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83-2000

EXPLORATION LICENCE 30/80

SOUTH EAST TASMANIA

REPORT FOR THE SIX MONTHS ENDED 15TH APRIL, 1983

OPEN FILE

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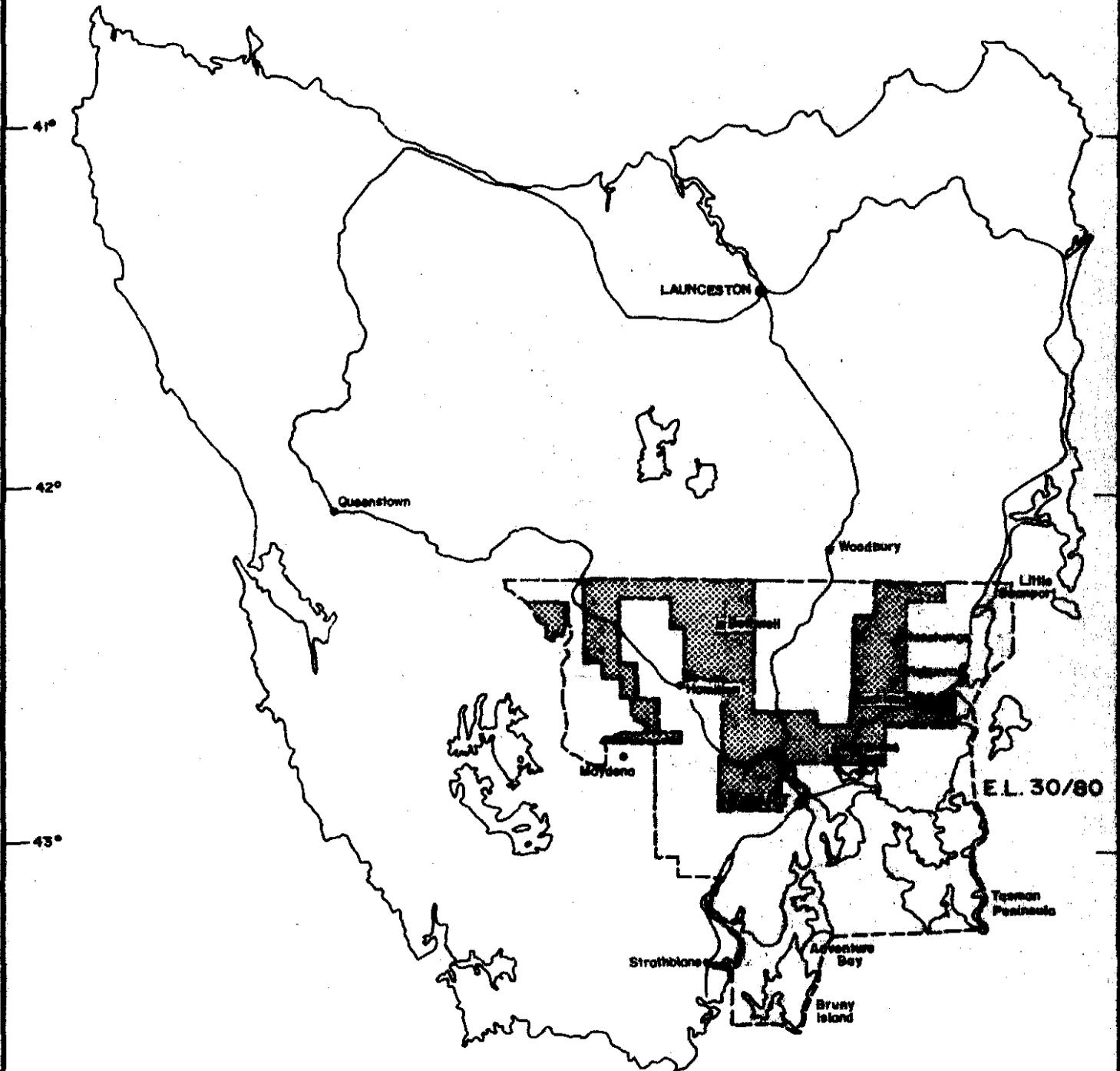
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145°

146°

147°

551005 Fig. 1



EL 30/80 relinquished

" " held for coal, oil and oil shale

5 cm



Centre Melbourne

Date OCT 1981

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

Project No. C350-2

Drawing No. A4-2261

SUMMARY

Exploration for coal in E.L. 30/80 in the six months to 15/4/83 concentrated on the Upper Triassic lithic sandstones. Areas investigated included interpreted grabens in which these coal measures may have been preserved, known areas of lithic sandstones and those discovered by field reconnaissance.

A total of fifteen holes (1183.4 m) was drilled on eight different targets using rotary chip and subordinate diamond coring methods. All holes were sited to test known or potential areas of Upper Triassic for the presence of coal. One hole was sited to test in addition for Tertiary lignite. Drill sites were screened for the possibility of subcropping dolerite using ground magnetics. Most holes were geophysically logged.

Coal seams were intersected in four holes: at Catagunya, Wetheron, Elderslie and Stonehouse. Fourteen seams were intersected, ranging from 0.3 to 3.5 m thick, with five of these exceeding 1.0 m. Included in the thicker seams however, are high proportions of stone bands. Limited quality data (from analyses of four core samples) indicate that the coal is of high to medium volatile bituminous rank, with ash ranging from 27.3 to 38.3%, sulphur 0.34 to 0.50% and gross specific energy 20.26 to 22.76 MJ/kg (all on dry basis).

Emphasis in exploration will shift from the Upper Triassic to Permian. The Permian is poorly known within the E.L. and a number of areas are being mapped. Several fully cored stratigraphic drill holes are being planned.

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.

The Department of Mines introduced new regulations on 1st July, 1982, governing the size of E.Ls, rentals, expenditure commitments and length of tenure. Approval was given for continuance of BHP's programme under the old conditions until 15th October, 1982, because the new regulations entail high rentals and the introduction of expenditure commitments.

E.L. 30/80 was renewed for six months to 15th April, 1983 with a reduction in size to 3273 sq. km. comprising two parts (Fig. 1). This report covers work done in that period.

The licence has subsequently been renewed for another 12 months to 15th April, 1984, with a further reduction in area to 2480 sq. km. in four separate parts (Fig. 2).

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

2. EXPLORATION PHILOSOPHY - TRIASSIC

Soon after E.L. 30/80 was granted, it was decided to drill three wildcat holes to test for Upper Triassic coal measures. The holes were drilled in the northeast portion of the E.L., which was poorly mapped, and were sited so as to be high in the Triassic sequence. Only Middle Triassic quartzose sandstones and mudstones were intersected by the drilling. No coal was found.

Since then, the programme up to and including the current period has been designed firstly to eliminate a large portion of the E.L. from further exploration, and secondly to define and drill targets for coal exploration in the area remaining. Attention has been given to both Triassic and Permian coal.

The initial drilling had shown that large areas of Upper Triassic lithic sandstones are likely to have been removed by erosion unless preserved either by downward block faulting, as at Woodbury, or by dolerite or basalt cover. Exploration was then 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.

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.

Exploration will concentrate on developing a regional concept of lithologies and depositional environments for the Permian. To this end, a programme of fully cored stratigraphic drill holes is being planned.

4. SUMMARY OF PREVIOUS WORK

- i) Literature survey and review of available data.
- ii) Drilling of three scout diamond drill holes, T1, T2 and T3 (52.0, 83.0 and 98.3 metres respectively) in the Buckland - Little Swanport area.
- iii) Sampling and analysis of selected intervals of drill core.
- iv) Petrographic examination of seven core samples from drill hole T3.
- v) Reassessment of the potential of the Permo - Triassic sequence in E.L. 30/80 for coal. Consultation with officers of the Department of Mines. Field Reconnaissance.
- vi) Photo-interpretation of three portions of the northern half of the original E.L.
- vii) Field checking of the photo-interpretation and of possible drilling targets.
- viii) Plotting of ground water bore and other drilling data including surface lithology and coal intersections.
- ix) Reduction in size of the original E.L. to 3273 sq. km.

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

5. WORK DURING THE SIX MONTHS ENDED 15th APRIL, 1983

- i) Continuing acquisition and compilation of data, including discussions with Department of Mines staff and plotting of H.E.C. bore hole and tunnel geological information for the north-west part of the E.L.
- ii) Field inspection of Triassic areas and of photogeological features. Formal mapping was not undertaken. The objectives were firstly to check whether Upper Triassic strata were present, or if there was room for such strata to sub-crop and secondly to check on the suitability of those targets which had not been at this stage rejected, for the siting of drill sites.
- iii) Ground magnetics over proposed drill sites. In several cases, holes were resited so as to avoid intersecting possible dolerite bodies indicated by the magnetics. As a result, dolerite was not encountered in any drill hole. (See Appendix 1.1. for details of the survey.
- iv) Drilling of 15 holes totalling 1183.4 metres (holes T4 to T16, plus T7A and T10A). Drilling methods are outlined in Appendix 1.2. Coordinates and total depths of all holes to date are presented in Table 1 and detailed written logs in Appendix 2.

Some of the holes were sited to test for the presence of Upper Triassic lithic sandstones and others were to test a known lithic sequence for the presence of coal. One hole (T4 at Richmond) was also sited to test for lignite in overlying Tertiary sediments.

- v) Eleven of the holes were geophysically logged. Methods and comments on the results are given in Appendix 1.3.
- vi) Five examples of drill core were submitted for proximate analysis, total moisture, specific energy, total sulphur and total dissolved solids (Table 2). For methods, see Appendix 1.4.
- vii) An area of Permian rocks to the north-west of Bothwell was mapped. Other Permian areas were reconnoitred and drill sites are being investigated. An attempt was made to walk into Part II of the E.L. from a track leading south from the Clark Dam on Lake King William. The trip was aborted because of the thick teatree scrub and other means of access are being considered.

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

6. DETAILS OF DRILLING TARGETS

6.1 FATHER OF MARSHES (Figs 3, 4).

Rationale. A northwesterly trending graben, 2 km wide, was recognised from photointerpretation. The structure lies along the same trend as the wider Derwent Valley graben, further southeast, in which Upper Triassic coal occurs at Lawrenny and Macquarie Plains. The objective was to test for Upper Triassic lithic sandstones.

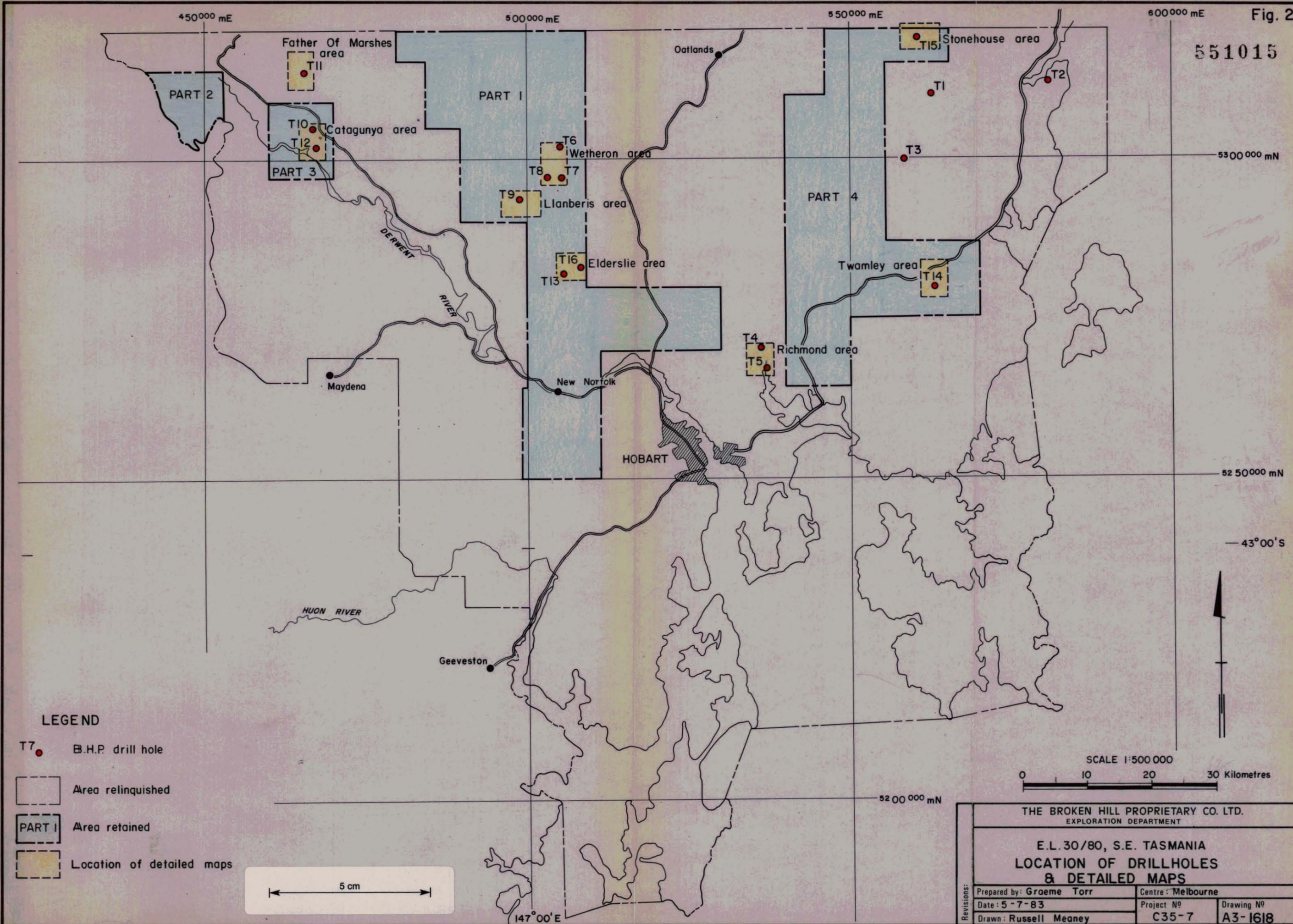
Drill Site. Reconnaissance showed that much of the structure was infilled by dolerite, but there remains a flat, marshy area approximately 4 x 1 km. No outcrop at all was found on the marsh, but it is flanked by hills of dolerite to the southwest, and basalt to the northeast. There was considered to be potential for subcropping Triassic sediments, which could also extend beneath the dolerite along the structure. Two sites were selected, but only one was drilled.

Magnetics. A dolerite body was interpreted to underlie the marsh at about 80 m depth which allows for sufficient thickness of sedimentary rocks.

Results. T11 intersected peat and unconsolidated sands to 12 m. The remainder of the hole to 70 m was through quartz-mica siltstones and fine sandstones, probably of middle Triassic age (Rm of Forsythe et al 1976. Similar multicoloured lutites were found in T5 and T6.

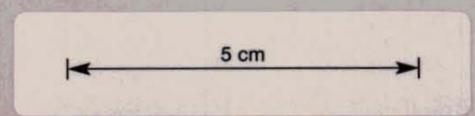
Recommendations. No Upper Triassic sediments were intersected and there is no reason for additional work.

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LEGEND

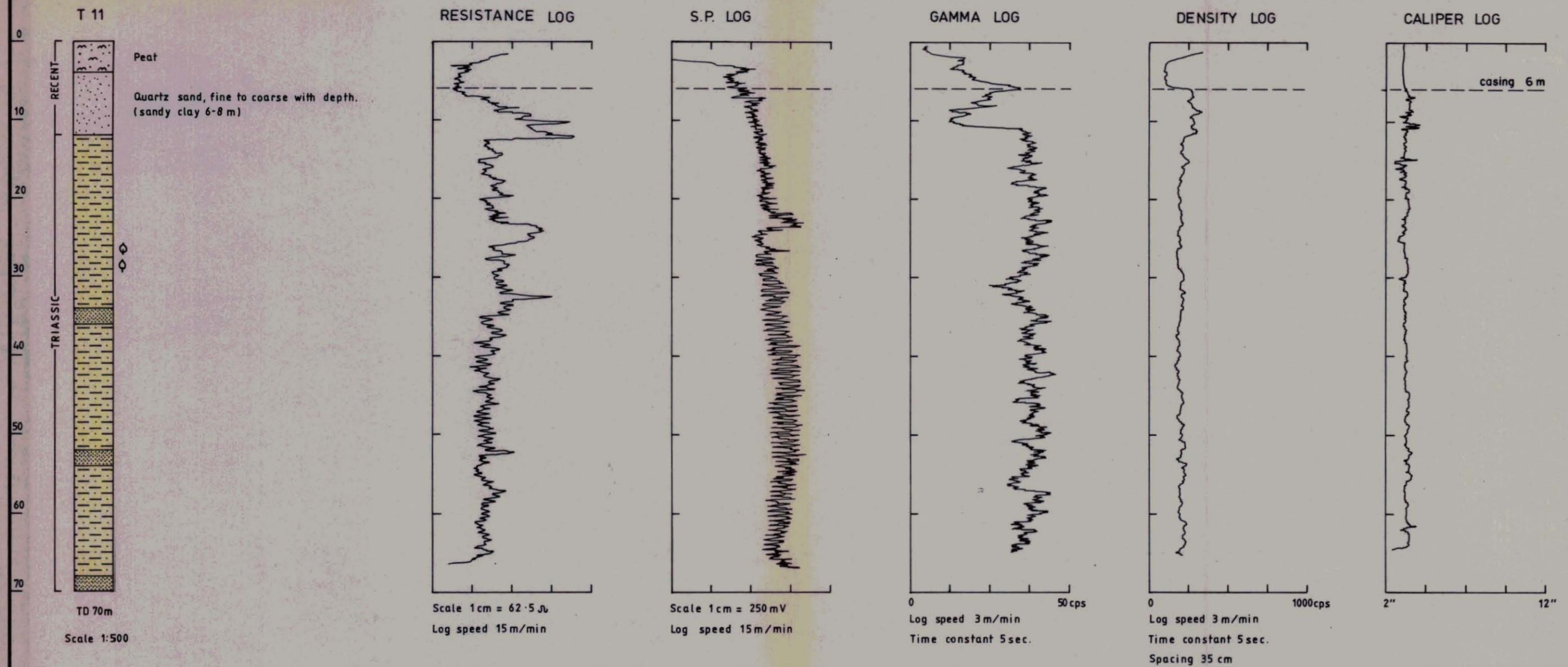
- T7 ● B.H.P. drill hole
- Area relinquished
- PART I Area retained
- Location of detailed maps



SCALE 1:500 000
 0 10 20 30 Kilometres

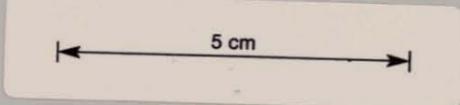
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA LOCATION OF DRILLHOLES & DETAILED MAPS		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 5-7-83	Project No	Drawing No
Drawn: Russell Meaney	C35-7	A3-1618

147°00'E

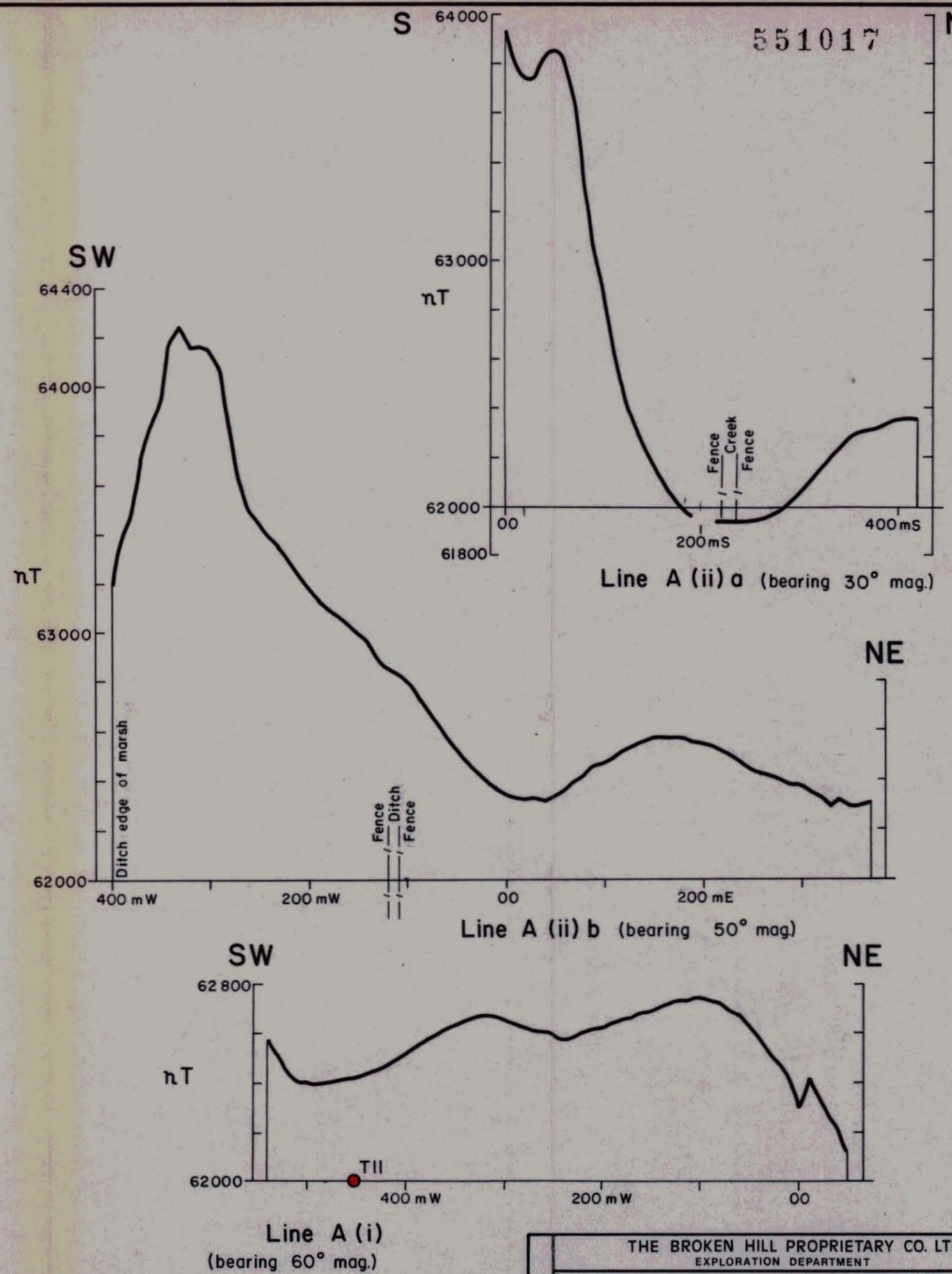
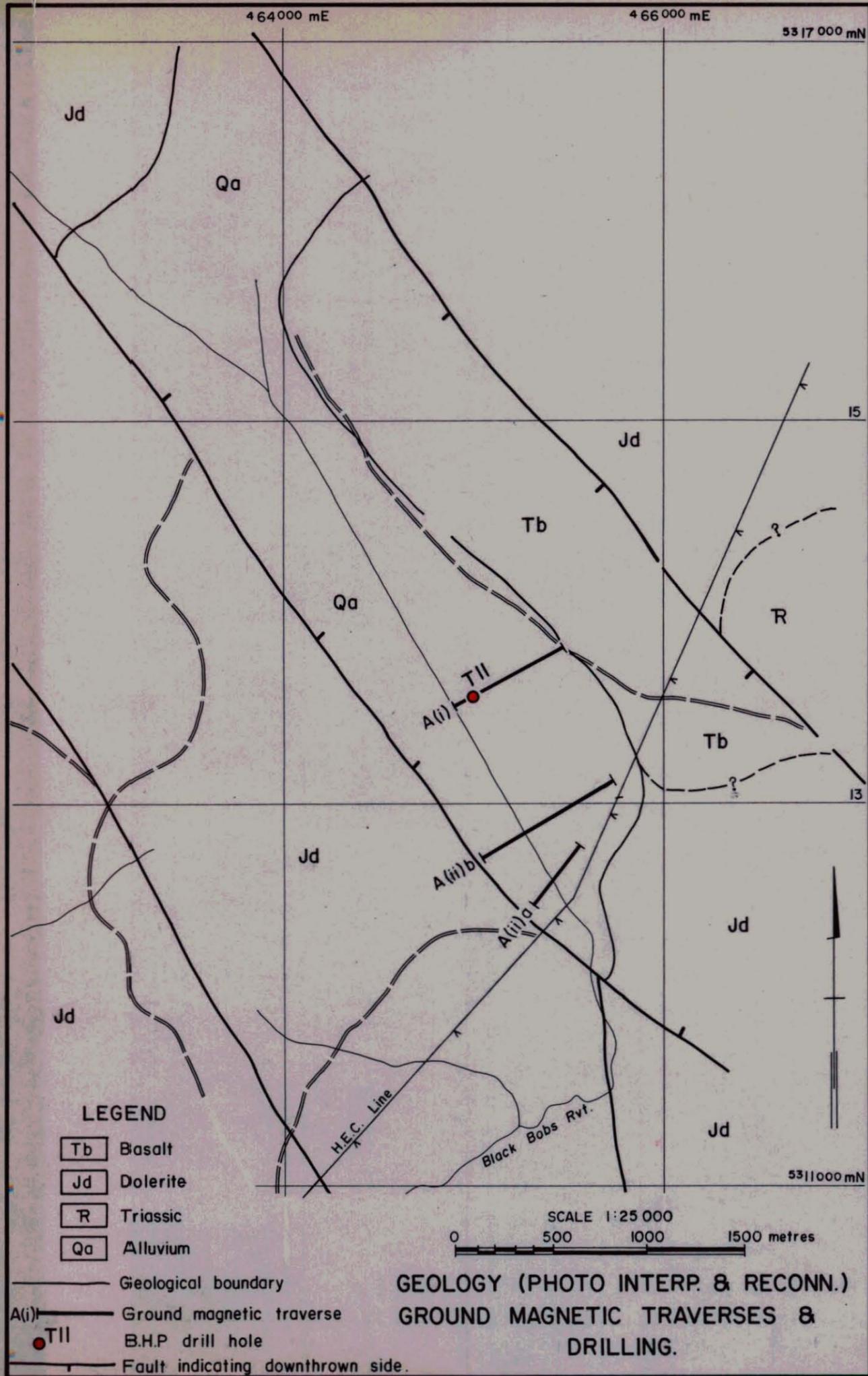


LOGGED 14/3/83

-  Peat
-  Quartz sand
-  Quartz suite
-  Siltstone
-  Very fine sandstone
-  Plant fossils



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T11 GRAPHIC AND GEOPHYSICAL LOGS		
Revisions: Prepared by: G. TORR Date: 16/6/83 Drawn: A. HANSEN	Centre: HOBART Project No C35-8	Drawing No A3-1619/1



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA FATHER OF MARSHES AREA GROUND MAG. PROFILES & GEOLOGY		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 23-6-83	Project No: C35-19	Drawing No: A3-1620/1
Drawn: Russell Meaney		

6.2 CATAGUNYA (Figs 5, 6, 7).

Rationale. Published geological mapping (Gulline & Forsythe, 1976) shows a small window of undifferentiated Triassic near the southern end of the Catagunya Dam access road, with basalt covering the intervening area between there and the Lyell Highway.

