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EXPLORATION LICENCE 30/80

SOUTH EAST TASMANIA

REPORT FOR THE TWELVE MONTHS ENDED 15TH APRIL, 1984

CONTENTS

SUMMARY

- 1. TITLE
- 2. EXPLORATION PHILOSOPHY - TRIASSIC
- 3. EXPLORATION PHILOSOPHY - PERMIAN
- 4. SUMMARY OF PREVIOUS WORK
- 5. WORK DURING THE TWELVE MONTHS ENDED 15TH APRIL, 1984
 - 5.1 Triassic
 - 5.2 Permian
- 6. CONCLUSIONS

APPENDICES

- Laboratory Analysis Results Sheets
- Laboratory Float/Sink Results Sheets
- Coal Petrographic Report by G. Khorasani
- Petrography of Upper Triassic Sandstones

TABLES

- 1. Drill Hole Coordinates
- 2. Analysis Results (air dried basis)
- 2A. Analysis Results (dry basis)
- 3. Summary of Coal Seams
- 4. Float/Sink Tests
- 5. Coal Samples sent for Petrography

FIGURES

- 1. Southeast Tasmania locality map A4 - 2261
- 2. Location of drill holes A3 - 1618

SUMMARY

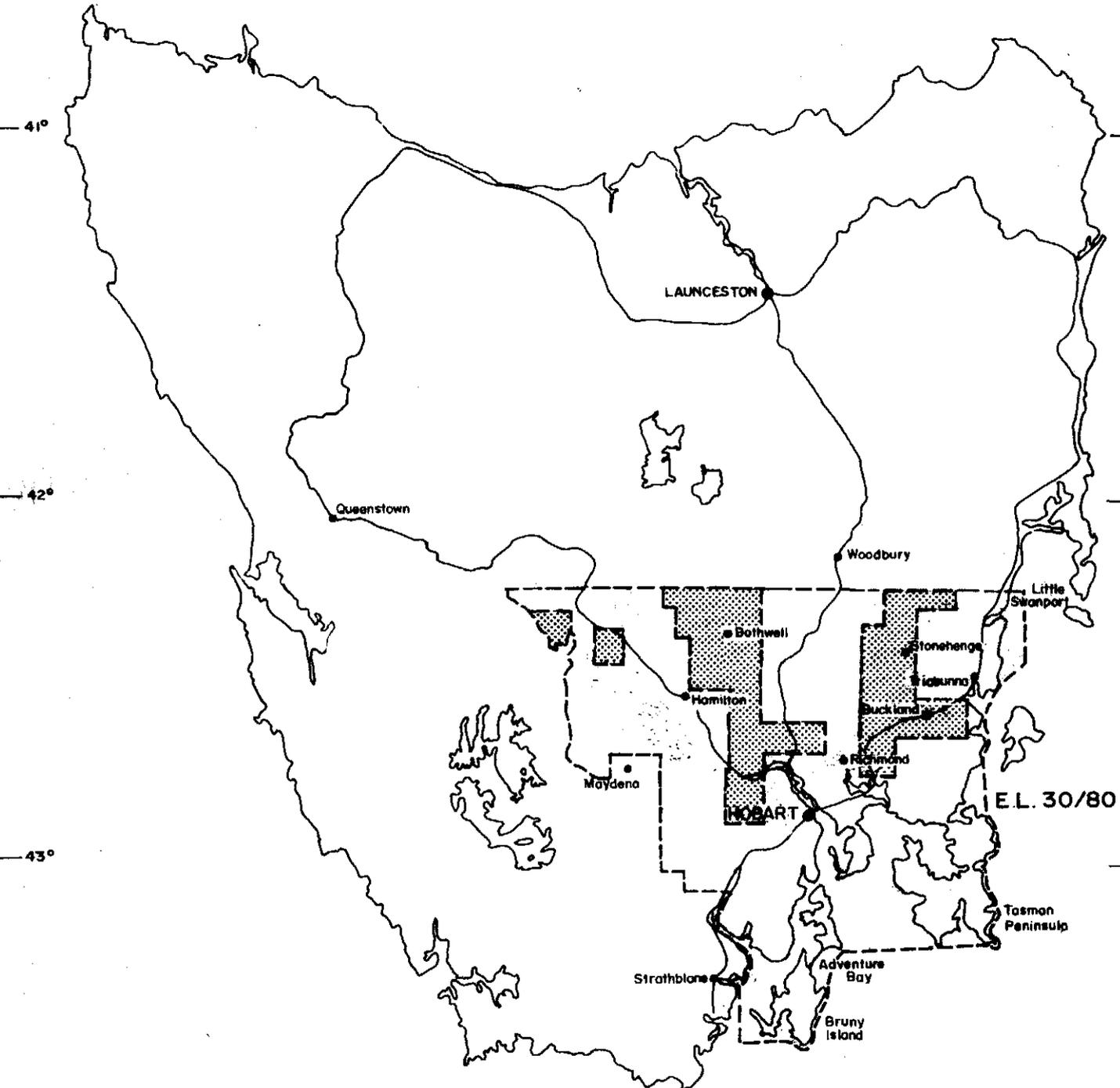
Exploration in E.L. 30/80 for Upper Triassic coal was confined mostly to laboratory work, following on from the drilling programme of the previous 12 month period. Geological logging of drill holes was completed. Three samples of coal were submitted for float/sink tests and others were petrographically examined. Reconnaissance was carried out on an area around Platform Peak, near New Norfolk.

The major part of the year's work was given to exploring the Permian sequence. Mobil Energy Minerals Australia Inc. carried out a programme of field mapping and drilling. This is the subject of a full separate report. Permian depositional environments were considered to be unsuited for large-scale coal formation.

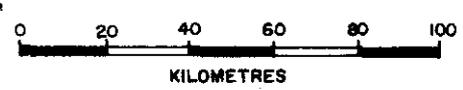
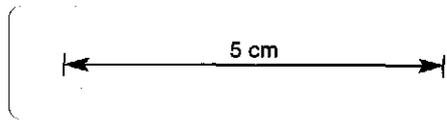
It is concluded that further exploration for Triassic or Permian coal is not justified and that the E.L. should not be renewed.

