

Mines Branch Information Circular IC 267

EVALUATION OF CANADIAN COMMERCIAL COALS:
NOVA SCOTIA - 1970

by

T.E. Tibbetts* and W.J. Montgomery**

ABSTRACT

Physical and chemical analyses of fifty-two coal samples are reported, representing the operating mines in Nova Scotia.

The samples were taken and analysed by the Fuels Research Centre during the year 1970. 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 267

EVALUATION DES HOUILLES COMMERCIALES CANADIENNES :
NOUVELLE-ECOSSE - 1970

par

T.E. Tibbetts* et W.J. Montgomery**

RESUME

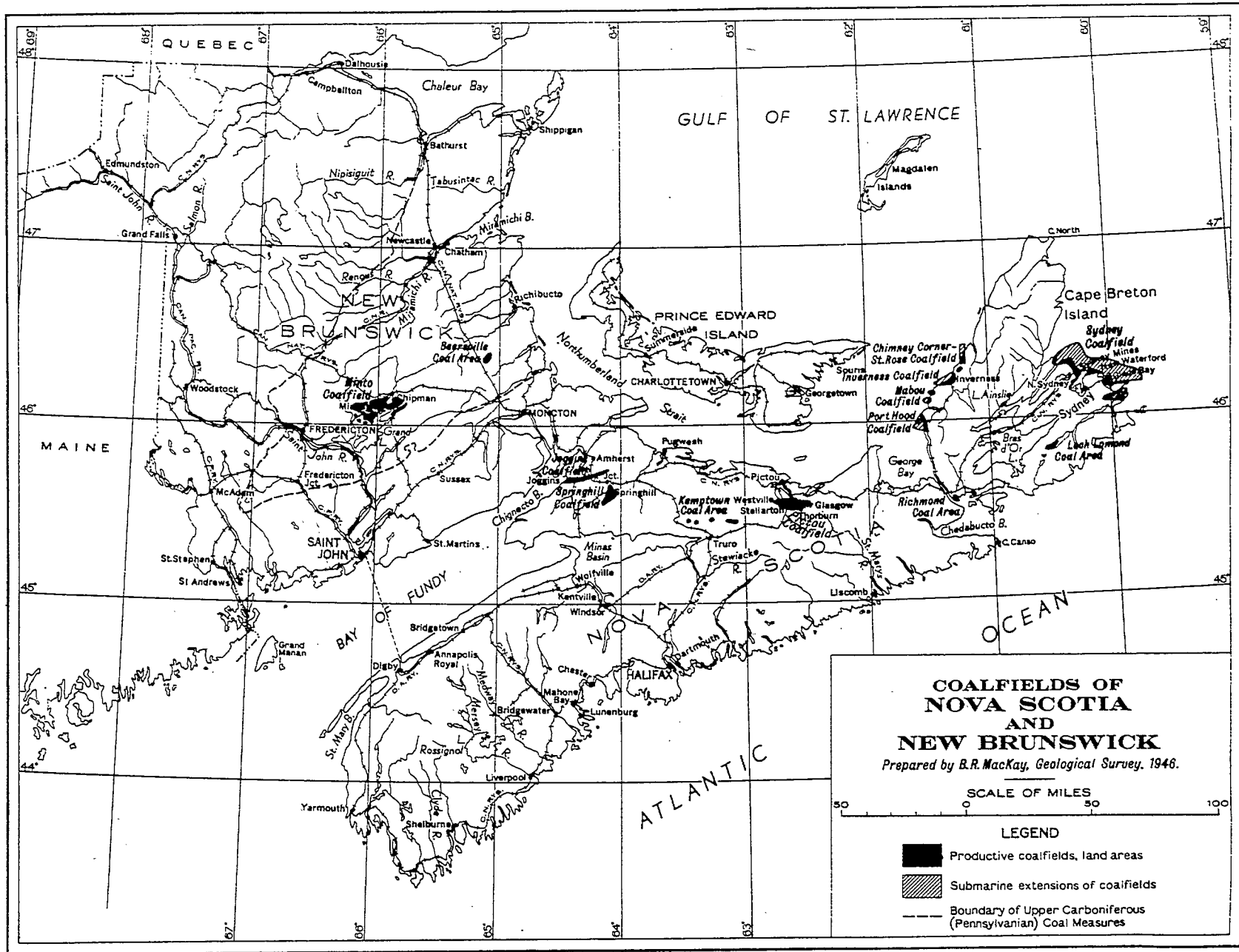
Les auteurs donnent les résultats des analyses chimiques et physiques de 52 échantillons de houille provenant des mines en exploitation en Nouvelle-Écosse.

Les échantillons ont été prélevés et analysés en 1970 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 1970 in thousands of short tons)

NOVA SCOTIA

Sydney and Inverness Areas

Cape Breton Development Corporation	1,900
Evans Coal Mines Limited	37

Pictou Area

Drummond Coal Company Limited	36
Thorburn Mining Limited	110

Springhill and Joggins Areas

River Hebert Coal Company Limited	25
Springhill Coal Mines Limited	48

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 certain 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.

