REPORT ON CATAMARAN COAL MINE

Location and Access

The Catamaran mine is situated on the north side of the Catamaran River and some 1½ miles west of the Catamaran settlement. This settlement is 53 miles south of Hobart and can be reached by road (74 miles) from Hobart. The road is suitable for motors, being in good order as far as Dover and fairly rough beyond that township.

Leases

The mine is situated on lease 10471/M of 400 acres, held in the name of the Catamaran Collieries Ltd. There are also three tramway easements (2699/W, 2700/W and 2701/W) held in the same name.

The arrangements between the New Catamaran Collieries Pty. Ltd., and the E.S. & A. Bank (holders of the mortgage) and/or the liquidators of the Catamaran Collieries Pty. Ltd., are not known.

Transport

Transport to Hobart has to be carried out by water, vessels proceeding from Recherche Bay via D'Entrecasteaux Channel and the River Derwent. Wharf accomodation and loading arrangements have been constructed at Everol's Point. The last company had the coal transported by small steamers, e.g. Melba, but the present operators intend to use barges.

Geology

The flat nature of the greater part of the Catamaran area, its covering by river or marine clays, and the dense vegetation combine to make the deciphering of the geology very difficult owing to the paucity of outcrops. In spite of this, however, the few outcrops, artificial exposures (cuttings &c.) the mine workings, and the boreholes enable a fairly complete determination of the geological structure to be made.

Shallow deposits 10' - 20' of clay extend inland along parts of the Catamaran River and form the surface of the flat in the vicinity of the coal mine. Diabase (dolerite) outcrops along the shore and extends inland for about a mile judging by the outcrops which protrude above the clay in numerous places.

Felspathic sandstones outcrop along the Catamaran River near the present mine workings and also on the hills to the west and north. The workings and the bores prove that these sandstones together with the interbedded mudstones and coal seams occupy an extensive tract of country with a general north and south trend parallel to the coast. These rocks are of Triassic age and constitute the

most important and extensive coal measures of Tasmania.

One feature of interest is the supposed wash -out struck in bores No.6 and B, and assumed to be a stream valley filled with diabase boulders. This interpretation does not agree with the bore results and the geological features and it is very probable that the occurrence represents the outcrop of a diabase dyke. This dyke has a E.N.E. - W.S.W. trend and can be traced across the low hill between Ribbon workings and the Anthracite dip adit, and its continuation is indicated in the north bank of the river to the west of the workings.

Economic Geology

Number of Seams Until recently only one seam - the Catamara has been worked in this field. It was reported in some of t older workings that another seam occurred below this seam but owing to its apparent absence in other parts its presenc was doubted. However the Ribbon workings have proved definitely the existence of this seam at a depth of 8 - 12 f below the Catamaran seam, and it is proposed to call this "bottom"seam the Young seam. Coal also occurs above the Catamaran seam but is apparently of poor quality and has not been investigated.

The discovery of the "Anthracite" seam was made in 1924 or 1925, and two other seams are said to have been proved above it. This suggests a total of six seams, but a recent examination of the bore results and the plotting of vertical cross-sections rather tends to show that these three seams are the same as the Catamaran group of three. This would be due to repetition due to faulting accompanyin the diabase dyke referred to above. If this is correct, the Anthracite seam corresponds to the Young seam, and the other two represent the Catamaran and the "upper" seam.

An alternative explanation is that none of the bores north of the diabase dyke intersected the Catamaran group of seam, but cut the overlying Anthracite group. If this is so, the Catamaran group of seams lie at unknown depths below the diabase met in every bore-hole. The thickness of the diabase is unknown (151 feet were proved in Bore No.4) and if large, will considerably detract from the value of the field as the Catamaran seam will lie at great depths.

Faulting

Faulting occurs in all Tasmanian coal fields particularly in association with the diabase intrusions. Only minor faulting has been proved in the workings but vertical cross sections based upon bore results etc. suggest at least two faults. One accompanies the diabase dyke and there is probably an upthrow on the northern side of 100 feet between Ribbon and Anthracite workings and 50 feet north of the Main Shaft. The other occurs further north near the extremity of the flat. The upthrow is on the north side and is about 600 feet, and appears to be connected with the underlying diabase. This fault passe near No.1 bore and north of No.5 bore.