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145° 146° 147° 148° 435004 Fig. 1



 EL 30/80 relinquished
 " " held for coal, oil and oil shale



Centre
Melbourne

Date Jan. 84

007-1001

THE BROKEN HILL PROPRIETARY CO. LTD.
E.L. 30/80
SOUTHEAST TASMANIA
LOCALITY MAP

Project No.
C350-2

Drawing No.
A4-2261

1. TITLE

The Broken Hill Proprietary Company Limited was granted Exploration Licence 30/80, covering 12,900 sq. km. in southeast Tasmania, on 15th April, 1981 for six months.

The licence was renewed for twelve months to 15th October, 1982. A further renewal was made for six months to 15th April, 1983 with a reduction in size to 3273 sq. km. comprising two parts. The licence was subsequently renewed for another 12 months to 15th April, 1984, with a further reduction in area to 2480 sq. km. in four separate parts (Fig. 1).

The licence is held for three minerals - coal, oil and oil shale.

2. EXPLORATION PHILOSOPHY - TRIASSIC

Exploration has been focussed on three situations:

- i) recognition of graben structures within the Triassic sequence, wherein Upper Triassic coal measures could have been preserved,
- ii) investigation of Upper Triassic strata shown on the Geological Survey maps, and
- iii) discovery of lithic sandstones by field reconnaissance.

3. EXPLORATION PHILOSOPHY - PERMIAN

Permian coal is known from two relatively thin non-marine horizons within a predominantly glacio-marine sequence.

not so. The middle Permian Mersey Coal Measures yielded coals of better quality than the Triassic except for undesirable sulphur contents. Known occurrences were restricted to the north and central north-west parts of the Permo-Triassic basin. South of Hobart marine conditions prevailed, and marine incursions were made northwards during the same time interval.

The Upper Permian Cygnet Coal Measures represent the end of the glacio-marine conditions and the beginning of the terrestrial conditions which extended right through the Triassic. Coal is restricted in the main, to the south of Hobart, but thin seams are found in the midlands.

Known Permian coal deposits are thin and subject to lensing out over short distances. There may be scope for thicker, more extensive deposits elsewhere in the basin, particularly in the northern half of E.L. 30/80. Knowledge of the sequence in these parts is limited.

4. SUMMARY OF PREVIOUS WORK

- i) Literature survey and review of available data.
- ii) Drilling of three scout diamond drill holes (T1, T2, T3) totalling 233.3m on Triassic targets and geophysical logging of one hole with an SIE T450 logger.
- iii) Sampling, analysis and petrographic work on selected intervals of drill core.
- iv) Reassessment of the potential of the Permo - Triassic sequence in E.L. 30/80 for coal. Consultation with officers of the Department of Mines and field reconnaissance.
- v) Photo-interpretation of three portions of the northern half of the original E.L.
- vi) Field checking of the photo-interpretation and of possible drilling targets.
- vii) Plotting of ground water bore and other drilling data including coal intersections.
- viii) Reduction in size of E.L. 30/80 from 12,900 to 3273 sq. km. comprising two parts.
- ix) Continuing acquisition and compilation of data and plotting of H.E.C. bore hole information.
- x) Field inspection of selected areas to delineate drilling targets.
- xi) Ground magnetics over proposed drill sites.

- xii) Drilling of 15 holes (T4 to T16 and T7A, T10A) totalling 1183.3m on Triassic targets using rotary/percussion and diamond core methods.
- xiii) Intersection of 18 coal plies in four of these drill holes ranging from 0.3 to 2.5m in thickness down to 102m depth.
- xiv) Geophysical logging of most of these drill holes with an SIE T450 logger.
- xv) Analysis of five samples of drill core; four of coal and one of carbonaceous shale.
- xvi) Mapping of an area of Permian around Dungrove, northwest of Bothwell.
- xvii) Reduction in size of E.L. 30/80 from 3273 to 2480 sq. km. comprising four parts.

Details of the above work were submitted in the Reports for the Six Months Ended 15th October, 1981, 15th April, 1982, 15th October, 1982 and 15th April, 1983 and in regular quarterly expenditure reports.

TABLE 1.
DRILL HOLE COORDINATES
(Australian Map Grid)

	COORDINATES	COLLAR R.L. (m)	TOTAL DEPTH (m)
T1	EP 633105	280	52.0
T2	EP 811121	5	83.0
T3	EN 587990	305	98.3
T4	EN 365709	25	89.4
T5	EN 368672	5	100.0
T6	EP 052016	555	82.6
T7	EN 053972	495	88.0
T7A	EN 053972	495	22.1
T8	EN 023971	435	88.0
T9	DN 989935	425	84.0
T10	DP 666047	300	90.0
T10A	DP 666047	300	21.3
T11	DP 650136	535	70.0
T12	DP 665014	200	90.0
T13	EN 061823	130	108.0
T14	EN 634805	60	50.0
T15	EP 606185	335	100.0
T16	EN 088819	130	100.0

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TABLE 2.
ANALYSIS RESULTS

(Air Dried Basis)

SAMPLE NUMBER:	BL5011	5012	5013	5015	5014
DRILL HOLE:	T 7A	T 7A	T 7A	T 10A	T 10A
DEPTH:	1.93-2.82m	6.30-6.88m	17.04-17.63m	18.20-18.48m	15.52-16.74m
THICKNESS:	0.89m	0.58m	0.59m	0.28m	1.22m
	Coal	Coal	Coal	Coal	Carb-shale
Total Moisture (as received) %:	11.6	4.9	3.4	5.6	53.8
Moisture (ad) %:	7.3	4.2	2.5	5.1	6.0
Specific Energy (ad) MJ/Kg:	18.78	21.06	20.30	21.60	1.60
Total Sulphur (ad) %:	0.33	0.45	0.33	0.47	0.13
Total Diss. Solids (ad) %:	0.21	0.27	0.34	0.27	0.26
<u>Proximate Analysis</u>					
Moisture (ad) %:	10.3	4.3	2.2	1.4	1.4
Ash (ad) %:	24.5	33.6	37.5	29.8	88.0
Volatile Matt. (ad) %:	18.9	13.9	12.7	24.9	7.1
Fixed C. (ad.) %:	46.3	48.2	47.6	43.9	3.5

