

EXPLORATION LICENCE 2341  
MOUNT STAFFORD, NORTHERN TERRITORY  
FINAL REPORT, 29TH JUNE 1983

NAPPERBY SF 53-9

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CR83/291

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EXPLORATION LICENCE 2341  
MOUNT STAFFORD, NORTHERN TERRITORY  
FINAL REPORT, 29th JUNE 1983

1. GENERAL STATEMENT

Exploration Licence 2341 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralization.

Exploration commenced with a programme of reconnaissance stream sediment sampling. Two of these samples proved to be encouraging and a follow-up programme of check sampling was undertaken together with bulk testing of river gravels. Kimberlitic indicators were found in one of the bulk samples. A ground magnetometer survey on a 4 kilometre square grid was carried out upstream from this site. Three anomalies were selected and drilled but no kimberlites were located. A loam sampling programme over the same four kilometre grid also revealed no kimberlitic indicators. A further programme of stream and bulk sampling was negative. The licence was relinquished on 29th June 1983.

2. TITLES

Exploration Licence 2341 of 414.28 square miles was granted to BHP Minerals Ltd on 27th January 1981 for six years (Fig. 1). A partial reduction was submitted to the Department of Mines and Energy with effect from 27th January 1983 (Fig. 2).

3. FIELD INVESTIGATIONS

3.1 Stream Sampling 1981

A programme of heavy mineral stream sediment sampling was carried out over those parts of the exploration licence with active drainage, essentially the Reynolds Ranges. At each site a 20 kilogram sediment sample

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was collected together with a geochemical sample.

This sampling was under the supervision of a geologist. The most favourable trap site was selected where the heavy mineral content of the stream sediment was at a maximum for the drainage channel. The sites are marked on Figure 3.

### 3.2 Follow-up Stream Sampling 1981

The two reconnaissance samples which contained kimberlitic indicators were CA0028 and CA0029, located in streams draining the southern side of the Reynolds Range.

Initially fourteen follow-up stream samples RT0517 to RT0530 (Figure 3) were taken in the immediate vicinity of CA0028 and CA0029. One of these, RT0526, also contained a kimberlitic indicator. Therefore a closer interval sampling programme was carried out along the flanks of the Reynolds Range to ascertain the presence of any more kimberlitic indicator minerals. In all, 58 samples were collected; their locations are shown on Figure 4. All these follow-up samples were 20kg stream sediment samples. They were collected by helicopter from selected trap sites under the supervision of an experienced geologist.

None of these 58 follow-up samples taken in 1981 contained any indicator minerals.

### 3.3 Bulk Sampling of River Gravels 1981

The positive results from RT0526 warranted the bulk testing of the river gravels in the area. Five samples totalling 43 tonnes were taken from selected sites and treated in our mobile jig plant. Their locations are shown on Figure 4.

<u>Sample No.</u>	<u>Tonnes</u>
CJA009	10
CJA010	20

<u>Sample No.</u>	<u>Tonnes</u>
CJA011	5
CJA012	5
CJA014	3

The jig concentrates from these samples were examined for diamonds and kimberlitic minerals in our laboratory in Adelaide.

No diamonds were found in the heavy mineral concentrates from the 5 bulk samples CJA009-12 and CJA014. CJA011 was found to contain kimberlitic indicator minerals.

#### 3.4 Survey of Aboriginal Sacred Sites 1981

The Central Land Council in Alice Springs commenced a survey of the Exploration Licence towards the end of October and this was completed in November. The survey was carried out by Simon Harrison, an anthropologist from Canberra, together with Central Land Council officers and local traditional owners.

The report was received in November 1981 and outlined large areas within the licence area where sacred sites are located (Figure 5). However the present area of active interest in the tributaries of Tower Creek west of Mt. Thomas was declared free of sacred sites. Therefore further field work continued in November and December 1981.

The rest of the Exploration Licence contains many traditional sites and "the traditional owners have instructed the Central Land Council to inform Dampier that they do not want any work at all to take place in the areas marked on the accompanying map" (Figure 5).

This area amounts to approximately 75% of the total area of the exploration licence.

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A final part of the report relates to a series of drill holes in the vicinity of Blackhill Creek which have been drilled across the middle of an "extremely dangerous and sacred site". They requested "to know whether or not Dampier Mining Company is responsible for the destruction of the site". The Central Land Council has been informed that Dampier Mining Company Limited (now BHP Minerals Limited) have no knowledge of the drill holes referred to in their report.

Complete copies of this report and map have been sent to the Aboriginal Sacred Sites Protection Authority and the Senior Exploration Registrar, both in Darwin.

### 3.5 Ground Magnetometer Survey 1981

The positive bulk sample CJA011 contained several kimberlitic indicators including chrome diopside.

This indicator is not considered to travel in streams for distances of much over a kilometre. This, together with a high sand content of the creeks and relatively low indicator counts, led to the decision to carry out a ground magnetometer survey, four kilometres square, upstream from CJA011 (Figure 6) to locate potential kimberlitic magnetic anomalies. The grid comprised north south traverses at 200 metre spacing with readings taken at 10 metre intervals. A Scintrex MP2 magnetometer was used with a base station to correct for diurnal variations. The total magnetic intensity contours are shown on Figure 6 at a scale of 1:10,000. This map also shows the geology derived from the Reynolds Range 1:100,000 geological series sheet 5453. The magnetically flat areas to the north and south correspond to the known foliated biotite granites. Schist outcrops and associated rock units coincide with the WSW to ENE linear magnetic trends across the centre north of the grid. Calc-

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silicate rocks associated with the granite margin relate to the W to SE trend in the south central part of the grid. Interpretation of this ground magnetometer work produced three drill targets for 1982.

