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GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LIMITED

PROGRESS REPORT ON HEAP OF ROCKS

E.L. 46/80

TASMANIA

82-1881

P. HEITHERSAY
 DEVONPORT
 DECEMBER 1982

OPEN FILE

MICROFILMED

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- H.R. 46/80 6 Airborne Geophysics: Magnetics
- H.R. 46/80 7 Airborne Geophysics: Enhanced Magnetics
- H.R. 46/80 8 Airborne Geophysics: Data Profiles
- H.R. 46/80 8b - - : Data Profiles

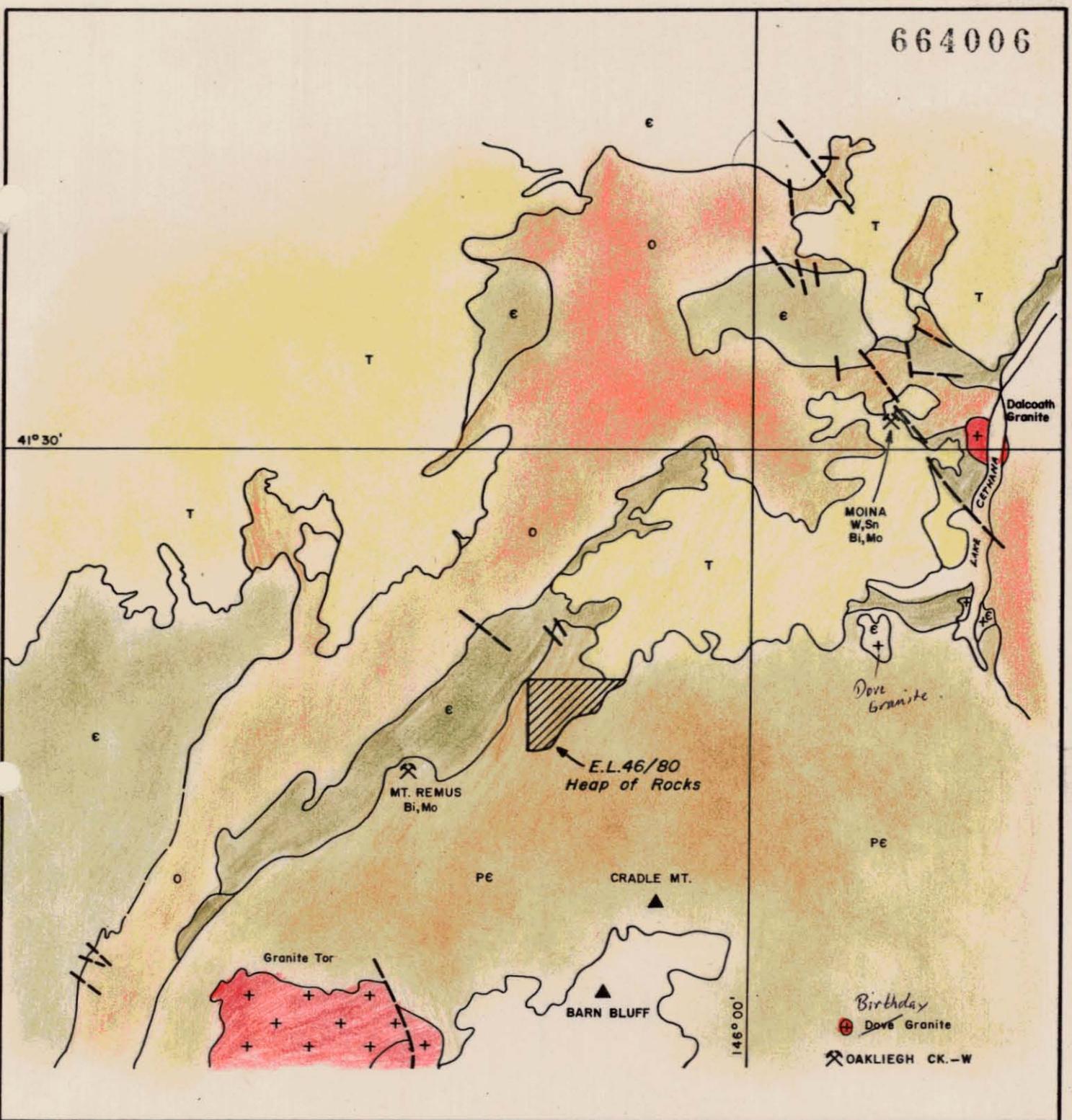
INTRODUCTION

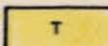
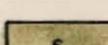
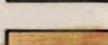
E.L. 46/80, nominated the Heap of Rocks E.L. was taken up in 1980 by Geopeko in order that the tin, tungsten potential of the area could be assessed. Exploration in the area was carried out in 1980 and 1981 in conjunction with work in the adjoining E.L. 2/70. In June 1981 E.L. 46/80 was included with E.L. 2/70 in the joint venture with Aberfoyle Limited and Paringa Mining and Exploration Company Limited.

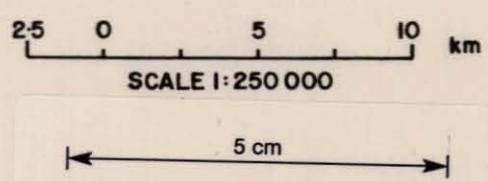
This report summarizes the results of exploration carried out since 1980 and outlines plans for future evaluation of the area.

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	Tertiary Basalt		Devonian Granite
	Ordovician - Conglomerate, sandstone, siltstone / limestone		
	Cambrian - Volcanics, volcanoclastics, intrusives		
	Precambrian - Quartzites, pelitic schists, carbonaceous siltstones		



GEOPEKO

E.L. 46/80 HEAP OF ROCKS, TAS.
REGIONAL GEOLOGY
LOCALITY PLAN

SUMMARY

The Heap of Rocks licence covers Precambrian metasediments of the Tyennan nucleus.

Exploration to date has consisted of very limited stream sediment sampling and reconnaissance geological mapping.

