

815001

|                      |      |      |      |             |
|----------------------|------|------|------|-------------|
| D of M               | A.O. | C.G. | E.O. | D.S.M.E     |
| Received<br>Answered |      |      |      | 25 MAR 1982 |
| DEPT. OF MINES       |      |      |      | registrar   |
| REF. No. 2257/82     |      |      |      | E & IL      |

THE SHELL COMPANY OF AUSTRALIA LIMITED  
AND  
INDUSTRIAL & MINING INVESTIGATIONS PTY. LTD.  
EXPLORATION LICENCE 5/61 (GRAY)

SIX MONTHLY REPORT  
24/8/81 TO 24/2/82

CONTENTS:

Six Monthly Report  
Appendix: Harefield Analytical Results  
Area Maps Showing Existing & Proposed Bores:

|                     |                  |
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| EL5/61 General Area | Drawing No. 2516 |
| Mt. Nicholas Area   | Drawing No. 2517 |
| Harefield Area      | Drawing No. 2518 |

Attachment: Harefield Interim Geological Report CEPR4/82

C. L. PATTERSON  
March 1982

INTRODUCTION:

This report presents a summary of exploration and feasibility work undertaken in EL5/61 (Gray) during the six months from 24th August, 1981 to 24th February, 1982. The Licence is held in joint tenure by The Shell Company of Australia Limited and Industrial & Mining Investigations Pty. Ltd.

A detailed discussion of the geology, tenure and exploration history of the area is contained in a previously submitted Shell Report, CEPR9/79.

SUMMARY:

Field exploration activities in EL5/61 during the period in question have involved drilling in the Douglas River and Harefield areas, in addition to the ongoing programme of systematic surface mapping in the remainder of the area.

Appraisal and processing of the results of this work continues to occupy office geological staff for a significant proportion of their time. This has included the production of an interim geological report on the Harefield area (CEPR4/82), continuation of work on the third volume of the Mt. Nicholas appraisal (CEPR11/81), and commencement of an overall review of the status of geological information in the Licence area as a whole.

Feasibility oriented activity has included the completion of a Pre-Feasibility Study by Dames and Moore concerning underground mine development at Mount Nicholas.

Expenditure for the six months is estimated to be in excess of \$250,000.

MOUNT NICHOLAS:

Field activities concomitant to the areas evaluation to a pre-feasibility stage had been completed prior to the commencement of the period under review. Preparation for the institution of a field programme which will provide the basis for a feasibility study have recently commenced and involve the marketing of proposed boresites and access tracks, and requisition of the necessary permits to commence site preparation.

The proposed exploration programme for 1982 (see map attached) initially involves the drilling of six boreholes which will be fully cored over the coal measure interval. The boreholes will provide infill data on seam structure and quality, and geotechnical information relating to the roof and floor. These boreholes will be geophysically logged. On completion of these bores almost all of the reserves in the Mt. Nicholas area will be able to be accorded Measured status.

This programme will be complimented by detailed surface mapping which it is envisaged will define outcrops of the mineable seams, which will be sampled and subjected to washability testing. If necessary additional washability samples may be obtained from a few selected locations using large diameter coring techniques.

Outcrop areas which have apparent potential for development of initial mine entries will be evaluated by drilling of slim shallow open holes in the immediate area to determine local structure, scree thickness and oxidation patterns. A cored hole will also be employed at such locations to provide seam quality and geotechnical information.

Page two

A contract has been let for the surveying of all boreholes drilled during the course of the programme and for more detailed topographic mapping in the area of the possible initial mine entries.

HAREFIELD

A scout drilling programme of 54 cored and non-cored boreholes was carried out over this area in November and December, 1981. The results of this programme are reported in Shell Report CEPR4/82, which is forwarded herewith. This initial exploration indicated the existence of a significant reserve of coal at open cuttable depths, but provided insufficient information in terms of the structure or quality of the seams present to enable an economic evaluation.

The 1982 exploration programme for Harefield consists of approximately 35 shallow cored boreholes which it is envisaged will sufficiently clarify knowledge of the Harefield deposit to enable a pre-feasibility study to be instituted.

These bores will be of slim (NQ) diameter and will be drilled on a 400m grid (see map attached) which is being presently installed.

Providing sufficient encouragement from the slim hole programme is forthcoming, larger diameter drilling may be undertaken at a later stage to determine washability characteristics. Outcrop sampling is unlikely to be a practical alternative due to oxidation and a generally shallow water table.

DOUGLAS RIVER

Exploration has recommenced in this area during the period under review, with the object of upgrading an area of Indicated Reserves of apparently marketable quality to Measured Status. This has involved so far, the drilling of three additional boreholes, one of which is still in progress (see map attached). Additional samples have been obtained from an old adit in the same vicinity.

Progress can be summarised as follows:-

| <u>Bore</u> | <u>Metres<br/>Drilled</u> | <u>Completion Date</u> | <u>D Seam Thickness</u> |
|-------------|---------------------------|------------------------|-------------------------|
| GY103       | 238.12                    | 18/1/82                | 1.89                    |
| GY104       | 172.50                    | 3/2/82                 | 1.78                    |
| GY105       | 130.60                    | In progress            | -                       |

Analytical results are not as yet available. Further work in the area in the immediate future will be restricted to the cleaning out, geophysical logging and cementing of bores previously drilled, and the rehabilitation of old bore sites and access tracks. Further drilling may be undertaken during the latter part of 1982 if initial results are encouraging.

cont'd.

GENERAL

Systematic surface geological mapping of the area will continue, with special attention to those areas of coal measure subcrop. This will be supplemented by further assessment of existing regional gravity and magnetic information. Requirements for further exploration in areas of defined interest will be assessed.

