1984/12. The Seymour coalfield

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Abstract

Coal was mined from two seams in the Seymour coalfield during three periods of mining activity: from 1863-1880; 1928-1931; and from 1959-1964. The seams were both less than 1.5 m thick and were mined by underground methods.

During the original mining activity an attempt was made to use the 'slack' coal to produce kerosene by fractionation.

The coal seams are contained in a flat-lying fluvial sequence of Triassic age, a correlate of the Upper Division of the Upper Parmeener Super-Group. At Seymour this sequence is approximately 100 m thick and overlies a correlate of the Lower Division of the Parmeener Super-Group, which, in this locality, is wholly Permian in age. Drilling suggests that the Permian sequence is approximately 170 m thick. Regionally, an erosional unconformity separates the Upper and Lower Divisions of the Parmeener Super-Group.

The potential for future exploration of the Seymour coalfield is limited due to the thin nature of the seams, and the restricted lateral extent of the coalfield.

LOCATION AND ACCESS

The Seymour coalfield is located on the coastal plain adjacent to Long Point [FP080775], on the east coast of Tasmania. Long Point is 14 km north of Bicheno and 20 km south-east of St Marys.

The country is flat and open, is used for grazing purposes, and is marshy in places. Access is by farm roads off the Tasman Highway.

GEOLOGY

The geology of the Seymour area has been mapped by Turner *et al.* (in prep.) and Sansom (1979) (fig. 1). The Seymour coalfield is situated on a 1-2 km wide coastal plain underlain by a flat-lying coal-bearing Triassic sequence, a correlate of the Upper Division of the Parmeener Super-Group.

Seymour Borehole 4 (1888), collared near sea level, reached the base of the Upper Parmeener Super-Group at 104 m and intersected a further 168 m correlated with the Lower Parmeener Super-Group, bottoming probably near basement in granite-boulder conglomerate. Typically for north-eastern Tasmania, only the Lower Freshwater Sequence and the Upper Marine Sequence are represented in the Lower Parmeener Super-Group, which is here wholly Permian in age. Regionally, an erosional disconformity separates the Lower and Upper Divisions of the Parmeener Super-Group.

The dominant and characteristic lithology of the Upper Parmeener Super-Group is medium-grained lithic arenite; usually thick-bedded, cross-bedded and interbedded with mudstone, carbonaceous mudstone and coal. The base of sandstone beds is often erosional, and flaky intraclasts of mudstone and coal are often included in the lower parts of sandstone beds. These lithologies are repetitive and unchanging through the sequence; hence, no