Photointerpretation suggested that the access road runs entirely over the same "soft sedimentary rock" which is known near the southern end and that basalt is restricted to hills on either side. Upper Triassic coal measures are shown on the published map sheet to occur at Wayatinah and along the Derwent Valley near Ouse. Lithic sandstones crop out on the western bank of the Meadowbank Dam at Dunrobin Bridge. In addition, 0.1 m of coal was recorded in a tunnel investigation hole about 4 km southeast of the Catagunya access road (unpublished H.E.C. data).

Field inspection showed that the "undifferentiated" Triassic exposure was in fact very fine-grained lithic or quartz-lithic sandstone. Some fragments of zeolitized plant remains were found.

Drill Sites. Two sites were drilled. T10 was to test the part of the area previously mapped as basalt. Dolerite and basalt scree is common there but no sedimentary rocks were seen. T12 was sited in the southern part of the area where lithic sandstones crop out. Half way between the two sites, there is a patch of rubble consisting of hard silicified conglomerate, presumably a silcrete related to the basalt. Both sites are in moderately hilly, open farming land.

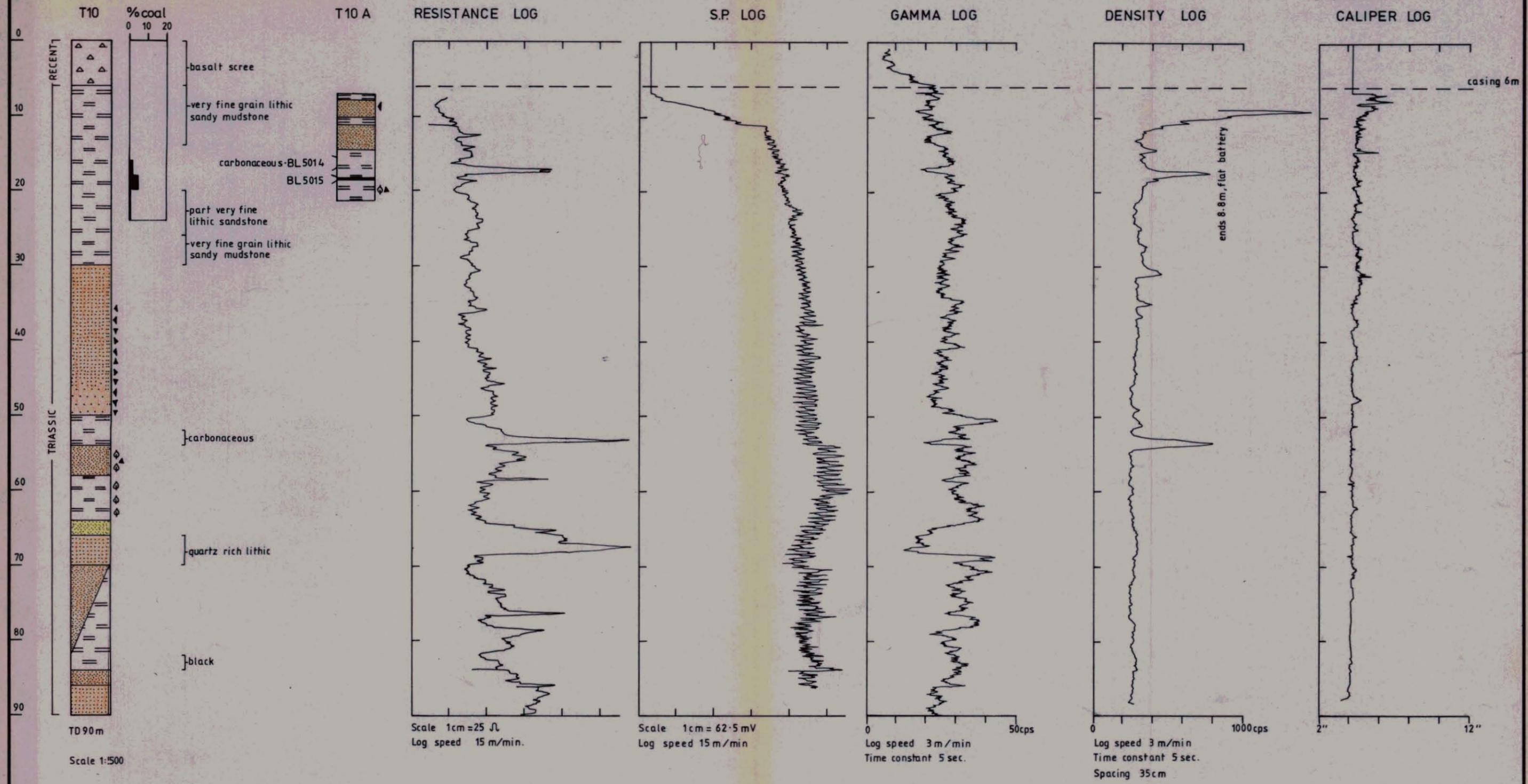
- 10 -

Magnetics. Seven lines were read. Both holes were resited so as to avoid distinct anomalies consistent with sub-cropping dolerite. Anomalously low readings were obtained when approaching the basalt, which are probably attributable to remnant magnetism.

Results. T10 drilled through lithic sandstones and mudstones beneath 6m basalt scree, to 90m depth. Two coal seams were intersected. T10A was drilled 1 m from T10 to obtain core of the upper seam.

T12 drilled through lithic sandstones and siltstones. No coal was intersected. The presence of siltstones, rather than mudstones, suggests that T12 drilled lower in the sequence than T10. The collar of T12 is 100 m lower than that of T10 and if the beds are relatively shallow-dipping, this idea would be supported.

Recommendation. This portion of the E.L. should be retained and follow up work considered.

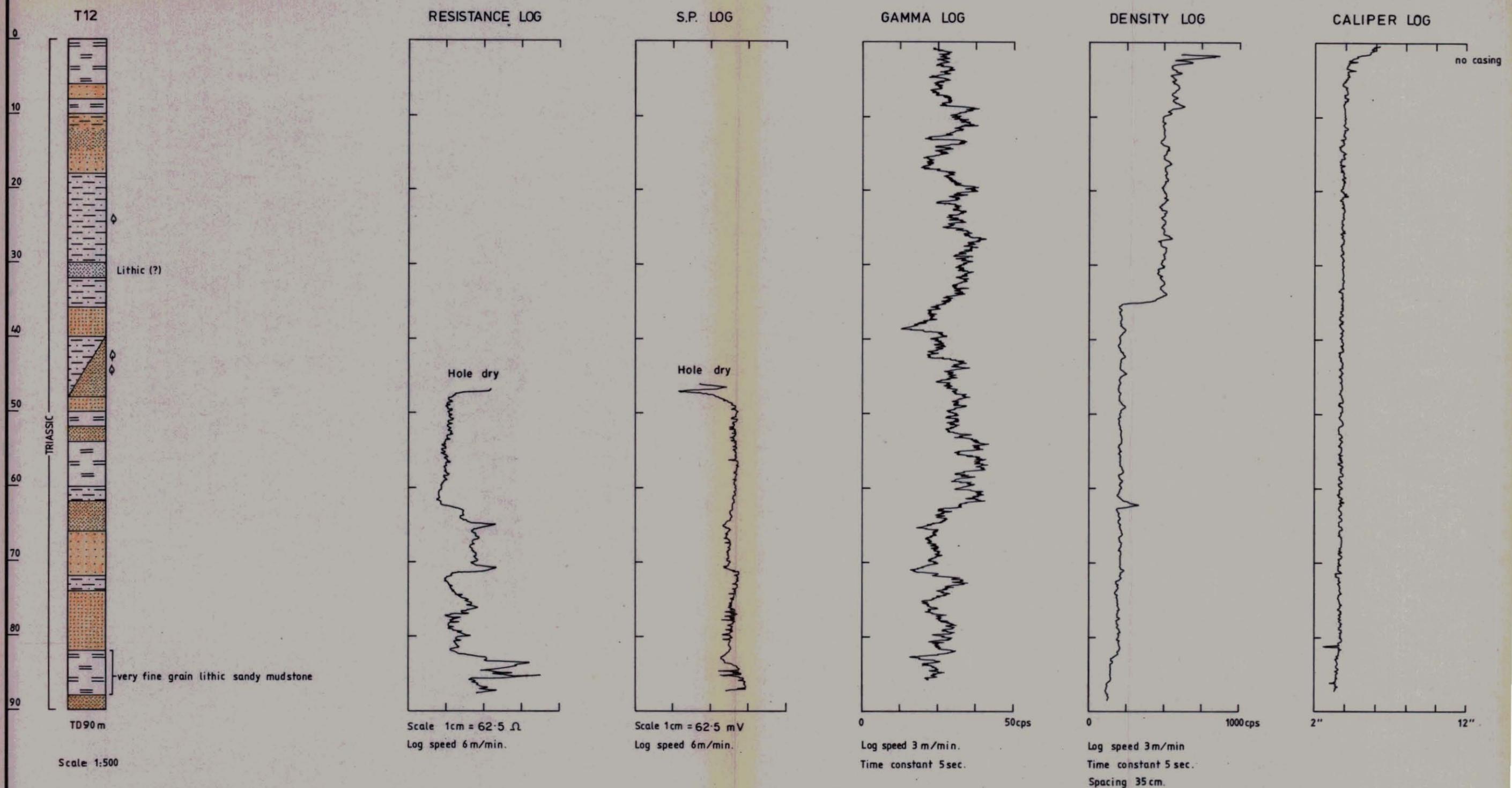


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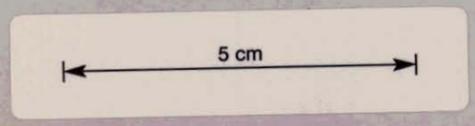
- Basalt scree
- Fine sandstone
- Lithic suite
- Plant fossils
- Mudstone
- Medium sandstone
- Quartz suite
- coal fragments
- Very fine sandstone
- Coal seam

5 cm

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EL 30/80 TASMANIA DRILL HOLES T10, T10 A GRAPHIC AND GEOPHYSICAL LOGS		
Prepared by: G. TORR	Centre: HOBART	
Date: 23/5/83	Project No:	Drawing No:
Drawn: A. HANSEN	C35-9	A3-1619/2



- Mudstone
- Siltstone
- Very fine sandstone
- Fine sandstone
- Medium sandstone
- Plant fossils
- Lithic suite
- Quartz suite



LOGGED 14/3/83

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT			
EL 30/80 TASMANIA DRILL HOLE T12 GRAPHIC AND GEOPHYSICAL LOGS			
Revisions:	Prepared by: G. TORR	Centre: HOBART	
	Date: 1/6/83	Project No	Drawing No
	Drawn: A. HANSEN	C35-10	A3-1619/3

- 11 -

6.3 WETHERON (Figs 8, 9, 10, 11).

Rationale. Several small scattered outcrops of Upper Triassic coal measures (Rg) are shown on the published geological map (Forsythe et al, 1976). Although these could be merely rafted blocks in the surrounding dolerite, drilling was designed to establish their depth extent. If these blocks proved to be in the order of 100 m thick, then some weight would be given to the possibility that they represent a continuous sheet of lithic sandstones overlain by dolerite. Large patches of scree surrounding some of these outcrops could mask the actual contacts of these sediments with the dolerite.

A small gravity low (- 3 milligals) coinciding with one of the outcrops, indicated that the underlying rocks could be sedimentary, rather than dolerite, to a considerable depth. This was tested by hole T6.

A thin outcrop of weathered coal is exposed in a creek between holes T7 and T8. All three holes were drilled to test for coal seams.

Drill Sites. All holes were drilled in quite hilly, open farming land, and all are close to dolerite outcrops. T6 was sited on dolerite scree, T7 on outcrop of lithic sandstone and T8 close to very poor outcrop of lithic sandstone.

Magnetics. The contact with dolerite showed up clearly on lines run across all three sites.

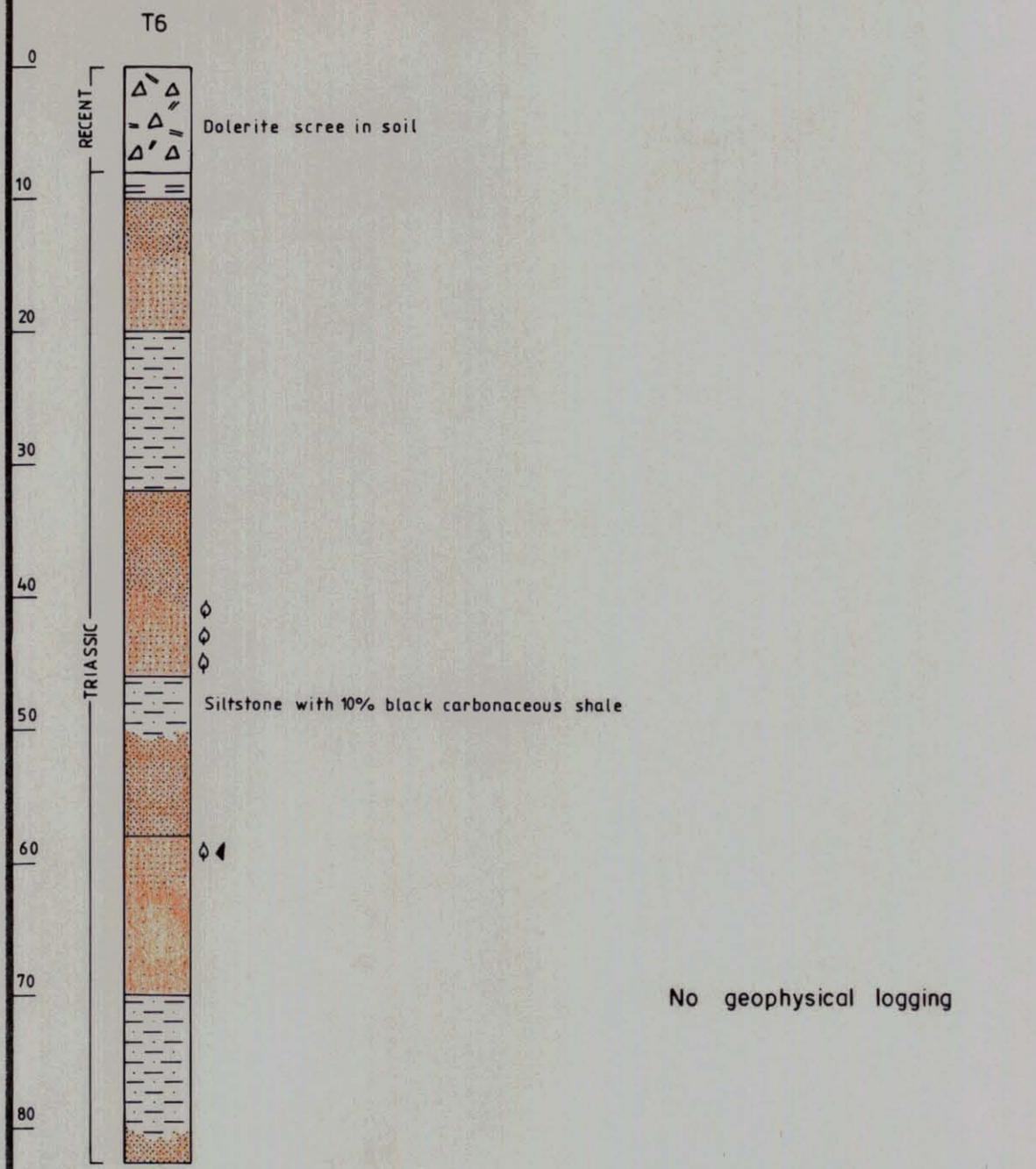
- 12 -

Results. T6 intersected Upper Triassic lithic sandstones and siltstones distributed in several fining upward cycles. Only traces of coal were noted. The lithology suggests that the hole might be too low in the lithic sequence for thick coal seams to be expected (similar to T12).

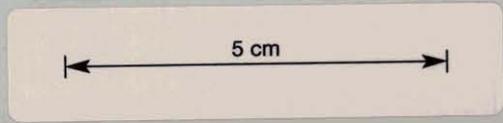
T7 drilled through Upper Triassic lithic sandstones and mudstones and intersected six coal seams, including one within the top 3 m. Lithologically the hole is similar to T10. T7A was drilled 1m from T7 to obtain core of the upper three seams.

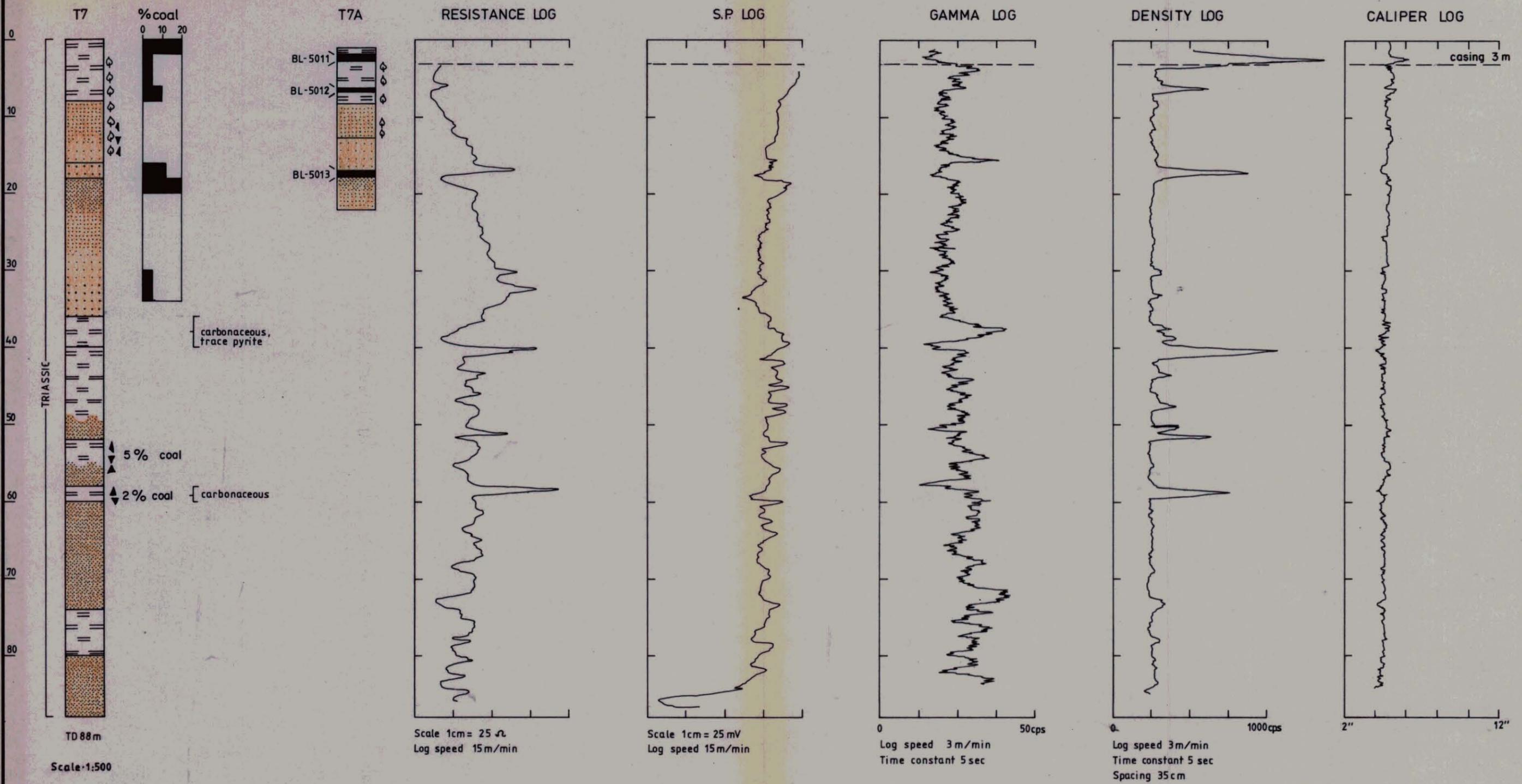
T8 failed to find coal seams although fragments were noted in places. Lithic sandstones and mudstones are interbedded with siltstones, increasingly so towards the bottom. The stratigraphic position might be similar to that of T6.

Recommendation. Coal seams may extend beneath dolerite north and south from T7. Further work, including mapping, should be considered.



- | | | |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|  Dolerite scree |  Very fine sandstone |  Lithic suite |
|  Mudstone |  Fine sandstone |  Coal fragments |
|  Siltstone |  Medium sandstone |  Plant fossils |

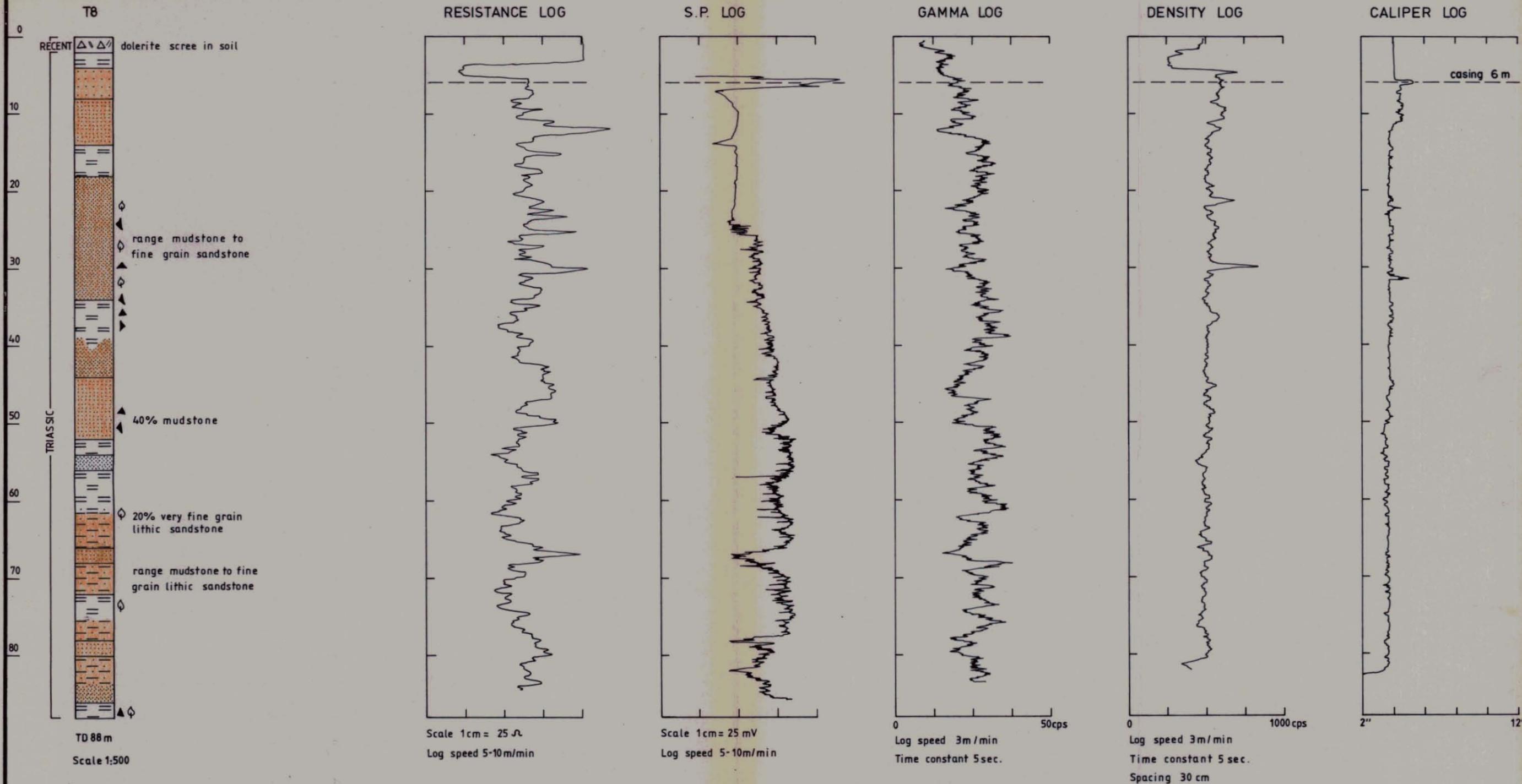




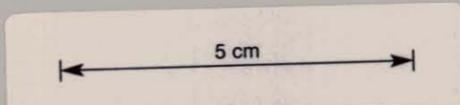
- Mudstone
- Very fine sandstone
- Fine sandstone
- Medium sandstone
- Coarse sandstone
- Coal seam
- Lithic suite
- Quartz suite
- Plant fossils
- Coal fragments

