Table 1. List of samples from five seam sections of the Parkgate coal bed, United Kingdom.

Colliery	National Grid E	National Grid N	Seam section interval	Section thickness (cm)	Lab number
Thoresby	468584	370324	Bed A	30	E 249094
			Bed B	30	E 249095
			Bed C	30	E 249096
			Bed D	30	E 249097
			Bed E	30	E 249098
			Bed F	30	E 249099
			Bed G	6	E 249100
Thoresby	468793	368972	Bed A	30	E 249101
			Bed B	30	E 249102
			Bed C	30	E 249103
			Bed D	30	E 249104
			Bed E	30	E 249105
			Bed F	29	E 249106
Welbeck	462987	372020	Bed A	30	E 249107
			Bed B	11	E 249108
			Bed C	12	E 249109
			Bed D	24	E 249110
			Bed E	3	E 249111
			Bed F	18	E 249112
			Bed G	30	E 249113
			Bed H	10	E 249114
			Bed J	30	E 249115
			Bed K	24	E 249116
			Bed M	4	E 249117
Maltby	456697	395100	Bed A	28	E 249118
			Bed B	38	E249119
			Bed C	30	E 249120
			Bed D	34	E 249121
			Bed E	12	E 249122
			Bed F	12	E 249123
Thoresby	461578	374957	Bed A	25	E 249124
			Bed B	25	E 249125
			Bed C	1	E 249126
			Bed D	10	E 249127
			Bed E	39	E 249128
			Bed F	39	E 249129
			Bed G	1	E 249130
			Bed H	20	E 249131
			Bed I	25	E 249132

Table 2. Statistics for chemical analyses of 38 samples of the Parkgate coal on a dry, whole-coal basis.

Parameter	Units	Median	Average	Standard deviation
Si	weight %	0.96	1.66	1.92
Al	weight %	0.65	1.15	1.42
Ca	weight %	0.17	0.22	0.18
Mg	weight %	0.038	0.054	0.06
Na	weight %	0.21	0.2	0.07
K	weight %	0.072	0.186	0.31
Fe	weight %	0.682	1.055	0.99
Ti	weight %	0.03	0.049	0.07
P	weight %	0.0006	0.0025	0.004
S	weight %	1.76	2.13	1.12
525 degree C Ash	%	6.05	8.79	8.14
Remnant Moisture	%	1.72	1.75	0.44
As	ppm	11.6	31.3	45
Ba	ppm	84.0	100	63
Be	ppm	1.45	1.65	0.82
Bi	ppm	0.09	0.12	0.10
Cd	ppm	0.04	0.05	0.03
Cl	ppm	5850	6120	1810
Co	ppm	2.35	3.38	2.3
Cr	ppm	8.90	14.8	18
Cs	ppm	0.280	0.79	1.23
Cu	ppm	30.0	39.0	28
Ga	ppm	2.01	3.26	3.1
Ge	ppm	5.52	9.31	10.4
Hg	ppm	0.087	0.174	0.21
Li	ppm	10.0	29.1	62
Mn	ppm	24.4	30.1	23
Mo	ppm	2.81	3.39	2.7
Nb	ppm	0.780	1.17	1.3
Ni	ppm	24.1	40.0	51
Pb	ppm	12.8	23.5	23
Rb	ppm	3.70	9.8	16
Sb	ppm	1.69	2.29	1.8
Sc	ppm	2.14	3.15	3.0
Se	ppm	1.45	2.33	2.1
Sn	ppm	1.07	1.45	1.1
Sr	ppm	35.0	46.0	35
Te	ppm	0.07	0.07	0.03
Tl	ppm	0.33	0.73	1.0
U	ppm	0.78	1.09	0.8
V	ppm	25.1	35.0	27
Y	ppm	4.60	5.84	4.5
Zn	ppm	7.61	8.44	3.4

Table 3. Correlation coefficients from centred logratio values and regression values on raw values for K at 95% confidence level for Parkgate coal samples. Calculated organic concentrations in ppm for the Eggborough coal (Spears, 2002) are also shown. [r = correlation coefficient, intercept = regression value on element axis in ppm, lower limit = lower limit of intercept at 95% confidence level, percent = intercept expressed as percentage of median elemental value]

