

000

598001

of M	A.O.	C.G.	E.O.	D.S.M.
Received	23 MAR 1983			E & L
Answered				
DEPT. OF MINES				
2284/83				

MICROFILMED

OPEN FILE

CSR COAL DIVISION

FOR

AAR LIMITED

EXPLORATION LICENCE 20/80, LAUNCESTON

REPORT ON AREA RELINQUISHED

22 FEBRUARY, 1983

P. Ellis

Prepared By:
 CSR Coal Division
 Exploration & Evaluation Group
 13th Floor,
 10 Eagle Street,
BRISBANE Qld. 4000

CONTENTS

	<u>Page No.</u>
1. SUMMARY	1
2. INTRODUCTION	
2.1 Scope of Report	2
2.2 Tenement Details	2
2.3 Location and Access	2
2.4 Climate, Physiography and Land Use	3
3. GEOLOGY	
3.1 Regional Setting of EL 20/80	4
3.2 Parmeener Supergroup	4
3.2.1 Introduction	4
3.2.2 Parmeener Supergroup in EL 20/80	5
3.2.2.1 Lower Parmeener Supergroup	5
3.2.2.2 Upper Parmeener Supergroup	6
3.2.3 Jurassic Dolerite	7
3.3 Tertiary	7
3.3.1 Tertiary in EL 20/80	7
3.4 Geology of the Relinquished Areas	9
4. EXPLORATION	
4.1 Previous Exploration	10
4.1.1 Introduction	10
4.1.2 Bauxite Exploration	10
4.1.3 Groundwater Exploration	10
4.1.4 Oil Exploration	10
4.1.5 Uranium Exploration	11
4.2 Exploration in the Relinquished Areas	11

002

CONTENTS Cont'd

	<u>Page No.</u>
5. RESOURCE ASSESSMENT	13
6. CONCLUSIONS	13
7. REFERENCES	14

003

FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Drawing No.</u>
1.	Exploration Licence 20/80 Launceston	70020-8
2.	Stratigraphy of the Parmeener Supergroup and Launceston Basin in EL 20/80	70020-90
3.	Major Tertiary Structures of Tasmania	70020-122
4.	Relinquished Areas of EL 20/80 and Location of Exploration	70020-115

004

TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page No.</u>
1.	EL20/80 Details of Exploration Statistics	12

APPENDICES

1. EL20/80 Copies of English Logs of Drillholes From the Relinquished Areas.
2. EL20/80 Graphic Logs of Drillholes From the Relinquished Areas.
3. EL20/80 Copies of Geophysical Logs of Drillholes From the Relinquished Areas.

1. SUMMARY

Eight areas within EL20/80 covering a total area of 1,385km² have been relinquished. These areas are mainly located along the northern, western and southern boundaries of the EL. Two small areas occur along the eastern margin of the EL. In general the relinquished areas do not occur within the Tertiary Launceston Basin. The areas relinquished cover outcropping units of Precambrian, Ordovician, Silurian, Permian, Triassic, Jurassic, Tertiary and Quaternary Strata.

A total of 10 holes were drilled for an aggregate of 387.9m rotary chip and 36.1m of core by CSR in the relinquished areas. Literature research and field mapping has also been undertaken.

Numerous exploration holes have been drilled by the Tasmanian Department of Mines, private water well contractors, and mining companies. This data has been assessed and it is suggested that the relinquished areas do not contain coal seams of economic thickness.

007

2. INTRODUCTION

2.1 Scope

This report details the exploration conducted in the 1,385km² area of EL 20/80, which was relinquished in February, 1983.

2.2 Tenement Details

EL 20/80 covering an area of 2,339km² was granted to AAR Limited, a wholly owned CSR subsidiary, on 19th September, 1980. The EL was progressively renewed until 22nd February, 1983.

In February, 1983 application was made to transfer title of EL 20/80 from AAR Limited to CSR Limited. A total of 1,385km² was relinquished during February, 1983. An application has been made for the renewal of EL 20/80 now covering an area of 954km² for the six month period 22 February, 1983 to 22 August, 1983.

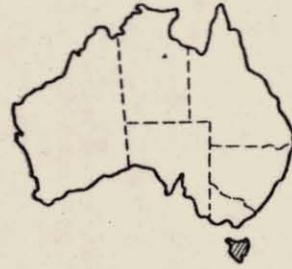
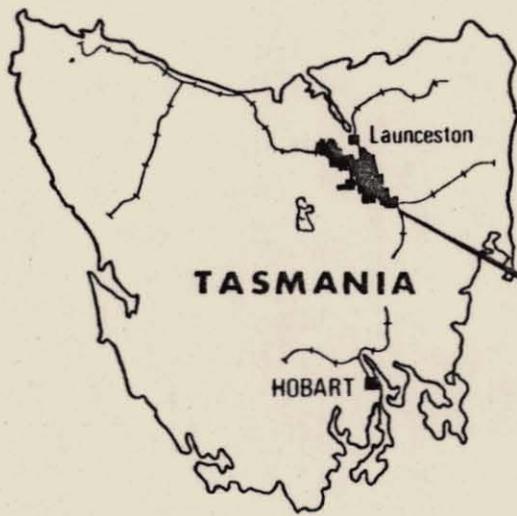
2.3 Location and Access

The retained area of EL 20/80 Launceston extends northwards from Conara Junction to the southern suburbs of Launceston, and continues northwest of Longford and north of Westbury (Figure 1). It includes the towns of Cressy, Perth, Longford, Breadalbane and Carrick, and the villages of Rosevale, Westwood and Selbourne.

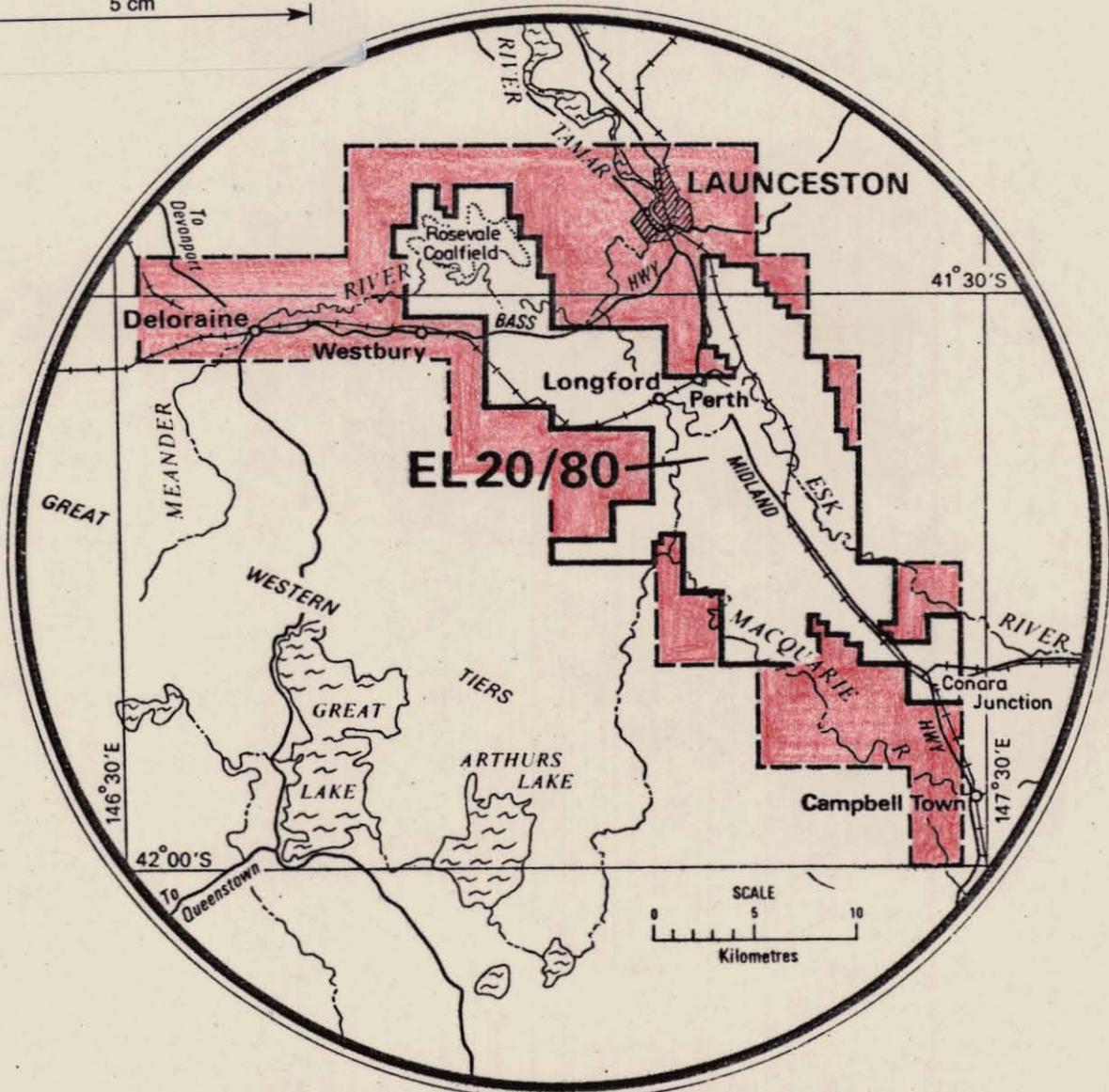
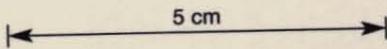
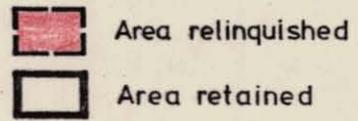
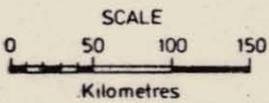
The relinquished areas include the Launceston, Bridgenorth, Birralea, Deloraine, Cressy and Campbell Town districts, (refer to Figures 1 and 4). These areas are mainly located along the northern, western and southern boundaries of the EL. Two small areas occur along the eastern boundary of the EL. The relinquished areas are discussed further in Section 3.4

008

598009



EL20/80



**EXPLORATION LICENCE 20/80
TASMANIA**

2.4 Climate, Physiography and Land Use

The climate of the area is temperate. The annual average rainfall throughout the area ranges from approximately 500 to 1,000mm and generally falls during the winter months, (Matthews, in press).

The Launceston Basin is flat to gently undulating. It is surrounded on all sides by much higher terrain, notably the Great Western Tiers to the west and Ben Lomond to the east.

The major land use of EL 20/80 Launceston is farming, predominantly sheep and cattle grazing. The Carrick-Westbury area is notable for its large number of horse, cattle and sheep studs, and intense cultivation of peas, beans, opium poppy, and cereal crops.

3. GEOLOGY

3.1 Regional Geological Setting of EL 20/80

Precambrian, Cambrian Ordovician and Silurian strata outcrop along the northwest and western margins of EL20/80 and are unconformably overlain by Permo-Triassic Parmeener Supergroup strata. Tertiary Launceston Beds, (Johnson 1888) unconformably overlay the Parmeener Supergroup and outcrop over approximately three quarters of the licence area.

Parmeener Supergroup strata outcrop along the margins of the Launceston Basin and in a discontinuous central horst which is expressed in the Hummocky Hills and hills to the north of Perth which extend north-westerly to Carrick.

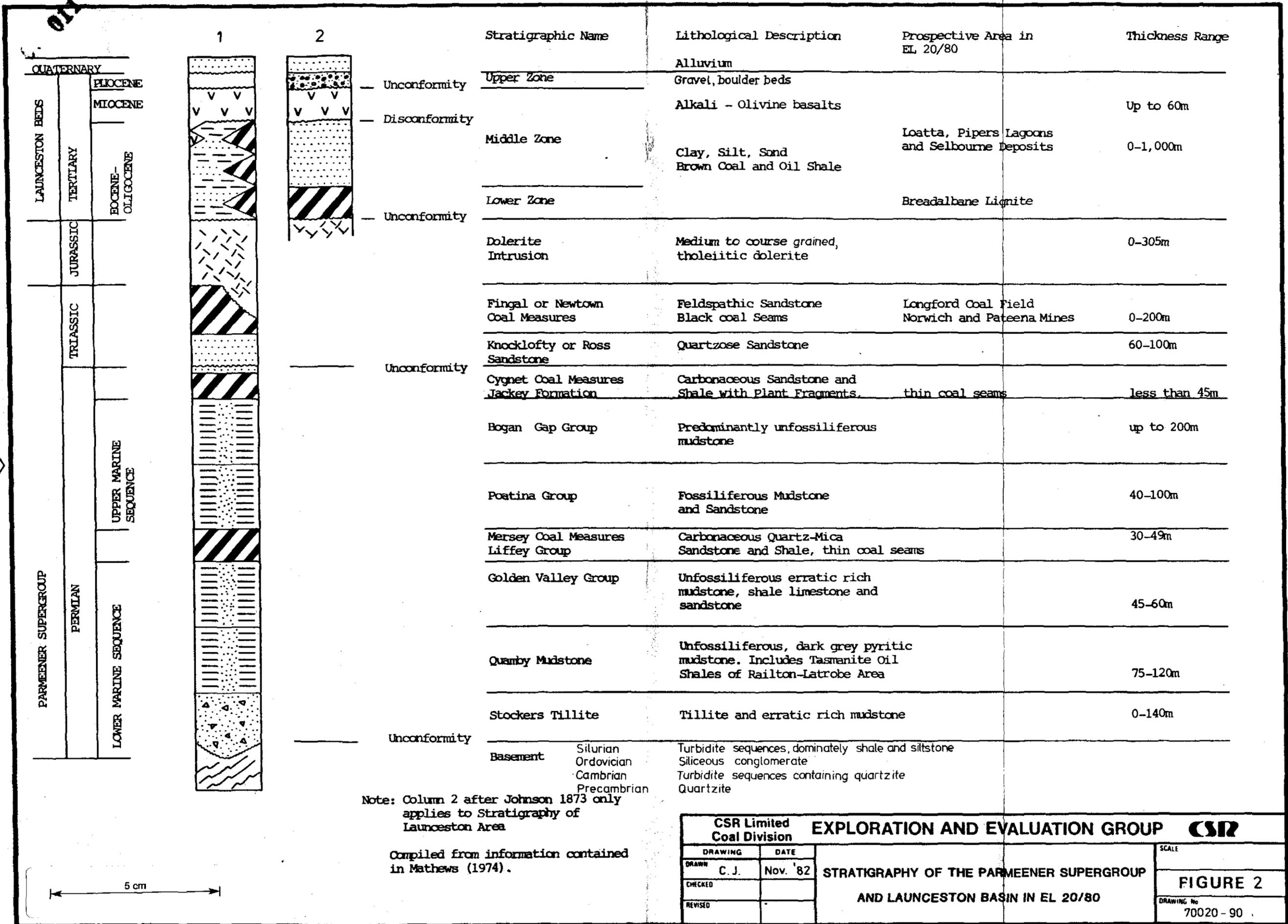
The stratigraphy of the Parmeener Supergroup and Launceston Basins of EL 20/80 is shown in Figure 2. The stratigraphic sequence has been compiled from the Launceston, Quamby, Longford and Frankford 1 : 63,600 Geological Atlas Series, and the Lake River 1 : 50,000 Geological Atlas and the respective accompanying explanatory notes.

3.2 Parmeener Supergroup

3.2.1 Introduction

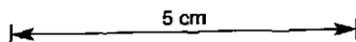
The Parmeener Supergroup refers to sedimentary strata of Permian to late Triassic age. Approximately half of Tasmania is underlain by Parmeener Supergroup strata. The stratigraphy of the Parmeener Supergroup is shown in Figure 2.

Permo-Triassic coal seams are characteristically thin and lensoidal. The coal measure sequences are characterized by rapid lateral and vertical facies variations. The Parmeener Supergroup is affected by major faulting and folding, commonly producing steep dips.



Note: Column 2 after Johnson 1873 only applies to Stratigraphy of Launceston Area

Compiled from information contained in Mathews (1974).



CSR Limited Coal Division		EXPLORATION AND EVALUATION GROUP		CSR	
DRAWING	DATE	STRATIGRAPHY OF THE PARMEENER SUPERGROUP AND LAUNCESTON BASIN IN EL 20/80		SCALE	
DRAWN	C. J.			Nov. '82	FIGURE 2
CHECKED					DRAWING No 70020-90
REVISED					

012

Igneous intrusions are frequently present within Parmeener Supergroup coal measure strata. The two main factors affecting the preservation of coal are erosion and intrusion of coal measure strata by dolerite dykes and sills.

3.2.2 Parmeener Supergroup in EL 20/80

3.2.2.1 Lower Parmeener Supergroup

The Lower Parmeener Supergroup has been divided into a "Lower Marine Sequence", a "Lower Freshwater Sequence" and an "Upper Marine Sequence".

The Lower Marine Sequence, which consists of the Stockers Tillite and time equivalents, is overlain by the Quamby Mudstone which is overlain by the Golden Valley Group. The Stockers Tillite rests unconformably on pre Permian basement rocks. The Quamby Mudstone contains the Tasmanite oil shales of the Latrobe-Devonport area, (Jennings, et al 1976).

The Lower Freshwater Sequence includes the Mersey Coal Measures. They consist of coarse-grained, well washed cross bedded quartz and mica sandstone with minor carbonaceous shale and coal seams.

The Mersey Coal Measures are known to occur in the north-western portion of the Parmeener Supergroup Coal Basin. They take their name from the coal locality in the Mersey River Valley south of Devonport. These coal measures are found in the Lower Permian Remnants at Preolenna and Barn Bluff. (refer Figure 3). However Kerogenite and Pelionite oil shales are commonly interbedded with the coal. Coal and oil shale seams are less than 1m and up to 2m thick respectively. Coal seams contain high sulphur, low ash, moderate specific energy steaming coal, and oil shale.

013

The Liffey Group is a time equivalent of the Mersey Coal Measures in EL 20/80. Thin (less than 30mm) coal seams are documented in the Liffey Group.

The Upper Marine Sequence is up to 300m thick to the south-east of EL 20/80, and ranges in thickness from 80 to 150m within the EL. It consists of the Poatina and Bogan Gap Groups.

3.2.2.2 Upper Parmeener Supergroup

The Upper Parmeener Supergroup has been subdivided into an "Upper Freshwater Sequence" and a "Triassic Sequence".

The Upper Freshwater Sequence contains the Cygnet Coal Measures which are not documented in the Midlands area of Tasmania. The Cygnet Coal Measures take their name from a small out-crop area near Mt. Cygnet, approximately 50km south-west of Hobart. In EL 20/80 the Jackey Formation is a time equivalent of the Cygnet Coal Measures, and ranges up to 50m thick. The Jackey Formation and Clog Tom Sandstone are possibly time equivalents.

Coal from the Cygnet Coal Measures is a moderately high ash and low sulphur content, moderate specific energy steaming coal. Semi-anthracite to anthracite coal is found in seams proximal to Jurassic dolerite intrusions.

The Jackey Formation is underlain by the Bogan Gap and Poatina Groups. The thickness of these strata ranges up to 300m.

The Triassic sequence commences with the Knocklofty Sandstone and time equivalents which range in thickness up to 100m.

014

The Triassic Coal Measures occur throughout most of the upper Triassic sequence. Seams are characterized by common stone bands and coal with moderately high to high inherent ash, low sulphur and moderate specific energy. In the Fingal-Cornwall District seam thicknesses including stone bands range up to 4.9m.

Associated coal measure sediments are lithic sandstones, siltstones, mudstones and carbonaceous shales.

3.2.3 Jurassic dolerite

Parmeener Supergroup Strata are intruded by Jurassic tholeiitic dolerite sills and dykes in excess of 305m thick.

In most places the dolerite appears as a capping such as on the Great Western Tiers and other remnant peaks.

3.3 Tertiary

Non-marine Tertiary sediments were deposited in north to north-west trending grabens initiated in the early Tertiary. Four major grabens are recognised in Tasmania, namely the Midlands Graben, the Derwent and Macquarie Harbour Grabens and the Oyster Bay Graben, (refer Figure 3.) Brown coal and carbonaceous horizons are recorded from all grabens.