During 1980 the area was flown with an airborne electromagnetic, resistivity, magnetic system which delineated strong EM conductors, some of which had weak coincident magnetic character. Follow up work revealed that graphitic siltstone/mudstones were probably the source of the EM anomalies, however the magnetic character remains unexplained.

Graphitic fine grained sediments are considered good indicators of possible carbonate horizons down dip. The coincidence of magnetic and EM character can indicate pyrrhotite or magnetite with associated sulphides, both of which are proven associates with tin and tungsten in Tasmania.

Geological mapping, ground magnetics, stream sediment sampling and Jacro soil sampling are recommended for future work.

RECOMMENDATIONS

1. A grid should be established over the defined magnetic anomalies (A & B), with a reconnaissance line over anomaly C. Fig 2 is a suggested grid configuration. This grid should be read with ground magnetics and Jacro soil sampled. The area is sufficiently open for this phase to be done quickly, however it is definitely a summer job.
2. A detailed stream sediment survey should be undertaken. Both -80 mesh fraction and pan concentrates should be taken and analysed. The pan concentrates should be examined for gold and any cassiterite found should be examined for textural maturity to give a clue as to its provenance.
3. The licence area warrants detailed mapping with emphasis on detailing potential carbonate bearing black siltstone/slate sequences. Some thought should be given to structure in the area, particularly the significance of photo linears.
4. If any encouragement is forthcoming, then costeaning should be considered.

