

COAL BANK SAMPLE

COAL:REITSPRUIT

GRADE:SMALLS

SEAM:

BCC COAL RANK CODE:801

ECE / ISO CLASSIFICATION:611

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	3.7
Ash	12.4
Volatile matter	30.5
Fixed carbon	53.4
Volatile matter (dmmf)	36.9

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	83.6
Hydrogen (dmmf)	4.7
Oxygen (dmmf)	9.2
Nitrogen (dmmf)	1.68

ASH ANALYSIS  
(% on ash)

Na <sub>2</sub> O	0.3
K <sub>2</sub> O	1.0
CaO	1.4
MgO	0.6
Fe <sub>2</sub> O <sub>3</sub>	4.5
Al <sub>2</sub> O <sub>3</sub>	30.2
SiO <sub>2</sub>	61.2
SO <sub>3</sub>	0.8
TiO <sub>2</sub>	1.4
Mn <sub>2</sub> O <sub>4</sub>	<0.1
P <sub>2</sub> O <sub>5</sub>	0.6

CAKING PROPERTIES

Swelling Index	2
Gray-King Coke Type	D

Organic sulphur (db)	0.33
Sulphate as S (db)	0.07
Pyritic sulphur as S (db)	<0.01

Chlorine (db)	0.02
Carbon dioxide (db)	0.20
Mineral matter (db)	14.15

CALORIFIC VALUE

kJ / kg (daf)	34140
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MACERAL ANALYSIS  
(% by volume, mmf)

Vitrinite	70
Exinite	3
Inertinite	27

ASH FUSION RANGE (°C) \*

Deformation temp.	>1500
Hemisphere temp.	>1500
Flow temp.	>1500

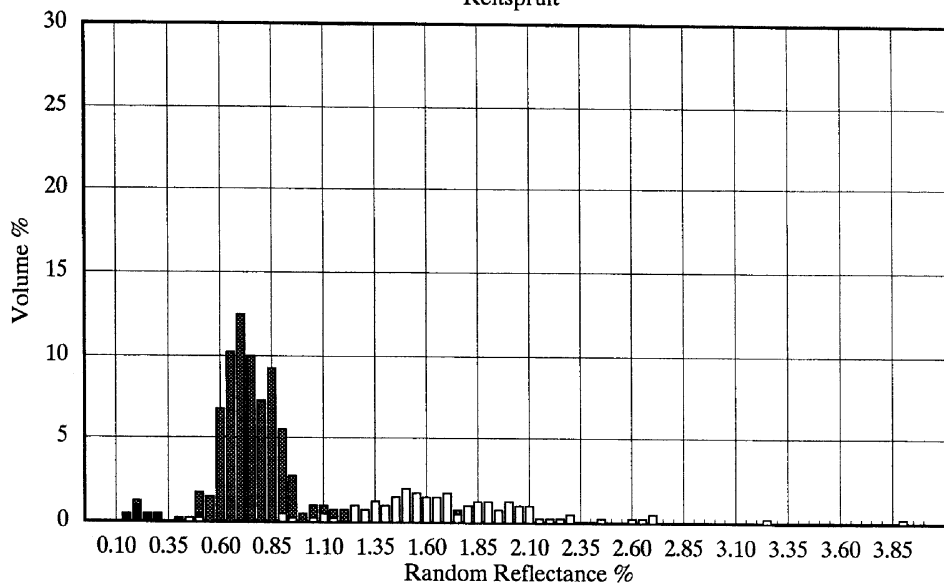
\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

ad: as analysed  
db: dry basis  
daf: dry, ash free  
dmmf: dry, mineral matter free  
mmf: mineral matter free

This analysis is typical of this specially selected sample, but there may be slight variations between the data given above and that of the actual sample supplied.

