

## Abstract

Although a number of coal seams of reasonable quality and thickness are known to exist within the Douglas River coalfield, access difficulties have, to date, prevented any major mining operation from taking place. The coal occurs in seams up to 2-3 m thick, is of Triassic age, and is a minor component of a freshwater sequence of lithic sandstone, mudstone and siltstone. The sequence has been intruded by dolerite of Jurassic age, and is disturbed by faulting. Together with the adjoining Dalmaine coalfield to the north, the coalfield is of considerable interest for further exploration.

## LOCATION AND ACCESS

The Douglas River coalfield lies to the south of the Dalmaine coalfield. The coalfield comprises the land for several kilometres on either bank of the Douglas River (fig. 1).

A large part of the coalfield is covered by a dissected dolerite plateau, which forms part of the central eastern highlands. The plateau is separated from the sea by a narrow coastal plain from one to two kilometres wide. Access over the plateau area is by rough four-wheel drive tracks, with some farm roads and the Tasman Highway traversing the coastal plain.

## GENERAL GEOLOGY

The oldest rocks in the area are the Siluro-Devonian Mathinna Beds, a sequence of quartzwacke turbidites. These rocks do not crop out, but were encountered in Department of Mines Bicheno Diamond Drill Hole 10 at a depth of about 330 m.

The Mathinna Beds are unconformably overlain by flat-lying sediments of the Parmeener Super-Group. Almost a complete section of the Lower Parmeener Super-Group was encountered in DOM Bicheno DDH 10. This sequence has been informally divided into three parts: a Lower Marine Sequence (predominantly black mudstone with dropstones; marine fossils at top); a Lower Freshwater Sequence (predominantly well-sorted quartz sandstone, minor carbonaceous mudstone and coal); and an Upper Marine Sequence (subdivided into a basal limestone, followed by poorly sorted glauconitic sandstone, followed by a dark grey mudstone with foraminifera, sparse dropstones and rare woody debris). The detailed stratigraphy of the Lower Parmeener Super-Group in the drill hole, together with macro-invertebrate and palynological investigations, may be found in Calver *et al.* (in press).

The Upper Parmeener Super-Group sediments, which consist of an interbedded sequence of lithic sandstone, mudstone, siltstone and coal, disconformably overlie the Lower Parmeener Super-Group sediments. This sequence, 100 m thick in DOM Bicheno DDH 10 and 215 m thick in DOM Seymour DDH 5, probably reaches a maximum thickness of 300-400 m in the Douglas River area. Plant fossils are common in the mudstones within the coal-bearing sequence. Carbonaceous streaks and coaly debris occur in both mudstone and sandstone. The bulk of the sequence is composed of lithic sandstone, which displays variable bedding characteristics, from massive to fine or cross bedded (Sansom, 1979).