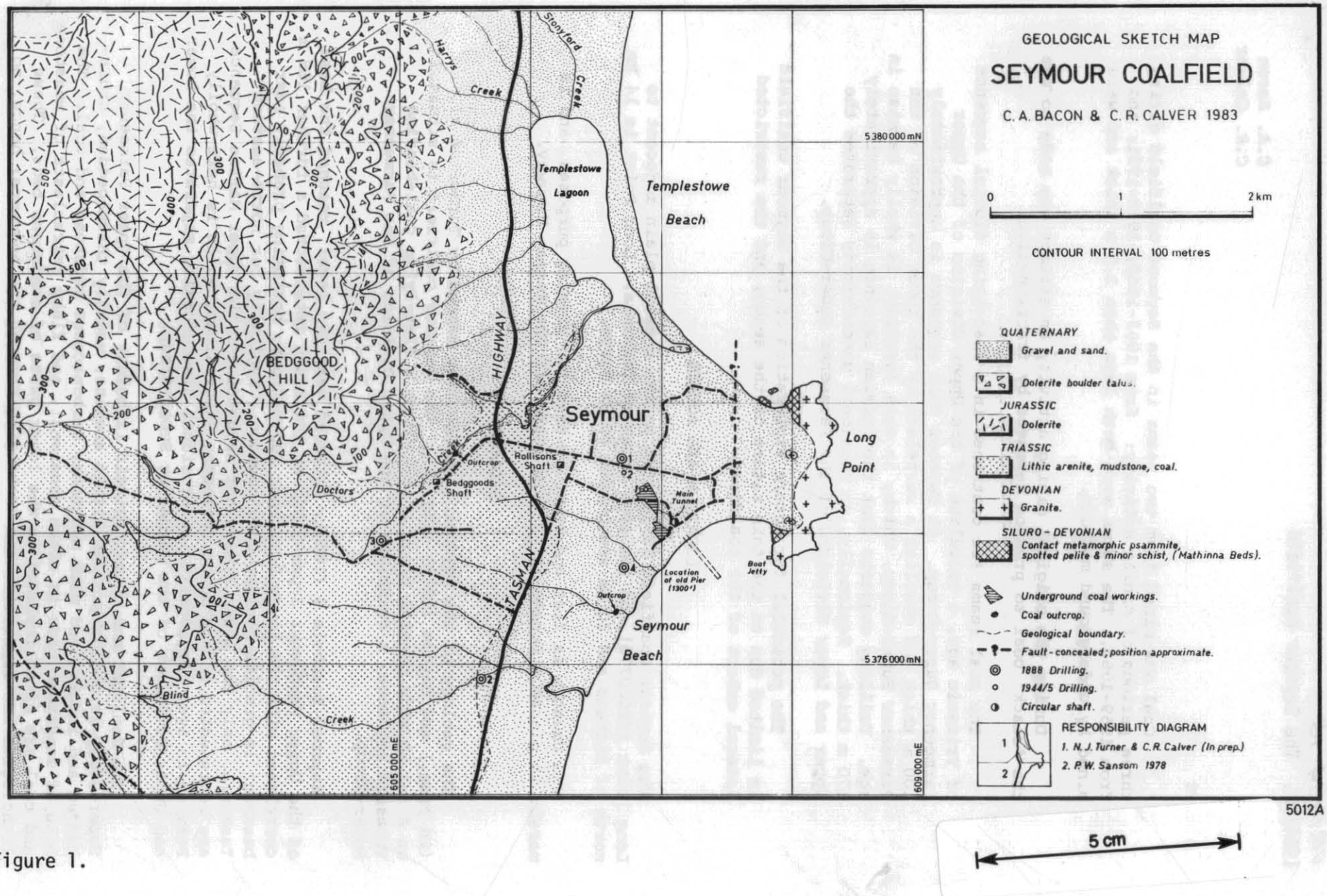

Figure 1.

[12-1a]

mappable subdivisions are discernible. However, by comparison with the Triassic sequence in the rest of the St Marys Quadrangle, the distinct absence of pebbly horizons from abundant outcrop along Doctors Creek as far west as Cliff Creek suggests these rocks are low in the sequence (within 160 m of the base of the Upper Parmeener Super-Group).

Jurassic dolerite intrudes the Parmeener Super-Group and caps the sequence on the highlands to the west. Dolerite crops out on Bedggood Hill [FP043783] and at a relatively low level in Cliff Creek [FP036780]. This low-level dolerite is probably a transgressive mass, possibly a large feeder.

A thick mantle of dolerite boulder talus covers the slopes flanking the coastal plain, obscuring the dolerite/sediment contact relationships. A veneer of Quaternary gravel and sand blankets most of the coastal plain, and outcrop is largely confined to the banks of incised streams.

Long Point, a prominent headland, is composed of Siluro-Devonian Mathinna Beds and Devonian granite. A major fault, concealed by Quaternary sediments, is inferred to trend approximately N-S across the neck joining Long Point to the mainland. This fault must have an eastward upthrow of at least 270 m.

COAL GEOLOGY

Correlation between drill holes in the Seymour coalfield shows that four seams exist over most of the area. These have been labelled S1 to S4. Correlation between the seams at Seymour and those at Dalmayne to the west cannot confidently be made on the available data.

Three seams were noted by Cundy (1931) as being of interest. Their depths, as encountered in the mine workings, were given as:

S1 : Top seam (No. 1) at 10.6 m depth; thickness 1.37 m.
S3 : Middle seam (No. 2) at 50 m depth; average thickness 1.47 m.
S4 : Bottom seam (No. 3) at 56.4 m depth; thickness not known.

The S2 seam, not mentioned by Cundy (1931), is usually no more than 0.50 m thick where present in drill core, and where not present the seam is represented by a carbonaceous or muddy interval.