APPENDIX 21B

INTERACTIVE REFLECTANCE HISTOGRAM  
Reitspruit



Inertinite
  Liptinite
  Vitrinite

Mean random vitrinite reflectance 0.73  
Vitrinite Standard Deviation 0.15

COAL BANK SAMPLE

COAL:OLLERTON

GRADE:DOUBLES

SEAM:PARKGATE

BCC COAL RANK CODE:702

ECE / ISO CLASSIFICATION:732

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	6.1
Ash	3.4
Volatile matter	34.8
Fixed carbon	55.7
Volatile matter (dmmf)	38.7

CAKING PROPERTIES

Swelling Index	5.5
Gray-King Coke Type	G

CALORIFIC VALUE

kJ / kg (daf)	34280
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ASH FUSION RANGE (°C) \*

Deformation temp.	1190
Hemisphere temp.	1210
Flow temp.	1250

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	83.5
Hydrogen (dmmf)	5.0
Oxygen (dmmf)	8.3
Nitrogen (dmmf)	1.85
Organic sulphur (db)	1.10
Sulphate as S (db)	<0.1
Pyritic sulphur as S (db)	0.40
Chlorine (db)	0.57
Carbon dioxide (db)	0.07
Mineral matter (db)	4.45

MACERAL ANALYSIS

(% by volume , mmf)	
Vitrinite	74
Exinite	10
Inertinite	16

ASH ANALYSIS

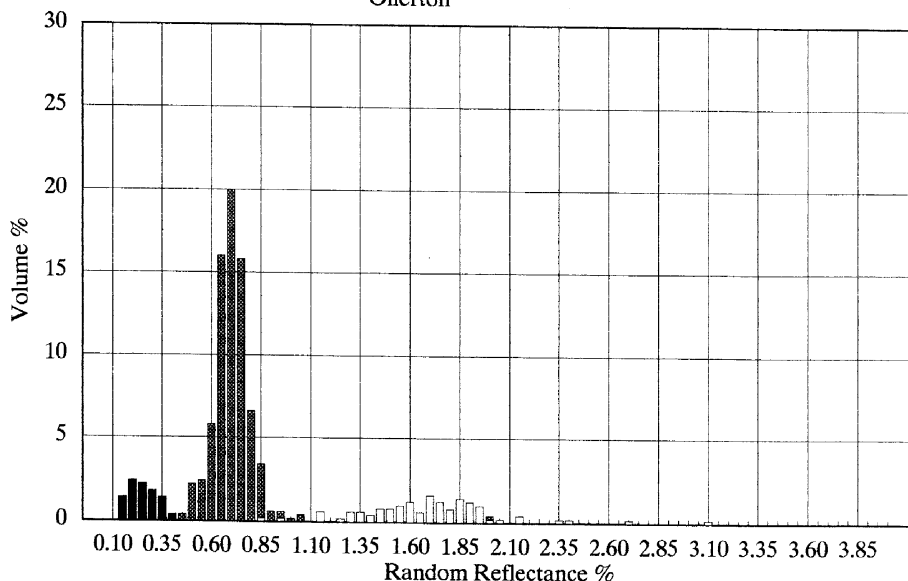
(% on ash)	
Na <sub>2</sub> O	6.1
K <sub>2</sub> O	1.4
CaO	5.0
MgO	0.7
Fe <sub>2</sub> O <sub>3</sub>	16.5
Al <sub>2</sub> O <sub>3</sub>	29.1
SiO <sub>2</sub>	39.3
SO <sub>3</sub>	3.4
TiO <sub>2</sub>	1.3
Mn <sub>3</sub> O <sub>4</sub>	<0.1
P <sub>2</sub> O <sub>5</sub>	<0.3

\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

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 db: dry basis  
 daf: dry, ash free  
 dmmf: dry, mineral matter free  
 mmf: mineral matter free

INTERACTIVE REFLECTANCE HISTOGRAM  
 Ollerton



□ Inertinite    ■ Liptinite    ▨ Vitrinite

Mean random vitrinite reflectance 0.68  
 Vitrinite Standard Deviation 0.11

COAL BANK SAMPLE

COAL:BENTINCK (ANNESLEY)