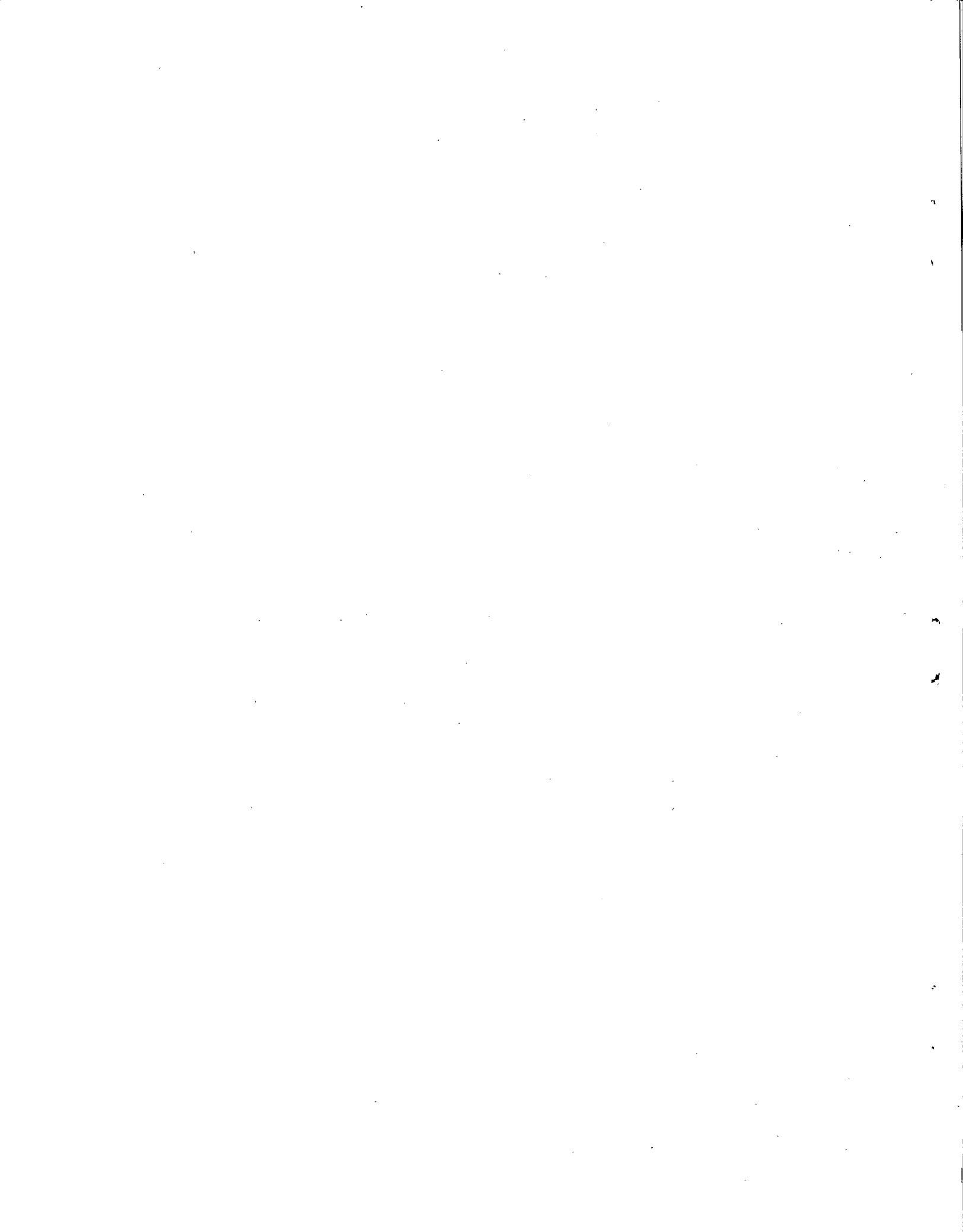
The gross samples were crushed and reduced in volume in the field prior to being shipped to Ottawa for analysis. A laboratory with complete sample preparation facilities was opened by the Fuels Research Centre at Glace Bay, Nova Scotia, in 1965. This was subsequently re-established in the Point Edward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

In 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 certain instances 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 general analyses on the "as received" moisture basis of all commercial coal samples collected under this project during the year 1970 at mines and delivery points in Nova Scotia. It

also contains the ultimate analyses and ash analyses of selected samples, mainly the slack and fine sizes.

All analyses were conducted by the Fuels Research Centre. 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.