The Top (S1) seam contained a band of "shale, mudstone and coaly matter" which discounted the value of the coal considerably (Cundy, 1931), and was not worked as extensively as the Middle (S3) seam.

The Middle (S3) seam varied in thickness from 1.14 m to 1.68 m and was the seam from which most of the mined coal was extracted during the 1923-31 and 1959-64 periods of mining.

Cundy (1931) records that in the 'old workings' (*i.e.* 1863-1880 mining) some "six acres" (2.5 ha) of coal were mined from the No. 1 (S1) seam and "eight acres" (3.2 ha) were mined from the No. 2 (S3) seam.

A seismic reflection traverse of the coalfield by Richardson and Leaman (1980) found four reflectors which appear to represent sections of two seams. Two of these reflectors correspond to seams in DOM Seymour 1888 DDH 1 at 7.94 m (1.46 m thick, S1 seam) and 25.48 m (0.52 m thick, S2 seam). A zone of poor signal over the central part of the traverse does not allow correlation between the two ends of the traverse. However the two reflectors

at the eastern end of the traverse are most probably the continuation of the two seams.

Small faults with throws of less than five metres break the seams. Some faults do not disrupt the upper coal seam and these appear to be contemporaneous with coal deposition. Seam sections are shown in Figure 2 and seam intersections are given in Appendix 2.

PREVIOUS MINING HISTORY

A.H. Swift commenced mining operations at Seymour in 1861, and wrote to the Executive Council requesting government assistance in laying a tramway and building a jetty. Swift stated that 20 men were employed getting 100 t of coal weekly (CSD 4/6/40, 11 December 1861)*.

Charles Gould was sent to inspect Swift's claims (CSD 4/6/40, 11 December 1861) and reported to the Colonial Secretary on 24 December 1861 that the work consisted of two shafts, between 18 m and 21 m deep, and a drive 50 m in length. Gould noted that although the total seam was 2.08 m thick, only the basal 1.63 m was exposed in the roadways and a section of only 1.14 m (including bands) was worked.

The coal was tried by a steamboat; both the captain and the engineer commencted unfavourably on its suitability as a steaming coal, saying the coal contained much ash. Gould recommended the coal as being suitable for household use, and Swift asked for another trial of coal at the Hobart Gas Works.

The Marine Board sent an officer to inspect the site of Swift's proposed jetty (CSD 4/6/40, 4 January 1862) and the Inspector of Public Works examined a stockpile of coal at Patterson's wharf with a view to using some of the coal in a trial at the gas works. The Inspector (Falconer) noted that the coal was "badly got out, being a mixture of coal, shale and dirt; no tests could be made to ascertain the value for steam raising until coal alone was supplied". He added that the coal would have to be sold at 10/- per ton, half the cost of Newcastle coal (CSD 4/6/40, 4 January 1862).

The House of Assembly granted Swift £1,000 towards building a tramway and jetty on 17 January 1862. The sum was to be recouped by a royalty on coal when mined.

The Seymour Coal Mining Company formed in 1863, and a report of the directors at the first ordinary general meeting of shareholders on Wednesday 4 March 1863 states that the pier was partly complete, being 18 m long, and a depot capable of holding 400-500 t of coal was almost complete. An iron tramroad from the pit mouth to the jetty had been laid, and three shafts sunk. At the next meeting, in August 1863, the directors reported a stockpile of 1400 t, and continued efforts to build the pier and two depots.

In 1868, the Australian Coal and Kerosene Company was formed by Swift, to utilize 50-60 t per month of 'slack' coal from the Seymour mine. Some 2700 litres of oil was retorted from the coal and sent to Melbourne to be refined (Tasmanian Times, 18 June 1868).

CSD - records from the Chief Secretary's Department, held in the Tasmanian State Archives.