LOGGED 1/3/83

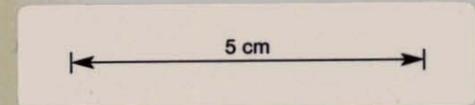
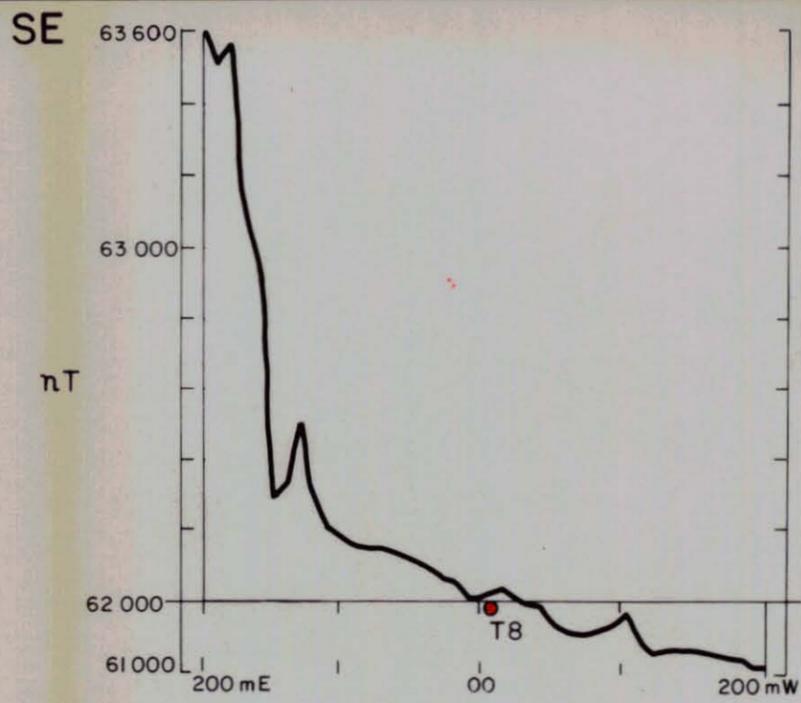
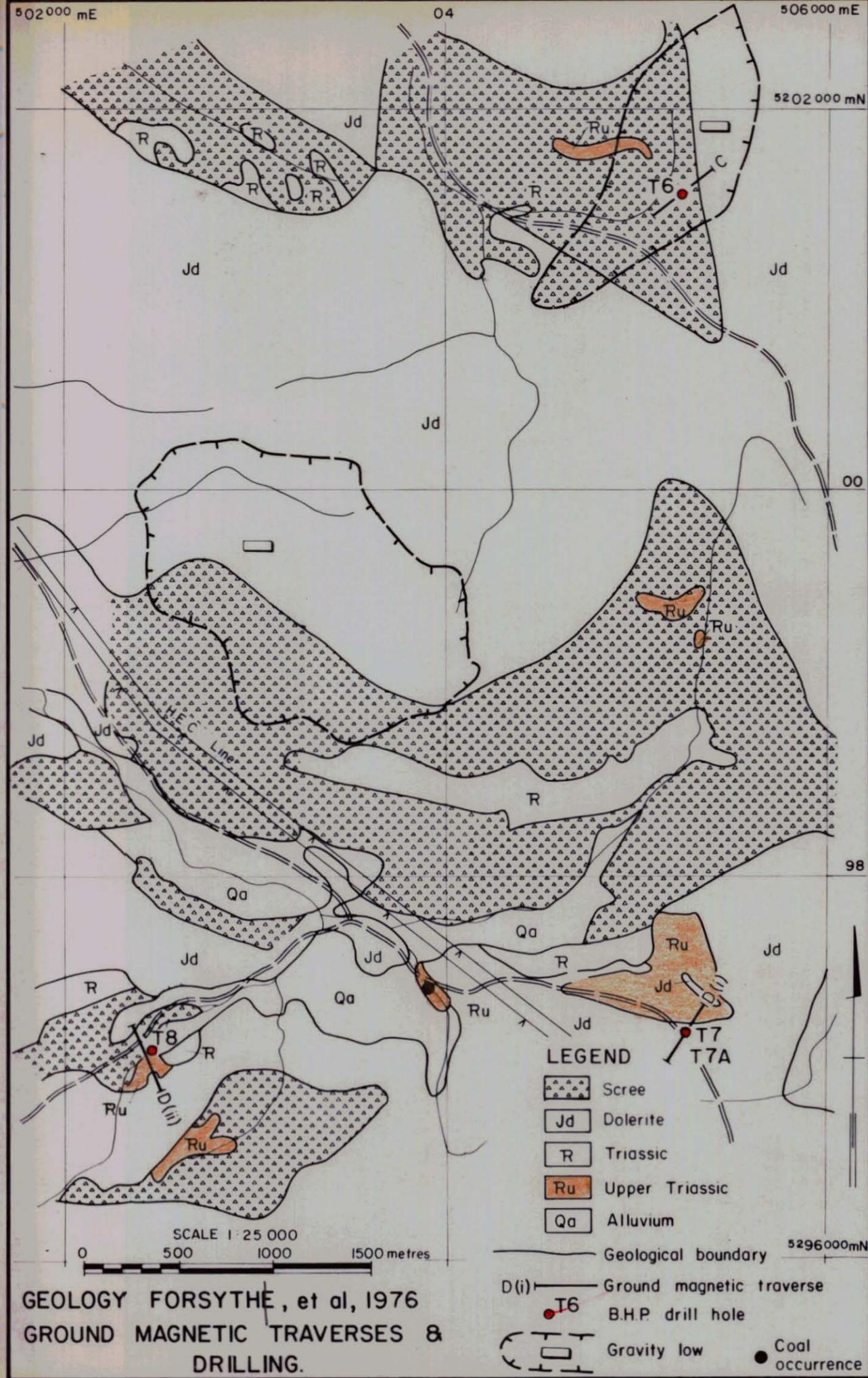
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLES T7, T7A GRAPHIC AND GEOPHYSICAL LOGS		
Revisions:	Prepared by: G. TORR	Centre: HOBART
	Date: 30/5/83	Project No
	Drawn: A. HANSEN	C35-11
		Drawing No A3-1619/4



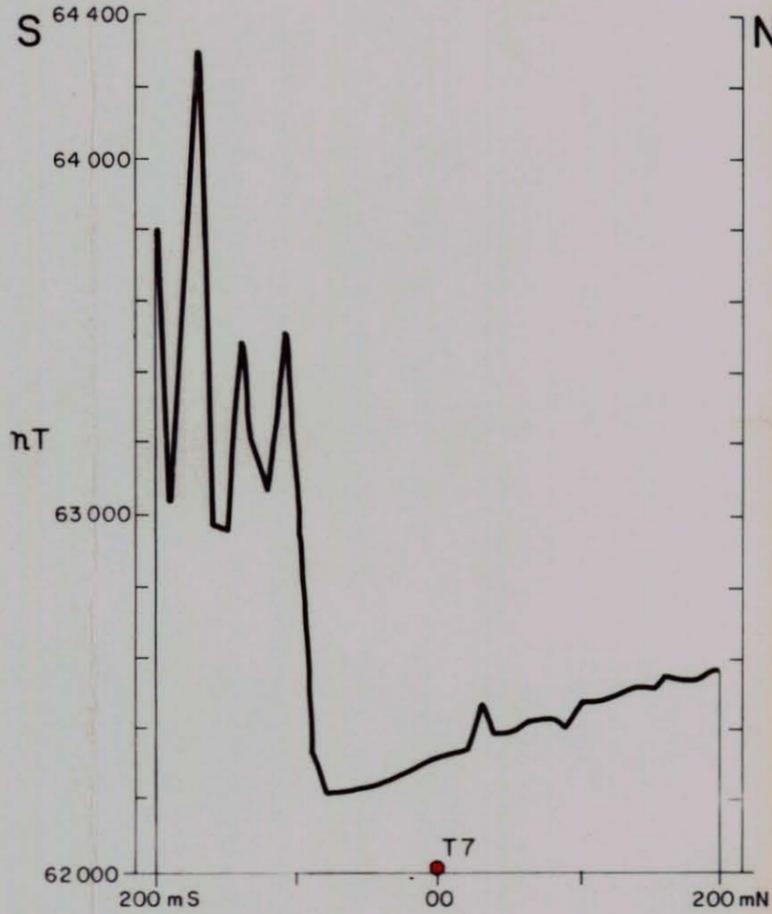
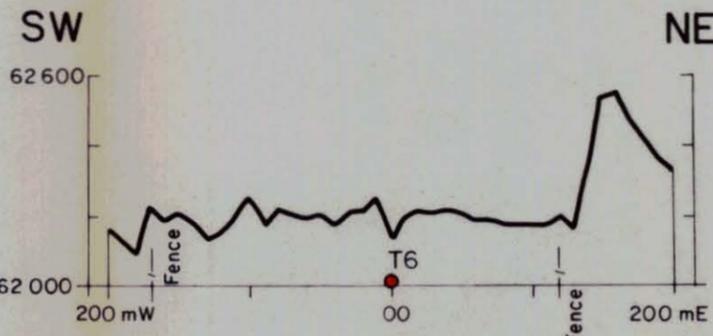
- | | | | | | |
|--|------------------------|--|---------------------------|--|----------------|
| | dolerite scree in soil | | very fine grain sandstone | | lithic suite |
| | mudstone | | fine grain sandstone | | coal fragments |
| | siltstone | | medium sandstone | | plant fossils |



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EL 30/80 TASMANIA DRILL HOLE T8 GRAPHIC AND GEOPHYSICAL LOGS			
Revisions:	Prepared by : G. TORR	Centre : HOBART	
	Date : 7/6/83	Project No.	Drawing No.
	Drawn : A. HANSEN	C 35 - 12	A3-1619/5



Horizontal scale 1:5000



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA WETHERON AREA		
GROUND MAG. PROFILES & GEOLOGY		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 28-6-83	Project No	Drawing No
Drawn: Russell Meaney	C 35-20	A3-1620/2

6.4 LLANBERIS (Figs 12, 13).

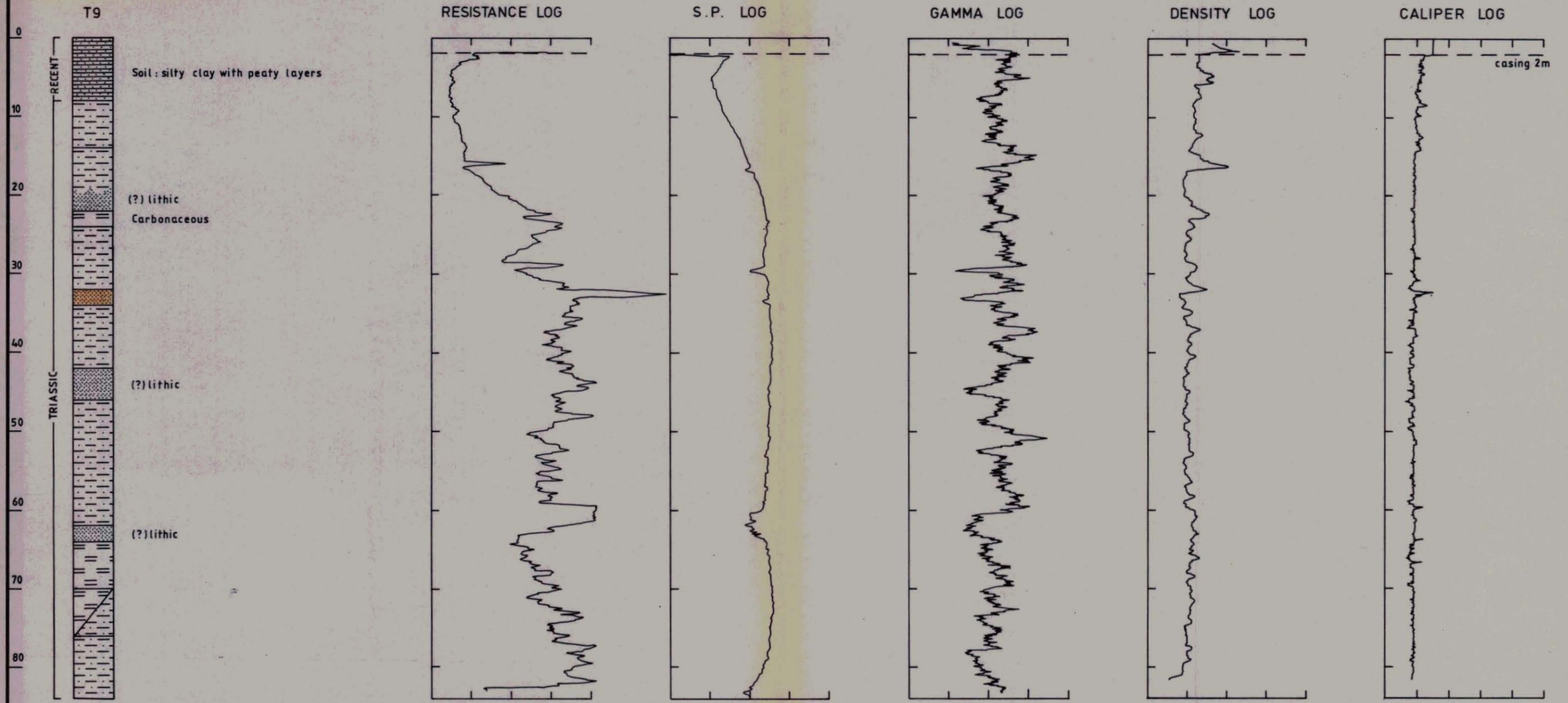
Rationale. Photointerpretation suggested a northwesterly trending graben, 1 1/2 km wide. Geology at the southeastern end of this structure is shown on the published geological map (Leaman & Legge, 1975) as undifferentiated (non-lithic) Triassic sediments. Field inspection showed rubbly outcrop of quartz sandstones 1 km east of the drill site. However, it was considered worthwhile testing the central-northwestern portion of the graben, where no outcrop was found, for Upper Triassic coal measures.

Drill Site. T9 was sited on open, flat farming land.

Magnetics. Three lines were read and the drill site was shifted 200 m southwest to avoid a slight anomaly which could have been attributed to a dolerite body at depth.

Results. T9 encountered siltstones, predominantly, with lesser amounts of very fine sandstone and mudstone (in part carbonaceous). These sediments are probably Middle Triassic (Rm of Forsythe et al, 1976) and thus too low in the sequence for coal measures.

Recommendation. No further work is required.



TD84m
Scale 1:500

Scale 1cm = 25 Ω
Log speed 15m/min

Scale 1cm = 62.5 mV
Log speed 15m/min

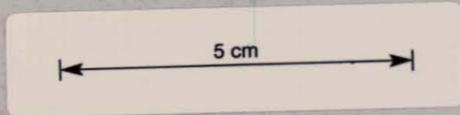
0 50cps
Log speed 3 m/min
Time constant 5 sec.

0 1000cps.
Log speed 3m/min
Time constant 5 sec.
Spacing 35 cm

2" 12"

LOGGED 10/3/83

-  soil
-  mudstone
-  lithic suite
-  siltstone
-  very fine sandstone



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT			
EL 30/80 TASMANIA DRILL HOLE T9 GRAPHIC AND GEOPHYSICAL LOGS			
Revisions:	Prepared by: G. TORR	Centre: HOBART	
	Date: 15/6/83	Project No:	Drawing No:
	Drawn: A. HANSEN	C35-13	A3-1619/6

6.5 ELDERSLIE (Figs 14, 15 16).

Rationale. Two areas mapped as Upper Triassic lithic sandstones (Leaman & Legge, 1975) were tested. These areas lie on opposite sides of the Jordan River, and on the northern margin of a large dolerite mass which extends south to Mount Dromedary. There is a good exposure of lithic sandstones, with minor lenses of coal, in the road cutting at Elderslie itself. The strata exposed dip at 5 to 15° WSW.

The western of these two areas also lies at the southern end of a photointerpreted graben, 2 km wide.

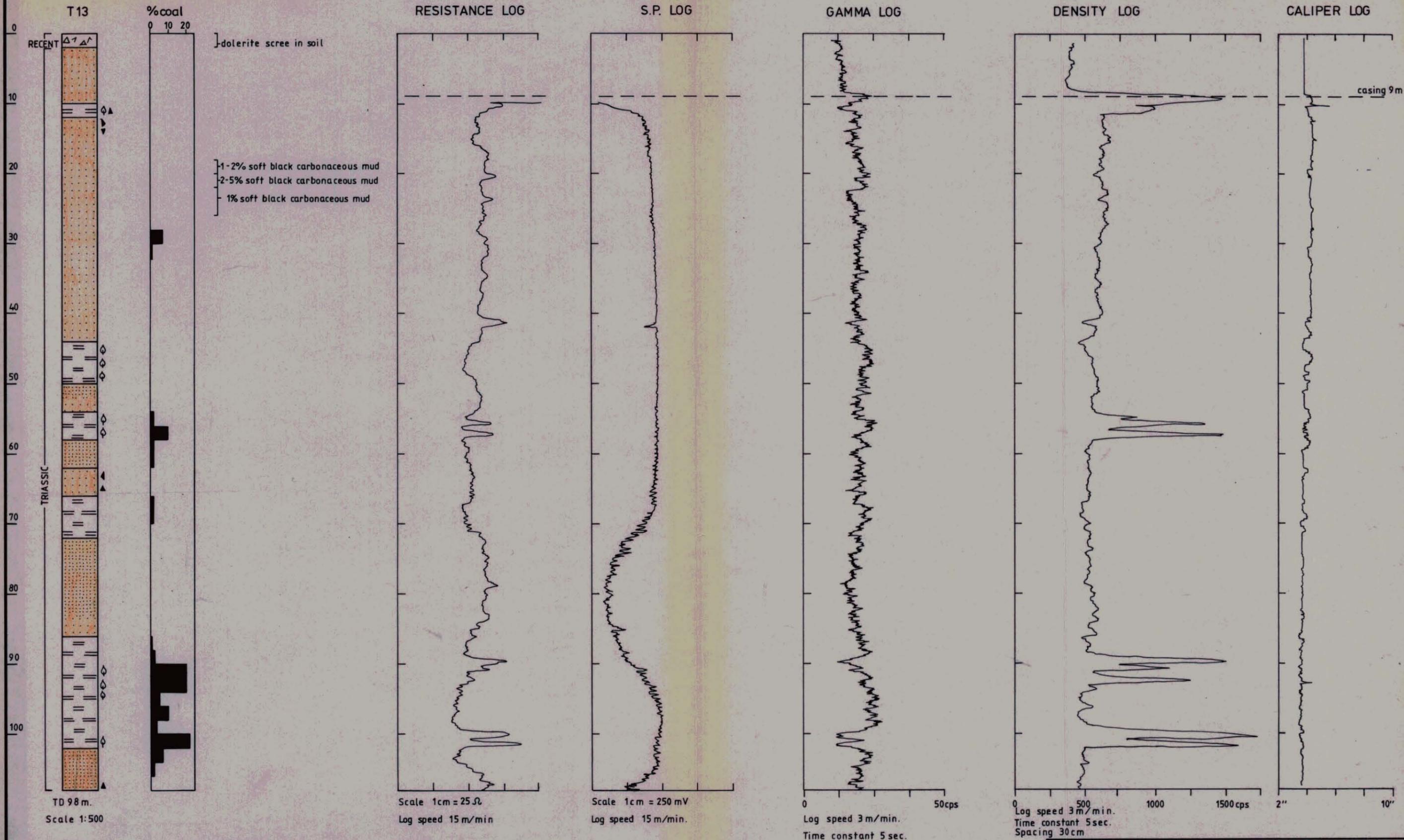
Drill Sites. The two areas were both drilled. Both sites are on hill slopes in open farmland. No outcrop was noted at either site. Rubble of both dolerite and petrified wood is common. The holes were drilled to test for coal seams in known coal measures.

Magnetics. Dolerite showed up distinctly on lines run across both sites. The contact was placed further uphill to the west from T13. Dolerite was detected at the eastern end of this line where it ran across the road to the alluvial flat.

Results. T13 drilled through thick sequences of fine to medium grained Upper Triassic lithic sandstones and mudstones. Three multiple-ply seams of coal were intersected, all deeper than 50 m.

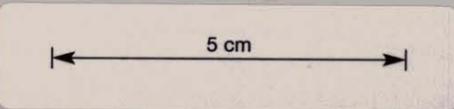
T16 however, apparently drilled through the boundary between the lowermost lithic sandstone and underlying siltstones. No coal was found.

Recommendations. For any large development of coal, exploration should be continued to the south beneath the dolerite. Further work, including mapping and geophysics should be planned. Exploration should be designed to determine if the multiple seams intersected could grade laterally into single seams, each in the order of 2 to 3 metres thick.

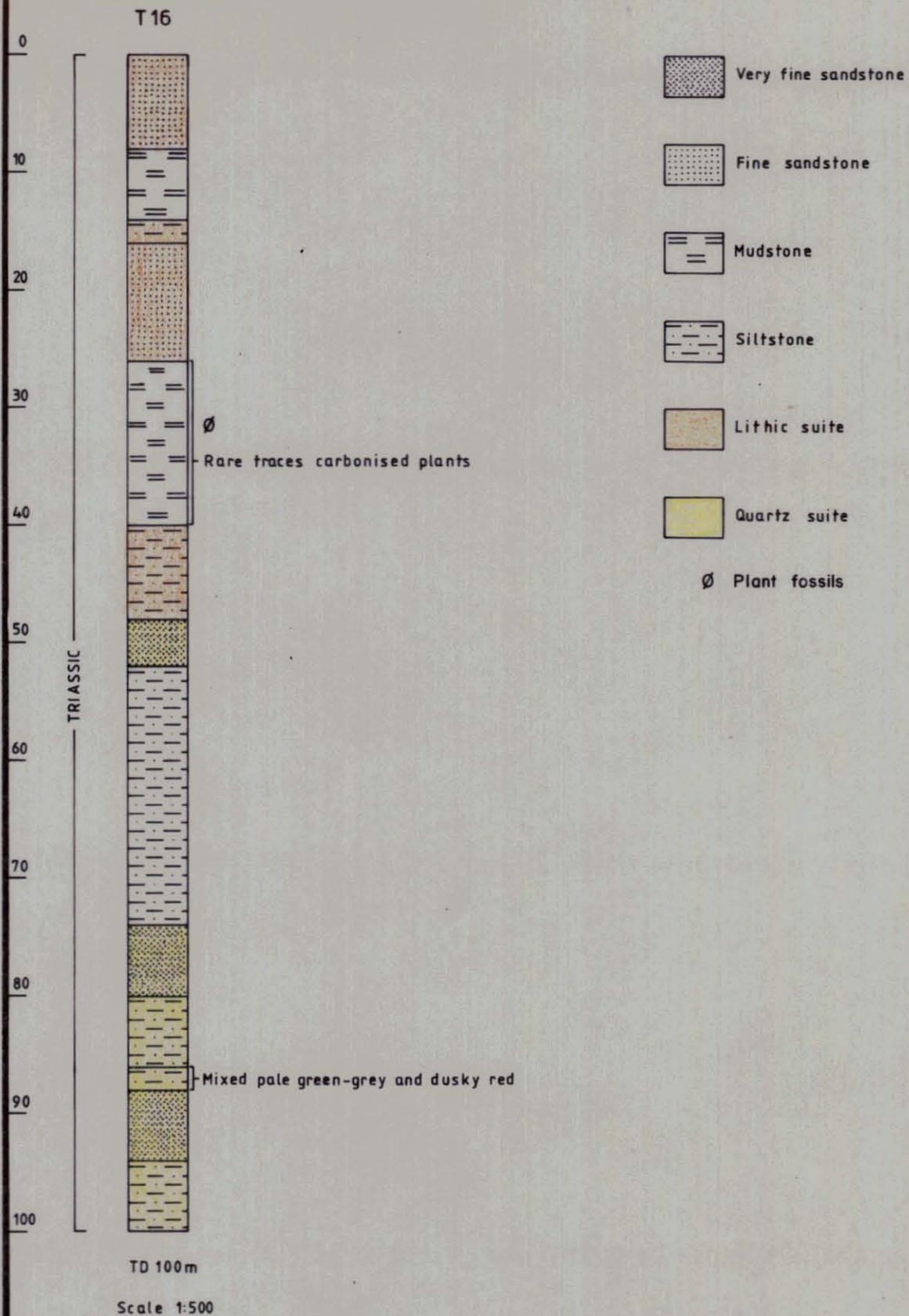


- Dolerite scree in soil
- Medium sandstone
- Coal seam
- Mudstone
- Lithic suite
- Plant fossils
- Fine sandstone
- Quartz suite
- Coal fragments

LOGGED 18/3/83



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T13 GRAPHIC AND GEOPHYSICAL LOGS		
Revisions:	Prepared by: G. TORR Date: 30/5/83 Drawn: A. HANSEN	Centre: HOBART Project No: C35-14 Drawing No: A3-1619/7