008

5 cm

E.L. 46/80

ANOMALY B

ANOMALY D

ANOMALY A

ANOMALY C

-664009

2800

3000

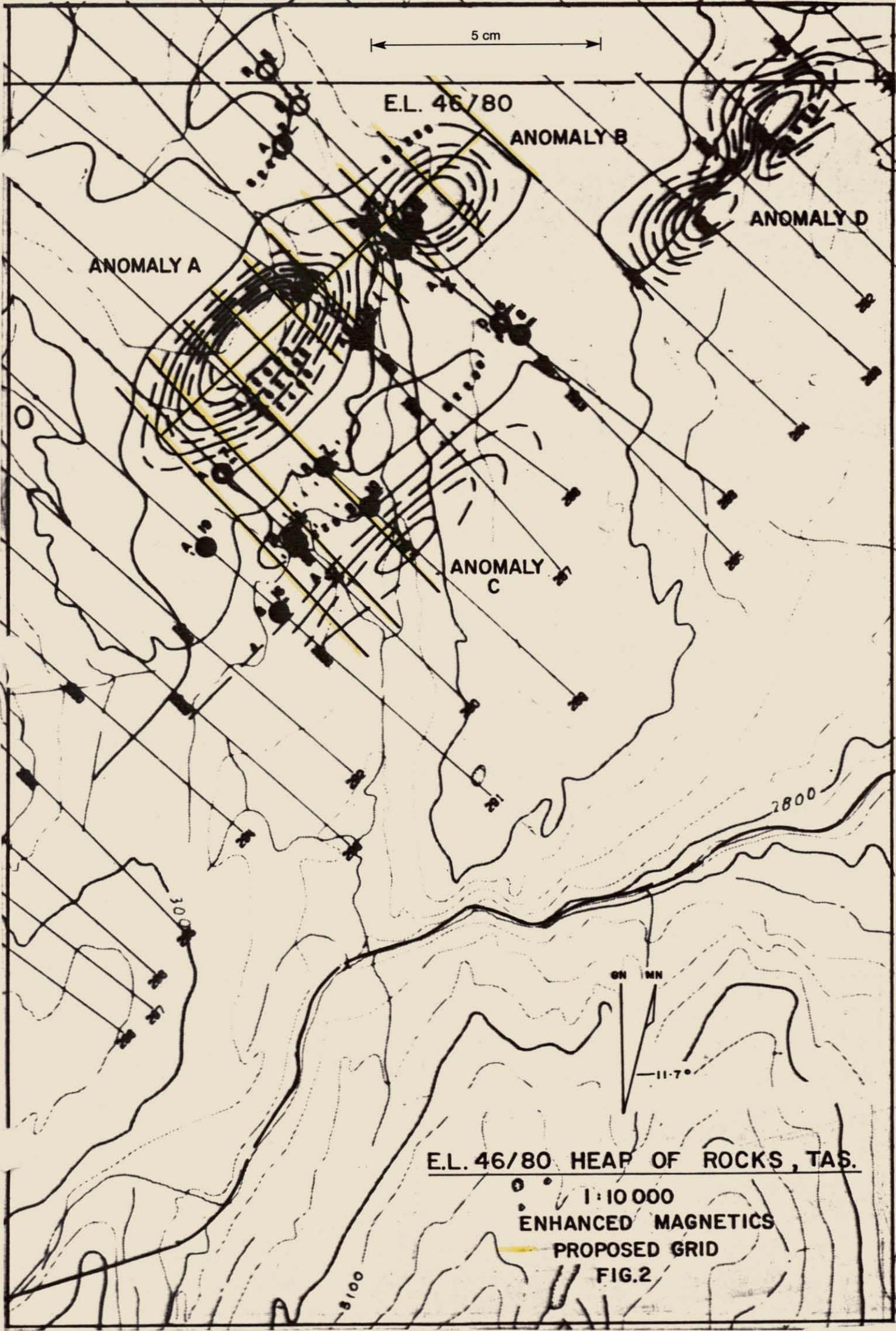
GN MN

11.7°

E.L. 46/80 HEAP OF ROCKS, TAS.

1:10 000
ENHANCED MAGNETICS
PROPOSED GRID

FIG.2



LOCATION, ACCESS, GEOGRAPHY

The Heap of Rocks E.L. is located in the central north west of Tasmania and shares its south eastern boundary with the Cradle Mt. Lake St Clair National Park. (Refer Fig 1)

The area is dominated by extensive, poorly drained button grass plains. The button grass vegetation particularly favours the Precambrian metasediments (Fury Plains) in preference to the volcanic and volcanoclastic sequences to the north west.

Access to the area is obtained by walking tracks from Pencil Pine Lodge. A crude track put in by Paringa Mining and Exploration Co. Ltd. in the early 1970's extends down to Back Peak. This track is only negotiable by all terrain vehicles such as Bombardiers.

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PREVIOUS WORK

During 1979 Paringa Mining and Exploration Co. Ltd. on behalf of the Aberfoyle group initiated a helicopter borne electromagnetic and magnetometer survey over the northern parts of their E.L. 2/70. This work was undertaken by McPhar Geophysics Pty. Ltd. AEM anomalies found within the Heap of Rocks licence were investigated and attributed to strong continuous conductors within the Precambrian metasediments. Soil geochemical sampling failed to give encouragement and no further work was recommended.