APPENDIX - HAREFIELD ANALYTICAL RESULTS

## COAL SEAM ANALYSIS SUMMARY

HAREFIELD EL5/61

815006

| SEAM               | AREA               | SAMPLE NO. | BASE DEPTH THICKNESS |        | RAW COAL |       | WASHED COAL (F1.7) |       |
|--------------------|--------------------|------------|----------------------|--------|----------|-------|--------------------|-------|
|                    |                    |            | m                    | m      | R.D.     | ASH % | MASS %             | ASH % |
| DD                 | Eastern            | 47A02      | 87.98                | 0.28   | 1.69     | 40.7  | 44.1               | 22.5  |
|                    |                    | 47A03      | 89.22                | 1.24   | 1.64     | 38.4  | 59.3               | 22.6  |
|                    |                    | 47A04      | 89.57                | 0.35   | 1.49     | 27.1  | 81.3               | 17.7  |
|                    | Eastern<br>Central | 82A01      | 21.59                | 1.14   | 1.75     | 45.3  | 42.2               | 31.1  |
|                    |                    | 82A02      | 22.32                | 0.73   | 1.69     | 46.6  | 48.9               | 23.5  |
|                    |                    | 84A01      | 19.36                | 0.84   | 1.67     | 42.1  | 44.5               | 27.5  |
|                    |                    | 84A02      | 20.03                | 0.67   | 1.92     | 61.9  | 11.1               | 33.8  |
|                    |                    | 86A01      | 18.40                | 0.99   | 1.85     | 51.7  | 23.4               | 33.6  |
|                    |                    | 86A02      | 19.22                | 0.82   | 1.79     | 48.6  | 45.5               | 32.5  |
|                    |                    | 90A01      | 8.60                 | 0.44   | 1.54     | 28.7  | 75.5               | 23.8  |
| 90A02*             | 8.67               | 0.07       | 1.89                 | 60.0   | 12.1     | 34.6  |                    |       |
| D2                 | Eastern<br>Central | 84A03      | 24.30                | 0.05   | 1.47     | 24.1  | 86.5               | 19.9  |
|                    |                    | 90A03      | 15.91                | 0.69   | 1.67     | 36.8  | 63.6               | 23.0  |
|                    |                    | 102A1      | 12.96                | 0.44   | 1.64     | 36.1  | 75.2               | 29.3  |
|                    | Western            | 80A01      | 12.60                | 0.71   | 1.79     | 47.8  | 17.2               | 30.2  |
|                    | D3                 | Eastern    | 47A05                | 102.66 | 0.85     | 1.6   | 31.1               | 75.7  |
| Eastern<br>Central |                    | 90A04      | 24.01                | 0.93   | 1.47     | 23.2  | 88.5               | 17.2  |
|                    |                    | 102A2      | 22.33                | 0.55   | 1.72     | 42.1  | 57.6               | 26.3  |
| Western            |                    | 78A01      | 9.67                 | 0.59   | 1.64     | 34.1  | 64.1               | 25.0  |
|                    |                    | 78A02      | 10.13                | 0.47   | 2.04     | 59.0  | 29.7               | 20.1  |
|                    |                    | 80A04      | 19.35                | 1.00   | 1.43     | 23.3  | 88.4               | 17.1  |
| D4                 |                    | Eastern    | 47A07                | 117.22 | 1.12     | 1.82  | 43.9               | 36.8  |
|                    | 99A01              |            | 17.86                | 0.84   | 1.72     | 42.3  | 57.5               | 30.3  |
|                    | 100A1              |            | 7.49                 | 1.26   | 1.72     | 45.2  | 58.5               | 30.3  |
|                    | Eastern<br>Central | 102A3      | 26.35                | 0.49   | 1.85     | 52.3  | 3.1                | 39.1  |
|                    | OTHER              | Western    | 78A03                | 13.12  | 0.34     | 1.41  | 18.2               | 90.4  |
| 80A02              |                    |            | 13.35                | 0.39   | 1.85     | 53.0  | 5.3                | 40.1  |
| 80A03              |                    |            | 14.55                | 0.27   | 1.49     | 24.7  | 92.9               | 22.1  |

\* Core loss in lower half of seam reduced sample selection.

Note 1. 47A01 & 47A06 have been excluded from this table as they are from transitional contacts that have been excluded from seam nomenclature.

2. The drill hole number is represented by the digits preceding the letter A within the sample number.

DD SEAM DETAILED ANALYSES

47A20 - A composite of the cumulative RD 1.70 floats of 47A02, 47A03, 47A04 combined in the raw coal mass ratio of 47:207:49.  
(Calculated yield of 60.5% over a seam thickness of 1.87m.)

| SAMPLE DETAILS    |       | 47A20 |
|-------------------|-------|-------|
| ULTIMATE ANALYSIS |       |       |
| D.A.F.            | Basis |       |

|                                  |   |       |
|----------------------------------|---|-------|
| Carbon                           | % | 81.5  |
| Hydrogen                         | % | 4.40  |
| Nitrogen                         | % | 1.45  |
| Sulphur                          | % | 0.41  |
| Oxygen                           | % | 12.24 |
| -----                            |   |       |
| Carbonates<br>(CO <sub>2</sub> ) | % | 0.42  |

| PROXIMATE ANALYSIS |  |  |
|--------------------|--|--|
| A.R. Basis         |  |  |

|                       |   |        |
|-----------------------|---|--------|
| Moisture              | % | 5.5    |
| Ash                   | % | 21.9   |
| Volatile<br>Matter    | % | 22.0   |
| Fixed Carbon          | % | 50.6   |
| -----                 |   |        |
| Sulphur               | % | 0.30   |
| Chlorine              | % | 0.08   |
| Phosphorus            | % |        |
| Specific Energy MJ/kg |   | 23.730 |

Hardgrove Grindability  
Index 55

| ASH ANALYSIS |  |  |
|--------------|--|--|
|--------------|--|--|

|   |   |      |
|---|---|------|
| Silicon as SiO <sub>2</sub>                 | % | 64.9 |
| Aluminium as Al <sub>2</sub> O <sub>3</sub> | % | 27.3 |
| Iron as Fe <sub>2</sub> O <sub>3</sub>      | % | 2.44 |
| Calcium as CaO                              | % | 0.46 |
| Magnesium as MgO                            | % | 0.35 |
| Titanium as TiO <sub>2</sub>                | % | 1.48 |
| Sodium as Na <sub>2</sub> O                 | % | 0.17 |
| Potassium as K <sub>2</sub> O               | % | 0.28 |
| Phosphorus as P <sub>2</sub> O <sub>5</sub> | % | 0.03 |
| Manganese as Mn <sub>3</sub> O <sub>4</sub> | % | 0.21 |
| Sulphur as SO <sub>3</sub>                  | % | 0.56 |

| ASH FUSION PROPERTIES |  |  |
|-----------------------|--|--|
|-----------------------|--|--|

|             |    |        |
|-------------|----|--------|
| Deformation | °C | 1490   |
| Spherical   | °C | > 1600 |
| Hemisphere  | °C | > 1600 |
| Flow        | °C | > 1600 |



AUSTRALIAN COAL INDUSTRY  
RESEARCH LABORATORIES LTD.

P.O. Box 83  
North Ryde, N.S.W.  
2113

# COAL ANALYSIS

Report No. 04/3592

Date 18/9/81

815008

Authorisation Order No. 43454

Client SHELL COMPANY OF AUSTRALIA LIMITED.

Report to Mr. W.H. Koppe - Head of Coal Exploration - Southern States

Shell Company of Australia Ltd.,

P.O. Box 872K, MELBOURNE. VIC. 3001

| Sample Details        | 44A22  | 45A22  | 47A20<br>(DD Seam) |
|-----------------------|--------|--------|--------------------|
| As Received Basis     |        |        |                    |
| Total Moisture %      |        |        |                    |
| As Analysed Basis     |        |        |                    |
| Moisture %            | 7.1    | 4.4    | 5.5                |
| Ash %                 | 17.1   | 39.1   | 21.9               |
| Volatile Matter %     | 24.5   | 18.2   | 22.0               |
| Fixed Carbon %        | 51.3   | 38.3   | 50.6               |
| Sulphur %             | 0.34   | 0.19   | 0.30               |
| Chlorine %            | 0.07   | 0.10   | 0.08               |
| Phosphorus %          |        |        |                    |
| Specific Energy MJ/kg | 25.270 | 17.120 | 23.730             |
| Crucible Swelling No. |        |        |                    |
| Gray-King Coke Type   |        |        |                    |

Copies have been sent to

Determinations carried out in Duplicate  
Analysed in accordance with BS1016

Sampled by



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North Ryde, N.S.W.  
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# COAL ANALYSIS

Report No. ....04/3592.....

