

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

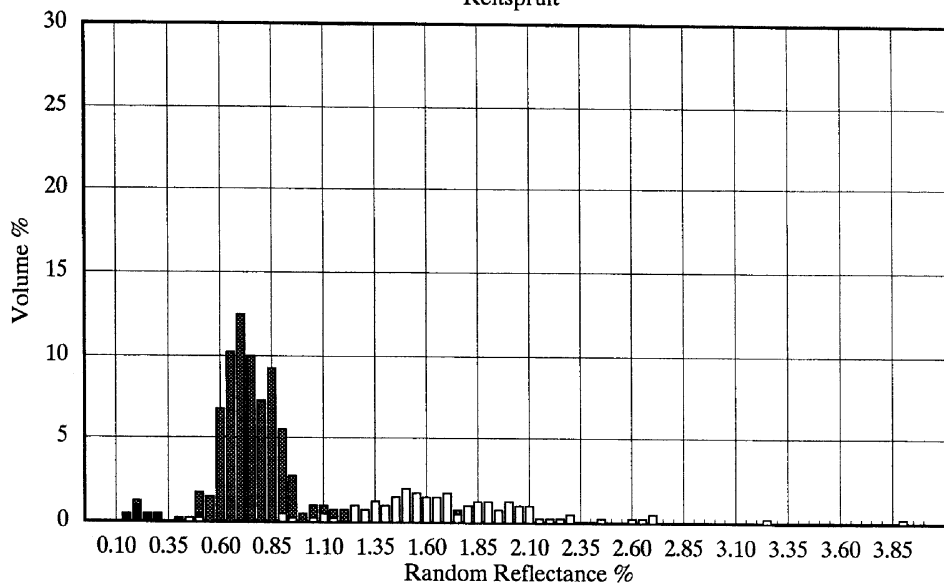
*Test atmosphere: reducing (50% CO₂ / 50% H₂)

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.

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

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

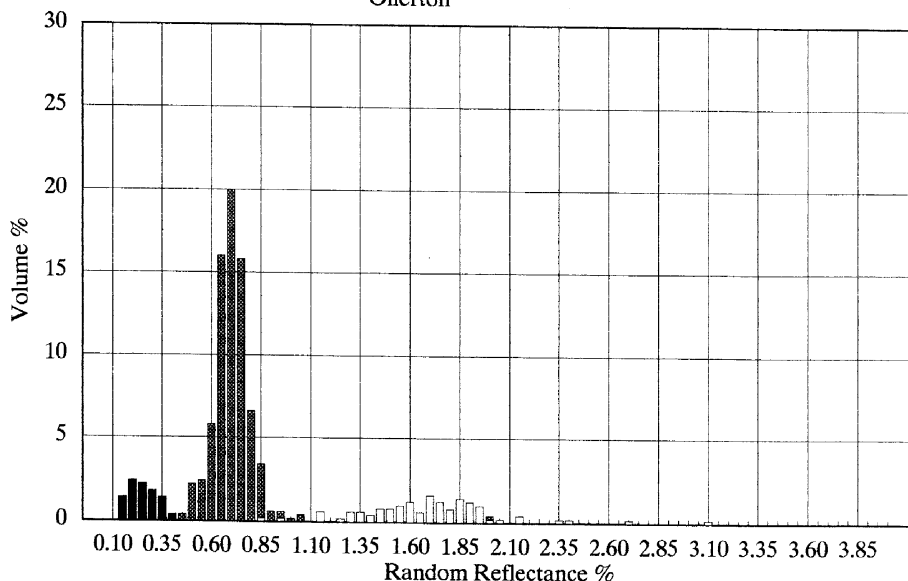
(% on ash)	
Na ₂ O	6.1
K ₂ O	1.4
CaO	5.0
MgO	0.7
Fe ₂ O ₃	16.5
Al ₂ O ₃	29.1
SiO ₂	39.3
SO ₃	3.4
TiO ₂	1.3
Mn ₃ O ₄	<0.1
P ₂ O ₅	<0.3

