
Sulphur %	2.7	2.6	2.6
Calorific Value Btu/lb.	9,230	10,820	10,970
Ash Fusibility			
Initial Temp.°F	2025	2130	2100
Softening Temp:(a) Spherical....°F	2230	2260	2240
(b) Hemispherical.°F	2390	2430	2410
Fluid Temp.°F	2500	2610	2500
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	1	1.5	1.5
Classification by Rank (ASTM)	High Volatile A Bituminous		

Mine Operator THORBURN MINING LIMITED
 Mine Location Thorburn, Pictou County, Nova Scotia
 Name of Mine or Coal McBean; Coal Washing Plant (1)

Date Sampled	10-6-69	3-7-69	10-6-69	3-7-69
Weight Sampled (approx.) tons	155	166	178	198

Size: Mine Designation	Egg	Egg	Nut	Nut
Screen Opening in.	+ 1 3/4 sq	+ 1 3/4 sq	1 3/4 x 3/4 sq	1 3/4 x 3/4 sq

FRC Laboratory No.	2971-69	2998-69	2972-69	2999-69
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Proximate Analysis

Moisture %	2.6	3.9	3.9	3.9
Ash %	17.6	17.5	16.6	17.0
Volatile Matter %	27.2	28.1	26.8	27.3
Fixed Carbon %	52.6	50.5	52.7	51.8
Sulphur %	0.5	0.6	0.5	0.5
Calorific Value Btu/lb.	11,820	11,570	11,820	11,690
Ash Fusibility				
Initial Temp.°F	2660+	2730	2660+	2690
Softening Temp:(a) Spherical....°F	2660+	2740+	2660+	2740+
(b) Hemispherical.°F	2660+	2740+	2660+	2740+
Fluid Temp.°F	2660+	2740+	2660+	2740+
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	1	1	1	1
Classification by Rank (ASTM)	High Volatile A Bituminous			

(1) Mine and coal washing plant at Stellarton operated and managed by the Cape Breton Development Corporation; all samples were taken at the coal washing plant.

Mine Operator THORBURN MINING LIMITED
 Mine Location Thorburn, Pictou County, Nova Scotia
 Name of Mine or Coal McBean; Coal Washing Plant (1)

Date Sampled	10-6-69	3-7-69	10-6-69	3-7-69
Weight Sampled (approx.) tons	185	202	183	195
Size: Mine Designation	Stoker	Stoker	Fines	Fines
Screen Opening in.	3/4 x 3/16 sq	3/4 x 3/16 sq	3/16 sq x 0	3/16 sq x 0
FRC Laboratory No.	2973-69	3000-69	2975-69	3002-69
Proximate Analysis				
Moisture %	4.2	4.2	5.0	4.0
Ash %	16.1	17.2	16.8	16.4
Volatile Matter %	27.1	26.8	27.2	27.1
Fixed Carbon %	52.6	51.8	51.0	52.5
Sulphur %	0.6	0.5	0.6	0.5
Calorific Value Btu/lb.	11,770	11,650	11,320	11,490
Ash Fusibility				
Initial Temp.°F	2660+	2690	2650	2660
Softening Temp:(a) Spherical°F	2660+	2740+	2670	2710+
(b) Hemispherical.°F	2660+	2740+	2700+	2710+
Fluid Temp.°F	2660+	2740+	2700+	2710+
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	1	1	1	1
Classification by Rank (ASTM)	High Volatile A Bituminous			

(1) Mine and coal washing plant at Stellarton operated and managed by the Cape Breton Development Corporation; all samples were taken at the coal washing plant.

Mine Operator THORBURN MINING LIMITED
 Mine Location Thorburn, Pictou County, Nova Scotia
 Name of Mine or Coal McBean; Coal Washing Plant (1)