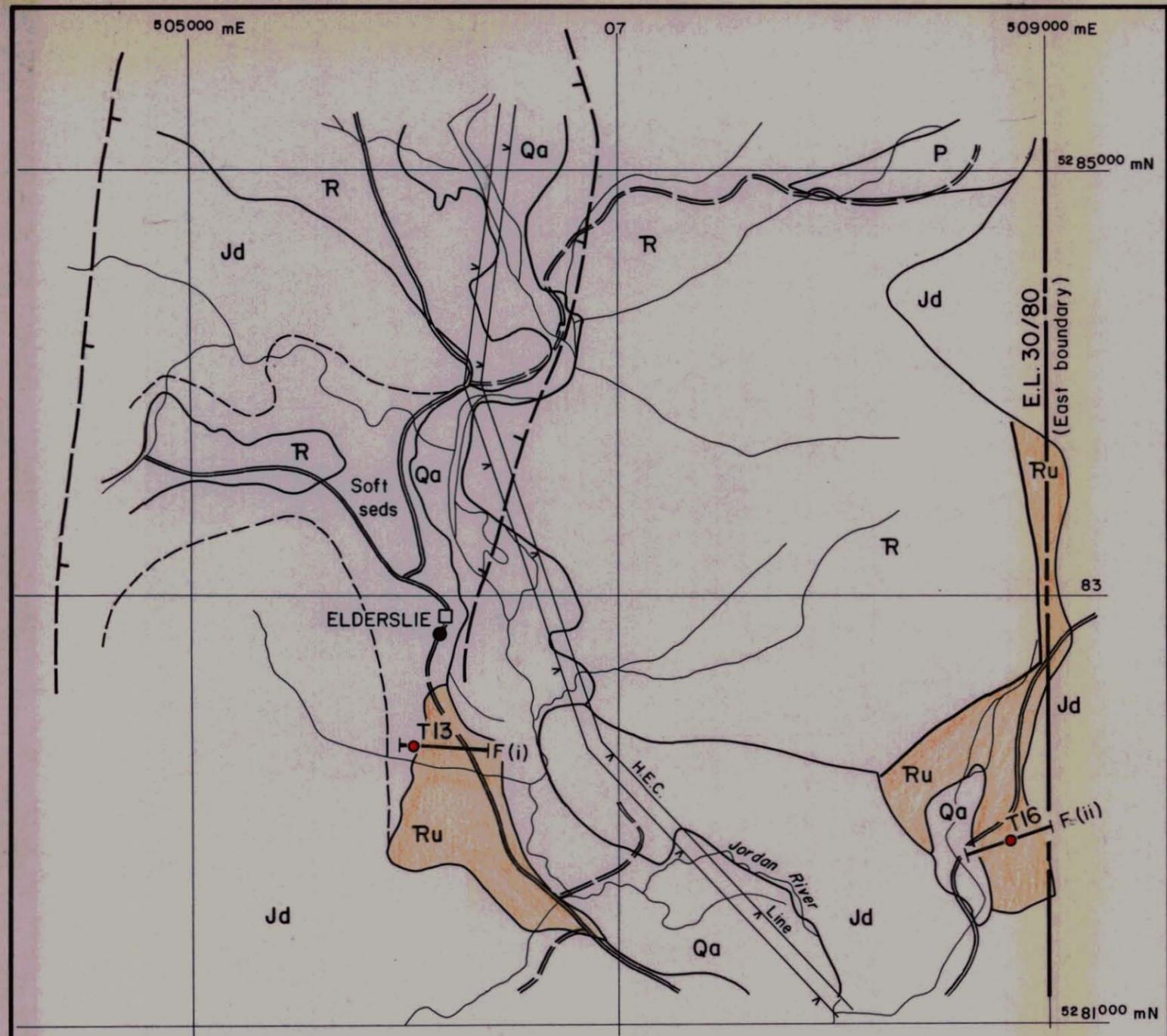
Centre
HOBART

Date
1/7/83

THE BROKEN HILL PROPRIETARY CO. LTD.
EL 30/80 TASMANIA
DRILL HOLE T16 GRAPHIC LOG

Project No.
C35-28

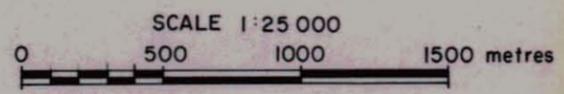
Drawing No.
A4/2407/2



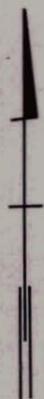
LEGEND

- Jd Dolerite
- R Triassic
- Ru Upper Triassic
- Qa Alluvium
- P Permian

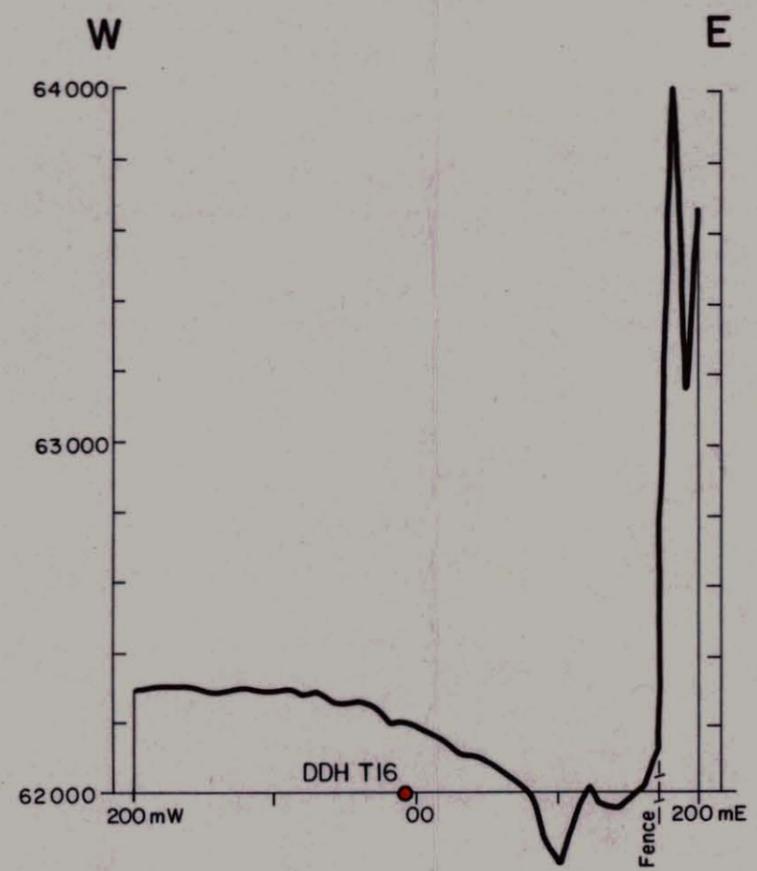
- Geological boundary
- Ground magnetic traverse
- B.H.P. drill hole
- Fault indicating downthrown side.
- Photo interp. boundary
- Coal occurrence



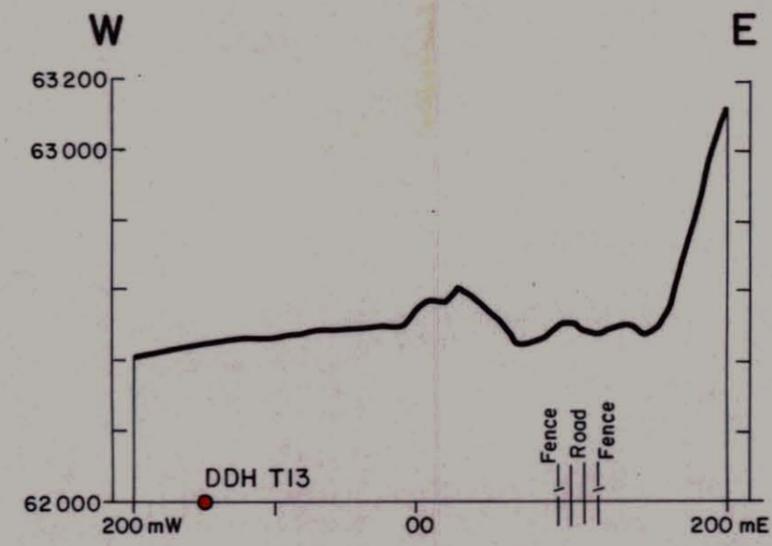
**GEOLOGY (LEAMAN & LEGGE 1975 & MINOR PHOTO INTERPRETATION)
GROUND MAGNETIC TRAVERSES & DRILLING.**



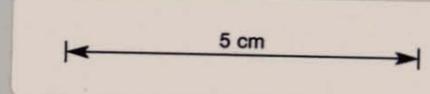
Horizontal scale 1:5000



Line F (ii)
(bearing 60° mag)



Line F (i)
(bearing 80° mag)



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA ELDERSLIE AREA		
GROUND MAG. PROFILES & GEOLOGY		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 23-6-83	Project No: C35-21	Drawing No: A3-1620/3
Drawn: Russell Meaney		

6.6 RICHMOND (Figs 17, 18, 19).Rationale.

(i) Tertiary lignites are shown to extend over an area of 4 x 2 km to the north of Richmond on the published geological map (Leaman & Legge, 1975) although partly covered by basalt. Three water bores (Leaman, 1971) intersected "clay with coal" over intervals ranging from 3 m to 96 m. Two holes were sited to test for lignite.

(ii) Upper Triassic coal measures are well exposed in the eastern bank of the Coal River below Richmond, including a 0.3 m thick coal seam dipping approximately 25 - 30° WSW. An old bore hole on the river flat opposite intersected three seams (0.4, 0.6 and 0.7 thick), as reported by Hills et al, 1922. The coal measures were considered most likely to extend for several kilometres each side of the outcropping area, following the north-south trending Coal River graben structure. Two holes were sited to test for coal measures beneath Tertiary sediments.

Drill Sites. Only two holes were drilled. T4 was designed to test for both Tertiary lignite and Triassic coal measures. T5 tested for Triassic coal measures beneath Tertiary cover. Another site (Hi) to the northwest of Richmond, to test for both lignite and Triassic was not drilled. Both sites drilled are on flat open farming land with no outcropping rock.

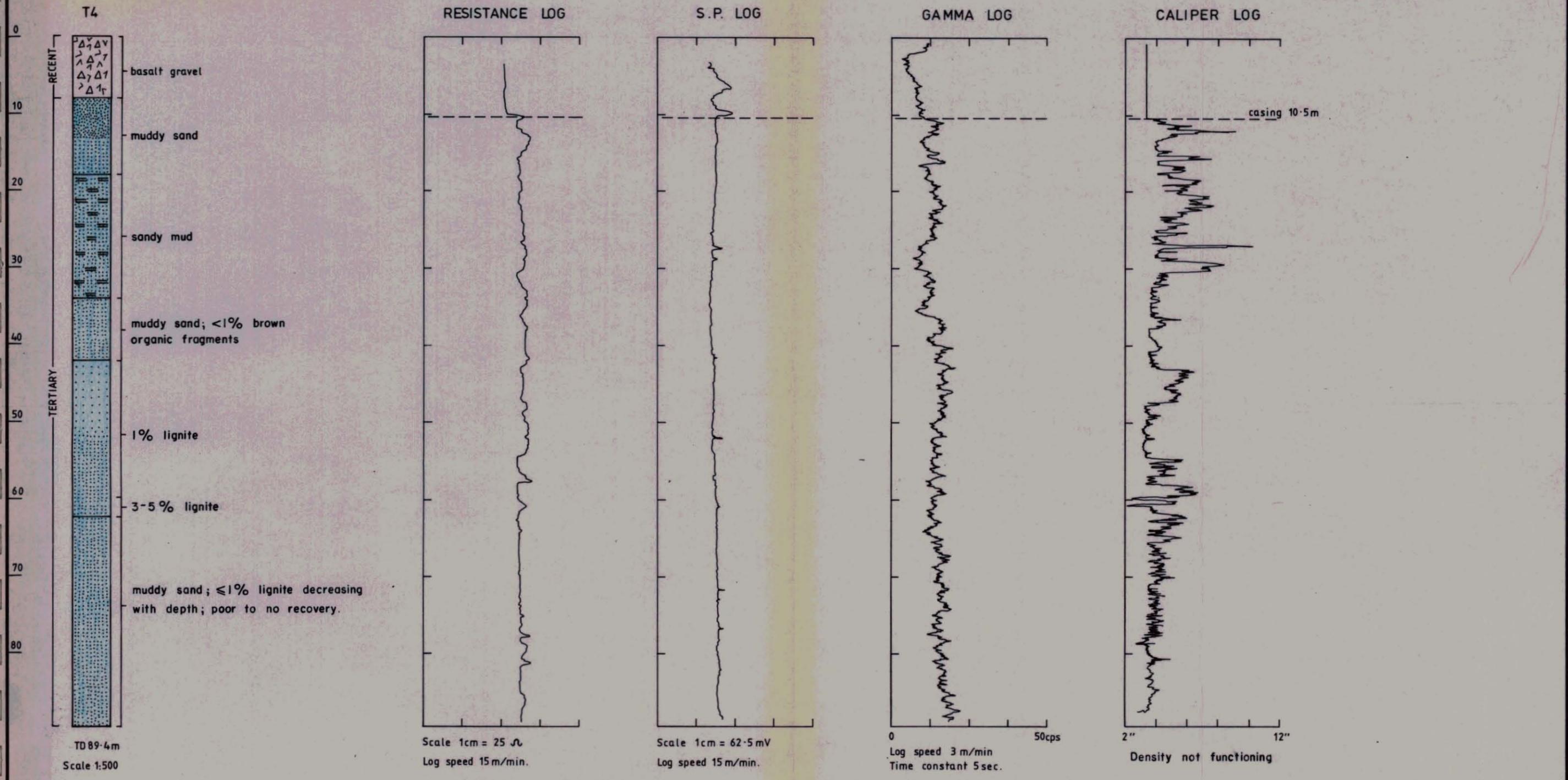
- 17 -

Magnetics. No dolerite bodies were detected beneath the drill sites. Dolerite was delineated at the western ends of the lines run across the undrilled northwestern site (Hi). Basalt shows no distinct signature, and only a slight increase in noise level, compared with sedimentary rocks.

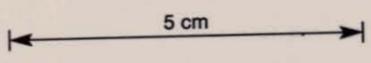
Results. T4 penetrated poorly consolidated Tertiary clayey sands with very minor fragments of lignite (34 - 62 m). No Triassic was encountered although the hole bottomed on very hard rock which may have been either Triassic sediments or dolerite. Recovery was very poor throughout the hole, with much contamination.

T5 drilled through Cenozoic sediments to 26 m, followed by shales and minor sands. No coal was noted. The probable age of these rocks is Middle Triassic.

Recommendations. There is no strong reason for further work, although the possibility of Triassic coal measures at depth to the north of Richmond has not been fully tested.

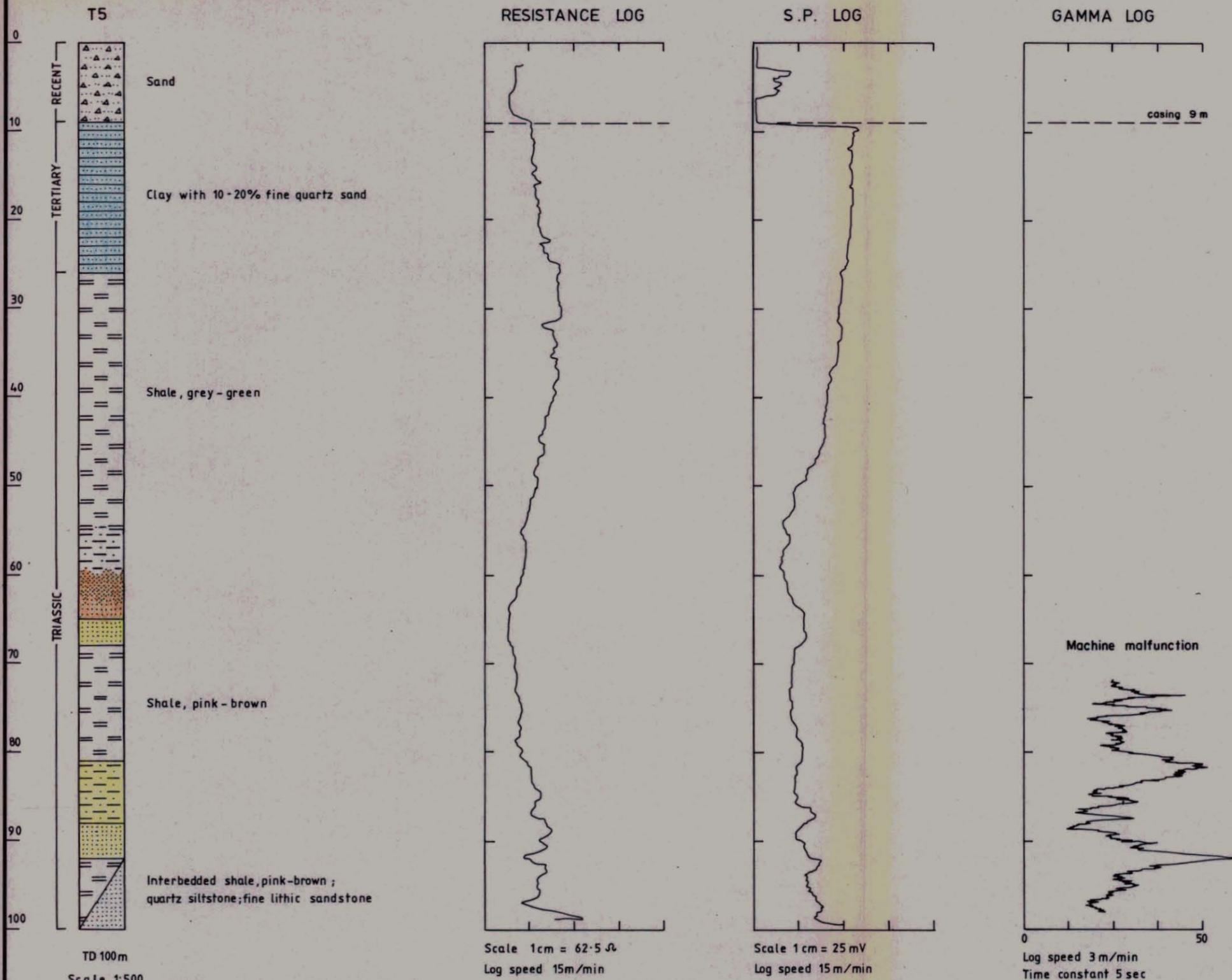


- basalt gravel
- mudstone
- tertiary deposits (undifferentiated)
- very fine sandstone
- fine sandstone
- medium sandstone



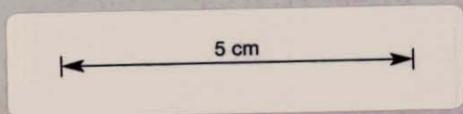
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T4 GRAPHIC AND GEOPHYSICAL LOGS		
Prepared by: G. TORR	Centre: HOBART	
Date: 2/6/83	Project No	Drawing No
Drawn: A. HANSEN	C35-15	A3-1619/8

551038



LOGGED 24/2/83

- Sand
- Siltstone
- Tertiary deposits (undifferentiated)
- Clay with sand
- Very fine sandstone
- Lithic suite
- Mudstone
- Fine sandstone
- Quartz suite



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T5 GRAPHIC AND GEOPHYSICAL LOGS		
Prepared by: G. TORR	Centre: HOBART	
Date: 3/6/83	Project No:	Drawing No:
Drawn: A. HANSEN	C35-16	A3-1619/5

6.7 STONEHOUSE (Figs 20, 21).

Rationale. A window of "soft sedimentary rocks" (4 x 1 km; partly overlain by basalt and intruded by dolerite) was suggested by photointerpretation. The window straddles a north-south trending photointerpreted graben, and corresponds to a small area on the published geological map (Gulline & Forsythe, 1976) shown as both undifferentiated Triassic and alluvium.

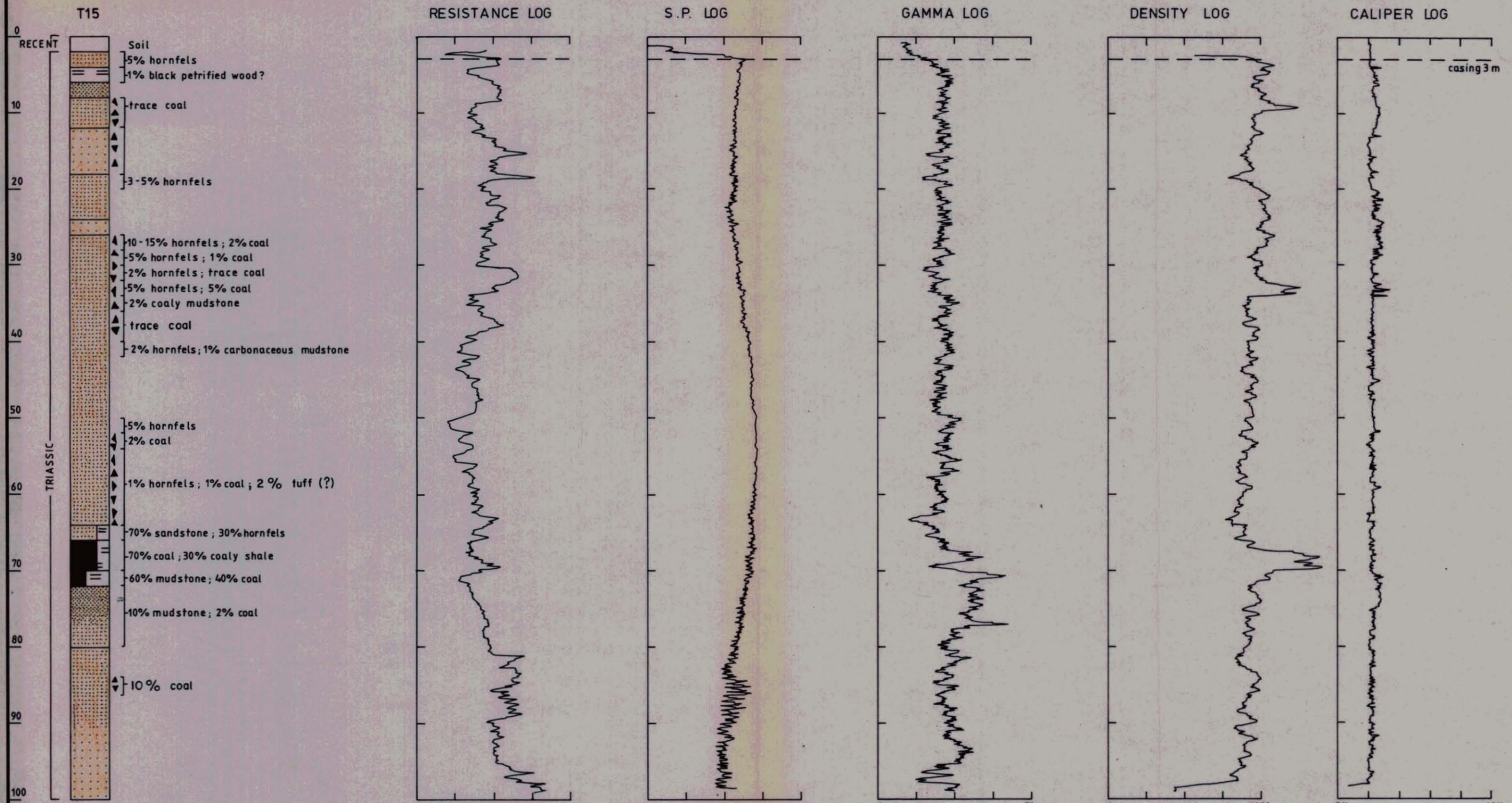
Field reconnaissance revealed outcrops of fine to medium grained lithic sandstone. A seam of coal, 0.15 cm thick, is exposed in a creek. The target was drilled to test for coal seams in Upper Triassic lithic sandstones.

Drill Sites. Two sites were selected, but only the western one was drilled because of wet conditions at the time. Both sites are in almost flat, open farming land, surrounded by wooded hills of dolerite and basalt. T15 itself lies close to an outcrop of lithic sandstone.

Magnetics. The line read over T15 site confirmed the presence of dolerite on both sides of the valley.

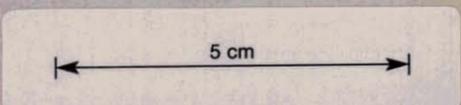
Results. T15 encountered Upper Triassic fine to medium lithic sandstones and minor mudstones throughout. Three coal seams were intersected, with traces of coal elsewhere through the hole. Identification of coal from chips was made difficult because of the presence of both hornfelsed mudstone and probable petrified wood. Both materials, although distinct because of extreme hardness, are dark grey to black, brittle, and have a conchoidal break. Estimation of relative proportions of these materials and of coal, is prone to error.

Recommendations. Any deposit of large extent would have to lie beneath surrounding dolerite. Exploration would have to be designed to determine whether the dolerites form sills overlying coal measures, or if they are thick intrusions. There is limited areal extent for open cuttable coal.