GRADE:SINGLES

SEAM:BLACKSHALE

BCC COAL RANK CODE:602

ECE / ISO CLASSIFICATION:633

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	5.8
Ash	5.2
Volatile matter	33.0
Fixed carbon	56.0
Volatile matter (dmmf)	37.6

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	83.1
Hydrogen (dmmf)	5.1
Oxygen (dmmf)	8.5
Nitrogen (dmmf)	1.83

ASH ANALYSIS  
(% on ash)

Na <sub>2</sub> O	2.8
K <sub>2</sub> O	1.3
CaO	2.3
MgO	0.8
Fe <sub>2</sub> O <sub>3</sub>	25.1
Al <sub>2</sub> O <sub>3</sub>	26.5
SiO <sub>2</sub>	39.3
SO <sub>3</sub>	2.1
TiO <sub>2</sub>	0.9
Mn <sub>3</sub> O <sub>4</sub>	0.1
P <sub>2</sub> O <sub>5</sub>	0.2

CAKING PROPERTIES

Swelling Index	5.5
Gray-King Coke Type	G3

Organic sulphur (db)	1.11
Sulphate as S (db)	<0.05
Pyritic sulphur as S (db)	1.10

Chlorine (db)	0.46
Carbon dioxide (db)	0.09
Mineral matter (db)	6.93

CALORIFIC VALUE

kJ / kg (daf)	34600
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MACERAL ANALYSIS  
(% by volume, mmf)

Vitrinite	78
Exinite	10
Inertinite	12

ASH FUSION RANGE (°C) \*

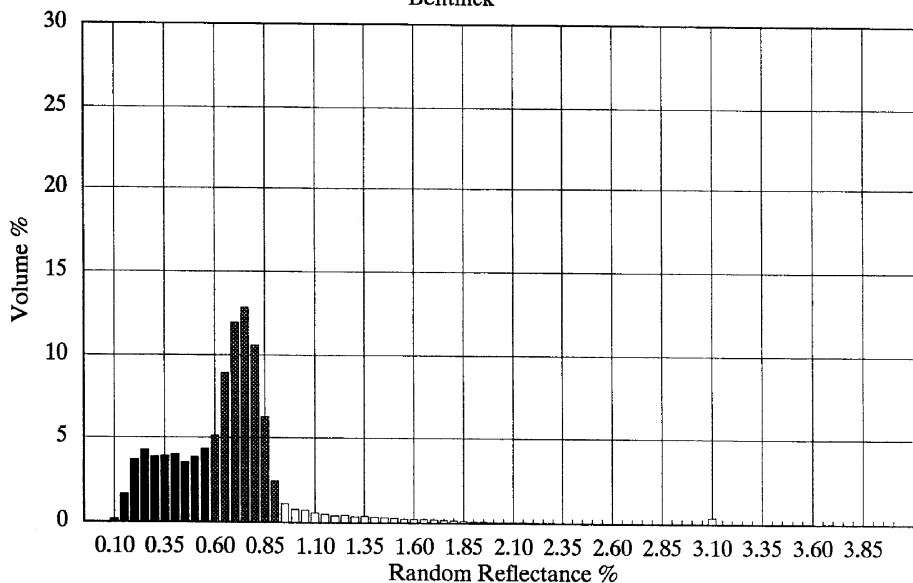
Deformation temp.	1070
Hemisphere temp.	1170
Flow temp.	1300

\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

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ad: as analysed  
db: dry basis  
daf: dry, ash free  
dmmf: dry, mineral matter free  
mmf: mineral matter free

REFLECTANCE HISTOGRAM  
Bentinck



Mean random vitrinite reflectance 0.71  
Vitrinite Standard Deviation 0.08

COAL BANK SAMPLE

COAL:YANOWICE

GRADE:SINGLES

SEAM:

BCC COAL RANK CODE:802

ECE / ISO CLASSIFICATION:611

PROXIMATE ANALYSIS

(% a.d.)	
Moisture	3.8
Ash	5.4
Volatile matter	35.4
Fixed carbon	55.4
Volatile matter (dmmf)	39.3

