1983/36. Analysis of coal from the Duncan seam, Duncan Colliery, Fingal

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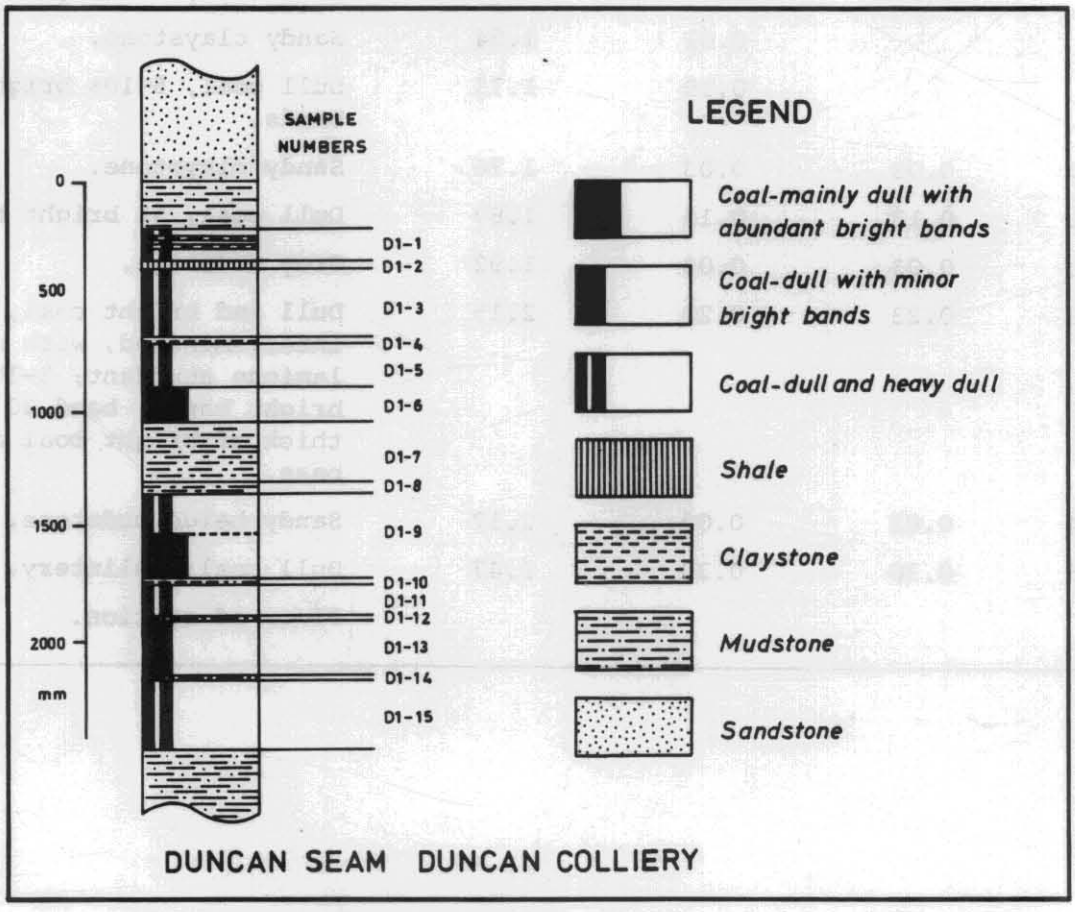
A 300 mm x 200 mm channel sample was collected from the area of the No. 1 Working Section of the Duncan Colliery on 19 April 1983.

Graphic and descriptive sections of the seam together with the results of analyses of the sample by the Joint Coal Board of New South Wales are given below.

LOCATION

AMG Grid co-ordinates:	585 390 mE 5 387 230 mN
Reduced Level:	427 m above sea level
Depth of cover:	approximately 220 m
Seam thickness:	2.47 m
Roof:	lithic sandstone
Floor:	mudstone

[5 August 1983]



