

13372

CANADA  
DEPARTMENT OF MINES  
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MINES BRANCH  
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**BULLETIN No. 24**

# Analyses of Canadian Fuels

IN FIVE PARTS

PART III  
MANITOBA AND SASKATCHEWAN

COMPILED BY  
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and  
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## EXPLANATORY NOTES.

The samples of Manitoba and Saskatchewan fuels collected previous to 1910 were analysed at McGill University by the staff then engaged in a special "Investigation of the Coals of Canada." Early in 1910, however, this work was transferred to the Division of Fuels and Fuel Testing, Mines Branch, Department of Mines, Ottawa; and all subsequent samples have been tested there.

The expressions "anal." and "calc." at the head of any column indicate whether the figures recorded were obtained directly by analysis, or by calculation. The usual practice was to analyse the fuels after air-drying, although, in some cases, determinations were made on samples either in the condition received, or after being completely dried.

A "Commercial" sample of any grade of fuel is one representative of the corresponding product as shipped from any mine.

The "Mine" and "Prospect" samples were collected by technical officers of either the Federal or Provincial governments; the former term being applied to those procured from deposits already under development. "Prospect" samples are apt to be weathered, and may, therefore, only give an indication of the composition of the main body of the deposit.

In making the determinations the necessary calculations were made to give one more significant figure than is reported. All deduced values were calculated before the rounding-off process took place.

Figures in columns "R" refer to fuels as received; in columns "AD" to air-dried fuels; and in columns "D" to those dried at 105°C.



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## MANITOBA PEAT BOGS.

Description.	Litter Bog,*	Mud Lake Bog,*	Rice Lake Bog,*		Boggy Creek Bog,*	
	2 miles from Point Dubois, Secs. 33-34, Tp. 15, R. 14 E. of principal meridian.	3 miles from Point Dubois, Secs. 28 & 33, Tp. 15, R. 14 E. of principal meridian.	7 1/2 miles from Point Dubois, Secs. 25-26, Tp. 15, R. 13 E. of principal meridian.	148	135	136
Sample No. ....	134	130	147	148	135	136
Moisture condition (see note p. 3).....	D	D	D	D	D	D
Loss on air-drying.....%	....	....	....	....	....	....
Results obtained by.....	....	....	....	....	....	....
Proximate analysis:—						
Moisture.....%	....	....	....	....	....	....
Ash.....%	7.7	7.7	56.1	31.8	8.3	28.6
Volatile matter.....%	66.1	69.1	34.8	51.1	65.0	53.0
Fixed carbon.....%	26.2	23.2	9.1	17.1	26.7	18.4
Ultimate analysis:—						
Carbon.....%	....	....	....	....	....	....
Hydrogen.....%	....	....	....	....	....	....
Ash.....%	....	....	....	....	....	....
Sulphur.....%	0.2	....	....	....	....	....
Nitrogen.....%	1.6	1.5	1.8	2.4	....	2.5
Oxygen.....%	....	....	....	....	....	....
Calorific value:—						
Calories per gram, gross...	5,050	4,870	....	....	4,850	....
B. Th. U. per lb., gross...	9,090	8,760	....	....	8,730	....
Fuel ratio.....	0.40	0.34	0.26	0.33	0.41	0.35
Carbon-Hydrogen ratio.....	....	....	....	....	....	....
Coking properties.....	....	....	....	....	....	....
Hoffmann potash test.....	....	....	....	....	....	....
Location in mine.....	All prospect.					
Kind of sample.....	All by A. Anrep, Mines Branch, Ottawa.					
Quality of coal.....	During summer of 1911.					
Taken by.....	All by A. Anrep, Mines Branch, Ottawa.					
Date of sampling.....	During summer of 1911.					
Remarks.....	*Bog traversed by City of Winnipeg Construction Railway.					