Element	r	Intercept ppm	Lower limit ppm	Median ppm	Percent	Organic composition Eggborough coal
Ag	0.94	0.1	0.08	0.19	53	
As						2.4
Ba						16
Be						
Bi	0.89	0.07	0.05	0.12	58	
Cd						
Cl						
Co						
Cr	0.94	4.5	2.24	14.8	30	17
Cs	0.99	0.05	0.004	0.79	6	
Cu	0.86	24.3	19	38.9	62	22
Ga	0.93	1.5	1.05	3.26	46	2.8
Ge						4.6
Hg						
Li	0.9	-4.9	-15	29.1	0	
Mn						
Mo						0.9
Nb	0.83	0.5	0.22	1.17	53	0.7
Ni						18
Pb						6.1
Rb	0.99	0.39	0.068	9.8	4	0
Sb						0.5
Sc	0.88	1.5	0.97	3.15	48	
Se						0.6
Sn	0.84	0.86	0.62	1.45	59	0
Sr						18
Te						
Th	0.91	0.3	-0.16	1.86	16	0
Tl						
U	0.86	0.67	0.5	1.08	62	0
V	0.79	22	15	35	62	60
Y	0.9	3.4	2.6	5.84	58	3.3
Zn						10

Table 4. Calculated trace element concentrations (in ppm) in pyrite for 1) the Parkgate coal (this study), 2) the Harworth coal (Spears et al., 1999b), 3) the Eggborough coal (Spears, 2002, and Spears et al., 2007) and 4) observed concentrations in pyrite from coals in the Yorkshire-Nottinghamshire coalfield in the work of White et al. (1989).

Element	Parkgate	Harworth	Eggborough	East Midlands
Hg	7.2			
Tl	40			17
Pb	875	390	406	322
As	1440	1346	1070	1029
Se	78	38	27	97
Mo	96	128	98	107
Cd	0.9			
Ni	1870	525	337	309
Sb	53	26	20	
Zn	97	564	455	21
Co	72			
Cu		885		315

Figure 1. Location of the Yorkshire-Nottinghamshire coalfield in the United Kingdom. Collieries from which samples were collected are Maltby (M), Thoresby (T), and Welbeck (W).
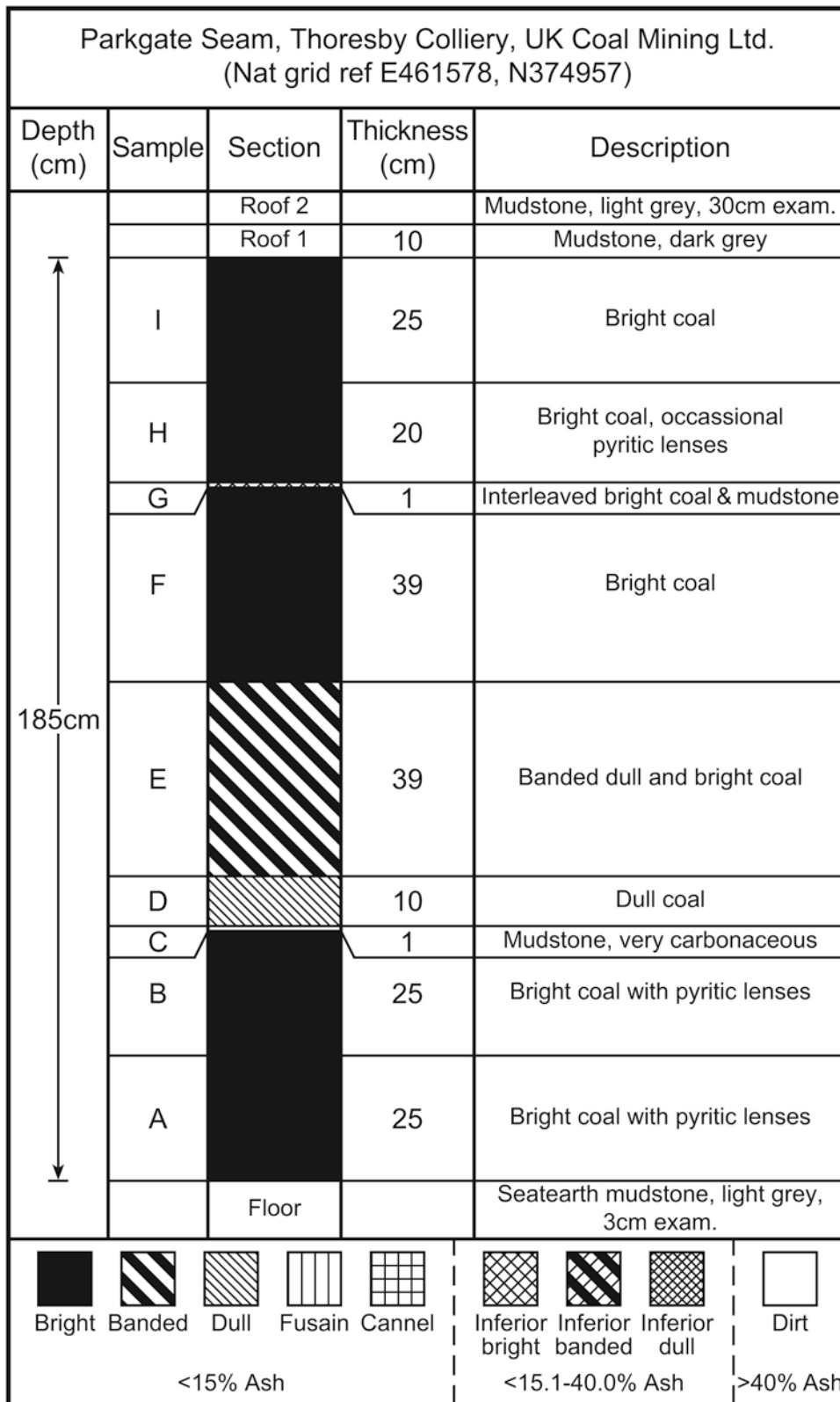
Depth (cm)	Sample	Section	Thickness (cm)	Description
		Roof 2		Mudstone, light grey, 30cm exam.
		Roof 1	10	Mudstone, dark grey
	I		25	Bright coal
	H		20	Bright coal, occassional pyritic lenses
	G		1	Interleaved bright coal & mudstone
	F		39	Bright coal
185cm	E		39	Banded dull and bright coal
	D		10	Dull coal
	C		1	Mudstone, very carbonaceous
	B		25	Bright coal with pyritic lenses
	A		25	Bright coal with pyritic lenses
		Floor		Seatearth mudstone, light grey, 3cm exam.