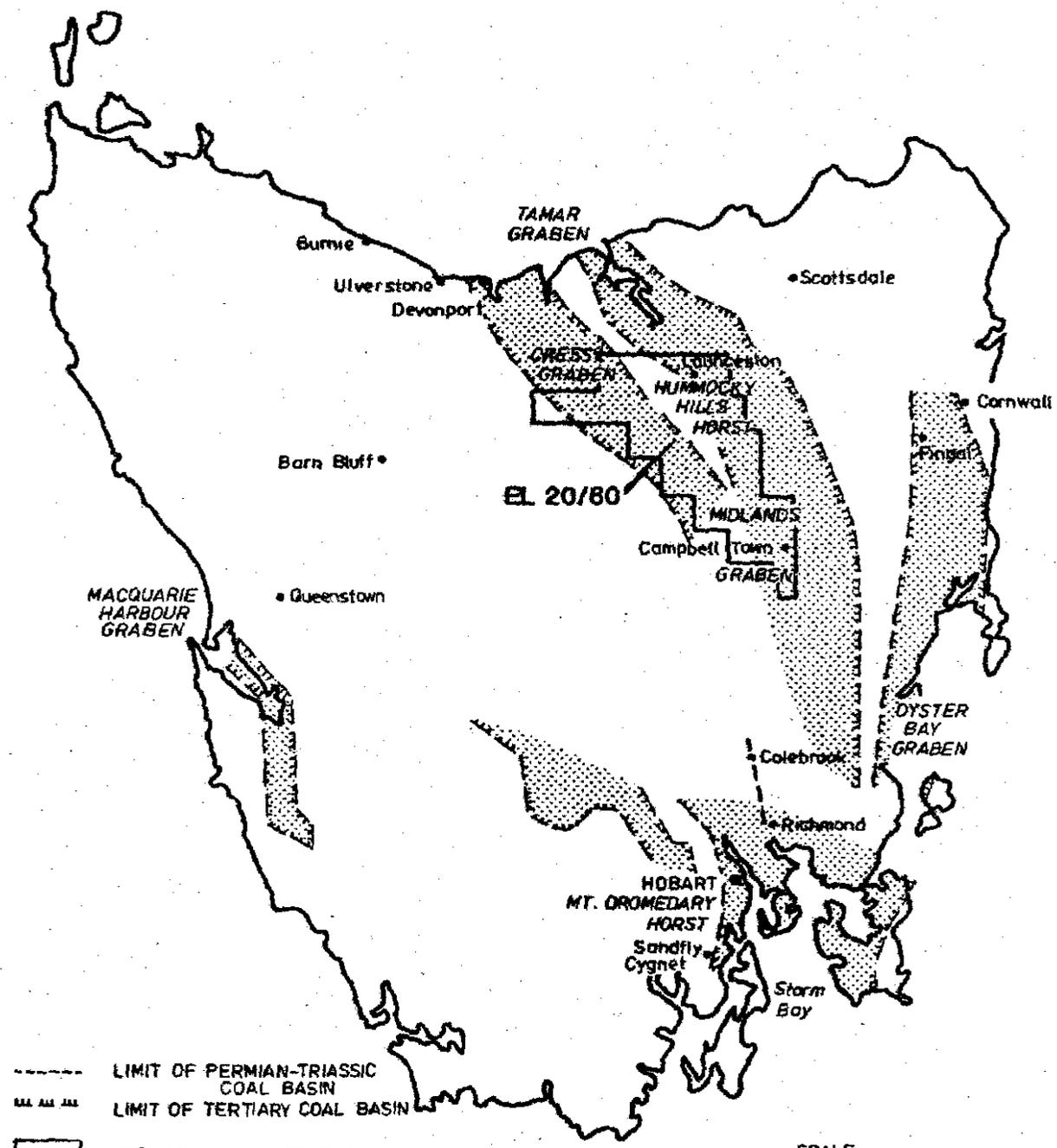
3.3.1 Tertiary In EL 20/80

EL 20/80 Launceston lies within the Midlands Graben. The Midlands Graben bifurcates on either side of the Hummocky Hills. The western or Cressy Graben, extends northwards to Port Sorrell and Devonport. The eastern or Tamar Graben continues to the ocean at the mouth of the Tamar River, (refer Figure 3.) The Launceston Basin refers to both the Cressy and Tamar Grabens.

015

598016

BASS STRAIT



- LIMIT OF PERMIAN-TRIASSIC COAL BASIN
- LIMIT OF TERTIARY COAL BASIN
- PRE-PERMIAN BASEMENT
- PERMIAN-TRIASSIC BASIN
- ▨ TERTIARY COAL BASIN

SCALE
0 20 40 60 80
Kms.

5 cm

CSR Limited Coal Division		EXPLORATION AND EVALUATION GROUP		CSR	
DRAWING / DATE		MAJOR TERTIARY STRUCTURES OF TASMANIA (after Banks, 1962)		SCALE	
DRAWN C.J. Feb. '83				AS SHOWN	
CHECKED				FIGURE 3	
REVISED				DRAWING No 70020 - 122	

016

The Tamar Graben extends southwards as far as the Ross area. Smaller horsts and grabens continue through the Midlands to the Hobart area. A deep but narrow graben between Richmond and Colebrook may be a southerly extension of the Cressy Graben.

Deposition of sediments commenced in the Palaeocene - Lower Eocene and continued until the Upper Oligocene (Matthews, 1974). Sediments are predominantly non-marine clays, silts, sands and gravels with minor marine or brackish environment influences.

The primary source of the inorganic sediments was the sandstones, siltstones and mudstones of the Permian and Triassic strata, and the Jurassic dolerite.

Johnson (1873) arbitrarily divided the sediments of the Launceston area of the Launceston Basin into 3 zones, known as the lower, middle and upper zones. The regional stratigraphy of EL 20/80 is summarised in Figure 2.

The lower zone lies unconformably upon Parmeener Supergroup strata on the West Tamar. This zone contains laminated strata, and numerous fossil leaves.

The middle zone is represented by cross bedded sands and clays, most probably deposited in a fluviatile environment. Middle zone strata outcrop at Windmill Hill in Launceston.

The upper zone is represented by low rounded hills and terraces flanking the present course of the Tamar River.

017

3.4 Geology of the Relinquished Areas.

The areas of EL20/80 which have been outlined for relinquishment include the Launceston, Bridgenorth, Birralee, Deloraine, Cressy and Campbell Town districts (Figure 4). These areas are mainly located along the northern, western and southern boundaries of the EL. Two minor areas (areas 7 and 8) occur along the eastern boundary of the EL.

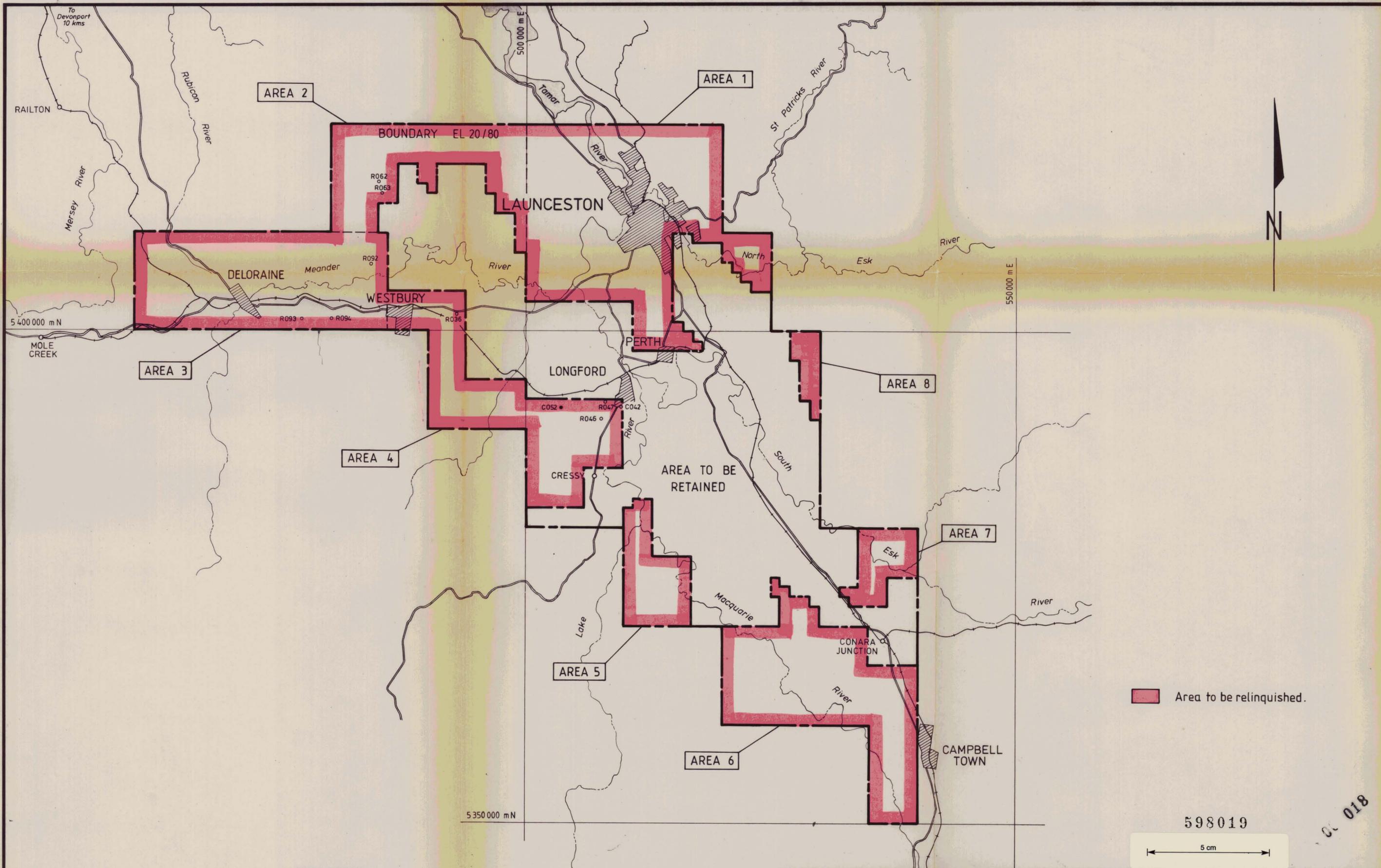
The Launceston District (area 1) includes the City of Launceston which is a populous residential and industrial area. Jurassic dolerite up to 300m thick outcrops throughout most of the district. Tertiary sediments outcrop in the valley of the Tamar River.

The Bridgenorth-Birralee District (area 2) is located in the north of the EL. Most of the area to be relinquished lies outside the Tertiary coal basin, while the remainder of the area is covered by a thin Tertiary sequence.

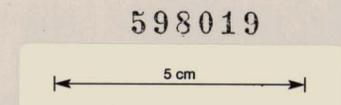
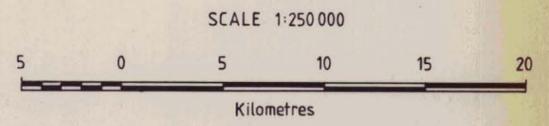
The Deloraine District (area 3) is located west of Westbury. Tertiary basalt generally overlies detritus derived from the Great Western Tiers.

The area for relinquishment in the Cressy District (area 4) is situated southwest of the Western Line Railway between the towns of Westbury and Cressy. A thick succession of Tertiary sediments generally capped by Tertiary basalt unconformably overlies Parmeener Supergroup strata in this area. Numerous exploration holes have been drilled in this area by the Tasmanian Department of Mines and the Getty Oil Development Company.

The Campbell Town District (areas 5 and 6), is situated south and west of the Hummocky Hills. Jurassic dolerite, Triassic sediments and Tertiary basalt outcrop throughout most of this area.



Area to be relinquished.



CSR Limited Coal Division		EXPLORATION AND EVALUATION GROUP		CSR		
DRAWING	DATE	EL 20/80 - LAUNCESTON RELINQUISHED AREA OF EL 20/80 AND LOCATION OF DRILLHOLES		SCALE	1 : 250 000	
DRAWN	MRN			Dec.'82	FIGURE	4
CHECKED					DRAWING No	70020 - 115
REVISED						

01 018

4. EXPLORATION

4.1 Previous Exploration

4.1.1 Introduction

The first recorded drilling in the area presently covered by EL 20/80 was in 1886, when attempts were made to determine the subsurface extent of the Fingal coal measures which outcrop near Longford at the abandoned Longford Coal Field.

Subsequent exploration has been undertaken to explore for bauxite, clay, groundwater, oil, uranium, oil shale and coal.

4.1.2 Bauxite Exploration

In 1946 the Australian Aluminium Commission mapped and extensively sampled bauxite occurring in the Tamar region.

4.1.3 Groundwater Exploration

The first recorded drilling for groundwater in the Launceston Basin was in 1929. Numerous hand dug wells and contract water bores have been completed since 1929. The Tasmanian Department of Mines commenced an extensive and systematic study of the groundwater resources of the Launceston Basin in 1965. Some 236 holes have been drilled.

4.1.4 Oil Exploration

Two oil exploration holes were drilled at Hagley and in the Bracknell area. These are the two deepest holes drilled in the Launceston Basin, and did not intersect oil bearing zones.

020

4.1.5 Uranium Exploration

Getty Oil Development Company Ltd undertook a 122 hole rotary chip drilling programme in 1972-73 aimed at locating uranium mineralization. Their work downgraded the uranium potential of the area, but significant ligneous horizons including brown coal seams were intersected.

4.2 Exploration in the Relinquished Areas

Eight rotary chip and two partially cored holes have been drilled in the relinquished areas. AAR Limited drilled 3 rotary chip and 2 partially cored holes to explore for oil shale. CSR Limited drilled 5 rotary chip holes to explore for brown coal. Thin brown coal seams and bands less than 1m thick were intersected in partially cored holes CO42 and CO52. No coal was intersected in the rotary chip holes. A summary of borehole statistics is included as Table 1.

English and graphic logs of boreholes are included with this report as Appendices 1 and 2. Geophysical logs of drillholes have been forwarded with Osborne (1981) and Ellis (1982 b) and are included with this report as Appendix 3.

TABLE 1
EL20/80 LAUNCESTON
DETAILS OF EXPLORATION STATISTICS

D'hole No.	Collar RL (m)	ASL	AMG N'ing	Co-ord E'ing	Date Commenced	Date Cmp'd	Total Open Depth (m)	Cored Hole (m)	Geophysical Logging				Spontaneous Potential (M)	Logged Depth (M)	Details of Coal Int'sects	
									Density	Gamma	Resistivity	Caliper				
R036	150	5402220	0493100	19/11/81	19/11/81	11.0	11.0	-	-	-	-	-	-	-	-	
C042	150	5392400	0509700	14/03/81	15/03/81	60.0	39.0	21	-	1	1	-	1	40	Seams less than 1m thick throughout interval 48' - 60m.	
R046	150	5391100	0507500	19/03/81	19/03/81	56.0	56.0	-	-	1	1	-	1	32	-	
R047	150	5392800	0507900	20/03/81	20/03/81	52.0	52.0	-	-	1	1	-	1	43	-	
C052	185	5392300	0503700	25/03/81	25/03/81	65.0	49.9	15.1	-	1	1	-	1	51	Coal bands throughout interval 52 - 56m.	
R062	173	5415100	0485230	24/03/82	24/03/82	36.0	36.0	-	1	1	1	1	1	36	-	
R063	163	5413980	0485770	24/03/82	24/03/82	18.0	18.0	-	1	1	1	1	1	18	-	
R092	150	5406750	0477500	20/04/82	20/04/82	66.0	66.0	-	1	1	1	1	1	66	-	
R093	220	5401000	0477500	20/04/82	21/04/82	36.0	36.0	-	-	-	-	-	-	-	-	
R094	200	5400500	0480500	21/04/82	21/04/82	24.0	24.0	-	1	1	1	1	1	24	-	
TOTALS							424.0	387.9	36.1							

021

598022

023

5. RESOURCE ASSESSMENT

An assessment of all available drillhole data indicates that coal seams greater than 1m thick will not be intersected in the eight relinquished areas of EL20/80. Coal seams intersected during exploratory drilling were banded and less than 1m thick and occurred at depths generally greater than 50m.

6. CONCLUSIONS

The relinquished areas 1, 2, 6, 7 and 8 mainly lie outside of the Tertiary Launceston Basin, and are not prospective for Permian Supergroup black coal or Tertiary brown coal.

The relinquished areas 3, 4 and 5, lie primarily within the Tertiary Launceston Basin. Drillhole data indicates that thin banded coal seams less than 1m thick generally occurring at depths greater than 50m may be present in the Tertiary strata.

7. REFERENCES

- BANKS, M.R.,
MAXWELL, R.A.,
Spry, A., 1962 The Geology of Tasmania.
Jour. Geol. Sec. Aust. V9, Part 2.
- BLAKE, A.M., 1959 Geological Atlas 1 : 63,360 Series Longford.
Department of Mines Tasmania.
- BURNS, S.D. 1981 A Review of the Longford Basin, Tasmania,
Australia. Mines Administration Pty. Limited.
(Unpublished Company Report)
- CAREY, S.W. 1947 Geology of the Launceston District, Tasmania.
Rec. Queen Vict. Mus. II. I pp 31 - 45.
- ELLIS, P. 1982a Six Monthly Report for the Period Ending 19th
January, 1982. Exploration Licence 20/80
Launceston, Tasmania. AAR Limited.
(Unpublished Report)
- ELLIS, P. 1982b Three Monthly Report for the Period Ending
22nd May, 1982, Exploration Licence 20/80
Launceston, Tasmania. AAR Limited.
(Unpublished Report)
- ELLIS, P. 1982c Six Monthly Report for the Period Ending 22nd
August, 1982, Exploration Licence 20/80
Launceston, Tasmania. AAR Limited.
(Unpublished Report)
- ELLIS, P. 1982d Exploration Licence 20/80 Launceston,
Tasmania. A Review of the Coal Resources and
Prospectivity. (Unpublished Company Report).
- ELLIS, P. 1982e Exploration Licence 20/80 Launceston,
Tasmania. A Review of the Non-Coal Resources
and Prospectivity. (Unpublished Company
Report).
- GILL, E.D., 1962 Cainozoic in "The Geology of Tasmania"
Jour. Geol. Soc. Aust., V9, Part 2, pp 233 -
253.
- GULLINE, A.B., 1981 Geological Survey Exploratory Report
Geological Atlas 1 Mile Series
Zone 7, Sheet 38 Frankford
Department of Mines, Tasmania.

- 025
- GULLINE, A.B.,
BRAVO, A.P.,
NAQVI, I.H., 1973
Geological Atlas, 1 Mile Series,
Zone 7, Sheet 38, Frankford.
Department of Mines Tasmania.
- HILLS, L.,
REID, A.M.,
NYE, P.B.,
REID, H.G.W.,
REID, W.D. 1922
The Coal Resources of Tasmania.
Miner. Resour. Geol. Surv. Tasm. 7
- JENNINGS, I.B.
NOLDART, A.J.,
WILLIAMS E., 1976
Geology and Mineral Resources of Tasmania
Geological Survey Bulletin 50,
Department of Mines, Tasmania.
- JOHNSON, R.M. 1873
Regarding the Composition and Extent of
Certain Tertiary Beds in and Around Launceston.
Proc. Roy. Soc. Tas. 1873 pp 39 - 47.
- JOHNSON, R.M. 1874
The Launceston Tertiary Basin.
Proc. Roy. Soc. Tas. 1874, pp 53 - 62.
- JOHNSON, R.M. 1874
A systematic Account of the Geology of
Tasmania.
Government Printer : Hobart.
- LONGMAN, M.J.,
MATHEWS, W.L.,
ROWE, S.M., 1964
Launceston Geological Atlas 1 : 63.360 Series
Department of Mines, Tasmania.
- LONGMAN, M.J. 1966
Geological Survey Explanatory Report. One Mile
Geological Map Series K/55 - 7 - 39, Launceston
Department of Mines, Tasmania.
- LONGMAN, M.J.
LEAMAN, D.E., 1971
Gravity Survey of the Tertiary Basins in
Northern Tasmania.
Geol. Surv. Bull 51.
Department of Mines, Tasmania
- MATTHEWS W.L., (1974) Longford Basin Geology 1 : 100,000 Geological
Map. Department of Mines, Tasmania.
- MATTHEWS W.L., (1974) Longford Basin Hydrology 1 : 100,000
Hydrological Map. Department of Mines,
Tasmania.
- MATTHEWS W.L., (1974) Lake River, Geological Atlas 1 : 50,000
Series. Department of Mines, Tasmania.
- MATTHEWS W.L.
(In Press)
The Geology and Groundwater Resources of
the Longford Tertiary Basin. Bull. Geol.
Surv. Tasm. 59.

026

598026

16.

MC CLENAGHAN, M.P.,
BAILLIE, P.W., 1975

Geological Survey Explanatory Report
Geological Atlas 1 : 250,000 Series
Sheet No. SK - 55/4 Launceston
Department of Mines, Tasmania.