## MANITOBA PEAT BOGS.

Description.	Transmission Bog,* 18 miles from Point Dubois, Secs. 19-21, 28-30, Tp. 15, R. 12 E. of principal meridian.	Whitemouth Bog,† Whitemouth, Tps. 4-13, Ranges 11-14 E. of principal meridian.	Lac du Bonnet Bog‡ near Lac du Bonnet, Sec. 2, Tp. 15, R. 10 E. of principal meridian.	Big Grass Marsh, Gladstone, Tps. 15-18, Ranges 10-11 W. of principal meridian.	
Sample No.....	146	142	468	145	143
Moisture condition (see note p. 3).....	D	D	D	D	D
Loss on air-drying.....%	.....	.....	.....	.....	.....
Results obtained by.....	.....	.....	.....	.....	.....
Proximate analysis:—					
Moisture.....%	.....	.....	.....	.....	.....
Ash.....%	19.0	15.4	19.5	15.0	46.7
Volatile matter.....%	56.8	58.9	55.4	59.4	43.4
Fixed carbon.....%	24.2	25.7	25.1	25.0	9.9
Ultimate analysis:—					
Carbon.....%	.....	.....	.....	.....	.....
Hydrogen.....%	.....	.....	.....	.....	.....
Ash.....%	.....	.....	.....	.....	.....
Sulphur.....%	.....	.....	0.4	.....	.....
Nitrogen.....%	1.6	.....	2.2	1.4	2.0
Oxygen.....%	.....	.....	.....	.....	.....
Calorific value:—					
Calories per gram, gross....	.....	4,510	4,410	3,990	.....
B. Th. U. per lb., gross....	.....	8,110	7,940	7,190	.....
Fuel ratio.....	0.43	0.44	0.45	0.42	0.23
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....
Coking properties.....	.....	.....	.....	.....	.....
Hoffmann potash test.....	.....	.....	.....	.....	.....
Location in mine.....	All prospect.				
Kind of sample.....	All by A. Anrep, Mines Branch. Ottawa.				
Quality of coal.....	During summer of 1911.				
Taken by.....	*Bog traversed by				
Date of sampling.....	†Bog traversed by Canadian Pacific				
Remarks.....	City of Winnipeg Construction Rail- way.				

## SASKATCHEWAN COAL FIELDS.

### Estevan Area.

Description.	Western Dominion Collieries, Ltd., Taylorton. Taylorton mine, Sec. 3, Tp. 2, R. 6, W. 2 meridian.											Manitoba & Saskatchewan Coal Co., Ltd., Sec. 10, Tp. 2, R. 6, W. 2 meridian.		
	R	M 40 A.D	D	M 2,040 D	R	1,075 A.D	D	R	1,076 A.D	D	R	1,082 A.D	D	
Sample No.....	14-7										9-0			
Moisture condition (see note p. 3).....	Calc.	Calc.	Anal.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.	
Loss on air-drying..... %	30.1	18.0	....	....	34.3	23.9	....	33.8	24.0	....	34.1	27.6	....	
Results obtained by.....	5.6	6.6	8.1	9.4	6.8	7.8	10.3	6.5	7.5	9.9	7.6	8.3	11.5	
Proximate analysis:—	34.3	40.2	49.0	42.7	26.3	30.5	40.1	26.0	29.8	39.3	25.6	28.2	38.9	
Moisture..... %	30.0	35.2	42.9	47.9	32.6	37.8	49.6	33.7	38.7	50.8	32.7	35.9	49.6	
Ash..... %	41.8	49.0	59.8	64.7	....	....	....	....	....	....	....	....	....	
Volatile matter..... %	6.8	6.0	4.8	4.5	....	....	....	....	....	....	....	....	....	
Fixed carbon..... %	5.6	6.6	8.1	9.4	....	....	....	....	....	....	....	....	....	
Ultimate analysis:—	0.4	0.5	0.6	0.7	....	....	....	....	....	....	....	....	....	
Carbon..... %	0.7	0.8	1.0	1.1	....	....	....	....	....	....	....	....	....	
Hydrogen..... %	44.7	37.1	25.7	19.6	....	....	....	....	....	....	....	....	....	
Sulphur..... %	4.150	4.870	5.940	6.010	....	....	....	....	....	....	....	....	....	
Nitrogen..... %	7.480	8.770	10.690	10.820	....	....	....	....	....	....	....	....	....	
Oxygen..... %	0.88	0.88	0.88	1.10	1.25	1.25	1.25	1.30	1.30	1.30	1.25	1.25	1.25	
Calorific value:—	6.2	8.2	12.4	14.4	....	....	....	....	....	....	....	....	....	
Calories per gram, gross.....	non-coking.			non-coking.			non-coking.			non-coking.				
B. Th. U. per lb., gross.....	non-coking.			non-coking.			non-coking.			non-coking.				
Fuel ratio.....	non-coking.			non-coking.			non-coking.			non-coking.				
Carbon-Hydrogen ratio.....	non-coking.			non-coking.			non-coking.			non-coking.				
Coking properties.....	non-coking.			non-coking.			non-coking.			non-coking.				
Hoffmann potash test.....	non-coking.			non-coking.			non-coking.			non-coking.				
Location in mine.....				8 ft. seam—straight north entry.			No. 4 west entry.			Main south entry.				
Kind of sample.....	Commercial—3 tons.			Commercial—5 tons			Mine.			Mine.				
Quality of coal.....	Run-of-mine.			Run-of-mine.										
Taken by.....	T. Denis, Mines Branch, Ottawa.			Mine authorities.			W. J. Dick, Commission of Conservation, Ottawa.			W. J. Dick.				
Date of sampling.....	July 11, 1908.			July 25, 1908.			Summer of 1917.			1917.				
Remarks.....														