Parkgate Seam, Thoresby Colliery, UK Coal Mining Ltd.
(Nat grid ref E461578, N374957)

Legend:
Bright | Banded | Dull | Fusain | Cannel | Inferior bright | Inferior banded | Inferior dull | Dirt

<15% Ash | <15.1-40.0% Ash | >40% Ash

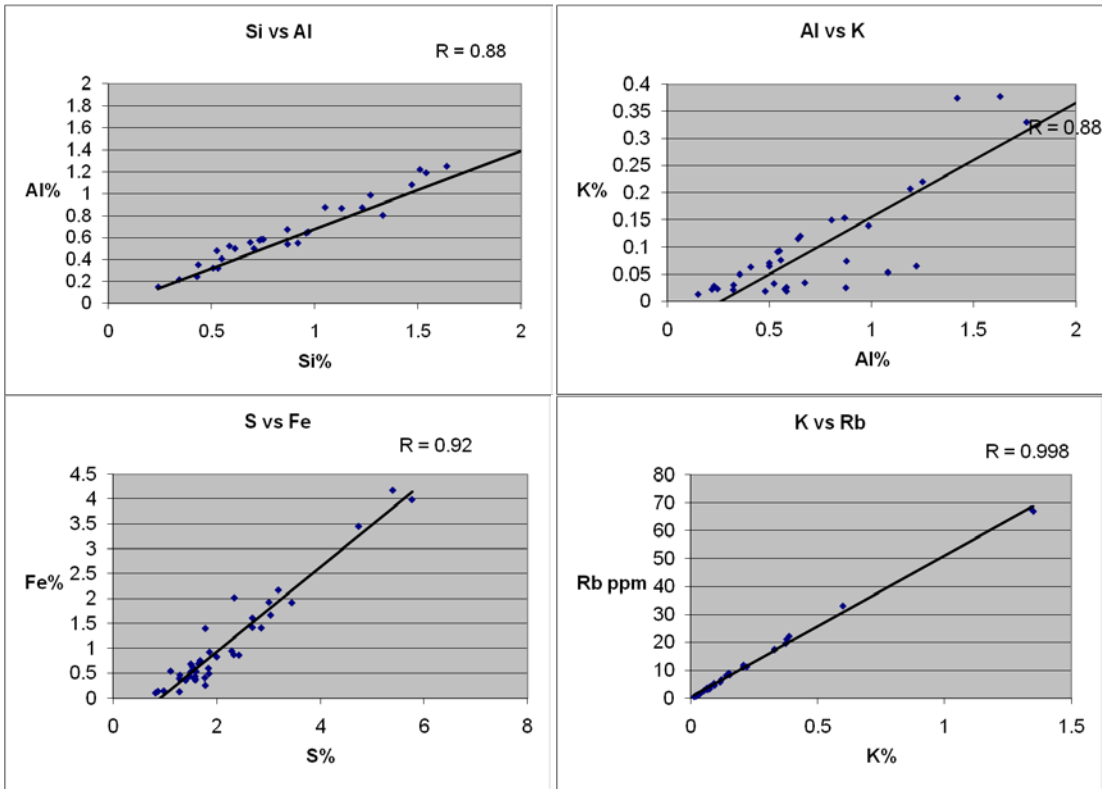Figure 2. Parkgate seam section, Thoresby colliery.(Nat grid ref E461578 N374957).