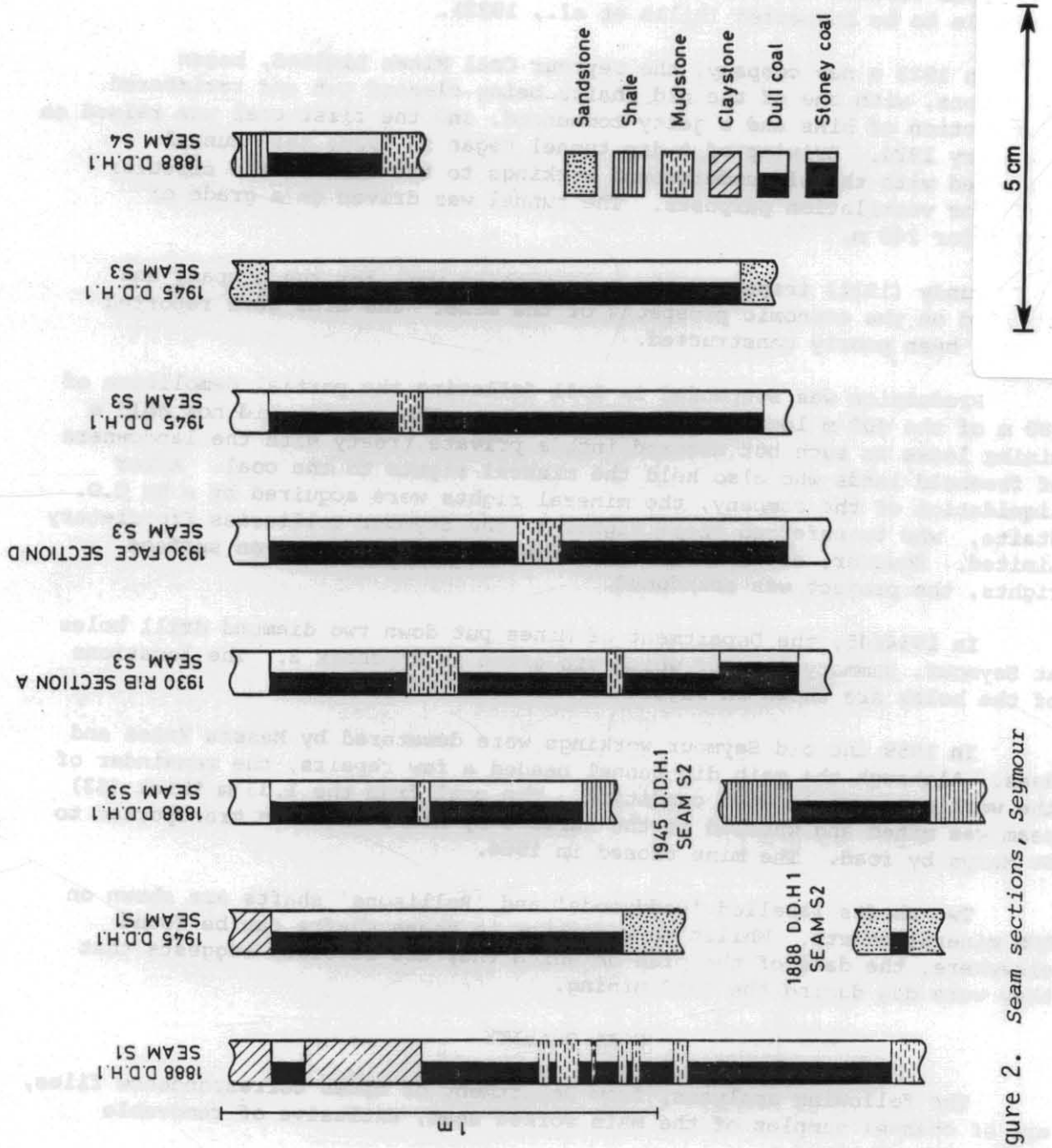

Figure 2. *Seam sections, Seymour*

The original mining venture operated for 17 years (Hills *et al.*, 1922), and so would have ceased in 1880. One of the original shafts was circular and lined with bricks.

Four diamond drill holes were put down by the Department of Mines in 1888 near Seymour, and one hole was drilled close to the Douglas River. The locations of these holes are shown in Figure 1.

Reid visited the Seymour coalfield in 1921, when no workings were able to be inspected (Hills *et al.*, 1922).

