

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

COMBINED ANNUAL AND FINAL REPORT ON

EL 2709 BRUNETTE DOWNS

AUTHOR: S.A. Dashlouty REPORT: 08.1141
DATE: JUNE 1982 COPY NO: 1

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SUMMARY

Gravity and magnetic surveys, undertaken at 200m spacings, in the Brunette Downs EL 2709 correlated well with the regional gravity and magnetic data.

Depth to the source of the Bouguer anomaly was estimated to be greater than 3 km. The plotted water bore data did not reveal any significant anomalies in the EL area.

Relinquishment of El 2709 was recommended and is currently being processed.

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1.0 INTRODUCTION

1.1 Location and Access

Exploration Licence 2709, Brunette Downs is located in the Georgina Basin close to its north eastern margin some 900 kilometres south east of Darwin (Fig.1).

The Brunette Downs area is readily accessible from the Tableland Highway by good dirt station roads. Fieldwork is limited to the dry season due to the black soil cover in the area (Fig 2.).

1.2 Title

Exploration Licence 2709 was granted to the Shell Company of Australia Limited (Shell) on 13th April 1981, and renewed over the original EL area, for a further twelve months from April 12, 1982.

The EL covers 1268,66 (km)² and the EL boundaries are shown in Fig. 2.

1.3 Aboriginal Land Status

No aboriginal land claim is current in the EL area, however, through conversation with Mr Jack Cotton the representative of the Northern Land Council at Brunette Downs, he advised that some sacred sites are located north of Corella Lake in the western part of the EL area.

1.4 Previous Exploration

The area was mapped at 1: 250 000 scale by the B.M.R. in 1962.

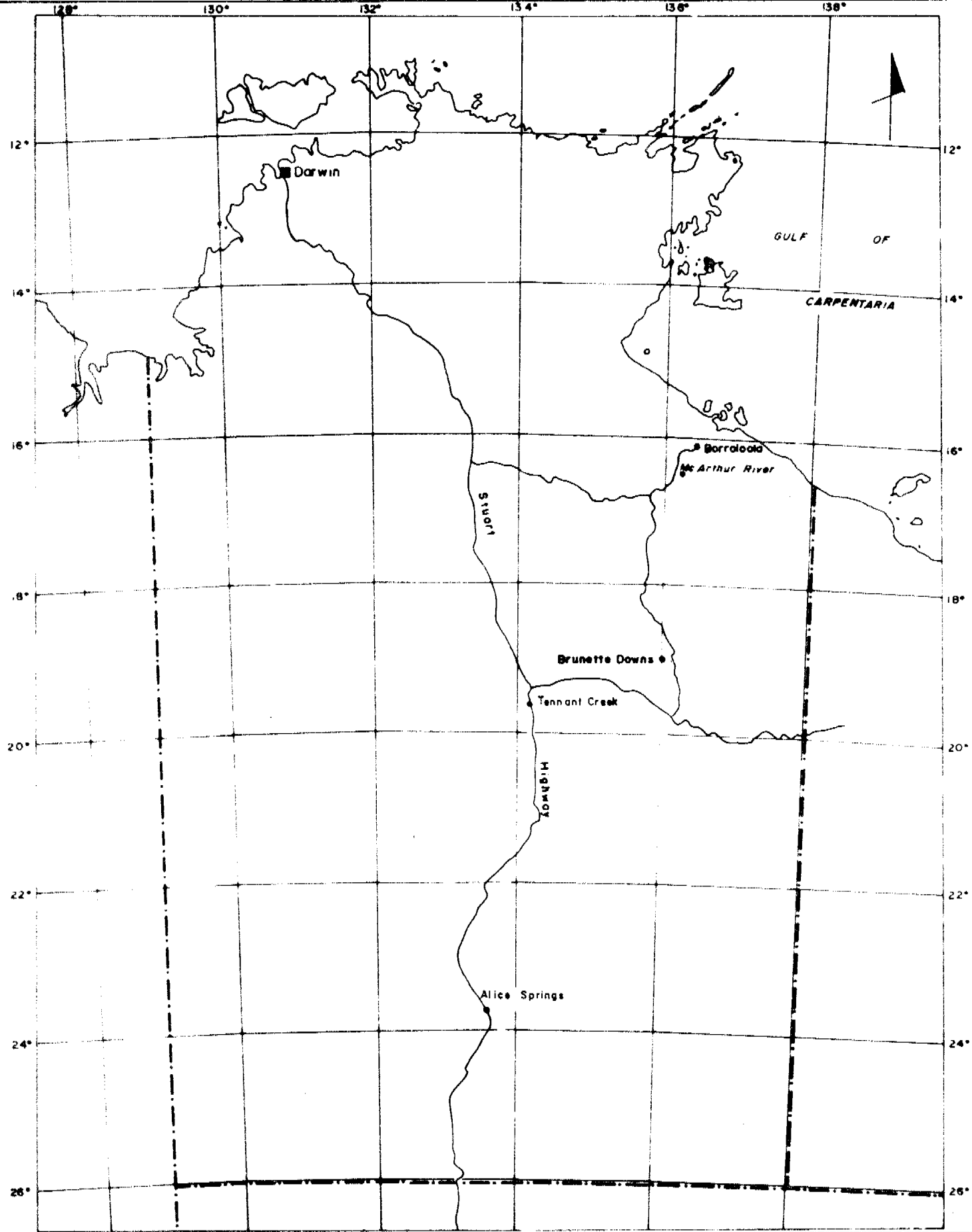
Regional Gravity survey was also conducted by the B.M.R. (1967).

Aeromagnetic survey over Oil leases O.P. 67 and 73 in the Alroy, Brunette Downs, and Wallhallow 1 : 250 000 sheet areas was undertaken by Adastra Hunting Geophysics Pty Ltd for Mines Administration Pty Ltd in 1963.

In 1964 Sedco Exploration (Aust.) Pty Ltd drilled Brunette Downs No.1 Stratigraphic Well to 621.8 m for Papuan-Apinaipi Petroleum Co Ltd. This hole was collared 9 km east of the eastern boundary of the EL and intersected the following sequence.

- 0 - 320.0 Anthony Lagoon Beds (Cambrian)
- 320 - 429.8 Mittiebah Sandstone (Upper Proterozoic)
- 429.8 - 621.8 Mulera Formation (Upper Proterozoic)

Twenty shallow water bores were drilled by N.T. Water Resources in the EL area.