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TABLE 2A
ANALYSIS RESULTS

(Dry Basis)

SAMPLE NUMBER:	BL5011	5012	5013	5015	5014
DRILL HOLE:	T 7A	T 7A	T 7A	T 10A	T 10A
DEPTH:	1.93-2.82m	6.30-6.88m	17.04-17.63m	18.20-18.48m	15.52-16.74m
THICKNESS:	0.89m	0.58m	0.59m	0.28m	1.22m
	Coal	Coal	Coal	Coal	Carb-shale
Specific Energy (d) MJ/Kg:	20.26	21.98	20.82	22.76	1.70
Total Sulphur (d) %:	0.36	0.47	0.34	0.50	0.14
Total Diss. Solids (d) %:	0.23	0.28	0.35	0.28	0.28
<u>Proximate Analysis</u>					
Ash (d) %:	27.3	35.1	38.3	30.2	89.2
Volatile Matt. (d) %:	21.1	14.5	13.0	25.3	7.2
Fixed C. (d.) %:	51.6	50.4	48.7	44.5	3.6

435012
8.

TABLE 3.SUMMARY OF COAL SEAMS

<u>Drill Hole</u>	<u>Top of Seam</u>	<u>Estimated Thickness</u>
T7	1.9 m	0.9 m
	6.3 m	0.6 m
	17.0 m	0.6 m
	39.9 m	1.0 m
	51.1 m	0.4 m
	58.2 m	0.8 m
T10	17.2 m	0.3 m
	52.8 m	0.7 m
T13	55.4 m	0.7 m
	56.9 m	0.6 m
	89.6 m	0.7 m
	90.8 m	0.4 m
	92.4 m	0.7 m
	99.8 m	1.0 m
	101.4 m	0.6 m
T15	9.2 m	0.6 m
	32.6 m	1.4 m
	67.6 m	2.5 m

5. WORK DURING THE TWELVE MONTHS ENDED 15th APRIL, 19845.1 TRIASSICi) Drill Sample Logging and Analysis

Geological logging of drill samples from the recent Triassic programme was completed. Written and graphic drill logs were incorporated into the Report for the Six Months Ended 15th April, 1983. A summary of holes drilled and their coordinates is again provided for reference (Table 1). Locations of the drill holes are shown in Fig. 2 but detailed maps are not included in this report.

Analysis results are summarised in Table 2 (air dried basis) and in Table 2A. (dry basis). Coal seams are summarised in Table 3. Copies of the laboratory analysis sheets are appended.

ii) Float/Sink Testing

Three of the previously analysed core samples were submitted to SGS Australia Pty Ltd for float/sink tests. As recommended in Australian Standard 2519 - 1982 the samples were crushed to minus 11.2 mm and separated in liquids of SG 1.30, 1.45 and 1.60. Tests were carried out following Australian Standard 1661 - 1979.

Results should be used as an indication only because of four factors:

- a) thinness of seams;
- b) poor core recovery;
- c) one half of split core was analysed originally: float/sink tests were carried out on the remaining half core.

- d) low mass of sample available for testing in two cases.

Copies of the laboratory results sheets are appended. The ash contents are reported on an "as analysed" basis. Summaries showing cumulative ash content recalculated to dry basis for comparison are presented in Table 4 below.

TABLE 4
FLOAT/SINK TESTS

DRILL HOLE:	T 7A		T 7A		T 10A	
SAMPLE NO.	BL 5012		BL 5013		BL 5015	
Fraction	Ash [*]	* Cum Ash	Ash	Cum Ash	Ash	Cum Ash
S 1.30/F 1.45	17.0	17.0	18.2	18.2	18.9	18.9
S 1.45/F 1.60	25.8	22.2	24.5	23.9	29.0	25.3
S 1.60	61.1	34.3	62.0	40.1	52.8	28.2
Proximate analysis Ash [*]		35.1		38.3		30.2

* (all results on dry basis %)

iii) Coal Petrography

Nine samples of coal-bearing material (Table 5) were sent to Dr. Ganjavar Khorasani at the University of Queensland. Work requested included maximum vitrinite reflectance determination, maceral analysis, comments on degree of oxidation and comments on environment of deposition. Four samples were taken from half split core and five were taken from bags containing rotary/percussion drill chip samples. It was expected that examination of the latter would prove difficult because the chips recovered did not always correspond well with the coal seams detected by down-hole geophysical logging. In some cases coal formed a minor component of the chip sample and hand selection was necessary.

TABLE 5
COAL SAMPLES SENT FOR PETROGRAPHY

DRILL HOLE	DEPTH (m)	SAMPLE	TYPE
T 7A	1.93 - 2.82	BL 5011	Core
	6.30 - 6.88	5012	Core
	17.04 - 17.93	5013	Core
T 7	58 - 60	5022	Chip
T 10A	18.20 - 18.48	5015	Core
T 13	56 - 58	5017	Chip
	90 - 94	5018	Chip
	100 - 102	5019	Chip
T15	66 - 70	5016	Chip

13.

A copy of Dr. Khorasani's report is appended. Her work has shown that all the coal has been affected by heat of intrusion, sometimes markedly, with anomalously high maximum vitrinite reflectances of up to 2.2% in a minor development of natural coke.

iv) Sediment Petrology

Two samples of drill core were submitted for routine petrographic examination at the BHP Melbourne Research Laboratories. Clays were identified by X-Ray diffraction. The samples were described in the field as a fine to medium grained lithic sandstone. They represented some of the coarsest of the sedimentary sequence hosting in the coal seams. The samples were as follows:

<u>Drill Hole</u>	<u>Depth</u>	<u>Sample No.</u>	<u>MRL No.</u>
T 10A	21.17m	BL 5020	14889
T 7A	16.35m	BL 5021	14890

The petrographic descriptions, copies of which are appended, confirm the field identifications. The rocks comprise dominantly quartz and chert set in a clay matrix. Lesser constituents include grains of feldspars and various rock fragments and micas. The sands are described as immature to submature.

v) Reconnaissance Platform Peak

A preliminary reconnaissance was made of an area centred around Platform Peak, 10 km north of New Norfolk. Access and land ownership was investigated. Windows of Upper Triassic lithic sandstones in dolerite were briefly examined.