CAKING PROPERTIES

Swelling Index	1
Gray-King Coke Type	D

CALORIFIC VALUE

kJ / kg (daf)	34020
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ASH FUSION RANGE (°C) \*

Deformation temp.	1200
Hemisphere temp.	1270
Flow temp.	>1500

ULTIMATE ANALYSIS (%)

Carbon (dmmf)	83.0
Hydrogen (dmmf)	4.6
Oxygen (dmmf)	10.0
Nitrogen (dmmf)	1.62
Organic sulphur (db)	0.64
Sulphate as S (db)	0.00
Pyritic sulphur as S (db)	0.06
Chlorine (db)	0.04
Carbon dioxide (db)	0.47
Mineral matter (db)	6.39

MACERAL ANALYSIS

(% by volume , mmf)	
Vitrinite	67
Exinite	10
Inertinite	23

ASH ANALYSIS

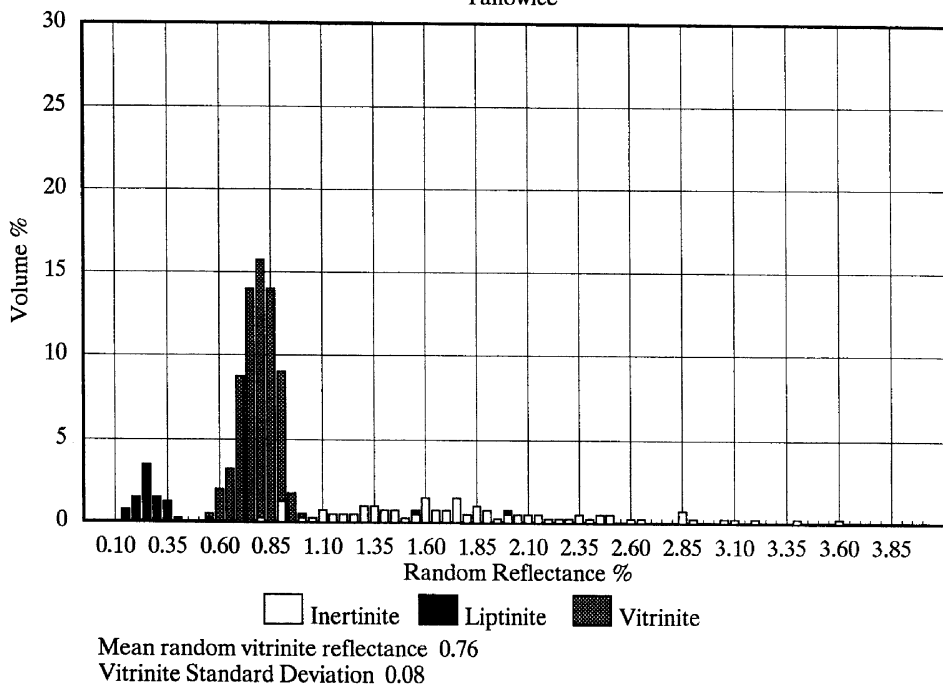
(% on ash)	
Na <sub>2</sub> O	1.1
K <sub>2</sub> O	1.6
CaO	3.4
MgO	2.1
Fe <sub>2</sub> O <sub>3</sub>	12.0
Al <sub>2</sub> O <sub>3</sub>	29.1
SiO <sub>2</sub>	41.4
SO <sub>3</sub>	1.8
TiO <sub>2</sub>	1.2
Mn <sub>3</sub> O <sub>4</sub>	0.1
P <sub>2</sub> O <sub>5</sub>	2.2

\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

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 daf: dry , ash free  
 dmmf: dry , mineral matter free  
 mmf: mineral matter free