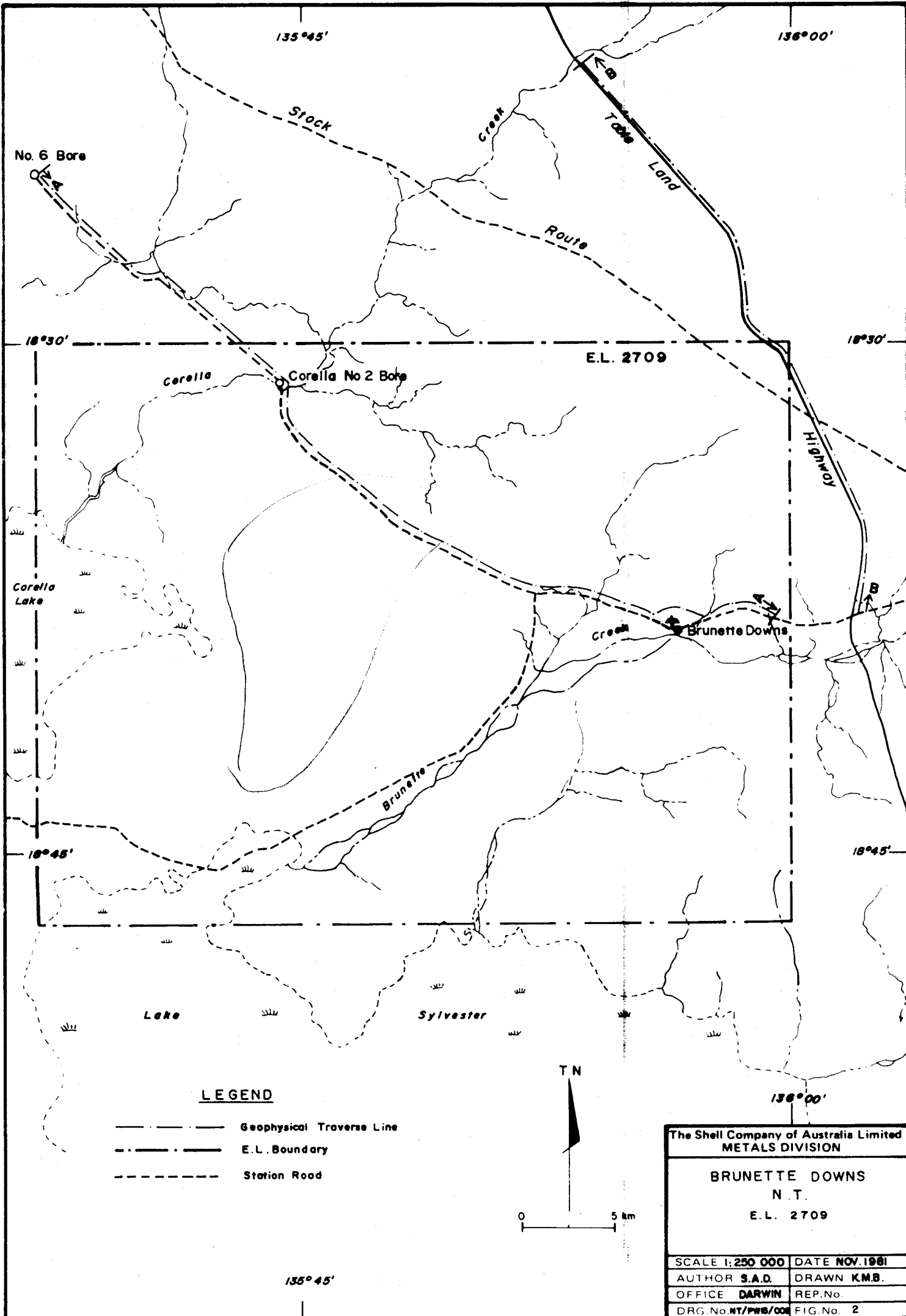


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 METALS DIVISION
 LOCATION MAP
 BRUNETTE DOWNS
 GEORGINA BASIN

Scale 1:7 500 000

REPORT NO.
 ENVIRONMENT/PM35017
 DATE JULY 1982
 DRAWN BY TEE
 CHECKED BY SAD
 DATE DARWIN

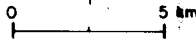




LEGEND

- Geophysical Traverse Line
- E.L. Boundary
- - - Station Road

T N



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BRUNETTE DOWNS
N.T.

E.L. 2709

SCALE 1:250 000 DATE NOV. 1981

AUTHOR S.A.D. DRAWN K.M.B.

OFFICE DARWIN REP.No.

DRG.No. NT/PWB/008 FIG.No. 2

1.5 Exploration Target

Stratiform and strata bound sulphide base metal deposits are the target of exploration in EL 2709.

A nine milligal bouguer anomaly marginal to 65 nT magnetic anomaly were interpreted to indicate favourable structural setting for the occurrence of such base metal deposits.

1.6 Current Exploration Programme

During the year, Shell carried out ground gravity and magnetic surveys to refine the previous regional gravity and aeromagnetic surveys.

The chemical analyses of the water bores were utilised to detect possible geochemical anomalies within the rock units intersected by the water bores.

2.0 GEOLOGY

The Middle Cambrian Anthony Lagoon Beds and Tertiary Brunette Limestone are the only outcropping rockunits in the area (Fig.3).

Summary of lithologic descriptions are given as follows:

Quaternary Cover

Predominantly black and gray clayey soil with some sand gravel, and pebbles of pisolitic ironstone and chert.

Brunette Limestone

Several small outcrops of nodular white limestone containing chert nodules and bands with minor quartz sandstone and conglomerate were observed.

Anthony Lagoon Beds

The Anthony Lagoon Beds consist mainly of dolomite and dolomitic limestone with chert nodules and bands with some algal dolomitic limestone, and ferruginous grey and white quartz sandstone.

3.0 GEOPHYSICS

3.1 Regional

A regional bouguer anomaly of 9 milligals is the main gravity feature in the EL area (Fig. 4).

The gravity and magnetic data may indicate accumulation of dense Carpentarian sediments within a fault-bound sub-basin or be caused by the Murphy Metamorphics.

3.2 Detailed

To assess the regional gravity and magnetic data two gravity and magnetic traverses totalling 85 km were planned (Figs. 6 & 7).

Two lines A(51 km), B (34km) were pegged at 200m intervals. Gravity and magnetic readings commenced in mid October 1981.

Due to access difficulty resulting from wet weather conditions in November 1982, gravity and magnetic reading of line A was not completed.

The gravity readings were read using a Warden gravity meter and barometric leveling. Readings were corrected for instrument drift, free air and bouguer corrections.

