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REPORT NO. 681

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EXPLORATION  
DEPARTMENT

REPORT NO. 681

AIRBORNE SCINTILLOMETER SURVEY

EL 13/65, TASMANIA

C.P. TAYLOR

MELBOURNE

APRIL, 1968

 THE BROKEN HILL PROPRIETARY  
COMPANY LIMITED AUSTRALIA

68-541

Airborne Scintillometer  
Survey E.L.13/65 (B.H.P.)  
REP 681

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DISTRIBUTION LIST

1. Director of Exploration
2. Chief Operational Geologist
3. Chief Research Geologist
4. Exploration Superintendent
5. Hobart Geological Office
6. Department of Mines, Hobart.

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AIRBORNE SCINTILLOMETER SURVEY

EL 13/65, TASMANIA

G. P. TAYLOR

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SUMMARY

An airborne scintillometer survey over selected areas in EL13/65 tested the uranium prospects of Ordovician and Precambrian conglomerates and the granite contacts near Low Rocky Point.

Most of the larger anomalies detected, up to three times background, followed the coastline between Low Rocky Point and the Wanderer River. They are not explained by the known geology but may be caused by ground water enriched with radioactive elements emerging from peat cover at the coast.

Smaller anomalies are tabulated and related to geology where possible.

Ground follow-up work, consisting of geological examination and radioactive measurement, on the coastal anomalous zone and six selected anomalies is recommended. The smaller anomalies require investigation if time and access permit.

INTRODUCTION

No uranium occurrences are known in Exploration Licence 13/65 in southwest Tasmania, but the Precambrian and Ordovician conglomerates provide favourable environment. In his memorandum 15/9/66, J.6/26-3 the Chief Research Geologist recommended a helicopter scintillometer survey over selected parts of the Exploration Licence.

The survey was flown in February 1968 over the eight areas shown on Fig.1. The 462 line miles of survey aimed to test the radioactivity of:-

1. Owen Conglomerate in Areas 2,3 & 4.
2. Cambrian sediments and volcanics known to be mineralized in Areas 1,5 & 8.
3. Precambrian conglomerate in Area 6.
4. Granite and Cambrian volcanics in Area 7.

Bureau of Mineral Resources flight lines along the coast between Macquarie Harbour and Port Davey detected radioactive anomalies in Areas 5 & 7.

The survey was supervised by W. C. Smith. A Nuclear Enterprises total count scintillometer, comprising a 5" x 3" NaI crystal and a 5" photo multiplier tube, and a Benser radio altimeter were hired from Geophysical Resources and Development who also supplied B. Auston as technician. The Bell G2 helicopter attached to the Birch Inlet camp was used.

The planned helicopter flight height was 300' and the ground speed 60 mph. Both the altitude and the radioactive intensity were recorded on 10" chart paper moving at 2 inches per minute. The scintillometer had a time constant of 2.2 seconds.

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Anomaly	Background Counts/Min	Anomaly (x Background)		Length* (miles)	Comments
		uncorr.	corrected		
101	340	1.9	No altimeter	$\frac{1}{2}$	
102	260	1.85	"	1	
103	260	1.9	"	$1\frac{1}{2}$	
104	270	1.7	"	1	
105	270	1.65	"	1	
106	230	2.8	"	$1\frac{1}{2}$ ?	Coast-Sediments
107	260	2.3	"	$1\frac{1}{2}$	"
108	260	1.9	"	1	
109	270	2.6	"	$1\frac{1}{2}$	"
110	230	2.3	"	2	Owen Conglomerate sediment contact
111	250	2.5	"	1	Coast-Sediments
112	280	2.4	"	1	" "
113	400	2.0	"	$\frac{3}{4}$	Volcanics
201	750	1.4	No corrections	$\frac{1}{2}$	
202	780	1.3	1.15	1	
203	830	1.15	1.1	$\frac{1}{2}$	
301	300	1.4	2.2	$\frac{1}{2}$	Owen Conglomerate
302	480	1.21	1.9	$\frac{1}{2}$	
303	320	1.8	No correction	$1\frac{1}{2}$	
401	300	1.9	1.6	$2\frac{1}{2}$ ?	
501	220	1.35	2.1	1	Sediments
502	190	1.5	No altimeter	$\frac{1}{2}$	
601	460	1.3	No correction	$1\frac{1}{2}$	
602	450	1.3	"	$\frac{1}{2}$	
603	460	1.3	"	$\frac{1}{2}$	
701	190	1.1	"	$\frac{1}{2}$	
702	180	2.0	"	$\frac{1}{2}$	Volcanics
703	200	1.7	"	1	
704	200	2.25	"	$\frac{1}{2}$	Coast-Granite
705	180	2.7	"	$\frac{1}{2}$	Coast-Volcanics
706	180	1.9	1.8	$\frac{1}{2}$	
707	180	2.5	No correction	$\frac{1}{2}$	Coast-Volcanics
708	200	2.1	No correction	$\frac{1}{2}$	Coast-Granite
709	200	2.3	1.8	$\frac{1}{2}$	
710	300	1.65	No altimeter	$\frac{1}{2}$	
711	300	3.3	No alt./turb.	$\frac{1}{2}$	Volcanics
801	250	1.9	1.45	$\frac{1}{2}$	
802	250	1.9	1.45	$\frac{1}{2}$	
803	200	1.5	No altimeter	$\frac{1}{2}$	
804	300	1.15	No altimeter	1	* Length along flight line

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RESULTS

Difficult flying conditions were experienced during the survey and the helicopter could not maintain the planned constant height of 300' above ground level or the speed of 60 mph. Rain increased the background radioactivity up to 400% and drainage in valleys after rain caused apparent background variations.

Details of anomalies detected are shown on the table opposite and their locations are plotted on Figs. 2,3,4,5,6,7,8 & 9 and also on Fig.10. The hundred digit of the anomaly number indicates the area in which the anomaly is located.

Although the survey was for general reconnaissance, height corrections were made on selected anomalies. These were based on an average height of 300' above ground level and were calculated assuming an inverse square law for a small radioactive source.

The only first order (3 times background) anomaly detected by the survey was 711 which was recorded over Cambrian rhyolite near its contact with granite. Although the true amplitude of the anomaly cannot be calculated due to no altimeter records and possible turbulence, this anomaly requires further investigation.

Fourteen second order anomalies having magnitudes between 2 and 3 times background were detected. Nine of these follow the coastline between Low Rocky Point and the Wanderer River. They are probably caused by ground water enriched with radioactive elements emerging from peat cover at the coast. Two of the other five are over Cambrian volcanics, one is over Cambrian sediments, one is over Owen Conglomerate and one is at the contact between Owen Conglomerate and Cambrian sediments.