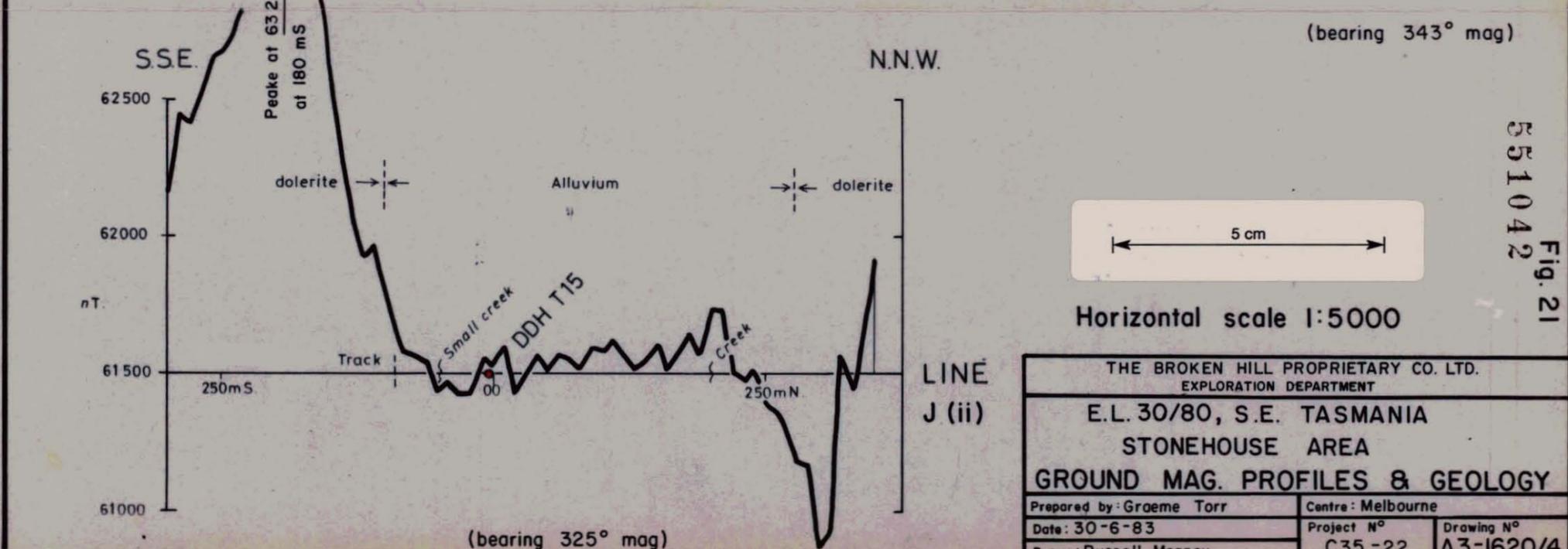
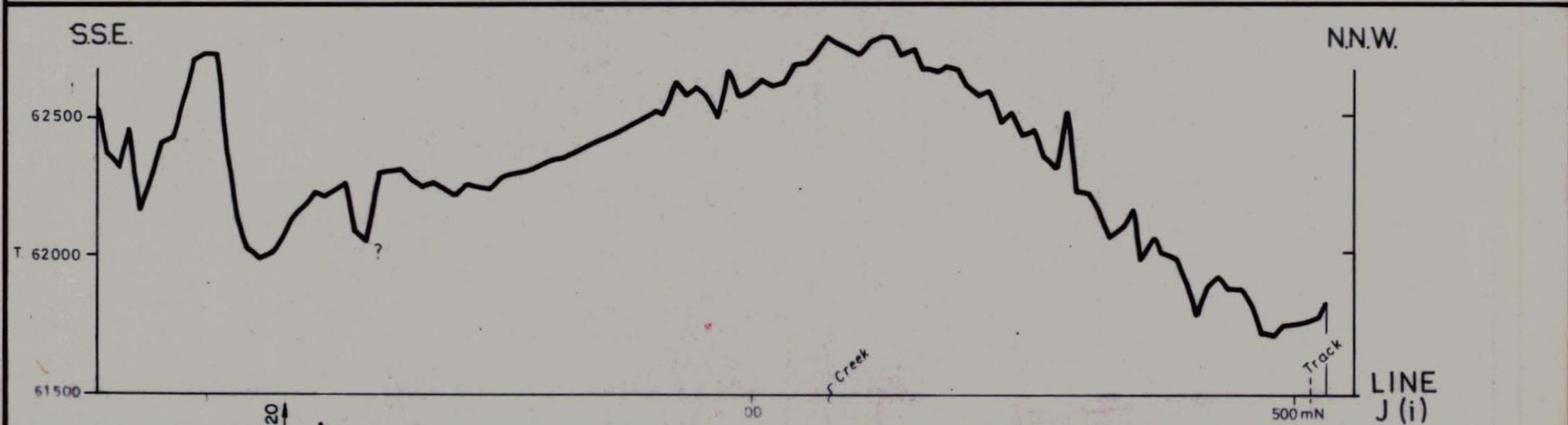
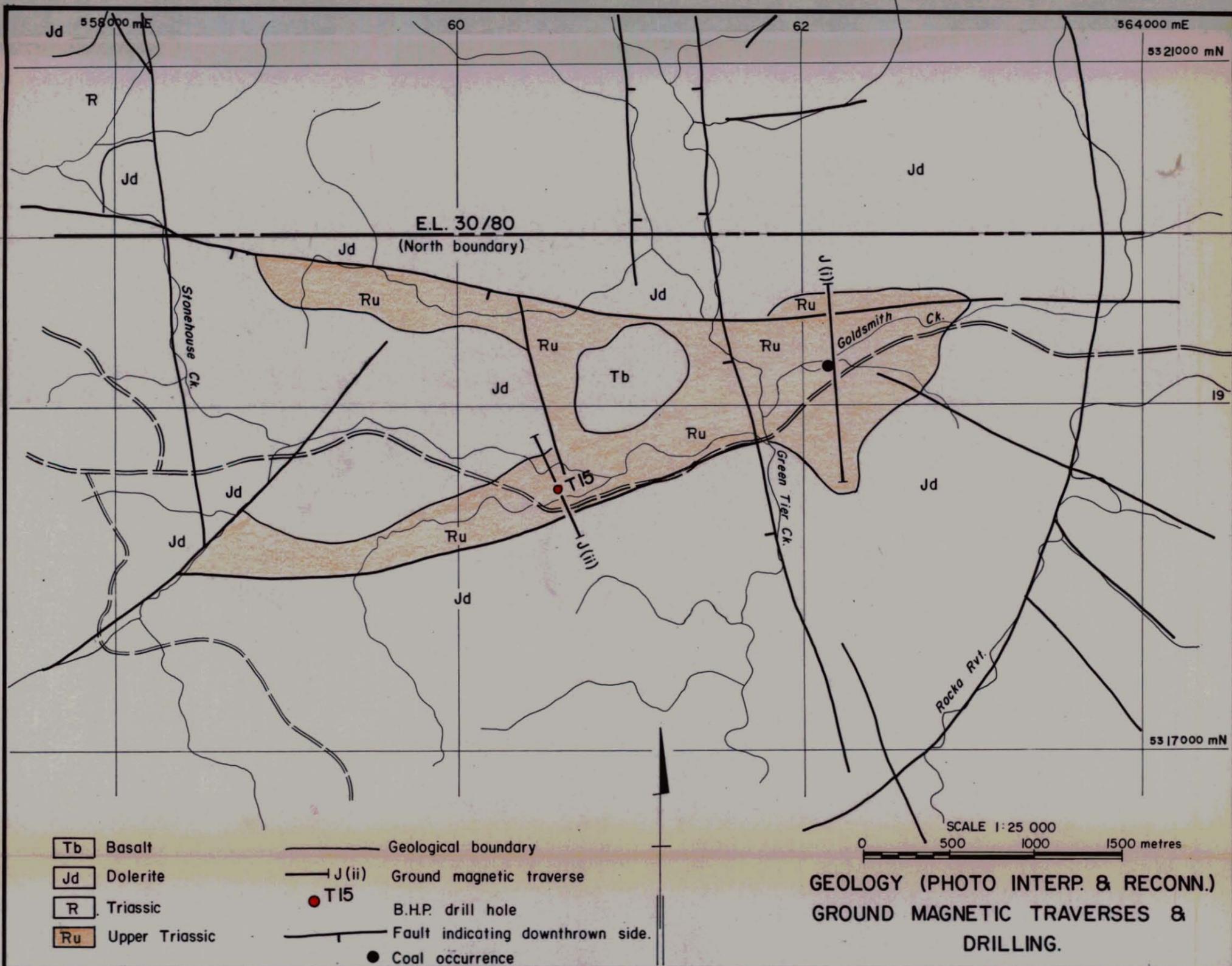
TD 100 m
Scale 1:500

- soil
- very fine sandstone
- coal
- mudstone
- fine sandstone
- coal fragments
- siltstone
- medium sandstone
- lithic suite



Date logged 27/3/83

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T15 GEOPHYSICAL AND GRAPHIC LOGS		
Prepared by: G. TORR	Centre: HOBART	
Date: 1/7/83	Project No	Drawing No
Drawn: A. HANSEN	C35-17	A3-1619/10



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA STONEHOUSE AREA		
GROUND MAG. PROFILES & GEOLOGY		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 30-6-83	Project N°	Drawing N°
Drawn: Russell Meaney	C35-22	A3-1620/4

551042
Fig. 21

6.8 TWAMLEY (Figs 22, 23).

Rationale. A north-south trending fault shown on the published geological map (Blake, 1958) separates downthrown Triassic sedimentary rocks around Buckland from dolerite on the eastern side. The fault and the large area of undifferentiated Triassic rocks were also delineated by photointerpretation. To the north, on the western side of this fault, a small outlier of Upper Triassic coal measures is exposed. Coal was worked uneconomically in the past from this area, which was known as the Prosser Plains Field (Hills et al, 1922).

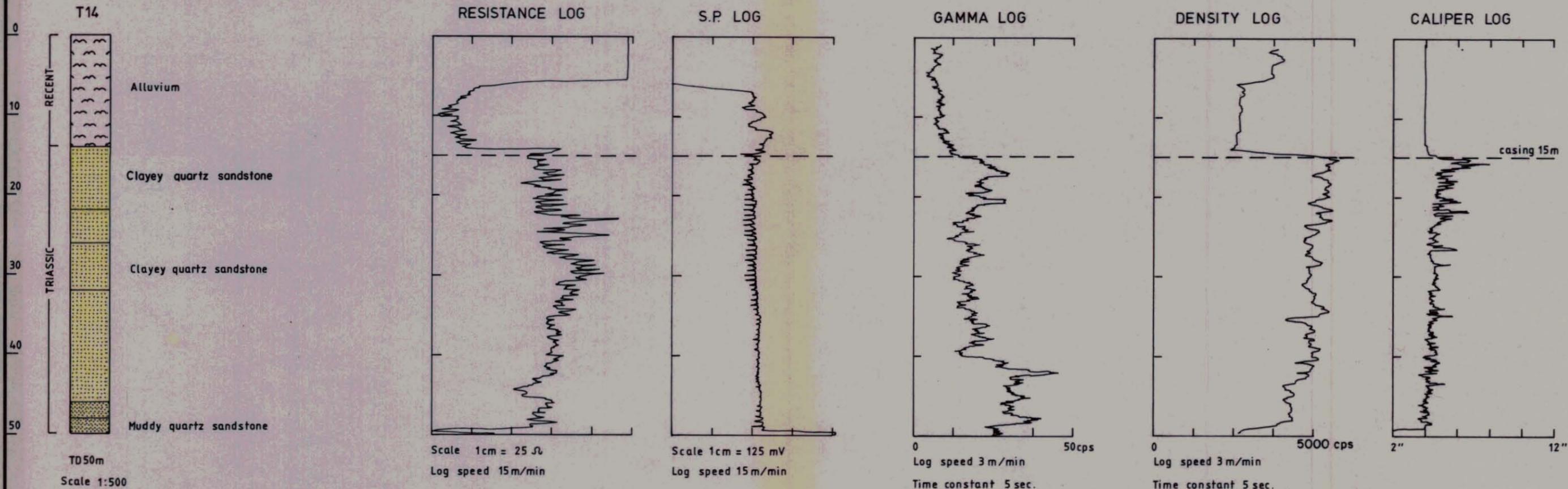
Further south around Twamley, is a relatively large area of poor exposure. It was decided to test for the presence of Upper Triassic coal measures.

Drill Site. T14 was sited on flat, open farming land, on river terrace, with no outcropping rocks. Two kilometres to the south, Triassic quartz sandstones are exposed but it was considered that easily weathered lithic sandstones could underlie the river terrace.

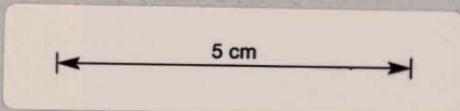
Magnetics. Three lines were read, revealing no dolerites.

Results. T14 drilled through 14 m of boulder terrace, and the remainder of the hole was in quartz sandstones and muddy quartz sandstones of Lower Triassic aspect.

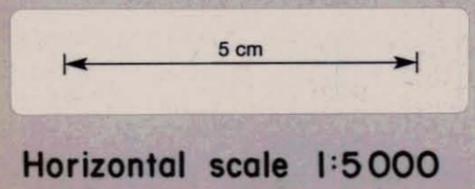
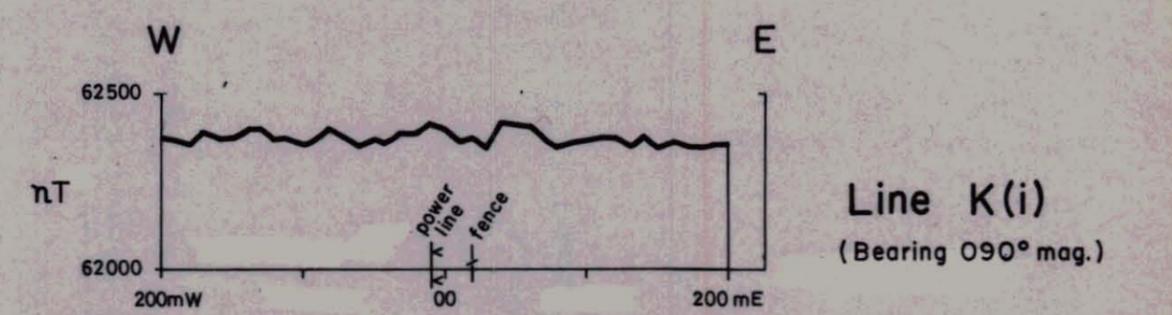
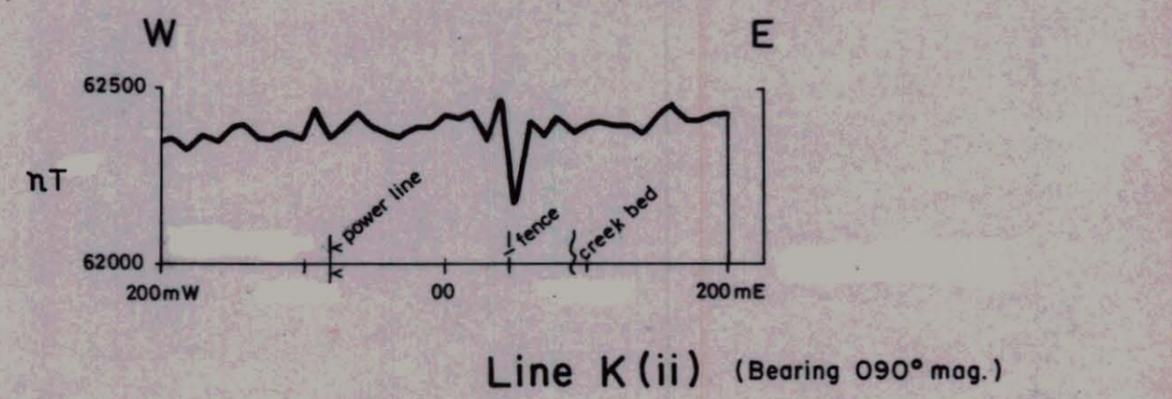
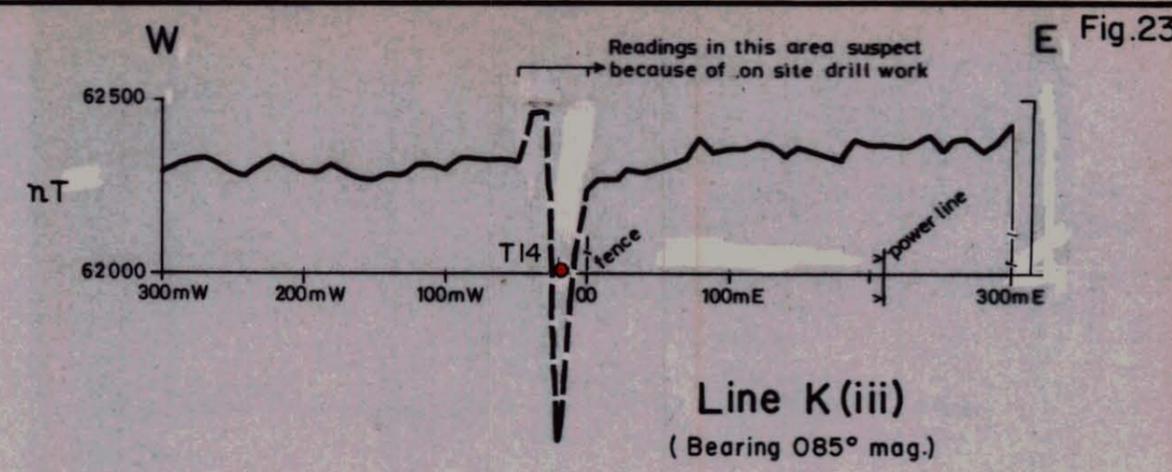
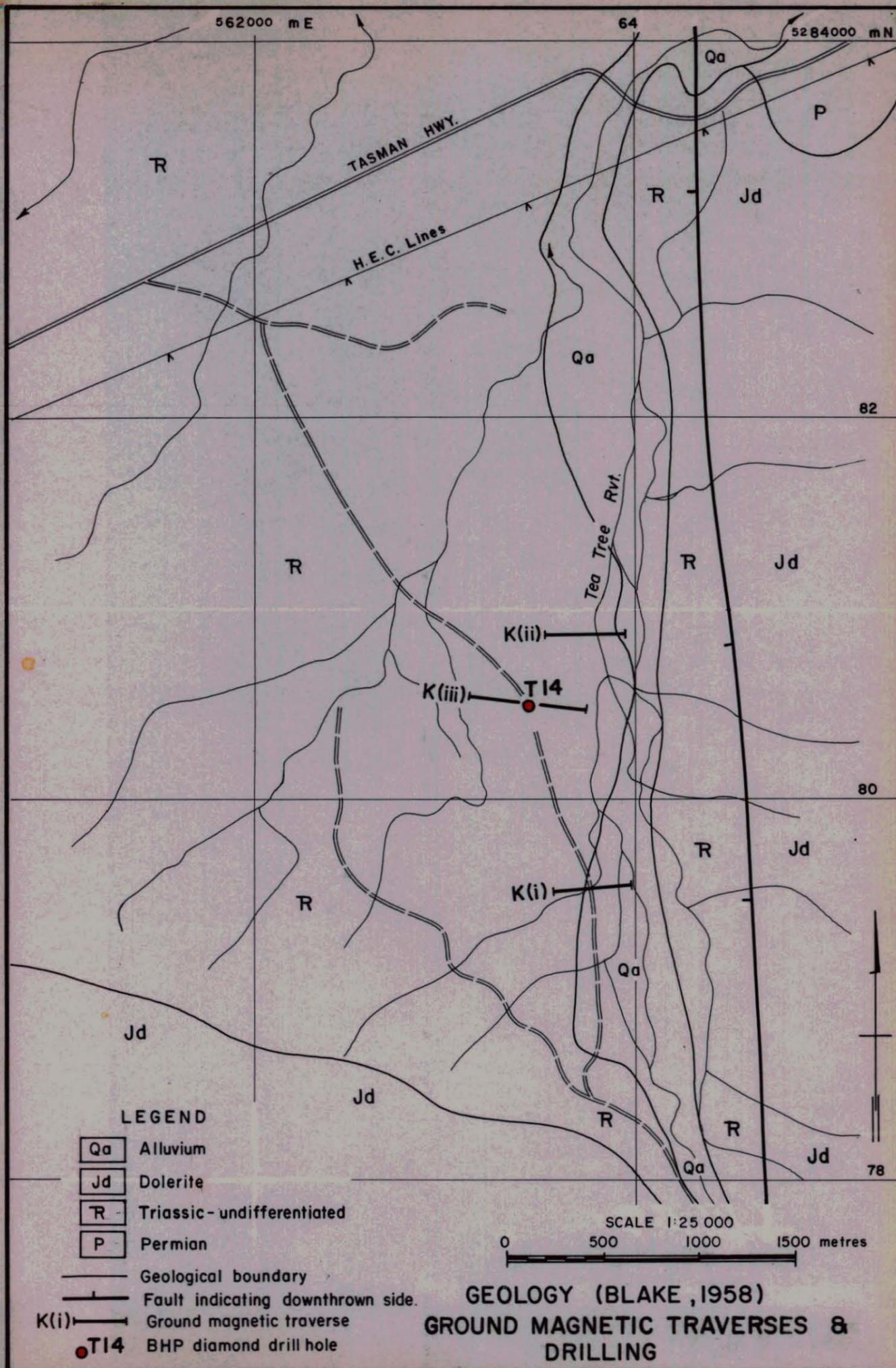
Recommendation. No further work is required.



LOGGED 24/3/83



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 30/80 TASMANIA DRILL HOLE T14 GRAPHIC AND GEOPHYSICAL LOGS		
Prepared by: G. TORR	Centre: HOBART	
Date: 16/6/83	Project No	Drawing No
Drawn: A. HANSEN	C35-18	A3-1619/11



551045

THE BROKEN HILL PROPRIETARY CO. LTD.		
E.L. 30/80, S.E. TASMANIA TWAMLEY AREA		
GROUND MAG. PROFILES & GEOLOGY		
Prepared by: Graeme Torr	Centre: Melbourne	
Date: 1-7-83	Project N° C 35 - 23	Drawing N° A3-1620/5
Drawn: M. Rosker		

TABLE 2.

ANALYSIS RESULTS

SAMPLE NUMBER:	BL5011	5012	5013	5015	5014
DRILL HOLE:	T 7A	T 7A	T 7A	T 10A	T 10A
INTERVAL:	1.93-2.82m Coal	6.30-6.88m Coal	17.04-17.93m Coal	18.20-18.48m Coal	15.52-16.74m 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 (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>					
Moisture (ad) %:	10.3	4.3	2.2	1.4	1.4
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

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
T15	101.4 m	0.6 m
	9.2 m	0.6 m
	32.6 m	1.4 m
	67.6 m	2.5 m

7. COAL THICKNESS & QUALITY

Coal seams were intersected in four holes: T7 (Wetheron), T10 (Catagunya), T13 (Elderslie) and T15 (Stonehouse^{engc}). A summary of seams and estimated thicknesses is presented in Table 3.

In cases where core was available (T 7A and T 10A) the length of coal seam cored was taken as the minimum thickness, and the total length of coal plus adjacent core loss to be the maximum. In several cases there was significant loss from the seams. Comparison of depth to coal seam measured in T10A with depth to seam indicated by the geophysical logs and cuttings for T10 suggests that all depth measurements for T10A are overestimated by 1 metre.

The primary estimator of seam thickness was the density log. The "half-width" rule was used, i.e.: thickness was measured at a point on the graph halfway between background and peak. This method is slightly inaccurate because of the relationship between actual thickness and logging parameters.

As a secondary indicator of coal seam depth, but not thickness, the geological log of the cuttings was used. In most cases the seams picked out on the geophysical logs were evident in the cuttings, but because of the inherent inaccuracies of the drilling method, the geological log overestimated their thickness. In a few cases, coal seams appearing on geophysical logs were either not corroborated in the cuttings, or were logged as carbonaceous mudstones.

- 24 -

As shown in Table 3, seven seams (or plies) were intersected in T 13, six in T 7, three in T 15 and two in T 10. Thicknesses range from 0.3 m to 2.5 metres and are most commonly around 0.6 m to 1.0 metres.

In T13, the seven seams/plies constitute three multiple seams. If each seam is considered as an entity including stone bands, the statistics become:

<u>Drill Hole</u>	<u>Top of Seam</u>	<u>Estimated Thickness</u>	<u>% Coal</u>
T 13	55.4 m	2.1 m	62
	89.6 m	3.5 m	51
	99.8 m	2.2 m	73

Only four samples of coal were analysed, so any comprehensive statement on coal quality is unwarranted. Also it should be noted that sample BL5011 was taken from within the zone of oxidation.

To gain some appreciation of the quality of these raw coals, they were compared with four "typical Tasmanian" coals (Noldart, 1975). The four coals from this project are higher in ash than the "typical Tasmanian" coals by about 10%. Gross specific energies are better for the "typical Tasmanian" coals.

On the basis of Volatile Matter (daf) and Specific Energy, the coals from this project are classified as medium to high volatile bituminous. A number of samples of coal have been submitted for petrographic work.

8. CONCLUSIONS & SUMMARY OF WORK PROPOSED

Eight targets were selected to test areas of known or potential Upper Triassic coal measures. Selection was based on consideration of the published and unpublished geological data, bore hole data, photointerpretation and field reconnaissance.

Of the eight targets, coal was found in Upper Triassic lithic sandstone/mudstone sequences in four areas, but not by all holes into any particular target. In all four cases, exploration must establish the extent of the seams beneath dolerite at depths too great for open cut extraction.

By a combination of two factors (number of seams intersected, and seam thicknesses) the four areas ranked in decreasing order of prospectivity are:

- Elderslie
- Stonehouse
- Wetheron
- Catagunya

Limited data indicate coal quality is only mediocre, and no better than other Tasmanian Triassic coals, i.e.: high in ash, and low in energy and sulphur.

In the exploration programme for the twelve months ending 15th April, 1984, these Triassic targets will take second place to the evaluation of the Permian. A small number of deep, fully cored stratigraphic holes is being planned to investigate lithologies and depositional environments of the Permian sequence in poorly known areas.

The programme for the year comprises:

- i) Assessment of recent Triassic drilling programme, preparation of report and recommendations for subsequent work.
- ii) Mapping of selected areas of Permian and final decision on drill sites.
- iii) Permian Drilling Programme. Nominal 1000 m stratigraphic diamond drilling.
- (iv) Follow-up Triassic Drilling Programme. Nominal 1000 m rotary/percussion and diamond drilling. Prior mapping of selected areas
- (v) Geophysics. All sites to be screened for possible dolerite bodies at depth by ground magnetics. Downhole geophysical logging of all holes will be attempted.
- (vi) Helicopter reconnaissance of Part II of EL.

COSTING

Salaries and Wages	\$32,000
Accommodation and Support	15,000
Travel and Vehicles	5,000
Helicopter Charter	3,000
Geophysics	10,000
Drilling: 1000 m diamond	80,000
1000 m rotary	25,000
Sample Analysis	2,000
Mineral Tenement Fees	20,000
Other	<u>8,000</u>
Total	<u>\$200,000</u>

9. REFERENCES

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APPENDIX 1

TECHNICAL METHODS

A1.1. GROUND MAGNETICS

The distribution of dolerite in the Tasmanian Permo-Triassic sequence presents a considerable problem because it is erratic, and difficult to predict from surface geology. Several of the drill holes were sited close to exposures of dolerite and at other sites there was little or no exposure of any rock type.

It was decided that ground magnetics could be a suitably rapid and low cost method of detecting dykes of dolerite in the vicinity of proposed drill sites. Accordingly, at least one line was read across each site, for a minimum of 200m in each direction. In many cases, several sub-parallel lines were read to gain better knowledge of the distribution of magnetic rocks in the target area.

A Scintrex MP-2 proton precession magnetometer with digital read-out was used for the survey. Stations were read at nominal 10m intervals along line. Lines were orientated so as to best suit the predicted geological conditions.

The method proved to be successful. It was possible to distinguish ground underlain by dolerite scree, dolerite outcrop and sedimentary rocks, and also to predict bodies of dolerite lying at shallow depths beneath sedimentary cover. Dolerite scree and outcrop were characterised by very noisy and usually higher readings, sediments by magnetically flat or low-noise profiles. Probable dolerite bodies at depths of up to 100m were indicated by smooth curves with amplitudes of several hundred nT. Surprisingly, no strongly magnetic signature for basalt was evident, making discrimination between basalt and sediments difficult. In some cases readings over basalt were anomalously low, and could be ascribed to remnant magnetism.

As a result of the survey, the positions of several drill holes (eg. T10, T12, T13) were relocated by up to 200m.