Figure 3.Correlation plots of raw data (dry, whole-coal) with correlation coefficients from centred logratio values for closely associated elements in the Parkgate coal.
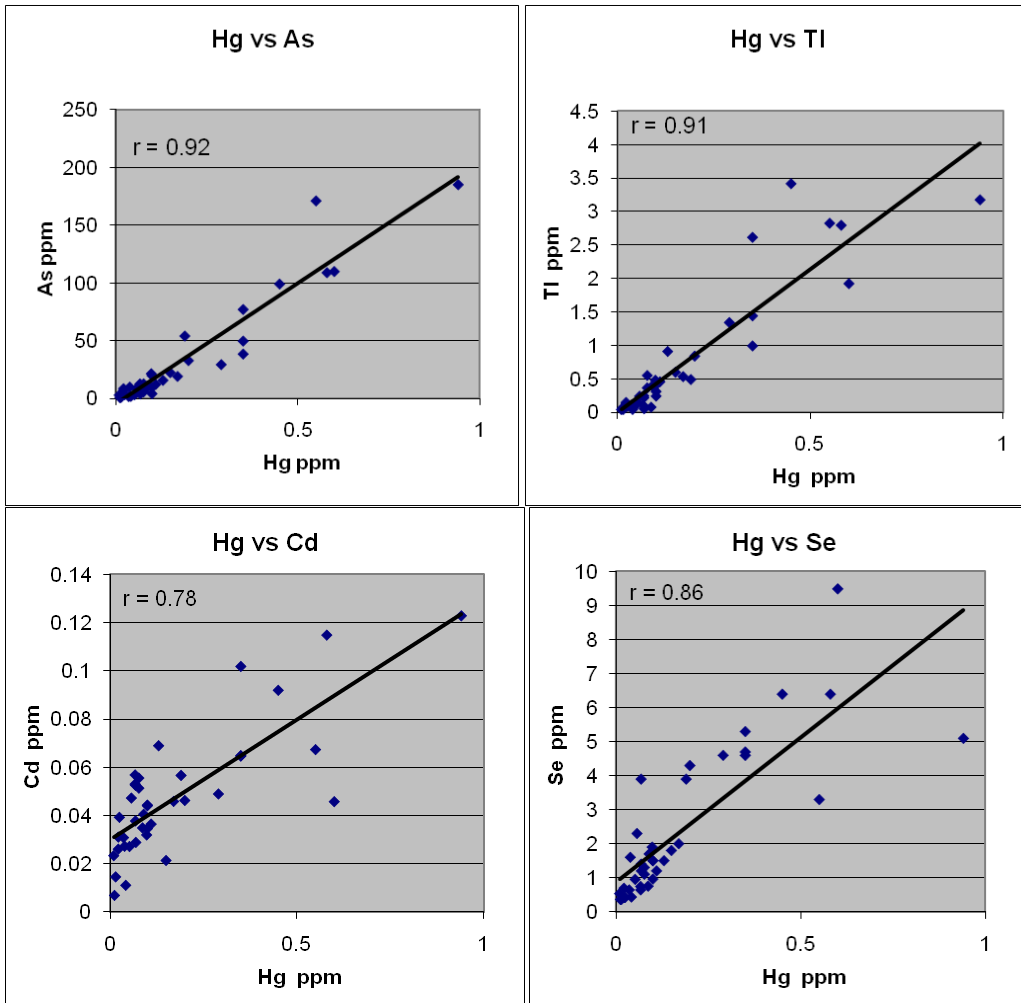
Figure 4. Correlation plots for raw Hg versus As, Tl, Cd and Se in the Parkgate coal samples and the correlation coefficients for the centred logratio value.