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CONCLUSIONS

With the exception of one anomaly (301) 2.2 times back ground at a location 0.5 mile northeast of Mt. Osmund, no first or second order radiometric anomalies were detected over the Ordovician and Precambrian conglomerates and these do not appear a potential source of uranium.

The anomalies detected by the BMR reconnaissance traverses were confirmed and shown to extend along the coastline, especially between Low Rocky Point and the Wanderer River. These anomalies are up to three times background but they are probably caused by ground water enriched with radioactive elements coming to the surface from under peat cover and are not thought to indicate uranium mineralization.

Three anomalies were detected over Cambrian Volcanic rocks. One of these, 711, was 3.3 times background and the largest detected in the survey but it was recorded in turbulent conditions with no corresponding altimeter reading. There was a small anomaly at the Deep Creek hematite - deposit and over the Owen Conglomerate/Cambrian contact 1 mile southwest of Mt. Osmund.

Over 50% of the Owen Conglomerate and over 50% of the Precambrian conglomerate outcropping in EL13/65 were covered by the survey.

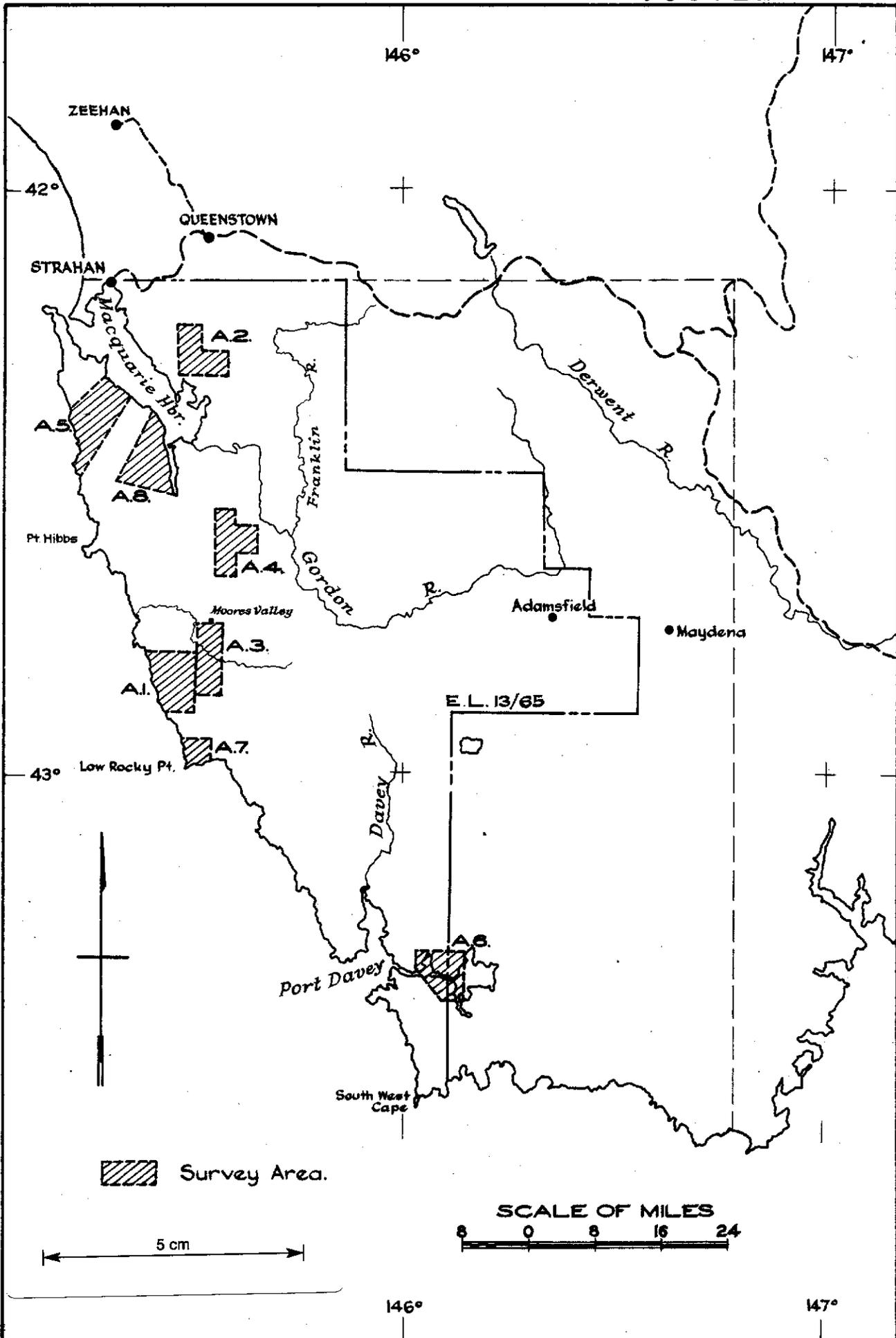
RECOMMENDATIONS

The second order radiometric anomalies along the coast (106, 107, 109, 111, 112, 704, 705, 707 & 708) should be checked by ground survey. Of these anomaly 708 is readily accessible and careful examination should establish whether the coastal anomalies are caused by radioactive minerals or ground water containing radioactive elements.

Ground surveys are also recommended over anomaly 711 and the five second order anomalies not along the coast (110, 113, 301, 501 & 702). However, these anomalies do not suggest any major uranium deposits.

The smaller anomalies could be examined on the ground whenever routine mapping or geophysical or geochemical surveys are being done in the vicinity of the anomalies.