OSBORNE, R. 1981

Six Monthly Report for the Period Ending 23rd
August, 1981, Exploration Licence 20/80
Launceston, Tasmania. AAR Limited.
(Unpublished Report)



P. ELLIS,
Geologist - Coal
Exploration and Evaluation Group
CSR Coal Division

027

APPENDIX 1

Copies of English Logs of Drillholes From the
Relinquished Areas.

R036
C042
R046
R047
C052
R062
R063
R092
R093
R094

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

EL2080 LAUNCESTON, C0042

028

Eastings: 509700.000
Northings: 5392400.000
Grid Type: Australian Mappings Grid
Accuracy: Approximate
Cr1: 150.00
Datum: Australian Height Datum
Sheet Reference:
Sheet Index:
Total Depth: 60.00
Drilling Commenced: 14/03/81
Drilling Completed: 15/03/81
Inclination: 90
Azimuth:
Standing Water Level:

Logging Organisation: AAR Limited
Leased By: GSBHQLZ
Drilling Contractor: Exploration Drilling, WA Pty. Ltd.
Geophysical Logging: AAR Limited

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 125
Core Diameter:
Cased Depths:
Core Barrel: Triefus Triple Barrel

Available Data: Gamma Loss
Self Potential Loss
Resistivity Loss

Drill Bits:

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON, C0042

598028

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
TE					2.00	2.00	SILT	Humified, red - brown, highly weathered, soft, iron oxide, secondary, staining.
TE					7.00	5.00	CLAY	Siliceous, gravelly, red - brown, highly weathered, soft, iron oxide, secondary, staining.
TE					15.00	8.00	CLAY	Mottled red - grey, highly weathered, soft, plasticity (un-differentiated), iron oxide, secondary, staining.
TE					20.00	5.00	CLAY	Dark grey - brown, plasticity (un-differentiated), abundant carbonaceous remains; THIN SIDERITE BANDS 1 TO 5CM THROUGHOUT, 35CM SIDERITE BAND BETWEEN 29 AND 32M
TE				C0101	21.00	1.00	CLAY	
TE					33.00	12.00	CLAY	
TE					37.00	4.00	SILT	Sandy, light brown - grey, abundant carbonaceous remains; FEW THIN SIDERITE BANDS, WOOD FRAGMENTS NUMEROUS
TE				C0102	38.00	1.00	SILT	
TE					40.00	2.00	SILT	
TE					48.00	8.00	GRAVEL	Pebbly, grey, loose, non-plastic, poorly sorted, rounded, occasional carbonaceous remains; PEBBLES OF QUARTZ AND QUARTZITE
TE					60.00	12.00	CLAY	Siliceous, dark brown - grey, soft, plasticity (un-differentiated), abundant carbonaceous remains; THIN LIGNITE INTERBEDS. MUCH HOLE CONTAMINATION FROM GRAVELS, POOR SAMPLES. CORE RUNS-RECOVERY 20-23, REC 1.2M; 23-26 REC 2.2M; 26-29 REC 2.55M; 29-32 REC 1.0M; 32-35 REC 1.5M, 35-38 REC 2.2M; 38-41 REC 1.5M AAR BH1 HAS BEEN RENAMED C0042

029

END OF BORE AT 60.00 m

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

 EL2080 LAUNCESTON, C0052

Eastings: 503700.000
 Northings: 5392300.000
 Grid Type: Australian Mapping Grid
 Accuracy: Approximate
 Crl: 185.00
 Datum: Australian Height Datum
 Sheet Reference:
 Sheet Index:
 Total Depth: 65.00
 Drilling Commenced: 25/03/81
 Drilling Completed: 26/03/81
 Inclination: 90
 Azimuth:
 Standing Water Level:

Lossing Organisation: AAR Limited
 Logged By: OSBHOLZ
 Drilling Contractor: Exploration Drilling, WA Pty. Ltd.
 Geophysical Logging: AAR Limited

County:
 Parish:
 Portion:

Plus Depths:
 Hole Diameter: 125
 Core Diameter: 20
 Cased Depths: 0.1
 Core Barrel: Triefus Triple Barrel

Available Data: Gamma Loss
 Detail Density Loss
 Self Potential Loss

Drill Bits:

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON, C0052

030

598030

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					2.00	2.00	SOIL	Silty, clayey, red - brown, highly weathered, soft, friable.
					15.00	13.00	CLAY	MOTTLED AND BANDED BROWN, RED-BROWN, AND BLUE-GREY (PLASTIC) CLAYS
					30.00	15.00	CLAY	Dark grey - brown, soft, plasticity (un-differentiated), abundant carbonaceous remains.
					34.00	4.00	CLAY	Dark grey - brown, soft, plasticity (un-differentiated), abundant carbonaceous remains; INTERBEDDED BLUE-GREY (PLASTIC) CLAY AND MINOR LIGHT GREY SILT
					36.00	2.00	CLAY and SILT	Irregularly interbedded 80:20. CLAY: light blue - grey, soft, plasticity (un-differentiated); SILT: light to medium grey; CORE RUN 1 FROM 36.00 TO 39.00 REC 100X
				C1101	36.35	0.35	SILT	Clayey, light grey.
				C1101	36.45	0.10	SILT	Light grey, high strength; (SIDERITIC?)
				C1101	36.55	0.10	SILT	Clayey, light grey.
				C1101	36.62	0.07	SILT	Light grey, high strength; (SIDERITIC?)
				C1101	38.00	1.38	CLAY	Silty, light grey.
				C1102	38.10	0.10	CLAY	Silty, light grey.
				C1102	38.57	0.47	SILT	Clayey, light grey.
				C1102	39.00	0.43	CLAY	Silty, light grey.
				C1102	39.45	0.45	CLAY	Silty, light grey; VERY SOFT WATERLOGGED MIXED UP DURING THE DRILLING PROCESS CORE LOSS PROBABLY OCCURRED HERE
				C1102	39.66	0.21	SILT	Clayey, light grey; FEW LIGNITIC LAMELLAE

EL2080 LAUNCESTON. C0052

031

598031

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
				C1102	39.73	0.07	SILT	Clayey, grey - brown, abundant carbonaceous remains; FEW LARGE WOODY FRAGMENTS
				C1102	39.81	0.08	SILT	Clayey, light grey - brown.
				C1102	39.91	0.10	SILT	Sandy, light grey.
				C1102	40.00	0.09	SILT	Sandy, light grey, high strength; (SIDERITIC?)
				C1102	40.02	0.02	SILT	Sandy, light grey, high strength; (SIDERITIC?)
				C1102	40.07	0.05	SILT	Clayey, light grey.
				C1102	40.15	0.08	SILT	Sandy, light grey - brown; LARGE WOODY FRAGMENTS
				C1102	44.00	3.85	SILT and SAND	Interbedded 90:10. SILT: clayey, light grey; SAND: silty, loose, non-plastic, fine grained; WOODY FRAGMENTS ABUNDANT
				C1102	50.00	6.00	SILT and CLAY	Interbedded 50:50. SILT: light grey; CLAY: silty, light grey - brown; MINOR FINE SAND WOODY FRAGMENTS ABUNDANT
				C1102	52.65	2.65	CLAY	Soft, abundant carbonaceous grains; GRADES IN COLOUR FROM A DARK BROWN AT 50.00 TO A LIGHT GREY-BROWN AT 52.65 SOME LARGE WOODY FRAGMENTS
				C1102	52.75	0.10	CLAY	Silty, light grey - brown; WOODY FRAGMENTS
				C1102	52.85	0.10	SILT	Clayey, light grey - brown; WOODY FRAGMENTS
				C1102	52.94	0.09	SILT	Light grey; SOME LARGE WOODY FRAGMENTS
				C1102	53.01	0.07	SILT	Light grey, high strength; (SIDERITIC?)
				C1102	53.10	0.09	SILT	Grey - brown; WOODY FRAGMENTS

EL2080 LAUNCESTON. C0052

032

598032

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
				C1102	56.10	3.00	SILT and CLAY	Interbedded 50:50. SILT: light grey; CLAY: silty, light grey - brown, plasticity (undifferentiated); ABUNDANT WOOD FRAGMENTS AND PIECES MINOR FINE SAND
				C1102	57.00	0.90	SILT and SILT	Interbedded 50:50. SILT: light grey - brown; SILT: clayey, light grey - brown, abundant carbonaceous grains; MINOR GREY CLAY LAMINAE AND MINOR WOODY FRAGMENTS
				C1102	60.00	3.00	SILT and CLAY	Interbedded 50:50. SILT: light grey; CLAY: silty, light grey - brown; MINOR FINE SAND AND WOODY FRAGMENTS
				R1103	62.00	2.00	CLAY	
					65.00	3.00	CLAY	

033

CORE RUNS 36-39 REC 3.0M (100%); 39-42 REC 1.15M (38%); 50-53.1 REC 3.1M (100%); 53.1-56.1 REC 15.5CM (5%); 56.1-59.1 REC 0.9M (30%)
AAR BOREHOLE 11 IS NOW NUMBERED C0052

END OF BORE AT 65.00 m

EL2080 LAUNCESTON. C0052

598033

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

EL2080 LAUNCESTON. R0036

034

Eastings: 493100.000
Northings: 5402220.000
Grid Type:
Accuracy:
Crt:
Datum:
Sheet Reference:
Sheet Index:
Total Depth: 11.00
Drilling Commenced: 19/11/81
Drilling Completed: 19/11/81
Inclination:
Azimuth:
Standing Water Level:

Logging Organisation: CSR Exploration and Evaluation Group
Logged By: HINRICHS
Drilling Contractor:
Geophysical Logging:

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 150
Core Diameter:
Cased Depths:
Core Barrel:

Available Data:

Drill Bits: Blades

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON. R0036

598034

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					2.00	2.00	SDIL	Light to medium brown - red, loose, non-plastic.
					4.50	2.50	SILT	Sandy, light to medium brown - red, firm, low plasticity (silt).
					7.00	2.50	SILT	Sandy, medium to dark brown, loose, non-plastic.
					9.10	2.10	GRAVEL	Clayey, sandy, medium to dark brown, loose, non-plastic.
					11.00	1.90	SILCRETE	Medium to dark green - black, high strength, tough;

035

HOLE ABANDONED DUE TO INTERSECTING
PROBABLE PERMIAN BASEMENT ROCK.
UNSURE WHETHER LITHOLOGY IS A BASALT
OR PERMIAN SILICIFIED SHALE

END OF BORE AT 11.00 m

EL2080 LAUNCESTON. R0036

598035

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

EL2080 LAUNCESTON, R0046

036

Eastings: 507500.000
Northings: 5391100.000
Grid Type: Australian Mapping Grid
Accuracy:
Cr1: 150.00
Datum: Australian Height Datum
Sheet Reference:
Sheet Index:
Total Depth: 56.00
Drilling Commenced: 19/03/81
Drilling Completed: 19/03/81
Inclination: 90
Azimuth:
Standing Water Level:

Lossing Organisation: AAR Limited
Lossed By: HOLZOSB
Drilling Contractor: Exploration Drilling, WA Pty. Ltd.
Geophysical Lossing: AAR Limited

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 125
Core Diameter:
Cased Depths: 6.0
Core Barrel:

Available Data: Gamma Loss
Self Potential Loss
Resistivity Loss

Drill Bits: Blades

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON, R0046

598036

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEHENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WRK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
TE					15.00	15.00	CLAY	Siliceous, mottled brown - grey, highly weathered, soft, occasional carbonaceous remains; INTERBEDDED SILTS AND CLAYS; BLUE GREY PLASTIC CLAYS, NON PLASTIC BROWN CLAYS, BROWN SILT. LIKONITIC PISDLITHS TO 2CM DIAMETER TO 6.0M DEPTH
TE					28.00	13.00	CLAY	Dark grey - brown, soft, plasticity (un- differentiated), abundant carbonaceous remains.
TE				R0501	30.00	2.00	CLAY	
TE					41.00	11.00	CLAY	
TE					56.00	15.00	SAND	Gravelly, pebbly, grey, loose, non-plastic, fining upwards; AAR BOREHOLE 5 HAS BEEN RENAMED R0046

END OF BORE AT 56.00 m

EL2080 LAUNCESTON. R0046

037

598037

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

038

 EL2080 LAUNCESTON, R0047

Eastings: 507900.000
 Northings: 5392800.000
 Grid Type: Australian Mappings Grid
 Accuracy:
 Cr1: 150.00
 Datum: Australian Height Datum
 Sheet Reference:
 Sheet Index:
 Total Depth: 52.00
 Drilling Commenced: 20/03/81
 Drilling Completed: 20/03/81
 Inclination: 90
 Azimuth:
 Standing Water Level:

Lossing Organisation: AAR Limited
 Logged By: HOLZSB
 Drilling Contractor: Exploration Drilling, WA Pty. Ltd.
 Geophysical Logging: AAR Limited

County:
 Parish:
 Portion:

Plus Depths:
 Hole Diameter: 125
 Core Diameter:
 Cased Depths: 2.0
 Core Barrel:

Available Data: Gamma Loss
 Self Potential Loss
 Resistivity Loss

Drill Bits: Blades

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON, R0047

598038

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
TE					2.00	2.00	SILT	Clayey, humified, light to medium brown, soft.
TE					7.00	5.00	CLAY and SILT	Interbedded 50:50. CLAY: siliceous, light to medium blue - grey, plasticity (un- differentiated); SILT: clayey, brown.
TE					13.00	6.00	CLAY and CLAY	Interbedded 50:50. CLAY: light brown, soft, plasticity (un- differentiated), occasional carbonaceous remains; CLAY: siliceous, light brown, soft, occasional carbonaceous remains.
TE					18.00	5.00	CLAY	Dark grey, soft, plasticity (un- differentiated), abundant carbonaceous remains.
TE				R0601	20.00	2.00	CLAY	Dark grey, soft, plasticity (un- differentiated), abundant carbonaceous remains.
TE					33.00	13.00	CLAY	Dark grey, soft, plasticity (un- differentiated), abundant carbonaceous remains; THIN SIDERITE BANDS PRESENT AT 24M AND 26M
TE					37.00	4.00	CLAY and SILT	Interbedded 50:50. CLAY: dark grey - brown, soft, plasticity (un- differentiated), abundant carbonaceous remains; SILT: light grey, abundant carbonaceous remains.
TE					38.00	1.00	SILT and SAND	Interbedded 50:50. SILT: light grey, soft, abundant carbonaceous remains; SAND: light grey, loose, non-plastic, fine grained, abundant carbonaceous remains; NUMEROUS FRAGMENTS OF COALIFIED WOOD
TE				R0602	40.00	2.00	SILT	
TE					44.00	4.00	SAND	
TE					52.00	8.00	SAND	Gravelly, pebbly, grey, loose, non-plastic, medium and coarse grained, abundant carbonaceous remains; MORE PEBBLY TOWARDS BASE, PEBBLES OF QUARTZ, SILTSTONE, QUARTZITE, SLIGHT ARTESIAN WATER FLOW ON COMPLETION OF HOLE, AAR BOREHOLE 6 IS NOW NUMBERED R0047

039

END OF BORE AT 52.00 m

EL2080 LAUNCESTON. R0047

598039

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEHENT 2080

040

EL2080 LAUNCESTON. R0062

Eastings: 485250.000
Northings: 5415100.000
Grid Type: Australian Mapping Grid
Accuracy: Approximate
Cr1: 173.00
Datum: Approximate Level - Not Surveyed
Sheet Reference:
Sheet Index:
Total Depth: 36.00
Drillings Commenced: 24/03/82
Drillings Completed: 24/03/82
Inclination:
Azimuth:
Standing Water Level:

Lossins Organisation: CSR Exploration and Evaluation Group
Lossed By: ELLIS
Drillings Contractor: Headline Drillings
Geophysical Lossins: Century Geophysical Corp.

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 120
Core Diameter:
Cased Depths:
Core Barrel:

Available Data: Gamma Loss
Neutron Loss
Density Loss
Self Potential Loss
Resistivity Loss
Caliper Loss

Drill Bits: Blades

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON. R0062

598040

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WRK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					0.50	0.50	SILT	Sandy, clayey, light to medium brown, weathered, firm, low plasticity (silt), very fine grained.
					2.50	2.00	SILT	Sandy, clayey, light to medium brown, weathered, firm, low plasticity (silt), very fine grained.
					3.00	0.50	CLAY	Silty, sandy, mottled grey - brown, weathered, firm, low plasticity (clay); DRILLED ON AIR UNTIL WATER TABLE WAS REACHED ABOVE STRATA ARE MOIST
					3.80	0.80	CLAY	Light to medium grey, firm, low plasticity (clay).
					4.50	0.70	SILT	Clayey, sandy, mottled white - grey, soft, non-plastic; Additional features include: kaolinitic.
					6.00	1.50	SILT	Clayey, sandy, mottled white - grey, soft, non-plastic; Additional features include: kaolinitic; Bands include: GRAVEL, light to medium grey, medium dense, non-plastic; MEDIUM GRAVEL. ROUNDED-WELL ROUNDED QUARTZ AND QUARTZITE
					7.00	1.00	SAND	Gravelly, quartzose, light to medium yellow, medium dense, non-plastic.
					8.00	1.00	SAND	Gravelly, quartzose, light to medium yellow - orange, medium dense, non-plastic; WITH MICACEOUS SILTY SANDY SCHIST PEBBLES, WEATHERED, SOFT LOW PLASTICITY
					9.00	1.00	SAND	Gravelly, quartzose, light to medium yellow - orange; WITH SCISTOSE MATERIAL AS ABOVE BUT YELLOW IN COLOR
					11.00	2.00	SAND	Gravelly, quartzose, medium to dark grey, medium dense, non-plastic, medium and coarse grained; CONTAINS SCHISTOSE MATERIAL DESCRIBED PREVIOUSLY, BUT FELDSPATHIC ALSO CONTAINS UP TO 10% CARB SHALE PULL DOWN USED, FORMATION SOFT REWORKED PRETERTIARY BASEMENT
					13.50	2.50	SAND	Gravelly, quartzose, light to medium grey, medium dense, non-plastic, medium and coarse grained.

EL2080 LAUNCESTON. R0042

041

598041

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					16.00	2.50	SAND	Gravelly, quartzose, light to medium yellow - orange, medium dense, non-plastic, medium and coarse grained, well sorted.
					16.50	0.50	SAND	Gravelly, quartzose, light to medium grey, medium dense, non-plastic, medium and coarse grained; Additional features include: clayey.
					18.00	1.50	CLAY	Silty, micaceous, medium to dark grey, firm, low plasticity (clay); WEATHERED BASEMENT
					36.00	18.00	SILTSTONE	Sandy, micaceous, medium to dark grey, low strength, brittle, very fine grained; TWO SCHISTOSITIES SOME HARD BANDS-CALCITE BASEMENT PERMIAN?

042

END OF BORE AT 36.00 m

EL2080 LAUNCESTON. R0062

598042

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

EL2080 LAUNCESTON. R0063

043

Eastings: 485540.000
Northings: 541420.000
Grid Type: Australian Mapping Grid
Accuracy: Approximate
Crll: 163.00
Datum: Approximate Level - Not Surveyed
Sheet Reference:
Sheet Index:
Total Depth: 18.00
Drilling Commenced: 24/03/81
Drilling Completed: 24/03/81
Inclination:
Azimuth:
Standing Water Level:

Loggers Organisation: CSR Exploration and Evaluation Group
Logged By: ELLIS
Drilling Contractor: Deadline Drilling
Geophysical Loggers: Century Geophysical Corp.

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 120
Core Diameter:
Cased Depths:
Core Barrel:

Available Data: Gamma Loss
Neutron Loss
Density Loss
Self Potential Loss
Resistivity Loss
Caliper Loss

Drill Bits: Blades

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON. R0063

598043

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					0.80	0.80	CLAY	Silty, medium to dark brown - grey, decomposed, firm, low plasticity (clay); WITH SOME COARSE SAND
TR					5.00	4.20	SAND	Quartzose, clayey, light to medium yellow - orange, highly weathered, firm, non-plastic; LOOKS LIKE TRIASSIC OUT CROPPING ON ROAD TO WEST
TR					6.00	1.00	SAND	Quartzose, clayey, light to medium orange, highly weathered, firm, non-plastic; BASE OF WEATHERING
					11.00	5.00	SILTSTONE	Sandy, quartzose, light to medium grey, soft, friable; WATER AT 11M
					16.00	5.00	SILTSTONE	Sandy, quartzose, light to medium grey, low strength, brittle.
					18.00	2.00	SILTSTONE	Sandy, quartzose, medium to dark grey, low strength, brittle; HOLE DRILLED ON AIR, HOLE MAKING OWN WATER SO NO NEED FOR AIR INJECTION

044

END OF BORE AT 18.00 m

EL2080 LAUNCESTON. R0063

598044

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

045

 EL2080 LAUNCESTON. R0092

Eastings: 484450.000
 Northings: 5406750.000
 Grid Type: Australian Mapping Grid
 Accuracy: Approximate
 Cr1: 150.00
 Datum: Approximate Level - Not Surveyed
 Sheet Reference:
 Sheet Index:
 Total Depth: 66.00
 Drilling Commenced: 20/04/82
 Drilling Completed: 20/04/82
 Inclination:
 Azimuth:
 Standing Water Level: 9.2

Logging Organisation: CSR Exploration and Evaluation Group
 Logged By: HOULT
 Drilling Contractor: Deadline Drilling
 Geophysical Logging: Century Geophysical Corp.