## SASKATCHEWAN COAL FIELDS.

### Estevan Area.

Description.	The Bienfait Mine. Bienfait. Sec. 19, Tp. 2, R. 6, W. 2 meridian.						Saskatchewan Coal, Brick and Power Company. Shand. Shand Mine. Sec. 4, Tp. 2, R. 7, W. 2 meridian.								
	R	1,077 A D		D	R	1,078 A D		R	982 A D		R	1,081 A D			
Moisture condition (see note p. 3)	14.0				13.4				10.6			8.6			
Loss on air-drying..... %	Calc.	Anal.		Calc.	Calc.	Anal.		Calc.	Calc.	Anal.		Calc.	Anal.		
Results obtained by.....															
Proximate analysis:—															
Moisture..... %	34.3	23.6			34.2	24.0			34.6	26.9			34.8	28.6	
Ash..... %	5.5	6.4		8.4	6.1	7.1		9.3	8.6	9.6		13.2	10.0	10.9	
Volatile matter..... %	27.0	31.4		41.1	30.0	34.6		45.6	24.9	27.8		38.0	24.5	26.9	
Fixed carbon..... %	33.2	38.6		50.5	29.7	34.3		45.1	31.9	35.7		48.8	30.7	33.6	
Ultimate analysis:—															
Carbon..... %									40.8	45.6		62.4			
Hydrogen..... %									6.4	5.8		3.8			
Ash..... %									8.6	9.6		13.2			
Sulphur..... %									0.3	0.4		0.5			
Nitrogen..... %									0.7	0.8		1.1			
Oxygen..... %									43.2	37.8		19.0			
Caloric value:—															
Calories per gram, gross.....									3,790	4,240		5,800			
B. Th. U. per lb., gross.....									6,830	7,640		10,450			
Fuel ratio.....	1.25	1.25		1.25	0.99	0.99		0.99	1.30	1.30		1.30	1.25	1.25	
Carbon-Hydrogen ratio.....									6.4	7.9		16.4			
Coking properties.....		non-coking				non-coking				non-coking		1		non-coking	
Hoffmann potash test.....															
Location in mine.....															
	No. 1 west level				No. 5 east entry				9 ft. seam, entry off main, south entry						
Kind of sample.....															
	Mine				Mine				30 ton. Lump				Mine		
Quality of coal.....															
	W. J. Dick, Commission of Conservation.				W. J. Dick				Mine authorities, by request.				W. J. Dick		
Taken by.....															
Date of sampling.....															
	Summer of 1917				1917				Feb. 1917. Small sample April 30, 1917.				1917		
Remarks.....															

