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1985/27. The Saltwater River coalfield

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Abstract

The first mine to be operated in Tasmania was a coal mine, opened by the Colonial Government on Tasman Peninsula. The workings, known as the Saltwater River Coal Mine were actually situated four kilometres north of the Saltwater River, close to Plunkett Point. The mine operated from 1834-1877, producing coal for the Hobart market. The Government leased the mine to Alexander Clark in 1848, after which time convict labour was not used to mine the coal. The coal is of poor quality and the area of the coalfield is limited to a small faulted block of lithic sandstone. Whilst the coalfield is of historical significance, the economic importance of the coalfield is negligible.

LOCATION AND ACCESS

The Saltwater River coalfield is located on the northern part of Tasman Peninsula, close to Plunkett Point [EN581405]. The area is traversed by a number of unsealed roads. Currently the area is classed as an Historic Site and is exempt from the provisions of the Mining Act, 1929. The area adjoining and to the north of the Coal Mines Historic Site is classed as a Nature Reserve (Lime Bay Nature Reserve) and is similarly exempt from the provisions of the Mining Act, 1929.

GENERAL GEOLOGY

The coal at Saltwater River is of Triassic age and forms a minor component of a fluviatile sequence of interbedded lithic sandstone, mudstone and claystone of the upper part of the Upper Parmeener Super-Group. These sediments are confined to a small, 0.5 km wide fault block, extending in a north-westerly direction from Plunkett Point.

The area has been examined by Reid (*in* Hills *et al.*, 1922), Brill and Hale (1954) and Gulline (1984). The area around Coal Mine Hill was mapped in detail by S.M. Forsyth and the author for this report. The geology is shown in Figure 1.

Good outcrops are exposed on the coastline, although few outcrops occur further inland. Magnetometer traverses were made over Coal Mine Hill to determine the position of the western boundary of the dolerite body covering the hill. Rock type classifications are as outlined in Forsyth (1984).

The known stratigraphy of Parmeener Super-Group sediments is given in Figure 2. Not all of these rock units are represented in the Saltwater River coalfield. Contacts between rock units in this coalfield are almost invariably faulted although the stratigraphic position of each rock unit is known from mapping elsewhere in the State.

The oldest rock in the area is glaciomarine mudstone with common dropstones (Pu or Ferntree Formation) of the Lower Parmeener Super-Group. This mudstone is faulted against quartzose sandstone (Rp) north of Turners Point [EN581396], which is in turn faulted against lithic sandstone (Rg) near Coal Mine Hill. The lithic sandstone (Rg) block, in which the coal seams are confined, has been downfaulted and is partly capped by dolerite.

Outcrops of stratigraphically younger 'Rsq' (quartz arenite with minor lutite) and 'Rsfl (quartz-rich lithic arenite with minor lutite) occur east of Coal Mine Hill. The boundary relationships of these units with the younger lithic sandstone (Rg) are not clear from field observation.

Dolerite has intruded the Parmeener Super-Group sediments. Near Coal Mine Hill the intrusion appears to be a dyke spreading out into a sill to the east. The dyke-like appearance of the intrusion can be seen on the foreshore at EN584399. Magnetometer traverses show the western boundary of the dolerite mass to be steeply dipping while the northern and eastern boundaries were less clearly defined. The main shaft [at EN581405] was sunk through a thin dolerite cap. Small dykes are recorded at the eastern end of Lime Bay and north of Sloping Main beach by Brill and Hale (1954).

Basalt caps some of the low hills in the area such as Mt Stewart and the two smaller hills west of Ironstone Point. A volcanic centre has been identified 800 m west of Lime Bay (Brill and Hale, 1954).

Alluvial sand covers much of the area. From exploratory auger holes the sand cover near Plunkett Point is known to be more than 10 m thick (Cromer *et al.*, 1979).

PREVIOUS MINING HISTORY

Coal was discovered on the western bank of Norfolk Bay (near Plunkett Point) in February 1830 by two surveyors, Woodward and Hughes (GO 33/16/265). In 1834 a mining operation was commenced by the Colonial Government to extract the coal. This was the first mining venture to be started in Tasmania. The initial mine development was supervised by a convict named Lacey, who gained his freedom from the successful planning and operation of the mine. Coal was being sold in Hobart for 10/- to 19/- ($1.00 to $1.90) per ton by June 1834 (CSO 412/9273, 13 June 1834).