Date .....18/9/81.....

Authorisation ..... Order No. 43454.....

Origin ..... SHELL COMPANY OF AUSTRALIA LIMITED.....

Report to ..... Mr. W.H. Koppe.....

| Sample Details                                | 44A22                 | 45A22                 | 47A20<br>(DD Seam)    |
|---|-----------------------|-----------------------|-----------------------|
| D.A.F. Basis                                  |                       |                       |                       |
| Carbon %                                      | 82.6                  | 76.6                  | 81.5                  |
| Hydrogen %                                    | 4.56                  | 4.59                  | 4.40                  |
| Nitrogen %                                    | 1.42                  | 1.37                  | 1.45                  |
| Sulphur %                                     | 0.44                  | 0.33                  | 0.41                  |
| Oxygen %                                      | 10.98                 | 17.11                 | 12.24                 |
| A.A. Basis Carbonates (CO <sub>2</sub> ) %    | 0.04                  | 0.44                  | 0.42                  |
| Forms of Sulphur                              |                       |                       |                       |
| Pyritic %                                     |                       |                       |                       |
| Sulphate %                                    |                       |                       |                       |
| Organic %                                     |                       |                       |                       |
| Hardgrove Grindability Index (AS1038.20 1981) | 55 (+600 $\mu$ m 50%) | 63 (+600 $\mu$ m 55%) | 55 (+600 $\mu$ m 57%) |

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Determinations carried out in Duplicate  
Analysed in accordance with BS1016

Sampled by.....

Ultimate analysis carried out at Central Laboratory.  
& Hardgrove Grindability " " " "



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*[Signature]*  
AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES  
Bellambi Laboratory



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# COAL ANALYSIS

Report No. 04/3592

Date 18/9/81

Authorisation Order No. 43454

Client SHELL COMPANY OF AUSTRALIA LIMITED.

Report to Mr. W.H. Koppe.

| Sample Details                        | 44A22  | 45A22  | 47A20<br>(DD Seam) |
|---------------------------------------|--------|--------|--------------------|
| As Received Basis<br>Total Moisture % |        |        |                    |
| As Analysed Basis                     |        |        |                    |
| Moisture %                            |        |        |                    |
| Ash %                                 |        |        |                    |
| Volatile Matter %                     |        |        |                    |
| Fixed Carbon %                        |        |        |                    |
| Sulphur %                             |        |        |                    |
| Chlorine %                            |        |        |                    |
| Phosphorus %                          |        |        |                    |
| Specific Energy MJ/kg.                |        |        |                    |
| Ash Fusibility Temperatures           |        |        |                    |
| Deformation °C                        | 1540   | > 1600 | 1490               |
| Spherical °C                          | > 1600 | > 1600 | > 1600             |
| Hemisphere °C                         | > 1600 | > 1600 | > 1600             |
| Flow °C                               | > 1600 | > 1600 | > 1600             |

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*Chawling*

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# COAL AND COKE ASH ANALYSIS REPORT

Report No. 04/3592

Date 18/9/81

Authorisation Order No. 43454

Client SHELL COMPANY OF AUSTRALIA LIMITED.

Report to Mr. W.H. Koppe.

| Sample Details                                | 44A22 | 45A22 | 47A20<br>(DD Seam) |
|---|-------|-------|--------------------|
| Silicon as SiO <sub>2</sub> %                 | 65.3  | 58.5  | 64.9               |
| Aluminium as Al <sub>2</sub> O <sub>3</sub> % | 28.6  | 33.4  | 27.3               |
| Iron as Fe <sub>2</sub> O <sub>3</sub> %      | 2.80  | 3.26  | 2.44               |
| Calcium as CaO %                              | 0.49  | 0.45  | 0.46               |
| Magnesium as MgO %                            | 0.70  | 0.41  | 0.35               |
| Titanium as TiO <sub>2</sub> %                | 1.00  | 1.07  | 1.48               |
| Sodium as Na <sub>2</sub> O %                 | 0.17  | 0.06  | 0.17               |
| Potassium as K <sub>2</sub> O %               | 0.27  | 0.26  | 0.28               |
| Phosphorus as P <sub>2</sub> O <sub>5</sub> % | 0.04  | 0.05  | 0.03               |
| Manganese as Mn <sub>2</sub> O <sub>4</sub> % | 0.01  | 0.29  | 0.21               |
| Sulphur as SO <sub>2</sub> %                  | 0.02  | 0.38  | 0.56               |
|   |       |       |                    |
|   |       |       |                    |
|   |       |       |                    |

Copies have been sent to

Determinations carried out in Duplicate  
Analysed in accordance with BS1016



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# ANALYSIS AND TESTING REPORT

Report No. 04/3592

Date 18/9/81

Authorisation ..... Order No. 43454

Client ..... SHELL COMPANY OF AUSTRALIA LIMITED.

Report to ..... Mr. W.H. Koppe.

815012

SAMPLE NO. 45A22

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 46.6         | 17.3 | 46.6         | 17.3 |
| 1.60 - 1.70                  | 12.3         | 34.3 | 58.9         | 20.9 |

*Chauhan*  
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# ANALYSIS AND TESTING REPORT

Report No. 04/3478

Date 19/6/81

Authorisation Order No. 43454

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W.H. Koppe - Head of Coal Exploration -  
Southern States,  
The Shell Company of Australia Ltd.,

P.O. Box 872K, MELBOURNE. VIC. 3001

815013

## FLOAT AND SINK ANALYSIS OF SAMPLES CRUSHED TO -25.0 MM

Sample No. GY42A02

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 74.5         | 13.1 | 74.5         | 13.1 |
| 1.60 - 1.70                  | 2.6          | 35.2 | 77.1         | 13.8 |
| 1.70 - 1.80                  | 2.1          | 48.3 | 79.2         | 14.8 |
| S1.80                        | 20.8         | 79.2 | 100.0        | 28.2 |

Relative Density of Raw Coal - 1.49

Sample No. GY45A01

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 45.6         | 23.3 | 45.6         | 23.3 |
| 1.60 - 1.70                  | 12.4         | 37.2 | 58.0         | 26.3 |
| 1.70 - 1.80                  | 1.0          | 41.0 | 59.0         | 26.5 |
| S1.80                        | 41.0         | 79.0 | 100.0        | 48.0 |

Relative Density of Raw Coal - 1.67

Sample No. GY45A02

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 69.2         | 19.2 | 69.2         | 19.2 |
| 1.60 - 1.70                  | 7.2          | 38.4 | 76.4         | 21.0 |
| 1.70 - 1.80                  | 3.7          | 48.7 | 80.1         | 22.3 |
| S1.80                        | 19.9         | 73.7 | 100.0        | 32.5 |

Relative Density of Raw Coal - 1.52

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# ANALYSIS AND TESTING REPORT

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Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W.H. Koppe.