# SASKATCHEWAN COAL FIELDS.

## Estevan Area.

Description.	Estevan Coal and Brick Co., Ltd., Estevan, Sec. 14, Tp. 2, R. 8, W. 2 meridian.								
Sample No. ....				1,079					
Moisture condition (see note p. 3) .....	R	M 41	D	R	A D	D	R	1,080	D
Loss on air-drying..... %	18.4	A D		10.0	A D		9.0	A D	
Results obtained by..... %	Calc.	Calc.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.
Proximate analysis:—									
Moisture..... %	33.3	18.2	....	35.9	28.8	....	34.9	28.4	....
Ash..... %	11.2	13.7	16.8	9.7	10.7	15.1	9.9	10.9	15.2
Volatile Matter..... %	26.7	32.7	40.0	26.4	29.4	41.3	24.7	27.1	37.9
Fixed Carbon..... %	28.8	35.4	43.2	28.0	31.1	43.6	30.5	33.6	46.9
Ultimate analysis:—									
Carbon..... %	38.5	47.1	57.7	....	....	....	....	....	....
Hydrogen..... %	6.6	5.6	4.3	....	....	....	....	....	....
Ash..... %	11.2	13.7	16.8	....	....	....	....	....	....
Sulphur..... %	0.3	0.4	0.5	....	....	....	....	....	....
Nitrogen..... %	0.6	0.8	0.9	....	....	....	....	....	....
Oxygen..... %	42.8	32.4	19.8	....	....	....	....	....	....
Calorific value:—									
Calories per gram, gross.....	3,570	4,380	5,360	....	....	....	....	....	....
B. Th. U. per lb., gross.....	6,430	7,890	9,650	....	....	....	....	....	....
Fuel ratio.....	1.10	1.10	1.10	1.05	1.05	1.05	1.25	1.25	1.25
Carbon-Hydrogen ratio.....	5.8	8.5	13.8	....	....	....	....	....	....
Coking properties.....	non-coking			non-coking			non-coking		
Hoffmann potash test.....									
Location in mine.....				8 ft. seam at surface.			8 ft. seam, 2nd room west.		
Kind of sample.....				Mine			Mine		
Quality of coal.....	Commercial—2 tons.			Run-of-mine.			W. J. Dick, Commission of		
Taken by.....	T. Denis, Mines Branch.			W. J. Dick, Commission of			W. J. Dick		
Date of sampling.....	July 11, 1908			Conservation.			1917.		
Remarks.....	Operated by Eureka Coal and Brick Co., at time of sampling.			Summer of 1917					

# SASKATCHEWAN COAL FIELDS.

## Willowbunch Area.

Description.	Eidness Bros' mine, Gladmar, Sec. 11, Tp. 3, R. 19, W. 2 meri- dian.	R. Appleby's mine, Roanmine, Sec. 17, Tp. 3, R. 21, W. 2 meri- dian.	W. H. Treleaven's mine, Waniska, Sec. 2, Tp. 4, R. 23, W. 2 meridian.	Abandoned mine at Coal Mine lake, near Bengough, Sec. 3, Tp. 5, R. 23, W. 2 meridian	Open-pit worked by District farmers, Sec. 28, Tp. 1, R. 24, W. 2 meridian.
Sample No.....	R 330	R 329	R 331	R 328	R 332
Moisture condition (see note p. 3).....	D	D	D	D	D
Loss on air-drying..... %	Anal.	Anal.	Anal.	Anal.	Anal.
Results obtained by.....	Calc.	Calc.	Calc.	Calc.	Calc.
Proximate analysis:—					
Moisture..... %	7.3	9.1	8.1	8.8	8.1
Ash..... %	18.1	17.0	11.4	12.8	15.2
Volatile matter..... %	38.4	41.2	38.2	39.6	36.9
Fixed carbon..... %	36.2	32.7	42.3	38.8	39.8
Ultimate analysis:—					
Carbon..... %	.....	.....	.....	.....	.....
Hydrogen..... %	.....	.....	.....	.....	.....
Ash..... %	.....	.....	.....	.....	.....
Sulphur..... %	.....	.....	.....	.....	.....
Nitrogen..... %	.....	.....	.....	.....	.....
Oxygen..... %	.....	.....	.....	.....	.....
Calorific value:—					
Calories per gram, gross.....	.....	.....	.....	.....	.....
B. Th. U. per lb., gross.....	.....	.....	.....	.....	.....
Fuel ratio.....	0.94	0.79	1.10	0.98	1.10
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....
Coking properties.....	.....	.....	.....	.....	.....
Hoffmann potash test.....	.....	.....	.....	.....	.....
Location in mine.....	All mine.				
Kind of sample.....	All by Dr. B. Rose, Geological Survey, Ottawa.				
Quality of coal.....	Summer of 1913.				
Taken by.....	1913.				
Date of sampling.....	1913.				
Remarks.....	July 31, 1913.				