SECTION 1 - GENERAL ANALYSES

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	1-10-70	1-10-70	1-10-70
Weight Sampled (approx.) tons	85	75	105
Size: Mine Designation	Screened	Special Slack*	Slack
Screen Opening in.	Plus 2 sq	Minus 2 sq	Minus 2 sq
FRC Laboratory No.	3283-70	3284-70	3285-70
Proximate Analysis			
Moisture %	3.1	3.9	4.3
Ash %	7.0	7.9	5.1
Volatile Matter %	34.9	33.2	34.3
Fixed Carbon %	55.0	55.0	56.3
Sulphur %	1.4	3.3	2.3
Calorific Value Btu/lb.	13,890	13,770	14,140
Ash Fusibility			
Initial Temp.°F	2050	2200	2100
Softening Temp:(a) Spherical°F	2200	2330	2330
(b) Hemispherical.°F	2280	2350	2350
Fluid Temp.°F	2500	2400	2400
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	7 1/2	6 1/2	7
Classification by Rank (ASTM)	High-Volatile A Bituminous		

* Prepared by removing about 85% of fines.

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	25-3-70*	1-10-70	15-10-70*
Weight Sampled (approx.) tons	365	150	225
Size: Mine Designation	Fines	Fines	Fines
Screen Opening in.	Minus 1/4 s1	Minus 1/4 s1	Minus 1/4 s1
FRC Laboratory No.	2384-70	3286-70	3297-70
Proximate Analysis			
Moisture %	5.0	4.8	5.0
Ash %	5.8	5.2	8.7
Volatile Matter %	33.2	33.7	32.5
Fixed Carbon %	56.0	56.3	53.8
Sulphur %	2.4	2.6	2.4
Calorific Value Btu/lb.	13,880	13,970	13,310
Ash Fusibility			
Initial Temp.°F	2080	2030	2230
Softening Temp:(a) Spherical°F	2360	2130	2430
(b) Hemispherical.°F	2460	2220	2510
Fluid Temp.°F	2700	2300	2650
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	-	7 1/2	7
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	16-2-70	25-3-70*	22-9-70	15-10-70*
Weight Sampled (approx.) tons	920	255	490	365
Size: Mine Designation	Slack	Slack	Slack	Slack
Screen Opening in.	Minus 1 1/2 sq	Minus 1 1/2 sq	Minus 1 1/2 sq	Minus 1 1/2 sq
FRC Laboratory No.	2251-70	2383-70	3282-70	3296-70
Proximate Analysis				
Moisture %	4.2	4.5	4.5	4.2
Ash %	4.0	4.3	5.8	6.2
Volatile Matter %	35.5	31.3	34.9	35.0
Fixed Carbon %	56.3	59.9	54.8	54.6
Sulphur %	2.8	2.8	3.0	2.8
Calorific Value Btu/lb.	14,140	14,080	13,800	13,800
Ash Fusibility				
Initial Temp. °F	2050	2100	2200	2000
Softening Temp: (a) Spherical °F	2230	2240	2270	2070
(b) Hemispherical. °F	2280	2320	2330	2250
Fluid Temp. °F	2630	2750	2410	2460
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	7 1/2	-	7 1/2	7
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. 26 Mine

Date Sampled	26-2-70	6-10-70	19-10-70*	19-10-70*
Weight Sampled (approx.) tons	325	60	120	295

Size: Mine Designation	Screened	Screened	Egg	Nut
Screen Opening in.	Plus 1 1/4 sl	Plus 1 1/4 sl	Plus 1 3/4 rd	1 3/4 to 3/4 rd

FRC Laboratory No.	2252-70	3279-70	3361-70	3362-70
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Proximate Analysis					
Moisture	%	3.5	3.2	4.1	4.2
Ash	%	3.7	2.6	2.6	2.5
Volatile Matter	%	33.4	35.8	35.1	34.6
Fixed Carbon	%	59.4	58.4	58.2	58.7
Sulphur	%	1.7	0.8	1.0	1.1
Calorific Value	Btu/lb.	14,370	14,670	14,400	14,410
Ash Fusibility					
Initial Temp.	°F	2160	2200	2130	2130
Softening Temp: (a) Spherical	°F	2320	2270	2200	2240
(b) Hemispherical.	°F	2350	2350	2320	2280
Fluid Temp.	°F	2610	2540	2420	2400
Grindability Index (Hardgrove)		-	-	-	-
Free Swelling Index (ASTM)		8	6 1/2	8	-
Classification by Rank (ASTM)		High-Volatile A Bituminous			

* Sampled at wash plant at Sydney Mines.