In 1923 a new company, the Seymour Coal Mines Limited, began operations, with one of the old shafts being cleaned out and retimbered. Construction of bins and a jetty commenced, and the first coal was raised on 7 January 1924. Driving of a dip tunnel began in 1928; this tunnel connected with the old underground workings to the west of the circular shaft for ventilation purposes. The tunnel was driven on a grade of 1 in 5 for 240 m.

Cundy (1931) inspected the construction work for the company and reported on the economic prospects of the mine. The bins were reported to have been poorly constructed.

Production was suspended in 1931 following the partial demolition of 180 m of the 400 m long jetty by heavy seas. The company did not hold a mining lease as such but entered into a private treaty with the landowners of freehold lands who also held the mineral rights to the coal. After liquidation of the company, the mineral rights were acquired by a Mr C.O. Staite, who transferred these rights to the Seymour Collieries Proprietary Limited. However, after a small expense had been incurred on surface rights, the project was abandoned.

In 1944/45, the Department of Mines put down two diamond drill holes at Seymour, summary logs of which are given in Appendix 2. The locations of the holes are shown in Figure 1.

In 1959 the old Seymour workings were dewatered by Messrs Yates and Haas. Although the main dip tunnel needed a few repairs, the remainder of the workings were in good condition. The coal from the 1.33 m thick (S3) seam was mined and wheeled to the surface by hand, and then transported to St Marys by road. The mine closed in 1964.

Two shafts labelled 'Beddgoods' and 'Rollisons' shafts are shown on DOM mineral charts. Whilst no reference to these shafts can be found elsewhere, the date of the plan on which they are recorded suggests that they were dug during the 1930 mining.

COAL QUALITY

The following analyses, from Department of Mines correspondence files, are of channel samples of the main worked seam, exclusive of removable dirt bands (Table 1.)

Table 1. ANALYSES OF COAL SAMPLES, SEYMOUR

	1	2	3	4	5	6	7	8	9	10
Moisture (%)	0.94	1.54	3.10	2.75	1.20	0.96	1.56	3.14	3.14	3.14
VCM (%)	28.48	25.00	22.80	30.40	22.68	28.94	29.60	22.91	19.10	26.40
FC (%)	50.62	55.96	61.60	49.70	58.06	51.90	34.30	50.55	49.86	54.34
Ash (%)	19.96	17.50	12.50	17.70	18.06	18.20	34.54	23.40	27.90	16.12
Sulphur (%)	0.85	0.81	0.74	0.92	0.67	0.88	0.96	0.56	0.49	0.59
SE (MJ/kg)	26.4	27.5	28.9	27.9	26.7	27.3	20.7	23.0	-	-

1. Channel sample (1.75 m) of working face 'B'; exclusive of removable bands, 1930.

2. Channel sample (1.32 m) of working face 'C'; exclusive of removable bands, 1930.

3. Channel sample (1.52 m) of working face 'D'; exclusive of removable bands, 1930.

4. As for 3.

5. Channel sample (1.55 m) of rib section 'A'; exclusive of removable bands, 1930.

6. As for 5

7. As for 5

8. Samples from an outcrop 0.8 km south of the Circular Shaft (Hills *et al.*, 1922)

9. As for 8

10. As for 8

The channel sections listed above are shown in Figure 2 and analyses of coal from DOM drilling are given in Appendix 2.

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RECENT EXPLORATION

Since the last operating mine closed in 1964, there has been no further exploration for coal in the Seymour area.

In 1971 a study of heavy minerals in beach sands over part of the east coast by Inland Exploration N.L. covered the Seymour coalfield. A number of shallow holes were drilled over Long Point (Shirley, 1971).

A seismic reflection traverse of the Seymour coalfield was made in 1980 (Richardson and Leaman, 1980), and the area was included in the gravity survey of the Central Eastern Highlands (Leaman and Richardson, 1981).

The area is currently covered by E.L. 5/61, held by the Shell Company of Australia Ltd.

FUTURE POTENTIAL

The thin and banded nature of the coal seams at Seymour, together with the restricted lateral extent, suggest that the coalfield has limited potential for future exploration.

The inferred *in situ* reserves of the coalfield are small.

REFERENCES

CUNDY, W.H. 1931. Seymour coal mines. *(Unpublished report)* [Open file 31-048].