5 cm

Table 1. SEAM DESCRIPTION

Sample number	Sample thickness (m)	Ply thickness (m)	Cumulative thickness (m)	Description
-				Lithic sandstone (roof).
	-	0.21	0.21	Grey mudstone.
D1-1	0.14	0.04	0.25	Dull coal, 5% bright band.
		0.01	0.26	Brown claystone.
		0.02	0.28	Dull coal, 5% bright band.
		0.01	0.29	Brown claystone.
		0.06	0.35	Dull coal.
D1-2	0.03	0.03	0.38	Carbonaceous shale.
D1-3	0.30	0.30	0.68	Dull coal, stony.
D1-4	0.02	0.02	0.70	Beige mudstone, shaly.
D1-5	0.19	0.19	0.89	Dull coal, stony and splintery.
D1-6	0.16	0.16	1.05	Dull coal, 15% bright bands.
D1-7	0.26	0.26	1.31	Grey mudstone.
D1-8	0.05	0.05	1.36	White 'puggy' clay.
D1-9	0.37	0.17	1.53	Dull coal, 5% bright bands.
		0.01	1.54	Sandy claystone.
		0.19	1.73	Dull coal, 5-10% bright bands.
D1-10	0.03	0.03	1.76	Sandy claystone.
D1-11	0.13	0.13	1.89	Dull coal, 5% bright bands.
D1-12	0.03	0.03	1.92	Grey mudstone.
D1-13	0.23	0.23	2.15	Dull and bright coal, interlaminated, with mud laminae abundant; 5-10% bright bands; band 30 mm thick of bright coal at base.
D1-14	0.02	0.02	2.17	Sandy beige mudstone.
D1-15	0.30	0.30	2.47	Dull coal; splintery.
				Floor of section.

Table 2. ASH ANALYSES

Sample number	Ply thickness (m)	Description	APPT SG	Air dried moisture (%)	Analysis - dry basis				Specific Energy (MJ/kg)	
					Ash (%)	VM (%)	FC (%)	Total sulphur (%)	Dry basis	Dry ash free
D1-1	0.14	Dull coal, minor mud-stone	1.71	5.8	45.6	16.8	37.6	0.21	17.34	31.88
D1-2	0.03	Carbonaceous shale	1.86	9.4	63.9					
D1-3	0.30	Dull coal, stony	1.84	6.6	58.4					
D1-4	0.02	Beige mudstone	2.18	11.9	89.2					
D1-5	0.19	Dull coal, stony	1.59	6.1	35.5	20.2	44.3	0.32	20.62	31.96
D1-6	0.16	Dull coal	1.47	5.5	27.0	28.9	44.1	0.46	24.32	33.32
D1-7	0.26	Grey mudstone	2.40	5.8	91.6					
D1-8	0.05	White claystone	2.13	13.2	90.9					
D1-9	0.37	Dull coal, minor clay-stone	1.52	5.9	29.5	23.9	46.6	0.34	22.94	32.54
D1-10	0.03	Claystone	2.04	5.1	72.3					
D1-11	0.13	Dull coal	1.40	6.6	19.2	30.5	50.3	0.43	26.64	32.96
D1-12	0.03	Grey mudstone	2.36	2.1	73.2					
D1-13	0.23	Dull coal	1.59	4.8	39.3	23.7	37.0	0.34	19.30	31.80
D1-14	0.02	Beige mudstone	2.02	2.0	46.9	35.2	17.9	0.17	8.98	16.90
D1-15	0.30	Dull coal	1.37	5.8	16.8	26.3	56.9	0.37	27.80	33.40
D1-1 to D1-15		Composite inc. bands		6.5	48.4	18.6	33.0	0.24	15.88	30.78
D1-1 to D1-15		Composite 12.7 mm x 0 F1.60		5.9	20.4	26.5	53.1	0.39	26.68	33.52

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Table 3.

	D1-1 to D1-15 composite	
	Including bands	12.7 mm x 0 F1.6
ULTIMATE ANALYSIS (Dry ash free %)		
Carbon	79.6	83.6
Hydrogen	5.01	4.86
Nitrogen	1.51	0.46
Sulphur	0.49	9.7
Oxygen	13.4	9.7
CO_2 AD %	1.22	0.58
MACERAL ANALYSIS		
Vitrinite	14	20
Exinite	6	7
Micrinite	1	1
Macrinite	5	5
Inertodetrinite	19	21
Semi-fusinite	26	37
Fusinite	2	3
Sclerotinite	-	-
Clay	24	4
Carbonates	2	1
Pyrite	-	-
Quartz	1	1
MEAN MAXIMUM REFLECTANCE	0.66	0.66
SULPHUR DISTRIBUTION		
Sulphate sulphur	Nil	Nil
Pyritic sulphur	Nil	0.01
Organic sulphur	0.24	0.38
ASH ANALYSIS		
SiO_2	62.7	63.0
Al_2O_3	22.9	20.2
Fe_2O_3	4.66	6.70
CaO	4.31	4.63
MgO	1.01	1.19
TiO_2	0.85	0.92
Na_2O	0.23	0.05
K_2O	1.19	0.36
P_2O_5	<0.01	<0.01
Mn_3O_4	0.14	0.15
SO_3	0.68	1.35
ASH FUSION TEMPERATURES		
Deformation temperature (°C)	1160	1160
Softening temperature (°C)	1360	1300
Hemisphere temperature (°C)	1390	1330
Flow temperature (°C)	1480	1430

