

## Section 2—Coal

TR9-89-95

# 12 THE EASTERLY EXTENSION OF THE FINGAL COALFIELD

by V. M. Threader

### ABSTRACT

An area of approximately 40 square miles on the south of the Break O' Day River has been mapped and examined geologically. Five diamond drill holes are recommended to search for coal reserves.

### INTRODUCTION

During October and November, 1964, a portion of the southern side of the Break O' Day Valley was mapped for the purpose of determining suitable drilling sites for coal. The area mapped is bounded in the north by the Esk Highway and the State Railway to St Marys, beginning 3 miles from Fingal at the Tasmanian Board Mills road turnoff and extending nine miles to within 1 mile of St Marys. This area extends to the main mass of dolerite which outcrops approximately 4 miles to the south.

The base map was prepared from existing Lands and Surveys Department charts. A base line was surveyed by B. Knox, Surveyor, Department of Mines. Contouring was based on closed altimeter traverse readings using base line stations for vertical control. B. Gulline, Geologist, assisted in the mapping.

Apart from the Esk Highway and railway, the only access to the area is on the western margin by means of the Tasmanian Board Mills road which serves a sawmill and the Valley Coal Mine, formerly Barbers Coal Mine.

### GEOLOGY

#### Permian

The oldest rocks outcropping in the area mapped are Permian mudstone and limestone which occupy the floor of the valley as far east as the Silkstone Fault and to a limited extent beyond it. This fault downthrows 200 feet to the east as determined in the Mt Nicholas Coalfield. These beds and the overlying coal measures dip 3° to 5° south (Keid, 1922) which accounts for the 1 mile offsetting of Permian beds (see Figures 19 and 20). Permian beds occur at 280 feet depth in the Harefield borehole which indicates that there is also an easterly dip (1°) or the presence of further downthrow faulting. The Harefield borehole was drilled by the Department of Mines in 1880 and a complete log, together with that for the neighbouring Killymoon borehole, was given by Keid.

The Permian succession in these holes consists of conglomerate, shale, sandstone, mudstone, limestone and thin coal seams. The thicknesses are 415 feet in the Harefield hole and 500 feet in the Killymoon hole.