# GEOLOGICAL SKETCH MAP DOUGLAS RIVER COALFIELD

C. A. BACON

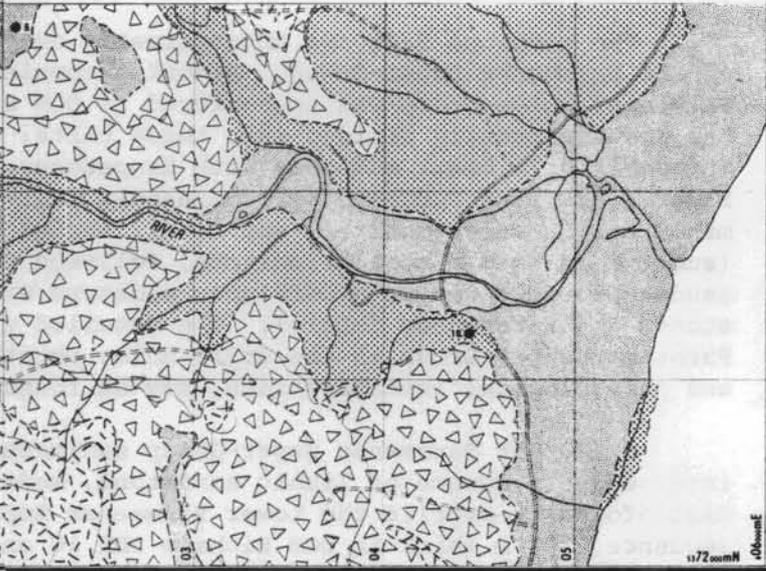
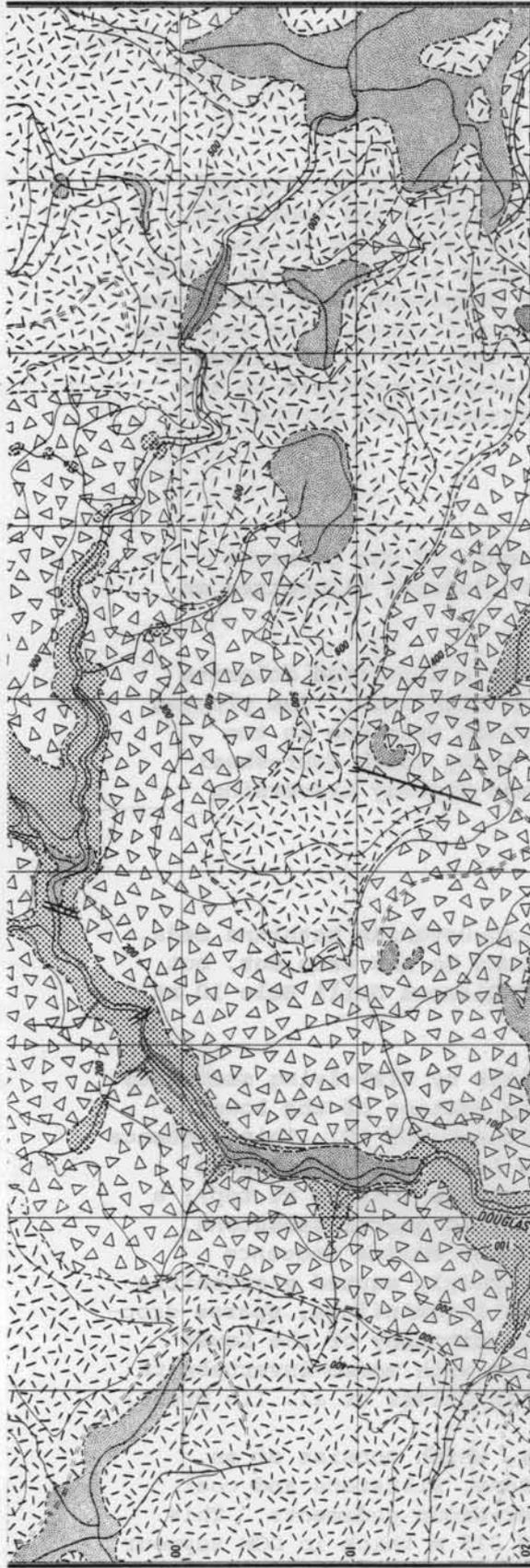
Geology after P. W. Sansom (1979) and R. H. Castleden.

Contour interval 100 m

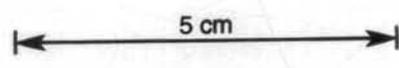


### LEGEND

- QUATERNARY**
  - Sand and gravel
  - Dolomite boulder talus.
- JURASSIC**
  - Dolomite
  - Dolomite dyke
- TRIASSIC**
  - Lithic sandstone, mudstone, coal } UPPER PARMEENER SUPER-GROUP
- Borehole: Department of Mines
- Adit
- Geological boundary — position approximate
- Major road
- Vehicular Track



Western margin of map not reproduced



Fossilised wood occurs frequently in the sequence. A silicified tree trunk 300 mm or more in diameter and 10 m or more in length lies bedded in lithic sandstone at EP998749. Scattered pebbles of quartzite are found throughout the area and are probably derived from the weathering of conglomerate bands within the sandstone.

Jurassic dolerite has intruded and disrupted the sedimentary sequence, and now forms a cap over most of the plateau country. The underlying coal-bearing strata are exposed only where streams (e.g. Douglas River, Mayson River, Possum Creek, Coal Creek) have eroded a passage through the dolerite.

Numerous small waterfalls occur in the upper and middle reaches of the river. The largest waterfall [at FP003785] is in dolerite. In its middle section, the river has cut a deep channel through sandstone, with cliff faces 20-25 m high rising from the water's edge to form the river banks. From FP003785 to EP998751 the river drops 300 m in four kilometres, producing a spectacular gorge which is in part choked with dolerite boulders of varying sizes.

A dolerite feeder is centred on Nichols Cap (Leaman and Richardson, 1981). Two dykes, both <5 m in width, are exposed in the bed of the Douglas River [at EP993758 and EP997752]. The contact between dolerite and sedimentary rocks has produced a localised hornfels, exposed in a quarry [FP035749] (Sansom, 1979).

Dolerite talus thickly mantles the lower slopes of the river valley, masking the dolerite-sediment contact. The talus is derived from the weathering of a retreating escarpment, with landslips helping to transport weathered material. Many small faults are evident, and a number of active landslips occur on the steep slopes of the Douglas River valley.

Recent alluvium and sand cover the narrow coastal plain through which the lower part of the Douglas River has cut a meandering channel.