Magnetic readings were using a Geometrics Proton Magnetometer. All readings were corrected for diurnal variations.

The gravity and magnetic traverses correlated very well with the regional gravity and magnetic surveys and completion of Line A is not warranted.

The depth to the source of the gravity anomaly on traverse B was estimated to be deeper than 3 km indicating that the gravity anomaly is not due to the presence of the Fickling Group and more likely to Murphy metamorphics.

4.0 GEOCHEMISTRY

Water bore data in the EL area were utilised to detect possible anomalies caused by underground water flowing in rockunits intersected by the water bores. Fluorine, Sulphate, calcium values are presented in Figs. 8, 9 and 10. The Ca/Mg ratio contours are shown in Fig. 11.

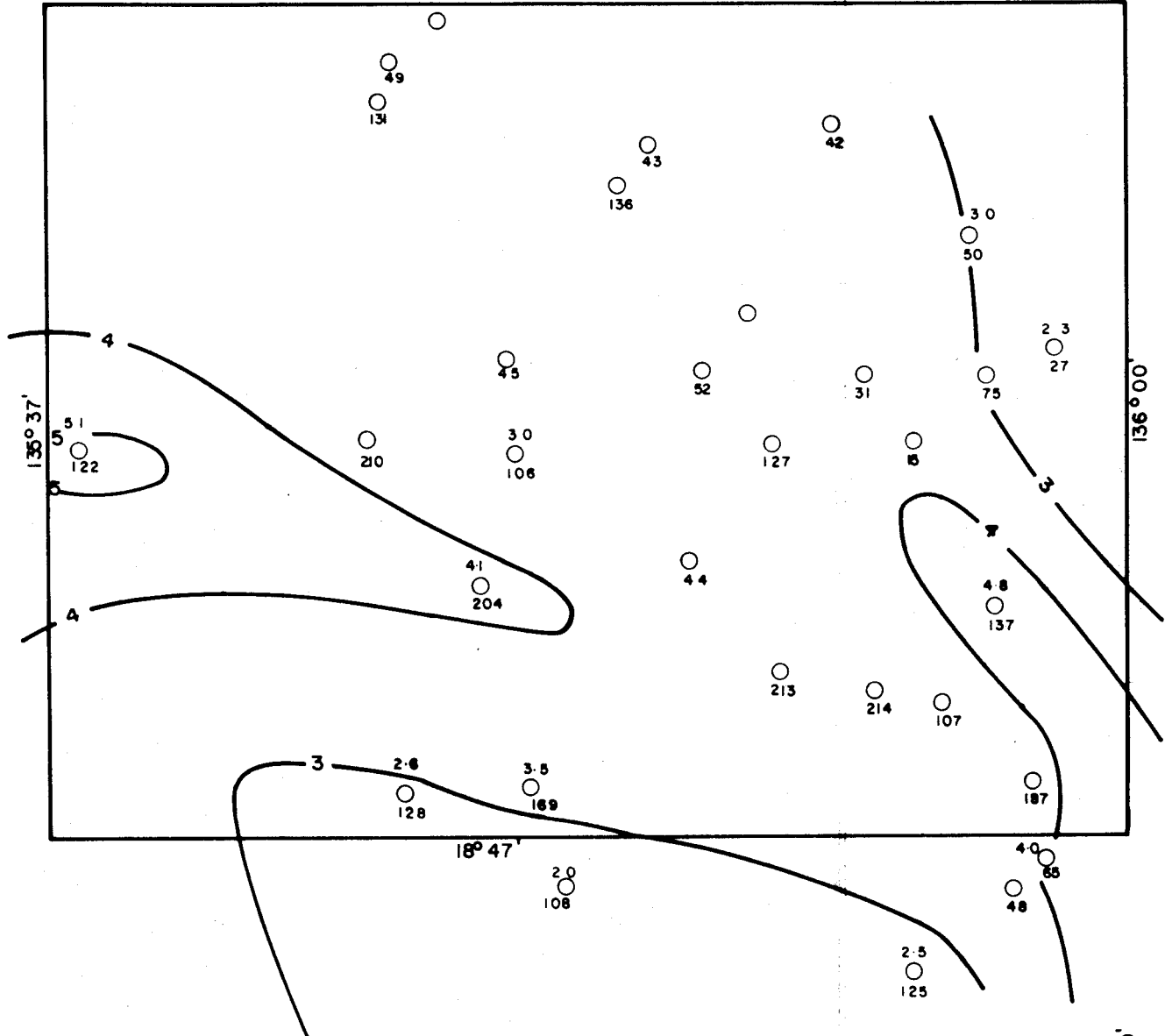
No significant anomalies were observed from the water bore data.

○ 120

136°00'

18° 30'

18° 30'



LEGEND

- 2.9 F ppm
- Water Bore Location
- 190 File No. (Dept. of Transport & Works)

The Shell Company of Australia Limited METALS DIVISION	
E.L. 2709 BRUNETTE DOWNS WATER BORE ANALYSES FLUORINE	
SCALE 1 250000	DATE JUNE 1982
AUTHOR SAD	DRAWN KMB
OFFICE DARWIN	REP.No.
DRG NONT/PWIS/014	FIG.No. 8

136°00'