5 cm

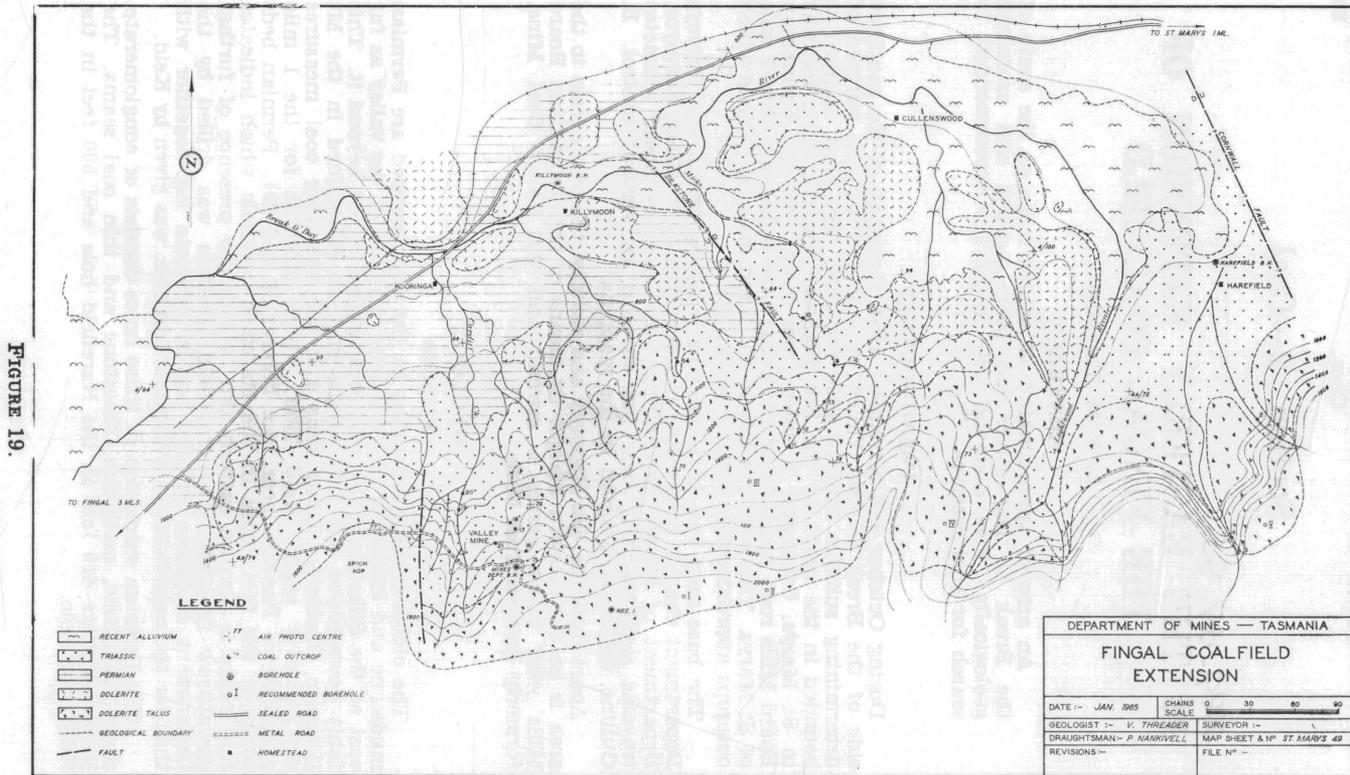
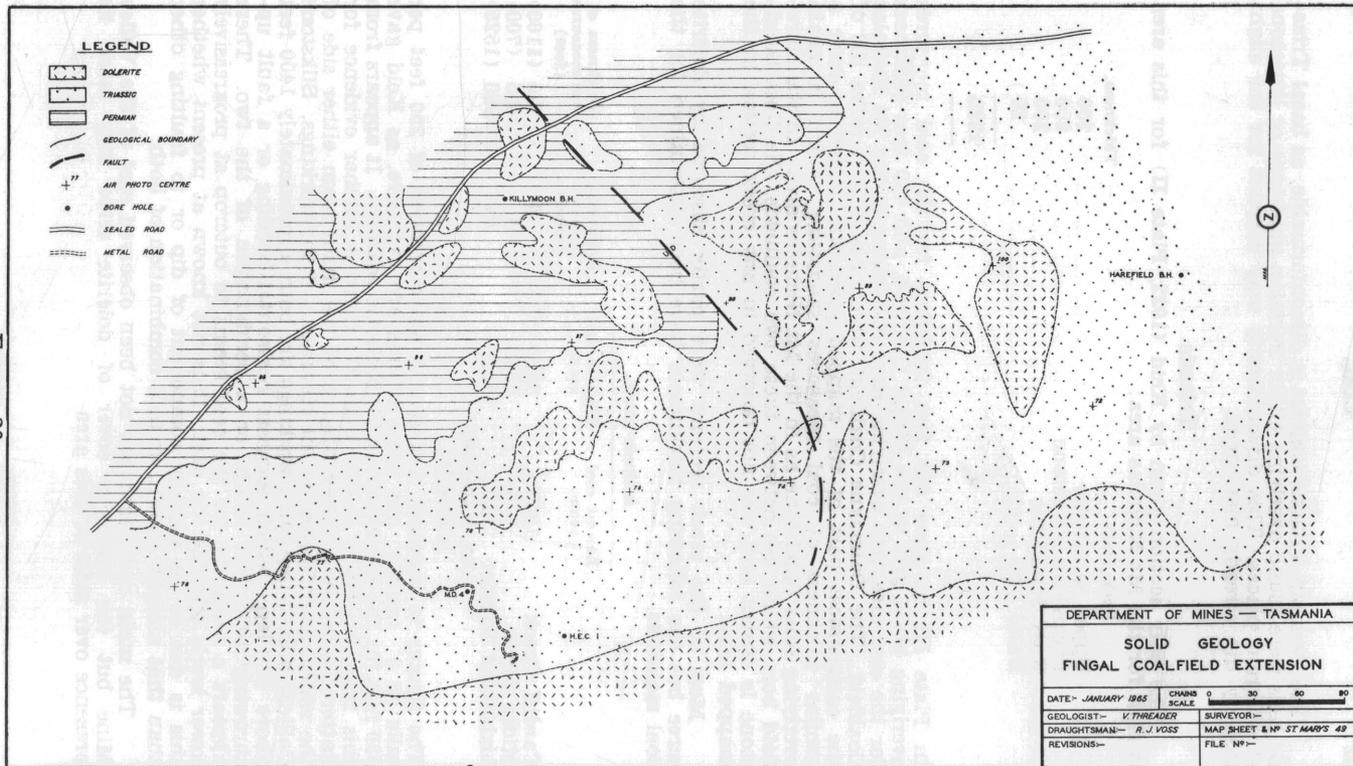


FIGURE 19.