GEOLOGY (Refer Plan 1)

The geology of E.L. 46/80 is dominated by rocks of Precambrian age. The area is part of the north west portion of the central older metamorphic basement of Tasmania known as the Tyennan nucleus.

The geology consists of thick subparallel belts of pelites and quartzites which trend generally NNE. This is in contrast to the dominant ENE trend shown in the Precambrian overall in this region. (Refer Mackintosh 1 mile Geological Map).

Pelitic rocks dominate the sequence in E.L. 46/80 with quartzites becoming more common in the west around the Heap of Rocks. To date the central northern portion has been examined due to coincident electromagnetic and magnetic anomalies located in this region. In this area quartz sericite schists are common with subordinate quartzites. The schists show multiple deformation features such as crenulated cleavages and structural lineations. Within the sequence, narrow beds of graphitic black siltstones and mudstone occur and these are frequently finely spotted with metamorphic porphyroblasts. No magnetic minerals, however, were found. Gee et.al. (1981) report that the sequence has been regionally metamorphosed to greenschist facies. The regional metamorphism reflects the Frenchman metamorphic period (Spry, 1963).

The Precambrian rocks are overlain unconformably in the NW (Herrmann 1980) by Cambrian volcanic and volcanoclastic rocks with associated subvolcanic intrusions.

Covering significant areas of the licence are fluvioglacial and periglacial sediments of Cainozoic age.

Geochemical analysis of selected rock samples reveals background values for Cu, Zn, Ag, Fe, Sn and W. Some samples taken within the graphitic siltstones and schists returned values of up to 380ppm Pb.

012

GEOCHEMISTRY (Refer Plans 2 & 3)

Very limited drainage geochemistry was completed in the northeastern corner of the E.L. This was essentially an "overflow" from detailed stream sediment sampling undertaken in E.L. 2/70. However, the limited number of samples taken indicated that anomalous values of tin and tungsten were occurring in streams draining this section of E.L. 46/80. Some lower order gold anomalies also indicated a provenance in the Heap of Rocks licence. In all, it provides encouragement to engage a detailed stream sediment survey of the area.

GEOPHYSICS (Refer Plans 4 - 8)

During 1980 a Dighem II electromagnetic/resisitivity magnetic survey of 385 line-km was flown over E.L.'s 2/70 and 46/80.

The survey revealed a large conductive zone in central part of the licence. These are described by Fraser (1980).

Anomalies 285F - 290xA	Grade 2 to 4 anomalies
285D - 291B	reflecting a series of parallel
286B - 291A	bedrock conductors

Significantly anomalies 285D, 288A and 289xA appear to be coincidental with weak magnetic activity.

Reconnaissance mapping in the area revealed black graphitic siltstones and mudstones. These types of rocks are certainly conductive enough to explain the electromagnetic anomalies delineated. No magnetic material could be found, however, to explain the magnetic character of this area.

DISCUSSION

The prospect is obviously at a very early stage of development and has been hampered by lack of funds for detailed exploration.

The potential for Devonian granite derived mineralization in the region is demonstrated locally by the Mt Remus bismuth molybdenum prospect, and further afield by the Oakleigh Creek tungsten mine and the Moina tungsten, tin, bismuth molybdenum deposit. (Refer Fig 1)

The nearest exposed Devonian granites are approximately 20km away equidistant from the Heap of Rocks prospect. They include the Granite Tor to the southwest, the Dove Granite to the southeast and the Dalcoath Granite to the northwest (Refer Fig 1).

Experience has shown that black shales and their metamorphic equivalents can contain carbonate units which are prospective for tin and/or tungsten magnetite, pyrrhotite skarns or pyrrhotite 'replacement' type deposits.

Preliminary indications reveal coincident magnetic and EM anomalies which have not been sufficiently examined. The magnetic anomalies, which are delineated well in the enhanced magnetic plan (Plan 7) are made up of a southwestern lobe (Anomaly A) and a smaller northeastern lobe (Anomaly B). While a possible source of magnetic material is disseminated pyrrhotite in the carbonaceous units, it would appear unlikely because of the localised nature of the magnetic anomalies. If disseminated pyrrhotite was the source then one would expect some magnetic character, along the extensive conductive zones outlined in Plan 4. Significantly a distinct photoliner runs into the magnetic anomaly. This could represent a fault which is a potential mineralizing plumbing system.