*Test atmosphere: reducing (50% CO₂ / 50% H₂)

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 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

CAKING PROPERTIES

Swelling Index	5.5
Gray-King Coke Type	G3

CALORIFIC VALUE

kJ / kg (daf)	34600
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ASH FUSION RANGE (°C) *

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

ULTIMATE ANALYSIS (%)

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

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

MACERAL ANALYSIS

(% by volume , mmf)	
Vitrinite	78
Exinite	10
Inertinite	12

ASH ANALYSIS

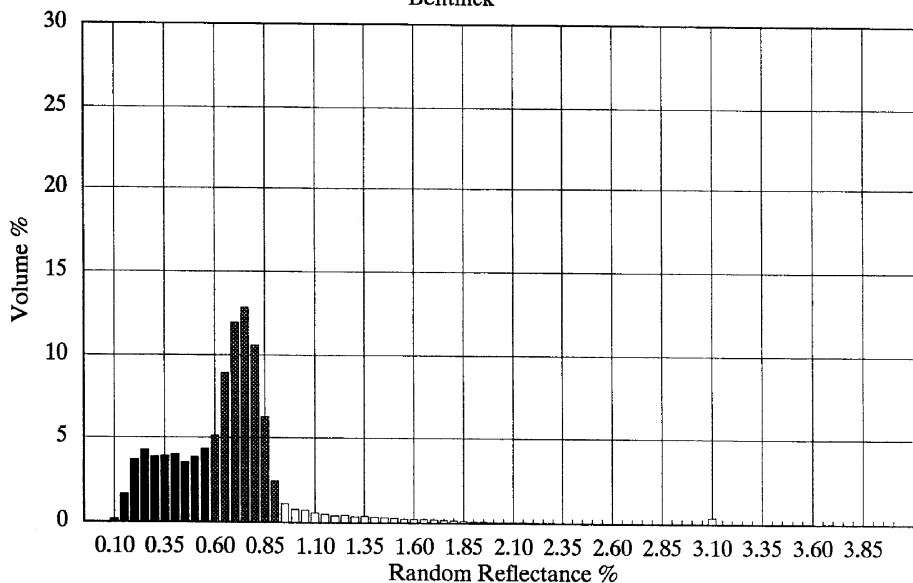
(% on ash)	
Na ₂ O	2.8
K ₂ O	1.3
CaO	2.3
MgO	0.8
Fe ₂ O ₃	25.1
Al ₂ O ₃	26.5
SiO ₂	39.3
SO ₃	2.1
TiO ₂	0.9
Mn ₃ O ₄	0.1
P ₂ O ₅	0.2

*Test atmosphere: reducing (50% CO₂ / 50% H₂)

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 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

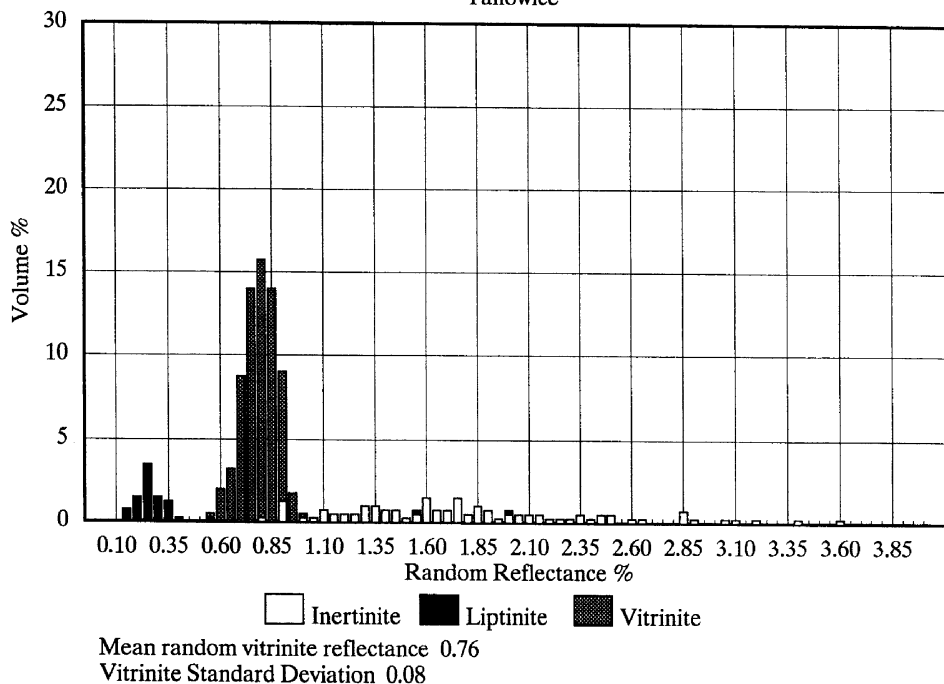
(% on ash)	
Na ₂ O	1.1
K ₂ O	1.6
CaO	3.4
MgO	2.1
Fe ₂ O ₃	12.0
Al ₂ O ₃	29.1
SiO ₂	41.4
SO ₃	1.8
TiO ₂	1.2
Mn ₃ O ₄	0.1
P ₂ O ₅	2.2