A steam engine, designed and erected by Alexander Clark, was installed in 1842. Prior to this, coal was raised up shafts by a winch which used convict labour (Ford, 1932) and two pumps for removing water from the workings were also manned by convicts. The mine headings were only 1.2 m high and the ventilation was poor. The roof, which was composed of shale, was supposed to be left, but was often taken to make the working conditions easier (*Advertiser*, 9 August 1839, p.3).

Lempriere (1839) records that two jetties had been built to allow vessels to be loaded. Convicts wheeled wagons, each containing 90 kg of coal, along tram lines to the ships. At the time of Lempriere's visit 150 convicts were employed at the mines as follows:

Miners not under sentence	27
Miners under sentence	2
Blacksmiths, carpenters, masons	18
Servants, woodcutters, signalmen	36
Labourers	67

Some eleven miners were employed in getting the coal, and their daily quota was 2700 kg or thirty wagon loads each. The mine produced about 50 t of coal per day (Besford, 1958). In addition to the two shafts at Coal (Plunkett) Point which comprised the Saltwater River mine, a shaft was sunk at nearby Five Mile Beach in 1830 (Lempriere, 1839), although this area was not developed further.

A visit to the mine in 1842 by a D. Burn was described in *The Mercury:*

> "Next morning I descended the main shaft along with Captain Booth; it is 52 yards deep. The winch was manned by convicts under punishment. One stroke of the knife might sunder the rope, and then ..... however it has never been tried, deeds of ferocity being very infrequent. A gang on the surface worked the main pump and another below worked a horizontal or slightly inclined draw pump which threw water into the chief well .... The seam has been excavated 110 yards from the shaft also several chambers diverging left and right. The height of the bore is four feet. The quality of the coal partakes much more of anthracite than of bitumen, it flies a great deal but produces intense heat. The miners are esteemed the most irksome punishment the felon encounters because he labours night and day eight hours on a spell. Continuous stooping and close atmosphere caused our party to be bedewed with perspiration. I cannot therefore wonder at the abhorrence of the compulsory miner in loathing what I conceive to be a dreadful vocation ....".

The Rev. H.P. Fry visited the mine in 1848 and recorded that the shaft was 92.5 m deep, and that 400 convicts were employed at the mine site, although only 83 actually worked underground. Fry (1850) described the workings in detail:

> "....we groped our way with difficulty along passages which were said to be five miles in length. The roof in many places was so low that we were obliged to creep along the passage beneath it. The air was so confined that our lamps could with difficulty be kept burning and several of them went out. A few lamps at long intervals were attached to the walls, but seemed only like sparks glimmering in the mist, and not many yards from them the passage was in perfect darkness. There were 83 men at work in the mines when I visited them, the greater number employed in wheeling the coal to the shaft to be hoisted up. They worked without any other clothing than their trousers and perspired profusely. The men in the mine were under the charge of a prisoner-overseer and a prisoner constable".

To be sent to work at the coal mine was regarded as a punishment by the convicts at Port Arthur, although the work at the mines was no more severe than at Port Arthur and the rations were the same (Besford, 1958). The punishment rate was, however, high. Hartwell (1950) notes that for the year 1847, 1400 punishments were meted out to the 400 employees. These included728 sentences of solitary confinement with bread and water, given out by the Superintendent, while the Magistrate imposed 672 punishments of flogging, sentencing to chains, or periods of solitary confinement.

The quality of the coal mined was a source of constant complaint. The first shipment of coal arrived in Hobart on 10 June 1834 and was tried in the Kings Yard in place of the charcoal that was then used in the forges, but was found to be unsuitable for this purpose. The cargo of coal was eventually sold in small lots, fetching prices of from 15/- to 19/- ($1.50 to $1.90) per ton. The second shipload to arrive, on 7 July 1834, was inspected by the Port Authority and found to be "12 or 13 tons and better quality than the last". The Colonial Secretary obtained a specimen of this shipment for testing and reported:

> "I have tried these coals, and do not find them in any respect better than the last" (Besford, 1958).