Date Sampled	12-6-69*	10-6-69	12-6-69*	3-7-69
Weight Sampled (approx.) tons	350	30	70	33
Size: Mine Designation	Nut Slack	Splint ^x	Splint ^x	Splint ^x
Screen Opening in.	1 3/4 sq x 0	1 1/2 x 0	1 1/2 x 0	1 1/2 x 0
FRC Laboratory No.	2976-69	2974-69	2977-69	3001-69
Proximate Analysis				
Moisture %	4.5	5.1	5.6	4.5
Ash %	17.1	30.8	27.5	19.9
Volatile Matter %	27.4	23.8	25.5	26.2
Fixed Carbon %	51.0	40.3	41.4	48.4
Sulphur %	0.5	0.5	0.5	0.4
Calorific Value Btu/lb.	11,390	9,180	9,520	11,130
Ash Fusibility				
Initial Temp.°F	2660	2550	2560	2700
Softening Temp: (a) Spherical....°F	2700	2580	2640	2710+
(b) Hemispherical.°F	2700+	2660+	2700+	2710+
Fluid Temp.°F	2700+	2660+	2700+	2710+
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	1	1 1/2	1	1
Classification by Rank (ASTM)	High Volatile A Bituminous			

(1) Mine and coal washing plant at Stellarton operated and managed by the Cape Breton Development Corporation; except where noted otherwise, all samples were taken at the coal washing plant.

* Sampled from deliveries to the Trenton Power Plant, N.S.P.C.

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SECTION II - NEW BRUNSWICK

ANALYSES

Mine Operator N.B. COAL COMPANY
 Mine Location Newcastle Creek, Minto Coalfield, New Brunswick
 Name of Mine or Coal No. 7 Shaft

Date Sampled	13-11-69*	10-11-69	10-11-69	10-11-69
Weight Sampled (approx.) tons	75	6	7	30
Size: Mine Designation	Mine Run	Lump	Nut	Slack
Screen Opening in.		+ 2 sq	2 x 1 1/4 sq	1 1/4 sq x 0
FRC Laboratory No.	3441-69	3437-69	3438-69	3439-69
Proximate Analysis				
Moisture %	3.6	2.9	3.0	3.7+
Ash %	21.3	18.6	20.1	24.9
Volatile Matter %	29.5	30.4	30.5	28.6
Fixed Carbon %	45.6	48.1	46.4	42.8
Sulphur %	9.2	7.8	6.2	6.4
Calorific Value Btu/lb.	11,270	11,880	11,670	10,720
Ash Fusibility				
Initial Temp.°F	2150	2130	1940	2180
Softening Temp:(a) Spherical.....°F	2240	2230	2320	2370
(b) Hemispherical.°F	2270	2300	2480	2550
Fluid Temp.°F	2380	2510	2580	2600
Grindability Index (Hardgrove)	62	62	63	69
Free Swelling Index (ASTM)	5 1/2	5 1/2	6	5
Classification by Rank (ASTM)	High Volatile A Bituminous			

* Sampled from deliveries to the Grand Lake Power Plant, N.B.E.P.C.

Mine Operator N.B. COAL COMPANY
 Mine Location Newcastle Creek, Minto Coalfield, New Brunswick
 Name of Mine or Coal No. 6 Shaft (1)

Date Sampled	13-11-69*	10-11-69	10-11-69
Weight Sampled (approx.) tons	75	20	80
Size: Mine Designation	Mine Run	Lump	Slack
Screen Opening in.		+ 1 1/4 sq	1 1/4 sq x 0
FRC Laboratory No.	3436-69	3433-69	3434-69
Proximate Analysis			
Moisture %	3.5	2.9	3.2 +
Ash %	23.8	21.0	20.4
Volatile Matter %	29.2	30.1	30.4
Fixed Carbon %	43.5	46.0	46.0
Sulphur %	5.5	6.4	5.8
Calorific Value Btu/lb.	11,950	11,490	11,560
Ash Fusibility			
Initial Temp.°F	1940	2140	2130
Softening Temp:(a) Spherical°F	2320	2220	2230
(b) Hemispherical.°F	2510	2260	2310
Fluid Temp.°F	2680	2470	2510
Grindability Index (Hardgrove)	68	61	65
Free Swelling Index (ASTM)	5 1/2	5 1/2	6
Classification by Rank (ASTM)	High Volatile A Bituminous		

(1) Shaft formerly operated by C.H. Nichols.

* Sampled from deliveries to the Grand Lake Power Plant, N.B.E.P.C.