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Centre.  
Melbourne

Date.  
26-4-1968

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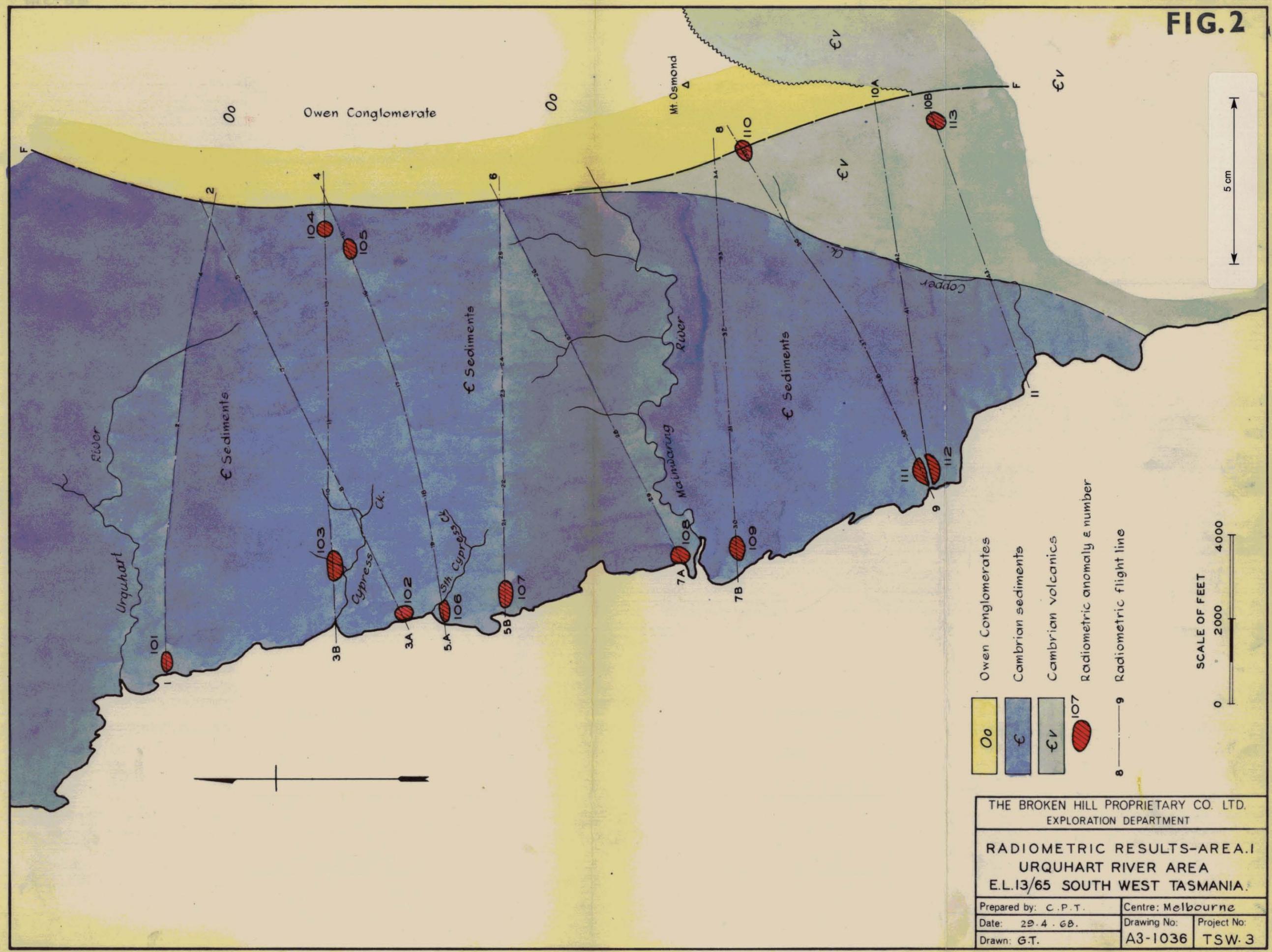
**E.L. 13/65 SOUTH WEST TASMANIA**

**AIRBORNE SCINTILLOMETER SURVEY AREAS**

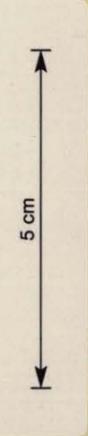
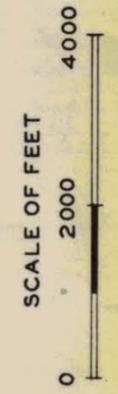
Project No.  
**TSW 2**

Drawing No.  
**A4-1051**

FIG. 2

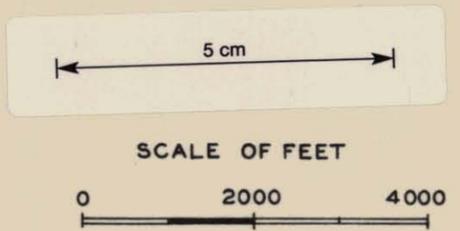
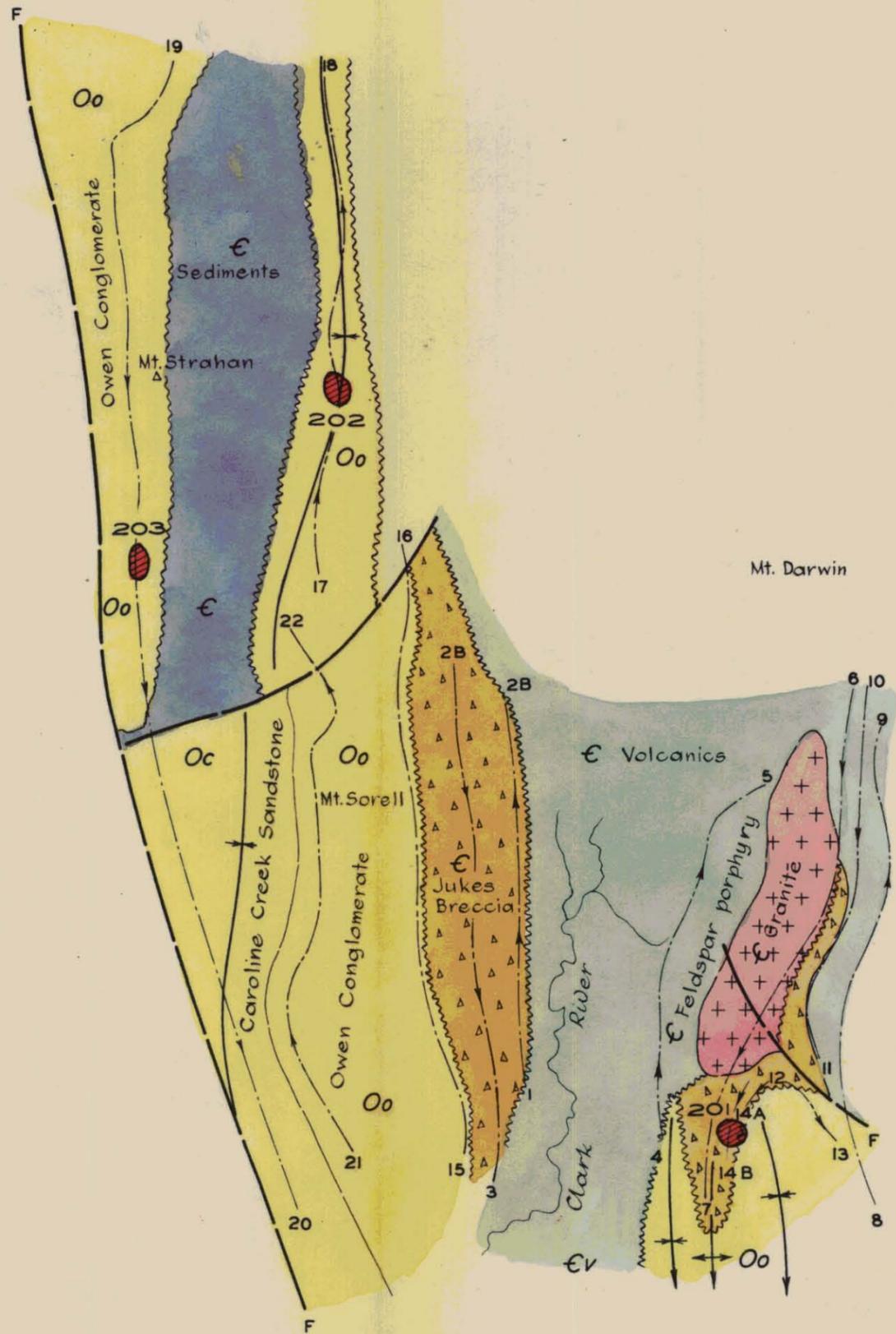