Mining continued despite the apparent poor quality of the coal. Production was 3395 t in 1834, increasing to 8600 t in 1839 and 10 600 t in 1840. Production dropped to 8000 t in 1842 (Booth, 1962). The coal always sold for a lower price than the New South Wales coal, due to the inferior quality of the product. In 1839 the Saltwater River coal was selling in Hobart for 11/- to 12/- ($1.10 to $1.20) per ton, while N.S.W. coal sold for 30/- ($3.00) per ton.

Convicts were sent to the coal mine as punishment until 1840. From 1840-1848 the convicts working at the mine were those on probation, and were released at the end of their probationary periods (Booth, 1962). In September 1848 the mine was leased to Alexander Clark who was forbidden to use convict labour underground (CGF 10591/4, 30 September 1848).

During the last years of operation of the mine (1863-1877), no convict labour was used at all in the mine (HAJ 1864, Rep. 65, p.8). The mine closed in 1877. Most of the coal produced from the mine was used in Hobart as a domestic fuel, and all extraction was by the bord and pillar method.

A masonry lined well can be found at EN575411. The two seams of coal were mined from a series of circular shafts on and around Coal Mine Hill during the time the mine was operated by the Colonial Government. After the lease had been acquired by Alexander Clark, an adit was driven into the seam, close to the foreshore [EN585402]. The adit has since collapsed. This adit greatly improved the drainage and ventilation of the mine. A small tramway was constructed from a loading jetty to the adit entrance, and the earthworks for part of this construction can still be seen.

An outcrop of coal was discovered near Mt Communication [EN534323] in 1843, and an adit driven into the coal. The seam was reported to be 1.1 m thick (CSO 22/67/1473, 7 February 1843). No further work was done in this area.

RECENT EXPLORATION

No exploration activity for coal has taken place in the Saltwater River coalfield since the closure of the mine in 1877.

COAL QUALITY

The only coal quality data available comes from historic sources. A sample of coal from the Saltwater River mine was analysed at the Museum of Practical Geology, London, in July 1850. A sample was taken in 1921 from one of the dumps close to the old pithead.

The results of these investigations are tabled below:

	1	2
Moisture (%)		3.42
Ash (%)	26.40	22.62
Volatile matter (%)		11.08
Fixed carbon (%)		62.88
Sulphur (%)	1.03	0.41
Hydrogen (%)	3.34	3.32
Carbon (%)	65.33	60.52
Oxygen (%)	1.81	11.81
Nitrogen (%)	1.89	1.32
Specific energy (MJ/kg)		23.8

1. sample analysed at Museum of Practical Geology, London, July 1850 (GO 1/78, p. 373-379).

2. sample from dump; Hills *et al.*, 1922.

POTENTIAL FOR FUTURE EXPLORATION

Owing to the small size of the coalfield and the poor quality of the coal present, there is no potential for further exploration in this area.