County:
 Parish:
 Portion:

Plus Depth:
 Hole Diameter: 120
 Core Diameter:
 Cased Depth:
 Core Barrel:

Available Data: Gamma Loss
 Neutron Loss
 Density Loss
 Self Potential Loss
 Resistivity Loss
 Caliper Loss

Drill Bits: Blades
 Tungsten Carbide

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON. R0092

598045

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (#)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					0.20	0.20	SOIL	Clayey, silty, medium to dark brown - red, weathered, firm, low plasticity (clay).
					0.70	0.50	CLAY	Medium to dark brown, weathered, very stiff, high plasticity (clay).
					1.60	0.90	CLAY	Sandy, medium to dark yellow - brown, weathered, firm, low plasticity (clay).
					2.00	0.40	BASALT	Medium to dark grey - black, weathered, low strength, brittle; GRAVELLY
					2.20	0.20	BASALT	Medium to dark grey - black, weathered, low strength, brittle.
					3.00	0.80	BASALT	Clayey, medium to dark brown - black, weathered, high strength, tough; POSSIBLE FRACTURES WITH CLAY COATING
					5.30	2.30	BASALT	Medium to dark grey - brown, high strength, tough.
					5.70	0.40	BASALT	Dark grey - brown, high strength, tough.
					7.00	1.30	BASALT	Dark grey - brown, weathered, high strength, tough.
					8.20	1.20	BASALT	Dark brown - grey, weathered, high strength, tough; INTERSECTED AQUIFER, UP TO APPROX 200 GALLONS PER HOUR
					11.00	2.80	BASALT	Dark brown - black, high strength, tough.
					13.40	2.40	BASALT	Dark brown - black, weathered, high strength, tough; Additional features include: yellow - brown; Additional features include: orange; FRACTURED ROCK, POSSIBLY VESICULAR
					15.00	1.60	BASALT	Dark black, high strength, tough.

046

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					16.30	1.30	BASALT	Dark yellow - orange, weathered, high strength, tough; Bands include: BASALT, dark brown - black, high strength, tough.
					17.50	1.20	BASALT	Dark brown - black, weathered, high strength, tough.
					18.80	1.30	BASALT	Dark black - grey, weathered, high strength, tough; Bands include: CLAY, silty, medium to dark orange - grey, weathered, firm, high plasticity (clay); Bands include: BASALT, medium to dark orange - grey, weathered, high strength, tough.
					19.40	0.60	CLAY	Medium to dark orange - yellow, firm, high plasticity (clay).
					20.20	0.80	CLAY	Light grey - blue, firm, high plasticity (clay).
					23.00	2.80	CLAY	Silty, dark brown - grey, firm, high plasticity (clay), common woody fragments.
					25.20	2.20	CLAY and CLAY	Interbedded 70:30. CLAY: light to medium grey - brown, firm, high plasticity (clay), occasional woody fragments; CLAY: light blue - grey, firm, high plasticity (clay).
					28.90	3.70	CLAY and CLAY	Interbedded 80:20. CLAY: sandy, light to medium blue - grey, firm, high plasticity (clay), occasional woody fragments; CLAY: light to medium grey - brown, firm, high plasticity (clay).
					30.80	1.90	CLAY and CLAY and CLAY	Interbedded 65:25:10. CLAY: sandy, light to medium brown - grey, firm, high plasticity (clay), fine and medium grained, common woody fragments; CLAY: sandy, light to medium yellow - grey, firm, high plasticity (clay), fine and medium grained, common woody fragments; CLAY: light blue - grey, firm, high plasticity (clay), common woody fragments.
					38.00	7.20	CLAY and CLAY	Interbedded 90:10. CLAY: silty, sandy, light to medium brown - grey, firm, high plasticity (clay), fine and medium grained, common woody fragments; CLAY: sandy, light blue - grey, firm, high plasticity (clay), fine grained.

047

EL2080 LAUNCESTON. R0092

598047

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAK NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					42.80	4.80	CLAY and CLAY	Interbedded 90:10. CLAY: sandy, medium to dark grey - blue, firm, high plasticity (clay), abundant woody fragments; CLAY: sandy, medium to dark grey - brown, firm, high plasticity (clay) NOTE HIGH RESISTIVITY OF THIS ZONE POSSIBLE AQUIFER
					46.40	3.60	CLAY and CLAY	Interbedded 90:10. CLAY: sandy, medium to dark grey - blue, firm, high plasticity (clay), fine and medium grained, abundant woody fragments; CLAY: sandy, medium to dark grey - brown, firm, high plasticity (clay).
					47.80	1.40	CLAY	Sandy, medium to dark grey - blue, firm, high plasticity (clay); NOTE HIGH RESISTIVITY OF THIS UNIT
					52.00	4.20	CLAY and CLAY	Interbedded 90:10. CLAY: sandy, medium to dark grey - blue, firm, high plasticity (clay), abundant woody fragments; CLAY: sandy, medium to dark grey - brown, firm, high plasticity (clay).
					55.00	3.00	CLAY	Sandy, medium to dark grey - blue, firm, high plasticity (clay), fine and medium grained, abundant woody fragments.
					56.30	1.30	CLAY and CLAY	Intermixed 80:20. CLAY: sandy, light to medium yellow - grey, firm, low plasticity (clay), fine and medium grained, common woody fragments, iron oxide, secondary, cement; CLAY: sandy, medium to dark grey - blue, firm, high plasticity (clay), fine and medium grained.
					57.80	1.50	CLAY	Sandy, light to medium grey - brown, firm, high plasticity (clay), fine and medium grained, rare woody fragments.
					59.00	1.20	CLAY	Sandy, kaolinitic, dark grey - cream, firm, high plasticity (clay), occasional bioturbation; Additional features include: occasional carbonaceous root traces; Additional features include: rare woody fragments.
					65.80	6.80	CLAY	Sandy, kaolinitic, light to medium grey - cream, firm, high plasticity (clay), fine and medium grained.

048

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					66.00	0.20	CLAY	Light blue - grey, firm, high plasticity (clay); CLAY FROM 59 METRES IS DECOMPOSED DOLERITE

049

 END OF BORE AT 66.00 m

EL2080 LAUNCESTON. R0092

598049

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

050

EL2080 LAUNCESTON, R0093

Easting: 477500.000
Northings: 5401000.000
Grid Type: Australian Mapping Grid
Accuracy: Approximate
Crl: 220.00
Datum: Approximate Level - Not Surveyed
Sheet Reference:
Sheet Index:
Total Depth: 36.00
Drillings Commenced: 20/04/82
Drillings Completed: 21/04/82
Inclination:
Azimuth:
Standing Water Level:

Logging Organisation: CSR Exploration and Evaluation Group
Logged By: ELLIS
Drilling Contractor: Deadline Drilling
Geophysical Logging:

County:
Parish:
Portion:

Plus Depths:
Hole Diameter: 120
Core Diameter:
Cased Depths:
Core Barrel:

Available Data:

Drill Bits: Blades
Tungsten Carbide

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON, R0093

598050

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					1.20	1.20	SOIL	Siliceous, sandy, medium to dark brown, decomposed, firm, non-plastic; Additional features include: clayey.
					1.40	0.20	CLAY	Mottled yellow - grey, firm, low plasticity (clay).
					3.20	1.80	CLAY	Sandy, lithic, mottled yellow - brown, firm, low plasticity (clay), fine and medium grained; LITHIC SAND, WEATHERED, PARTLY DECOMPOSED TO CLAY, POSSIBLY DERIVED FROM TRIASSIC SANDSTONES
					3.80	0.60	SAND	Medium to dark red, low strength, brittle, iron oxide, cement; WEATHERED DOLERITE
					4.50	0.70	SILT	Sandy, clayey, medium to dark brown, soft, non-plastic, fine and medium grained; Bands include: CLAY, silicified, medium to dark yellow, low strength, brittle.
					6.50	2.00	SILT	Sandy, clayey, medium to dark yellow - brown, soft, non-plastic, fine and medium grained; Additional features include: khaki.
					7.50	1.00	CLAY	Silty, sandy, medium to dark yellow - khaki, soft, non-plastic, fine and medium grained.
					11.00	3.50	BASALT	Gravelly, dark grey, weathered, high strength, brittle, fine grained; BASALT VESICULAR; ZEOLITE INFILLING VESICLES UP TO 5MM. CHANGE TO ROCK BIT AT 11M MIX BAROPOL AND QUIKTROL AT 12M DUE TO CAVING
					13.80	2.80	BASALT	Dark grey, weathered, high strength, tough, fine and medium grained.

051

EL2080 LAUNCESTON. R0093

598051

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					14.80	1.00	BASALT	Dark grey, weathered, high strength, brittle; COMMON VESICLES UP TO 10CM IN SIZE, RODS DROP SUDDENLY THROUGH CAVITIES, COMMON ZEOLITE INFILLING, BASALT WEATHERED AROUND VESICLES.
					15.20	0.40	CLAY	Sandy, medium to dark brown - red, highly weathered, firm, low plasticity (clay), medium and coarse grained.
					16.00	0.80	SAND	Clayey, medium to dark brown - red, highly weathered, medium dense, non-plastic, very coarse grained; CHANGED MUD AND CHANGED TO BLADES AT 15M. CHANGED TO ROCK BIT AT 16M
					18.50	2.50	BASALT	Dark grey - brown, weathered, high strength, brittle; Additional features include: green; BASALT JOINTED, CALCITE ALONG JOINTS ZEOLITE INFILLING VESICLES
					22.50	4.00	BASALT and SILT	Intermixed 70:30. BASALT: dark grey - brown, highly weathered, high strength, brittle; SILT: clayey, sandy, medium to dark brown - yellow, soft, non-plastic, fine grained; Additional features include: quartzose.
					25.50	3.00	BASALT	Dark grey, high strength, brittle; TALC ON SLICKERSIDES
					26.50	1.00	CLAY	Sandy, silty, medium to dark orange - yellow, highly weathered, soft, low plasticity (clay), fine grained; Additional features include: quartzose.

052

EL2080 LAUNCESTON. R0093

598052

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					27.00	0.50	CLAY and SANDSTONE	Intermixed 80:20. CLAY: sandy, silty, light to medium orange - yellow, highly weathered, firm, low plasticity (clay), fine to coarse grained; SANDSTONE: quartzose, clayey, light to medium buff - yellow, moderately weathered, low strength, brittle; DETRITUS DERIVED FROM TRIASSIC CHANGE TO BLADES AT 27M
					29.50	2.50	CLAY	Silty, medium to dark orange, firm, low plasticity (clay), common woody fragments; Bands include: CLAY, light to medium brown - grey, firm, high plasticity (clay).
					30.00	0.50	CLAY	Silty, kaolinitic, light grey - purple, firm, high plasticity (clay).
					32.50	2.50	CLAY	Sandy, quartzose, light grey - purple, soft, low plasticity (clay), fine and medium grained; Additional features include: lithic, micaceous; Bands include: CLAY, sandy, light to medium green - grey, firm, low plasticity (clay), fine and medium grained.
					36.00	3.50	CLAY	Sandy, quartzose, light purple - grey, soft, low plasticity (clay); Additional features include: interbedded 70:30: lithic, micaceous; SILTSTONE: micaceous, light purple - grey, low strength, brittle, subfissile; TRIASSIC STRATA, PYRITE ON BEDDING PLANES BIOTITE ALIGNED PARALLEL TO BEDDING PLANES SCHISTOSITY CROSS CUTS 50 AT 45 DEGREES.

053

END OF BORE AT 36.00 m

EL2080 LAUNCESTON. R0093

598053

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

054

EL2080 LAUNCESTON. R0094

Eastings: 480500.000
Northings: 5400500.000
Grid Type: Australian Mapping Grid
Accuracy: Approximate
Cr1: 200.00
Datum: Approximate Level - Not Surveyed
Sheet Reference:
Sheet Index:
Total Depth: 24.00
Drillings Commenced: 21/04/82
Drillings Completed: 21/04/82
Inclination:
Azimuth:
Standing Water Level:

Lossing Organisation: CSR Exploration and Evaluation Group
Lossed By: ELLIS
Drilling Contractor: Deadline Drilling
Geophysical Lossing: Century Geophysical Corp.

County:
Parish:
Portion:

Plus Depth:
Hole Diameter: 120
Core Diameter:
Cased Depth:
Core Barrel:

Available Data: Gamma Loss
Neutron Loss
Density Loss
Self Potential Loss
Resistivity Loss
Caliper Loss

Drill Bits: Blades
Tungsten Carbide

ALL ROCKS ARE FRESH UNLESS OTHERWISE INDICATED

EL2080 LAUNCESTON. R0094

598054

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

STRAT NAME	SEQ NO.	SEAM NAME	WORK SECT	SAMPLE NUMBER	DEPTH (m)	THICK (m)	ROCK TYPE	GEOLOGICAL DESCRIPTION OF STRATA
					0.80	0.80	SILT	Sandy, light to medium grey, medium dense, non-plastic, fine grained, uniform.
					2.50	1.70	CLAY	Silty, medium to dark brown - yellow, firm, low plasticity (clay).
					3.00	0.50	CLAY	Sandy, light to medium grey, firm, high plasticity (clay).
					3.30	0.30	IRONSTONE - UN-DIFFERENTIATED	Medium to dark orange - brown, high strength, brittle.
					3.50	0.20	CLAY	Light to medium grey, firm, high plasticity (clay).
					3.70	0.20	IRONSTONE - UN-DIFFERENTIATED	Medium to dark orange - brown, high strength, brittle.
					5.50	1.80	CLAY	Sandy, gravelly, mottled grey - green, firm, high plasticity (clay); ANGULAR TO WELL ROUNDED QTZ + SANDSTONE + SILTST DETRITUS; DETRITUS DERIVED FROM PERM. AND TRIASSIC
					6.50	1.00	SILTSTONE	Medium to dark grey, weathered, low strength, brittle.
					20.00	13.50	SILTSTONE	Dark grey, low strength, brittle, subfissile.
					24.00	4.00	SILTSTONE and SILTSTONE	Interbedded 60:40. SILTSTONE: dark grey, low strength, brittle, subfissile; SILTSTONE: light to medium grey, low strength, brittle; Bands include: SILTSTONE, light to medium grey - green, high strength, brittle.

055

END OF BORE AT 24.00 m

EL2080 LAUNCESTON. R0094

598055

LAUNCESTON.

GEOLOGICAL LOG REPORT

ATP EL2080
LAUNCESTON

TENEMENT 2080

056

END OF GEOLOGICAL LOG REPORT

598056

APPENDIX 2

70020 - 144

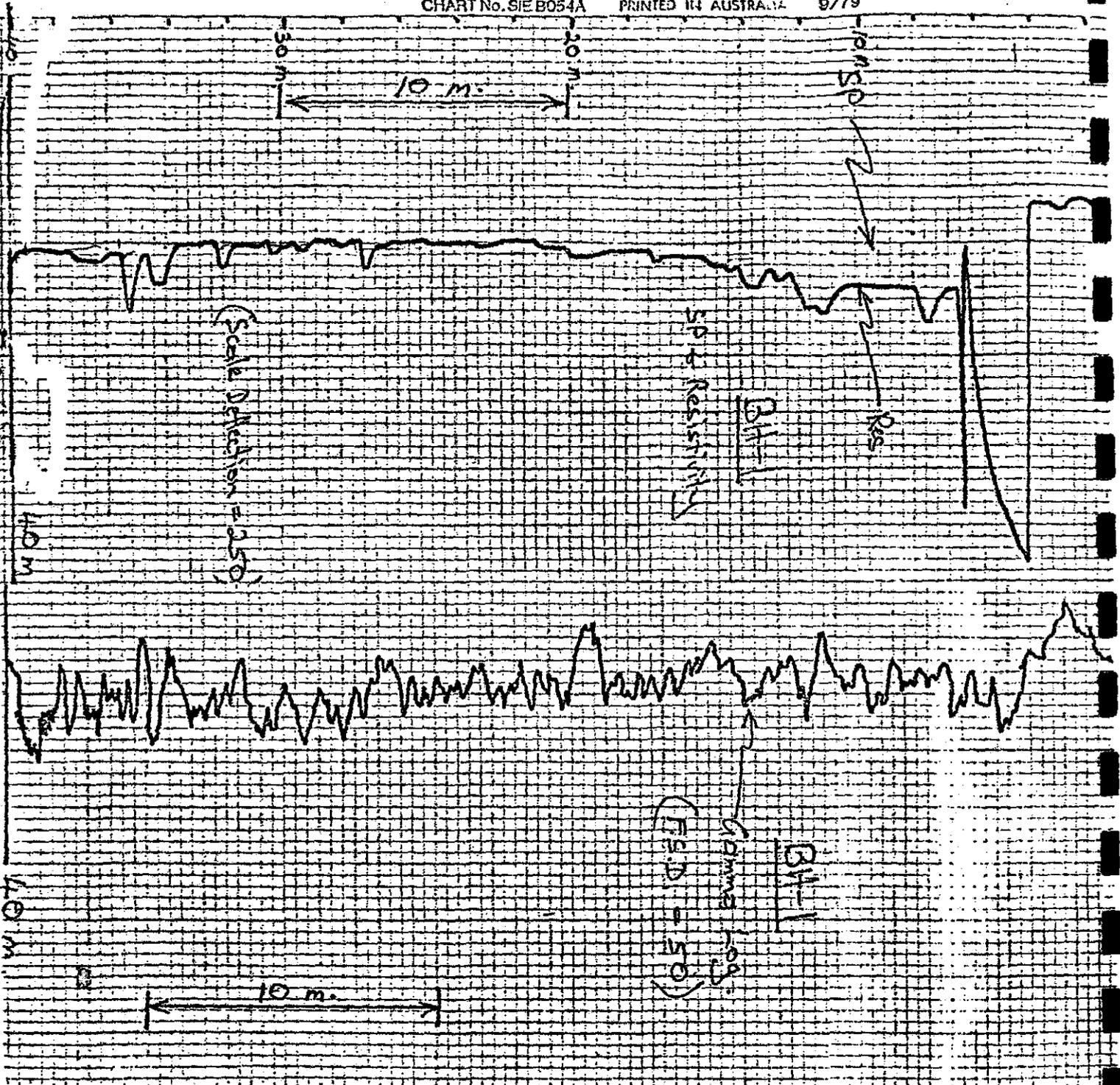
Graphic Logs of Drillholes From the Relinquished
Areas.

R036
C042
R046
R047
C052
R062
R063
R092
R093
R094

APPENDIX 3

Copies of Geophysical Logs of Drillholes From the Relinquished Areas.