- Owen Conglomerates
- Cambrian sediments
- Cambrian volcanics
- Radiometric anomaly & number
- Radiometric flight line



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RADIOMETRIC RESULTS-AREA. I URQUHART RIVER AREA E.L.13/65 SOUTH WEST TASMANIA.		
Prepared by: C.P.T.	Centre: Melbourne	
Date: 29.4.68.	Drawing No:	Project No:
Drawn: G.T.	A3-1036	TSW. 3

- Oo Owen Conglomerate
- Oc Caroline Creek Sandstone
- € Cambrian sediments
- €v Cambrian volcanics
- Δ Δ Δ Δ Δ Jukes Breccia
- + + + + + Cambrian granite
- 201 Radiometric anomaly & number
- 4 ——— 5 Radiometric flight lines

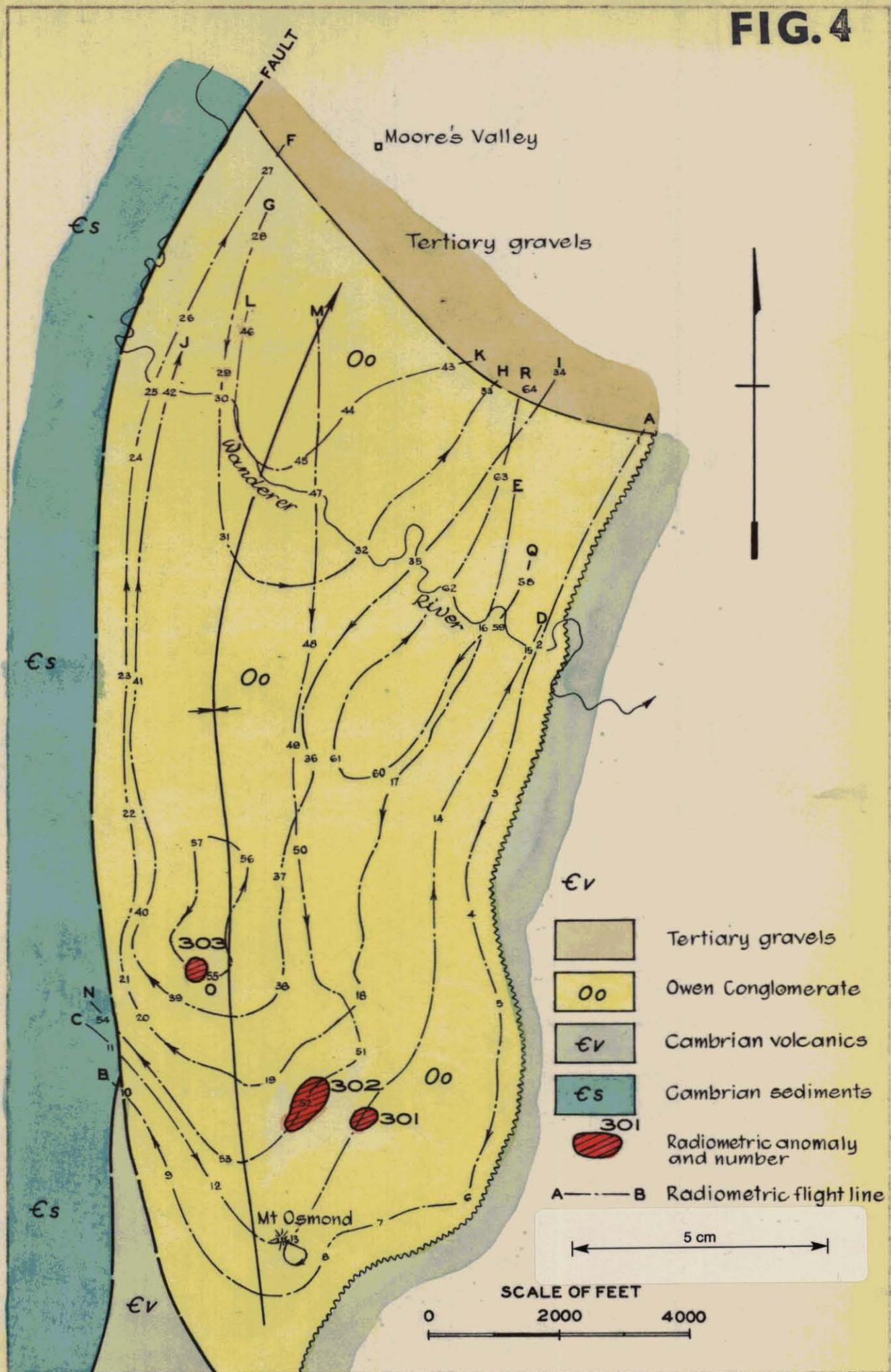


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RADIOMETRIC RESULTS-AREA 2 MT DARWIN AREA E.L.13/65 SOUTH WEST TASMANIA.		
Prepared by: C. P. T.	Centre: Melbourne	
Date: 30.4.68	Drawing No:	Project No.
Drawn: G.T.	A3-1037	TSW.4