### 3.6 Drilling 1982

The geophysical interpretation of the ground magnetometer grid (Figure 6) produced in November, 1981, delineated three drill targets which could be possible sources for the kimberlitic indicators found in bulk sample CJA011 in June, 1981.

Anomaly 1 - This was considered to be a shallow source and the source rock would be only mildly magnetic. Four shallow holes were recommended:-

Co-ordinates	11000E/10100N Drillhole PMS4
	11000E/10150N Drillhole PMS1
	11000E/10200N Drillhole PMS2
	11000E/10250N Drillhole PMS3

Anomalies 2 and 3 - These were considered to be much lower priority targets and three holes were recommended for each anomaly.

#### Anomaly 2

Co-ordinates	8800E/11440N Drillhole PMS8
	8820E/11455N Drillhole PMS10
	8780E/11425N Drillhole PMS9.

#### Anomaly 3

Co-ordinates	8400E/10050N Drillhole PMS6
	8400E/10100N Drillhole PMS5
	8400E/10150N Drillhole PMS7

This drilling programme was carried out in mid-June 1982 using a BHP Company Edson drilling rig. The rocks encountered were various mica schists. Lenses rich in magnetic haematite were located and are the probable cause of the magnetic anomalies.

A total of 166 metres of RAB drilling was completed in ten drill holes PMS1 to 10 (see Figures 6 & 7).

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Anomaly 1 (Drillholes PMS1, 2, 3, 4)

The bedrock at this locality comprises various mica schists which are cut by pegmatites in drill holes PMS1 and PMS2. Magnetic haematite was found in PMS1, 2 and 4 between 4 metres and 20 metres and is considered to be the source of this anomaly.

Anomaly 2 (Drillholes PMS8, 9, 10)

Mica schists are the dominant rocks encountered in drill holes PMS8, 9 and 10 with some minor granulites. A few grains of magnetic haematite were found in PMS8 and 9 which would explain this weak anomaly.

Anomaly 3 (Drillholes PMS5, 6, 7)

Mica schists and quartzites were located in drill holes PMS5, 6 and 7 under a surface cap of calcrete. Magnetic haematite was found in PMS5 from 10 to 14 metres and is considered to be the explanation of this anomaly.

Some chips of equigranular magnetic haematite and quartz were recovered suggesting lenses of this composition within the schists of the area. The drill holes are summarized in the Graphic Logs in Figure 7.

These schists form part of Lander Rock Beds of the Arunta Block. Outcrop in the general area of the drill holes shows similar rocks to those found in the drill hole rock chips. Lineations and dips measured agree with mapped geological data shown on the Reynolds Range Region 1:100,000 Geology 1981 B.M.R. map.

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3.7 Loam Sampling 1982

In view of the presence of kimberlitic indicator minerals including chrome diopside in CJA011, the four kilometre magnetometer grid block was loam sampled. Each loam sample comprised residual surface soils collected over one square metre at 200 metre centres. This residual sediment was screened and then concentrated in a Pleitz Jig to produce a heavy mineral concentrate of -10+24 mesh size (approx. -2mm+.7mm). This concentrate was observed in the field for kimberlitic indicator minerals. A total of 441 loam samples were collected.

No kimberlitic indicator minerals were found. Therefore it is assumed that no sizeable kimberlitic source is located within the area of the grid.

The negative nature of both the drilling programme and the loam sampling pointed to a source outside the four kilometre grid or to the fact that the original positive results were spurious. Therefore a final stream and bulk sampling programme was undertaken to repeat the original positive sample and delineate the general source area if it was upstream from the grid block.

3.8 Stream Sampling 1982

A further ten stream samples, RT0992 - 994 and RT0996 - 1002 were collected in the drainage upstream from CJA011 and CJ0280. These samples were each approximately 100 kilogrammes of which 80 kilogrammes were concentrated and observed in the field and 20 kilogrammes were sent to our Perth Laboratory for treatment. These have now been observed and no kimberlitic indicators have been found.

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3.9 Bulk Sampling 1982

The first bulk sample in the tributary of Tower Creek, CJA011, which contained kimberlitic indicators, was only 5 tonnes. Therefore a larger bulk sample, CJ0280 of 25 tonnes, was treated from the same site when the loam sample grid proved to be negative. A small mobile jig plant was used with a supporting tipper truck and tractor mounted back-hoe. The coarse fraction of the concentrate (+3mm) was observed in the field and no kimberlite indicators were found. The fine fraction (-3mm) was despatched to Perth for laboratory examination. No diamonds or kimberlitic indicators were found in this sample.

4. CONCLUSION

The initial indicators found in stream samples CA0029 and RT0526 were not repeated in bulk sample CJA09. Likewise the indicators found in CA0028 and CJA011 were not confirmed in later stream and bulk samples. The ground magnetometer grid work and loam sampling was negative.

It is now considered that the initial kimberlitic results were spurious as detailed follow-up work has failed to repeat the positive indicators. Now that all the results have been received it is considered that no further kimberlite search is warranted. The licence was relinquished on the 29th June 1983.