5.2 PERMIAN

A technical report covering all exploration for Permian coal within E.L. 30/80 for the 12 month period is provided in a report by Mobil Energy Minerals Australia Inc., which is being forwarded separately.

6. CONCLUSIONS

The coal seams intersected do not lend themselves to open cut extraction methods and do not attain workable thicknesses for underground operations. Limited quality data suggested that this coal is no better than Triassic coal known and mined elsewhere in the state. All coal has apparently been affected by heat of intrusion to some degree.

The E.L. has not been conclusively tested by drilling but there is no reason to expect that discovery of coal of a far superior quality would be likely. The depositional environment in the Upper Triassic is reasonably uniform on a regional basis.

The MEMA programme was designed to provide information on Permian depositional environments, rather than to intersect coal seams. MEMA conclude (in their Final Report on E.L. 30/80, March 1984) that suitable coal forming environments are unlikely to be found, but if present, would be very thin.

Any further exploration in E.L. 30/80 for coal of either age would still be at "grass roots" level. On current evidence and considering the statutory expenditure commitments, any such programme to discover coal meeting the quality, tonnage and workability requirements of a viable operation, is not an attractive proposition.

Accordingly it is recommended that E.L. 30/80 should not be renewed.

GDT:JOH

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APPENDIX

LABORATORY ANALYSIS RESULTS SHEETS

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SGS Australia Pty. Ltd. 18 APR 1983

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Page 1 of 2

Laboratories Division

COAL ANALYSIS REPORT

REPORT No.: SL 2285

DATE IN: 7/3/83

DATE OUT: 21/3/83

CLIENT: BHP EXPLORATION DEPT.

CLIENT REFERENCE: C 350

 ADDRESS: P.O. Box 559
 CAMBERWELL VIC 3124

RESULTS TO: Mr. G. Torr

COPY TO:

SAMPLE REFERENCE: SAMPLE: BL5011, 5012, 5013

ANALYSIS	BASIS	BL 5011	BL 5012	BL 5013			
Total Moisture %	*	11.6	4.9	3.4			
Moisture %	**	7.3	4.2	2.5			
Ash %							
Volatile Matter %							
Fixed Carbon %							
Crucible Swelling No.							
Specific Energy Mj/kg	***	20.26	21.98	20.82			
Total Sulphur %	***	0.36	0.47	0.34			
Carbon %							
Hydrogen %							
Nitrogen %							
Oxygen %							
Carbon Dioxide %							
Surface Moisture %	* *	4.5	0.9	0.9			

DETERMINED IN ACCORDANCE WITH:

 BASIS RESULTS REPORTED ON * As Received
 ** Air Dried
 *** Dry Basis

Analyses determined in accordance with AS 1038 P1,5,6

 COLIN MEADS
 MANAGER
 LABORATORIES



SGS Australia Pty. Ltd.

Page 2 of 2

Laboratories Division

COAL ANALYSIS REPORT

REPORT No.: SL 2285

DATE IN: 7/3/83

DATE OUT: 21/3/83

CLIENT: BHP EXPLORATION DEPT.

CLIENT REFERENCE: C 350

ADDRESS: P.O. Box 559
CAMBERWELL VIC 3124

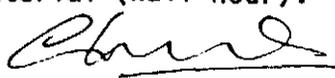
RESULTS TO: Mr. G. Torr

COPY TO:

SAMPLE REFERENCE: LEACHED MATERIAL - See Note

ANALYSIS	BASIS	BL 5011	BL 5012	BL 5013			
Total Moisture %							
Moisture %	*	10.3	4.3	2.2			
Ash %	**	27.3	35.1	38.3			
Volatile Matter %	**	21.1	14.5	13.0			
Fixed Carbon %	**	51.6	50.4	48.7			
Crucible Swelling No.							
Specific Energy MJ/kg							
Total Sulphur %							
Carbon %							
Hydrogen %							
Nitrogen %							
Oxygen %							
Carbon Dioxide %							
Sodium (ppm)	**	0.023	0.010	0.005			
Chlorine (ppm)	**	0.023	0.014	0.014			
Total Dissolved Solids %	**	0.23	0.28	0.35			

DETERMINED IN ACCORDANCE WITH:

BASIS RESULTS REPORTED ON * Air Dried
** Dry BasisNote: Product of boiling water extraction of pulverised material (half hour).Analyses determined in accordance with AS 1038 P3,8 ETSA
- Method for sodium in Coal.

 COLIN MEADS
 MANAGER
 LABORATORIES


SGS Australia Pty. Ltd.

(Incorporated in N.S.W.)

 74 McEvoy St.,
 Alexandria NSW 2015
 Telephone (02) 699 7625,
 Telex 22395
 NATA Reg. No. 1062

Page 1 of 3

 BHP Exploration Dept.
 P.O. Box 559
 Camberwell Victoria 3124

Attn: Mr. J. Cook

Copies: Mr. G. Torr. Tas.

REPORT NO .SL. 2329 . . . CLIENT REF. NO . . . C350
DATE SAMPLES IN .11/4/83 . . . DATE REPORT OUT .18/5/83 . . .

REPORT TITLE: ANALYSIS OF SAMPLES BL5014, BL5015 (AMENDMENT)

The tests contained in this report have been carried out in accordance with the Australian Standards or other NATA approved methods listed below:-

AS 1038 Pt. 1	Total Moisture
AS 1038 Pt. 3	Proximate Analysis
AS 1038 Pt. 5	Specific Energy
AS 1038 Pt. 6	Ultimate Analysis
AS 1038 Pt. 8	Chlorine
AS 1038 Pt.11	Forms of Sulphur
AS 1038 Pt.12.1	Crucible Swelling Number
AS 1038 Pt.12.2	Gray King Coke Type
AS 1038 Pt.14.1	Ash Analysis
AS 1038 Pt.15	Fusibility of Ash
AS 1038 Pt.20	Hardgrove Grindability Index
AS 1038 Pt.21	Relative Density
AS 1661	Float/Sink Testing
AS 1676	Sampling
AS 2137	Gieseler Plastometer (Dis-continuous stirring method)
AS 2486	Reflectance of Vitrinite
AS 2515	Maceral Analysis
ISO 349	Audibert Arnu Dilatometer
ISO 1018	Moisture Holding Capacity
BS 1016 Pt.17	Size Analysis
LECO Method	Total Sulphur

022



SGS Australia Pty. Ltd.