PREVIOUS MINING HISTORY

Two 2.4 m thick outcrops of coal in the bed of the Douglas River [at EP998749 and FP002745] were described by Milligan (1849). The same two outcrops, located 6 km from the mouth of the river, were also visited by Selwyn (1855) and Gould (1861). These two outcrops probably represent the same seam, dislocated by faulting. In addition to these outcrops Gould (1861) reported on a number of seams further upstream. A letter from W. Thompson (Surveyor) to the Surveyor-General dated July 4 1857 details the finding of two large seams (the outcrops mentioned above) of coal in the Douglas River, and is accompanied by a map (CSD 1/22/4404).

In 1881-82 coal was sampled from one of the two 2.4 m seams by Messrs Gill and party. Twelvetees (1902) noted that a short drive, dug in 1891 on the north bank of the river into the most easterly of the two outcrops [at FP002745] was full of water at the time of his visit. Another short tunnel was dug into an outcrop of coal in Coal Creek in 1886.

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

The Department of Mines drilled one hole (Seymour DDH 5) on the north bank of the Douglas River in 1888. Coal intersections are given in Appendix 2.

Two leases for coal (6/M; 7/M) were held in the Douglas River area in 1901-02 by J.R. May, and one lease was held by B. Tevelin (1232/M) from 1905 to 1908. Part of this lease was taken up from 1914 to 1915 by J. Brooks, who transferred the lease to R.B. Reynolds (1915-16) who in turn transferred the lease to the Mt John Coal Company.

This company held the lease until 1925. Reid visited the area in 1921 and recorded the work done by the company as consisting of "a number of prospecting adits and shafts of shallow depth", as well as a tunnel 50 m long with a crosscut 47.5 m wide on the "main seam" (i.e. the most westerly of the two outcrops at EP998749) (Hills et al., 1922). Production for 1925 was 25 tons.

#### COAL QUALITY

Although a number of coal seams are known to crop out in the Douglas River area, few analyses are available for these seams.

	1	2	3	4	5
Moisture (%)	3.4	4.26	4.50	5.50	5.50
VCM (%)	24.08	25.58	27.10	29.20	30.90
FC (%)	42.22	48.51	52.00	48.10	50.80
Ash (%)	30.30	23.65	16.40	17.20	12.30
Sulphur (%)	0.48	0.56		0.05	0.50
H (%)	4.11	4.24			
C (%)	49.49	54.00			
O (%)	14.56	16.51			
N (%)	1.06	1.04			
Specific Energy (MJ/kg)	19.7	22.8			

1. Sample 417; channel sample from "main tunnel seam" (Hills et al., 1922).
2. Sample 418: channel sample from seam below "main tunnel seam" (Hills et al., 1922).
3. Sample from upper part of "main seam" (Twelvetrees, 1902).
4. Sample from one of the 2.4 m seams, taken in 1881 (Twelvetrees, 1902).
5. Sample from seam in Coal Creek (Twelvetrees, 1902).

#### RECENT EXPLORATION

Two drillholes have been bored in the coalfield: DOM Seymour DDH 5 (1888) and more recently DOM Bicheno DDH 10 (1978). The latter hole was one of several drilled on the East Coast as control points for an extensive gravity survey of the East Coast coalfields (Leaman and Richardson, 1981).

The stratigraphy of DOM Bicheno DDH 10, together with macro-invertebrate and palynological studies of the sequence, are presented in Calver et al. (in press). The log of the coal-bearing section of DOM

Bicheno DDH 10 is given in Appendix 3.

The coalfield is currently covered by an exploration licence held by the Shell Company of Australia Limited.

#### FUTURE POTENTIAL

Exploration to date has revealed an *in situ* indicated reserve of black coal of 30 million tonnes, in one seam. The area has considerable potential for future exploration.

#### REFERENCES

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[28 March 1984]

## APPENDIX 1

AMG references of boreholes and workings in the Douglas River coalfield.

## DEPARTMENT OF MINES DRILLING

<i>Year</i>	<i>Hole</i>	<i>AMG reference</i>	<i>Elevation (m)</i>
1888	Seymour DDH 5	FP020748	≈140
1978	Bicheno DDH 10	FP044733	≈25

## ADIT

<i>AMG reference</i>	<i>Elevation (m)</i>
EP998749	≈100

## APPENDIX 2

Coal seam intersections, Department of Mines drilling

DDH	From (m)	To (m)	Thickness	Particulars of core
Seymour				
5 (1888)	169.00	169.46	0.46	Coal seam with 200 mm of clean coal
	186.90	188.19	1.29	Banded coal
Bicheno				
10 (1978)	18.60	19.50	0.90	Dull coal
	48.20	48.38	0.18	Dull coal
	59.80	60.80	1.00	Dull coal, minor mudstone bands
	66.25	67.80	1.55	Dull coal, minor mudstone bands
	71.98	72.25	0.27	Dull coal

APPENDIX 3

Log of Department of Mines Bicheno DDH10