Thus the coal is divided into at least two areas - Area A, between the outcrop and the diabase dyke and Area B, between the dyke and the 600 foot fault.

Dip of Seams. The coal seam in the working has a general dip of 1 in 5 to the north-west. This dip is more or less uniform throughout the field judging by the bore-results. Towards the west, however, the prospecting work rather suggests that the dip alters in direction and becomes north-east.

Quantity of Coal

(1) Catamaran Field as a Whole. During 1920 and 1921 the Catamaran field was investigated by the Geological Survey and the results are included in the Coal Resources of Tasmania (1922). The following figures for reserves are taken from that report.

Based on Existing Economic Conditions

2 seams with aggregate thickness of 7 feet
230 acres
1,098,000 tons.

Based on International Geological Congress Scheme

1 seam 3.6 feet thick

Actual Reserve	- 60 acres	-	354,000 tons
Probable	- 1,200 acres	-	3,936,000 tons
Possible	- Fairly large.		

(2) That Part of the Field Workable from Present (Ribbon) Workings (Area A)

It is considered that the area which can be worked from the present workings is that which is bounded on the south by the outcrop, on the north by the diabase dyke or faulting associated with same, on the east by old workings (James & Tributors), and on the west by the river and the diabase dyke. This has an area of approximately 20 acres. The reserves would be

Catamaran Seam	46 ins. coal	92,000 tons
Young Seam	30 to 36 ins. coal	60,000 to 72,000 tons

(3) That Part of the Field Partly Proved by Bore-holes, Prospecting Shafts &c. (Area B). This part is bounded on the south-east by the diabase dyke and faulting associated with same, on the north-west by a probable large fault, on the west by the limit of prospected ground, and on the east by the limit of the bored ground.

This part includes approximately 200 acres, which from the information available represents a continuous area of coal without any large faults. It could probably be worked as a whole from one or more dip adits or shafts.

The reserves would be:

Catamaran Seam	40 inches (say)	800,000 tons
Young Seam	30 inches (say)	600,000 tons

The possibility of working these seams depends upon whether they are the seams cut in the boreholes or whether they lie at great depths beneath the diabase.

(4) Area C. This represents the eastern extension of Area A and offers similar facilities for working. Little is known of the coal and though it extends some distance at least in that direction, no figures of reserves can be given.

(5) Area D. This represents the eastern extension of Area B.

(6) Area E. This occurs north of Area B, but beyond the outcrop of a seam stated to be the Catamaran seam, nothing further is known of it.

Quality

Catamaran Seam

The Catamaran seam has always been regarded as producing the best quality coal of Triassic age in Tasmania. This has been supported by actual tests of the coal and analyses of representative samples. The following table shows three analyses from the Coal Resources and four of samples taken on 3/8/32.

	430	464	465	879	880	881	882
Moisture %	3.46	2.04	2.16	2.80	3.20	2.34	3.14
Volatile Matter %	22.00	23.34	61.66	28.90	25.74	27.46	20.36
Fixed Carbon%	58.84	61.66	62.08	60.84	57.76	51.86	43.30
Ash %	15.70	12.96	11.46	7.46	13.30	18.34	33.2
Sulphur%	0.44	0.51	0.56	0.52	0.52	0.44	0.25
Calorific Value (B.T.V.)		12,133	12,880	12,880	11,780	10,890	8370.

Sample 430 From bins near James Workings, Coal Resources (1922)
Sample 464 Bottom of Main shaft 2'7" samples do.
Sample 465 West Tunnel, James Workings 2'4" do.
Sample 879 Ratten drive, Ribbon workings 25" (lowest coal)
Sample 880 - - 8"
Sample 881 - - 13"
Sample 882 - - 9" (uppermost coal)

The four samples taken in the present workings prove that only the three lowest bands of coal should be marketed. These three would yield 46 ins. of coal with an average ash content of 11.55% and calorific value of 12,126 B.T.V. The two lowest bands would give 33 ins. coal with an average ash content of 8.87% and calorific value of 12,613 B.T.V.

These analyses indicate a coal much superior to other Tasmanian coals, and one which approaches N.S.W. coals in quality. Burning of the coal in a boiler indicates that it burns with a long flame and ignites readily so that it

will probably be very suitable for steaming purposes.