Limited stream sediment geochemistry suggests a tin tungsten source in the Heap of Rocks area. Further detailed assessment is clearly warranted.

Paul Matheson
1982.

REFERENCES

Fraser, D.C. 1980: Dighem II Survey of Mackintosh East Area, Tasmania. Unpublished Report.

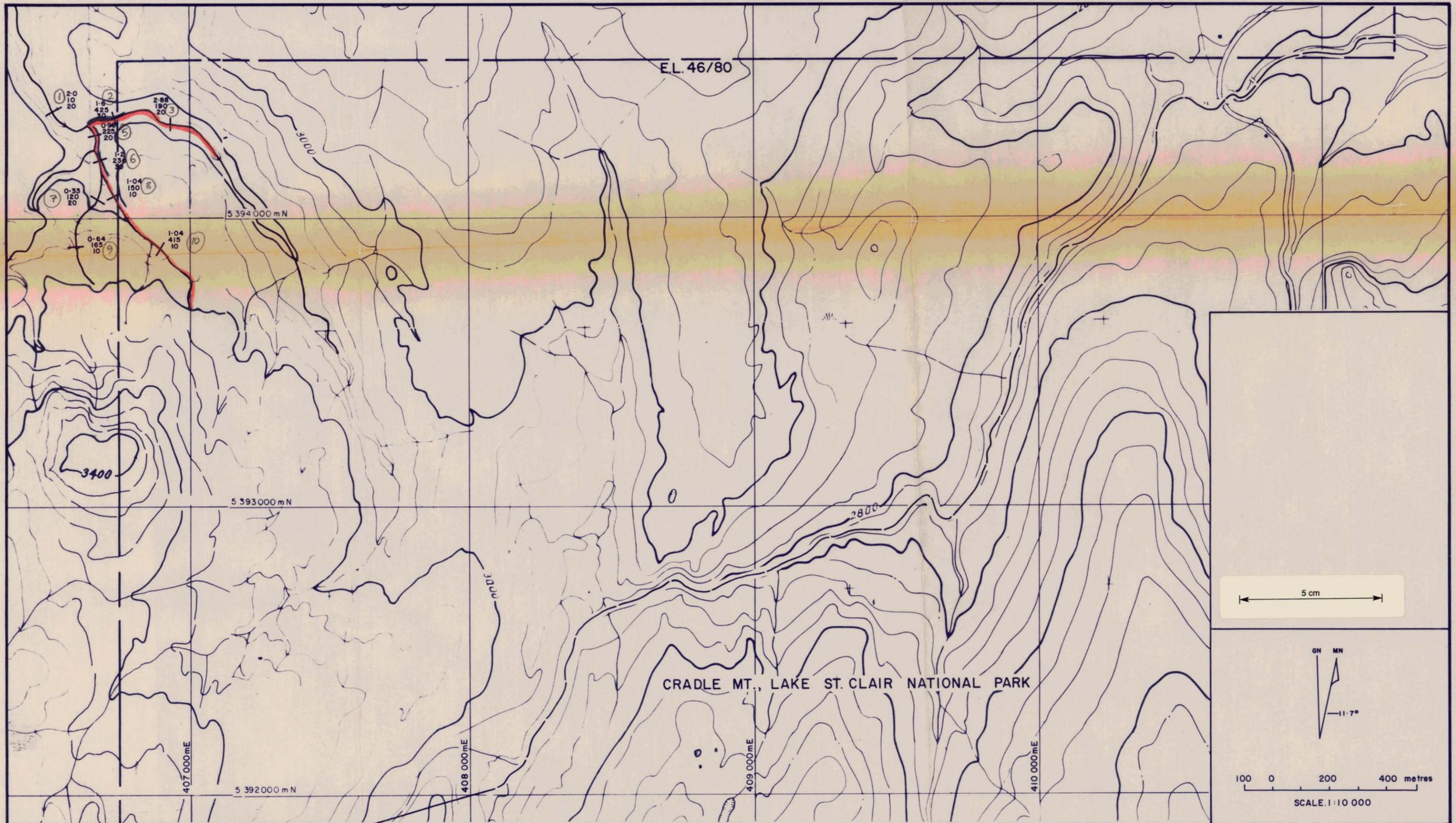
Herrmann, W. 1980: Progress Report on Mackintosh East Part of E.L. 2/70 Tasmania. Unpublished Geopeko Report.