INTERACTIVE REFLECTANCE HISTOGRAM  
 Yanowice



COAL BANK SAMPLE

COAL:LONGANNET

GRADE:SPECIAL

SEAM:HIRST

BCC COAL RANK CODE:N/A

ECE / ISO CLASSIFICATION:N/A

PROXIMATE ANALYSIS (% a.d.)		ULTIMATE ANALYSIS (%)		ASH ANALYSIS (% on ash)	
Moisture	9.2	Carbon (dmmf)	82.9	Na <sub>2</sub> O	0.2
Ash	10.8	Hydrogen (dmmf)	5.0	K <sub>2</sub> O	0.4
Volatile matter	28.0	Oxygen (dmmf)	10.0	CaO	1.8
Fixed carbon	52.0	Nitrogen (dmmf)	1.63	MgO	0.6
Volatile matter (dmmf)	35.4			Fe <sub>2</sub> O <sub>3</sub>	1.6
				Al <sub>2</sub> O <sub>3</sub>	40.3
HARDGROVE INDEX	51	Organic sulphur (db)	0.33	SiO <sub>2</sub>	51.1
		Sulphate as S (db)	0.02	SO <sub>3</sub>	0.6
CAKING PROPERTIES		Pyritic sulphur as S (db)	0.02	TiO <sub>2</sub>	1.5
Swelling Index	2.5			Mn <sub>3</sub> O <sub>4</sub>	<0.1
Gray-King Coke Type	C			P <sub>2</sub> O <sub>5</sub>	1.3
		Chlorine (db)	0.12		
		Carbon dioxide (db)	0.13		
		Mineral matter (db)	12.98		
CALORIFIC VALUE		MACERAL ANALYSIS			
kJ / kg (daf)	32940	(% by volume, mmf)			
		Vitrinite	89		
		Exinite	4		
		Inertinite	7		
ASH FUSION RANGE (°C) *					
Deformation temp.	>1500				
Hemisphere temp.	>1500				
Flow temp.	>1500				

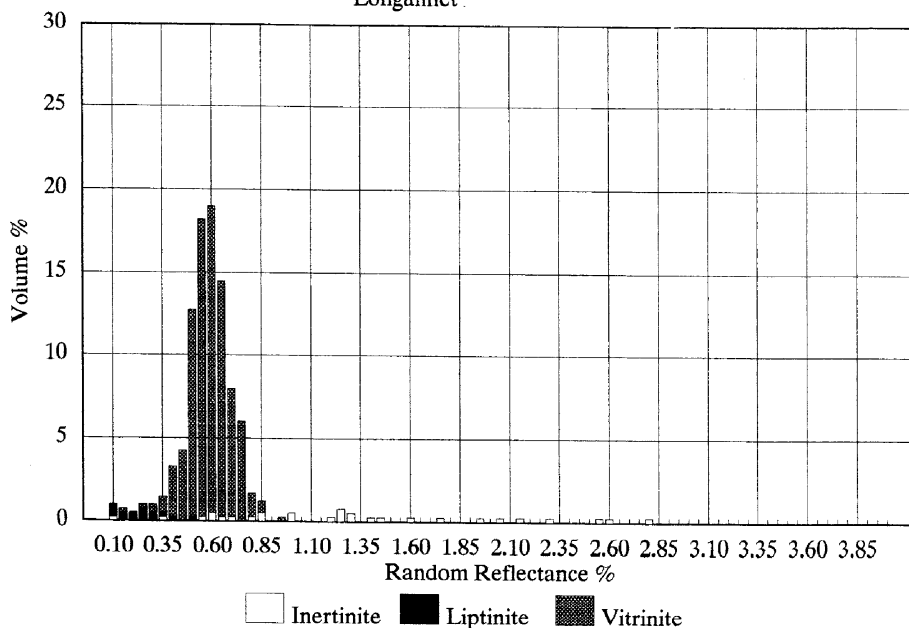
\*Test atmosphere: reducing (50% CO<sub>2</sub> / 50% H<sub>2</sub>)

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 mmf: mineral matter free

APPENDIX 25B

INTERACTIVE REFLECTANCE HISTOGRAM  
 Longannet



Mean random vitrinite reflectance 0.56  
 Vitrinite Standard Deviation 0.10