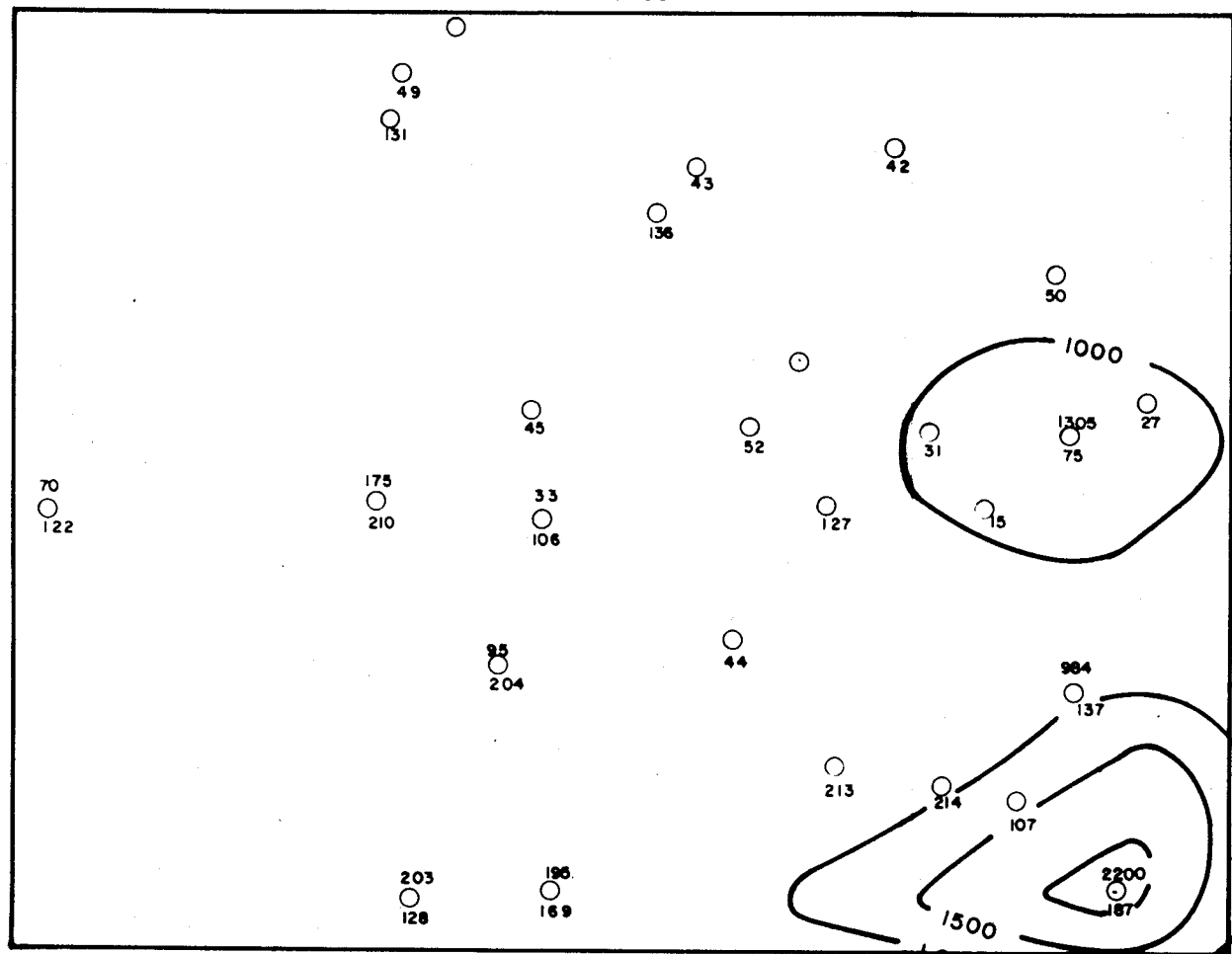
126

136°00'

18°30'

18°30'

135°37'



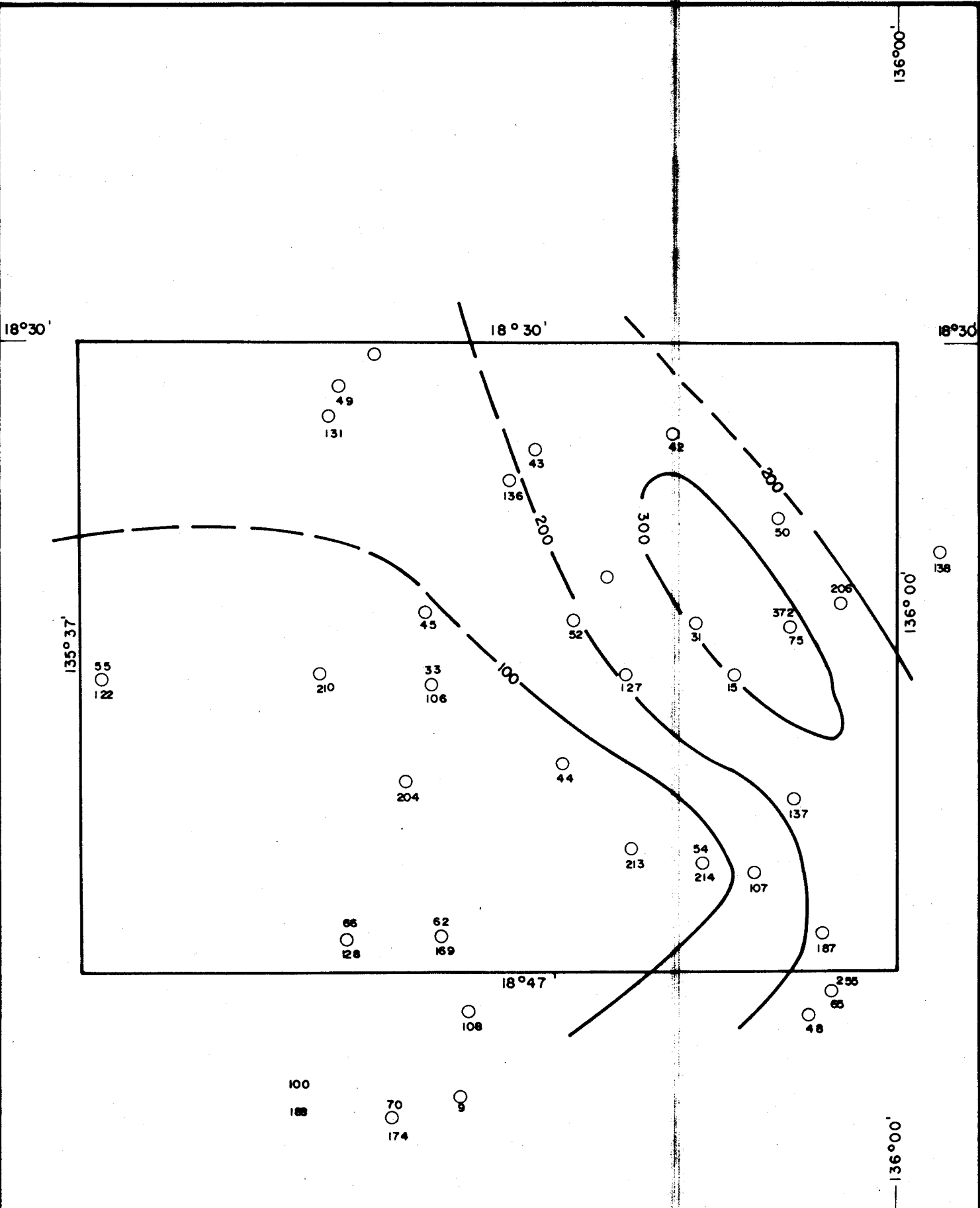
LEGEND

- 1320 SO₄ ppm
- WATER BORE LOCATION
- 192 File No (Dept. of Transport & Works)