Gee, R.D., Marshall, B and Burns, K.L. 1981: Geological atlas 1 mile series. Sheet 44 (8014N). Mackintosh. comp. by Collins, P.L.F; Gulline, A.B; Williams, E. Explan. Rep. Dep. Mines Tas.

Spry, A.H. 1963: The Precambrian rocks of Tasmania. Part V Petrology and structure of the Frenchmans Cap area. Pap. Proc. R. Soc. Tasm. 97: 105-127.

APPENDIX ARock Chip Geochemistry Results

Rock Type	Sample No	Cu	Pb	Zn	Ag	Fe	Sn	W
	6974	5	40	20	1	1.92	5	10
Line sample Schist and quartzite	6976	10	25	25	1	1.72	5	10
Line sample Carbonaceous schists	6977	10	35	25	1	3.60	5	10
Line sample Carbonaceous siltstones	6978	5	100	10	1	0.98	5	10
Line sample Carbonaceous siltstones	6979	20	120	30	1	1.60	5	10
Line sample Carbonaceous siltstones	6980	20	185	10	1	1.34	5	10
Line sample Sericite schists	6981	40	380	40	1	3.00	5	10
Crenulated pelite	6982	10	40	80	1	3.60	5	10
Carbonaceous siltstone with quartz veining	6983	40	50	10	1	1.88	5	10