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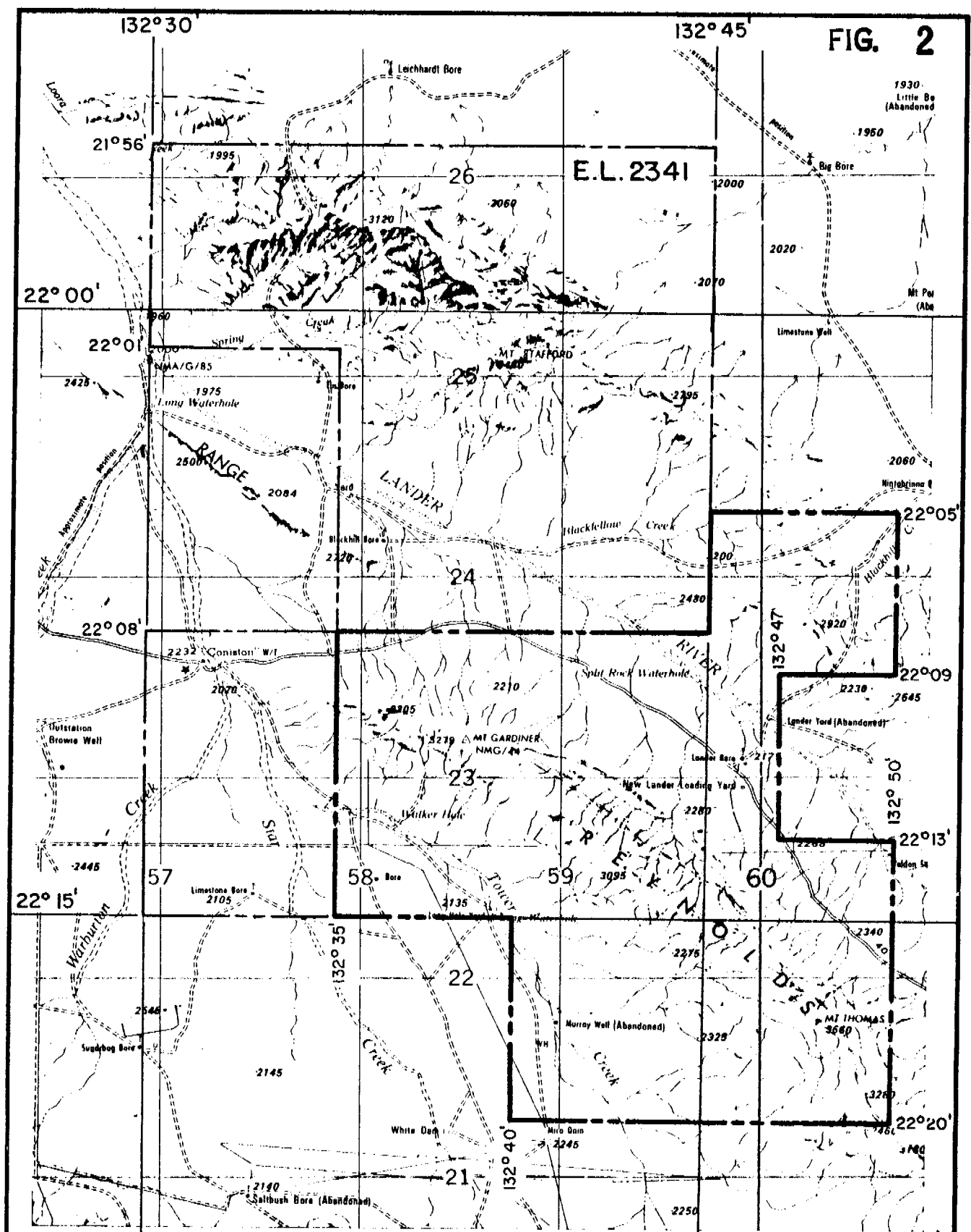
5. EXPENDITURE

Expenditure debited to E.L. 2341 during its tenure was made up as shown below:-

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Wages and Salaries	63,315	31,148	22,400
Messing & Accommod.	7,764	1,848	1,591
Fares and Mobilisation	5,741	1,232	1,592
Drilling	347	588	423
Transport	13,273	6,500	3,743
Aircraft Charter	7,194		
Radio Communications	242		112
Surveying (C.L.C.)	2,258		
Plant Services	77	280	
Mobilisation of Equip't	295		
Sample analysis	1,643	259	4,016
Geophysics	599		
Tenement Fees, Licences, etc.	834		1,580
Occupancy/Location Exps.	1,947	35	
Capital Items	1,782		
Administration	4,337	4,198	3,683
Sundries	18	92	128
	<u>\$111,666</u>	<u>\$46,180</u>	<u>\$39,268</u>

The total expenditure on E.L. 2341 was \$197,114

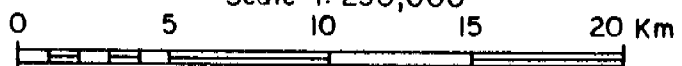
This report is submitted to the Department of Mines and Energy as required by Condition 7 of Exploration Licence 2341.



This map accompanies an application dated \_\_\_\_\_ on behalf of BHP Minerals Ltd.