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E.L. 2709
BRUNETTE DOWNS
WATER BORE ANALYSES
SULPHATE

SCALE 1:250 000	DATE JUNE 1982
AUTHOR SAD	DRAWN KMB
OFFICE DARWIN	REP.No.
DRG.No NT/PW15/015	FIG.No. 9



LEGEND

- 230 Ca /ppm
- Water Bore Location
- 99 File No. (Dept. of Transport & Works)

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E.L. 2709
BRUNETTE DOWNS
WATER BORE ANALYSES
CALCIUM

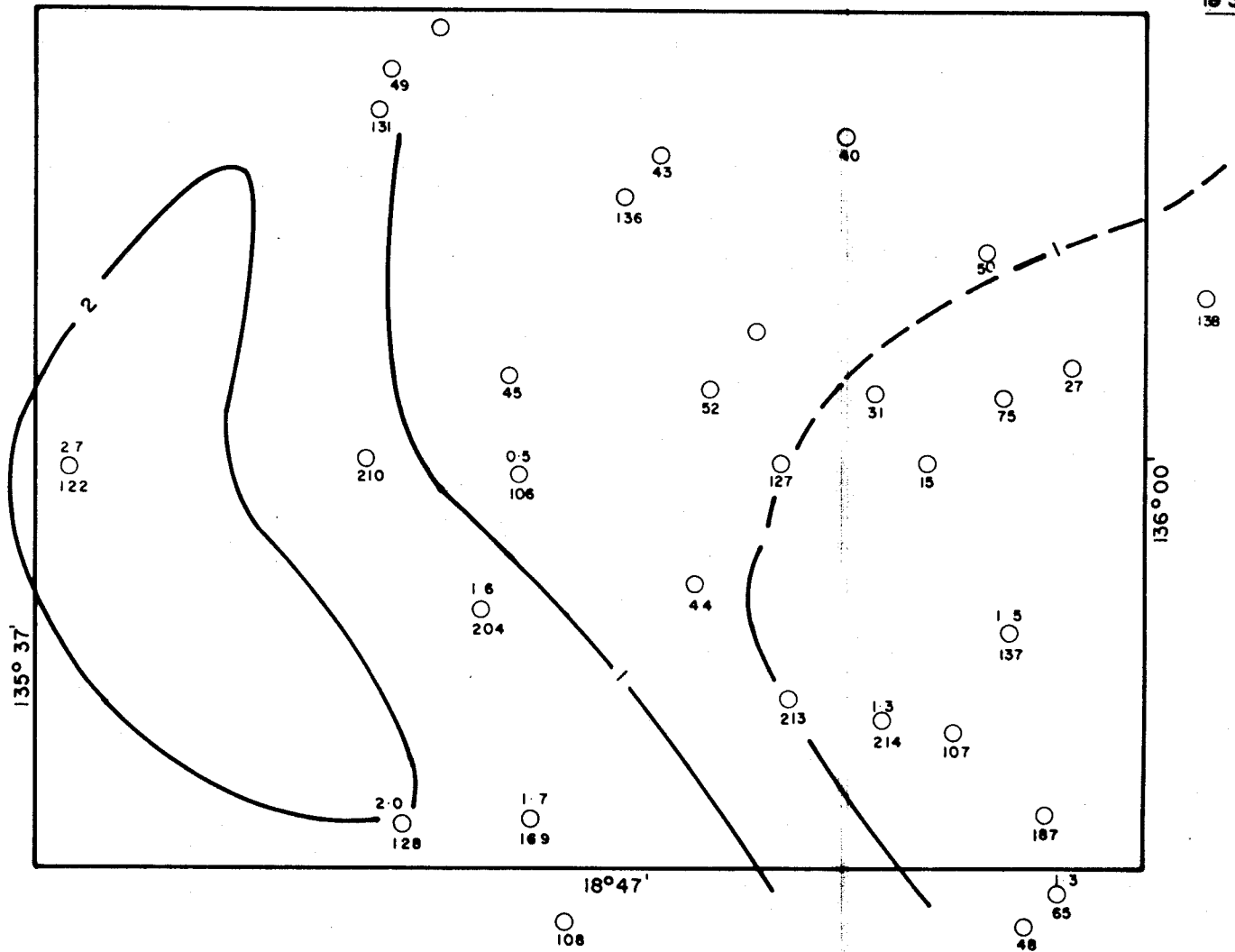
SCALE 1:250 000	DATE JUNE 1982
AUTHORSAD	DRAWN K MB
OFFICE DARWIN	REP.No.
DRG.No NT/PWIS/018	FIG.No. 10

120

136°00'

18°30'

18°30'



135°37'

136°00'

18°47'

136°00'

LEGEND

- 2.7 Ca/Mg Ratio
- Water Bore Location
- 122 File No (Dept. of Transport & Works.)

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METALS DIVISION

E.L. 2709
BRUNETTE DOWNS
WATER BORE ANALYSES
Ca/Mg Ratios

SCALE 1:250 000	DATE JUNE 1982
AUTHOR S.A.D.	DRAWN K.M.B.
OFFICE DARWIN	REP.No.
DRG.No. NT/PW 15/013	FIG.No. II

5.0 CONCLUSIONS AND RECOMMENDATIONS

The source of the bouguer anomaly in the Brunette Downs EL 2709 area is interpreted to be deeper than 3 km below the ground surface.

A sequence of Murphy Metamorphics and not the Fickling Group is considered to be the cause of the anomaly.

No further work is planned and relinquishment of EL 2709 is recommended.

6.0 REFERENCES

Adastra Hunting Geophysics Pty Ltd, 1963 - Report
on Airborne Magnetometer Survey of Brunette
Downs N.T. (Oil Lease O.P. 67) for Mines
Administration Pty Ltd.

Bureau of Mineral Resources, Bouguer
Anomalies, Brunette Downs 1:250 000 Sheet Area.

Randal, M.A., 1966 - Explanatory Notes on
Brunette Downs Geological 1:250 000 Sheet area,
Bureau of Mineral Resources.