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	26-2-70	6-10-70	19-10-70*
Weight Sampled (approx.) tons	275	75	140
Size: Mine Designation	Pea	Pea	Pea
Screen Opening in.	3/4 to 5/16	3/4 to 5/16	3/4 to 1/4
FRC Laboratory No.	2254-70	3281-70	3364-70
Proximate Analysis			
Moisture %	4.9	4.7	6.8
Ash %	3.9	6.5	2.2
Volatile Matter %	32.7	33.3	33.5
Fixed Carbon %	58.5	55.5	57.5
Sulphur %	0.9	1.0	0.8
Calorific Value Btu/lb.	14,090	13,650	14,100
Ash Fusibility			
Initial Temp.°F	2130	2150	2170
Softening Temp: (a) Spherical°F	2480	2370	2230
(b) Hemispherical.°F	2610	2450	2320
Fluid Temp.°F	2650	2520	2420
Grindability Index (Hardgrove)	-	-	-
Free Swelling Index (ASTM)	8 1/2	7 1/2	9
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	26-2-70	6-10-70	19-10-70*	19-10-70*
Weight Sampled (approx.) tons	975	1500	1200	950
Size: Mine Designation	Slack	Slack	Coarse Slack	Fines
Screen Opening in.	Minus 1 1/4 s1	Minus 1 1/4 s1	Minus 1 3/4 s1	Minus 1/4 s1
FRC Laboratory No.	2253-70	3280-70	3363-70	3365-70
Proximate Analysis				
Moisture %	6.0	5.2	8.1	6.8
Ash %	5.1	2.7	3.1	3.4
Volatile Matter %	31.2	34.3	32.4	33.3
Fixed Carbon %	57.7	57.8	56.4	56.5
Sulphur %	1.1	0.8	0.8	1.1
Calorific Value Btu/lb.	13,710	14,260	13,740	13,850
Ash Fusibility				
Initial Temp. °F	2100	2300	2250	2050
Softening Temp: (a) Spherical °F	2440	2350	2320	2120
(b) Hemispherical. °F	2650	2380	2350	2320
Fluid Temp. °F	2700	2530	2440	2460
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	9	7 1/2	8 1/2	6 1/2
Classification by Rank (ASTM)	High-Volatile A Bituminous			

* Sampled at wash plant at Sydney Mines.

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

Date Sampled	13-3-70	5-11-70	13-3-70	5-11-70
Weight Sampled (approx.) tons	200	145	150	195
Size: Mine Designation	Egg	Egg	Nut	Nut
Screen Opening in.	Plus 1 3/4 rd	Plus 1 3/4 rd	1 3/4 to 3/4 rd	1 3/4 to 3/4 rd
FRC Laboratory No.	2341-70	3413-70	2342-70	3414-70
Proximate Analysis				
Moisture %	4.9	5.5	4.0	5.5
Ash %	6.5	3.6	5.3	3.2
Volatile Matter %	36.3	36.7	36.9	36.8
Fixed Carbon %	52.3	54.2	53.8	54.5
Sulphur %	3.3	2.1	3.1	2.1
Calorific Value Btu/lb.	13,570	13,960	13,940	13,930
Ash Fusibility				
Initial Temp.°F	2180	2000	2100	1990
Softening Temp:(a) Spherical°F	2380	2130	2340	2200
(b) Hemispherical.°F	2480	2280	2420	2300
Fluid Temp.°F	2750+	2360	2680	2370
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	5 1/2	6	6	6 1/2
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 (Coal Washing Plant)

Date Sampled	13-3-70	5-11-70
Weight Sampled (approx.) tons	100	105

Size: Mine Designation	Pea	Pea
Screen Opening in.	3/4 rd to 1/4 sl	3/4 rd to 1/4 sl

FRC Laboratory No.	2344-70	3415-70
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Proximate Analysis

Moisture %	7.1	8.1
Ash %	13.6	2.8
Volatile Matter %	31.7	35.7
Fixed Carbon %	47.6	53.4
Sulphur %	2.6	1.7
Calorific Value Btu/lb.	12,030	13,680

Ash Fusibility

Initial Temp.°F	2150	1980
Softening Temp:(a) Spherical°F	2600	2170
(b) Hemispherical.°F	2730	2260
Fluid Temp.°F	2750+	2380

Grindability Index (Hardgrove)	-	-
Free Swelling Index (ASTM)	6	6
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 (coal washing plant)

Date Sampled	13-3-70	13-3-70	5-11-70
Weight Sampled (approx.) tons	300	300	590
Size: Mine Designation	Coarse Slack	Fines	Fines
Screen Opening in.	Minus 1 3/4 rd	Minus 1/4 s1	Minus 1/4 s1
FRC Laboratory No.	2343-70	2345-70	3416-70
Proximate Analysis			
Moisture %	8.9	6.7	7.7
Ash %	13.1	3.3	11.5
Volatile Matter %	32.1	34.7	31.8
Fixed Carbon %	45.9	55.3	49.0
Sulphur %	3.0	2.8	1.7
Calorific Value Btu/lb.	11,880	13,760	11,780
Ash Fusibility			
Initial Temp.°F	2180	2200	1990
Softening Temp:(a) Spherical°F	2530	2340	2150
(b) Hemispherical.°F	2660	2420	2270
Fluid Temp.°F	2750+	2640	2370
Grindability Index (Hardgrove)			
Free Swelling Index (ASTM)	6	6	5 1/2
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 and other DEVCO Collieries*