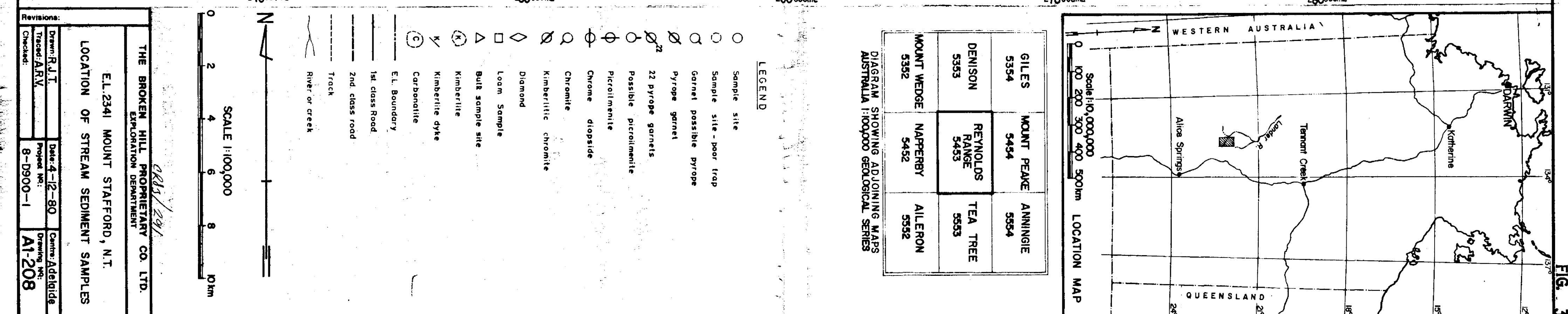
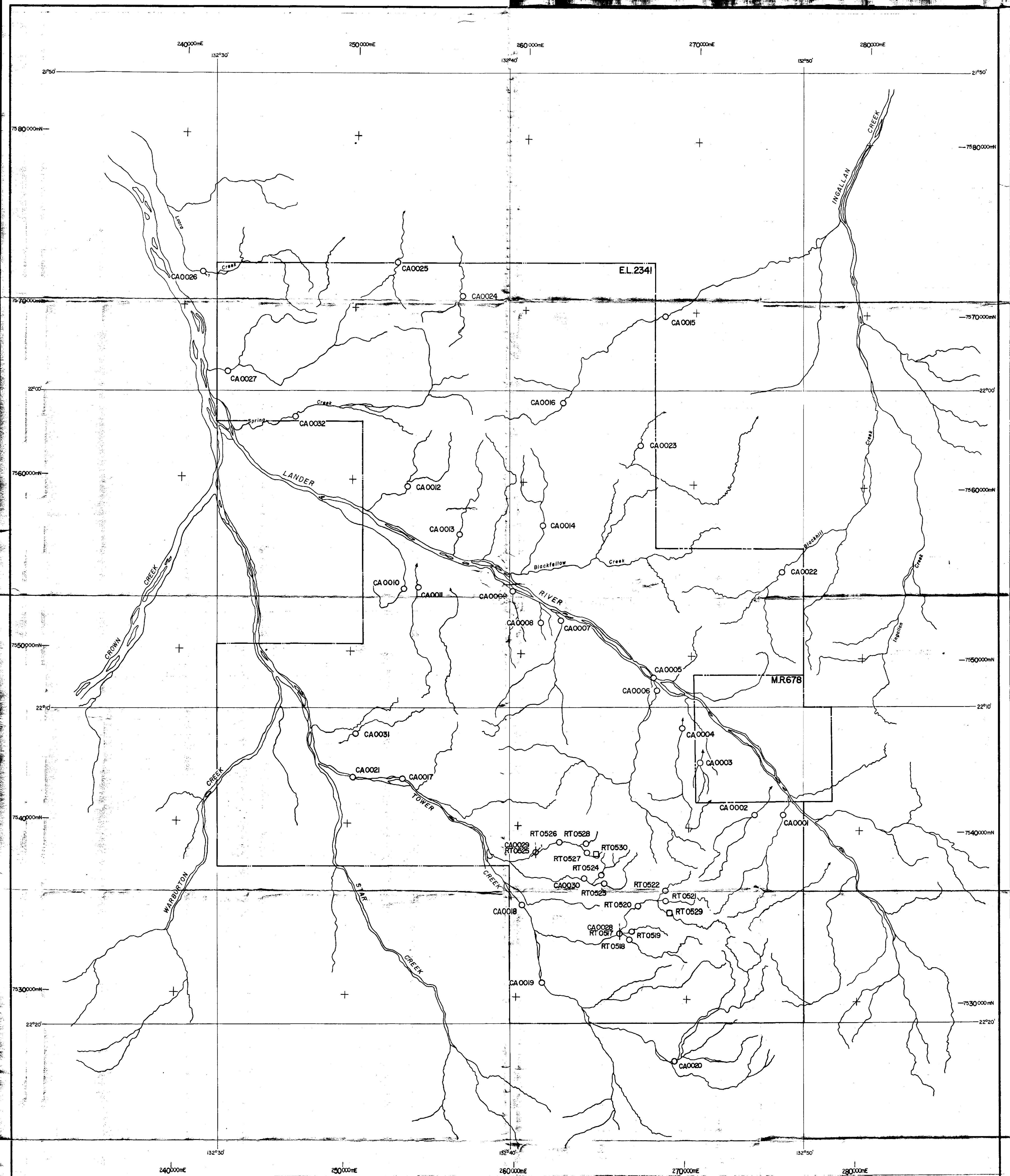
Area to be relinquished  
 Area to be retained