Mine Operator N.B. COAL COMPANY
 Mine Location Minto , Minto Coalfield, New Brunswick
 Name of Mine or Coal Little River and New England Strip Mines (1)

Date Sampled	13-11-69*
Weight Sampled (approx.) tons	70
Size: Mine Designation	Mine Run
Screen Opening in.	
FRC Laboratory No.	3450-69
Proximate Analysis	
Moisture %	3.3
Ash %	27.9
Volatile Matter %	27.2
Fixed Carbon %	41.6
Sulphur %	6.1
Calorific Value Btu/lb.	10,270
Ash Fusibility	
Initial Temp.°F	2050
Softening Temp:(a) Spherical°F	2220
(b) Hemispherical.°F	2250
Fluid Temp.°F	2380
Grindability Index (Hardgrove)	60
Free Swelling Index (ASTM)	5 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous

(1) Formerly operated by Avon Coal Co. Ltd.

* Sampled from deliveries to the Grand Lake Power Plant, N.B.E.P.C.

Mine Operator N.B. COAL COMPANY
 Mine Location Coal Creek, Minto Coalfield, New Brunswick
 Name of Mine or Coal Coal Creek Strip (1)

Date Sampled 13-11-69*

Weight Sampled (approx.) tons 30

Size: Mine Designation Mine Run

Screen Opening in.

FRC Laboratory No. 3449-69

Proximate Analysis

Moisture % 4.3

Ash % 24.3

Volatile Matter % 27.7

Fixed Carbon % 43.7

Sulphur % 8.7

Calorific Value Btu/lb. 10,670

Ash Fusibility

Initial Temp.°F 2150

Softening Temp:(a) Spherical°F 2250

(b) Hemispherical.°F 2380

Fluid Temp.°F 2500

Grindability Index (Hardgrove) 57

Free Swelling Index (ASTM) 5

Classification by Rank (ASTM) High Volatile A Bituminous

(1) Formerly operated by Midland Mining Co. Ltd.

* Sampled from deliveries to the Grand Lake Power Plant, N.B.E.P.C.

Mine Operator N.B. COAL COMPANY
 Mine Location Midland, Minto Coalfield, New Brunswick
 Name of Mine or Coal Midland Strip Mine (1)

Date Sampled 12-11-69*
 Weight Sampled (approx.) tons 400

Size: Mine Designation Mine Run
 Screen Opening in.

FRC Laboratory No. 3448-69

Proximate Analysis

Moisture % 4.6
 Ash % 16.4
 Volatile Matter % 32.9
 Fixed Carbon % 46.1
 Sulphur % 6.7
 Calorific Value Btu/lb. 12,050

Ash Fusibility

Initial Temp.°F 2000
 Softening Temp: (a) Spherical°F 2200
 (b) Hemispherical.°F 2230
 Fluid Temp.°F 2330

Grindability Index (Hardgrove) 68

Free Swelling Index (ASTM)

Classification by Rank (ASTM) High Volatile A Bituminous

(1) Formerly operated by D.W. & R.A. Mills Ltd.

* Sampled from deliveries to the Grand Lake Power Plant, N.B.E.P.C.

Mine Operator N.B. COAL COMPANY
 Mine Location Mills Siding, Minto Coalfield, New Brunswick
 Name of Mine or Coal Coal Washing Plant (1)

Date Sampled	12-11-69	12-11-69	12-11-69	12-11-69
Weight Sampled (approx.) tons	143	215	160	158
Size: Mine Designation	Nut	Coarse Slack	Stoker	Fines
Screen Opening in.	2 x 3/4 sq	2 sq x 0	3/4 x 1/4 sq	1/4 sq x 0
FRC Laboratory No.	3442-69	3443-69	3444-69	3446-69
Proximate Analysis				
Moisture %	2.2	3.0	2.2+	6.4+
Ash %	21.0	20.6	15.3	14.7
Volatile Matter %	31.5	30.1	31.8	32.3
Fixed Carbon %	45.3	46.3	50.7	46.6
Sulphur %	8.8	7.5	7.5	6.1
Calorific Value Btu/lb.	11,630	11,560	12,530	12,480
Ash Fusibility				
Initial Temp.°F	2140	2140	2150	2150
Softening Temp:(a) Spherical°F	2200	2200	2210	2210
(b) Hemispherical.°F	2230	2260	2230	2240
Fluid Temp.°F	2440	2350	2350	2360
Grindability Index (Hardgrove)	63	62	62	67
Free Swelling Index (ASTM)	5	5	6	5 1/2
Classification by Rank (ASTM)	High Volatile A Bituminous			

(1) The coal washing plant was formerly operated by D.W. & R.A. Mills Ltd.

