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Brown coal deposits in Tasmania
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Abstract

Occurrences of brown coal or lignite in unconsolidated Tertiary sediments are widespread across Tasmania. Most of these occurrences are extremely small and localised features, and are of no economic importance.

INTRODUCTION

The first discovery of brown coal in Tasmania was made by Captain James Kelly in 1815, on the shores of Macquarie Harbour. The first mining venture in Tasmania was an attempt by the Colonial Government to exploit the brown coal at Coal Head on Macquarie Harbour, using convict labour. The exercise was brief and unsuccessful.

Brown coal was subsequently found in many places in Tasmania. The largest deposit is at Rosevale, near Westbury. This area was evaluated as a potential source of fuel for a coal-fired power station.

ROSEVALE

In 1980 an exploration licence (EL20/80) was granted to AAR Ltd, a subsidiary of CSR Ltd, over an area of 2339 km^2 west of Launceston. The tenement was transferred to CSR Ltd in 1983. The licence was progressively reduced to 984 km^2 in August 1983, then to 100 km^2 in August 1984. A retention licence (RL877) of 50 km^2 was granted in 1987. This has since been relinquished; a summary of exploration is given in Coxhead (1987).

Exploration work outlined three separate deposits of brown coal which are collectively referred to as the Rosevale Coalfield. The deposits are of Tertiary age and consist of lignite bands extensively interbedded with clay and carbonaceous clay, with minor sandy intercalations.

Fifty-six holes were drilled into these deposits, and most of the holes were geophysically logged (gamma, dual spaced density, caliper neutron, resistivity, SP). Correlations were made using characteristic downhole geophysical log signatures. Indicated reserves totalling 134 million tonnes were calculated from the exploration work in three areas (Table 1).

The coal resources were calculated on the basis that seam subsections averaging 50% ash db (i.e. 27% ash at 45% moisture on an as-received basis) were excluded or treated as parting material. All partings greater than 0.5 m in thickness were also excluded from the tonnage calculations.

In terms of quality the coal is low in sulphur and specific energy and high in ash. The weighted average of the coal quality for the three deposits (using data collected prior to October 1983) is given in Table 2.

The deposits lie on private property, mostly under improved pasture used for sheep and cattle raising. Part of the Pipers Lagoon deposit is covered by sparse forest.

The tenement holder tried hard to find a market and offered the resource to the Hydro-Electric Commission, which at that time was looking at the option of a coal-fired power station. When no market could be secured, the area was relinquished in 1990.

Table 1

Indicated coal reserves, Rosevale area (Coxhead, 1987)

Area	*Resource (million tonnes)*	*No drillholes chip*	*core*	*Overburden ratios (bank m^3 overburden/ tonnes lignite*
Loatta	72	31	6	3.1
Pipers Lagoon	43	10	6	5.1
Selbourne	19		3	8.01
Total	134			

Table 2

Weighed average coal quality, Rosevale coalfield (total moisture basis) (Coxhead, 1987)

Deposit	*RD*	*Total Moisture (%)*	*VM (%)*	*FC (%)*	*Ash (%)*	*Total Sulphur (%)*	*Specific Energy (MJ/kg)*
Loatta	1.32	48.1	18.0	12.1	21.8	0.17	7.6
Pipers Lagoons	1.33	46.3	18.0	13.8	21.9	0.11	7.6
Selbourne	1.33	46.4	18.0	11.9	23.7	0.18	7.2
Weighted mean	1.33	47.2	18.0	12.7	22.1	0.13	7.5