C042
R046
R047
C052
R062
R063
R092
R094

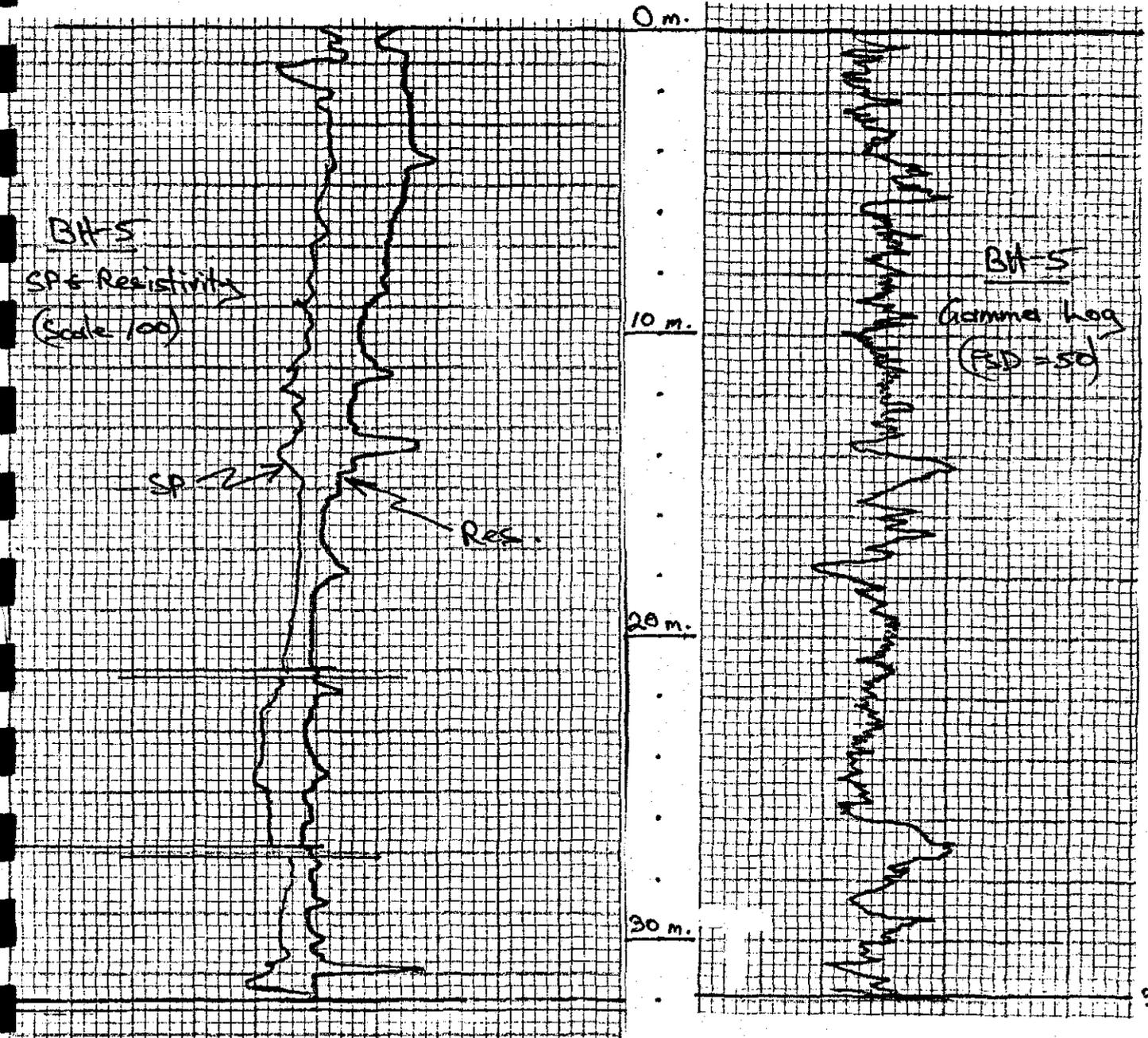


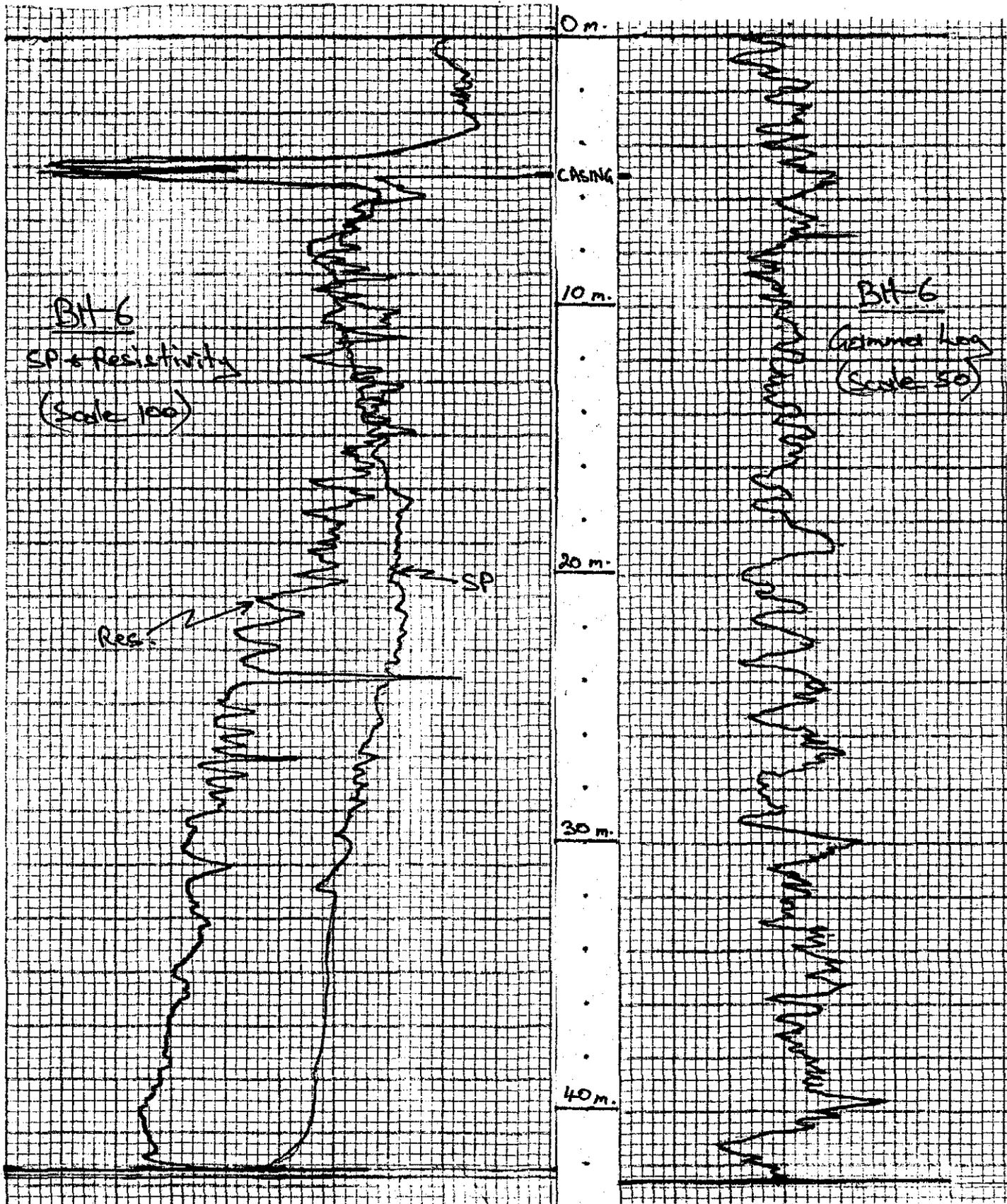
C0042

059

598059

R0046

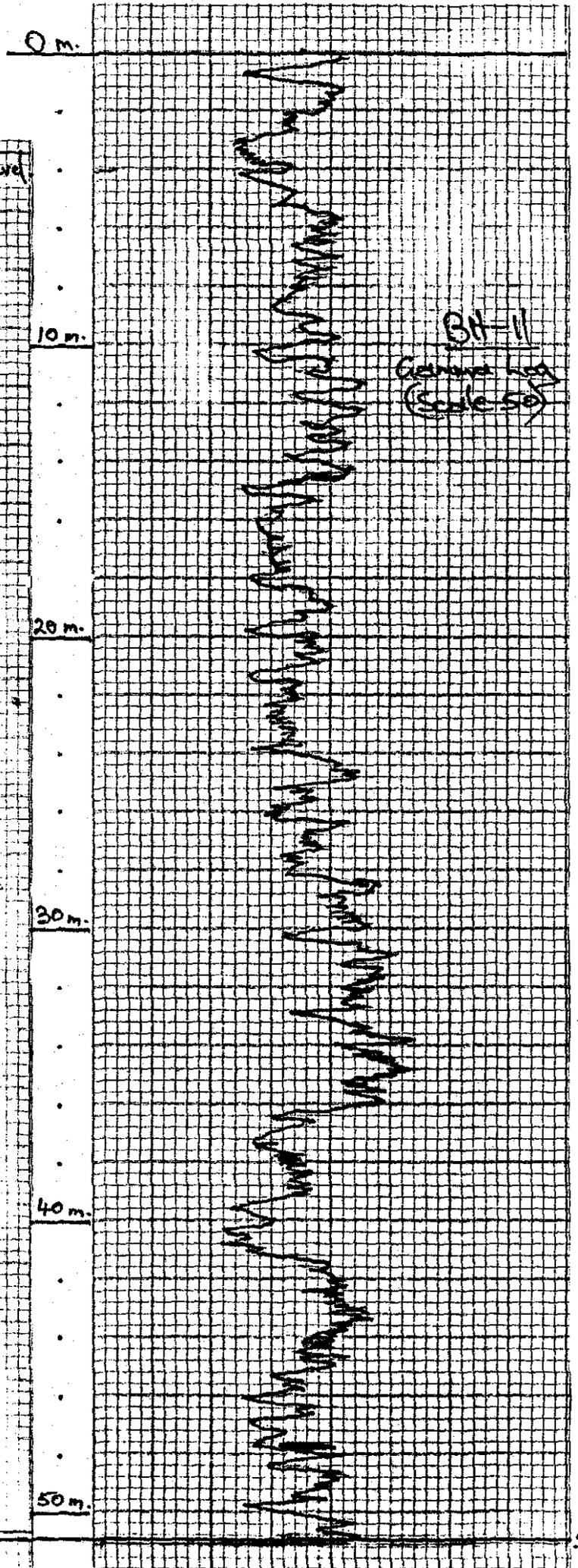
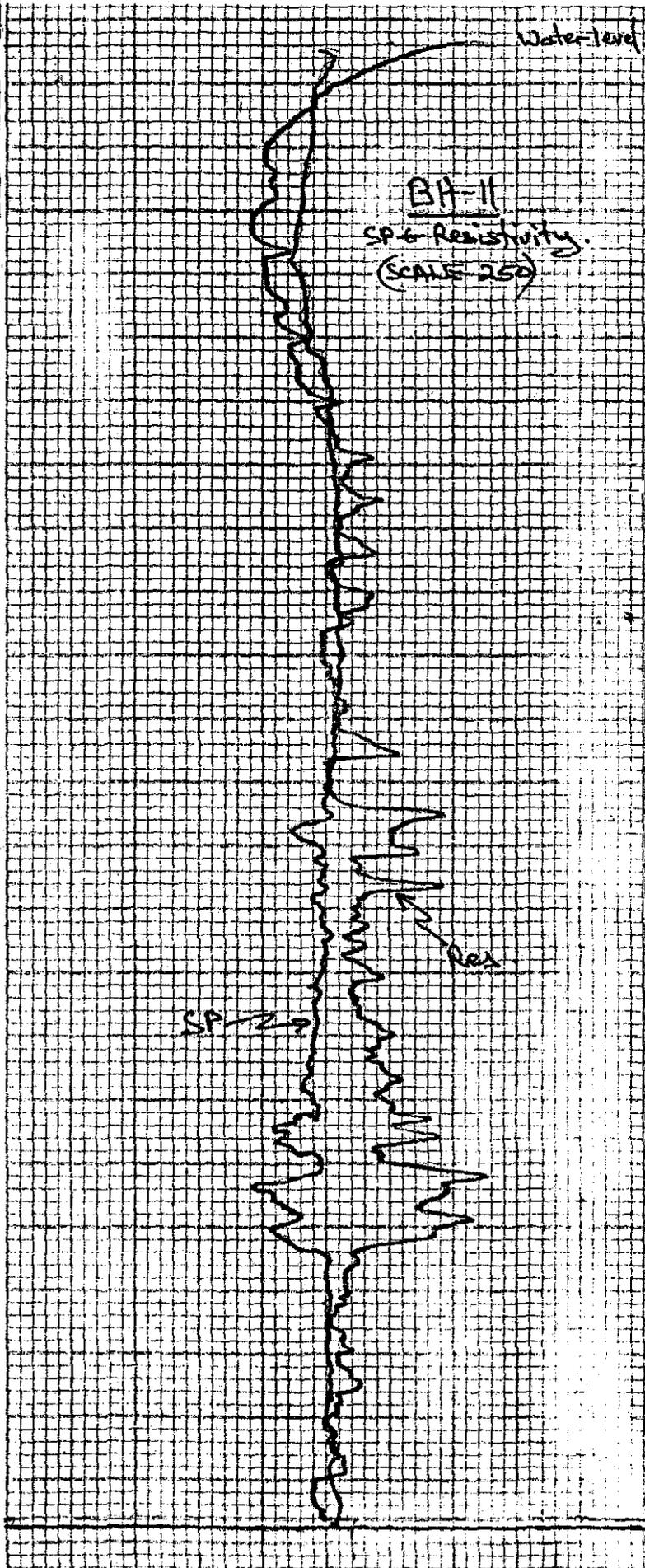


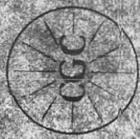


062

C0052

598062





CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

COMPANY
C.S.R.

BOREHOLE
R062

AREA
LAUNCESTON

STATE
TAS.

HOLE DATA

TOTAL DEPTH - DRILLER 36 M BIT SIZE 12 CM
 TOTAL DEPTH - LOGGER 36.0 M CASING - TYPE & SIZE -
 TOTAL WEARAGE LOGGED 36.0 M CASING DEPTH -
 LOGGING SPEED 5 M/MIN. BOREHOLE FLUID H2O
 REFERENCE LEVEL G.L. FLUID RESISTIVITY -
 PROBE NO. 9032C-901 SOFTWARE LEVEL V9L1
 TAPE TRACK 1 OPERATOR
 CLIENT

REMARKS

BOREHOLE
R062

UNIT/OPERATOR
8038 CREWS

DATE
24-03-82

FIELD OFFICE
BRISSBANE

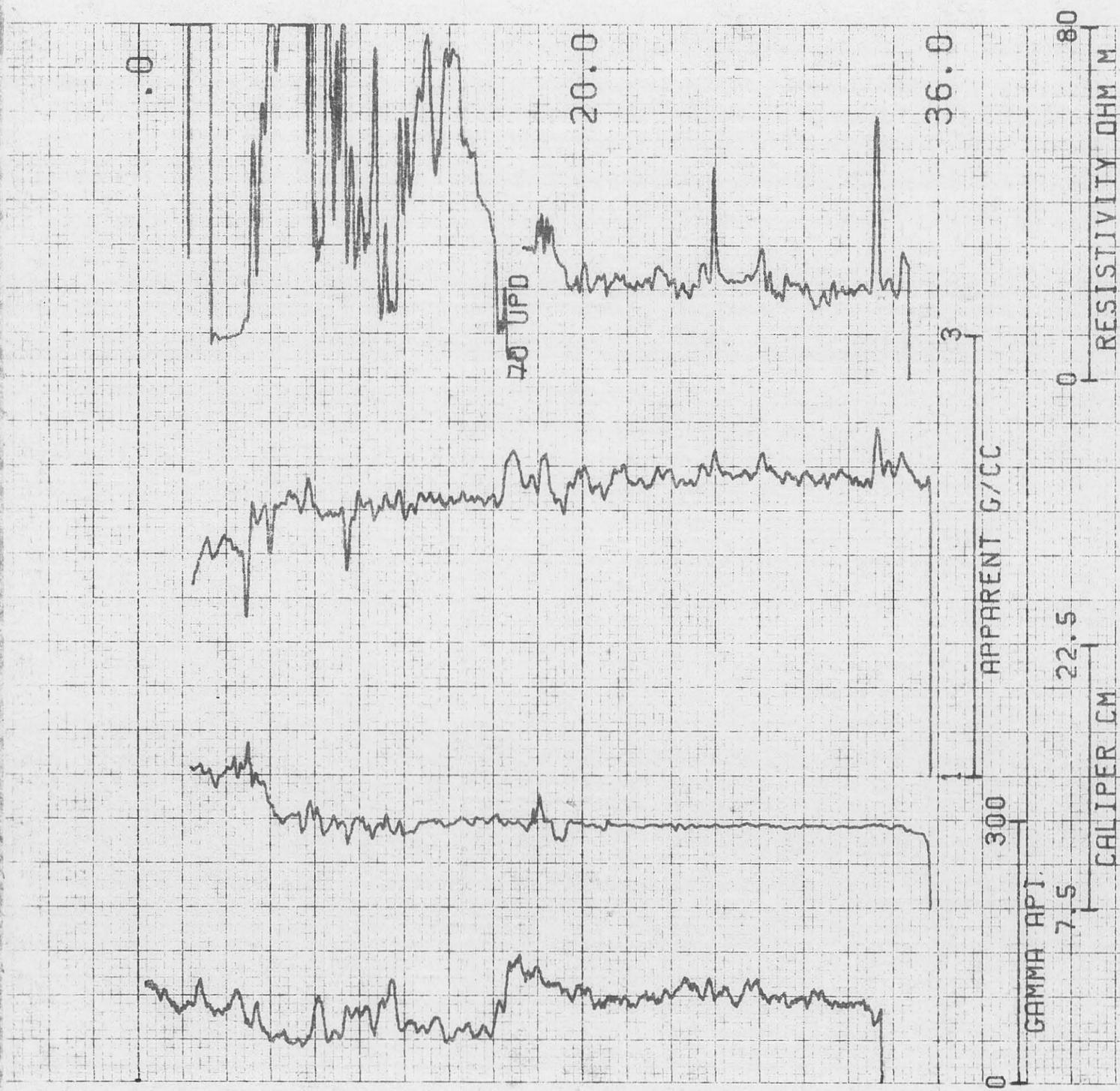
EQUIPMENT DATA

PROBE MODEL	9032	9032	9032
PROBE DIAMETER	12cm	12cm	12cm
DETECTOR TYPE	31mm x 1.1mm	31mm x 1.1mm	31mm x 1.1mm
DETECTOR SIZE	31mm x 1.1mm	31mm x 1.1mm	31mm x 1.1mm
SOURCE FACTOR	---	---	---
SOURCE DEPTH	---	---	---
CALIBRATION	---	---	---
K FACTOR	---	---	---
DEADTIME	---	---	---
TEST READING	---	---	---
WATER FACTOR	---	---	---
LOGGING FACTOR	---	---	---
DETECTOR TYPE	---	---	---
DETECTOR SIZE	---	---	---
SOURCE TYPE	---	---	---
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
DETECTOR TYPE	---	---	---
DETECTOR SIZE	---	---	---
SOURCE TYPE	---	---	---
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
SINGLE PT RESISTANCE	---	---	---
RESISTIVITY	---	---	---
SELF POTENTIAL	---	---	---
TEMPERATURE	---	---	---
DEVIATION	---	---	---
CALIPER	---	---	---

PART NO. 786-0040

16

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040 23-1952 16



COMPU-LOG V8L2 PLOT 03-24-82

R062

C.S.R.