Date Sampled	10-3-70	10-3-70	10-3-70	10-3-70
Weight Sampled (approx.) tons	180	300	140	470
Size: Mine Designation	EGG	Nut	Pea	Fines
Screen Opening in.	Plus 1 3/4 rd	1 3/4 to 3/4 rd	3/4 rd to 1/4 s1	Minus 1/4 s1
FRC Laboratory No.	2337-70	2338-70	2339-70	2340-70
Proximate Analysis				
Moisture %	4.5	5.4	7.8	7.1
Ash %	7.3	5.9	4.2	12.5
Volatile Matter %	34.7	34.5	35.6	32.9
Fixed Carbon %	53.5	54.2	52.4	47.5
Sulphur %	3.0	3.0	2.8	2.8
Calorific Value Btu/lb.	13,610	13,650	13,570	12,410
Ash Fusibility				
Initial Temp.°F	2130	2110	2110	2130
Softening Temp:(a) Spherical°F	2240	2250	2280	2360
(b) Hemispherical.°F	2420	2420	2320	2560
Fluid Temp.°F	2610	2570	2570	2660
Grindability Index (Hardgrove)				
Free Swelling Index (ASTM)	6 1/2	7	6 1/2	6
Classification by Rank (ASTM)	High-Volatile A Bituminous			

*Sampled at the wash plant, Sydney Mines.

Mine Operator DRUMMOND COAL COMPANY LIMITED
 Mine Location Westville, Pictou County, Nova Scotia
 Name of Mine or Coal Drummond No. 1 and No. 2, "Drummond"

Date Sampled	16-9-70	16-9-70	16-9-70	16-9-70
Weight Sampled (approx.) tons	17	10	12	10
Size: Mine Designation	Lump	Nut	Stoker	Fines
Screen Opening in.	Plus 1 1/2 sq	1 1/2 to 3/4 sq	3/4 to 1/4 sq	Minus 1/4 sq
FRC Laboratory No.	3243-70	3244-70	3246-70	3248-70
Proximate Analysis				
Moisture %	4.9	3.7	5.3	5.3
Ash %	19.1	20.6	21.0	18.8
Volatile Matter %	24.1	24.5	24.3	23.9
Fixed Carbon %	51.9	51.2	49.4	52.0
Sulphur %	0.7	0.8	1.2	0.9
Calorific Value Btu/lb.	11,250	11,120	10,840	11,160
Ash Fusibility				
Initial Temp.°F	2750+	2700+	2700+	2700+
Softening Temp:(a) Spherical°F	2750+	2700+	2700+	2700+
(b) Hemispherical.°F	2750+	2700+	2700+	2700+
Fluid Temp.°F	2750+	2700+	2700+	2700+
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	1 1/2	1 1/2	1 1/2	1 1/2
Classification by Rank (ASTM)	High-Volatile A Bituminous			

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

Date Sampled	10-9-70	10-9-70	10-9-70	10-9-70
Weight Sampled (approx.) tons	25	28	18	30
Size: Mine Designation	Medium Lump	Nut	Stoker	Fines
Screen Opening in.	6 to 2 rd	2 to 3/4 rd	3/4 to 1/2	Minus 1/2
FRC Laboratory No.	3226-70	3227-70	3229-70	3231-70
Proximate Analysis				
Moisture %	6.1	5.9	5.9	5.4
Ash %	8.2	10.3	10.3	10.8
Volatile Matter %	37.0	34.6	34.5	35.6
Fixed Carbon %	50.7	49.2	49.3	48.2
Sulphur %	6.5	6.4	6.0	5.2
Calorific Value Btu/lb.	12,340	11,940	11,950	11,970
Ash Fusibility				
Initial Temp.°F	1840	1850	2330	1880
Softening Temp:(a) Spherical°F	1960	1970	2420	1960
(b) Hemispherical.°F	2000	2020	2460	2020
Fluid Temp.°F	2200	2280	2750+	2240
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	5	2 1/2	2	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	2-12-70*	1-12-70	2-12-70*	1-12-70
Weight Sampled (approx.) tons	32	45	27	87
Size: Mine Designation	Lump	Lump	Slack	Slack
Screen Opening in.	Plus 1 1/2 sq	Plus 1 1/2 sq	Minus 1 1/2 sq	Minus 1 1/2 sq
FRC Laboratory No.	3570-70	3567-70	3571-70	3568-70
Proximate Analysis				
Moisture %	2.5	3.1	3.5	3.1
Ash %	10.8	10.6	14.8	15.2
Volatile Matter %	34.8	35.1	33.0	32.9
Fixed Carbon %	51.9	51.2	48.7	48.8
Sulphur %	5.1	5.4	4.9	4.7
Calorific Value Btu/lb.	12,910	12,770	12,100	12,120
Ash Fusibility				
Initial Temp.°F	-	-	-	-
Softening Temp: (a) Spherical°F	-	-	-	-
(b) Hemispherical.°F	-	-	-	-
Fluid Temp.°F	-	-	-	-
Grindability Index (Hardgrove)	-	-	-	-
Free Swelling Index (ASTM)	7 1/2	7 1/2	7	7 1/2
Classification by Rank (ASTM)	High-Volatile A Bituminous			

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

Mine Operator SPRINGHILL COAL MINES LIMITED
 Mine Location Springhill, Cumberland County, Nova Scotia
 Name of Mine or Coal No. 1 Seam (New Mine)