*Test atmosphere: reducing (50% CO₂ / 50% H₂)

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 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 ₂ O	0.2
Ash	10.8	Hydrogen (dmmf)	5.0	K ₂ 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 ₂ O ₃	1.6
				Al ₂ O ₃	40.3
HARDGROVE INDEX	51	Organic sulphur (db)	0.33	SiO ₂	51.1
		Sulphate as S (db)	0.02	SO ₃	0.6
CAKING PROPERTIES		Pyritic sulphur as S (db)	0.02	TiO ₂	1.5
Swelling Index	2.5			Mn ₃ O ₄	<0.1
Gray-King Coke Type	C			P ₂ O ₅	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				

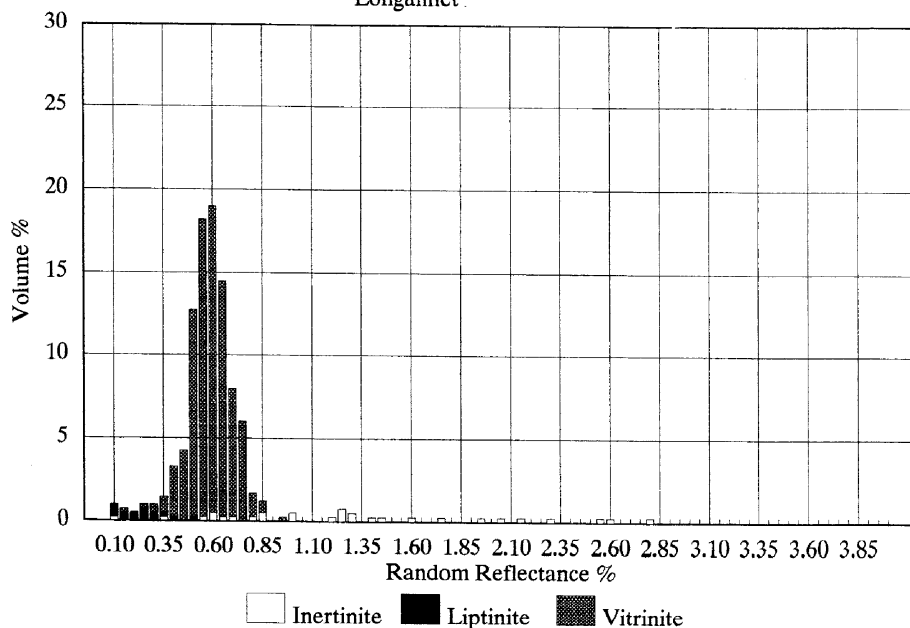
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 dmmf: dry, mineral matter free
 mmf: mineral matter free

APPENDIX 25B

INTERACTIVE REFLECTANCE HISTOGRAM
 Longannet



Mean random vitrinite reflectance 0.56
 Vitrinite Standard Deviation 0.10