The final outcome was that dolerite was not intersected in any hole, even in cases where dolerite cropped out within 50m of the collar. Holes T4 and T6 were terminated (at 89.4 and 82.6m respectively) because the rocks became too hard for penetration with the blade bit. When the same situation arose in T8 (at 12.4m) the hole was continued by diamond coring and the hard rock proved to be sandstone, not dolerite. Rock types at the bottoms of T4 and T6 are not known, but are not necessarily dolerite.

A1.2. DRILLING

All holes were drilled on privately owned farming land (see Table 4). No access tracks needed to be constructed.

With the exception of hole T11, the rig used was a truck-mounted Fox Mobile B80, contracted from H.J. Stacpoole of Launceston. The bulk of the drilling was done using a 4 3/4" (12.1 cm) blade bit and water/bentonite as drilling fluid. For hole collars and harder rock, 6" (15.2 cm) or 4 1/2" (11.4 cm) down-hole hammers were used, driven from a 750 cfm (375 l/s) x 350 psi (2.5 MPa) compressor mounted on a separate truck.

Water was carted from nearby rivers and creeks, or (at Bothwell) a standpipe, over distances ranging from on-site to 20km. Approximately three 50kg bags of bentonite were consumed per hole. The circulation system required digging sumps, channels and a depression for a 1000 gal. water tank.

Normal procedure was to drill holes with the hammer to bedrock, and then to seat steel casing or a standpipe before proceeding with blade drilling. Casing was left in the hole for geophysical logging, but all was subsequently recovered.

Two holes, T7 and T10, were redrilled (as T7A and T10A) in order to obtain core of coal seams which had been intersected within 20m of the surface. Part of T8 was cored when the rock proved too hard for the blade bit, and no hammer was available. An HQ wireline system was used for coring, with 3m triple-tube core barrel, and diamond impregnated bits.

Core recoveries, measured on a drilling run basis (usually 3.0m) ranged from 70% to 100%, with 80% of runs recovering 90% or more core. However, for the actual coal seams, there was considerable loss of soft material in hole T 7A. Recoveries for the three seams, from the top down, were only 25%, 50% and 65% respectively.

To cope with soft ground conditions, hole T11 was drilled with a Gemcodrill 210-D, also from H.J. Stacpoole, mounted on a trailer with all-up weight 1 1/2 tonne and supported by a 3 tonne truck. Water was piped from a nearby channel draining the marsh. The hole was drilled completely with blade bit. The rig had capacity to core if required, but did not have compressed air.

Collars of the holes were not surveyed. Coordinates in Table 1 (to nearest 100m) and reduced levels (to nearest 5m) were estimated from 1:100 000 topographic maps. All holes and excavations were backfilled on completion with soil and cuttings.

The programme lasted six weeks (17th February to 29th March); an average of 34m drilled per day worked. Totals for the different drilling methods were:

<u>BLADE</u>	<u>HAMMER</u>	<u>DIAMOND</u>	<u>TOTAL</u>
915.4 m	226.9 m	41.1 m	1183.4 m
(77.3%)	(19.2%)	(3.5%)	(100%)

TABLE 4.SCHEDULE OF LANDOWNERS

<u>Drill Hole</u>	<u>Property</u>	<u>Owner</u>
T4	Inverquharity	Mr. P. Nichols, "Inverquharity" <u>RICHMOND. TASMANIA. 7025</u>
T5	Richmond Park	Mr. H.N. Macleod, "Richmond Park", <u>RICHMOND. TASMANIA. 7025</u>
T6	Glenfern	Mr. A.J. Johnston, Michael Street, <u>BOTHWELL. TASMANIA. 7411</u>
T7, 7A, 8	Old Wetheron	Brazendale Bros., "Berriedale", <u>BOTHWELL. TASMANIA. 7411</u>
T9	Llanberis	Montacute Pty Ltd, C/- C.A. Bennetto, 148B, Collins Street, <u>HOBART. TASMANIA. 7000</u>
T10, 10A, 12	Cleveland	Mr. J.R. Shoobridge, "Cleveland", <u>OUSE. TASMANIA. 7461</u>
T11	-	Mr. C.L. Hall, Strickland, <u>Via OUSE. TASMANIA. 7461</u>
T13	Summerfield	Calvert Bros., "Summerfield", <u>BROADMARSH, TASMANIA. 7404</u>
T14	Twamley	Mr. D.F. Turvey, "Twamley", <u>BUCKLAND. TASMANIA. 7271</u>

T15	Stonehouse	Stonehouse Pastoral Association, C/- H.W. Burbury, "Stonehouse", <u>YORK PLAINS. TASMANIA. 7206</u>
T16	Sydney Cottage	H.L. & D.D. Jones, "Sydney Cottage", <u>BROADMARSH. TASMANIA. 7404</u>

Al.3 GEOPHYSICAL LOGGING

A company-owned SIE T450 E down-hole logging system was used on 11 holes to obtain analogue records of the following parameters: single point resistance, self potential, natural gamma, density and caliper. Original graphic logs were run at 1:200 scale. Copies are presented in this report at 1:500.

Initial malfunctions prevented a complete suite of logs being obtained from T4 and T5. T6, T16, T7A and T10A were not logged. Attempts were made to log T5 and T6 after the casing had been retrieved, but blockages were encountered at very shallow depths.

The S.P. log was at times affected by high frequency cyclic interference which could be attributed to faulty commutators picking up the signal. The traces drawn should still be valid if this effect is disregarded. Draining of batteries during operation, apart from requiring interruption of the logging, at times produced questionable traces for the density logs. For example in the graph for T15, traces where the log was re-run over short intervals following a disrapture to logging did not correspond well, and the log presented in Appendix 2 has been adjusted to allow for this.

Visual comparison of the graphic logs for different holes should be tempered with consideration of the changes in scaling used. Resistance and S.P. were run at different scales and zero positions. Density source-receiver spacing varied also, producing different background count rates at the same scale.

Coal seams are shown particularly well by density logs, and are usually corroborated on resistance and gamma logs.

Al.4. SAMPLING & ANALYSIS

Because the programme was designed primarily to obtain chip samples, core was obtained only in two cases where coal seams had been intersected at shallow depths. Thus no samples were obtained of the deep coal seams in T13 for example.

A total of four samples of coal, and one of carbonaceous mudstone, was collected, by halving the whole core with a manual splitter. One half was replaced in the tray and the other half was double-bagged in plastic and sent to SGS Australia Pty Ltd laboratories in Sydney.

Determinations requested were: total moisture (as received); gross specific energy and total sulphur (on unleached material); total dissolved salts; and proximate analysis (on leached material). All determinations were to accord with Australian Standard 1038, and results were to be reported on a dry basis.

Results are presented in Table 2.

APPENDIX 2

GEOLOGICAL DRILL LOGS

GEOLOGICAL DRILL HOLE LOG

551063

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T4
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 365709
<u>DATES</u>	: 17/2 - 22/2/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 25m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: Vertical
<u>BITS</u>	: 178mm hammer: 0-9m 105mm blade: 9-89.4m	<u>TOTAL DEPTH</u>	: 89.4m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 10.5m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: Abandoned when very hard rock encountered. Very poor sample return throughout.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	8	8	GRAVEL. Mostly basalt. River worn.
8	12	4	MUDDY SAND. Plastic. Light grey mottled with dark yellow orange. Very fine; range fine to silt. Subrounded. Sand mostly quartz but 10-15% lithics and feldspar; 10-15% mud.
12	16	4	MUDDY SAND. Firm, crumbly. Light grey. Very fine becoming fine; but range down to silt. Subrounded-subangular. Sand mostly quartz but 20% feldspar, 10% lithics; 10-15% light olive grey mud.
16	18	2	MUDDY SAND. Plastic. Light olive grey; minor mottled mod. yellow brown. Fine; range down to silt. Subangular - subrounded. Sand mostly quartz, 20% feldspar, 20% lithics; 20% mud.
18	34	16	SANDY MUD. Plastic to crumbly. Light blue grey and mod. yellow brown. Poorly sorted silty mud with 20-40% fine to very fine sand. Sand mostly quartz, subrounded, but 20% feldspar, 20% lithics. Highly variable.
34	42	8	MUDDY SAND. Plastic to crumbly. Light olive grey. Fine; range medium down to silt; poorly sorted. Subrounded. Sand mostly quartz, with 10% feldspar, 5-10% lithics. 10-15% mud. Less than 1% dark brown organic fragments.
42	62	20	SAND. Light olive grey. Medium grained. Subangular to subrounded. Quartz with 5% lithics. 1% black coal fragments (= lignite?). Grades with depth to: SAND. Fine; range medium down to silt. 10-20% feldspar and 10-20% lithics. 5% mud. 60-62m: 3-5% lignite.
62	72	10	MUDDY SAND. Plastic to crumbly. Light olive grey. Fine, poorly sorted; range medium down to silt. Subangular to subrounded; 10-20% feldspar; 10-20% lithics. 20% grey mud. Up to 1% black coal fragments (= lignite?), decreasing with depth. 64-66m: No recovery. Drill mud only.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
72	89.4 END	17.4	Recovery suspect. Mostly recirculated material embedded in drilling mud.

GEOLOGICAL DRILL HOLE LOG

551065

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T5
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 368672
<u>DATES</u>	: 23/2 - 24/2/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 5m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: Vertical
<u>BITS</u>	: 143mm blade: 0-9m 102mm blade: 9-100m	<u>TOTAL DEPTH</u>	: 100.0m
<u>CORE SIZE</u>	: -	<u>WATER DEPTH</u>	:
<u>LOGGED BY</u>	: G. Torr	<u>CASING</u>	: 9m
		<u>COMMENTS</u>	: Required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	9	9	SAND. Unconsolidated. Brown. Medium grained quartz-lithic.
9	26	17	SANDY CLAY. Sticky. Pale pink to pale grey becoming light red brown with depth. 10-20% fine quartz sand.
26	65	39	SHALE. Firm. Green-grey; lesser white, mustard, red shales. Silty shale, becoming fine lithic sandstone with depth.
65	68	3	QUARTZ SAND. Unconsolidated. Pale grey. Fine, clean.
68	81	13	SHALE. Pale brown-pink brown. Minor fine sandstone.
81	88	7	SILTSTONE. Soft. Pale grey. Quartzose.
88	92	4	QUARTZ SAND. Pale grey. Fine, clean.
92	100	8	MIXED SEDIMENTS. Pale brown shale; white siltstone; green-grey fine sandstone (lithic?).
	END		

GEOLOGICAL DRILL HOLE LOG

551066

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T6
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EP 052016
<u>DATES</u>	: 25/2 - 27/2/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 555m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 178mm hammer: 0-9m 108mm blade : 9-82.6m	<u>TOTAL DEPTH</u>	: 82.6m
<u>WATER DEPTH</u>			: -
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 9m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: 12m length waterpipe left in top of hole Hole abandoned when very hard rock encountered

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	8	8	BOULDER SCREE. Dolerite boulders in brown crumbly soil. Dolerite hard, fresh, but becoming weathered with depth.
8	10	2	MUDSTONE. Firm. Brown-grey.
10	20	10	LITHIC SANDSTONE. Grey, "salt & pepper". Very fine grading to fine with depth.
20	32	12	SILTSTONE. Fissile, firm. Dark grey to grey. 20% very fine grey lithic sandstone.
32	46	14	LITHIC SANDSTONE. Grey, "salt & pepper". Very fine becoming fine with depth. Minor black carbonised plant fragments from 36m.
46	58	12	SILTSTONE - LITHIC SANDSTONE. Firm. Grey. ?Lithic, with 10% black carbonaceous shale. Grades to very fine, then to fine lithic sandstone with depth.
58	70	12	LITHIC SANDSTONE. Grey, "salt & pepper". Fine, becoming medium grained at 62 metres. Occasional coal or carbonised plant fragments, especially at 60-62 metres.
70	82.6	12.6	SILTSTONE. Dark grey. Grading to grey, very fine lithic sandstone (part carbonaceous).
			END

GEOLOGICAL DRILL HOLE LOG

551067

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T7
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 053972
<u>DATES</u>	: 28/2 - 1/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 495m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: Vertical
<u>BITS</u>	: 178mm hammer: 0-3m 143mm blade: 3-88m	<u>TOTAL DEPTH</u>	: 88.0m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 3m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: Abandoned due to sudden complete circulation loss.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	6	6	MUDSTONE. Olive brown. 0-2m: with 20% black, dull-banded coal. 2-6m: with up to 5% carbonised plant material and thin black coal bands.
6	8	2	MUDSTONE. Grey. 10% carbonised plant material and thin coal bands.
8	16	8	LITHIC SANDSTONE. Grey, "salt & pepper". Fine; becoming medium-coarse with depth. Less than 5% black coal fragments and carbonised plants.
16	18	2	LITHIC SANDSTONE. Green-grey. Medium-coarse. 10-15% thin earthy coal or carbonaceous shale bands.
18	20	2	LITHIC SANDSTONE. Brown grey. Very fine. 20% black earthy coal.
20	36	16	LITHIC SANDSTONE. Grey. Very fine, grading to medium-coarse. 30-34m: 5% thin black coal bands.
36	52	16	MUDSTONE. Grey to dark grey. Minor siltstone. Grading to very fine lithic sandstone at depth. 38-40m: Carbonaceous mudstone; trace pyrite.
52	58	6	MUDSTONE. Grey. Grading to very fine lithic sandstone at depth. 52-54m: 5% black coal.
58	60	2	MUDSTONE. Dark grey, carbonaceous; 2% bright black coal.
60	74	14	LITHIC SANDSTONE. Grey, "salt & pepper". Very fine.
74	80	6	MUDSTONE/SILTSTONE. Dark grey.
80	88	8	LITHIC SANDSTONE. Very fine. 10-20% dark grey mudstone.
	END		

GEOLOGICAL DRILL HOLE LOG

551068

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T7A
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN053972
<u>DATES</u>	: 1/3 - 2/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 495m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: Vertical
<u>BITS</u>	: 178mm hammer: 0-1m Diamond: 1-22.1m	<u>TOTAL DEPTH</u>	: 22.1m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: HQ	<u>CASING</u>	: 1m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: Required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	1	1	NO CORE.
1.00	1.40	0.40	LITHIC SANDSTONE. Grey-brown, "salt & pepper", medium grained.
1.40	1.93	0.53	MUDSTONE. Soft. Brown-grey. Laminated. Becoming carbonaceous with depth.
1.93 (0.23 recovered)	2.82	0.89	COAL. Black. Earthy. Very broken by drilling. Dull with less than 5% bright bands.
2.82	6.30	3.48	MUDSTONE. Brown-grey to grey. Part laminated. Minor siltstone to very fine lithic sandstone. Common carbonised plant remains.
6.30 (0.30 recovered)	6.88	0.58	COAL. Black. Earthy. Dull-banded. Broken by drilling.
6.88	8.35	1.47	MUDSTONE. Grey. Minor carbonised plant remains.
8.35	12.80	4.45	LITHIC SANDSTONE. Fine. Micaceous. 5% carbonised wisps, bands and plant fragments. 1cm band black coal at 11.04m.
12.80	16.87	4.07	LITHIC SANDSTONE. Medium grained. Isolated carboniferous bands.
16.87	17.04	0.17	SHALE. Grey, banded, carbonaceous.
17.04 (0.60m recovered)	17.93	0.89	COAL. Black. Dull-banded. Trace pyrite.
17.93	22.10	4.17	LITHIC SANDSTONE. Very fine, carbonaceous at top, becoming fine, non-carbonaceous at depth.
	END		

GEOLOGICAL DRILL HOLE LOG

551069

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T8
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 023971
<u>DATES</u>	: 3/3 - 8/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 435m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-6m	<u>TOTAL DEPTH</u>	: 88.0m
	: 121mm blade: 6-12.4m	<u>WATER DEPTH</u>	:
	: Diamond: 12.4-18.07m	<u>CASING</u>	: 6m
<u>CORE SIZE</u>	: 102mm hammer: 18.07-88m	<u>COMMENTS</u>	: Water flow several tens
<u>LOGGED BY</u>	: G. Torr		: of litres/hr from 30m.
			Bicarbonate of soda taste. Hole abandoned:-
			increasing water pressure caused slow penetra-
			tion and poor recovery.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	2	2	BOULDER SCREE. Boulders of dolerite: fresh, dark grey, hard; in dark brown, crumbly soil.
2	4	2	MUDSTONE. Firm, weathered. Buff.
4	6	2	LITHIC SANDSTONE. Weathered. Buff. Medium grained.
6	8	2	LITHIC SANDSTONE. Unweathered. Grey. Medium grained.
8	14	6	LITHIC SANDSTONE. Hard, massive. Grey. Fine. Part calcareous. Occasional bands grey mudstone. Minor veins calcite.
14	18	4	MUDSTONE. Firm. Grey. Poorly banded, with fine lithic part calcareous sandstone (increasing with depth).
18	34	16	LITHIC SANDSTONE/SILTSTONE. Poorly sorted, mixed. Range mudstone to fine sandstone; part calcareous. Minor carbonised plant remains and carbon smears on joints. 26-28m: traces black coal. 32-34m: Minor black coal.
34	44	10	MUDSTONE. Grading to very fine lithic sandstone/siltstone with depth. 34-38m: Traces black coal.
44	52	8	LITHIC SANDSTONE. Grey. Fine. Part calcareous. 48-52m: with 40% grey mudstone and minor black coal fragments.
52	54	2	MUDSTONE. Grey. 30% very fine lithic sandstone.
54	56	2	LITHIC SANDSTONE. Very fine. 30% mudstone and siltstone.
56	66	10	MUDSTONE. Light grey. 20% very fine lithic sandstone. Grading with depth to SILTSTONE: grey; with 20% mudstone and very fine lithic sandstone. Minor carbonised plant fragments.
66	68	2	LITHIC SANDSTONE. Fine to medium
68	72	4	SILTSTONE. Grey. Range mudstone to fine lithic sandstone.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
72	78	6	MUDSTONE. Green-grey. Dark grey siltstone increasing to 50% with depth. Minor carbonised plants and traces black coal.
78	80	2	LITHIC SANDSTONE. Grey. Fine.
80	86	6	SILTSTONE/LITHIC SANDSTONE (very fine) Grey to dark grey.
86	88	2	MUDSTONE. Grey/dark grey/green-grey. 40% mixture of fine lithic sandstone, dark grey siltstone and one fragment of tuff(?) (very hard, silicified, grey, with green fragments or shards). Trace coal and carbonised plant fragments.
	END		

GEOLOGICAL DRILL HOLE LOG

551071

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T9
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: DN 989935
<u>DATES</u>	: 9/3 - 10/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 425
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 121mm blade: 0-84m	<u>TOTAL DEPTH</u>	: 84.0m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 2m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: Required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	4	4	SOIL. Brown, Clayey.
4	8	4	SOIL. Grey-brown. Silty clay. Calcareous. Black carbonaceous or peaty layers.
8	10	2	SILT. Yellow-brown. Clayey slightly calcareous.
10	14	4	SILTSTONE. Brown-grey to black. Part weathered, slightly calcareous.
14	22	8	SILTSTONE/SANDSTONE. Black siltstone at top; grading to very fine mid grey, slightly calcareous lithic (?) sandstone with depth.
22	24	2	MUDSTONE. Black, carbonaceous, calcareous.
24	32	8	SILTSTONE. Dark grey, becoming grey with depth.
32	34	2	SANDSTONE. Grey. Very fine. Lithic.
34	42	8	SILTSTONE. Dark grey.
42	46	4	SANDSTONE. Grey. Very fine. Quartz-feldspar-lithic.
46	62	16	SILTSTONE. Dark grey. Part micaceous.
62	64	2	SANDSTONE. Grey. Very fine. Lithic(?).
64	70	6	MUDSTONE. Pale grey-green.
70	76	6	MUDSTONE/SILTSTONE. Pale grey-green mudstone mixed with grey to grey-green siltstone.
76	84	8	SILTSTONE. Grey to grey-green. Some very fine grey-green lithic(?) sandstone.
	END		

GEOLOGICAL DRILL HOLE LOG

551072

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T10
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: DP 666047
<u>DATES</u>	: 11/3 - 12/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 300m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-7m 121mm blade: 7-90m	<u>TOTAL DEPTH</u>	: 90.0m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 6m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: Required depth.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	6	6	BOULDER SCREE. Boulders of basalt: fresh and weathered; in light brown clay soil.
6	14	8	MUDSTONE. Weathered. Buff. Becomes very fine lithic(?) sandy mudstone with depth. Rare traces black coal.
14	20	6	MUDSTONE. Dark grey. 16-18m: 2% black coal. 18-20m: 5% black coal.
20	26	6	MUDSTONE. Grey. Part very fine lithic sandstone. 1% black coal to 24m. Minor cream or pale green-yellow zeolite (harder than mudstone). 24-26m: 10% dark grey siltstone.
26	30	4	SANDY MUDSTONE. Grey. Very fine lithic sandy mudstone.
30	50	20	SANDSTONE. Grey. Fine. Becoming fine-medium with depth. Lithic. Minor black coal from 34m.
50	54	4	MUDSTONE. Dark grey. 50-52m: trace bright black coal. 52-54m: carbonaceous.
54	58	4	LITHIC SANDSTONE. Grey. Very fine. Minor black dull coal. Traces carbonised plant fragments.
58	64	6	MUDSTONE. Dark grey. Trace carbonised plant fragments.
64	66	2	SANDSTONE. Pale grey. Very fine. Quartz sandstone. 40% dark grey mudstone.
66	70	4	SANDSTONE. Grey. Fine. Quartz-feldspar-lithic.
70	82	12	LITHIC SANDSTONE. Grey. Very fine. 40% dark grey mudstone.
82	84	2	MUDSTONE. Black.
84	86	2	LITHIC SANDSTONE. Dark grey. Very fine.
86	90	4	LITHIC SANDSTONE. Grey. Fine.
			END

GEOLOGICAL DRILL HOLE LOG

551073

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T10A
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: DP 666047
<u>DATES</u>	: 14/3-15/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 300m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-7m Diamond: 7-21.3m	<u>TOTAL DEPTH</u>	: 21.3m
<u>CORE SIZE</u>	: HQ	<u>WATER DEPTH</u>	:
<u>LOGGED BY</u>	: G. Torr	<u>CASING</u>	: 6m
		<u>COMMENTS</u>	: required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	7	7	NO CORE
7.00	7.90	0.90	MUDSTONE. Soft, weathered, moderately broken. Buff to grey. Rare fragments black coal at top.
7.90	10.10	2.20	SANDSTONE. Soft, weathered. Light brown to brown-grey. Very fine. Lithic(?)
10.10	11.20	1.10	MUDSTONE. Soft, weathered, broken. Light grey-brown to grey.
11.20	13.00	1.80	SANDSTONE. Soft, weathered. Light brown. Very fine. Lithic(?). Bedding at 80° to long core axis.
13.00	14.54	1.54	LITHIC SANDSTONE. Base of weathering at 13.00m sharp. Soft, unweathered sandstone. Grey. Very fine, becoming fine with depth. Bedding defined by coal wisps and carbon layers at 70-90° to long core axis. Occasional carbonised plant remains.
14.54	15.06	0.52	MUDSTONE. Soft, unweathered. Grey. Laminated at 80° to long core axis. Small scale scour and fill indicates right-way-up.
15.06	15.15	0.09	LITHIC SANDSTONE. Soft. Grey. Very fine. Upper contact, sharp, at 50°; lower, sharp, at 80° to long core axis.
15.15	16.85	1.70	MUDSTONE. Soft. Dark grey. Laminated, carbonaceous(?) Dark brown streak. Becoming very soft, broken at bottom indicating fault zone. Trace pyrite.
16.85	17.41	0.56	LITHIC SANDSTONE. Grey to dark grey. Very fine. Banded with mudstone at 80° to long core axis.
17.41	18.15	0.74	MUDSTONE. Soft, very broken. Grey to dark grey. Occasional black coal fragments. 17.72-17.74: fault zone.
18.15	18.49	0.34	COAL. Broken. Black. Dull-banded. 1% pyrite. Central to lower section very low density. Upper 10cm is more of a coaly mudstone.
18.49	19.50	1.01	MUDSTONE. Soft. Dark grey. Occasional carbonised plant fragments.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
19.50	19.56	0.06	COAL. Broken. Dull-banded. 1% pyrite. Banding at 80° to long core axis.
19.56	19.68	0.12	LITHIC SANDSTONE. Medium grained.
19.68	21.06	1.38	MUDSTONE. Soft. Grey to dark grey. Banded with very fine lithic sandstone, increasing with depth. Banding at 80° to long core axis.
21.06	21.30	0.24	LITHIC SANDSTONE. Grey. Fine. Occasional very thin bands coaly material (1mm).
	END		

GEOLOGICAL DRILL HOLE LOG

551075

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T11
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: DP 650136
<u>DATES</u>	: 11/3 - 13/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 535m
<u>DRILLER</u>	: R. Lethborg	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Gemcodril 210-D	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 98mm blade: 0-70m	<u>TOTAL DEPTH</u>	: 70.0m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 6m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	4	4	PEAT
4	6	2	QUARTZ SAND. Unconsolidated. Brown-grey. Fine.
6	8	2	SANDY CLAY. Grey. Fine quartz sandy clay.
8	12	4	QUARTZ SAND. Unconsolidated, clean. Pale grey. Medium to coarse quartz sand.
12	18	6	SILTSTONE. Interbedded pale grey-green and pink-chocolate quartzose siltstones. Trace pyrite.
18	34	16	SILTSTONE. Grey-green. Quartz-muscovite siltstone. In part very fine sandstone. 26-28m: trace carbonised plants.
34	36	2	SANDSTONE. Green-grey. Very fine. Quartz with 10-20% muscovite; 5% opaques.
36	52	16	SILTSTONE. Dark green-grey; some interbands of pink-chocolate (especially at 42-44m). Quartz-muscovite siltstone. Part pale green very fine sandstone of same composition.
52	54	2	SANDSTONE. Pale green. Very fine. Quartz with 10% green mica and fine grains of siltstone. Subangular quartz.
54	68	14	SILTSTONE. Pale green to grey-green; some dark grey. Interbands of pink-chocolate, especially from 60m. Occasionally slightly calcareous from 60m. Quartz-muscovite siltstone. 30% very fine quartz sandstone.
68	70	2	SANDSTONE. Pale green. Very fine subangular quartz sandstone. 10-20% dark grey-green siltstone fragments.
	END		