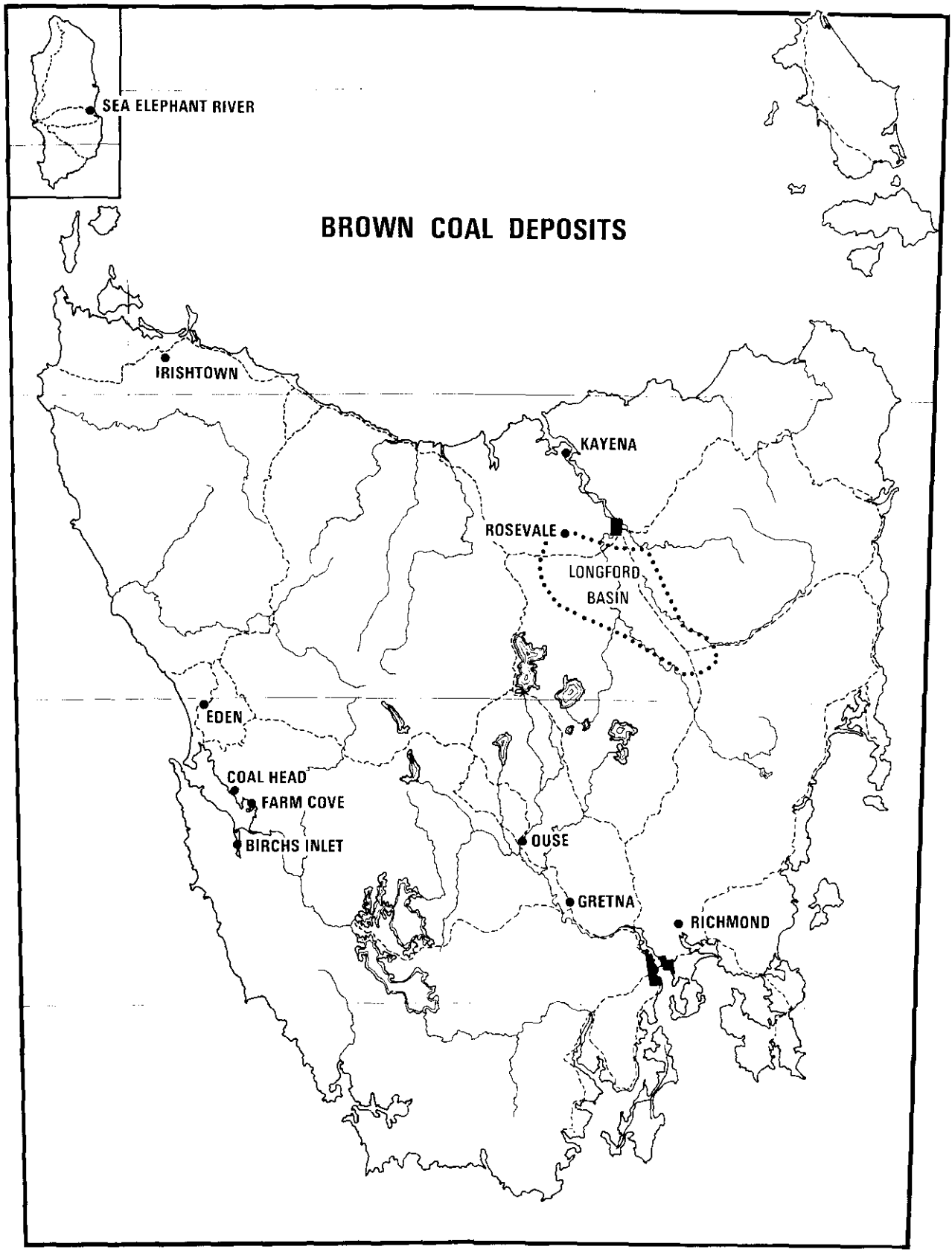
SEA ELEPHANT RIVER
BROWN COAL DEPOSITS
IRISHTOWN
KAYENA
ROSEVALE
LONGFORD
BASIN
EDEN
COAL HEAD
FARM COVE
BIRCHS INLET
OUSE
GRETNA
RICHMOND

Figure 1

5 cm

NORTHWEST COAST

Brown coal deposits have been recorded from Myrtle Hill near Irishtown, 8 km south of Smithton, from where Blake (1940) briefly described a seam one metre thick overlain by basalt 30 m thick. At Edith Creek (also in the Irishtown area), two seams 0.6–1.0 m thick and separated by 3.3 m of conglomerate are overlain by 30–40 m of basalt.

Various other isolated small outcrops of brown coal are known from the northwestern part of Tasmania.

MACQUARIE HARBOUR

Brown coal was noted on the northern shore of Macquarie Harbour in 1815 by Captain James Kelly; these deposits were visited by D. McCarthy in 1816 (*Hobart Town Gazette*, 15 June 1816). Subsequently, thin seams of brown coal were found exposed along the greater parts of the northern and eastern shores of Macquarie Harbour from Lettes Bay to Farm Cove, and for several miles south of Birchs Inlet.

A report by G. W. Evans, Deputy Surveyor to Lt Governor Sorell, dated 9 February 1822, stated "coals can be procured at a place called Coal Head and along the shore some distance south east of it" (*Hobart Town Gazette*, 9 February 1822).

Confessions of the convict Alexander Pearce (Sprod, 1977), who escaped from Macquarie Harbour on 20 September 1822, contain references to coal mining at Coal Head.