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FIG. 4

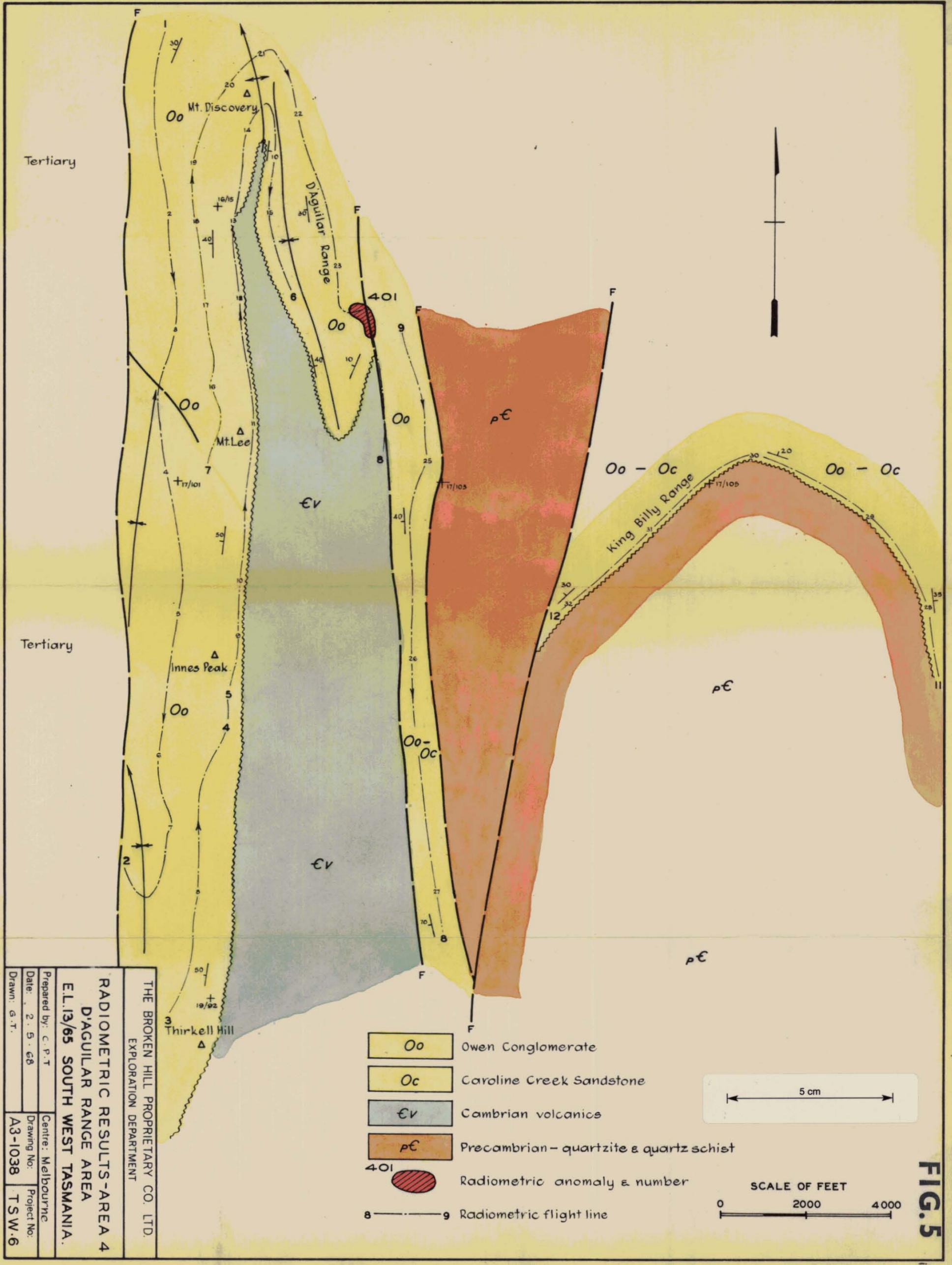
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Centre  
Melbourne  
Date  
1 . 5 . 68

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**RADIOMETRIC RESULTS-AREA 3**  
 MOORES VALLEY, S.W. T.A.S.

Project No.  
**TSW-5**  
 Drawing No.  
**A4-1052**



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RADIOMETRIC RESULTS-AREA 4  
D'AGUILAR RANGE AREA  
E.L.13/65 SOUTH WEST TASMANIA.

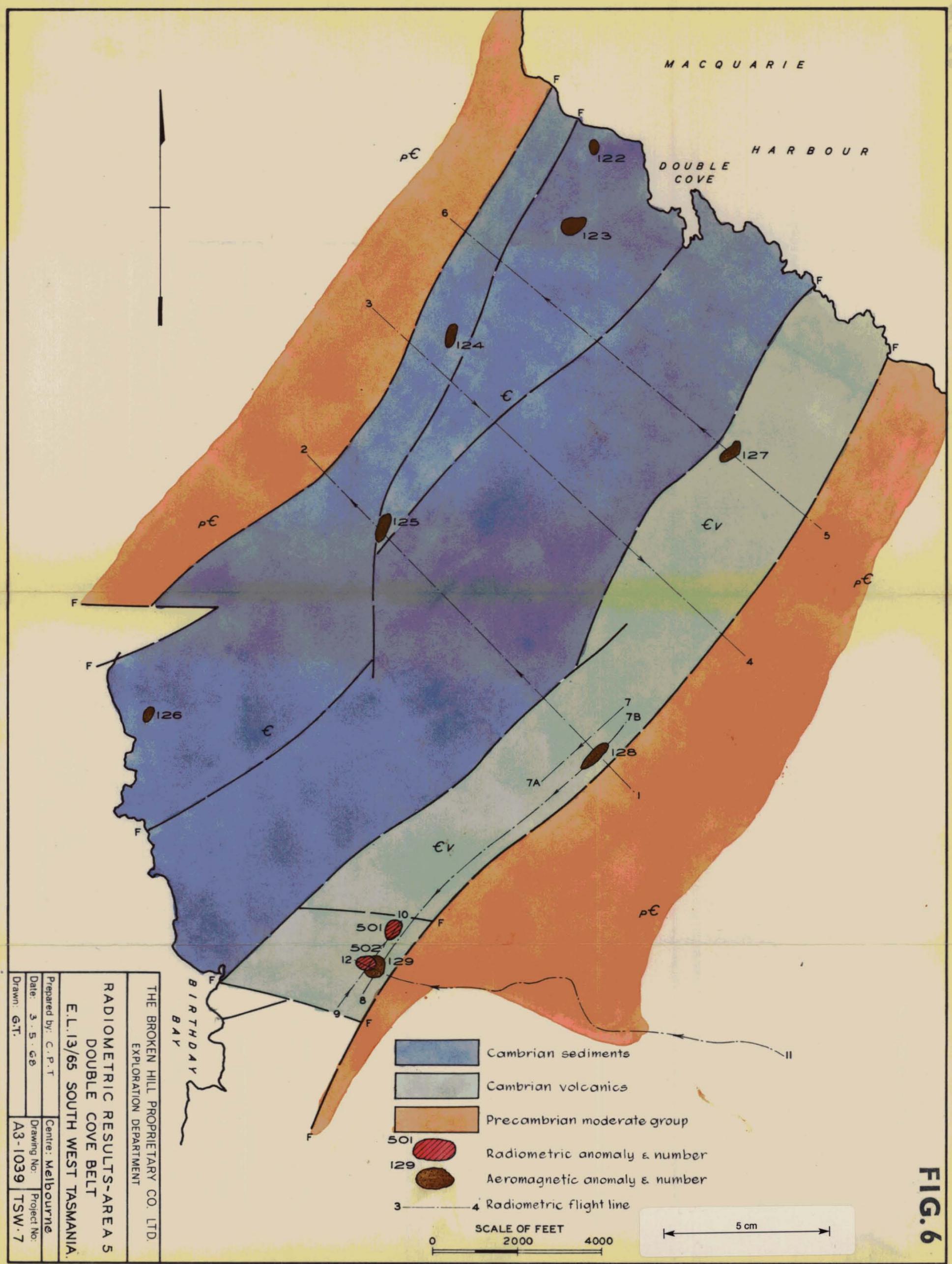
Prepared by: C.P.T.  
Date: 2.5.68  
Centre: Melbourne  
Drawing No: A3-1038  
Project No: TSW.6  
Drawn: G.T.