REPORT No: SL 2329 (AMENDMENT)
LEACHED MATERIAL

Sample Ref.		BASIS	BL5014	BL5015			
Analysis							
Total Moisture	%						
Moisture	%	*	1.4	1.4			
Ash	%	**	89.2	30.2			
Volatile Matter	%	**	7.2	25.3			
Fixed Carbon	%	**	3.6	44.5			
Crucible Swelling No.							
Specific Energy Mj/kg							
Total Sulphur	%						
Carbon	%						
Hydrogen	%						
Nitrogen	%						
Oxygen(plus errors)	%						
Carbon Dioxide	%						
Chlorine	%						
Relative Density							
Total Dissolved							
Solids %		**	0.28	0.28			

FUSIBILITY OF COAL ASH (Atmosphere): Sintered Alumina Support

Temperatures °C at Characteristic Shapes							
Initial Deformation							
Sherical							
Hemispherical							
Flow							
Comments:							

DETERMINED IN ACCORDANCE WITH: AS1038 p3

BASIS RESULTS REPORTED ON * Air Dried
** Dry Basis.

Note: Product of boiling water extraction of pulverised material(half hour).

COLIN MEADS
MANAGER - LABORATORIES

023



SGS Australia Pty. Ltd.

REPORT No: SL2329
Unleached Material

Analysis	Sample Ref.	Basis	BL5014	BL5015			
Total Moisture	%	*	53.8	5.6			
Moisture	%	**	6.0	5.1			
Ash	%						
Volatile Matter	%						
Fixed Carbon	%						
Crucible Swelling No.							
Specific Energy	Mj/kg	***	1.70	22.76			
Total Sulphur	%	***	0.14	0.50			
Carbon	%						
Hydrogen	%						
Nitrogen	%						
Oxygen (plus errors)	%						
Carbon Dioxide	%						
Chlorine	%						
Relative Density							

FUSIBILITY OF COAL ASH (Atmosphere): Sintered Alumina Support

Temperatures °C at Characteristic Shapes							
Initial Deformation							
Spherical							
Hemispherical							
Flow							
Comments:							

BASIS RESULTS REPORTED ON *as received
**air dried
***dry

Colin Meads
Manager
Laboratories

LABORATORY FLOAT/SINK RESULTS SHEETS

026



SGS Australia Pty. Ltd.

REPORT No: SL 2413

COAL ANALYSIS REPORT

SAMPLE NO BL 5012

Mass as received - 392.3g

Float/Sink Analysis Of -11.2 mm Material

	<u>Mass %</u>	<u>Cumulative Mass %</u>
F 1.30	NIL	-
S 1.30 - F 1.45	28.5	28.5
S 1.45 - F 1.60	40.5	69.0
S 1.60	31.0	100.0

SAMPLE NO BL 5013

Mass as received - 1284.5g

Float/Sink Analysis Of -11.2 mm Material

	<u>Mass %</u>	<u>Cumulative Mass %</u>
F 1.30	NIL	-
S 1.30 - F 1.45	5.4	5.4
S 1.45 - F 1.60	52.1	57.5
S 1.60	42.5	100.0

COLIN MEADS
MANAGER - LABORATORIES





SGS Australia Pty. Ltd.

REPORT No: SL 2413

Page 3 of 3

COAL ANALYSIS REPORT

SAMPLE NO BL 5015

Mass as received - 420.3g

Float/Sink Analysis Of -11.2 mm Material

	<u>Mass %</u>	<u>Cumulative Mass %</u>
F 1.30	0.1	0.1
S 1.30 - F 1.45	32.4	32.5
S 1.45 - F 1.60	56.9	89.4
S 1.60	10.6	100.0

COLIN MEADS
MANAGER - LABORATORIES



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28 JUL 1983

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Page 1 of 3

B.H.P. EXPLORATION DEPARTMENT
P. O. BOX 559
CAMBERWELL VIC 3124

ATTN : MR. G. TORR

REPORT NO .SL .2423 .. CLIENT REF. NOC .350.....
DATE SAMPLES IN15/7/83..... DATE REPORT OUT26/7/83.....

REPORT TITLE: Analysis of samples BL 5012, 5013, 5015

The tests contained in this report have been carried out in accordance with the Australian Standards or other NATA approved methods listed below:-

- | | |
|-----------------|---|
| AS 1038 Pt. 1 | Total Moisture |
| AS 1038 Pt. 3 | Proximate Analysis |
| AS 1038 Pt. 5 | Specific Energy |
| AS 1038 Pt. 6 | Ultimate Analysis |
| AS 1038 Pt. 8 | Chlorine |
| AS 1038 Pt.11 | Forms of Sulphur |
| AS 1038 Pt.12.1 | Crucible Swelling Number |
| AS 1038 Pt.12.2 | Gray King Coke Type |
| AS 1038 Pt.14.1 | Ash Analysis |
| AS 1038 Pt.15 | Fusibility of Ash |
| AS 1038 Pt.20 | Hardgrove Grindability Index |
| AS 1038 Pt.21 | Relative Density |
| AS 1661 | Float/Sink Testing |
| AS 1676 | Sampling |
| AS 2137 | Gieseler Plastometer (Dis-continuous stirring method) |
| AS 2486 | Reflectance of Vitrinite |
| AS 2515 | Maceral Analysis |
| ISO 349 | Audibert Arnu Dilatometer |
| ISO 1018 | Moisture Holding Capacity |
| BS 1016 Pt.17 | Size Analysis |
| LECO Method | Total Sulphur |

029

435030



SGS Australia Pty. Ltd.