SASKATCHEWAN COAL FIELDS.

Willowbunch Area.

Description.	Olaf H. Person's mine, Eddyside, Sec. 30, Tp. 2, R. 25, W. 2 meridian.		C. H. Waldon's mine, Hart, Sec. 32, Tp. 3, R. 26, W. 2 meridian.		Mine at Willowbunch lake, near Viceroy, Sec. 35, Tp. 5, R. 26, W. 2 meridian.		A. Caillet's mine, Readlyn, Sec. 27, Tp. 7, R. 27, W. 2 meridian.		Consumers Coal Co., Ltd., Mitchellton, Sec. 28, Tp. 10, R. 28, W. 2 meridian.		
Sample No. ....	R. 333 D		R 334 D		R 336 D		R 335 D		R	533 AD	D
Moisture condition (see note p. 3) .....	R.	D	R	D	R	D	R	D	1-8		
Loss on air-drying .....	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Calc.	Anal.	Calc.
Results obtained by .....											
Proximate Analysis:—											
Moisture .....	8.1	...	8.5	...	7.4	...	8.2	...	10.3	8.6	...
Ash .....	12.0	13.1	16.6	13.1	23.7	25.6	15.6	17.0	12.4	12.6	13.8
Volatile matter .....	40.8	44.4	39.5	43.2	34.6	37.3	40.6	44.3	37.4	38.1	41.8
Fixed carbon .....	39.1	42.5	35.4	38.7	34.3	37.1	35.6	38.7	39.9	40.7	44.4
Ultimate analysis:—											
Carbon .....	%		%		%		%		%		%
Hydrogen .....	%		%		%		%		%		%
Ash .....	%		%		%		%		%		%
Sulphur .....	%		%		%		%		%		%
Nitrogen .....	%		%		%		%		%		%
Oxygen .....	%		%		%		%		%		%
Caloric value:—											
Calories per gram, gross .....											
B. Th. U. per lb., gross .....											
Fuel ratio .....	0.96	0.96	0.90	0.90	0.99	0.99	0.88	0.88	1.05	1.05	1.05
Carbon-Hydrogen ratio .....											
Coking properties .....										non-coking	
Hoffmann potash test .....											
Location in mine .....	All mine.										
Kind of sample .....	All by Dr. B. Rose, Geological Survey.										
Quality of coal .....											
Taken by .....											
Date of sampling .....	August 1, 1913.		August 6, 1913.		1913.		1913.		1914.		
Remarks .....											

## SASKATCHEWAN COAL FIELDS.

## Wood Mountain Area.

Description.	Open-pit worked by District farmers, south of Willowvale Post Office, Sec. 8, Tp. 1, R. 2, W. 3 Meridian.		Open-pit on Mr. Frank's Ranch, Hay Meadow Creek Sec. 17, Tp. 4, R. 1 W. 3 Meridian.		From 2-foot Seam, Sec. 13, Tp. 5, R. 1 W. 3 Meridian.	
	R	D	R	D	R	D
Sample No. ....	394		395		397	
Moisture condition (see note p. 3).....						
Loss on air-drying..... %						
Results obtained by.....	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.
Proximate analysis:—						
Moisture..... %	13.8	.....	12.0	.....	12.8	.....
Ash..... %	10.6	12.3	9.4	10.8	17.2	19.7
Volatile matter..... %	38.3	44.4	40.9	47.0	35.9	41.2
Fixed carbon..... %	37.3	43.3	36.8	42.2	34.1	39.1
Ultimate analysis:—						
Carbon..... %	.....	.....	.....	.....	.....	.....
Hydrogen..... %	.....	.....	.....	.....	.....	.....
Ash..... %	.....	.....	.....	.....	.....	.....
Sulphur..... %	.....	.....	.....	.....	.....	.....
Nitrogen..... %	.....	.....	.....	.....	.....	.....
Oxygen..... %	.....	.....	.....	.....	.....	.....
Calorific value:—						
Calories per gram, gross.....	.....	.....	.....	.....	.....	.....
B. Th. U. per lb., gross.....	.....	.....	.....	.....	.....	.....
Fuel ratio.....	0.97	0.97	0.90	0.90	0.95	0.95
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....	.....
Coking properties.....	non-coking		non-coking		non-coking	
Hoffmann potash test.....	.....	.....	.....	.....	.....	.....
Location in mine.....	All mine.					
Kind of sample.....	All by Dr. B. Rose, Geological Survey.					
Quality of coal.....	All by Dr. B. Rose, Geological Survey.					
Taken by.....	All by Dr. B. Rose, Geological Survey.					
Date of sampling.....	May 30, 1914.		June 8, 1914.		June 10, 1914.	
Remarks.....						