LAUNCESTON

HOLE DIAMETER : 12.0
 PROBE # 9032C - 901
 SENSOR # 4 CAL STD CPS = 7127
 SENSOR # 4 CAL RUN CPS = 4690
 SENSOR # 4 CAL BIAS = -1
 DATA V8L2 TRUCK # 8038
 CREW CREWS APPL.#9030 KI

064

598063



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

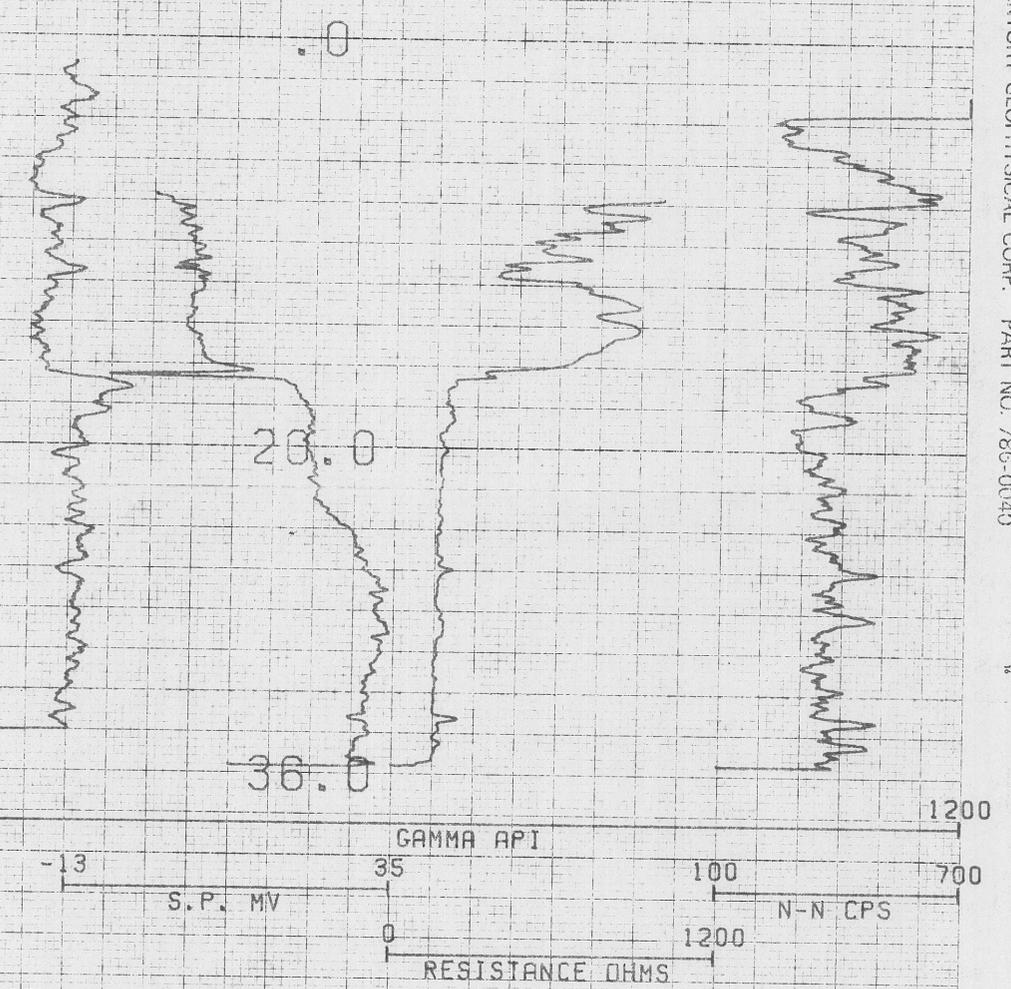
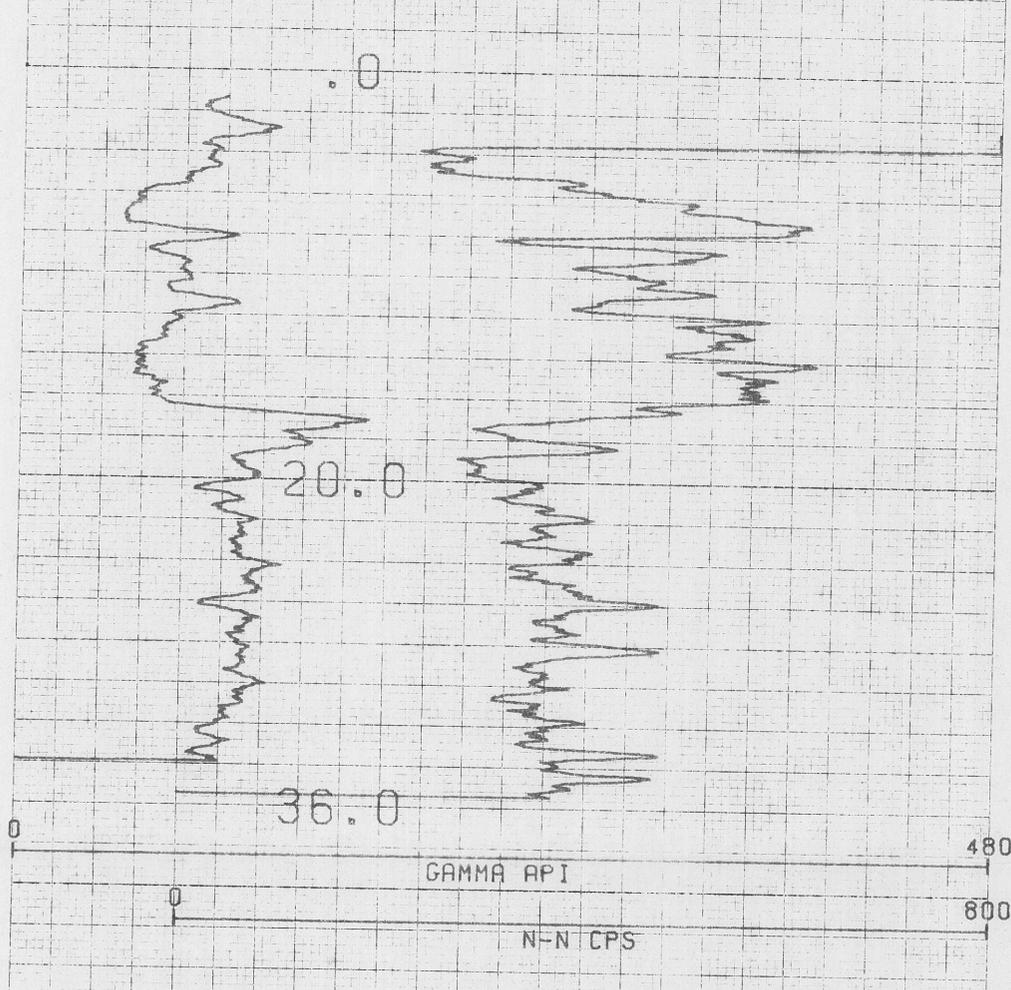
BOREHOLE: **R062** DATE: **24-03-82**
UNIT OPERATOR: **8038 CREWS** FIELD OFFICE: **BRISBANE**

COMPANY: **C.S.R.**
BOREHOLE: **R062**
AREA: **LAUNCESTON** ELEVATION:
SHIP: STATE: **TAS**

EQUIPMENT DATA			
PROBE MODEL	9050	9077	9050/9077
PROBE HEAD/TYPE	4mm	5mm	4mm
DETECTOR TYPE	NaI	NaI	NaI
DETECTOR SIZE	31mm x 114mm	31mm x 114mm	31mm x 109mm
STD. HEAD/TYPE	—	—	—
STD. HEAD/TYPE	—	—	—
STD. HEAD/TYPE	—	—	—
CAUSE MODEL LOC.	—	—	—
CAUSE DATE	—	—	—
K FACTOR: x 10	—	—	—
DEADTIME: μ sec	—	—	—
TEST READING	—	—	—
WATER FACTOR	—	—	—
CASING FACTOR	—	—	—
DETECTOR TYPE	NaI	NaI	NaI
DETECTOR SIZE	31mm x 114mm	31mm x 114mm	31mm x 109mm
SOURCE TYPE	—	—	—
SOURCE NO.	—	—	—
SOURCE STRENGTH	—	—	—
SOURCE SPACING	—	—	—
DETECTOR TYPE	—	—	—
DETECTOR SIZE	—	—	—
SOURCE TYPE	—	—	—
SOURCE NO.	—	—	—
SOURCE STRENGTH	—	—	—
SOURCE SPACING	—	—	—
INCL. PE RESISTANCE	—	—	—
RESISTIVITY	—	—	—
SELF POTENTIAL	—	—	—
TEMPERATURE	—	—	—
DEVIATION	—	—	—
CAMPER	—	—	—

HOLE DATA
TOTAL DEPTH - DRILLER: **36M** BIT SIZE: **12 CM**
TOTAL DEPTH - LOGGER: **36.0M** CASING - TYPE & SIZE: **—**
TOTAL METREAGE LOGGED: **36.0M** CASING DEPTH: **—**
LOGGING SPEED: **18M/MIN.** BOREHOLE FLUID: **H₂O**
REFERENCE LEVEL: **G.C.** FLUID RESISTIVITY: **—** °C
PROBE NO.: **9050-242** SOFTWARE LEVEL: **V9L2**
TAPE 1 TRACK 2 SCALE SELECTION: **OPERATOR CLIENT**

REMARKS:



COMPU-LOG V8L2 PLOT 03-24-82
R062
C.S.R.
LAUNCESTON
HOLE DIAMETER : 12.0
PROBE # 9055A - 242
SENSOR #4 CAL STD CPS = 152
SENSOR #4 CAL RUN CPS = 153
SENSOR #4 CAL BIAS = 0
DATA V8L2 TRUCK # 8038
GREG CREWS APPL. #1005 K

063

063

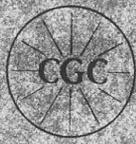
598064

83-1952

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

BOREHOLE **R063** DATE **24-03-82**
UNIT/OPERATOR **8038 CREWS** FIELD OFFICE **BRISBANE**

COMPANY **C.S.R.**
BOREHOLE **R063**
AREA **LAUNCESTON** ELEVATION
SHIRE STATE **TAS.**

EQUIPMENT DATA

PROBE MODEL	9990	9032	9050/55
PROBE DIAMETER	50mm	50mm	40mm
DETECTOR TYPE	NaI	NaI	NaI
DETECTOR SIZE	31mm x 114mm	31mm x 114mm	229mm x 100mm
STD. K FACTOR	---	---	558 x 10 ⁻³
STD. DEADTIME	---	---	1.18 μsec
CALIB. MODEL LOC.	---	---	---
CALIB. DATE	---	---	---
K FACTOR x 10 ⁻³	---	---	---
DEADTIME (μsec)	---	---	---
TEST READING	---	---	---
WATER FACTOR	---	---	---
CASING FACTOR	---	---	---

HOLE DATA

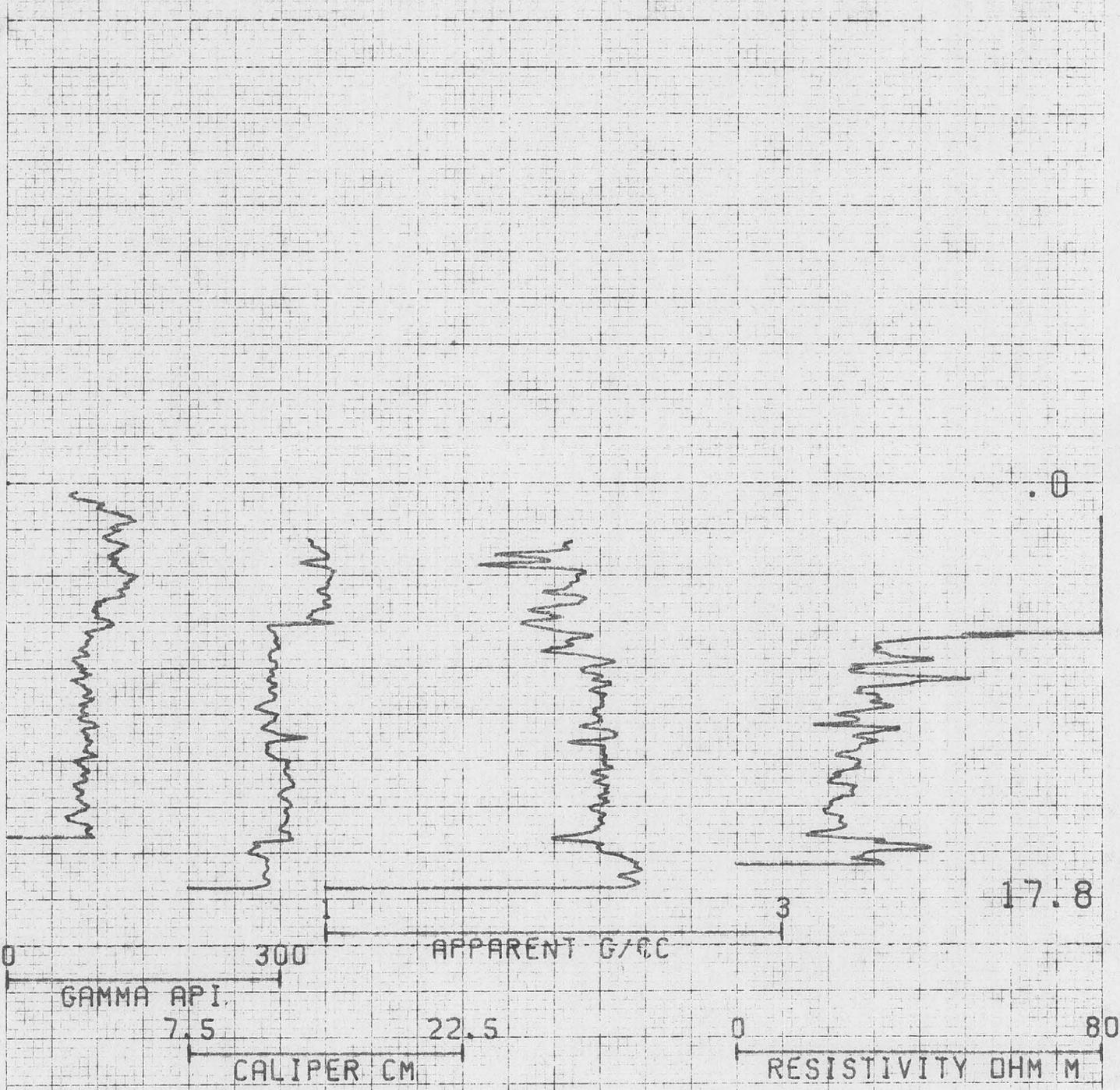
TOTAL DEPTH - DRILLER **18 M** BIT SIZE **12 CM**
TOTAL DEPTH - LOGGER **17.8 M** CASING - TYPE & SIZE
TOTAL METERAGE LOGGED **17.8 M** CASING DEPTH
LOGGING SPEED **5 M/MIN.** BOREHOLE FLUID **H2O**
REFERENCE LEVEL **G.L.** FLUID RESISTIVITY
PROBE NO **9032C-901** SOFTWARE LEVEL **V9L1**
TAPE 1 TRACK 3 SCALE SELECTION OPERATOR CLIENT

DETECTOR TYPE	NaI	NaI	---
DETECTOR SIZE	31mm x 36mm	31mm x 36mm	---
SOURCE TYPE	Ce	Ce	---
SOURCE NO.	---	483	---
SOURCE STRENGTH	---	125mCi	---
SOURCE SPACING	---	20cm	---

REMARKS:

DETECTOR TYPE	---	---	He	---
DETECTOR SIZE	---	---	25mm x 150mm	---
SOURCE TYPE	---	---	AmBe	---
SOURCE NO.	---	---	---	---
SOURCE STRENGTH	---	---	---	---
SOURCE SPACING	---	---	---	---

SMGL. PT RESISTANCE	---	---	26mm x 103mm
RESISTIVITY	16cm Focused	2.5cm Focused	---
SELF POTENTIAL	---	---	YES
TEMPERATURE	---	---	YES
DEVIATION	---	---	NO/YES
CALIPER	YES	YES	---



COMPU-LOG V8L2 PLOT 03-24-82

R063
C.S.R.
LAUNCESTON

HOLE DIAMETER : 12.0
PROBE # 9032C - 901
SENSOR #4 CAL STD CPS = 7127
SENSOR #4 CAL RUN CPS = 4690
SENSOR #4 CAL BIAS = -1
DATA V8L2 TRUCK # 8038
GREG CREWS APPL.# A

7029

598065

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

73-1952

CENTURY C



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

BOREHOLE: **R063** DATE: **24-03-82**
UNIT/OPERATOR: **8038 CREWS** FIELD OFFICE: **BRISBANE**

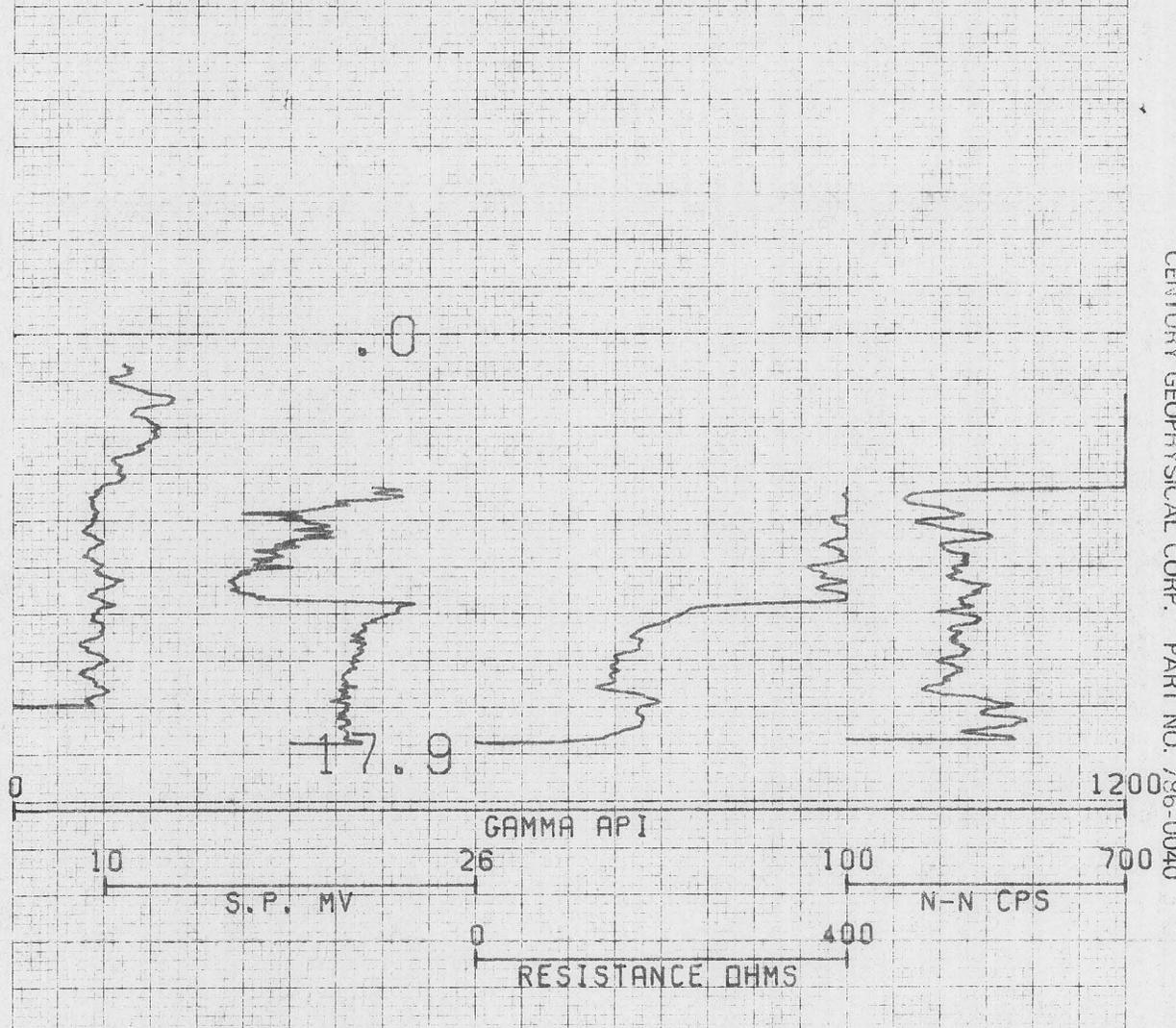
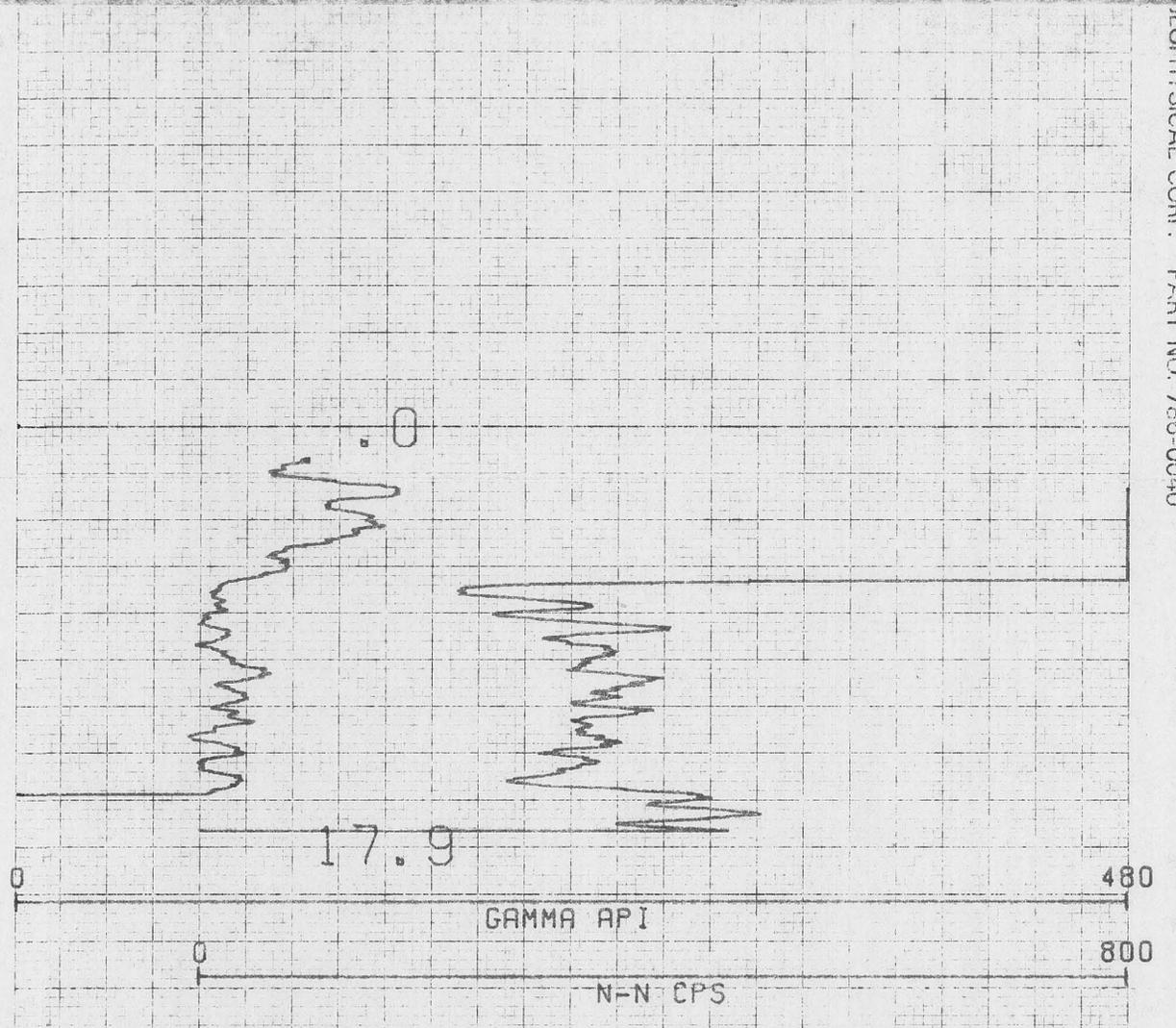
COMPANY: **C.S.R.**
BOREHOLE: **R063**
AREA: **LAUNCESTON**
SHIRE: _____
ELEVATION: _____
STATE: **TAS.**