Date Sampled Weight Sampled (approx.) tons	3-12-70 -
Size: Mine Designation Screen Opening in.	Channel Sample
FRC Laboratory No.	3573-70
Proximate Analysis Moisture % Ash % Volatile Matter % Fixed Carbon % Sulphur % Calorific Value Btu/lb. Ash Fusibility Initial Temp.°F Softening Temp: (a) Spherical°F (b) Hemispherical. °F Fluid Temp.°F Grindability Index (Hardgrove) Free Swelling Index (ASTM) Classification by Rank (ASTM)	6.7 9.4 32.6 51.3 2.7 12,200 2040 2130 2180 2280 60 5 1/2 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	18-9-70	18-9-70	18-9-70	18-9-70	18-9-70
Weight Sampled (approx.) tons	140	150	165	28	170
Size: Mine Designation	Egg	Nut	Stoker	Splint*	Fines
Screen Opening in.	Plus 1 3/4 sq	1 3/4 to 3/4 sq	3/4 to 3/16 sq	Minus 1 1/2	Minus 3/16 sq
FRC Laboratory No.	3233-70	3234-70	3236-70	3238-70	3239-70
Proximate Analysis					
Moisture %	2.7	2.6	1.7	2.4	2.8
Ash %	21.3	20.6	21.4	28.1	21.9
Volatile Matter %	27.7	27.0	27.3	28.5	27.1
Fixed Carbon %	48.3	49.8	49.6	41.1	48.1
Sulphur %	0.4	0.5	0.7	0.5	0.6
Calorific Value Btu/lb.	11,310	11,430	11,420	10,180	11,050
Ash Fusibility					
Initial Temp.°F	2370	2430	2360	2280	2280
Softening Temp:(a) Spherical°F	2490	2500	2560	2550	2420
(b) Hemispherical.°F	2510	2520	2670	2650	2560
Fluid Temp.°F	2680	2750+	2750+	2750+	2830+
Grindability Index (Hardgrove)	-	-	-	-	-
Free Swelling Index (ASTM)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
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.

* Washery middlings product.

SECTION II - ULTIMATE AND ASH ANALYSES

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	1-10-70	1-10-70	1-10-70
Weight Sampled (approx)tons.	85	75	105
Size: Mine Designation	Screened	Special Slack	Slack
Screen Openingin.	Plus 2 sq	Minus 2 sq	Minus 2 sq
FRC Laboratory No.	3283-70	3284-70	3285-70

Ultimate Analysis

Carbon	%	79.6	78.2	80.9
Hydrogen	%	5.2	5.1	5.3
Sulphur	%	1.4	3.4	2.4
Nitrogen	%	1.5	1.5	1.6
Ash	%	7.2	8.2	5.3
Oxygen (by difference)	%	4.2	2.8	3.8

Ash Analysis

SiO ₂	%	32.0	32.2	24.1
Al ₂ O ₃	%	21.0	18.3	17.5
Fe ₂ O ₃	%	37.7	45.5	49.7
TiO ₂	%	0.6	0.4	0.3
P ₂ O ₅	%	0.5	0.2	0.3
CaO	%	2.9	1.0	2.1
MgO	%	1.5	0.7	0.8
SO ₃	%	2.2	0.9	1.5
Na ₂ O	%	0.7	0.6	0.6
K ₂ O	%	1.5	1.3	1.0

Mine OperatorCAPE BRETON DEVELOPMENT CORPORATION
 Mine LocationNew Waterford, Cape Breton County, Nova Scotia
 Name of Mine or CoalNo. 12 Mine

Date Sampled	1-10-70	15-10-70
Weight Sampled (approx)tons.	150	225

Size: Mine Designation	Fines	Fines
Screen Openingin.	Minus 1/4 sl	Minus 1/4 sl

FRC Laboratory No.	3286-70	3297-70
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Ultimate Analysis

Carbon	80.7	77.1
Hydrogen	5.3	5.2
Sulphur	2.7	2.5
Nitrogen	1.5	1.6
Ash	5.4	9.0
Oxygen (by difference)	3.5	3.8

Ash Analysis

SiO ₂	31.6	37.3
Al ₂ O ₃	21.2	24.9
Fe ₂ O ₃	41.4	30.7
TiO ₂	0.5	0.4
P ₂ O ₅	0.2	0.1
CaO	1.2	0.7
MgO	0.8	1.0
SO ₃	0.8	0.5
Na ₂ O	0.8	0.8
K ₂ O	1.5	2.4

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	22-9-70	15-10-70
Weight Sampled (approx)tons.	490	365
Size: Mine Designation	Slack	Slack
Screen Openingin.	Minus 1 1/2 sq	Minus 1 1/2 sq
FRC Laboratory No.	3282-70	3296-70

Ultimate Analysis

Carbon	%	79.1	79.4
Hydrogen	%	5.2	5.4
Sulphur	%	3.1	2.9
Nitrogen	%	1.4	1.5
Ash	%	6.0	6.4
Oxygen (by difference)	%	4.2	3.6