## SASKATCHEWAN COAL FIELDS.

## Wood Mountain Area.

Description.	From a well, Sec. 21, Tp. 6, R. 1 W. 3 meridian.		From 2-foot Seam, Sec. 1, Tp. 6, R. 2 W. 3 meridian.		Mr. Sturgeon's Mine, N.W. of Sec. 10 Tp. 5, R. 4, W. 3 meridian.		A. Blood's Mine, Fir Mountain Sec. 24, Tp. 4, R. 6, W. 3 meridian.	
	396		398		393		399	
	R	D	R	D	R	D	R	D
Moisture condition*								
Loss on air-drying.....%								
Results obtained by.....%	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.	Anal.	Calc.
Proximate Analysis:—								
Moisture.....%	13.1	.....	12.7	.....	12.0	.....	13.5	.....
Ash.....%	16.4	18.0	13.4	15.4	25.2	28.6	13.8	16.0
Volatile matter.....%	35.0	41.3	41.3	47.3	33.6	38.2	36.9	42.7
Fixed carbon.....%	34.6	30.8	32.6	37.3	29.2	33.2	35.8	41.3
Ultimate analysis:—								
Carbon.....%	.....	.....	.....	.....	.....	.....	.....	.....
Hydrogen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Ash.....%	.....	.....	.....	.....	.....	.....	.....	.....
Sulphur.....%	.....	.....	.....	.....	.....	.....	.....	.....
Nitrogen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Oxygen.....%	.....	.....	.....	.....	.....	.....	.....	.....
Calorific value:—								
Calories per gram, gross.....	.....	.....	.....	.....	.....	.....	.....	.....
B. Th. U. per lb., gross.....	.....	.....	.....	.....	.....	.....	.....	.....
Fuel ratio.....	0.96	0.96	0.79	0.79	0.87	0.87	0.97	0.97
Carbon-Hydrogen ratio.....	.....	.....	.....	.....	.....	.....	.....	.....
Coking properties.....	non-coking.		non-coking.		non-coking.		non-coking.	
Hoffmann potash test.....	.....		.....		.....		.....	
Location in mine.....	Prospect.		Prospect.		Mine.		Mine.	
Kind of sample.....	.....		.....		.....		.....	
Quality of coal.....	.....		.....		.....		.....	
Taken by.....	All by Dr. B. Rose, Geological Survey.							
Date of sampling.....	June 9, 1914.		June 11, 1914.		May 23, 1914.		June 22, 1914.	
Remarks.....								

\*(See note, p. 3).

## SASKATCHEWAN OIL SHALE.

## Sample No. 841.

Oil shale said to be taken from a boring at Hanley, at a depth of about 1,600 feet.

Analysis:—

Moisture.....	2.9%
Ash.....	81.0%
Volatile matter.....	13.5%
Fixed carbon.....	2.6%
Nitrogen.....	0.26%

Calculated Ammonium Sulphate = 27.6 pounds per long ton, corresponding to a commercial yield of about 19 pounds per long ton by the Bailey method of computation.

Destructive distillation gave a yield of oil equivalent to 11 pounds per long ton. The oil was dark brown, and had a disagreeable odour.

The sample submitted was too small to give reliable results.

NOTE.—The sample was received from a private individual on October 19, 1916.

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Canada Mines Branch.

Report no. 481

*C. F. Smyth (ERL) 29-2-60*