REPORT No: SL 2423

Page 2 of 3

Analysis	Sample Ref.	BL 5012	BL 5012	BL 5012			
		S1.30 / F1.45	S1.45 / F1.60	S 1.60			
Total Moisture	%						
Moisture	%	3.0	2.5	5.1			
Ash	%	16.5	25.2	58.0			
Volatile Matter	%						
Fixed Carbon	%						
Crucible Swelling No.							
Total Sulphur	%						
Specific Energy	Mj/kg						

Analysis	Sample Ref.	BL 5013	BL 5013	BL 5013			
		S1.30 / F1.45	S1.45 / F1.60	S 1.60			
Total Moisture	%						
Moisture	%	2.0	2.4	1.9			
Ash	%	17.8	23.9	60.8			
Volatile Matter	%						
Fixed Carbon	%						
Crucible Swelling No.							
Total Sulphur	%						
Specific Energy	Mj/kg						

BASIS RESULTS REPORTED ON As Analysed

COLIN MEADS
MANAGER - LABORATORIES



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030



SGS Australia Pty. Ltd.

REPORT No: SL 2423

Analysis	Sample Ref.	BL 5015	BL 5015	BL 5015			
		S1.30 / F1.45	S1.45 / F1.60	S 1.60			
Total Moisture	%						
Moisture	%	3.5	3.9	3.8			
Ash	%	18.2	27.9	50.8			
Volatile Matter	%						
Fixed Carbon	%						
Crucible Swelling No.							
Total Sulphur	%						
Specific Energy Mj/kg							

Analysis	Sample Ref.						
Total Moisture	%						
Moisture	%						
Ash	%						
Volatile Matter	%						
Fixed Carbon	%						
Crucible Swelling No.							
Total Sulphur	%						
Specific Energy Mj/kg							

BASIS RESULTS REPORTED ON As Analysed

COLIN MEADS
MANAGER - LABORATORIES



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031

435032

COAL PETROGRAPHICAL REPORT BY G. KHORASANI

032

435033



THE UNIVERSITY OF QUEENSLAND

DEPARTMENT OF GEOLOGY AND MINERALOGY
ST. LUCIA, QUEENSLAND, AUSTRALIA, 4067

GK:YH
18th August 1983

Mr. G. Torr,
B.H.P. Co. Ltd.,
P.O. Box 559,
CAMBERWELL
VICTORIA 3124

Your ref: GLT:JOH
E9/3/2-C

Dear Mr. Torr,

Enclosed are the results of Tasmanian coal samples. Unfortunately the material was too poor to allow a very precise interpretation. I hope the information provided is helpful.

Please note that high vitrinite content of the chip samples can be essentially related to selective hand-picking of these samples.

I look forward to hearing from you again.

Yours sincerely,

G. Khorasani

G. Khorasani.

Encs.

INFORMATION DEPARTMENT	
CCP	JTB
BJV	RC
AD	CT
PC	
CEB	AM
EDB	MB
AB	PJP

22 AUG 1983

JNC	GLT
CLR	
RJI	
SME	
CM	
DJM	

SEARCHED	Signed
FILED	

033

ZHP DDH T7A SEAMS

DRILL HOLE 7 SAMPLE BL- 5011, 5012, 5013, 5022

These samples are all strongly heat-affected. The extent of alteration is the greatest in sample BL-5013, in which the bedding is disturbed and large pore formations have occurred.

1) SAMPLE BL-5022 (Chip)

Reflectance (max) = 1.71

Macerals

The hand-picked particles of this sample are very rich in vitrinite*.

It is not rich in mineral matter. Finely dispersed clay is the essential mineral constituent.

* This may have resulted from selection of coal particles by hand-picking.

2) SAMPLE BL-5013 (Core)

This coal is greatly heat-affected and partial formation of non-coherent coke is evident. Bedding is disturbed and coal is partly mylonitized.

Reflectance (max) = 1.80 in shattered vitrinites

= 2.22 in non-coherent cokes

It contains a high proportion of secondary calcite, formed as the result of the nearby intrusion.

3) SAMPLE BL-5012 (core)

Heat affected, but the degree of alteration is not as severe as sample BL-5013.

Reflectance (max) = 1.54

Macerals

~~Example~~
Vitrinite 36

Semi-inertinite 57

Inertinite 3

Inertodetrinite 4

100

STAMP
①

INERTINITE

SAMPLE BL-5012 (core) (continued)

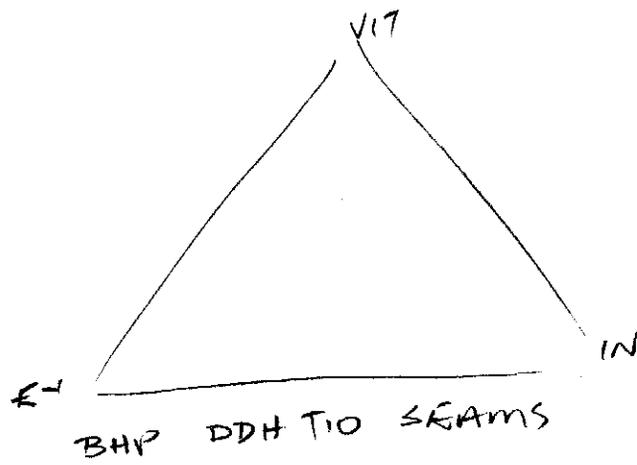
The sample is not rich in mineral matter; a very finely dispersed clay is intimately mixed with vitrinite macerals.

There is no microscopical indication of oxidation in this sample. If it has been oxidized, the degree of oxidation must be too mild to be detected microscopically.

4) SAMPLE BL-5011

This sample is too severely oxidized to allow any analysis. It is clearly heat-affected and devolatilized.

Note: The source of intrusion in Drill Hole 7 must be close to coal. The coal has been quite low in rank at the time of intrusion and, therefore, if the intrusive body is very large it is likely that coal to be affected for some distances.