EQUIPMENT DATA			
PROBE MODEL	9030	9032	9030/55
PROBE DIAMETER	50mm	50mm	40mm
DETECTOR TYPE	NaI	NaI	NaI
DETECTOR SIZE	31mm x 134mm	31mm x 114mm	20mm x 100mm
STD. K FACTOR	---	---	---
STD. DEADTIME	---	---	1.84 sec
CALIB. MODEL LOC.	---	---	---
CALIB. DATE	---	---	---
K FACTOR	2.30	---	---
DEADTIME	1.84 sec	---	---
TEST READING	---	---	---
WATER FACTOR	---	---	---
CASING FACTOR	---	---	---
DETECTOR TYPE	NaI	NaI	---
DETECTOR SIZE	110mm x 38mm	110mm x 38mm	---
SOURCE TYPE	---	---	---
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
DETECTOR TYPE	---	---	---
DETECTOR SIZE	---	---	---
SOURCE TYPE	---	---	---
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
SINGL. PT. RESISTANCE	---	---	---
RESISTIVITY	15cm electrode	15cm electrode	---
SELF POTENTIAL	---	---	---
TEMPERATURE	---	---	---
DEVIATION	---	---	---
CALIBER	---	---	---

HOLE DATA

TOTAL DEPTH - DRILLER	18M	BITSIZE	12CM
TOTAL DEPTH - LOGGER	17.9M	CASING - TYPE & SIZE	---
TOTAL METRAGE LOGGED	17.9M	CASING DEPTH	---
LOGGING SPEED	18M/MIN.	BOREHOLE FLUID	H2O
REFERENCE LEVEL	G.L.	FLUID RESISTIVITY	---
PROBE NO.	9050-242	SOFTWARE LEVEL	V9L1
TAPE 1 TRACK 4		SCALE SELECTION	OPERATOR / CLIENT

REMARKS: _____



COMPU-LOG V8L2 PLOT 03-24-82

R063
C.S.R.
LAUNCESTON

HOLE DIAMETER : 12.0
PROBE # 9055A - 242

SENSOR #4 CAL STD CPS = 152
SENSOR #4 CAL RUN CPS = 153
SENSOR #4 CAL BIAS = 0

DATA V8L2 TRUCK # 8038
GREG CREWS APPL.#1005 K

7030

598066

83-1952

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

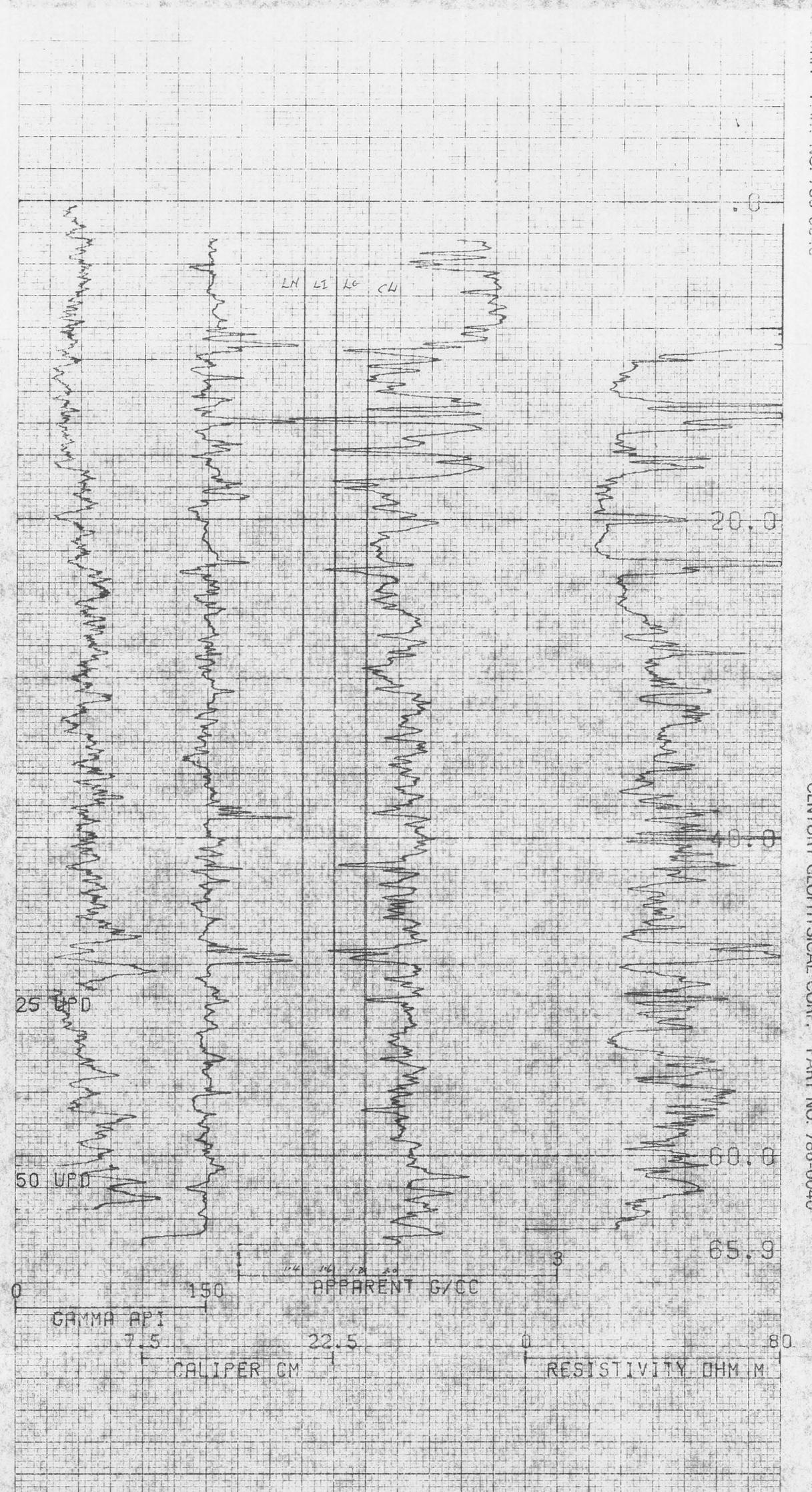
BOREHOLE **R092** DATE **20-04-82**
UNIT OPERATOR **8038 CREWS** FIELD OFFICE **BRISBANE**

COMPANY **C.S.R.**
BOREHOLE **R092**
AREA **LAUNCESTON**
SHIRE _____ ELEVATION _____ STATE **TAS.**

EQUIPMENT DATA				
PROBE MODEL	9030	9032	9050/55	
PROBE DIAMETER	50mm	50mm	48mm	
DETECTOR TYPE	NaI	NaI	NaI	
DETECTOR SIZE	31mm x 114mm	31mm x 114mm	22mm x 100mm	
STD. K FACTOR	---	---	558 & 10"	
STD. DEADTIME	---	---	1.18 μ sec	
CALIB. MODEL LOC.	---	---		
CALIB. DATE	---	---		
K FACTOR $\times 10^{-3}$	---	---		
DEADTIME μ sec	---	---		
TEST READING	---	---		
WATER FACTOR	---	---		
CASING FACTOR	---	---		
NATURAL GAMMA				
DETECTOR TYPE	NaI	NaI	---	
DETECTOR SIZE	12mm x 38mm	12mm x 38mm	---	
SOURCE TYPE	Cs-137	Cs-137	---	
SOURCE NO.	---	483	---	
SOURCE STRENGTH	---	125mc.	---	
SOURCE SPACING	---	20cm	---	
DENSITY				
DETECTOR TYPE	---	---	He-3	
DETECTOR SIZE	---	---	25mm x 150mm	
SOURCE NO.	---	---	AmBe	
SOURCE STRENGTH	---	---	---	
SOURCE SPACING	---	---	---	
NEUTRON				
SINGL. PT RESISTANCE	---	---	30mm x 63mm	
RESISTIVITY	15cm Focused	2.5cm Focused	---	
SELF POTENTIAL	---	---	YES	
TEMPERATURE	---	---	YES	
DEVIATION	---	---	NO/YES	
CALIPER	YES	YES	---	

HOLE DATA			
TOTAL DEPTH - DRILLER	66M	BIT SIZE	12CM
TOTAL DEPTH - LOGGER	65.9M	CASING - TYPE & SIZE	---
TOTAL METERAGE LOGGED	65.9M	CASING DEPTH	---
LOGGING SPEED	9M/MIN.	BOREHOLE FLUID	H ₂ O
REFERENCE LEVEL	G.L.	FLUID RESISTIVITY	---
PROBE NO.	9032C-901	SOFTWARE LEVEL	V9L1
TAPE 33 TRACK 1		SCALE SELECTION	<input checked="" type="checkbox"/> OPERATOR <input type="checkbox"/> CLIENT

REMARKS:



COMPU-LOG V8L2 PLOT 04-20-82
R092
C.S.R.
LAUNCESTON
HOLE DIAMETER : 12.0
PROBE # 9032C - 901
SENSOR #4 CAL STD CPS = 7127
SENSOR #4 CAL RUN CPS = 4736
SENSOR #4 CAL BIAS = -1
DATA V8L2 TRUCK # 8038
GREG CREWS APPL. #3030 K

7027

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

598067

83-1952

1028



CENTURY GEOPHYSICAL CORPORATION OF AUSTRALIA

BOREHOLE R092 DATE 20-04-82

UNIT OPERATOR 8038 CREWS FIELD OFFICE BRISBANE

COMPANY C.S.R. BOREHOLE R092 AREA LAUNCESTON ELEVATION STATE TAS.

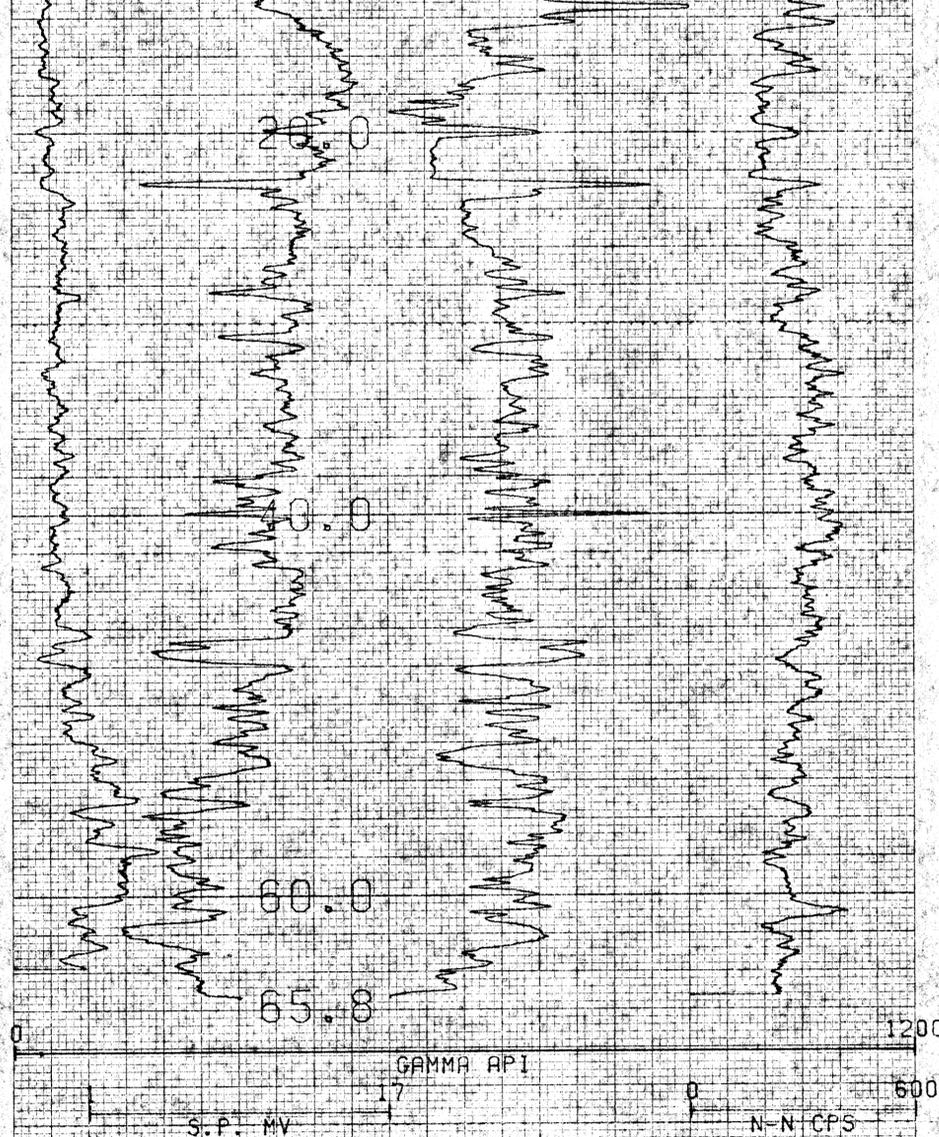
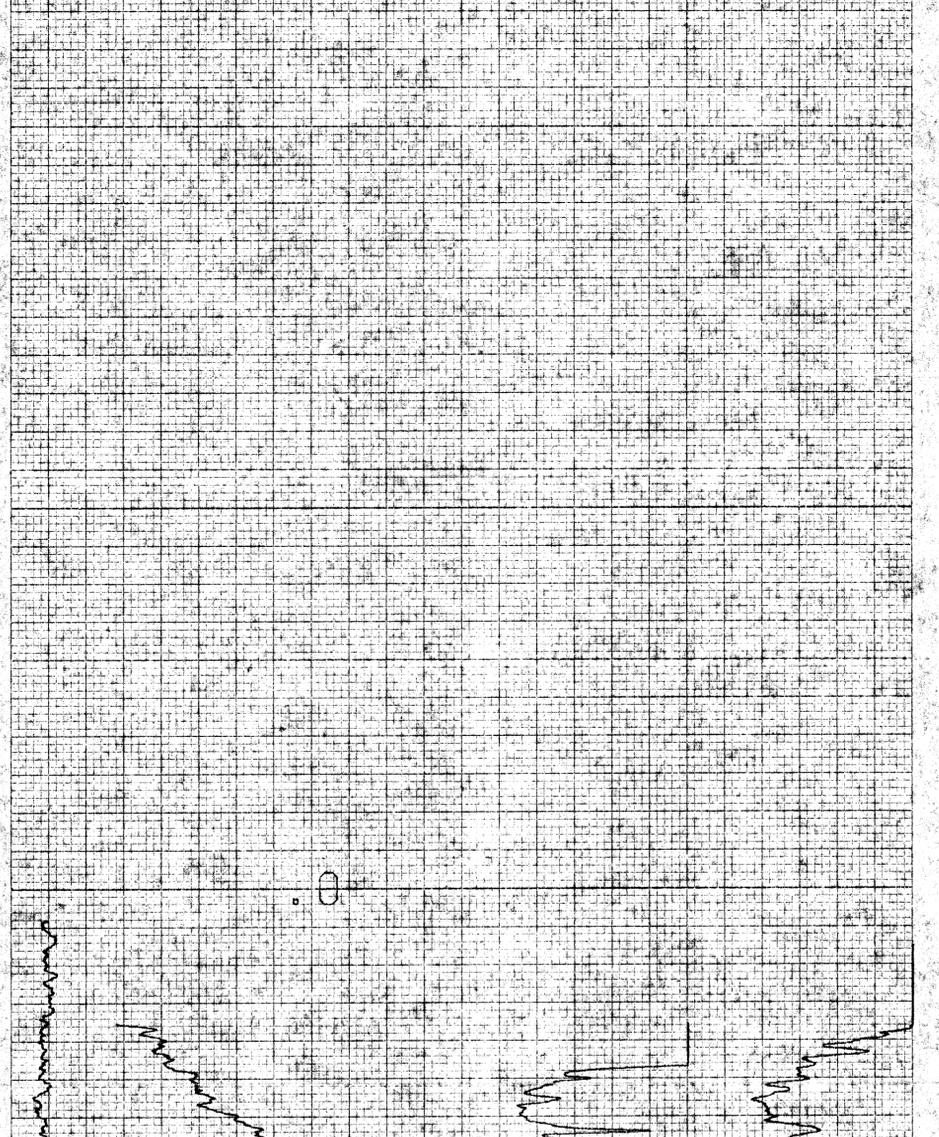
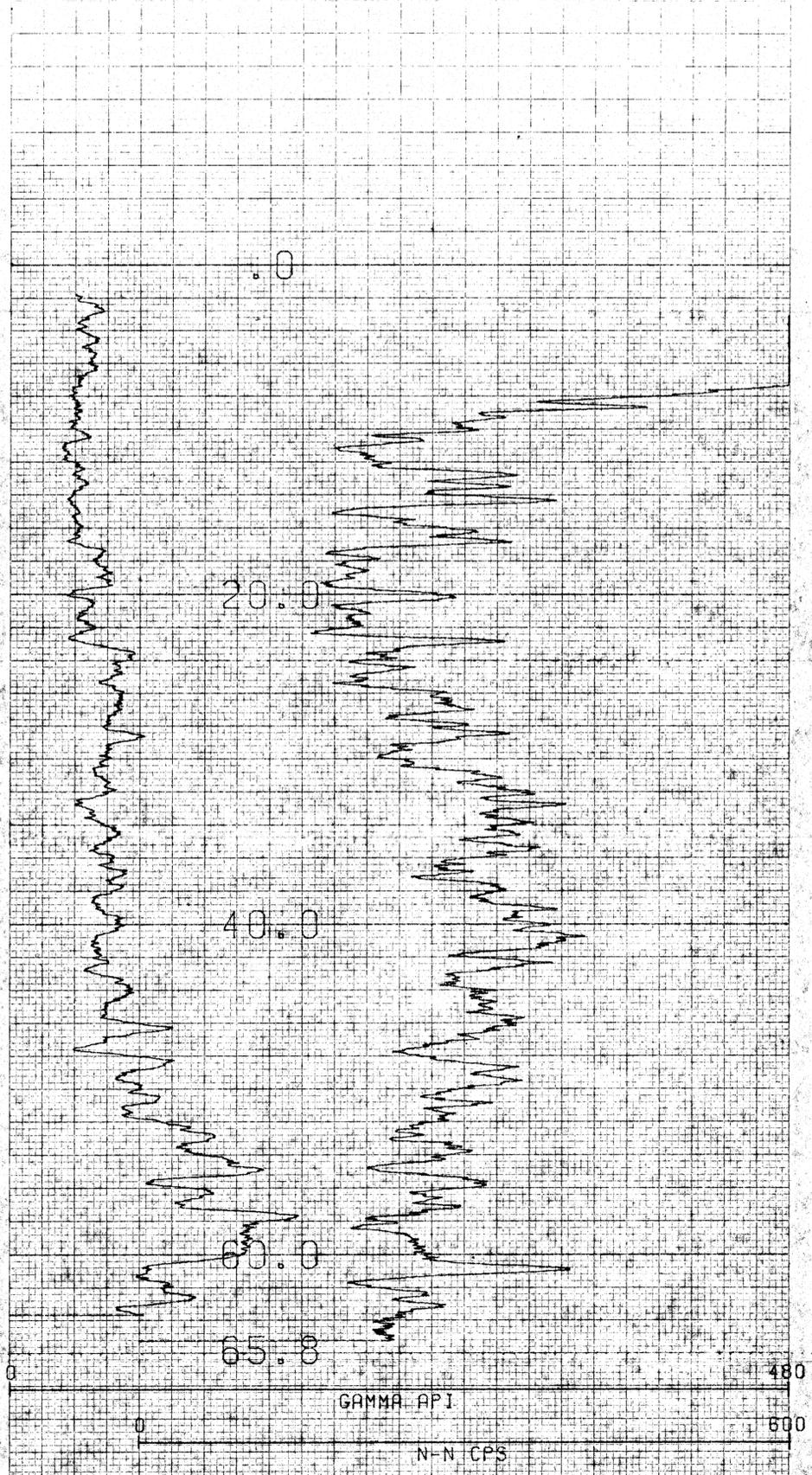
EQUIPMENT DATA

Table with columns for PROBE MODEL, DETECTOR TYPE, STD. K FACTOR, etc. Includes rows for NATURAL GAMMA, DENSITY, and N-137M.