Ash Analysis

SiO ₂	%	33.6	30.0
Al ₂ O ₃	%	22.2	13.9
Fe ₂ O ₃	%	37.3	41.1
TiO ₂	%	0.6	0.5
P ₂ O ₅	%	0.2	0.2
CaO	%	2.7	2.4
MgO	%	0.8	0.7
SO ₃	%	1.9	1.7
Na ₂ O	%	0.8	3.4
K ₂ O	%	1.2	1.4

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	6-10-70	6-10-70	6-10-70
Weight Sampled (approx) tons.	60	75	1500
Size: Mine Designation	Screened	Pea	Slack
Screen Opening in.	Plus 1 1/4 s1	3/4 to 5/16	Minus 1 1/4 s1
FRC Laboratory No.	3279-70	3281-70	3280-70
<u>Ultimate Analysis</u>			
Carbon	82.7	78.6	82.8
Hydrogen	5.4	5.2	5.4
Sulphur	0.8	1.0	0.8
Nitrogen	1.8	1.6	1.6
Ash	2.7	6.7	2.8
Oxygen (by difference)	5.4	5.8	5.5
<u>Ash Analysis</u>			
SiO ₂	36.8	46.6	33.0
Al ₂ O ₃	25.1	27.5	25.6
Fe ₂ O ₃	30.7	18.6	32.6
TiO ₂	0.6	0.7	0.7
P ₂ O ₅	0.3	0.2	0.2
CaO	2.7	1.4	3.3
MgO	1.6	1.6	1.8
SO ₃	1.8	1.0	2.2
Na ₂ O	0.8	0.9	1.0
K ₂ O	1.2	2.6	1.3

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	19-10-70	19-10-70
Weight Sampled (approx) tons.	1200	950
Size: Mine Designation	Coarse Slack	Fines
Screen Opening in.	Minus 1 3/4 s1	Minus 1/4 s1
FRC Laboratory No.	3363-70	3365-70
<u>Ultimate Analysis</u>		
Carbon	83.2	82.8
Hydrogen	5.4	5.4
Sulphur	0.8	1.2
Nitrogen	1.6	1.6
Ash	3.3	3.6
Oxygen (by difference)	4.8	4.6
<u>Ash Analysis</u>		
SiO ₂	37.2	36.1
Al ₂ O ₃	25.0	24.6
Fe ₂ O ₃	29.5	30.0
TiO ₂	1.0	0.8
P ₂ O ₅	0.2	0.3
CaO	2.1	3.4
MgO	1.4	1.4
SO ₃	2.0	2.8
Na ₂ O	0.7	0.7
K ₂ O	1.3	1.0

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

Date Sampled	5-11-70	5-11-70
Weight Sampled (approx)tons.	105	590

Size: Mine Designation	Pea	Fines
Screen Openingin.	3/4 rd to 1/4 s1	Minus 1/4 s1

FRC Laboratory No.	3415-70	3416-70
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Ultimate Analysis

Carbon	%	81.9	70.2
Hydrogen	%	5.4	4.7
Sulphur	%	1.8	1.8
Nitrogen	%	1.5	1.4
Ash	%	3.0	12.3
Oxygen (by difference)	%	5.2	8.6

Ash Analysis

SiO ₂	%	21.1	51.6
Al ₂ O ₃	%	17.2	27.9
Fe ₂ O ₃	%	55.8	14.2
TiO ₂	%	0.5	0.7
P ₂ O ₅	%	0.4	0.1
CaO	%	2.1	0.9
MgO	%	0.4	0.9
SO ₃	%	1.4	0.9
Na ₂ O	%	0.3	0.7
K ₂ O	%	0.6	3.2

Mine Operator DRUMMOND COAL COMPANY LIMITED
 Mine Location Westville, Pictou County, Nova Scotia
 Name of Mine or Coal Drummond No. 1 and No. 2

Date Sampled	16-9-70	16-9-70	16-9-70	16-9-70
Weight Sampled (approx)tons.	17	10	12	10
Size: Mine Designation	Lump	Nut	Stoker	Fines
Screen Openingin.	Plus 1 1/2 sq	1 1/2 to 3/4 sq	3/4 to 1/4 sq	Minus 1/4 sq
FRC Laboratory No.	3243-70	3244-70	3246-70	3248-70

Ultimate Analysis

Carbon	%	-	-	-	-
Hydrogen	%	-	-	-	-
Sulphur	%	0.7	0.8	1.2	0.9
Nitrogen	%	-	-	-	-
Ash	%	19.1	20.7	21.1	19.0
Oxygen (by difference)	%	-	-	-	-

Ash Analysis

SiO ₂	%	63.6	61.6	59.0	61.6
Al ₂ O ₃	%	30.7	32.0	32.0	31.3
Fe ₂ O ₃	%	2.3	2.5	4.4	3.1
TiO ₂	%	0.6	0.6	0.5	0.7
P ₂ O ₅	%	0.2	0.2	0.2	0.2
CaO	%	0.8	0.6	0.8	0.7
MgO	%	1.2	1.5	1.4	1.4
SO ₃	%	0.1	0.1	-	0.0
Na ₂ O	%	0.5	0.4	0.3	0.5
K ₂ O	%	1.5	1.8	1.9	1.6