A pleasing feature of the seam where opened up is the hardness of the coal. This will minimise slacking which was a feature of the coal in the workings to the east. This difference may be due to the fact that the coal in the old workings occurred under a flat, whereas the present workings are on a low hill, and it is possible that the coal was more affected by ground water in the flat.

Young Seam (or Bottom Seam)

Very little work had been done on this seam, until opened up in Ribbon workings in mistake for the Catamaran seam. The following table gives analyses of recent samples.

	462	463	464	465	877	878
Moisture%	2.95	5.06	3.94	3.65	2.80	3.56
Volatile%	20.13	20.04	26.86	22.53	28.26	22.60
Fixed Carbon%	54.32	36.46	52.54	60.12	58.60	57.60
Ash%	22.60	38.44	16.66	13.70	10.34	16.24
Sulphur%	0.55	0.57	0.55	0.48	0.57	0.37
Calorific Value B.T.U.	10,710	7,700	11,330	11,730	12,710	11,510

Sample 462 Ribbon Workings No. 2 East drive 12" samples (lowest) A
463 " " " " " 4" samples B
464 " " " " " 12" " C
465 " " " " " 24" " (top) D
877 " " " " " 7" " (same as C)
878 " " " " " 22" samples (same as D.)

Present Workings and Proposed Work

The present company commenced operations on the steep slope to the Catamaran River some 20 chains to the west of James and the tributors workings. A seam of coal was located and assumed to be the Catamaran seam. A dip adit was driven for a length of 340 feet and three drives opened out on either side. Back headings and bords were worked up the dip from the Nos. 1 and 2 east and west drives and coal won from these places. This coal was not as good as that from worked parts of the Catamaran seam and search was made for the latter by Ratten's drive which proved it to exist some 10 or 12 feet above the bottom or Young seam.

It is proposed to drive the No. 1 East and West drives from Ratten drive and open up eight bords or working places above these drives to work the coal towards the outcrop. The bords will be 12 feet wide with 18 feet pillars between, a 40 feet pillar being left on the west side of Ratten drive. This will entail an easterly drive 105 feet in length, and a westerly drive 138 feet in length.

It is also proposed to put in drives at Nos. 2 and 3 levels similar to Ratten drive to pick up the Catamaran seam at those levels. Each of these drives

will be approximately 60 feet in length.

The eight working places at No. 1 level with two men in each face and worked two shifts per day should yield 96 tons per day (assuming a conservative production of 3 tons per man per shift, whereas the production will be nearer 4 tons per man). This will produce in a fortnight (11 days) 1056 tons, or 528 tons per week. With coal won this should ensure a weekly output of 500 tons.

Development work will have to proceed immediately at Nos. 2 and 3 levels in order to provide other working places as those at No. 1 become depleted.

Later, it will be necessary to continue the dip adit and open up other levels below No. 3.

Cost of Producing Coal

The following estimates are based upon a weekly output of 500 tons. The wages adopted are those said to have been agreed upon between the company and the men; miners wages being 11/- per day, engine drivers 13/-, truckers 10/- etc. and the contract hewing rate per ton.

	Wages etc. per day					
	500 tons per week			300 tons per w		
Hewing	£24.	-.	-	£14.	8.	-
Wheeling (6 men)	3.	-.	- 4 men	2.	-.	-
Haulage (3 men)	1.	13.	- 2 "	1.	2.	-
Road layers(2 men)	1.	-.	-	1.	-.	-
Timber getters (3 men)	1.	7.	-		18.	-
" dresser (1 ")		11.	-		11.	-
Blacksmith (1 man)		11.	-		11.	-
Fitter and Diesel Engine driver		13.	4		13.	4
Loco. driver and guard (2 men)	1.	-.	-	1.	-.	-
Fettler		9.	-		9.	-
Pickers (2 men)		10.	-		10.	-
Carpenter		11.	-		11.	-
Labourer		9.	-		9.	-
Manager, Underground Manager and 2 Deputies	3.	4.	2	2.	9.	2
Development (16 miners)	8.	8.	-	8.	8.	-
	£47.	6.	6	£34.	19.	6

(= 10/- per ton approx.) = 12/2 per ton.

