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ANALYSIS OF SCREEN FRACTIONS OF G.C.O.S. COKE

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by

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INTRODUCTION

Eight samples of petroleum coke from Great Canadian Oil Sands were submitted by the Pyrometallurgy Group at Energy Research Laboratories. These samples represented screen fractions of +1", 1" x $\frac{1}{2}$ ", $\frac{1}{2}$ " x $\frac{1}{4}$ ", $\frac{1}{4}$ " x $\frac{1}{8}$ ", $\frac{1}{8}$ " x $\frac{1}{16}$ ", $\frac{1}{16}$ " x $\frac{1}{32}$ ", $\frac{1}{32}$ " x 0" and a composite made up from screen analysis data.

Proximate analysis and sulphur determinations were carried out on the screen fractions to determine if there were any significant differences in the composition of the individual sizes. Proximate, Ultimate, Calorific Value, Ash Fusibility and Ash Analysis was carried out on the composite as additional information.

ANALYTICAL RESULTS

Table I presents a complete analysis of the composite in addition to Proximate Analysis and Sulphur of the screen fractions.

Table II presents the chemical analysis of the ash of the composite. X-ray fluorescence analysis indicates the presence of other elements not determined quantitatively.

TABLE I

Report of Analysis
 Screen Fractions and Composite Coke
 from G.C.O.S. Submitted by G. Sirianni 13 Aug. 1976.

FRC No.	2793-76		2794-76		2795-76		2796-76		2797-76		2798-76	
Mark	+ 1"		1" x ½"		½" x ¼"		¼" x 1/8"		1/8" x 1/16"		1/16" x 1/32"	
Field Mark												
	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry
<u>Proximate Analysis</u>												
Moisture.....%	1.94	0.00	0.99	0.00	1.29	0.00	0.96	0.00	0.53	0.00	0.55	0.00
Ash.....%	3.18	3.24	3.27	3.30	3.35	3.39	3.81	3.85	3.76	3.78	3.75	3.77
Volatile Matter..%	11.97	12.21	12.20	12.32	11.53	11.68	12.61	12.73	12.75	12.82	12.87	12.94
Fixed Carbon.....%	82.91	84.55	83.54	84.38	83.83	84.93	82.62	83.42	82.96	83.40	82.83	83.29
<u>Ultimate Analysis</u>												
Carbon.....%												
Hydrogen.....%												
Sulphur.....%	5.82	5.94	5.89	5.95	5.82	5.90	5.89	5.95	5.87	5.90	5.83	5.86
Nitrogen.....%												
Ash.....%												
Oxygen.....%												

TABLE I (continued)

FRC No.	2799-76		2800-76									
Mark	1/32" x 0		COMPOSITE									
Field Mark												
	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry	As Rec'd	Dry
<u>Proximate Analysis</u>												
Moisture.....%	0.78	0.00	0.79	0.00								
Ash.....%	5.96	6.01	3.91	3.94								
Volatile Matter..%	13.11	13.21	12.73	12.83								
Fixed Carbon.....%	80.15	80.78	82.57	83.23								
<u>Ultimate Analysis</u>												
Carbon.....%			82.93	83.59								
Hydrogen.....%			3.74	3.77								
Sulphur.....%	5.74	5.79	5.78	5.83								
Nitrogen.....%			1.50	1.51								
Ash.....%			3.90	3.94								
Oxygen.....%			1.35	1.36								
<u>Calorific Value</u>												
Btu/lb Gross			14440	14550								
<u>Ash Fusibility</u>												
Initial	°F		OXID.	RED.								
Spherical	°F		2290	2380								
Hemispherical	°F		2510	2560								
Fluid	°F		2580	2610								
			2670	2700+								

TABLE II

ASH ANALYSIS OF COMPOSITE 2800-78

	%
SiO ₂	41.88
Al ₂ O ₃	23.06
Fe ₂ O ₃	7.74
Mn ₃ O ₄	0.19
TiO ₂	3.35
P ₂ O ₅	0.45
CaO	3.81
MgO	0.88
SO ₃	3.57
Na ₂ O	0.74
K ₂ O	1.82
Total	87.49

From XRF analysis it would appear that the remaining 12.51% is made up of the oxides of Nickel, Vanadium, Molebdenum and Cobalt.