APPENDIX I

EXPENDITURE REPORT

EXPENDITURE REPORT
EXPLORATION LICENCE 2709

<u>STAFF COSTS:</u>	\$9274.00
<u>SUPPORT COSTS:</u>	\$7927.00
<u>FIELD EXPENSES:</u>	\$7132.00
<u>CONCESSION PAYMENT:</u>	\$1978.00
<u>MISCELLANEOUS:</u>	---
<u>OVERHEADS:</u>	\$2937.00
<u>TOTAL:</u>	\$29248.00

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TITLE _____
TITLE COMBINED ANNUAL AND FINAL REPORT ON EL 2709 BRUNETTE DOWNS

DATE 25 / 6 / 82 (Publication date in Format dd/mm/yy)

AUTHOR

S.A. DASHLOOTY

SOURCE (If Non-SCOA)

DESCRIPTOR (Not indexed)

ANNUAL AND FINAL REPORT

PROSPECT/PROJECT

BRUNETTE DOWNS

KEYWORDS

EXPLORATION LICENCE

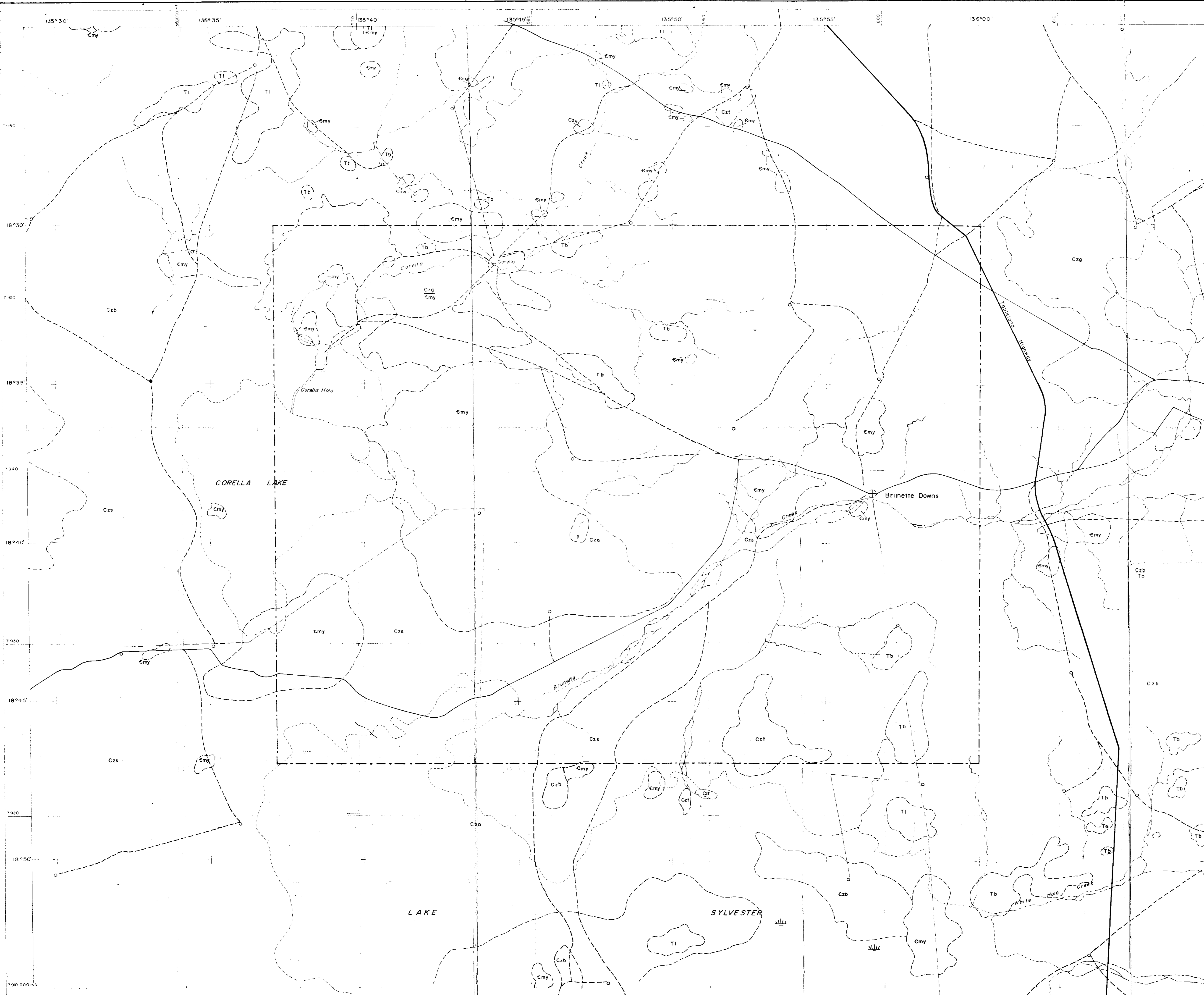
STRATIFORM SULPHIDE BASE METAL DEPOSITS

STRATABOUND SULPHIDE BASE METAL DEPOSITS

LOCATION

SHEET NAME (1:250,000) BRUNETTE DOWNS
SE53.11

REPORT No (Not indexed) 08 - 1141



LEGEND

Cza	Alluvium including river gravel, some black soil
Czb	Black and grey clayey soil some sand and gravel
Czg	Gravel, pebbles of psilotic ironstone and chert
Czs	Residual sand, some black soil and gravel, some sand
Czt	Travertine
BRUNETTE LIMESTONE	
Tb	Nodular white limestone silicified in part and containing chert nodules and bands, minor quartz sandstone and conglomerate, fossiliferous
Tl	Laterite, mainly ferruginised sandstone and siltstone and leached carbonate rocks some gravel & residual sand
UNDIFFERENTIATED	
E	Chert, dolomite, sandstone
ANTHONY LAGOON BEDS	
Emy	Dolomite and dolomitic limestone, with chert nodules & bands; some algal stromatolite limestone, ferruginous, grey and white quartz sandstone and siltstone