## 815014

Sample No. GY45A03

| Relative Density Fraction | Fractional % |      | Cumulative % |      |
|---------------------------|--------------|------|--------------|------|
|                           | Mass         | Ash  | Mass         | Ash  |
| F1.60                     | 33.0         | 19.8 | 33.0         | 19.8 |
| 1.60 - 1.70               | 3.6          | 42.4 | 36.6         | 22.0 |
| 1.70 - 1.80               | 8.2          | 49.1 | 44.8         | 27.0 |
| S1.80                     | 55.2         | 77.6 | 100.0        | 54.9 |

Relative Density of Raw Coal - 1.79

Sample No. GY47A01

Relative Density of Raw Coal - 2.17

Ash - 71.2%

Sample No. GY47A02 (Top of DD Seam)

| Relative Density Fraction | Fractional % |      | Cumulative % |      |
|---------------------------|--------------|------|--------------|------|
|                           | Mass         | Ash  | Mass         | Ash  |
| F1.60                     | 22.2         | 12.1 | 22.2         | 12.1 |
| 1.60 - 1.70               | 21.9         | 33.0 | 44.1         | 22.5 |
| 1.70 - 1.80               | 9.1          | 46.2 | 53.2         | 26.5 |
| S1.80                     | 46.8         | 56.8 | 100.0        | 40.7 |

Relative Density of Raw Coal - 1.69

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# ANALYSIS AND TESTING REPORT

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Date 19/6/81

Authorisation Order No. 43454

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W.H. Koppe.

815013

Sample No. GY47A03 (Middle of DD Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 42.8         | 18.0 | 42.8         | 18.0 |
| 1.60 - 1.70                  | 16.5         | 34.5 | 59.3         | 22.6 |
| 1.70 - 1.80                  | 7.7          | 45.5 | 67.0         | 25.2 |
| S1.80                        | 33.0         | 65.1 | 100.0        | 38.4 |

Relative Density of Raw Coal - 1.64

Sample No. GY47A04 (Bottom of DD Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 72.1         | 15.2 | 72.1         | 15.2 |
| 1.60 - 1.70                  | 9.2          | 37.0 | 81.3         | 17.7 |
| 1.70 - 1.80                  | 3.1          | 41.1 | 84.4         | 18.5 |
| S1.80                        | 15.6         | 73.3 | 100.0        | 27.1 |

Relative Density of Raw Coal - 1.49

Yield 1.70 (NO<sub>2</sub>, H<sub>2</sub>O, H<sub>2</sub>N) = 65.4  
Ash 1.70 ( ) = 21.3

AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES LTD.

Bellambi Laboratory



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P.O. Box 83  
North Ryde, N.S.W.  
2113

# ANALYSIS AND TESTING REPORT

Report No. 04/3659

Date 24/9/81

Authorisation Order No. 43454

Client SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W.H. Koppe, Head of Coal Exploration -  
Southern States,  
Shell Company of Australia Ltd.,

P.O. Box 872K, MELBOURNE. VIC 3001

815016

## FLOAT AND SINK ANALYSIS OF SAMPLES CRUSHED TO -25.0 MM

Sample No. GY47A05 (D3 Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 65.3         | 18.8 | 65.3         | 18.8 |
| 1.60 - 1.70                  | 10.4         | 36.3 | 75.7         | 21.2 |
| 1.70 - 1.80                  | 6.8          | 45.9 | 82.5         | 23.2 |
| S1.80                        | 17.5         | 68.0 | 100.0        | 31.1 |

Relative Density of Raw Coal - 1.60

Sample No. GY47A06

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 0.5          | 26.0 | 0.5          | 26.0 |
| 1.60 - 1.70                  | Nil          | -    | -            | -    |
| 1.70 - 1.80                  | Nil          | -    | -            | -    |
| S1.80                        | 99.5         | 77.8 | 100.0        | 77.5 |

Relative Density of Raw Coal - 2.27

Sample No. GY47A07 (D4 Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 27.6         | 22.8 | 27.6         | 22.8 |
| 1.60 - 1.70                  | 9.2          | 31.7 | 36.8         | 25.0 |
| 1.70 - 1.80                  | 16.0         | 38.8 | 52.8         | 29.2 |
| S1.80                        | 47.2         | 60.3 | 100.0        | 43.9 |

Relative Density of Raw Coal - 1.82

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# ANALYSIS AND TESTING REPORT

Report No. 04/3845

Date 29/12/81

Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe, Head of Coal Exploration - Southern State

The Shell Company of Australia Ltd.,

815017

P.O. Box 872K, MELBOURNE. VIC 3001

## FLOAT AND SINK ANALYSIS OF SAMPLES CRUSHED TO -25.0 MM

Sample No. 78A01 (Top D3 Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 47.3         | 22.0 | 47.3         | 22.0 |
| 1.60 - 1.70                  | 16.8         | 33.4 | 64.1         | 25.0 |
| 1.70 - 1.80                  | 11.0         | 40.8 | 75.1         | 27.3 |
| S1.80                        | 24.9         | 54.5 | 100.0        | 34.1 |

Relative Density of Raw Coal - 1.64

Sample No. 78A02 (Bottom of D3 Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 25.7         | 18.6 | 25.7         | 18.6 |
| 1.60 - 1.70                  | 4.0          | 29.7 | 29.7         | 20.1 |
| 1.70 - 1.80                  | 1.5          | 42.1 | 31.2         | 21.2 |
| S1.80                        | 68.8         | 76.1 | 100.0        | 59.0 |

Relative Density of Raw Coal - 2.04

Sample No. 78A03 (Other)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 86.2         | 13.5 | 86.2         | 13.5 |
| 1.60 - 1.70                  | 4.2          | 36.9 | 90.4         | 14.6 |
| 1.70 - 1.80                  | 3.8          | 41.5 | 94.2         | 15.7 |
| S1.80                        | 5.8          | 58.7 | 100.0        | 18.2 |

Relative Density of Raw Coal - 1.41

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# ANALYSIS AND TESTING REPORT

Report No. 04/3845

Date 29/12/81

Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815018

Sample No. 80A01 (D2 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 10.8         | 26.4 | 10.8         | 26.4 |
| 1.60 - 1.70                         | 6.4          | 36.5 | 17.2         | 30.2 |
| 1.70 - 1.80                         | 24.2         | 47.1 | 41.4         | 40.1 |
| S1.80                               | 58.6         | 53.3 | 100.0        | 47.8 |
| Relative Density of Raw Coal - 1.79 |              |      |              |      |

Sample No. 80A02 (Other)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 0.4          | 36.2 | 0.4          | 36.2 |
| 1.60 - 1.70                         | 4.9          | 40.4 | 5.3          | 40.1 |
| 1.70 - 1.80                         | 33.0         | 44.9 | 38.3         | 44.2 |
| S1.80                               | 61.7         | 58.5 | 100.0        | 53.0 |
| Relative Density of Raw Coal - 1.85 |              |      |              |      |

Sample No. 80A03 (Other)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 91.8         | 21.9 | 91.8         | 21.9 |
| 1.60 - 1.70                         | 1.1          | 38.1 | 92.9         | 22.1 |
| 1.70 - 1.80                         | 0.5          | 41.4 | 93.4         | 22.2 |
| S1.80                               | 6.6          | 59.7 | 100.0        | 24.7 |
| Relative Density of Raw Coal - 1.49 |              |      |              |      |