HOLE DATA

Table with columns for TOTAL DEPTH - DRILLER, BIT SIZE, LOGGING SPEED, BOREHOLE FLUID, etc.

REMARKS



COMPU-LOG V8L2 PLOT 04-20-82 R092 C.S.R. LAUNCESTON HOLE DIAMETER = 12.0 PROBE # 8055A - 242 SENSOR #1 CAL STD CPS = 152 SENSOR #1 CAL RUN CPS = 153 SENSOR #1 CAL BIAS = 0 DATA V8L2 TRUCK # 8038 GREG CREWS APPL. #1005-K

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

BOREHOLE: R094
UNIT OPERATOR: 8038 CREWS
DATE: 21-04-82
FIELD OFFICE: BRISBANE

COMPANY: C.S.R.
BOREHOLE: R094
AREA: LAUNCESTON
SHIRE: [blank]
ELEVATION: [blank]
STATE: TAS

EQUIPMENT DATA			
PROBE MODEL	9030	9032	9050/55
PROBE DIAMETER	50mm	50mm	48mm
DETECTOR TYPE	Nal	Nal	Nal
DETECTOR SIZE	31mm x 31.4mm	31mm x 31.0mm	22mm x 100mm
STD. FACTOR	---	---	558 x 10 ⁴
STD. DEADTIME	---	---	1278 μ sec
CALIB. MODEL LOC.	---	---	---
CALIB. DATE	---	---	---
K FACTOR x 10 ⁻⁴	---	---	---
DEADTIME	22.4 μ sec	---	---
TEST READING	---	---	---
WATER FACTOR	---	---	---
CASING FACTOR	---	---	---
DETECTOR TYPE	Nal	Nal	---
DETECTOR SIZE	22mm x 32mm	22mm x 32mm	---
SOURCE TYPE	252Cf	252Cf	---
SOURCE NO.	---	---	483
SOURCE STRENGTH	---	---	125mCi
SOURCE SPACING	---	---	20CM
DETECTOR TYPE	---	---	---
DETECTOR SIZE	---	---	22mm x 32mm
SOURCE TYPE	---	---	AmBi
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
SINGL. PT. RESISTANCE	---	---	20mm x 1.0m
RESISTIVITY	1000 Ohm Meter	2000 Ohm Meter	---
SELF POTENTIAL	---	---	---
TEMPERATURE	---	---	---
DEVIATION	---	---	---
CALIB.	---	---	---

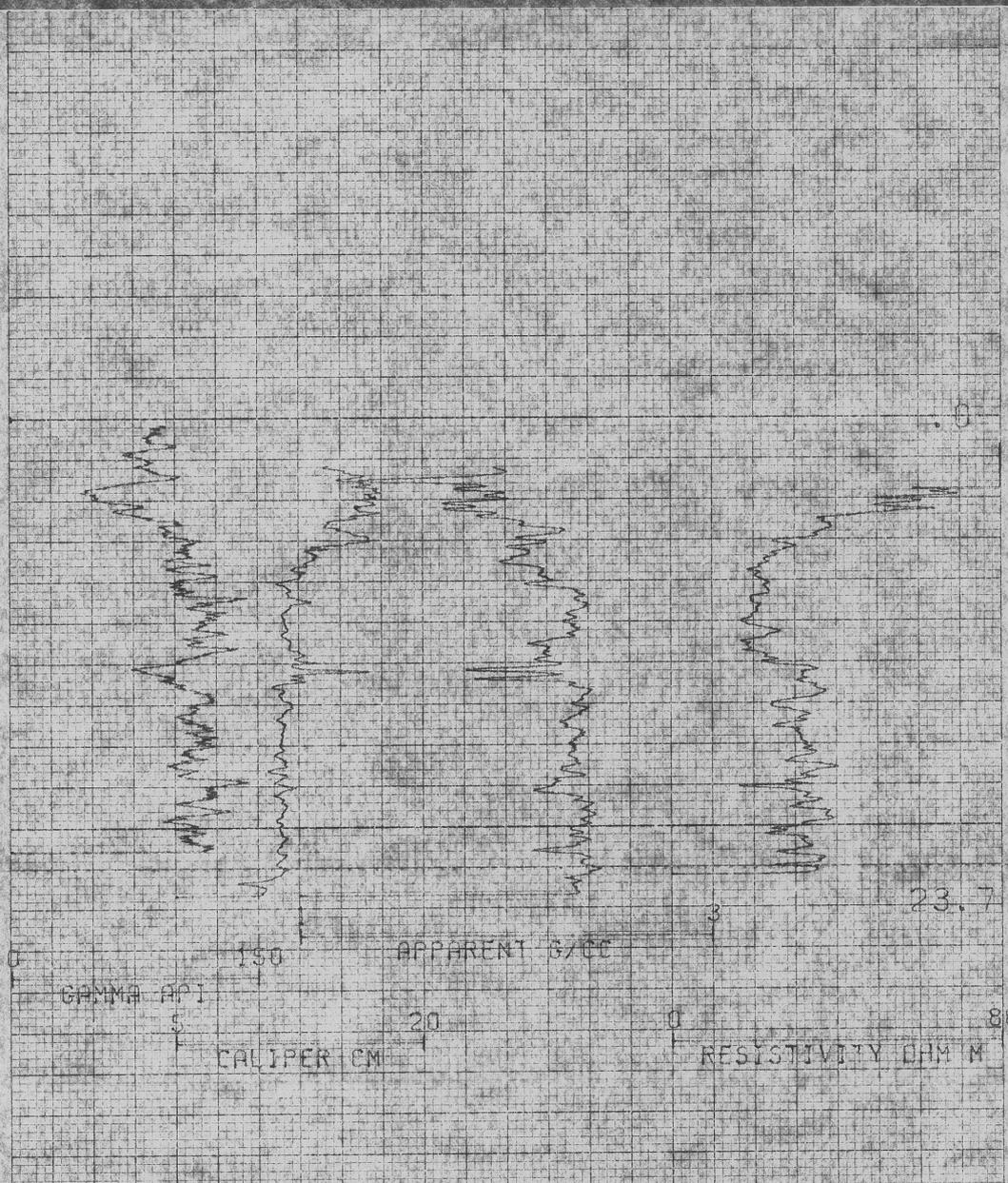
HOLE DATA

TOTAL DEPTH - DRILLER: 24M
TOTAL DEPTH - LOGGER: 23.7M
TOTAL METERAGE LOGGED: 23.7M
LOGGING SPEED: 7M/MIN.
REFERENCE LEVEL: G.L.
PROBE NO: 9032C-901
TAPE 33 TRACK 3

BIT SIZE: 12CM
CASING - TYPE & SIZE: ---
CASING DEPTH: ---
BOREHOLE FLUID: H₂O
FLUID RESISTIVITY: --- Ω cm
SOFTWARE LEVEL: V9L1
SCALE SELECTION: OPERATOR / CLIENT

REMARKS:

[Blank]



COMPU-LOG V8L2 PLOT 04-21-82

R094
C.S.R.
LAUNCESTON

HOLE DIAMETER = 12.0
PROBE # 9032C - 901
SENSOR #4 CAL STD CBS = 7127
SENSOR #4 CAL RUN CFS = 4736
SENSOR #4 CAL BIAS = -1

DATA V8L2 TRUCK # 8038
GRES CREWS APPL. #3030 K

598069
7026

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040



CENTURY GEOPHYSICAL CORPORATION
OF AUSTRALIA

BOREHOLE: R094 DATE: 21-04-82
UNIT/OPERATOR: 8038 CREWS FIELD OFFICE: BRISBANE

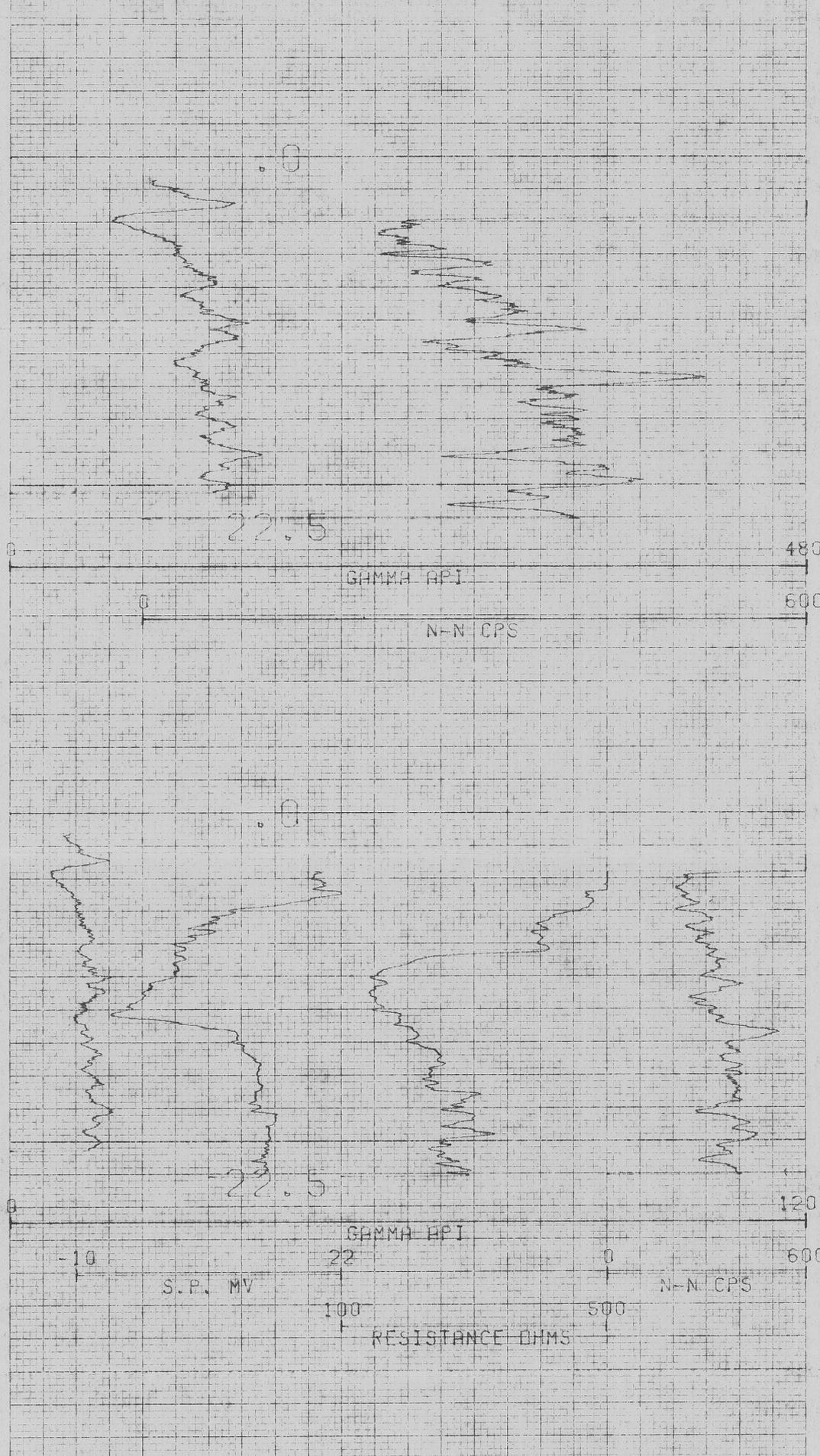
COMPANY: C.S.R.
BOREHOLE: R094
AREA: LAUNCESTON
SHIRE: ELEVATION: STATE: TAS.

EQUIPMENT DATA

PROBE MODEL	9030	9032	9050/55
PROBE DIAMETER	50mm	50mm	48mm
DETECTOR TYPE	NBI	NBI	NBI
DETECTOR SIZE	31mm x 174mm	31mm x 144mm	22mm x 100mm
STOCK FACTOR	---	---	358 x 10 ⁶
STD. DEATH TIME	---	---	1.8 µsec
CALIB. MODEL LOC.	---	---	---
CALIB. DATE	---	---	---
K-FACTOR x 10 ⁻³	---	---	---
DEATH TIME µsec	---	---	---
TEST READING	---	---	---
WATER FACTOR	---	---	---
CASING FACTOR	---	---	---
DETECTOR TYPE	NBI	NBI	---
DETECTOR SIZE	20mm x 88mm	20mm x 88mm	---
SOURCE TYPE	Ce ¹³⁷	Ce ¹³⁷	---
SOURCE NO.	---	---	---
SOURCE STRENGTH	---	---	---
SOURCE SPACING	---	---	---
DETECTOR TYPE	---	---	---
DETECTOR SIZE	---	---	20mm x 150mm
SOURCE TYPE	---	---	Am ²⁴¹
SOURCE NO.	---	---	377B
SOURCE STRENGTH	---	---	101
SOURCE SPACING	---	---	45cm
SPEEDY RESISTANCE	---	---	---
RESISTIVITY	20mV/100µA	20mV/100µA	---
SELF POTENTIAL	---	---	YES
TEMPERATURE	---	---	---
DEVIATION	---	---	NO
CALIBER	YES	YES	---

HOLE DATA
TOTAL DEPTH - DRILLER: 24M BIT SIZE: 12CM
TOTAL DEPTH - LOGGER: 22.5M CASING - TYPE & SIZE: ---
TOTAL METERAGE LOGGED: 22.5M CASING DEPTH: ---
LOGGING SPEED: 18M/MIN. BOREHOLE FLUID: H₂O
REFERENCE LEVEL: G.L. FLUID RESISTIVITY: --- @ °C
PROBE NO.: 9050-242 SOFTWARE LEVEL: V9L1
TAPE 33 TRACK 4 SCALE SELECTION: OPERATOR CLIENT

REMARKS:



CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

COMPU-LOG V8L2 PLDT 04-21-82

R094
C.S.R.
LAUNCESTON
HOLE DIAMETER : 12.0
PROBE # 9050A - 242
SENSOR #4 CAL STD CPS = 152
SENSOR #4 CAL RUN CPS = 153
SENSOR #4 CAL BIAS = 0
DATA V8L2 TRUCK # 8038
GREG CREWS APPL. #1005 K

065

598070

83-1952

L

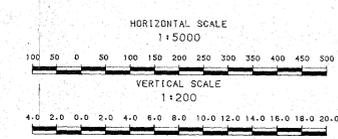
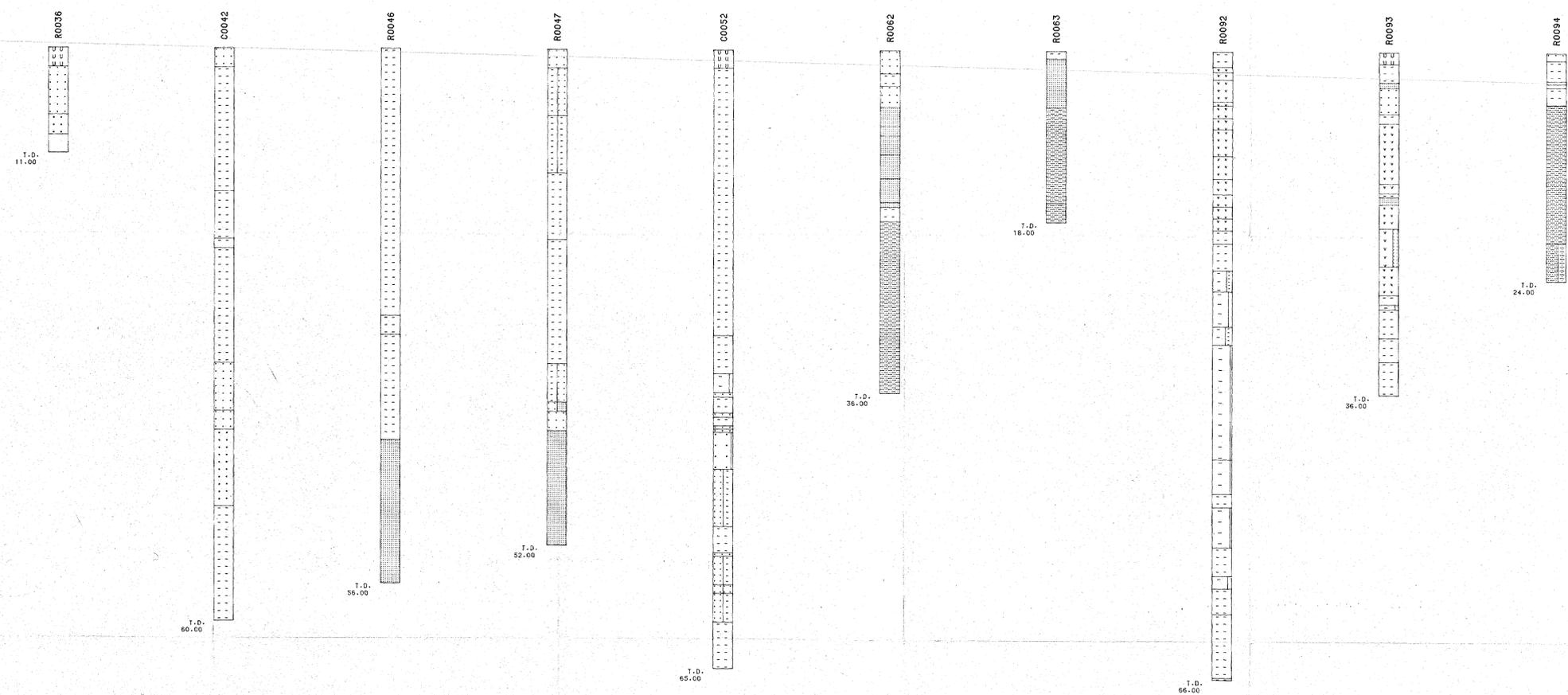
R

L

R

LEGEND
LITHOLOGY REFERENCE

- SOIL
- CLAY
- SILT
- SAND
- GRAVEL
- ALLUVIUM
- CLAYSTONE
- MUDSTONE
- SHALE
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- INTERBEDDED SEDIMENTS (SAND/ MUDST 50:50)
- LIMESTONE
- SIDERITE
- LIGNITE
- LIGNITE (UNDIFF.)
- LIGNITE WEATHERED
- LIGNITE INFERIOR
- LIGNEOUS CLAY
- DOLERITE
- BASALT
- BASEMENT (UNDIFF.)
- DURE LOSS



CSR Limited Coal Division		EXPLORATION AND EVALUATION GROUP		
DRAWING	DATE	EL20/80 LAUNCESTON LITHOLOGICAL LOGS OF RELINQUISHED AREA		
DRAM ELLIS	7-MAR-83	598071		SCALE V 1:200 H 1:5000 FIGURE DRAWING NO. 70020-147
CHECKED				83-1952
REVISED				1703