LEGEND

---	E.L. Boundary
==	Sealed Road
- - -	Minor Road, track
○	Bore
~	Creek
○	Lake

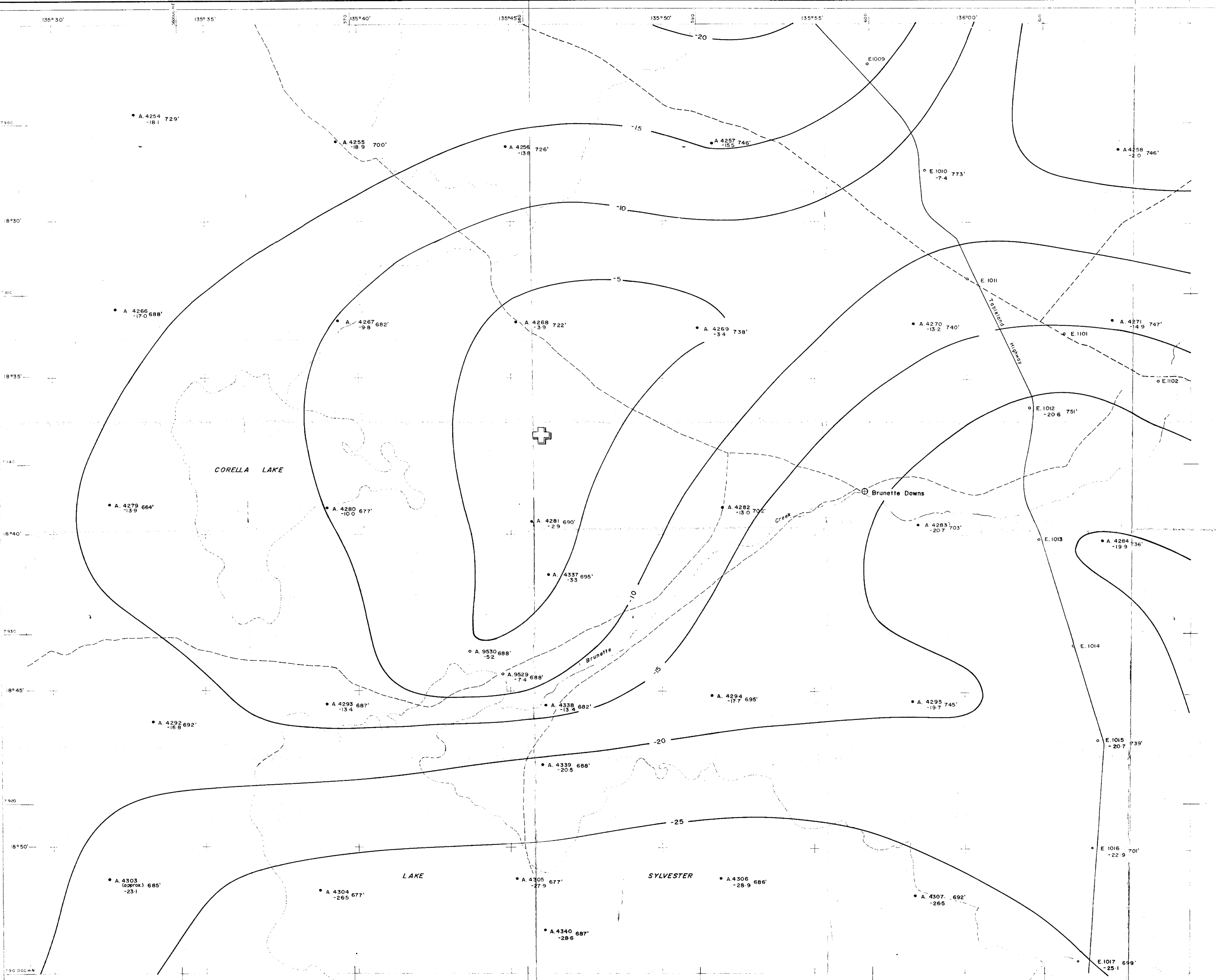
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**BRUNETTE DOWNS E.L. 2709
GEOLOGY**

Scale 1:100,000

FIG. NO. 3	REPORT NO.
ENCL. N.	REF. NO. NT/PW15/005
DATE OCT 1981	AUTHOR S.A.D.
DRAWN K.M.B.	OFFICE DARWIN

CR12/287



GRAVITY

- Permanently marked gravity station
- Other gravity station
- 12.3 Bouguer anomaly (milligals)
- 625' Elevation (feet)
- 5 Isogals
- ⊕ High anomaly

LEGEND

- Sealed Road
- - - Minor Road, track
- ~ Creek
- Lake



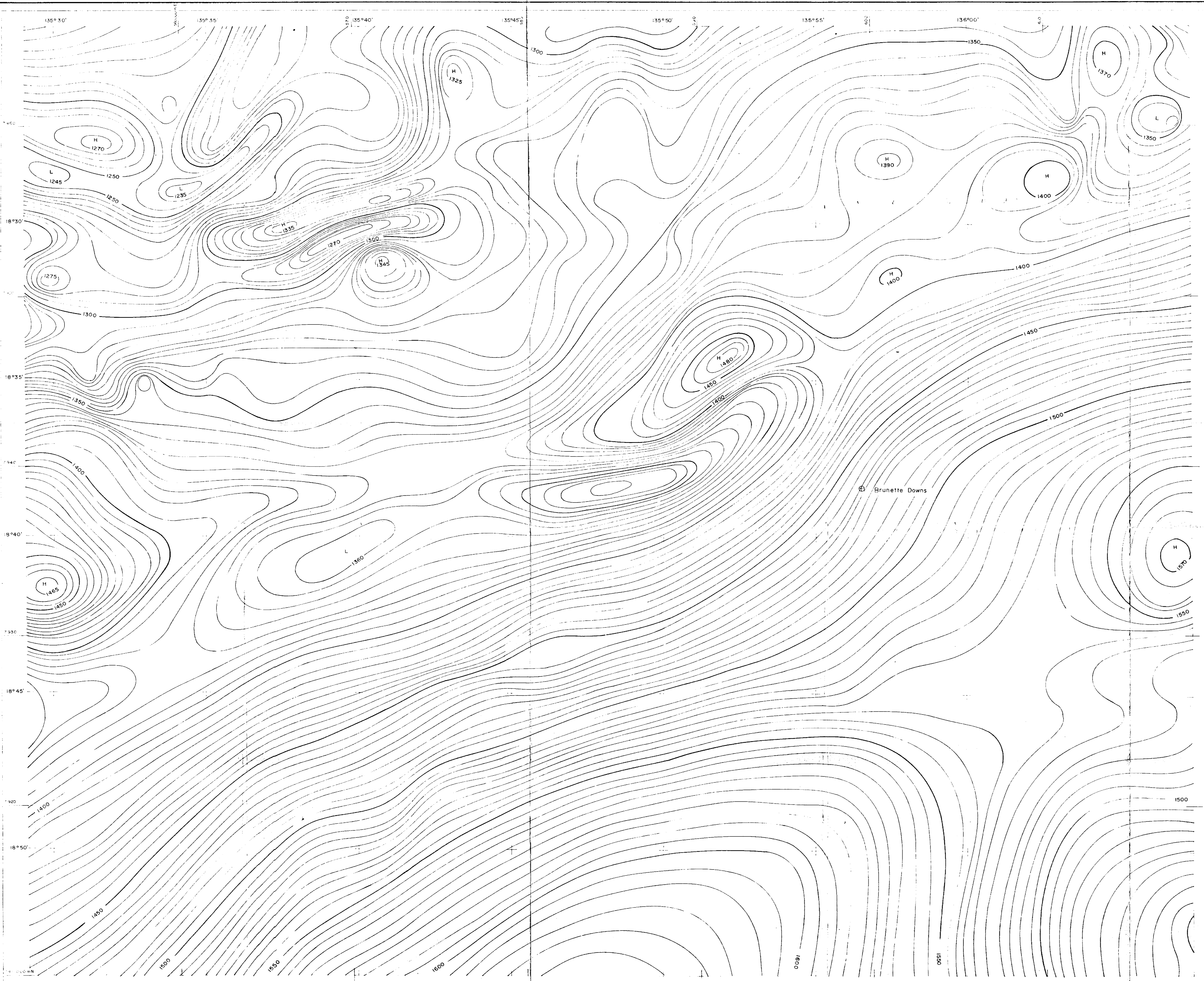
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**BRUNETTE DOWNS E.L. 2709
BOUGUER ANOMALY
MAP**