ANOMALY THRESHOLDS		Pencil No.
Fe	> 5%	19-35
Sn	> 30ppm	19-6
W	> 30ppm	

sample location

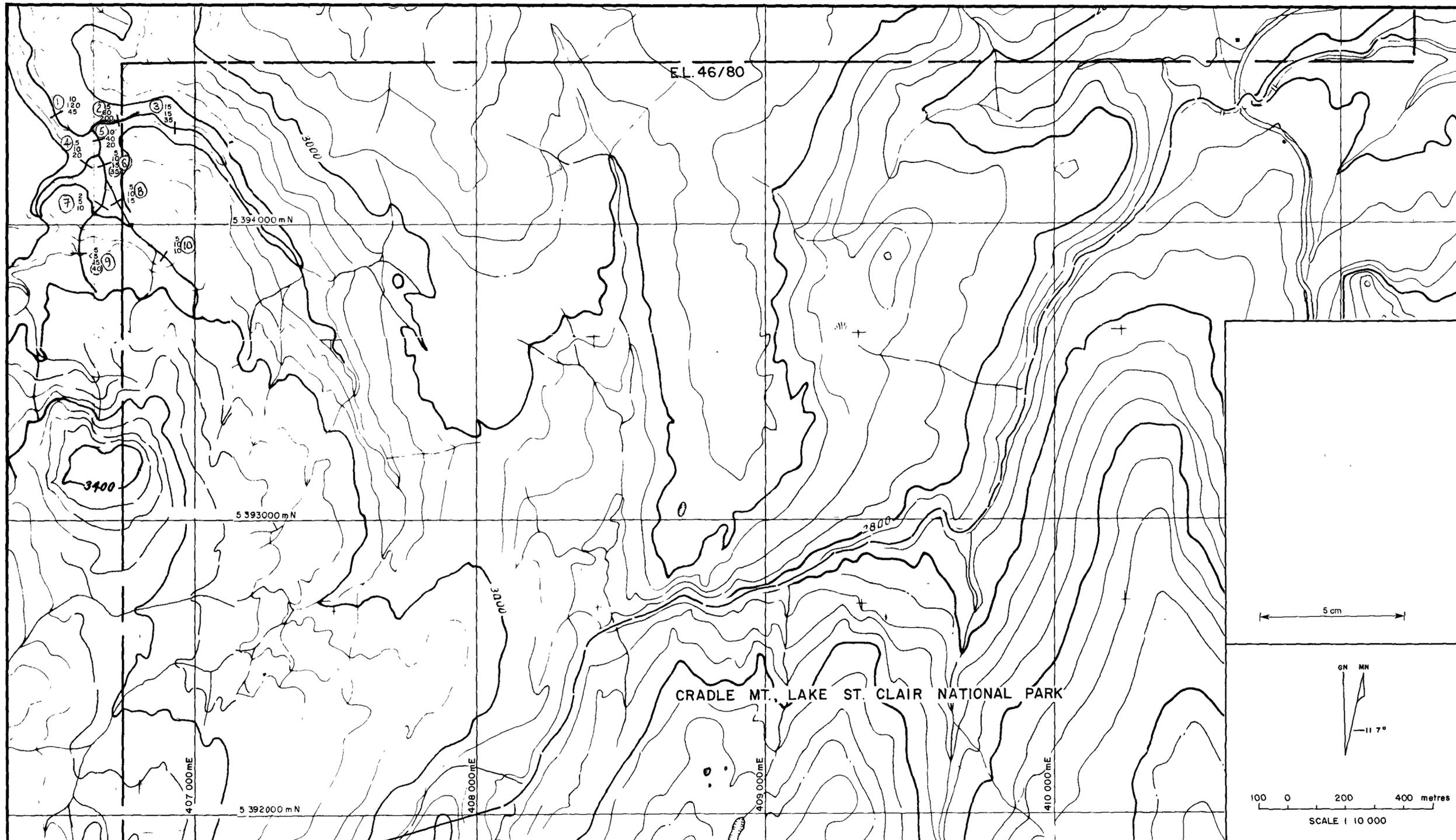
2-0
1-0
2-0

664018

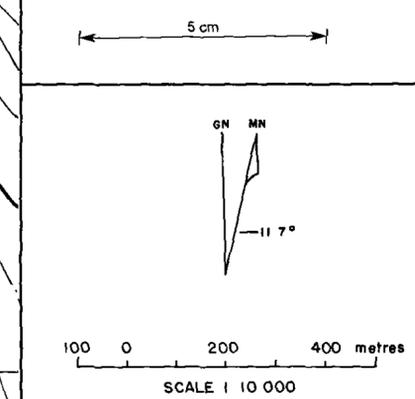
GEOPEKO
 E.L. 46/80 HEAP OF ROCKS, TAS.
 DRAINAGE GEOCHEMICAL RESULTS
 (-80mesh fraction)
 Fe, Sn & W 2457

DATE: 13/12/82 | GEOL: P.H. PA. | DRAWN: R.Tog | PLAN HR 46/80-2

82-1881



CRADLE MT., LAKE ST. CLAIR NATIONAL PARK



ANOMALY THRESHOLDS

- Cu > 25 ppm
- Pb > 110 ppm
- Zn > 200 ppm
- Au > 25 ppb

Note - Au values for every fourth sample.