- Oo Owen Conglomerate
- Oc Caroline Creek Sandstone
- Ev Cambrian volcanics
- Pc Precambrian - quartzite & quartz schist
- 401 Radiometric anomaly & number
- 8-9 Radiometric flight line

5 cm

SCALE OF FEET  
0 2000 4000

FIG.5



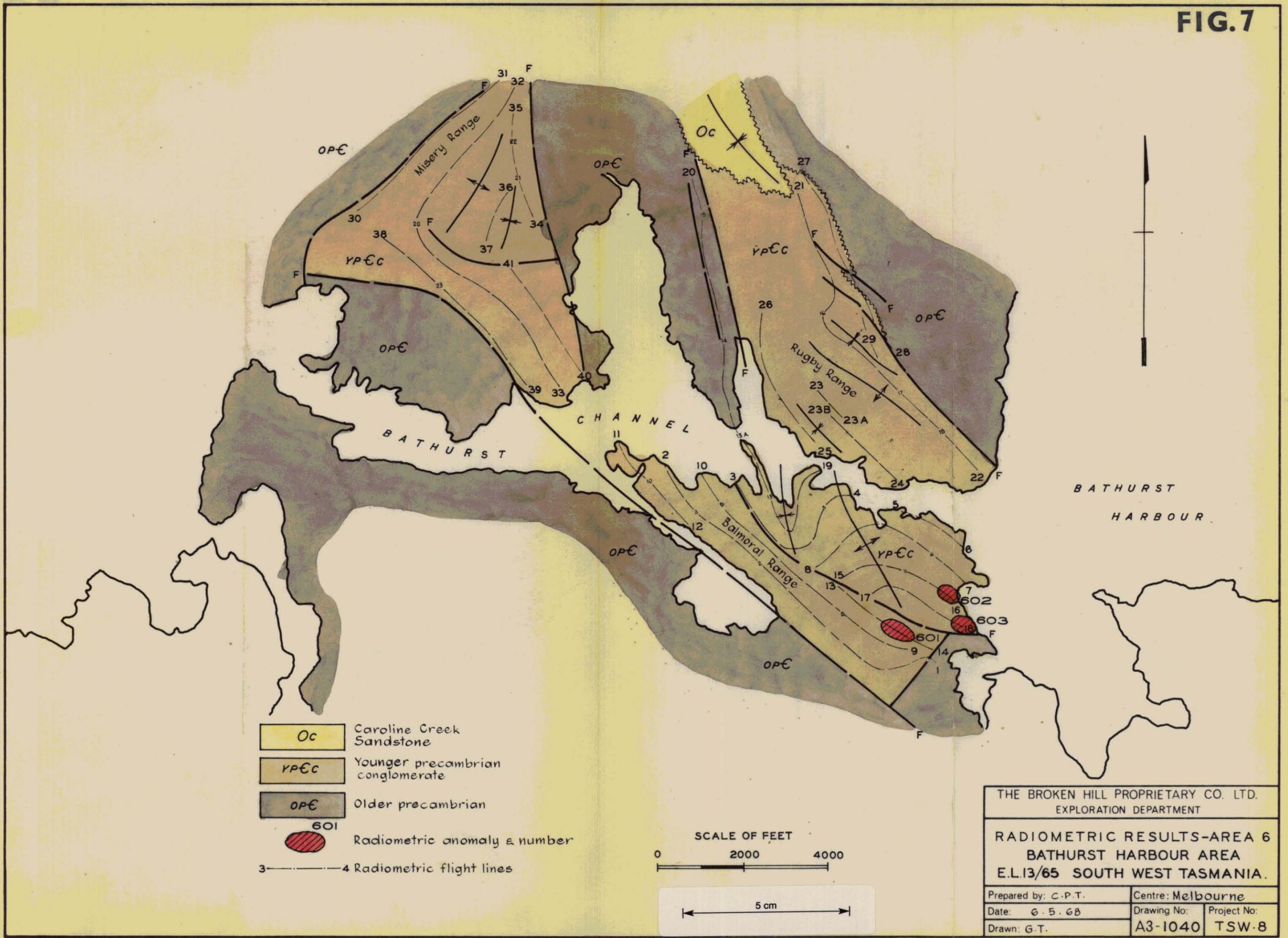
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RADIOMETRIC RESULTS-AREA 5  
DOUBLE COVE BELT  
E.L.13/65 SOUTH WEST TASMANIA.

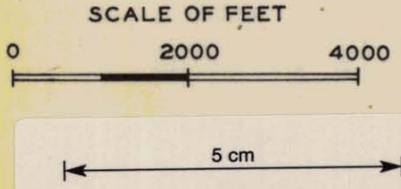
Prepared by: C.P.T.  
Date: 3.5.68  
Centre: Melbourne  
Drawing No: A3-1039  
Project No: TSW-7  
Drawn: G.T.