DEPARTMENT OF MINES — TASMANIA	
FINGAL COALFIELD EXTENSION	
DATE :- JAN. 1965	CHAINS SCALE 0 30 60 90
GEOLOGIST :- V. THREADER	SURVEYOR :-
DRAUGHTSMAN - P. NANKIVELL	MAP SHEET & N° ST MARY'S 49
REVISIONS :-	FILE N° :-

FIGURE 20.



The Permian-Triassic contact is disconformable, as basal Triassic beds were found overlying either Permian mudstone or limestone at different places. This disconformity may account for the slight easterly dip already mentioned.

### Triassic

The only section given by Keid (1922, Plate II) for this area is that for the Mt Nicholas area:

Rock Unit.	Thickness.
Upper sandstone .....	200
Felspathic sandstone .....	800
Ross Sandstone .....	200
Basal grit .....	20
	1220

In Plate III he gave 550 feet thickness for the coal measures overlying basal grit in the Fingal Coalfield, and 480 feet thickness for the coal measures overlying Ross Sandstone in the Mt Nicholas Coalfield. The Dalmayne Coalfield, which lies 3 to 4 miles SE of the easternmost part of the mapped area, was stated to have a similar thickness of coal measures sandstone, which is again overlying Ross Sandstone as in the Mt Nicholas area. In the Harefield bore which lies between these two coalfields, the Ross Sandstone is absent and was not observed in any creek section in the mapped area.

Most of the creek sections were partly obscured by dolerite scree but the following thicknesses have been determined for the coal measures.

	Altitude (feet)		Horizontal distance (miles)	Thickness of coal measures (feet)
	Lowest coal seam.	Highest coal seam.		
Cardiff Creek .....	1060	1830	$\frac{3}{4}$	770 (1160)
Micks Creek .....	870	1320	1	450 (700)
Lightwood Rivulet .....	620	1520	$2\frac{1}{2}$	900 (1525)
(in Harefield borehole)				

The figures in brackets represent a dip correction of 250 feet per mile or 3° (south), but these figures are excessive, as Keid gave 550 feet for the neighbouring Mt Nicholas coalfield. It appears from this that the dip is flatter than 3°; there is further evidence for flatter dip in the relative heights of the main seam either side of the valley, as indicated by the elevations of the workings. Silkstone Colliery and Valley Mine workings are both approximately 1400 feet above sea level which suggests horizontal bedding or a fault up-throwing 1000 feet south, or a combination of the two. There appears a tendency for the coal seams to outcrop at progressively lower levels towards the east. It is not known at present whether this is due to an easterly component of dip or to faulting other than that already known, or to a combination of both.

The main coal seam has not been observed east of the Valley Mine but the extensive cover of dolerite scree may mask its presence over most of this area.

### Jurassic Dolerite

The dolerite of the Mt Nicholas Range is a 300-500 feet sill, and that to the south of the area mapped has been described as a massive dyke (Keid, 1922). The evidence cited for this interpretation is a number of instances of transgressive contact. There is insufficient evidence at present to decide whether this mass is a dyke or a transgressive sill. The almost continuous cover of dolerite scree on the slopes between 800 and 2000 feet a.s.l. makes it difficult to determine if areas of dolerite on these slopes are in situ. One mass in particular, between 1100 and 1300 feet a.s.l. is considered to be a sill on the grounds of distribution of scree and fragments of chilled dolerite and baked sedimentary rock and the presence of isolated knolls and terraces.

Dolerite scree is even more widely distributed than indicated on the geological map as it covers an estimated 80% to 90% of the area marked as Triassic beds. These beds outcrop sparingly in the boulder filled creek beds and hardly at all on the interfluves.

### Tertiary and Recent

There are no Tertiary sediments in the valley, this period having been one of denudation and faulting. The Break O' Day River has cut a valley over 4 miles wide and 1000 feet deep, since Tertiary faulting formed the uplands east of St Marys, thus initiating the present drainage system. The river itself appears too insignificant to have cut this valley without the aid of faulting along the line of the present river course. The original extent of the dolerite cover is not known, but if the masses either side of the valley are sills, they may be remnants of the same sill which was breached by faulting in Tertiary times. The underlying Triassic beds would have been removed with ease by stream action resulting in undercutting of the dolerite and inducing scarp retreat. There is some evidence for this in the wide distribution of dolerite scree and its great thickness in diamond drill holes at the Fingal Coal Mine.