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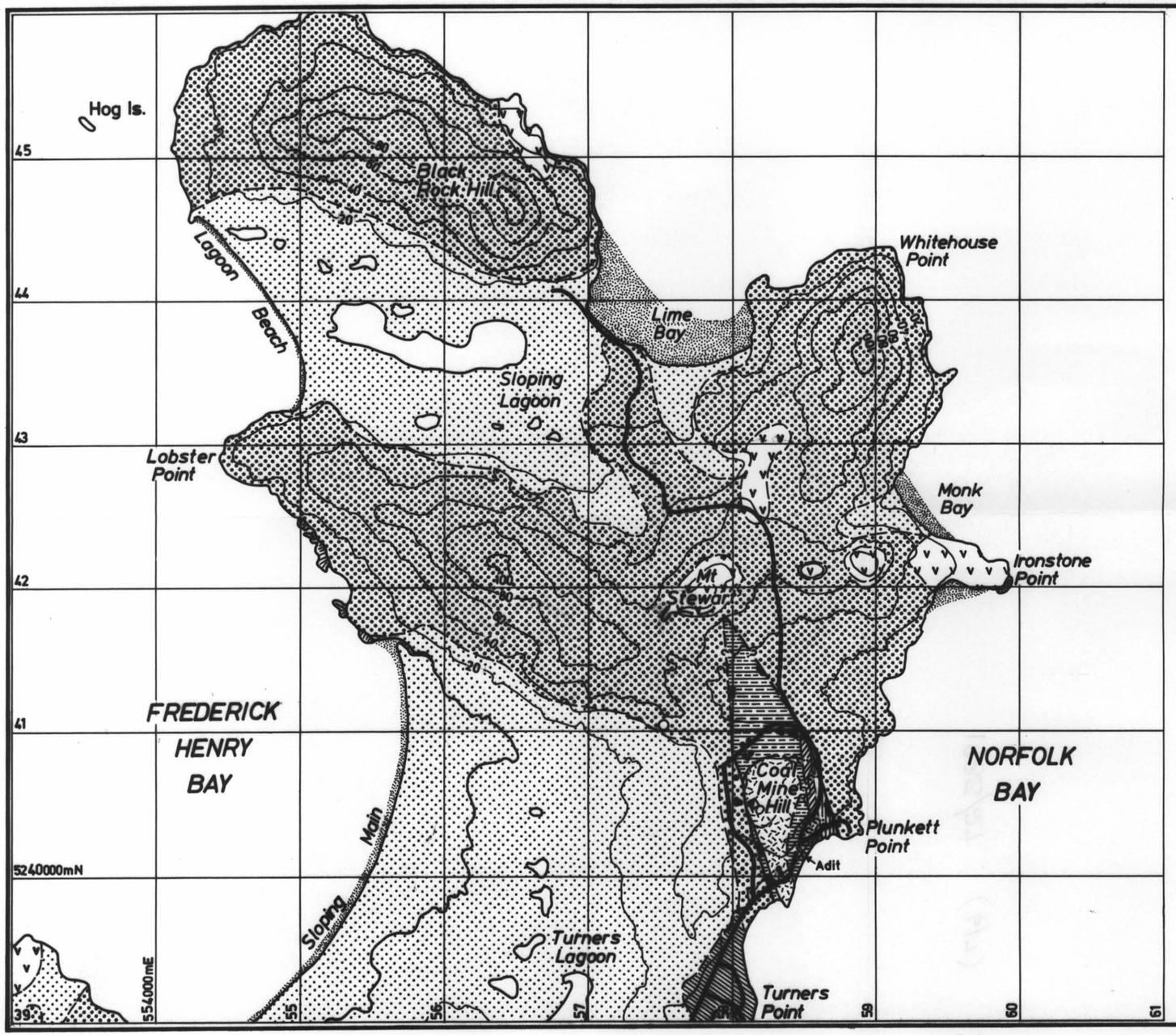
RECORDS HELD IN STATE ARCHIVES

GO = Government Office Records
CSO = Colonial Secretary's Office Records
CGF = Comptroller General's File
HAJ = House of Assembly Journal

[24 May 1985]