Scale 1: 250,000



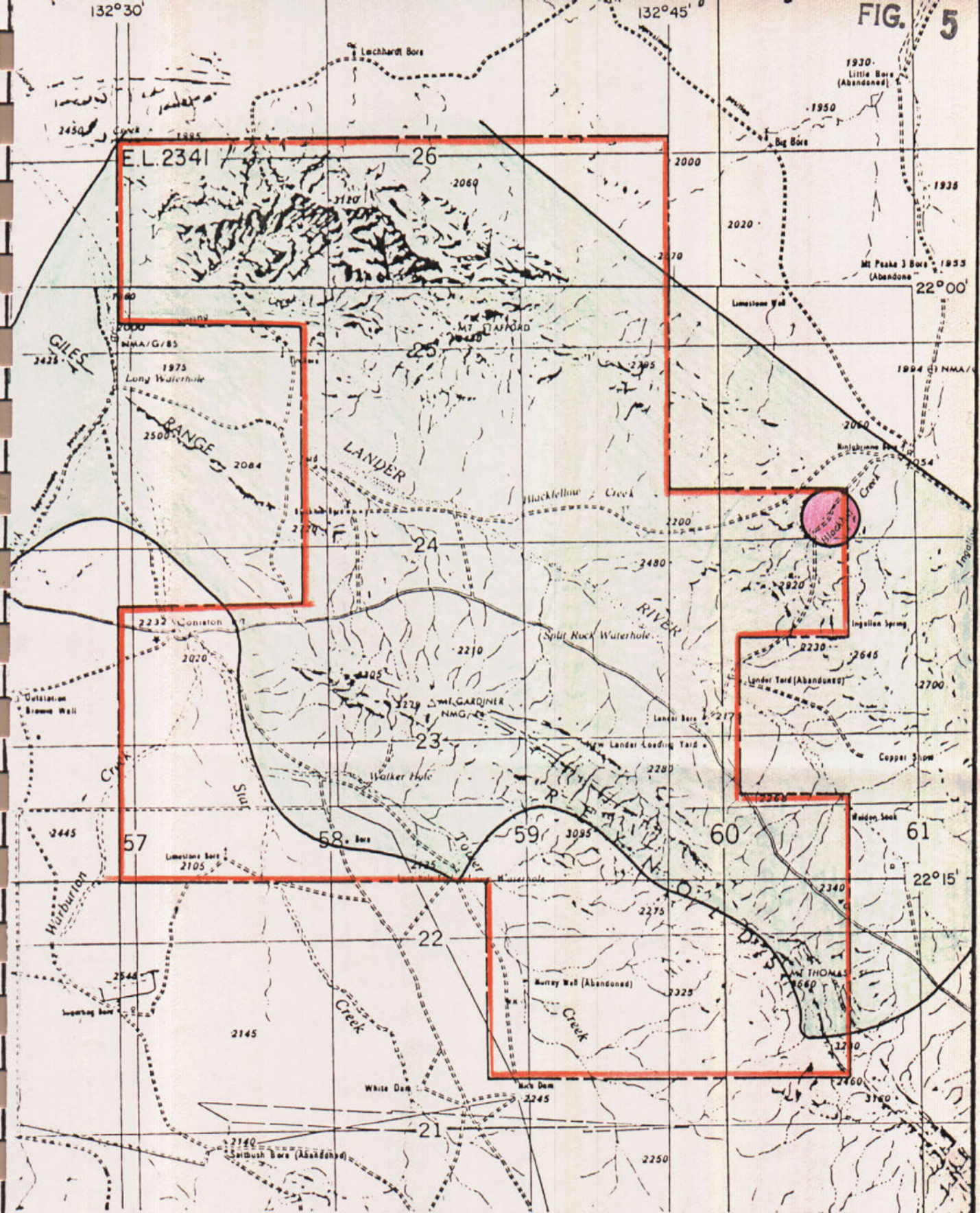
This map photo copied from 1:250,000 Topo: Mt. Peak and Napperby.



Centre Melbourne	BHP MINERALS LTD.	Project No D 900-2
Date 15-12-82	APPLICATION FOR REDUCTION OF E.L. 2341. MT. STAFFORD, N.T.	Drawing No A4- 2362