There is also evidence for uplift of the south block if the dip of the coal is 3° to 5° south; as stated earlier, this dip may be incorrect. However, if the beds are horizontal across the valley there can have been little or no relative movement between the two sides. It should be noted that there is a 500 feet movement on the Cornwall fault which suggests that in pre-faulting times the ground could have sloped easterly over much of the area. The valley, then, may have been shaped by an easterly flowing stream, possibly the South Esk river.

The history of this valley is relevant here only in its bearing on the structure of the coal measures and the form of the dolerite intrusions.

### COAL RESERVES

The accompanying table does not list any outcrop thicker than 3 feet, the majority being 2 feet or less. The extensive scree cover makes it necessary to defer ore reserves calculations until the diamond drilling programme is further advanced, and more is known of the nature of the dolerite intrusions and the number of workable coal seams present.

## DRILLING RECOMMENDATIONS

I and II. On the upper bench at  $\pm 2000$  feet elevation. These sites are approximately  $\frac{3}{8}$  and  $1\frac{1}{4}$  miles from the hole currently being drilled by the Hydro-Electric Commission.

III. On the lower bench at  $\pm 1500$  feet elevation. Drilling from this site should penetrate the dolerite sill at 200 or 300 feet if it exists.

IV. On a bench at 1600-1700 feet elevation with a continuous dolerite scree slope extending from it to plains level. A sharp dolerite spur lies to the west of this site and discontinuous Triassic sediments outcrop in Lightwood Rivulet to the east. The coal measures should be found underlying the scree. Access to this site may be difficult.

V. On a bench at 1600-1700 feet with scree slope below and coal outcrops at + 1400 feet in neighbouring creeks. This site is also difficult of access.

## COAL OUTCROPS

No.	Description.	Elevation (feet a.s.l.)
1	coal fragments in creek, outcrop not found	1390
2	Lenses in sandstone	1090
3	8-inch seam under 2-inch conglomerate band and sandstone	1450
4	nodules 2 feet long in sandstone	1200
5	fragments in creek with decomposed sandstone boulders, outcrop not seen	1200
6	2 ft. 4 in. seam with 2-inch clay band in middle. Shale floor and roof	1100
7	1 ft seam with sandstone roof, base of seam not exposed	1040
8	6 inch seam	1200
9	6 inch seam	960
10	black shale	870
11	black shale with plant fragments	1320
12	6 inch band of $\frac{1}{4}$ inch coal lenses with sandstone floor and roof	1250
13	8 inch seam containing two 1 inch white clay bands. Shale roof and mudstone floor. (Some spoil heaps indicative of mine workings were found here)	1000
14	minimum 12 inches exposed in creek bed, weathered	950
15	1 ft coal with white clay band	1830
	2 ft coaly shale	
	1 ft coal	
	6 in. white clay	
	15 ft sandstone	
	3 ft coal with white bands	
	2 ft grey mudstone	1800

16	2 ft coaly shale	
	1 ft coal	
	1 ft coaly shale	
	3 in. coal	
	6 in. shale	
	6 in. mudstone	
	2 in. coal	
	1 ft coaly shale	1730
17	20 ft sandstone	1330
	2 ft coal	
	1 ft light grey clay	
	20 ft gap	
	1 ft fine bedded sandstone	
18	2 ft coal	1300
	1 ft coaly shale	
19	3 ft mudstone with carbonaceous bands	1190
20	6 ft limonitic stained feldspathic sandstone containing wavy coaly bands	1060
21	5 ft coal seam at Valley Mine. This seam has not been seen in any outcrop to the east of the mine	1400

#### CURRENT DIAMOND DRILLING

The Department of Mines No. 4 hole has passed through several narrow coal seams, the principal ones being:

Depth		Thickness		Reduced Level
feet	inches	feet	inches	feet
62		2	3	1710
14		2	0	1630
238	6	3	3	1530

The site of this hole is alongside the creek in which observations 15 to 20 (inclusive) were made, but correlations are difficult and there are many gaps in the creek record due to the presence of dolerite scree.

The Hydro-Electric Commission commenced drilling in the area since this work was started and, at the time of writing, have drilled 250 feet in dolerite scree.

#### REFERENCES

- BAIRD, J., 1960.—Proposed drilling on the Fingal Coalfield. *Tech. Rep. Dep. Min. Tas.*, 5, 188-193.
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