GEOLOGICAL SKETCH MAP

SALTWATER RIVER COALFIELD

Geologist : C.A. BACON

0 1 2km

CONTOUR INTERVAL 20metres

5 cm

QUATERNARY
- Sand and gravel

TERTIARY
- Basalt

JURASSIC
- Dolerite

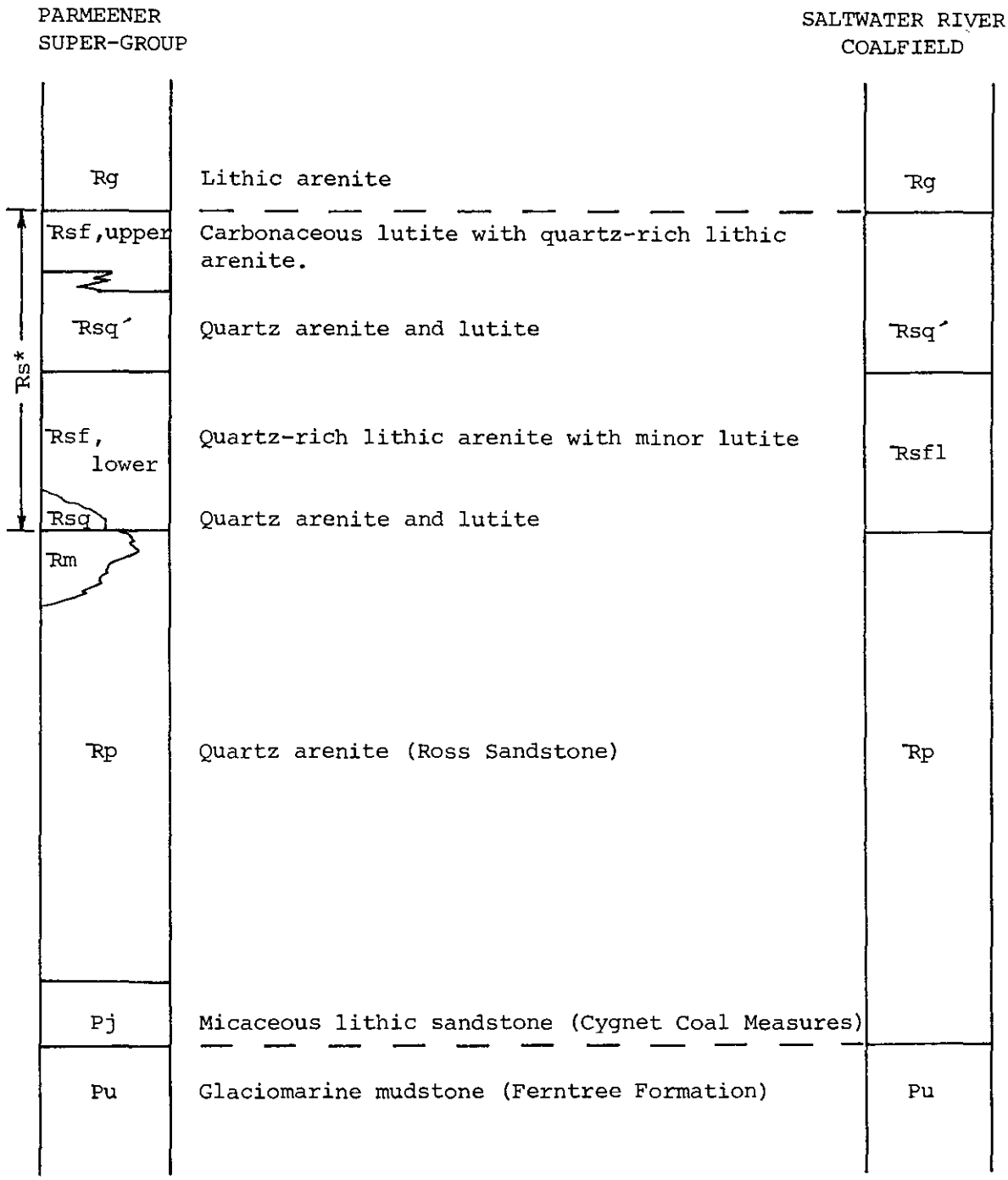
TRIASSIC–PERMIAN
- Lithic sandstone, mudstone, coal
- Quartzose sandstone with carbonaceous beds — UPPER
- Quartz-rich lithic sandstone with mudstone — PARMEENER SUPER-GROUP
- Quartzose sandstone, minor mudstone
- Glaciomarine mudstone with dropstones — LOWER

- Geological boundary, position approximate
- Geological boundary, position inferred
- Fault, downthrown side indicated
- Fault, inferred, downthrown side indicated
- Main shaft
- Shaft
- Well
- Adit

Minor source
Major source

1. Reconnaissance mapping by S.M.FORSYTH and C.A.BACON
2. GULLINE, A.B. 1982. Geological atlas 1:50000 series. Sheet 83 (8214). Sorell. *Department of Mines, Tasmania.*

Figure 1



* informal stratigraphic subdivision from Forsyth (1984)

Figure 2. *Stratigraphy of part of the Parmeener Super-Group and rock types represented in the Saltwater River coalfield.*