FIG.6

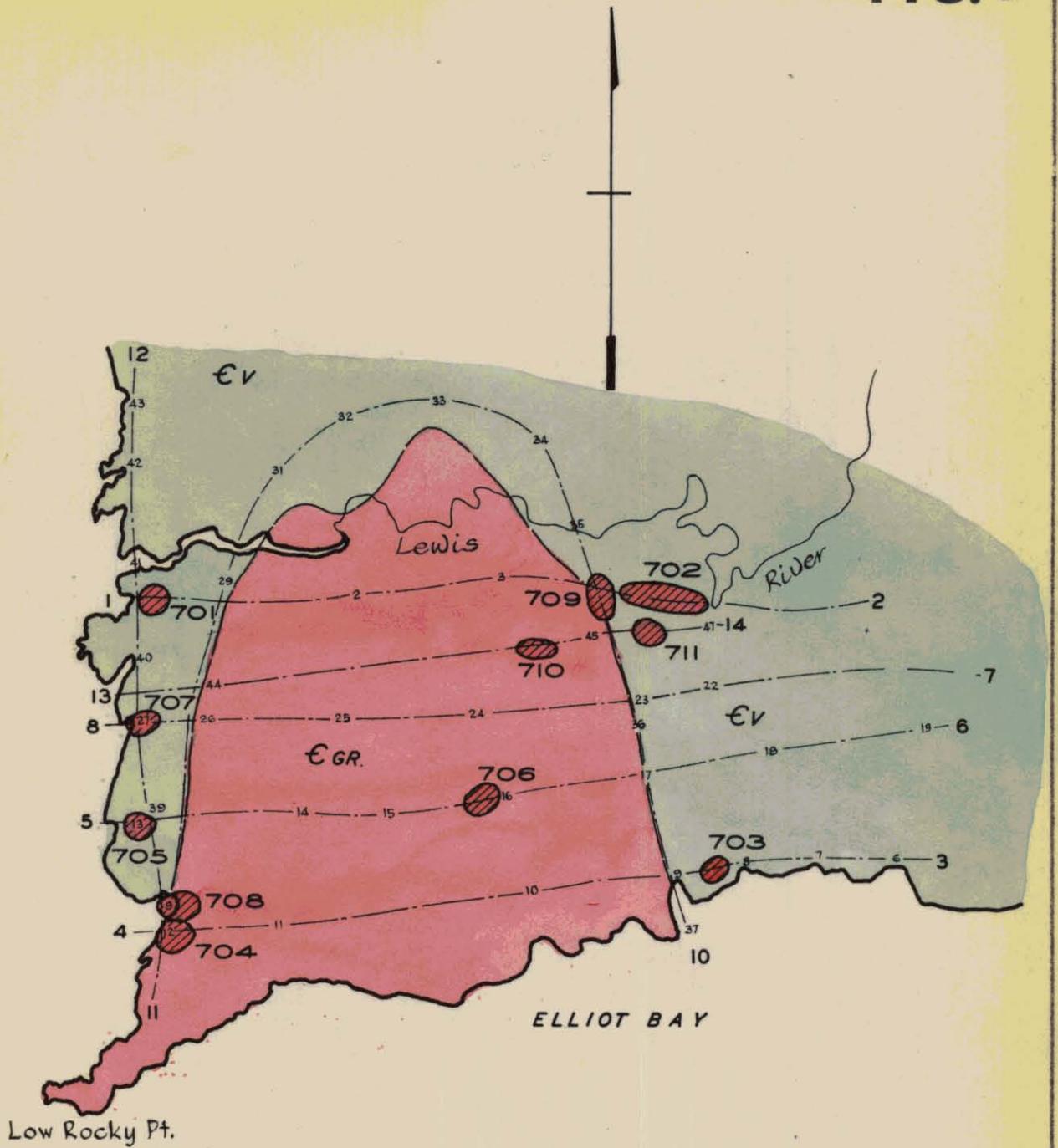
FIG. 7



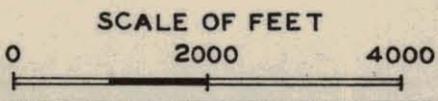
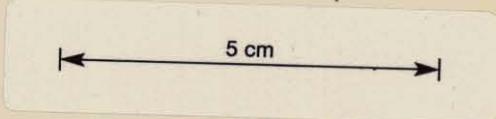
- Oc Caroline Creek Sandstone
- YPEC Younger precambrian conglomerate
- OPE Older precambrian
- 601 Radiometric anomaly & number
- 3 ——— 4 Radiometric flight lines



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
RADIOMETRIC RESULTS-AREA 6 BATHURST HARBOUR AREA E.L.13/65 SOUTH WEST TASMANIA.		
Prepared by: C.P.T.	Centre: Melbourne	
Date: 6.5.68	Drawing No:	Project No:
Drawn: G.T.	A3-1040	TSW-8



- €GR. Cambrian granite
- €V Cambrian volcanics
- 704 Radiometric anomaly & number
- 5 ——— 6 Radiometric flight line



Centre  
Melbourne  
Date  
7. 5. 68

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**RADIOMETRIC RESULTS-AREA 7**  
LOW ROCKY PT. S.W. TAS.

Project No.  
**TSW. 9**  
Drawing No.  
**A4-1053**

- Oc Caroline Creek Conglomerate
- Og Gordon Limestone
- € Cambrian sediments
- €v Cambrian volcanics
- p€ Precambrian moderate group
- + + + + Granite
- 804 Radiometric anomaly & number
- 7 ——— 8 Radiometric flight line F