035

BHP DDHT10 SEAMS

435036

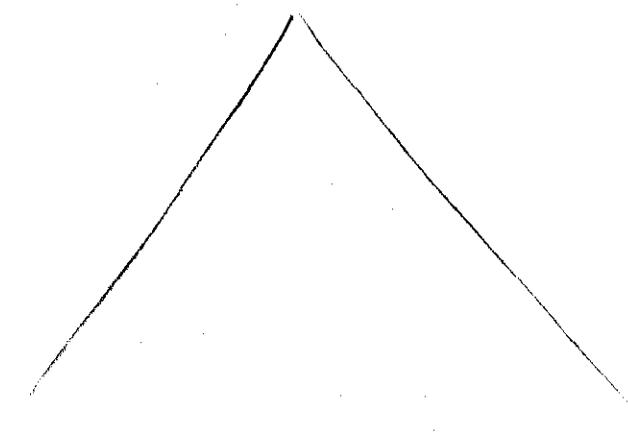
DRILL HOLE 10. SAMPLE BL-5015 (core sample)

Reflectance of vitrinite A (rank vitrinite) is $R_{max} = 0.85$, but the coal consisted mainly of dull layers including much inertinite. In these dull layers vitrinite is mainly of type B (not rank vitrinite) with an average reflectance of $R_{max} = 0.81$.

	<u>MACERALS</u>		
	Vitrinite	20	
INERTINITE	Semifusinite	38	} 63
	Inertinite	10	
	Inertodetrinite	15	
	<hr/>		
FANITE	Sporinite +		} 17
	Liptodetrinite	2	
	Cutinite	<u>15</u>	
		100	

Mineral matters are mainly clay minerals plus minor amount of carbonate. Minerals are largely associated with carbominerites, which are expected to have densities of 1.5 to 2, and therefore they can be separated easily by density separation techniques.

The sample was tough in crushing.



3HP DDH T13 SRAMS

DRILL HOLE 13 - SAMPLES BL- 5019, BL- 5018, BL- 5017 (all chip samples)

As these chip samples were all very poor in coal particles, the results of analyses are not likely to be representative.

Samples 5019, 5018 and 5017 are apparently affected by a source intrusion which is not close to coal.

1) SAMPLE BL - 5017 (Chip)

Reflectance (max) = 1.07 (vitrinite A)

Macerals

Vitrinite * 69

Semi-inertinite 22

Inertinite 2

Inertodetrinite 1

Cutinite 2

Suberinite 4

100

} 25

} 6

INERTINITE

EXINITE

This sample is poor in mineral matter, minerals being mainly finely dispersed clay and very little secondary calcite.

* NOTE 1 - Please note that the high percentage of vitrinite observed in all chip samples can be largely due to hand-pick selection of coal particles.

2) SAMPLE BL-5018 (Chip)

Reflectance (max) = 1.18 (vitrinite A)

Macerals

Vitrinite * 78

Semi-inertinite 16

Inertinite 2

Inertodetrinite 1.5

Cutinite 2.5

100

} 19.5

EXINITE

037

Mineral matters mainly clay plus minor quantities of carbonate and other minerals.

* Please see note 1.

3) SAMPLE BL-5019 (Chip)

Reflectance (max) = 1.18 (vitrinite A)

Macerals

This sample is very similar to sample BL-5018; they both appear to have similar maceral and mineral composition; and they have been affected to a similar extent by additional heat supplied by the intrusive body.

038
DRILL HOLE 15 - SAMPLE BL-5016 (Chip)

This coal is strongly heat-affected by a nearby intrusion.

Reflectance (max) = 1.82

Macerals

The hand-picked particles of coal from this chip sample has up to 92% of vitritinite* and is very clean.

*The high proportion of vitritinite is partly due to transformation of exinites into vitritinite (caused by heat of intrusion), and perhaps essentially due to selective hand-picking of the coal particles.

PETROGRAPHY OF UPPER TRIASSIC SANDSTONES

435041

U40 THE BROKEN HILL PROPRIETARY CO. LTD.

14 SEP 1983

EXPLORATION DEPARTMENT

Petrology Section

245-273 Wellington Road
Clayton, Victoria 3168
P.O. Box 264, Clayton
Telephone 560-7086

Memo to: MR. G. TORR - CAMBERWELL EXPLORATION OFFICE

Date 7/9/83

Our Ref: M679

Subject: E9/3/1-Q: PETROGRAPHY OF UPPER TRIASSIC SANDSTONES FROM
S.E. TASMANIA (MRL 14889-90)

Your Ref:

File: PM9

Date:

Two samples of drill core from the Upper Triassic of South-east Tasmania were submitted for thin section preparation and routine petrographic examination.

The rocks were identified as being clayey and quartz-cemented lithic subarkose.

The mineralogical and textural features of the two samples were similar although MRL14890 contained much less clay (montmorillonite) matrix, was slightly coarser grained, and was better cemented (by quartz) than MRL14889.

The rocks comprise dominantly quartz and chert, which occur as subangular to rounded grains, 100 to 600 μm in diameter set in a matrix of montmorillonite clay (MRL14889) or quartz-clay-sericite (MRL14890). Smaller but significant quantities of plagioclase, K-feldspar, chlorite, biotite flakes and rock fragments are also scattered throughout.

The lithic fragments are generally very fine grained and are often highly altered making identification difficult. Usually they consist of an intimate intergrowth of very fine grained to submicroscopic quartz and sericite and possibly minor feldspar. Possible origins include altered volcanic fragments (acid to intermediate) fine grained low grade metamorphics or diagenetically altered silty sediments.

No bedding or other sedimentary structures were noticed. The sediment appears to have average sorting and the clasts are poorly to moderately rounded. The sand is immature to submature both texturally and mineralogically.

The hand specimen MRL14890 contains occasional flattened discoidal black patches, up to 1 cm in diameter. These fragments are made up of a soft coaly or graphitic material and may be coalified plant fragments.



W. H. RINGENBERGS
PETROLOGIST

cc: Dr. A. Goode - Camberwell Office
Mrs. L. Liggins - Camberwell Office

041

MRL14889 Field No. BL5020
 Rock Type: Montmorillonitic lithic subarkose
 Stain: Alizarin (+), K-Feldspar (TS)

Hand Specimen: Poorly consolidated, very friable, light grey rock. Medium to fine sand sized grains in clay matrix. No bedding seen on hand specimen scale.