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

Date Sampled	10-9-70	10-9-70	10-9-70	10-9-70
Weight Sampled (approx)tons.	25	28	18	30

Size: Mine Designation	Medium Lump	Nut	Stoker	Fines
Screen Openingin.	6 to 2 rd	2 to 3/4 rd	3/4 to 1/2	Minus 1/2

FRC Laboratory No.	3226-70	3227-70	3229-70	3231-70
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Ultimate Analysis

Carbon	%	-	-	-	-
Hydrogen	%	-	-	-	-
Sulphur	%	6.5	6.5	6.1	5.2
Nitrogen	%	-	-	-	-
Ash	%	8.1	10.4	10.5	10.8
Oxygen (by difference)	%	-	-	-	-

Ash Analysis

SiO ₂	%	23.3	26.0	50.4	27.5
Al ₂ O ₃	%	12.1	13.0	29.4	13.6
Fe ₂ O ₃	%	46.4	43.0	4.1	35.5
TiO ₂	%	0.2	0.3	0.6	0.5
P ₂ O ₅	%	0.8	0.5	0.3	0.4
CaO	%	6.4	7.4	8.8	10.0
MgO	%	1.3	1.2	0.8	1.6
SO ₃	%	7.8	8.0	5.1	9.7
Na ₂ O	%	1.4	1.4	0.9	1.1
K ₂ O	%	0.4	0.7	1.5	0.7

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

Date Sampled	1-12-70	2-12-70
Weight Sampled (approx) tons.	87	27
Size: Mine Designation	Slack	Slack
Screen Opening in.	Minus 1 1/2 sq	Minus 1 1/2 sq
FRC Laboratory No.	3568-70	3571-70

Ultimate Analysis

Carbon	%	68.8	66.3
Hydrogen	%	4.6	4.7
Sulphur	%	2.7	4.9
Nitrogen	%	1.4	1.4
Ash	%	9.4	14.8
Oxygen (by difference)	%	6.6	4.4

Ash Analysis

SiO ₂	%	37.4	36.8
Al ₂ O ₃	%	16.7	20.7
Fe ₂ O ₃	%	26.8	24.6
TiO ₂	%	0.7	0.4
P ₂ O ₅	%	0.2	1.5
CaO	%	7.8	6.6
MgO	%	2.1	1.0
SO ₃	%	8.4	6.6
Na ₂ O	%	0.4	0.6
K ₂ O	%	1.0	2.3

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

Date Sampled	3-12-70
Weight Sampled (approx)tons.	-
Size: Mine Designation	Channel Sample
Screen Openingin.	-
FRC Laboratory No.	3573-70
<u>Ultimate Analysis</u>	
Carbon	68.8
Hydrogen	4.6
Sulphur	2.7
Nitrogen	1.4
Ash	9.4
Oxygen (by difference)	6.5
<u>Ash Analysis</u>	
SiO ₂	37.4
Al ₂ O ₃	16.7
Fe ₂ O ₃	26.8
TiO ₂	0.7
P ₂ O ₅	0.2
CaO	7.8
MgO	2.1
SO ₃	8.4
Na ₂ O	0.4
K ₂ O	0.9

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

Date Sampled	18-9-70	18-9-70	18-9-70	18-9-70	18-9-70
Weight Sampled (approx)tons.	140	150	165	28	170
Size: Mine Designation	Egg	Nut	Stoker	Splint	Fines
Screen Openingin.	Plus 1 3/4 sq	1 3/4 to 3/4 sq	3/4 to 3/16 sq	Minus 1 1/2	Minus 3/16 sq
FRC Laboratory No.	3233-70	3234-70	3236-70	3238-70	3239-70
<u>Ultimate Analysis</u>					
Carbon	-	-	-	-	-
Hydrogen	-	-	-	-	-
Sulphur	0.4	0.5	0.7	0.5	0.6
Nitrogen	-	-	-	-	-
Ash	21.3	20.6	21.4	28.1	21.9
Oxygen (by difference)	-	-	-	-	-
<u>Ash Analysis</u>					
SiO ₂	53.9	53.5	52.6	57.4	51.6
Al ₂ O ₃	28.7	29.2	30.8	30.6	28.1
Fe ₂ O ₃	4.3	4.3	3.4	4.5	4.3
TiO ₂	0.6	0.6	0.6	0.7	0.5
P ₂ O ₅	0.3	0.3	0.3	0.2	0.3
CaO	8.1	5.9	5.7	4.8	8.5
MgO	0.8	0.7	1.2	0.8	1.0
SO ₃	4.2	4.0	4.0	0.7	4.6
Na ₂ O	0.5	0.5	0.8	0.6	0.7
K ₂ O	1.3	1.5	1.8	1.6	1.6