GEOLOGICAL DRILL HOLE LOG

551076

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T12
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: DP 665014
<u>DATES</u>	: 13/3-14/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 200m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 121mm blade: 0-8m 114mm hammer: 8-90m	<u>TOTAL DEPTH</u>	: 90.0m Dry to approx. 80m.
<u>CORE SIZE</u>	: -	<u>WATER DEPTH</u>	: Filled with water for logging.
<u>LOGGED BY</u>	: G. Torr	<u>CASING</u>	: 2m
		<u>COMMENTS</u>	: Abandoned: slow progress due to wet clay clogging hammer

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	6	6	MUDSTONE. Mod. Hard, weathered. Grey-brown.
6	8	2	LITHIC SANDSTONE. Fresh, hard. Grey. Medium grained. Quartz-feldspar-lithic.
8	10	2	MUDSTONE. Mod. hard, weathered. Grey-brown.
10	14	4	SILTSTONE. Fresh, hard. Light grey. Grades to very fine lithic sandstone with depth.
14	16	2	LITHIC SANDSTONE. Fresh, hard. Light grey. Very fine to fine. Quartz-feldspar-mica-lithic.
16	18	2	LITHIC(?) SANDSTONE. Fresh, hard. Light grey. Fine to medium. Quartz-feldspar-mica-lithic(?)
18	30	12	SILTSTONE. Fresh, hard. Light grey. Range mudstone to very fine sandstone. Minor carb. wisps and (?)plant fragments.
30	32	2	LITHIC(?) SANDSTONE. Hard. Grey. Very fine. Quartz-feldspar-mica-lithic(?).
32	36	4	SILTSTONE. Hard. Dark grey. Range mudstone to very fine sandstone.
36	40	4	LITHIC(?) SANDSTONE. Hard. Light grey. Fine. Quartz-feldspar-mica-lithic(?) (Lithic component is predominantly pink in this hole, with less common dark and rare green fragments).
40	48	8	SILTSTONE/SANDSTONE. Hard, gritty. Grey. Range mudstone to very fine sandstone. Sandstone is quartz-feldspar-mica-lithic. Occasional carbonised plant remains.
48	50	2	LITHIC SANDSTONE. Gritty. Light grey. Fine. Quartz-feldspar-lithic. Many dark lithic grains.
50	52	2	MUDSTONE. Hard. Dark grey.
52	54	2	LITHIC SANDSTONE. Gritty. Light grey. Very fine.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
54	60	6	MUDSTONE. Light grey.
60	62	2	SILTSTONE. Hard, gritty. Grey.
62	66	4	LITHIC SANDSTONE. Light grey. Very fine. Quartz-feldspar-lithic.
66	72	6	LITHIC SANDSTONE. Mod. hard, gritty. Light grey. Medium grained. Quartz-feldspar-lithic. Lithic component includes many dark grains plus a pink angular glassy phase (could be stained quartz or altered volcanic).
72	74	2	SILTSTONE. Hard. Dark grey.
74	82	8	LITHIC SANDSTONE. Gritty. Light grey. Fine. Quartz-feldspar-lithic. Lithic composed of dark and pink grains as 66-72m.
82	88	6	SANDY MUDSTONE. Soft to plastic. Grey mudstone with 20-30% very fine gritty lithic sand component.
88	90	2	LITHIC SANDSTONE. Grey. Very fine. Quartz-feldspar-lithic (pink and dark grains).
	END		

GEOLOGICAL DRILL HOLE LOG

551078

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T13
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 061823
<u>DATES</u>	: 16/3-18/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 130m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-3m 121mm blade: 3-108m	<u>TOTAL DEPTH</u>	: 108.0m
<u>CORE SIZE</u>	: -	<u>WATER DEPTH</u>	:
<u>LOGGED BY</u>	: G. Torr	<u>CASING</u>	: 9m
		<u>COMMENTS</u>	: Required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	2	2	BOULDER SCREE. 40% dolerite boulders; hard, with weathered rims. 60% soil: loose, light brown, medium grained lithic sand.
2	10	8	LITHIC SANDSTONE. Weathered, friable. Light brown. Medium grained; subangular. Quartz-feldspar-lithic.
10	12	2	MUDSTONE. Weathered. Light brown to olive brown. Occasional non-carbonised plant fossils. 1% black coal fragments.
12	18	6	LITHIC SANDSTONE. Weathered. Light brown to grey brown, to olive grey, "salt & pepper". Medium to medium-coarse grained; subrounded to subangular. Quartz-feldspar-lithic. 10% mudstone. Less than 1% black coal grains.
18	28	10	LITHIC SANDSTONE. Part weathered, firmer. Olive brown to grey; "salt & pepper". Medium to medium-coarse; subrounded to subangular. 18-20m: 1-2% very soft black carbonaceous mud. 20-22m 2-5% very soft black carbonaceous mud (= weathered coal?) 22-26m: trace carbon mud.
28	44	16	LITHIC SANDSTONE. Base of oxidation. Fresh. Grey, "salt & pepper". Medium grained, subrounded. Quartz-feldspar-lithic. 30-32m: 1% coal.
44	50	6	MUDSTONE. Firm. Grey. Minor carbonised plant remains.
50	54	4	LITHIC SANDSTONE. Grey, "salt & pepper". Fine to medium grained, subrounded. Quartz-feldspar-lithic.
54	58	4	MUDSTONE. Firm. Grey. Minor carbonised plant remains. 54-56m: 2% black coal. 56-58m: 10% black coal.
58	62	4	LITHIC SANDSTONE. Grey, "salt & pepper". Fine to fine-medium, subrounded. Quartz-feldspar-lithic. 2% black coal.
62	66	4	LITHIC SANDSTONE. Grey, "salt & pepper", medium grained. Quartz-feldspar-lithic. Quartz angular-subangular. Rest subrounded. Trace black coal.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
66	70	4	MUDSTONE. Pale grey. Range up to siltstone and very fine lithic sandstone. Minor carbonised plants. 2% fine grains of black coal but contamination suspected.
70	72	2	MUDSTONE. Firm. Grey.
72	86	14	LITHIC SANDSTONE. Grey, "salt & pepper". Fine to fine-medium, subrounded quartz-feldspar-lithic. Minor portion of the lithic grains are fragments of coal. Grading to medium grained at bottom.
86	88	2	MUDSTONE. Firm. Grey to green-grey to dark grey. 1% black coal fragments.
88	90	2	MUDSTONE. Soft. Pale green-grey 2% black coal.
90	94	4	MUDSTONE/COAL. Firm, grey to dark grey mudstone to very fine lithic sandy mudstone. Carbonised plants common. 20% black dull-banded coal.
94	96	2	MUDSTONE. Soft. Pale grey. 5% black coal.
96	100	4	MUDSTONE. Soft. Grey. Part very fine lithic sandy mudstone. 96-98m: 10% black coal. 98-100m: 2-5% black coal.
100	102	2	MUDSTONE/COAL. Firm. Grey, part carbonaceous. Minor plant remains (not all carbonised). 20-25% black coal.
102	108	6	LITHIC SANDSTONE. Grey, "salt & pepper". Fine, subrounded. Becoming darker grey and fine-medium at bottom. Quartz-feldspar-lithic. 102-104m: 5-10% black coal fragments, medium to coarse size. 104-106m: 1-2% coal. 106-108m: Trace black coal fragments.
	END		

GEOLOGICAL DRILL HOLE LOG

551080

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T14
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 634805
<u>DATES</u>	: 23/3 - 24/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 60m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-15m 121mm blade: 15-50m	<u>TOTAL DEPTH</u>	: 50m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 15m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	6	6	ALLUVIUM. Poorly sorted; river terrace. Mixture of 20-30% boulders, mostly partly weathered, well-rounded dolerite to 5cm. Rest is sandy soil: fine-medium subangular quartz grains in yellow-brown silty clay. Friable to plastic.
6	14	8	ALLUVIUM. Poorly sorted; river terrace. 10-40% boulders, mostly well-rounded dolerite with weathered rims. 1-10cm. Rest is pale brown sticky-plastic sandy clay. Sand is quartz: fine to medium; angular to subangular, often iron-stained. Minor lithic grains.
14	22	8	CLAYEY QUARTZ SANDSTONE. Crumbly to firm. At top: soft, clayey, with 20-30% pebbles weathered dolerite. Rest is white very fine to fine, subangular. Composed of colourless quartz with 10-20% clay.
22	26	4	QUARTZ SANDSTONE. Crumbly to firm. White. Fine, clean, subangular, colourless quartz with minor clay.
26	32	6	CLAYEY QUARTZ SANDSTONE. Crumbly to firm. Pink brown. Very fine to fine, subangular, colourless quartz. 20% pale brown to pale green clay.
32	38	6	QUARTZ SANDSTONE. Friable. Clear to white. Fine, subangular quartz. Colourless with 1% white quartz and 1% lithic and feldspar grains. 2% red-brown clay-coated grains.
38	46	8	QUARTZ SANDSTONE. Friable. White to yellow brown. Fine, subangular to sub-rounded quartz. Colourless, with 1% white quartz and 1% lithic and feldspar grains. 2% patches yellow ochrous coating.
46	48	2	QUARTZ SANDSTONE. Muddy feel. Light yellow brown. Very fine to fine, subangular quartz. Colourless, with 1% white quartz. 2% clay.
48	50	2	MUDDY QUARTZ SANDSTONE. Pink-brown. Very fine to fine, subangular quartz, colourless. 20% white to brown mud.
			END

GEOLOGICAL DRILL HOLE LOG

551081

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T15
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EP 606185
<u>DATES</u>	: 25/3-27/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 335m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 121mm blade: 0-100m	<u>TOTAL DEPTH</u>	: 100.0m
		<u>WATER DEPTH</u>	:
<u>CORE SIZE</u>	: -	<u>CASING</u>	: 3m
<u>LOGGED BY</u>	: G. Torr	<u>COMMENTS</u>	: required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	2	2	SOIL. Mixed plastic, grey clay; dark brown fine sandy soil and rounded weathered pebbles lithic sandstone 1-3cm.
2	4	2	LITHIC SANDSTONE. Soft, friable, weathered. Grey brown to yellow brown. Fine. 5% dark grey, very hard, brittle (?)hornfelsed carbonaceous mudstone, conchoidal break.
4	6	2	MUDSTONE. Soft, unweathered. Grey. Very fine lithic sandy mudstone. 5% harder, iron-encrusted, weathered fine lithic sandstone. 1% very hard, black (?)petrified wood.
6	12	6	LITHIC SANDSTONE. Soft, unweathered. Grey to green grey, "salt & pepper". Very fine to fine, grading to fine with depth. Subangular to subrounded. Quartz-feldspar-lithic. Quartz partly stained brown. 6-8m: trace black hornfels. 8-12m: trace black coal.
12	18	6	LITHIC SANDSTONE. Grey to green-grey, "salt & pepper". Medium grained, subangular to subrounded. Quartz-feldspar-lithic. Trace black coal and hornfels.
18	26	8	LITHIC SANDSTONE. Grey to green-grey. Fine, subangular-subrounded. Medium grained 24-26m. 18-20m: 3-5% dark grey, very hard, brittle hornfelsed mudstone(?); conchoidal break. 20-24m: 1% hornfels.
26	36	10	LITHIC SANDSTONE. Grey "salt & pepper". Fine to medium, subangular to subrounded. Partly calcareous feldspar-lithic-quartz sandstone. 26-28m: 10-15% dark grey, hornfels; conchoidal break. 2% soft, black dull-banded coal. 28-30m: 5% hornfels; 1% coal. 30-32m: 2% hornfels; trace coal. 32-34m: 5% hornfels; 5% coal. 34-36m: 2% coaly mudstone.
36	64	28	LITHIC SANDSTONE. Light grey to green-grey, "salt & pepper". Fine, subangular-subrounded partly calcareous feldspar-lithic-quartz sandstone. Becoming fine to medium grained from 54m. 36-40m: trace black coal. 40-42m: 2% hornfels; 1% crumbly carbonaceous mudstone. 50-52m: 5% hornfels very hard, black. 52-54m: 2% softer, black coal. 54-64m: 1% hornfels; 1% black coal; and 2% pale grey-green shale or tuff.

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
64	66	2	LITHIC SANDSTONE/HORNFELS. 70% sandstone: Green to dark grey-green. Fine, subrounded. Slightly calcareous lithic-quartz-feldspar sandstone. Lithic grains green to grey-green. 30% hard hornfelsed mudstone: dark grey-green to black. Conchoidal break. $\frac{1}{2}$ % pyrite grains.
66	70	4	COAL/COALY SHALE. 70% coal: black, dull-banded, brittle. 10-20% satiny bright bands. 1-2% white calcite. Conchoidal break. Very ashy coal. Trace pyrite. 30% coaly shale: black streak.
70	72	2	MUDSTONE/COAL. 60% mudstone: olive grey, trace pyrite. 40% coal as above.
72	80	8	LITHIC SANDSTONE. Grey. Very fine, becoming fine with depth, subrounded. Slightly calcareous. Trace pyrite. 10% soft grey mudstone; 2% black satiny coal.
80	100	20	LITHIC SANDSTONE. Grey. Fine to fine-medium, subrounded to subangular. Slightly calcareous quartz-feldspar-lithic. Trace pyrite. Possible shell fragments as sandstone component. 84-86m: 10% black coal.
			END

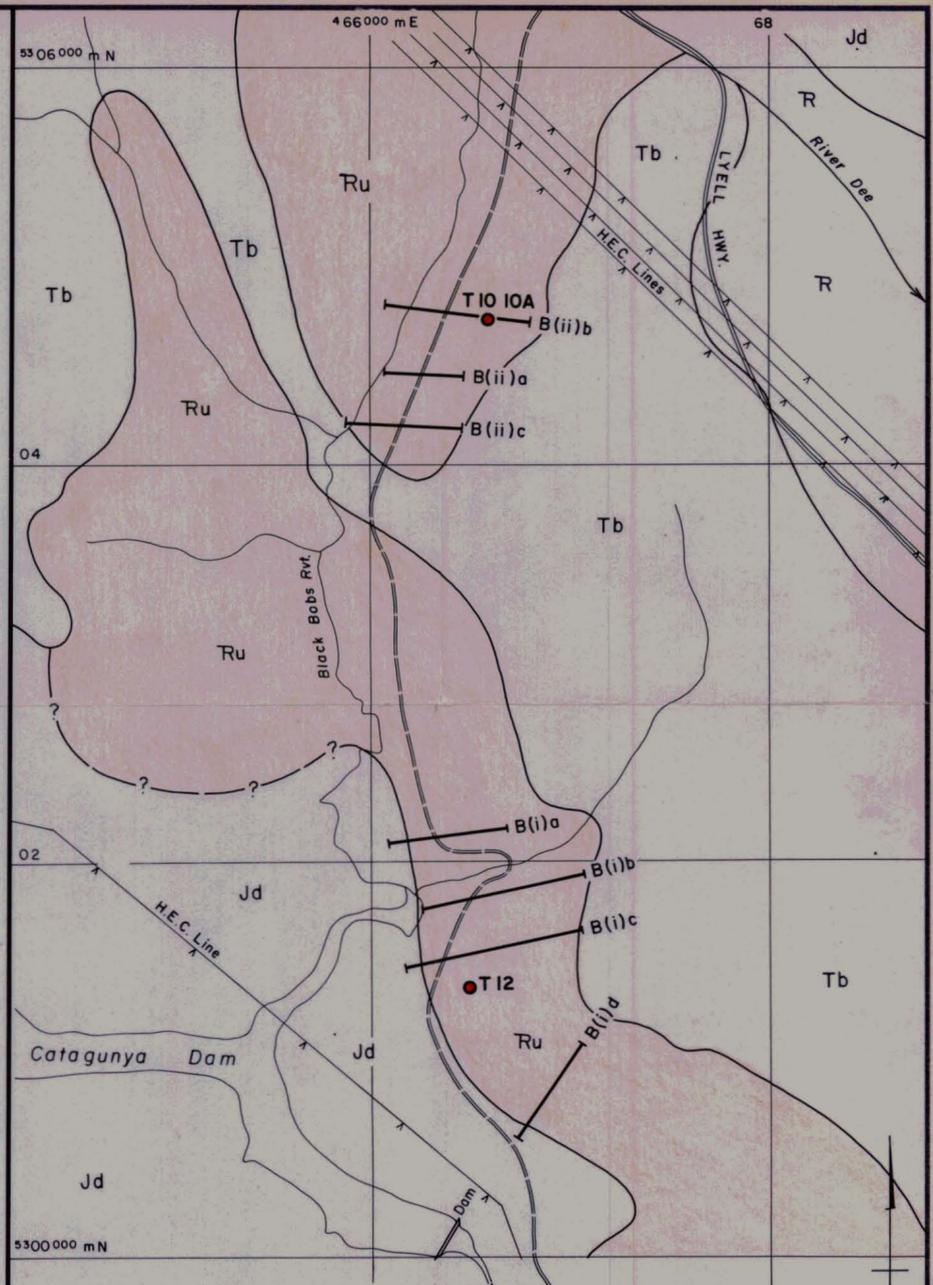
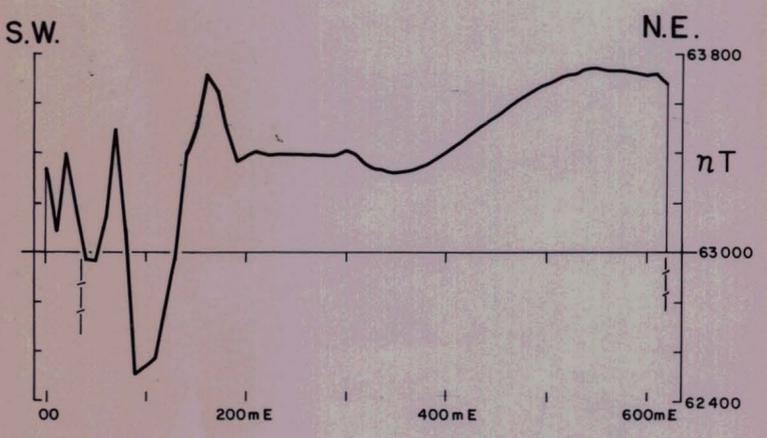
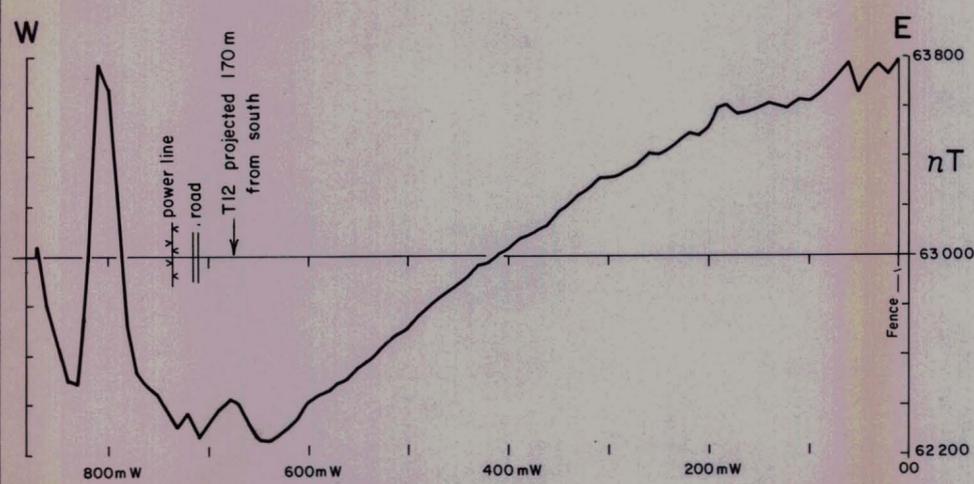
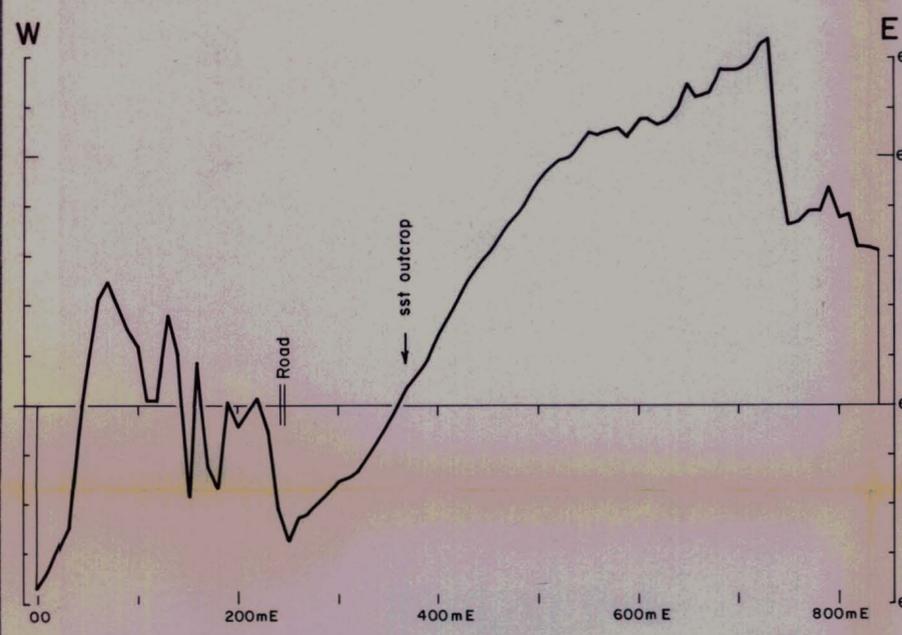
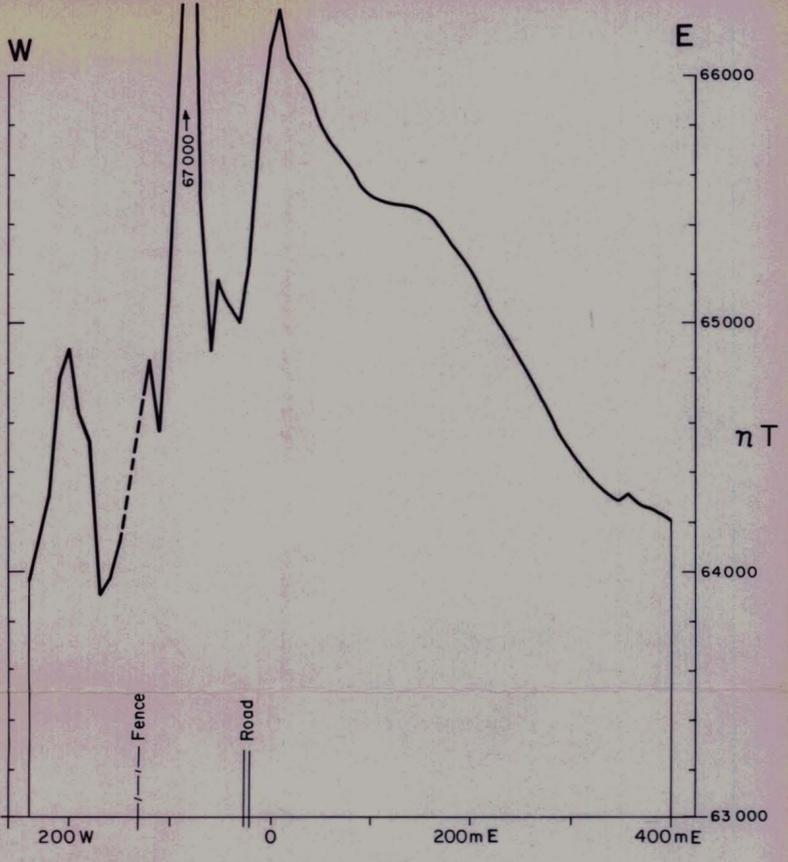
GEOLOGICAL DRILL HOLE LOG

551083

<u>PROJECT</u>	: S.E. Tasmania	<u>HOLE NO.</u>	: T16
<u>TENEMENT</u>	: E.L. 30/80	<u>AMG CO-ORDINATES</u>	: EN 088819
<u>DATES</u>	: 28/3-29/3/83		
<u>COMPANY</u>	: H.J. Stacpoole	<u>R.L.</u>	: 130m
<u>DRILLER</u>	: W. Bald	<u>ORIENTATION</u>	: -
<u>RIG</u>	: Fox Mobile B80	<u>DEPRESSION</u>	: vertical
<u>BITS</u>	: 152mm hammer: 0-6m 121mm blade: 6-100m	<u>TOTAL DEPTH</u>	: 100.0m
<u>CORE SIZE</u>	: -	<u>WATER DEPTH</u>	: -
<u>LOGGED BY</u>	: G. Torr	<u>CASING</u>	: 6m
		<u>COMMENTS</u>	: required depth

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
0	6	6	LITHIC SANDSTONE/SILTSTONE. 60% sandstone: weathered, yellow brown, fine feldspar-quartz-lithic. 40% siltstone: weathered fissile, yellow brown, micaceous, lithic(?) 0-2m: minor fresh dolerite.
6	8	2	LITHIC SANDSTONE. Crumbly. Yellow brown to grey orange. Fine, subrounded. Feldspar-quartz-lithic.
8	14	6	MUDSTONE. Mod. weathered. Olive brown to grey olive. Rare carbonised plant fragments. Minor Mn stains.
14	16	2	SILTSTONE. Base of oxidation. Grey. Range to very fine lithic sandstone.
16	26	10	LITHIC SANDSTONE. Grey, "salt & pepper". Fine. Quartz-feldspar-lithic.
26	40	14	MUDSTONE. Mod. dark grey to green grey. Ranges from clayey to silty. Rare traces carbonised plants.
40	48	8	SILTSTONE. Grey to green-grey. Range mudstone to very fine lithic sandstone.
48	52	4	QUARTZ SANDSTONE. Light grey. Very fine. Quartz-feldspar (+5% mafics = lithics?). Bottom half comprises 50% dark grey siltstone
52	74	22	SILTSTONE. Med. to light grey. Range mudstone to very fine quartz and lithic sandstone.
74	80	6	QUARTZ SANDSTONE. Grey-very fine. Quartz-feldspar (+5% mafics = lithics?).
80	86	6	SILTSTONE. Grey to green grey. Range mudstone to very fine quartz sandstone. Trace white mica.
86	88	2	SILTSTONE. Mixed: 2/3 pale green grey quartzose. 1/3 dusky red. (Similar to holes T5 and T11).