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Table 4. FLOAT - SINK ANALYSES

Sample number	Density of separation		Mass (%)	Ash (%)	Cumulative	
					Mass (%)	Ash (%)
D1-1		F1.40	Nil		Nil	
	S1.40	F1.60	37.1	24.0	37.1	24.0
	S1.60	F1.70	24.7	39.3	61.8	30.1
	S1.70	F1.80	9.8	48.0	71.6	32.6
	S1.80		28.4	73.6	100.0	44.2
D1-2		F1.40	Nil		Nil	
	S1.40	F1.60	Nil		Nil	
	S1.60	F1.70	5.4	45.8	5.4	45.8
	S1.70	F1.80	31.0	49.2	36.4	48.7
	S1.80		63.6	62.1	100.0	57.2
D1-3		F1.40	Nil		Nil	
	S1.40	F1.60	Nil		Nil	
	S1.60	F1.70	21.5	41.2	21.3	41.2
	S1.70	F1.80	26.6	46.7	47.9	44.3
	S1.80		52.1	63.3	100.0	54.2
D1-4	S1.80		100.0	78.6	100.0	78.6
D1-5		F1.40	3.9	14.0	3.9	14.0
	S1.40	F1.60	47.8	25.6	51.7	24.7
	S1.60	F1.70	32.6	35.8	84.3	29.0
	S1.70	F1.80	3.7	46.7	88.0	29.8
	S1.80		12.0	63.5	100.0	33.8
D1-6		F1.40	33.8	11.3	33.8	11.3
	S1.40	F1.60	45.6	25.0	79.4	19.2
	S1.60	F1.70	10.3	44.3	89.7	22.1
	S1.70	F1.80	4.1	52.7	93.0	23.4
	S1.80		6.2	74.1	100.0	26.5
D1-7	S1.80		100.0	86.3	100.0	86.3
D1-8	S1.80		100.0	78.9	100.0	78.9
D1-9		F1.40	9.8	12.8	9.8	12.8
	S1.40	F1.60	58.5	21.5	68.3	20.3
	S1.60	F1.70	21.2	38.0	89.5	24.5
	S1.70	F1.80	6.3	47.6	95.8	26.0
	S1.80		4.2	63.4	100.0	27.5
D1-10	S1.80		100.0	68.6	100.0	68.6
D1-11		F1.40	50.9	12.8	50.9	12.8
	S1.40	F1.60	44.6	18.7	95.5	15.5
	S1.60	F1.70	0.8	39.5	96.3	15.8
	S1.70	F1.80	0.5	46.5	96.8	15.9
	S1.80		3.2	67.3	100.0	17.6
D1-12	S1.80		100.0	71.7	100.0	71.7
D1-13		F1.40	14.9	11.1	14.9	11.1
	S1.40	F1.60	40.1	23.6	55.0	20.2
	S1.60	F1.70	11.4	43.7	66.4	24.2
	S1.70	F1.80	11.3	51.8	77.7	28.3
	S1.80		22.3	66.3	100.0	36.7
D1-14	S1.80		100.0	46.0	100.0	46.0

Table 4 (continued)

Sample number	Density of separation		Mass (%)	Ash (%)	Cumulative	
					Mass (%)	Ash (%)
D1-15		F1.40	65.1	9.4	65.1	9.4
	S1.40	F1.60	29.4	22.4	94.5	13.4
	S1.60	F1.70	3.1	38.8	97.6	14.2
	S1.70	F1.80	0.8	45.6	98.4	14.5
	S1.80		1.6	60.0	100.0	15.2
D1-1		F1.40	13.4	10.8	13.4	10.8
to	S1.40	F1.60	27.4	23.0	40.8	19.0
D1-15	S1.60	F1.70	13.5	39.4	54.3	24.1
	S1.70	F1.80	7.7	48.0	62.0	27.0
	S1.80		38.0	75.2	100.0	45.3

Note: 1. Density analysis carried out on 12.7 mm x 0 material.

2. Ash percentages reported on 'air-dried' basis.