In tracing the route taken by Pearce and his colleagues, Sprod (1977) writes: "The party which included Pearce met no difficulties in making their initial break by seizing a boat ..... from Logan's work gang at Kelly's Basin at the eastern end of Macquarie Harbour. From the basin they rowed along the northern shore to the coal mines at Coal Head, midway between their starting point and the open sea".

The initial mining attempts were apparently short lived. A despatch from Colonel Sorell to Under Secretary Horton, dated 29 November 1824, reads in part: "At the penal settlement of Macquarie Harbour, where the indications of coal were so strong as to induce the Deputy Surveyor General (Evans) to report its existence there, the want of professional research had deprived the local government of the means of working it" (*Historical Records of Australia*, 3(4):583).

The brown coal occurs as thin beds, 125–140 mm thick, in Tertiary sediments comprising lightly consolidated sand, clay, shale and mud. The coal bands comprise brown coal and carbonaceous shale with occasional black lignitised wood lenses. On the coast, the coal is commonly overlain by 15–30 m of sediments, and the thickness of overburden increases inland (Blake, 1939).

Leases were held in the area of Farm Cove from 1891 to 1903 by a number of individuals and syndicates, although no serious mining eventuated. Leases were also held at Coal Head (1888–1892) and near Eden (1902). The Government drilled two holes for the Eden Coal Company in 1902–03 (Twelvetrees, 1902*a*, 1902*b*, 1903*a*) to examine an outcrop of brown coal discovered near Eden by woodcutters, while dragging piles for the Strahan wharf to the railway (Twelvetrees, 1901). A third government bore was put down at Farm Cove (Twelvetrees, 1903*b*).

In 1981 CRA Exploration Pty Ltd drilled five chip holes in the Strahan area, and concluded that the potential for discovery of a major lignite horizon in the area was minimal (Clementson, 1981).

KING ISLAND

Brown coal was reported on King Island in 1930 by a Mr R. Hooper, who struck a thin seam while sinking a well on his property in the Sea Elephant River district. Carey (1946) documented a number of brown coal and peat deposits on King Island, listing the occurrence of:

(a) thin seams of brown coal of Miocene age;

(b) immature lignite of Quaternary age under sand dunes; and

(c) peat swamps belonging to the present cycle of sedimentation.

LONGFORD BASIN

One of the striking features of the Tertiary sediments in the Longford Basin is the presence of lignite fragments throughout (Matthews, 1983).

Thin seams of lignite were intersected in drilling for black coal at Belmont, near Longford, and at Carr Villa late last century. The thickest seam intersected was 1.2 m at 244 m depth. Additional thin seams, approximately one metre thick, are known to occur at various localities in the Longford and Launceston Basins, such as at Rosevale, Legana, east of St Leonards, and at Breadalbane. In some parts of the Longford Basin, particularly in the Evandale area, wood fragments have been replaced by iron oxide, and leaf impressions are common in iron oxide-rich boulders (Matthews, 1983).

Nye (1929) examined an outcrop of brown coal in the Rose Rivulet at Harland Rise, near Evandale.

TAMAR VALLEY

Brown coal is known to exist at various localities throughout the Tamar Valley. A small adit was driven in on an outcrop near Kayena (DQ912395) on the west bank of the River Tamar.

DERWENT VALLEY

Occurrences of brown coal have been recorded from near Ouse and around Glenora.

COAL QUALITY

Analyses of brown coal from various localities are listed in Table 3.

FUTURE POTENTIAL

The Rosevale brown coal deposit is of interest for future exploration and is currently held under exploration licence.

Table 3

Representative analyses of Tasmanian brown coals

	1	*2*	*3*	*4*	*5*	*6*	*7*
Moisture (%)	20.8	5.84	4.26	7.5	9.9	22.8	13.0
VCM (%)	33.45	30.24	22.20	29.82	51.0	57.7	34.5
Fixed carbon (%)	33.5	28.22	15.60	15.98	29.9	12.0	33.9
Ash (%)	12.25	35.70	57.94	46.70	9.2	7.5	18.6
Sulphur (%)		1.96	0.42	0.36	3.61	0.34	0.62
Specific energy (MJ/kg)						19.72	18.54

1. Lettes Bay, Macquarie Harbour (Blake, 1939)
2, 3. Southern end of Phillips Island, Macquarie Harbour (Blake, 1939)
4. Myrtle Hill, northwest Tasmania (Blake, 1940)
5. Muddy Creek, West Tamar, northern Tasmania (Blake, 1940).
6. Richmond area, southern Tasmania (Leaman, 1971)
7. Sea Elephant River area, King Island (Carey, 1946)

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