HILLS, C.L.; REID, A.M.; NYE, P.B.; KEID, H.G.W.; REID, W.D. 1922. The coal resources of Tasmania. *Miner.Resour.geol.Surv.Tasm.* 7.

LEAMAN, D.E.; RICHARDSON, R.G. 1981. Gravity survey of the East Coast coalfields. *Bull.geol.Surv.Tasm.* 60.

RICHARDSON, R.G.; LEAMAN, D.E. 1980. A seismic reflection traverse on the Seymour coalfield. *Unpubl.Rep.Dep.Mines Tasm.* 1980/45.

SANSOM, P.W. 1979. Report on geological mapping in the Douglas and Denison Valleys, EL 5/62, Gray. *Unpubl.Rep.Shell Co.Aust.Ltd.* CEPR 31/79 [Open file 81-1592].

SHIRLEY, J.E. 1971. Report on exploration in the Long Point area, EL 1/70 and 19/71, Tasmania. *Unpubl.Rep.Jeds Pty Ltd 1/70/1.* [Open file 71-832].

TURNER, N.J.; CALVER, C.R.; CASTLEDEN, R.H.; BAILLIE, P.W. In prep. Geological atlas 1:50 000 series. Sheet 49 [8514N]. St Marys. *Department of Mines, Tasmania.*

[17 February 1984]

APPENDIX 1

AMG references and elevations of boreholes and workings in the Seymour coalfield

BOREHOLES

Department of Mines 1888 drilling

Hole No.	*AMG Reference*	*Surface elevation (m a.s.l.)*
1	FP067776	≅10
2	FP056759	10
3	FP049770	40
4	FP067767	5

Department of Mines 1944-45 drilling

1	FP069774	≅10
2	FP067775	10

WORKINGS

AMG reference	*Name*	*Surface elevation (m a.s.l.)*
FP053774	Beddgoods Shaft	≅20
FP062775	Rollinsons Shaft	10
FP071771	Circular Shaft	5
FP070772	Main Dip Tunnel	5

APPENDIX 2

Coal seam intersections and analyses, Seymour coalfield

DDH	From (m)	To (m)	Seam	Thickness (m)	Description	VCM (%)	FC (%)	Ash (%)	Sulphur (%)	S.E. (MJ/kg)
Seymour										
1	3.81	4.88	S1	1.07	Coal					
(1944/45)	25.60	25.65	S2	0.05	Coal					
	42.14	42.52)		0.38	Coal	31.86	38.54	28.08	0.50	23.3
	42.60	42.91)		0.31	Coal	34.27	49.75	14.34	0.50	25.4
	42.91	43.13}	S3	0.22	Coal	24.41	25.86	47.96	0.34	14.6
	43.13	43.41)		0.28	Coal	25.42	31.37	41.02	0.36	17.5
	43.41	43.58)		0.17	Coal, stoney	15.69	21.23	60.82	0.16	9.1
2	46.03	47.40	S3	1.37	Coal					
(1944/45}										
1 (1888)	7.94	9.40	S1	1.46	Coal with numerous bands					
	25.48	25.90	S2	0.52	Coal with shale					
	44.00	44.92	S3	0.92	Coal with a 38 mm band					
	51.21	51.53	S4	0.32	Coal					
2 (1888)	30.79	32.68	S1	1.89	Banded coal with some white partings					
	70.55	71.81	S3	1.26	Coal with two 6 mm bands					
	78.07	78.45	S4	0.38	Coal with 3 bands					
3 (1888)	24.13	25.80	S1	1.67	Coal with white and black bands					
	60.48	61.26	S3	0.78	Coal					
	64.89	65.17	S4	0.28	Poor quality coal					

Appendix 2 (continued)

DDH	From (m)	To (m)	Seam	Thickness (m)	Description	VCM (%)	FC (%)	Ash (%)	Sulphur (%)	S.E. (MJ/kg)
4 (1888)	80.26	80.68	S3	0.42	Coal					
	85.18	86.05	S4	0.87	Banded coal					
Circular	10.6		S1	1.37	Coal with band					
Shaft	50		S3	1.47	Coal					
	56.4		S4		Coal					