Other expenses are (per annum)

Lease rents	£53. 5. -	
Insurance (Workers' Compensation)	200. -. -	(maximum)
Insurance (Fire)	70. 8. -	
Municipal Rates	34. 5. -	
Head Office Expenses	120. -. -	
Directors Fees	Nil	(at present)
Interest on Mortgage	600. -. -	
Stores (say)	500. -. -	
Interest on Capital £5,262)	263. 2. -	
	£1,841. -. -	

which equals 1/6 per ton on 25,000 tons.
or 2/5 " " 15,000 "
(this latter figure would probably be less say 2/- as stores and insurance would be less).

It is impossible to estimate the Federal and State taxation and to a less extent the depreciation, but 1/- per ton should more than cover the latter.

The costs of coal delivered at Hobart, wharf exclusive of taxation, are:-

	500 tons per week	300 tons per we
Mining etc.	10/-	12/2
Interest, Insurance etc.	1/6	2/-
Depreciation	1/-	1/-
Freight to Hobart	6/-	6/-
Contingencies	1/-	1/-
	19/6	22/2
Coal sales agency 5% in 30.-	1/6	1/6
	21/-	23/8

Conclusions and Recommendations

The Catamaran coal has found and should continue to find a ready market in Hobart for household purposes and steam raising. Its ash content is moderate (say 12%) and its calorific value is high (12,000 B.T.U.). If this quality can be maintained by careful mining, the coal could be used for many purposes for which Newcastle coal is at present used. The cost of the latter in the boats at Hobart is 34/- per ton. If the Catamaran coal were delivered to Hobart at a price of 27/6 to 30/- per ton, the lower prices should greatly help it to replace Newcastle coal.

Such prices would allow an average profit of at least 5/- per ton. If mined at the rate of 500 tons per week, the annual profit would be £6, 250 (for 50 weeks). Assuming three years supply of coal in Area A, the total profit would be £18,750.

The actual capital expenditure is stated to have been £5,262 (£1,692 of which has not been provided for) while a mortgage of £7,000 exists on the property. The above profit would enable the mortgage to be paid off and would provide return of capital (or dividends equivalent to same) and leave £6,488 to provide for development of other areas such as Area B.

The production of 300 tons a week would employ 60 men and that of 500 tons 77 men. In view of this, and the profitable nature of the enterprise (subject to good management and marketing and the realization of the above estimates) it is recommended that some assistance should be given to the New Catamaran Collieries Pty. Ltd. to enable them to reach the production stage. This assistance would be:

Driving of No. 1 level 243 feet at 12/- per foot	£145.	16.-
Driving of No. 2 drive say 60 feet at 12/-	36.	-.-
" No.2 E. and W. say 243 feet	145.	16.-
" No.3 drive say 60 feet	36.	-.-
" No.3 E. and W. say 243 feet	145.	16.-
	£479.	8.-

The above descriptions and estimates prove that the Catamaran mine is, subject to good management, a sound commercial proposition and is worthy of being assisted to the extent of approximately £500 to enable it to reach the production stage.

Sgd. J. Hudson
CHIEF INSPECTOR OF MINES

Sgd. P.B. Nye,
GOVERNMENT GEOLOGIST

Mines Department,
HOBART
12th August, 1932

COPY

Laboratory,

Launceston

20th March, 1933.

CERTIFICATE OF ANALYSIS.

To J. O. Hudson, Esq.,
Chief Inspector of Mines, Hobart.

The samples of Coal received from Mr. Hudson on the 14th March, 1933 and stated to be from Catamaran Colliery have been examined, with the following results:-

Registered Number	Constituents	Per Cent.
237	No.1 Sample, No.2 EastLevel Top Section	
	Moisture	1.40
	Volatile Combustible Matter	8.90
	Fixed Carbon	74.12
	Ash	15.58
	Sulphyr	0.25
	British Thermal Units	11,820.
238	No.2 Sample No. 2 East Level, Middle Section.	
	Moisture	2.00
	Volatile Combustible Matter	10.10
	Fixed Carbon	69.94
	Ash	17.96
	Sulphur	0.19
	British Thermal Units	11,200.
239	No.2 East Level, Bottom Section.	
	Volatile Combustible Matter.	11.40
	Moisture	0.80
	Fixed Carbon	79.70
	Ash	8.10
	Sulphur	0.30
	British Thermal Units	13,730.

(Sgd.) L. H. Bath,

Chief Government Chemist & Assayer.