Mineralogy: (CD) Quartz, clay; (M) K-feldspar, plagioclase; (T) calcite, biotite, chlorite, ? chalcedony.

Description & comments: Averagely well sorted, medium to fine (100-200 μ m), subrounded to rounded grains of quartz, feldspar, chert and very fine grained lithic fragments in clay matrix. Occasional biotite flakes and chloritic fragments. Traces patchy sparry calcite cement which also replaces some clasts. Lithic fragments usually very fine grained possibly volcanic and/or siltstone/mudstone some cherty, often altered and difficult to identify precisely, some stained by iron-oxides. XRD shows clay is mainly montmorillonite and traces kaolinite and/or chlorite.

MRL14890 Field No. BL5021
 Rock Type: Quartz-cemented lithic subarkose.
 Stain: Alizarin (+), K-feldspar (+)

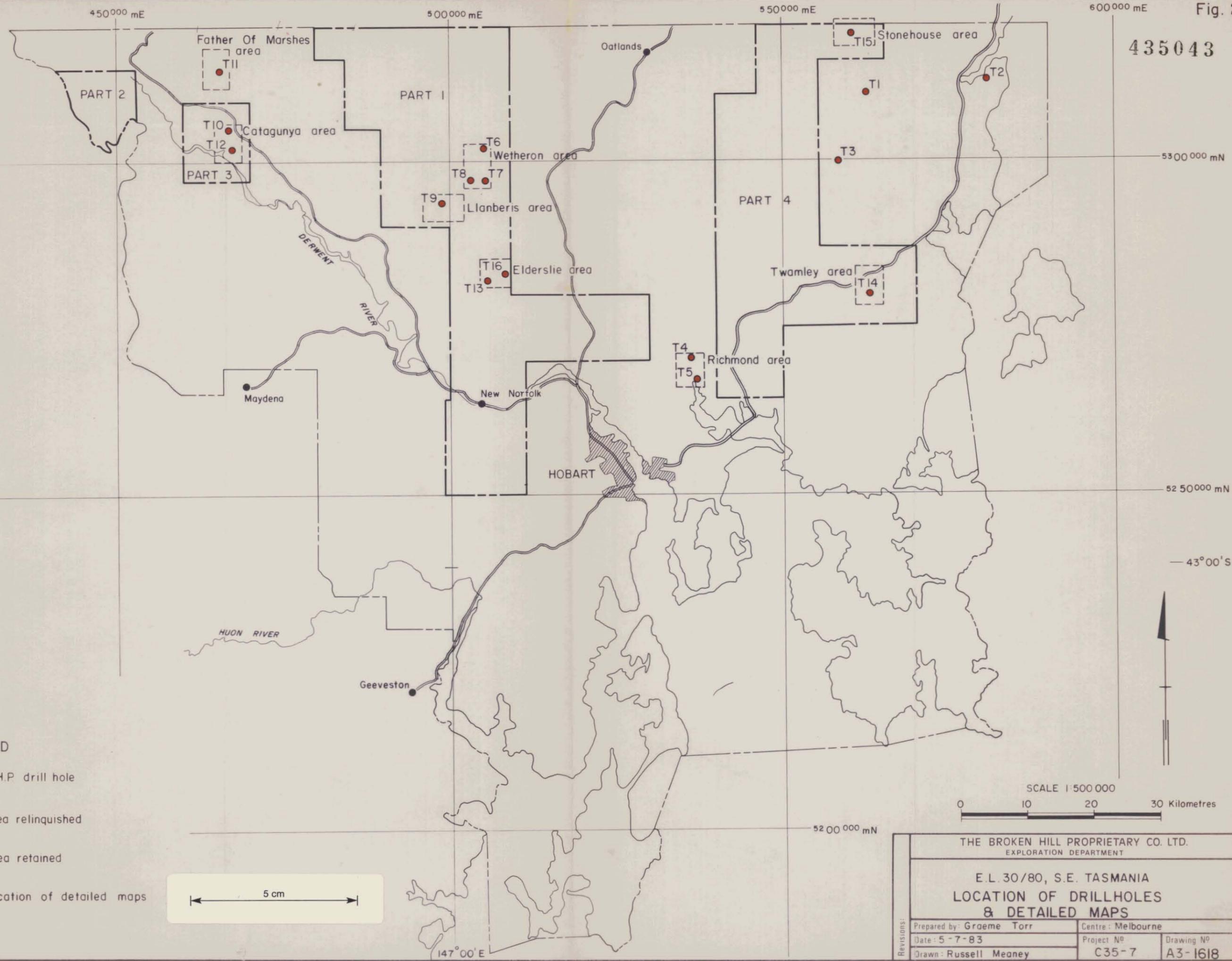
Hand Specimen: Uniform, medium grained sandstone similar to MRL14889 but slight coarser grained and better consolidated. No bedding detectable. Contains flat discordal patches of black material (carbon, graphite), possibly coalified plant remains.

Mineralogy: (D) Quartz; (M) Clay, plagioclase, chlorite; (T) K-feldspar, calcite, ? organic material, biotite.

Description and comments: Tightly packed averagely well sorted grains of quartz, feldspar and lithic fragments in cement of submicroscopic quartz and clay. Grains are subangular to subrounded and mainly fall within the 200 - 600 μ m size range. Traces of sparry calcite cement are present. No bedding or other sedimentary structures are visible. Some ?cellular structure within black coaly patches.

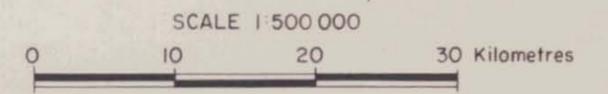
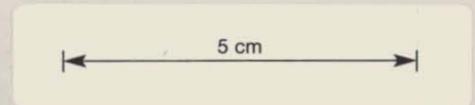
042

435043



LEGEND

- T7 ● B.H.P. drill hole
- Area relinquished
- PART I □ Area retained
- Location of detailed maps



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA LOCATION OF DRILLHOLES & DETAILED MAPS		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 5-7-83	Project No:	Drawing No:
Drawn: Russell Meaney	C35-7	A3-1618

147°00'E