 Area of sacred sites  
 Location of damaged site

 E.L. boundary



SCALE 1:250,000  
 0 5 10 15 20 kilometres

This map was photo-copied from 1:250,000 sheet: NAPPERBY, MT. PEAKE

Centre  
 Adelaide  
 Date  
 30-9-81

THE BROKEN HILL PROPRIETARY CO. LTD.  
 E.L.2341 MT. STAFFORD. N.T.  
 LOCATION MAP SHOWING SACRED SITES

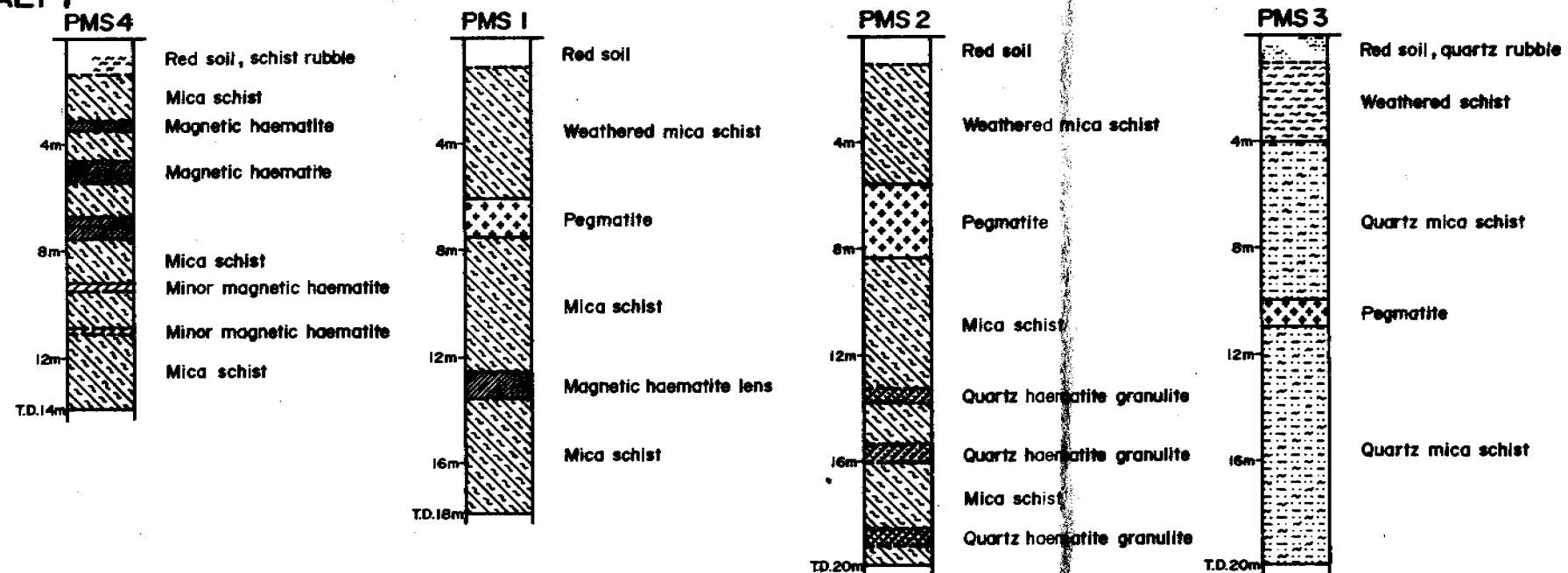
CR83/291

Project No.  
 8-D900-5  
 Drawing No.  
 A4-158A

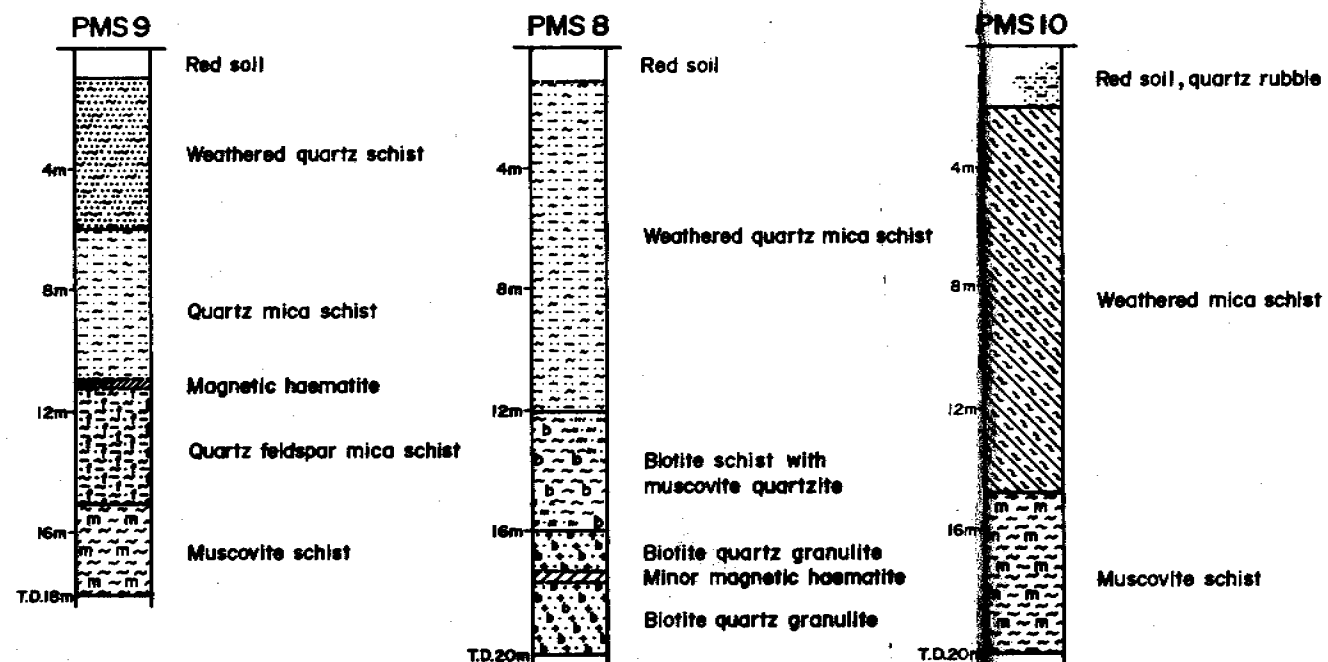




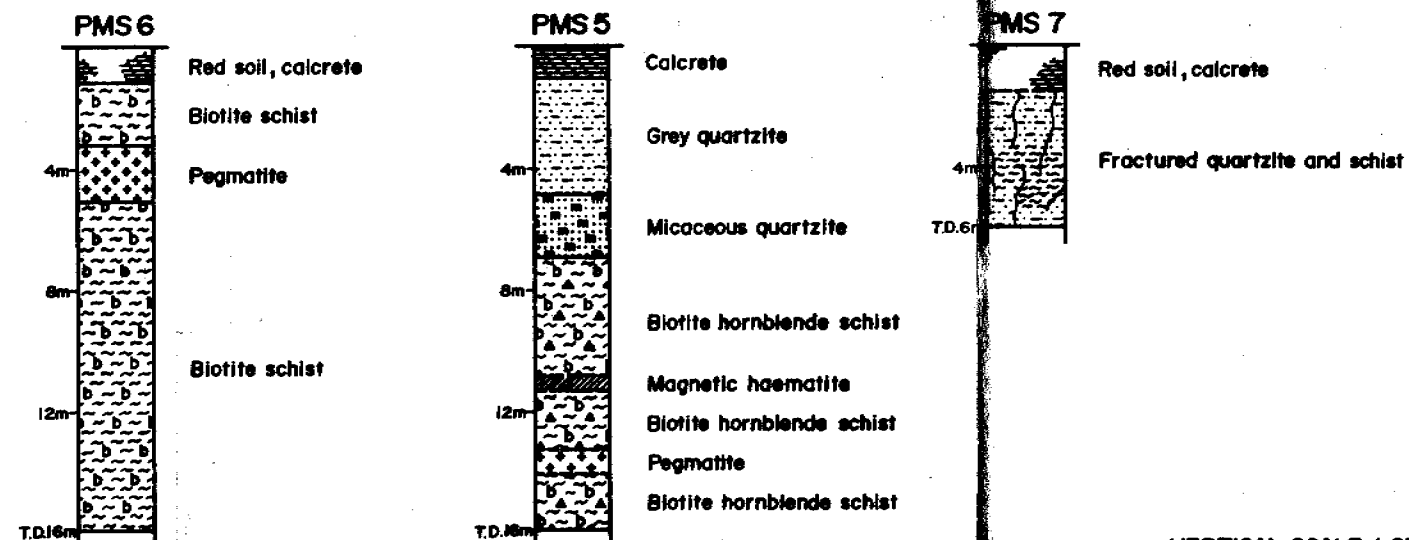
# ANOMALY 1



# ANOMALY 2

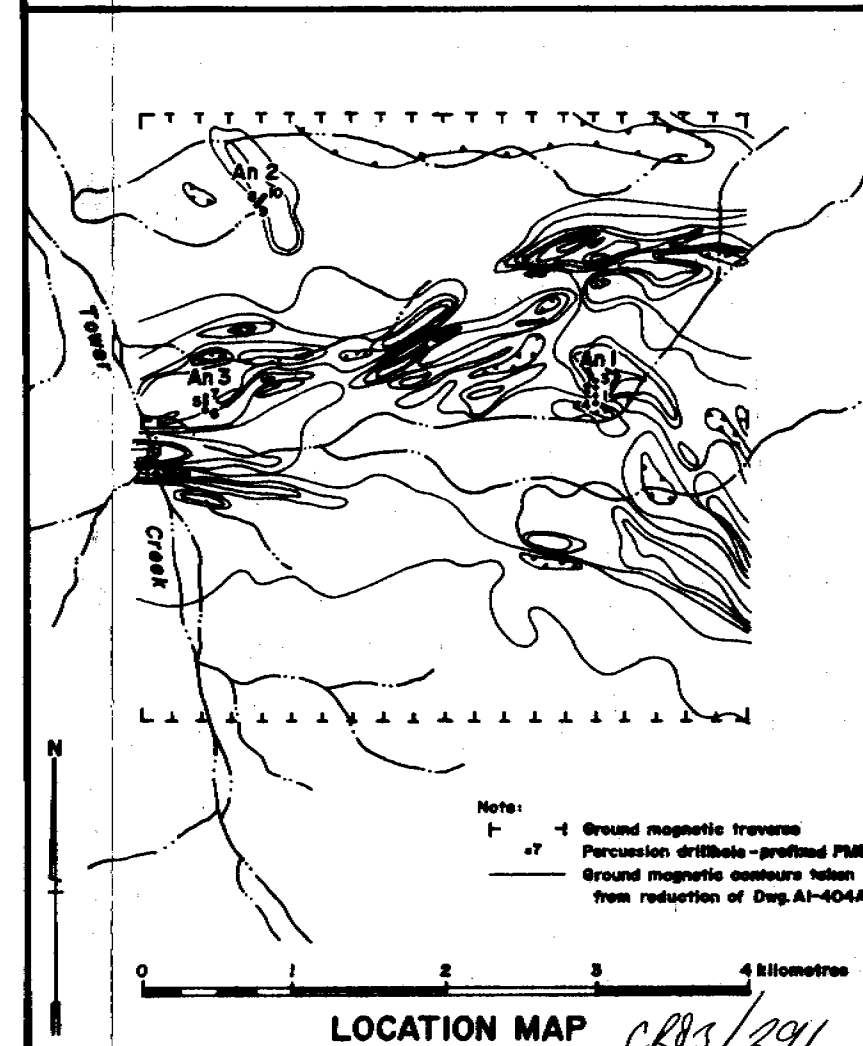
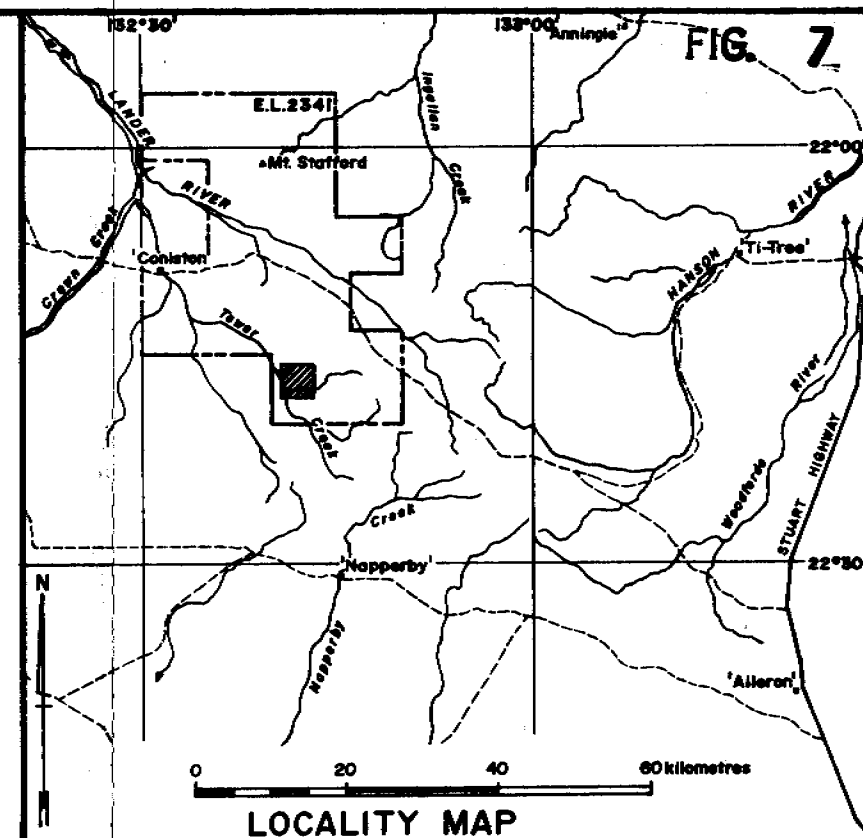