Scale 1:100,000

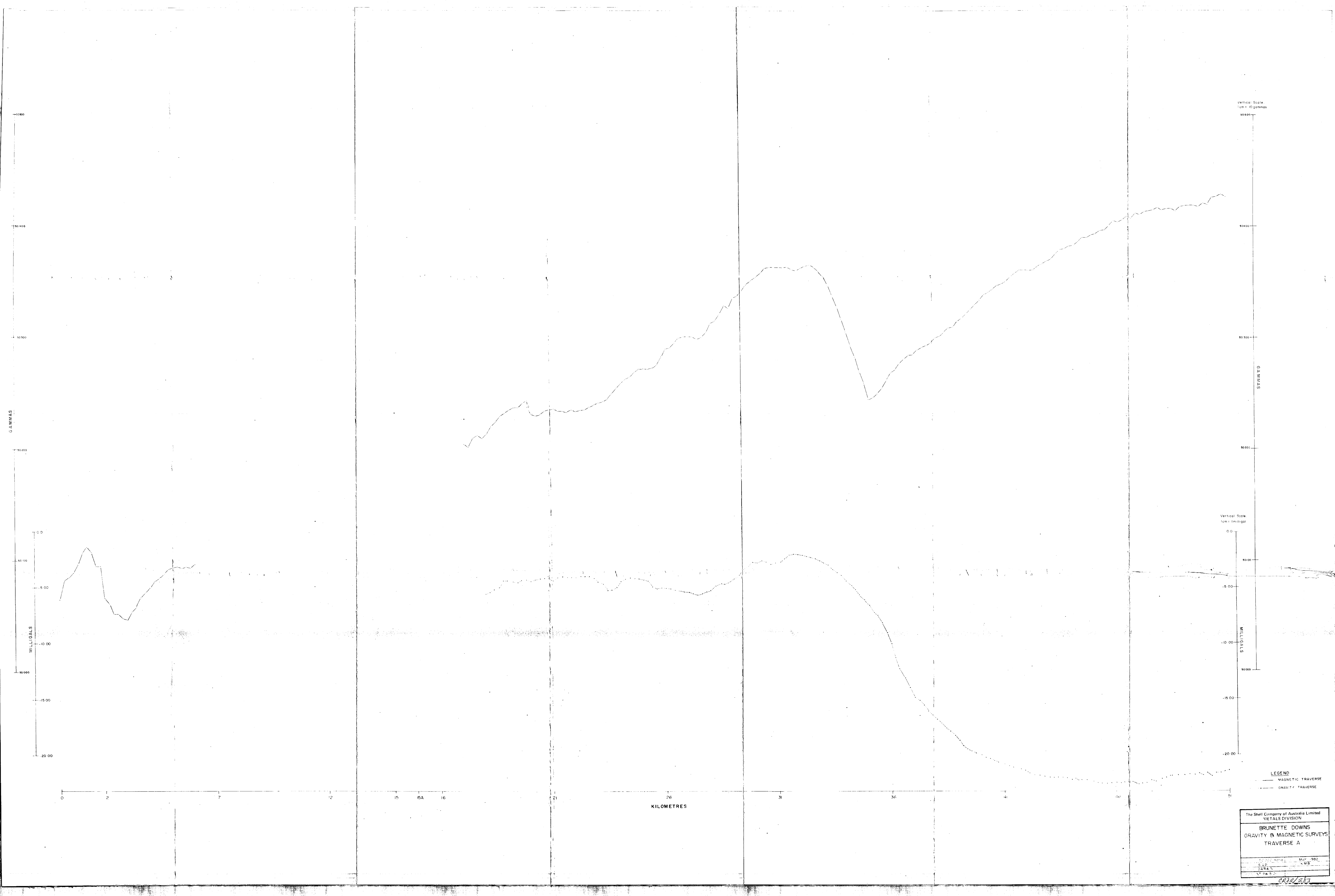
FIG No 4	REPORT No
ENCL No	DRG No NT/PWIS/004
DATE OCT 1981	AUTHOR S.A.D.
DRAWN K.M.B.	OFFICE DARWIN

0212/217



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BRUNETTE DOWNS E.L. 2709	
TOTAL MAGNETIC INTENSITY	
CONTOUR INTERVAL 5 GAMMAS	
Scale 1:100,000	
FILE No. 5	REPORT No.
ENR No.	DRG No. NT/PWIS/003
DATE: OCT 1981	AUTHOR: S.A.D.
DRAWN: K.M.B.	OFFICE: DARWIN

0222/222



Vertical Scale
1cm = 10 gammas

Vertical Scale
1cm = 1 milligal

GAMMAS

MILLIGALS

KILOMETRES

LEGEND
 — MAGNETIC TRAVERSE
 - - - GRAVITY TRAVERSE

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BRUNETTE DOWNS
 GRAVITY & MAGNETIC SURVEYS
 TRAVERSE A
 DATE: MAY 1982
 S.D. A.M.B.
 V.P.A. S.S.
 CR22/283

Vertical Scale
1cm = 10 Gammas

50400

50300

GAMMAS

50200

50100

KILOMETRES

32

30

25

20

15

10

5

0

Intersection of Tableland Highway & Brunette Downs Homestead road

Vertical Scale
1cm = 1 milligal

5.0

10.0

15.0

20.0

MILLIGALS

LEGEND

- MAGNETIC TRAVERSE
- - - GRAVITY TRAVERSE

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BRUNETTE DOWNS
GRAVITY & MAGNETIC SURVEYS
TRAVERSE B

SCALE 1:50 000 Horiz	DATE MAY 1982
AUTHOR S.A.D.	DRAWN T.E.E.
OFFICE DARWIN	REP.No.
DRG.No NT/PW15/012	FIG.No 7

0282/283