# ANALYSIS AND TESTING REPORT

Report No. 04/3845

Date 29/12/81



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North Ryde, N.S.W.  
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Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815019

Sample No. 80A04 (D3 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 82.8         | 15.7 | 82.8         | 15.7 |
| 1.60 - 1.70                         | 5.6          | 37.1 | 88.4         | 17.1 |
| 1.70 - 1.80                         | 0.6          | 43.7 | 89.0         | 17.2 |
| S1.80                               | 11.0         | 72.5 | 100.0        | 23.3 |
| Relative Density of Raw Coal - 1.43 |              |      |              |      |

Sample No. 82A01 (Top of DD Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 19.7         | 26.1 | 19.7         | 26.1 |
| 1.60 - 1.70                         | 22.5         | 35.4 | 42.2         | 31.1 |
| 1.70 - 1.80                         | 23.1         | 44.2 | 65.3         | 35.7 |
| S1.80                               | 34.7         | 63.3 | 100.0        | 45.3 |
| Relative Density of Raw Coal - 1.75 |              |      |              |      |

Sample No. 82A02 (Bottom of DD Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 40.0         | 20.0 | 40.0         | 20.0 |
| 1.60 - 1.70                         | 8.9          | 39.1 | 48.9         | 23.5 |
| 1.70 - 1.80                         | 7.3          | 45.6 | 56.2         | 26.4 |
| S1.80                               | 43.8         | 72.5 | 100.0        | 46.6 |
| Relative Density of Raw Coal - 1.69 |              |      |              |      |

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# ANALYSIS AND TESTING REPORT

Report No. G4/3845

Date 29/12/81



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Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815020

Sample No. 84A01 (Top of DD Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 28.1         | 22.2 | 28.1         | 22.2 |
| 1.60 - 1.70                         | 16.4         | 36.6 | 44.5         | 27.5 |
| 1.70 - 1.80                         | 14.0         | 42.9 | 58.5         | 31.2 |
| S1.80                               | 41.5         | 57.4 | 100.0        | 42.1 |
| Relative Density of Raw Coal - 1.67 |              |      |              |      |

Sample No. 84A02 (Bottom of DD Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 7.0          | 30.6 | 7.0          | 30.6 |
| 1.60 - 1.70                         | 4.1          | 39.3 | 11.1         | 33.8 |
| 1.70 - 1.80                         | 14.8         | 49.1 | 25.9         | 42.5 |
| S1.80                               | 74.1         | 68.6 | 100.0        | 61.9 |
| Relative Density of Raw Coal - 1.92 |              |      |              |      |

Sample No. 84A03 (D2 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 68.6         | 15.0 | 68.6         | 15.0 |
| 1.60 - 1.70                         | 17.9         | 38.7 | 86.5         | 19.9 |
| 1.70 - 1.80                         | 6.6          | 45.6 | 93.1         | 21.7 |
| S1.80                               | 6.9          | 56.7 | 100.0        | 24.1 |
| Relative Density of Raw Coal - 1.47 |              |      |              |      |

*C. W. Sansom*  
AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES LTD.

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# ANALYSIS AND TESTING REPORT

Report No. 04/3645

Date 29/12/81



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Authorisation P.W. Sansom - Letter of 8/12/81  
Client THE SHELL COMPANY OF AUSTRALIA LTD.  
Report to Mr. W. Koppe.

815021

Sample No. 86A01 (Top of DD Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 7.3          | 26.9 | 7.3          | 26.9 |
| 1.60 - 1.70                  | 16.1         | 36.7 | 23.4         | 33.6 |
| 1.70 - 1.80                  | 12.5         | 43.8 | 35.9         | 37.2 |
| S1.80                        | 64.1         | 59.9 | 100.0        | 51.7 |
| Relative Density of Raw Coal | 1.85         |      |              |      |

Sample No. 86A02 (Bottom of DD Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 18.8         | 25.5 | 18.8         | 25.5 |
| 1.60 - 1.70                  | 26.7         | 37.5 | 45.5         | 32.5 |
| 1.70 - 1.80                  | 12.8         | 45.7 | 58.3         | 35.4 |
| S1.80                        | 41.7         | 67.1 | 100.0        | 48.6 |
| Relative Density of Raw Coal | 1.79         |      |              |      |

Sample No. 90A01 (Top of DD Seam)

| Relative Density<br>Fraction | Fractional % |      | Cumulative % |      |
|------------------------------|--------------|------|--------------|------|
|                              | Mass         | Ash  | Mass         | Ash  |
| F1.60                        | 58.7         | 20.1 | 58.7         | 20.1 |
| 1.60 - 1.70                  | 16.8         | 36.8 | 75.5         | 23.8 |
| 1.70 - 1.80                  | 21.3         | 42.0 | 96.8         | 27.0 |
| S1.80                        | 3.2          | 55.5 | 100.0        | 28.7 |
| Relative Density of Raw Coal | 1.54         |      |              |      |

*C. Stanton*  
AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES LTD.

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# ANALYSIS AND TESTING REPORT

Report No. 04/3845

Date 29/12/81

Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815022

Sample No. 90A02 (Bottom of DD Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 5.5          | 28.4 | 5.5          | 28.4 |
| 1.60 - 1.70                         | 6.6          | 39.8 | 12.1         | 34.6 |
| 1.70 - 1.80                         | 6.3          | 44.6 | 18.4         | 38.0 |
| S1.80                               | 81.6         | 64.9 | 100.0        | 60.0 |
| Relative Density of Raw Coal - 1.89 |              |      |              |      |

Sample No. 90A03 (D2 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 50.3         | 18.6 | 50.3         | 18.6 |
| 1.60 - 1.70                         | 13.3         | 39.7 | 63.6         | 23.0 |
| 1.70 - 1.80                         | 8.0          | 46.2 | 71.6         | 25.6 |
| S1.80                               | 28.4         | 65.0 | 100.0        | 36.8 |
| Relative Density of Raw Coal - 1.67 |              |      |              |      |

Sample No. 90A04 (D3 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 85.4         | 16.4 | 85.4         | 16.4 |
| 1.60 - 1.70                         | 3.1          | 38.7 | 88.5         | 17.2 |
| 1.70 - 1.80                         | 1.6          | 45.4 | 90.1         | 17.7 |
| S1.80                               | 9.9          | 73.5 | 100.0        | 23.2 |
| Relative Density of Raw Coal - 1.47 |              |      |              |      |

*[Signature]*  
AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES LTD.  
Bellembi Laboratory

# ANALYSIS AND TESTING REPORT

Report No. 04/3845

Date 29/12/81



AUSTRALIAN COAL INDUSTRY  
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P.O. Box 83  
North Ryde, N.S.W.  
2113

Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815023

Sample No. 99A01 (D4 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 33.9         | 25.2 | 33.9         | 25.2 |
| 1.60 - 1.70                         | 23.6         | 37.6 | 57.5         | 30.3 |
| 1.70 - 1.80                         | 13.0         | 46.0 | 70.5         | 33.2 |
| S1.80                               | 29.5         | 64.0 | 100.0        | 42.3 |
| Relative Density of Raw Coal - 1.72 |              |      |              |      |