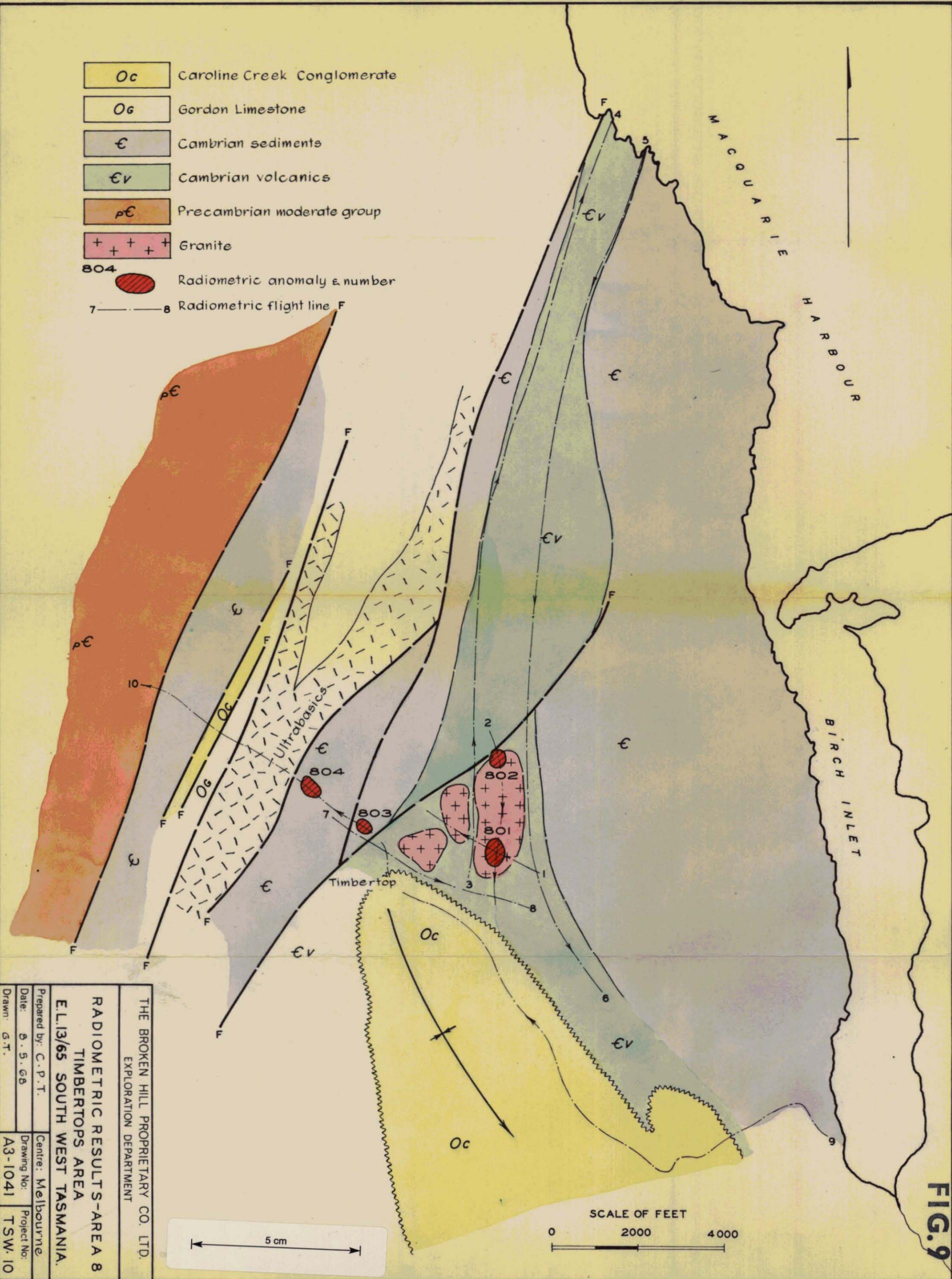


FIG.9

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EXPLORATION DEPARTMENT

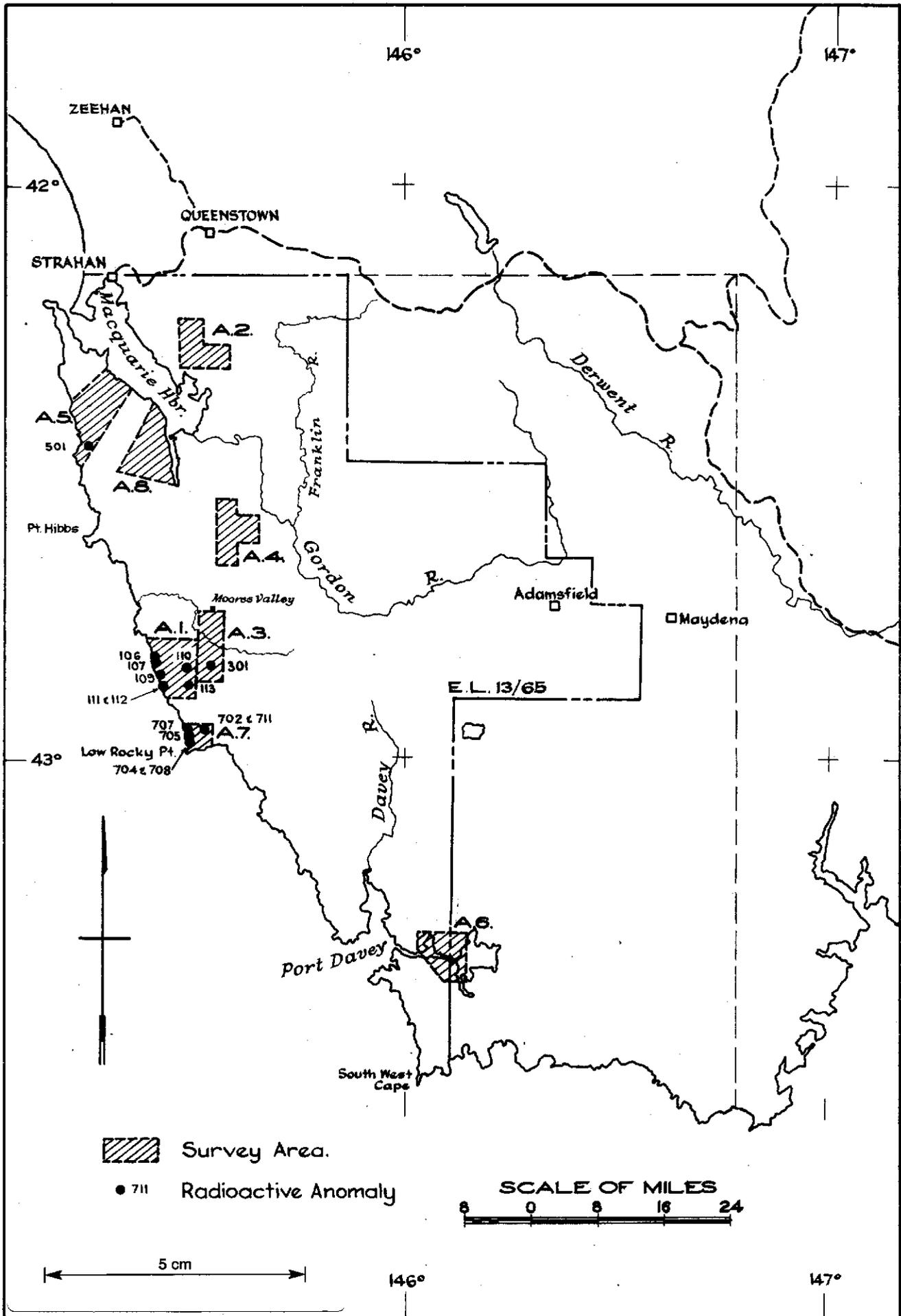
RADIOMETRIC RESULTS-AREA 8  
TIMBERTOPS AREA  
E.L.13/65 SOUTH WEST TASMANIA.

Prepared by: C.P.T.  
Date: 8.5.68  
Drawn: G.T.

Centre: Melbourne  
Drawing No: A3-1041  
Project No: TSW.10

5 cm

SCALE OF FEET  
0 2000 4000



 Survey Area.  
 711 Radioactive Anomaly

SCALE OF MILES  
 0 8 16 24

Centre. Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date. 26-4-1968	<b>E.L. 13/65 SOUTH WEST TASMANIA AIRBORNE SCINTILLOMETER SURVEY AREAS</b>	<b>TSW 2</b>
		Drawing No. <b>A4-1051</b>