FROM (m)	TO (m)	INTERVAL (m)	DESCRIPTION
88	94	6	QUARTZ SANDSTONE. Pale grey. Very fine. 5% mafics = lithics(?) Trace white mica.
94	100	6	SILTSTONE. Grey to light grey. Range mudstone to very fine quartz sandstone. Trace white mica.
	END		



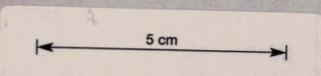
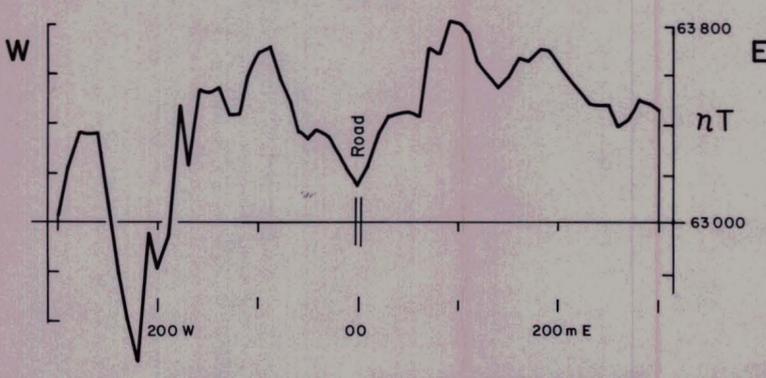
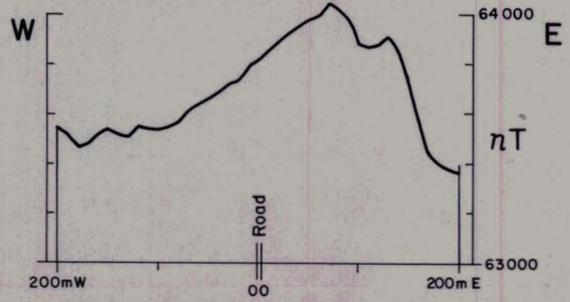
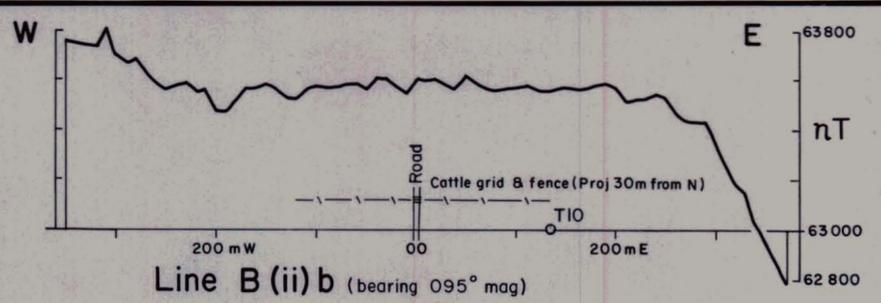
LEGEND

- Tb Basalt
- Jd Dolerite
- Ru Upper Triassic
- R Triassic
- Geological boundary
- B(i)a Ground magnetic traverse
- T12 BHP drill hole

SCALE 1:25,000

0 500 1000 1500 m

GEOLOGY (PHOTO INTERP. & RECONN.)
GROUND MAGNETIC TRAVERSES & DRILLING.

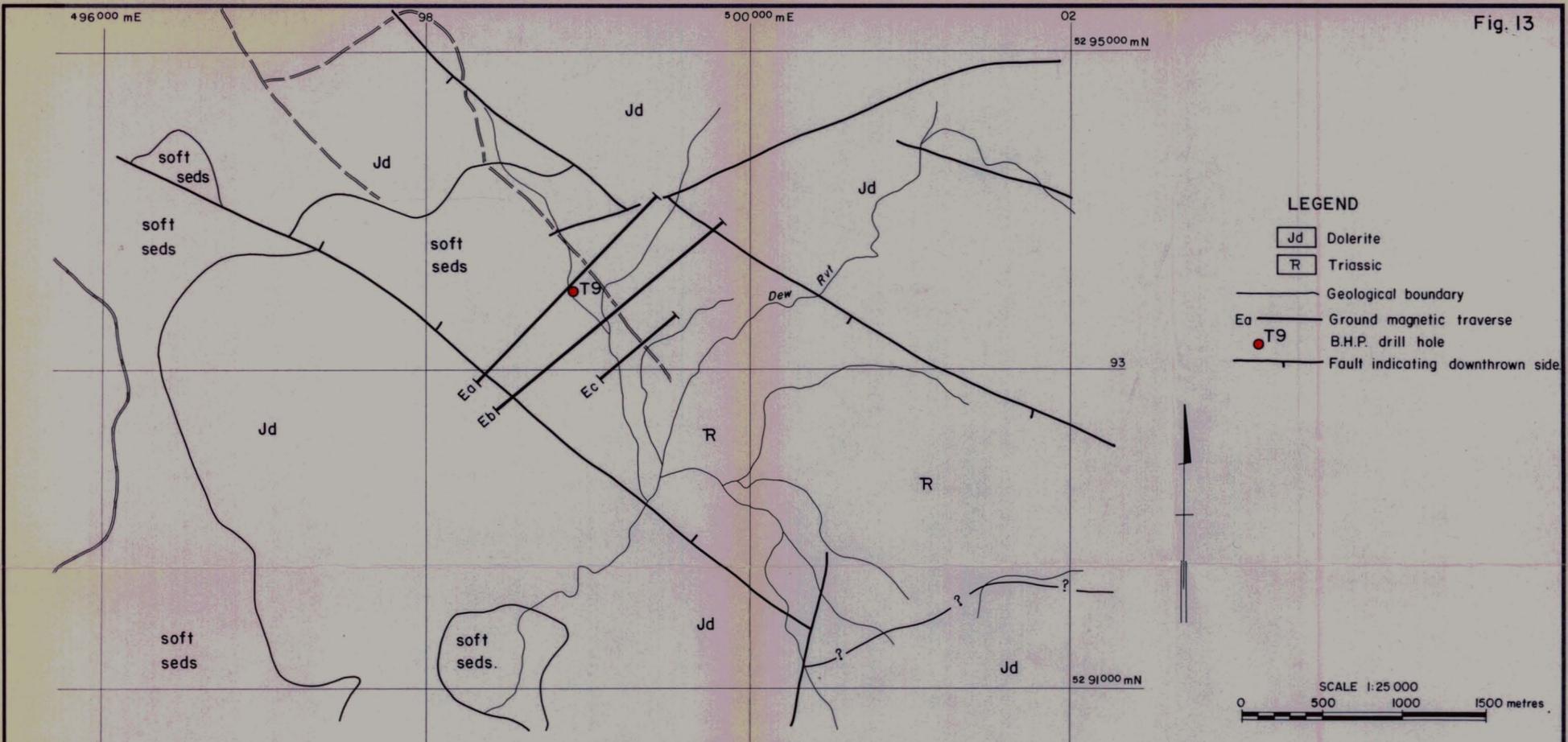


Horizontal scale 1:5,000

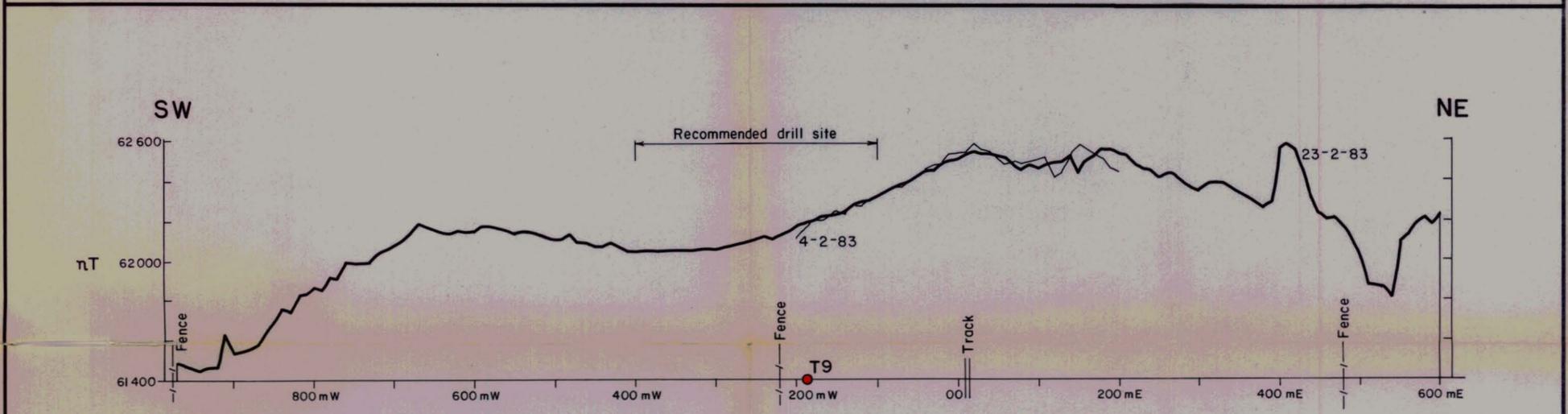
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Fig. 7

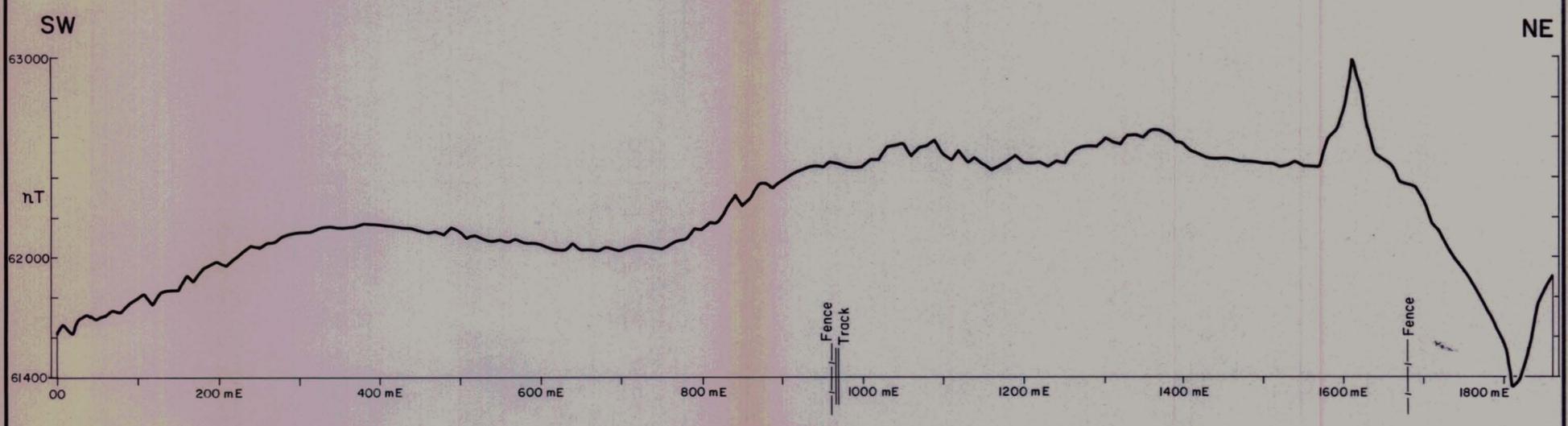
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L.30/80, S.E. TASMANIA CATAGUNYA AREA		
GROUND MAG. PROFILES & GEOLOGY		
Drawn: G. Torr	Date: 17-6-83	Centre: Melbourne
Traced: M. Rosker	Project No:	Drawing No:
Checked:	C35-24	A2-1490/1



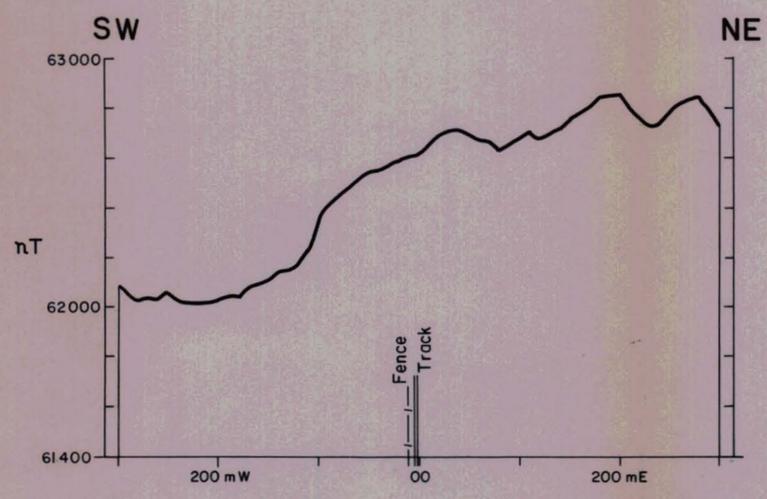
GEOLOGY (PHOTO INTERP. & RECONN. - WEST OF 500 000 mE; LEAMAN & LEGGE, 1975 - EAST OF 500 000 mE)
GROUND MAGNETIC TRAVERSES & DRILLING



Line E (a)
(bearing 30° mag.)



Line E (b)
(bearing 35° mag.)



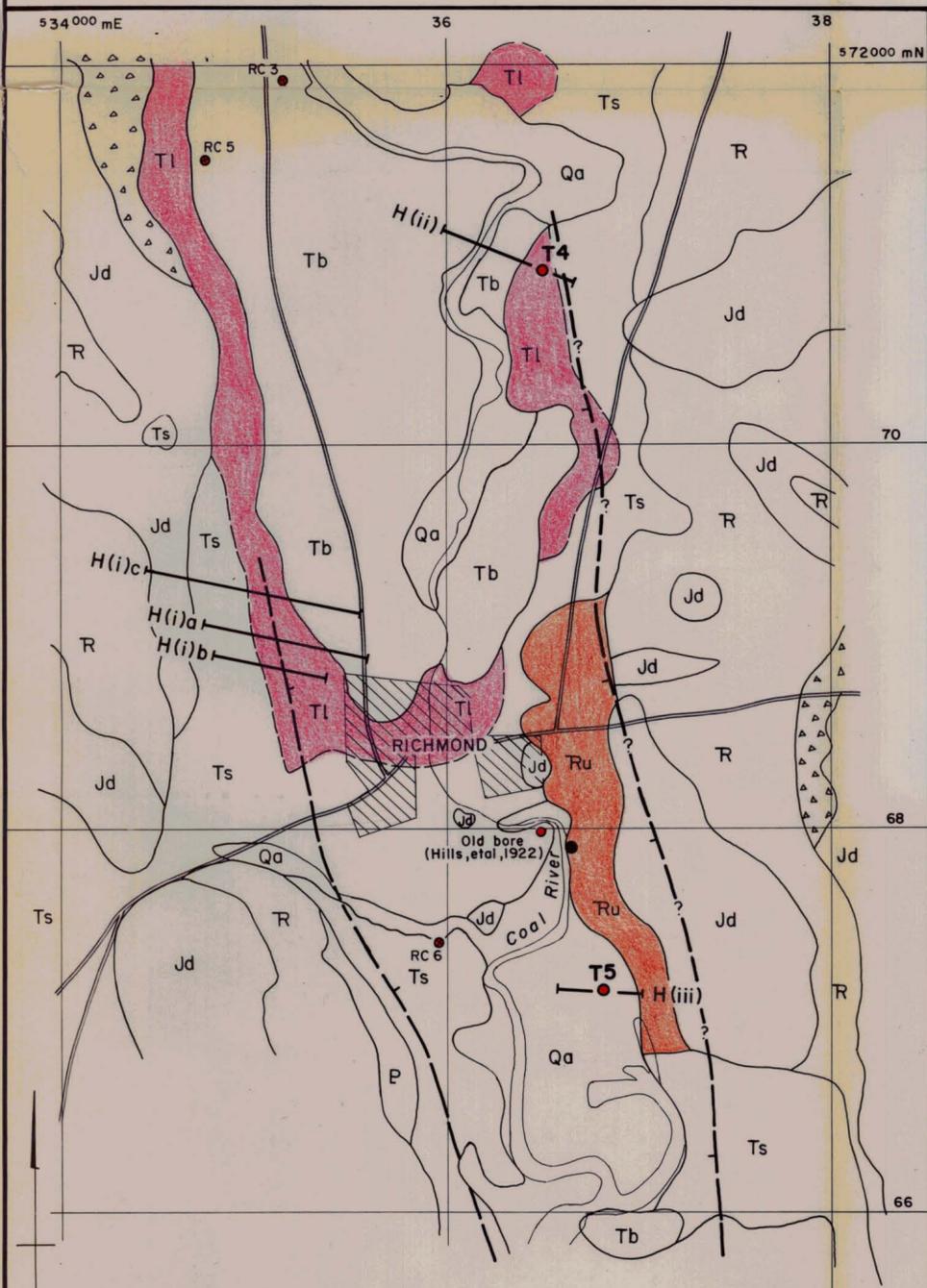
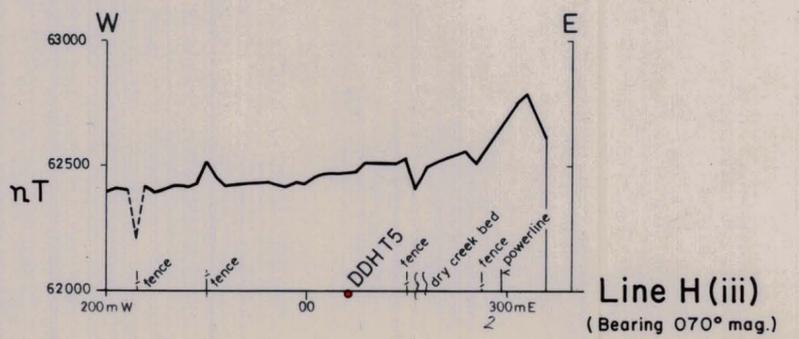
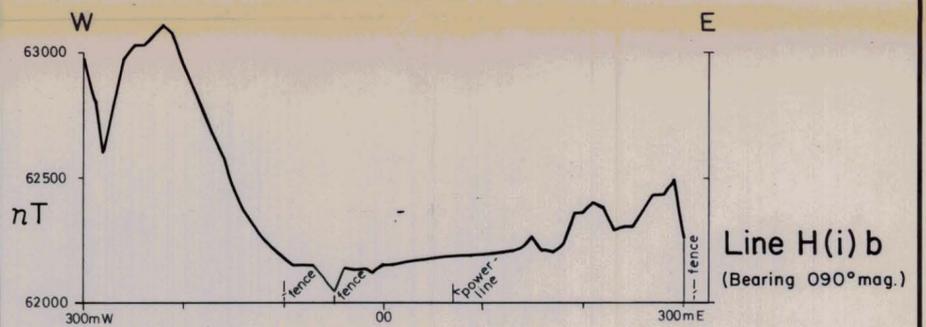
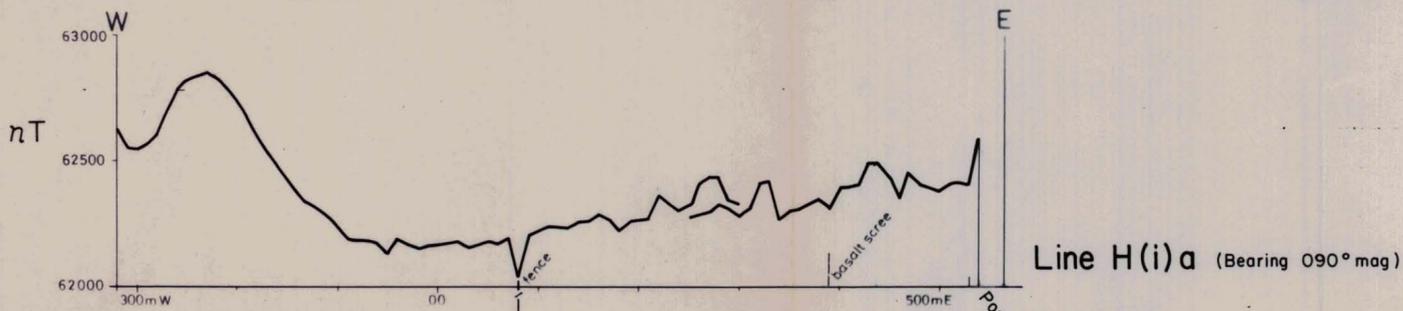
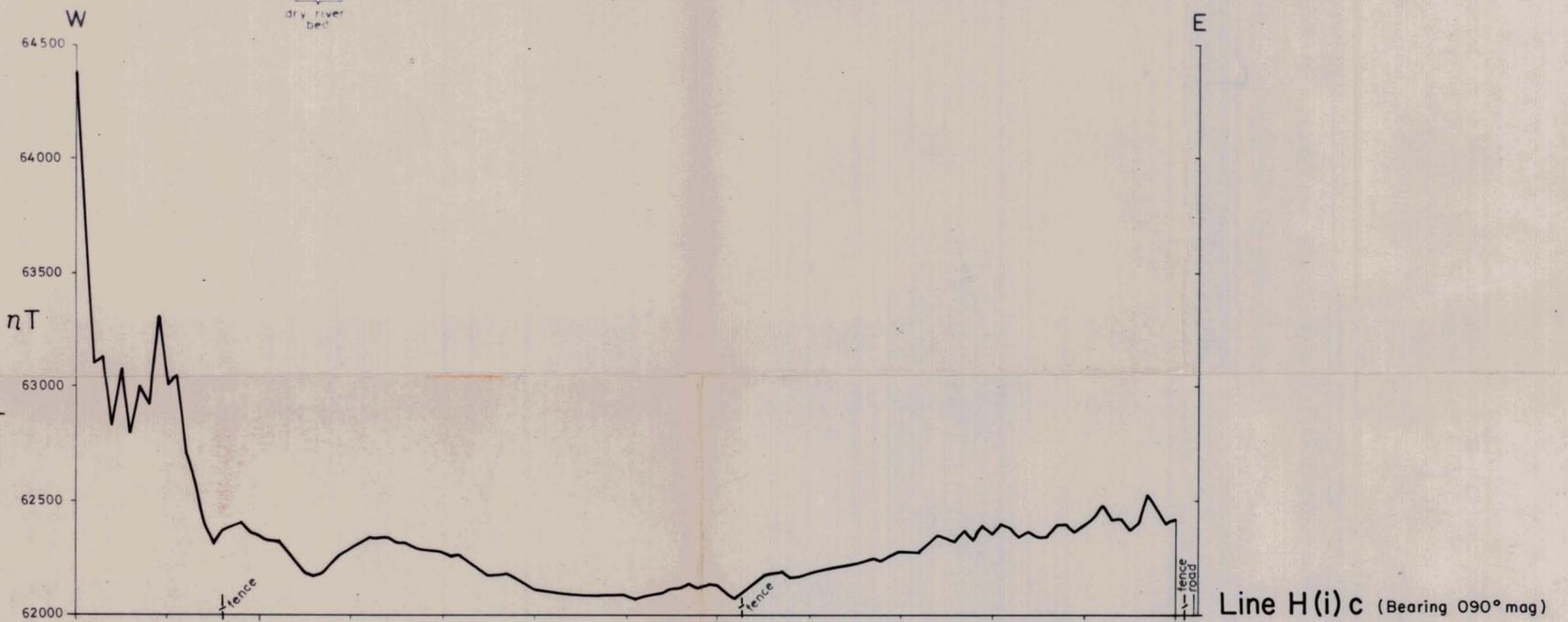
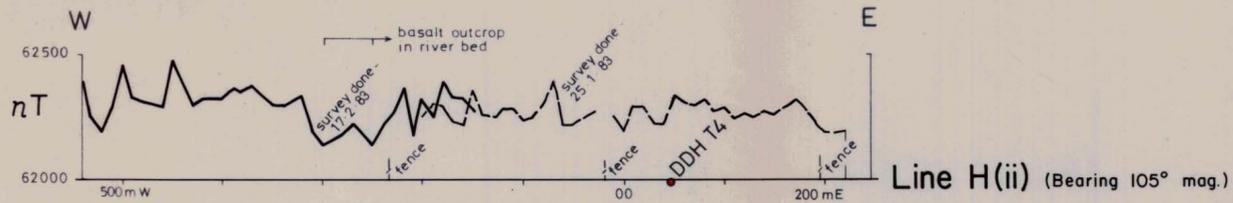
Line E (c)
(bearing 30° mag.)

5 cm

Horizontal scale 1:5 000

551086

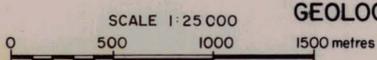
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
E.L. 30/80, S.E. TASMANIA LLANBERIS AREA		
GROUND MAG. PROFILES & GEOLOGY		
Drawn: Graeme Torr	Date: 1-7-83	Centre: Melbourne
Traced: Russell Meaney	Project No: C35-25	Drawing No: A2-1490/2
Checked:		



- LEGEND**
- Scree
 - Alluvium
 - Basalt
 - Sediments
 - Lignite bearing sediments
 - Dolerite
 - Upper Triassic
 - Triassic-undifferentiated
 - Permian
 - Geological boundary
 - Fault indicating downthrown side.
 - Ground magnetic traverse
 - BHP diamond drill hole.
 - Coal occurrence
 - Water bore intersecting lignite (Leaman, 1971)

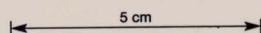
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Horizontal scale 1:5000



GEOLOGY (LEAMAN 1972, LEAMAN & LEGGE 1975)

GROUND MAGNETIC TRAVERSES & DRILLING.



THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
E.L. 30/80, S.E. TASMANIA
RICHMOND AREA
GROUND MAG. PROFILES & GEOLOGY

Drawn : G. Torr	Date : 17-6-83	Centre : Melbourne
Traced : M.R. C.O.	Project N° : C35-26	Drawing N° : A2-1490/3
Checked :		