# ANOMALY 3



VERTICAL SCALE 1:250  
5 10 15 20 metres

FIG. 7

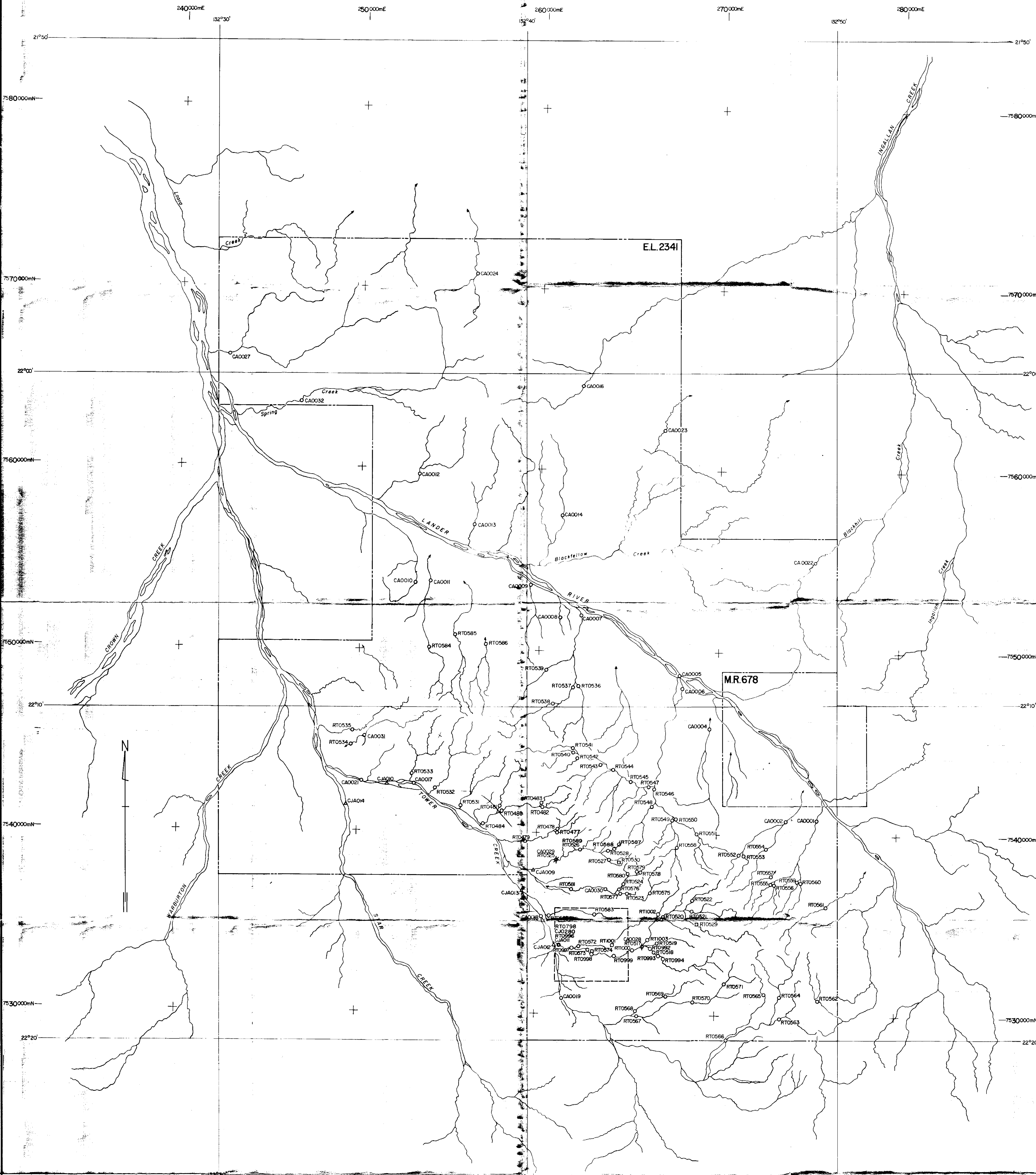


THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPARTMENT

E.L. 2341 MT. STAFFORD, N.T.

GRAPHIC LOGS OF DRILLHOLES PMS 1 TO 10

Prepared by: R. J. T.	Centre: Adelaide
Date: 3-8-82	Project No.
Drawn: A. R. V.	6-0800-12 A3-120



Revisions:

Drawn	Checked	Date	By
R.D.T.	A.R.V.	27-5-81	AT-291A

EL 2341 MOUNT STAFFORD, N.T.  
STREAM SAMPLE SITES  
SECOND STAGE FOLLOW-UP

THE BROKENHILL PROPRIETARY CO. LTD.  
EXPLORATION DEPARTMENT

08/291

SCALE 1:100,000

0 2 4 6 8 10 km

LEGEND

- Sample site
- Granite possible pyrope
- Pyrope garnet
- Possible picrolite
- Picrolite
- Chromite
- Chromite diopside
- Kimberlite
- Kimberlite dyke
- Carbonate
- E.L. Boundary
- Magnetometer and boom grid block

Scale 1:100,000

0 200 400 600 km

LOCATION MAP

WESTERN AUSTRALIA

QUEENSLAND

Adelaide

Perth

Geelong

Melbourne

Sydney

Brisbane

Adelaide

Perth

Geelong

Melbourne

Sydney

Brisbane