Sample No. 100A1 (D4 Seam)

| Relative Density<br>Fraction      | Fractional % |      | Cumulative % |      |
|-----------------------------------|--------------|------|--------------|------|
|                                   | Mass         | Ash  | Mass         | Ash  |
| F1.60                             | 40.9         | 27.5 | 40.9         | 27.5 |
| 1.60 - 1.70                       | 17.6         | 26.9 | 58.5         | 30.3 |
| 1.70 - 1.80                       | 7.0          | 44.4 | 65.5         | 31.8 |
| S1.80                             | 34.5         | 70.6 | 100.0        | 45.2 |
| Relative Density of Raw Coal 1.72 |              |      |              |      |

Sample No. 102A1 (D2 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 57.0         | 27.6 | 57.0         | 27.6 |
| 1.60 - 1.70                         | 18.2         | 34.5 | 75.2         | 29.3 |
| 1.70 - 1.80                         | 8.3          | 43.4 | 83.5         | 30.7 |
| S1.80                               | 16.5         | 63.8 | 100.0        | 36.1 |
| Relative Density of Raw Coal - 1.64 |              |      |              |      |



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# ANALYSIS AND TESTING REPORT

Report No. 04/3545

Date 29/12/81

Authorisation P.W. Sansom - Letter of 8/12/81

Client THE SHELL COMPANY OF AUSTRALIA LTD.

Report to Mr. W. Koppe.

815024

Sample No. 102A2 (D3 Seam)

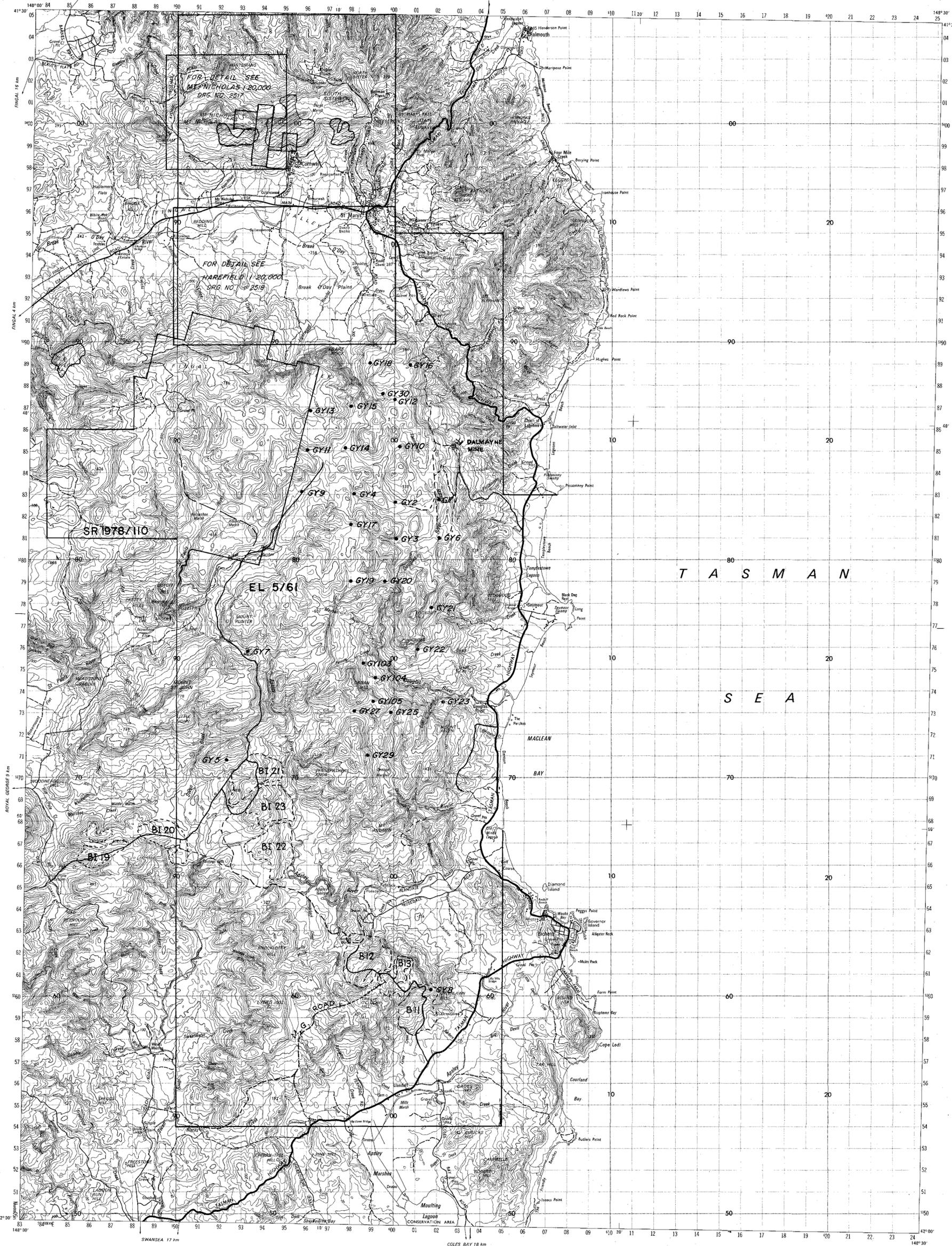
| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 42.3         | 22.6 | 42.3         | 22.6 |
| 1.60 - 1.70                         | 15.3         | 36.5 | 57.6         | 26.3 |
| 1.70 - 1.80                         | 11.5         | 41.4 | 69.1         | 28.8 |
| S1.80                               | 30.9         | 71.8 | 100.0        | 42.1 |
| Relative Density of Raw Coal - 1.72 |              |      |              |      |

Sample No. 102A3 (D4 Seam)

| Relative Density<br>Fraction        | Fractional % |      | Cumulative % |      |
|-------------------------------------|--------------|------|--------------|------|
|                                     | Mass         | Ash  | Mass         | Ash  |
| F1.60                               | 0.1          | 22.9 | 0.1          | 22.9 |
| 1.60 - 1.70                         | 3.0          | 39.6 | 3.1          | 39.1 |
| 1.70 - 1.80                         | 40.2         | 43.4 | 43.3         | 43.1 |
| S1.80                               | 56.7         | 59.4 | 100.0        | 52.3 |
| Relative Density of Raw Coal - 1.85 |              |      |              |      |

AUSTRALIAN COAL INDUSTRY RESEARCH LABORATORIES LTD.

Bellambi Laboratory



PRODUCED by the Survey Branch, Lands Department, Hobart, under the direction of the Minister for Mines and Energy, as part of the national mapping programme. PRINTED by authority of the Minister for Mines and Energy, 1975. DISTRIBUTED by the Department of Mines and Energy. A state edition is available from the State Government Printer, Hobart. MAP ACCURACY: The average accuracy of this map is ± 25 metres in the horizontal position and ± 3 metres in elevation. MAP RELIABILITY: Topographic information shown on this map is correct to 1975. ROAD CLASSIFICATION: Roads are classified according to their intended function as part of the national road system.

BLACK NUMBERED GRID LINES ARE 1000 METRE INTERVALS OF THE AUSTRALIAN MAP GRID, ZONE 55. GRID VALUES ARE SHOWN IN FULL ONLY AT THE SOUTH WEST CORNER OF THE MAP. HORIZONTAL DATUM: AUSTRALIAN GEODETIC DATUM 1966. VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM. TRANSVERSE MERCATOR PROJECTION. CONTOUR INTERVAL 20 METRES. ELEVATIONS IN METRES.

GRID REFERENCE

TO GIVE A UNIQUE REFERENCE ON THIS SHEET TO NEAREST 100 METRES

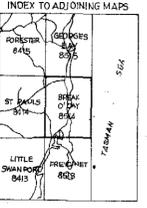
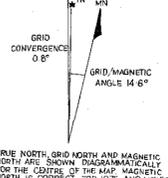
IGNORE THE SMALLER FIGURES of any grid number; these are for finding the full co-ordinates. Use ONLY the LARGER FIGURES of the grid number, eg 104200.

SAMPLE POINT: 778 & MOUNT ST JOHN

|  |      |
|--|------|
| 1. Quote this 1:100 000 map sheet  | 8514 |
| 2. Locate first VERTICAL grid line to LEFT of point and read LARGE figures | 90   |
| 3. Estimate metre figure from grid line to point                           | 72   |
| 4. Locate first HORIZONTAL grid line BELOW point and read LARGE figures    | 51   |
| 5. Estimate metre figure from grid line to point                           | 20   |

SAMPLE REFERENCE: 8514-902720

- Built-up area, National route marker
- Principal road and highway, Cutting
- Secondary road, Embankment
- Minor road, Road bridge
- Vehicular track
- Gate, Cattle grid
- Railway, multiple track, Station, Railway bridge
- Railway, single track, Railway tunnel
- Light railway or tramway
- Power transmission line
- Fence, Levee or bank
- Mine, Windmill, Yard, Quarry
- Building's Church, Ruin, Drive-in theatre
- Trig station, Bench mark, Spot elevation
- Cliff, Contour with value, Depression contour
- Abandoned Mine Workings
- Exploration Licence and State Reserve
- Boundary



•GY/ Shell Borehole Existing

SCALE 1:100 000

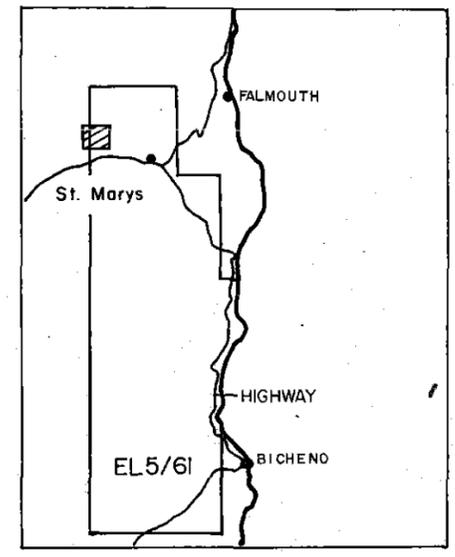
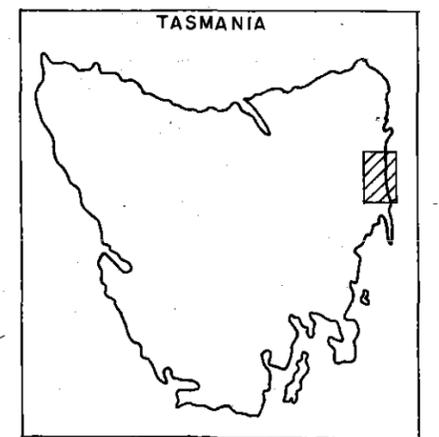
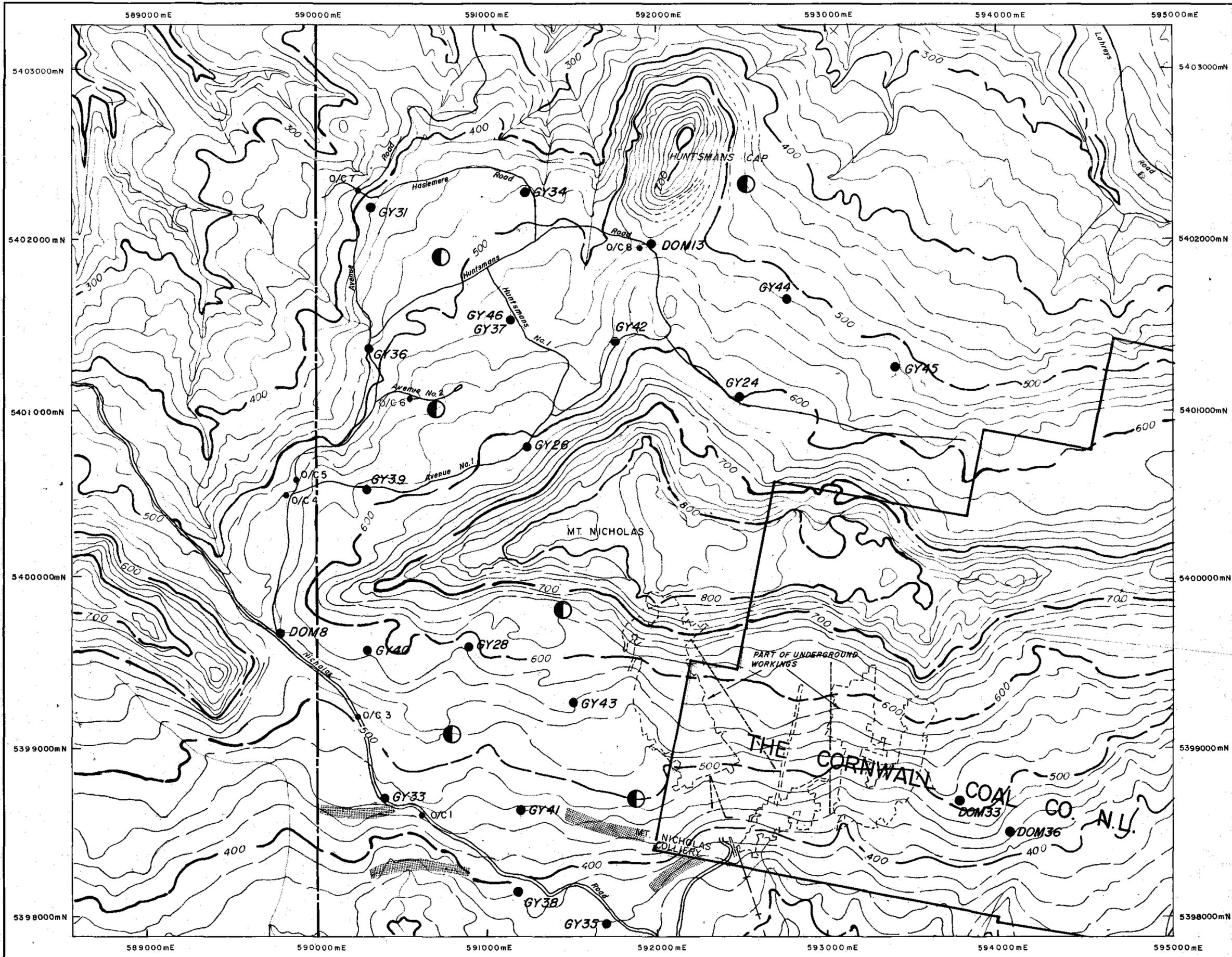
82-1716 815025

**THE SHELL COMPANY OF AUSTRALIA LTD.**

TASMANIA BASIN, TASMANIA  
SHELL - I M I EL 5/61 GRAY

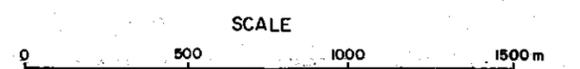
**TOPOGRAPHIC MAP**

|                       |                  |
|-----------------------|------------------|
| Author: Coal Division | Date: March 1982 |
| Report No:            | Drawing No: 2516 |



5 cm

- GY31 Drill Hole
- O/C 4 Surveyed Outcrop
- Proposed Drill Hole
- ▨ Proposed Subcrop Investigation (O.H. Drilling, Outcrop Sampling)



**THE SHELL COMPANY OF AUSTRALIA LTD.**

TASMANIA - GRAY EL 5/61  
MT NICHOLAS AREA

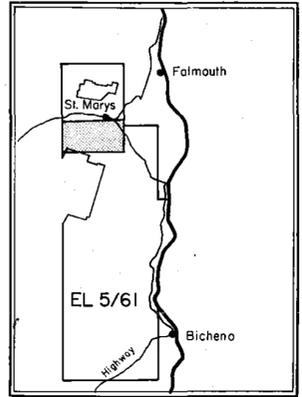
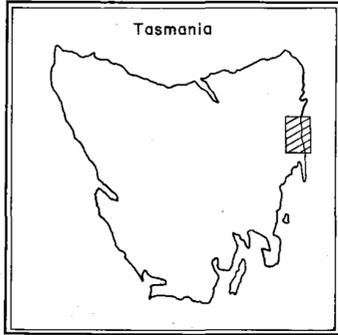
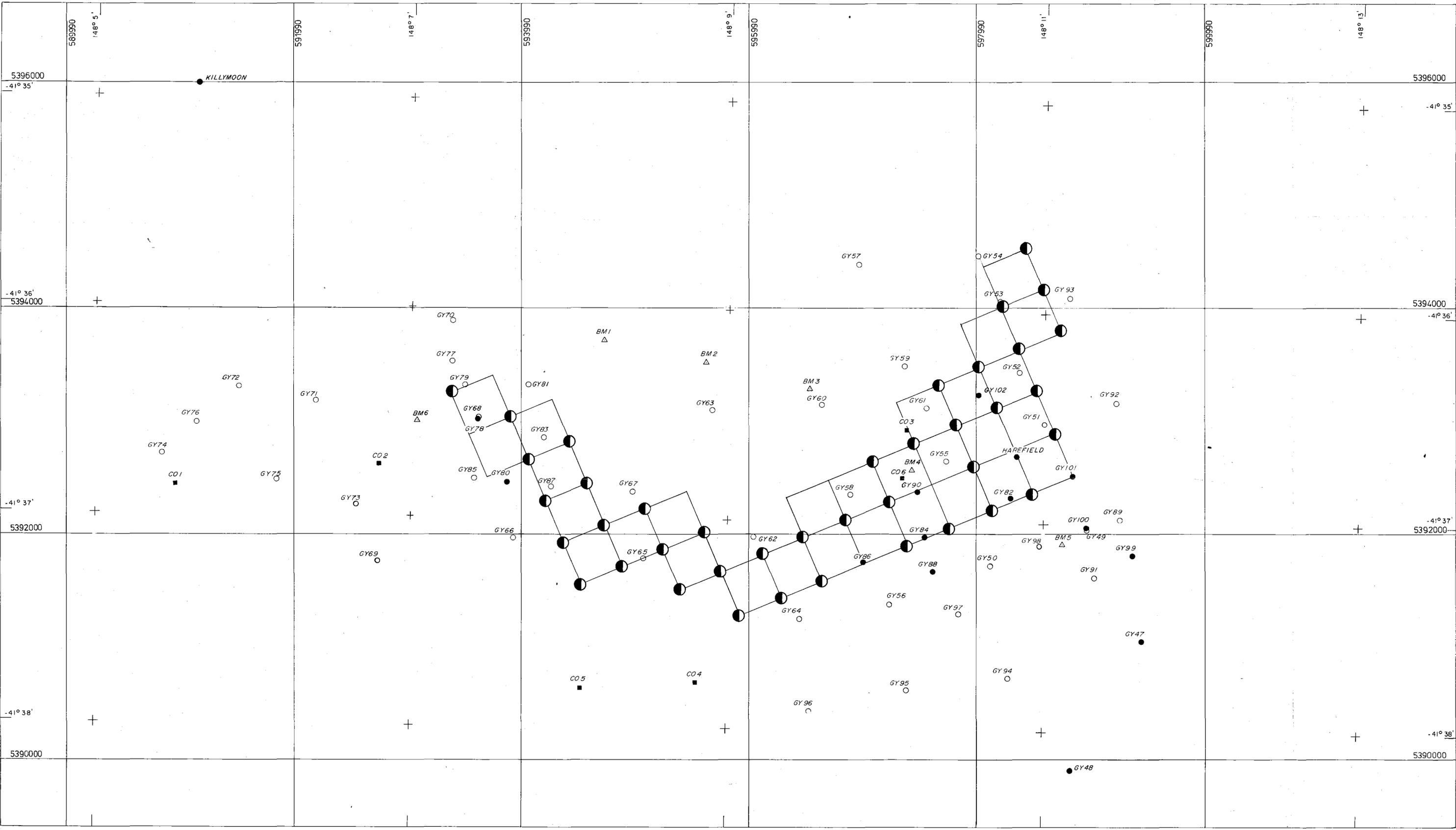
82-17/6.

**PROPOSED EXPLORATION 1982**

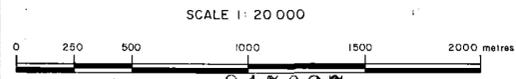
815026

Scale 1:20,000

|                       |                  |
|-----------------------|------------------|
| Author: Coal Division | Date: March 1982 |
| Report No:            | Drawing No: 2517 |



- Non cored drill hole existing
- Cored drill hole existing
- ◐ Cored drill hole proposed
- Coal Outcrop
- △ Bench Mark



815027

5 cm

82-1716.

**THE SHELL COMPANY OF AUSTRALIA LTD.**  
 TASMANIA - GRAY EL 5/61  
 HAREFIELD

**PROPOSED EXPLORATION 1982**

|                        |                   |
|------------------------|-------------------|
| Scale 1 : 20 000       |                   |
| Author : Coal Division | Date : March 1982 |
| Report No.:            | Drawing No: 2518  |