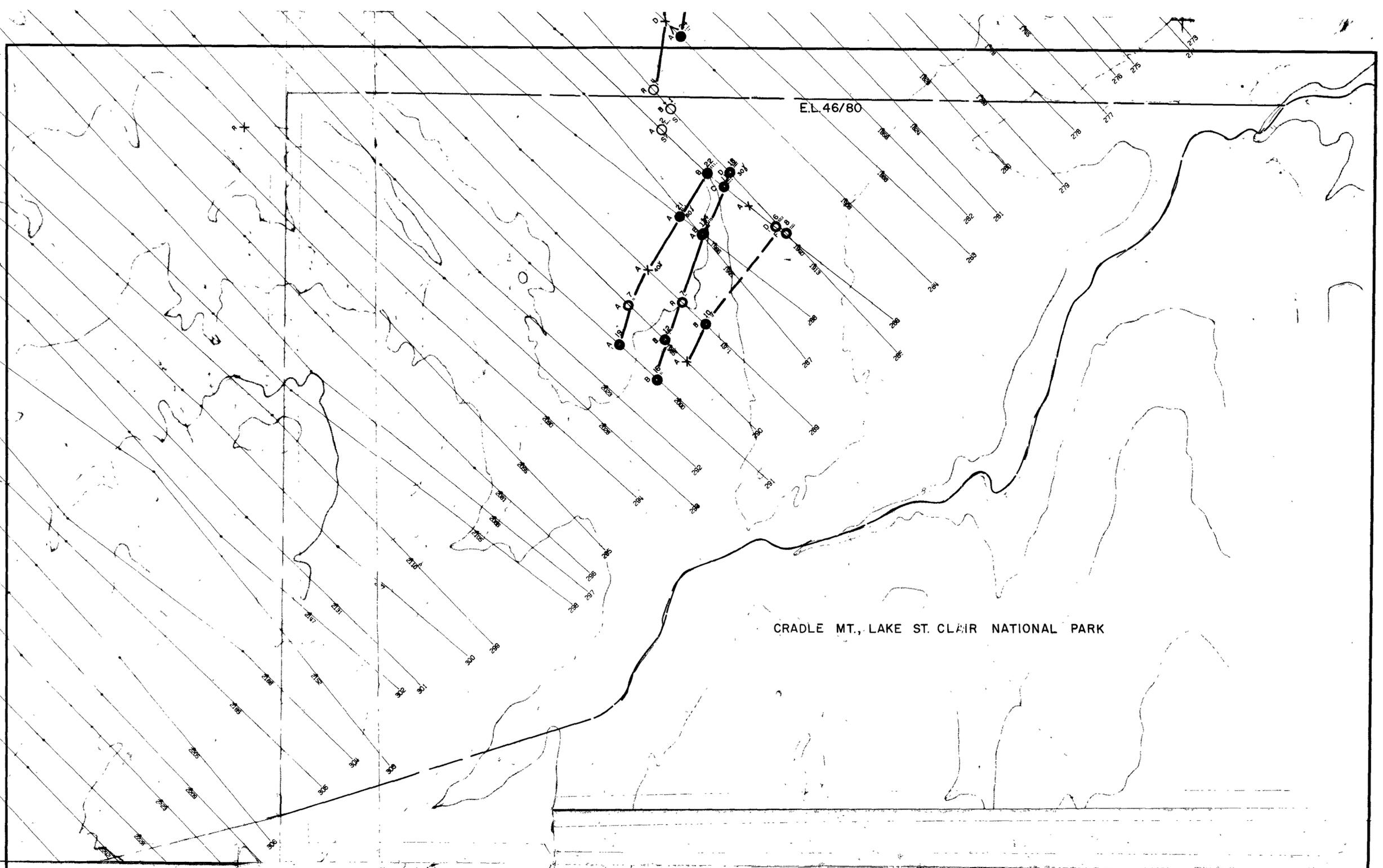
sample location



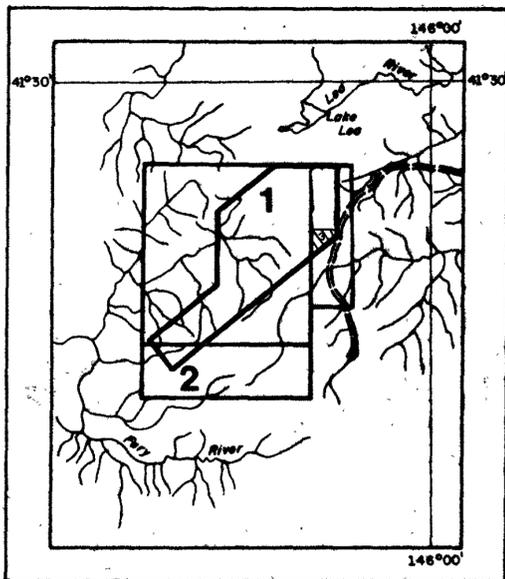
GEOPEKO 664019

E.L. 46/80 HEAP OF ROCKS, TAS.
DRAINAGE GEOCHEMICAL RESULTS
 (-80mesh fraction)
Cu, Pb, Zn & Au

DATE 13/12/82 | GEOL P.H. *R* | DRAWN R.Tog | PLAN HR 46/80-3



LOCATION MAP



Scale 1: 250,000

Plan No. 5584 S/B

PLAN HR 46/80-4

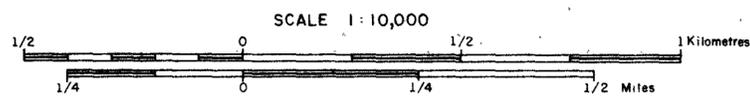
DIGHEM^{II} SURVEY

MACKINTOSH EAST, TASMANIA

ELECTROMAGNETICS

FOR

GEOPEKO LIMITED



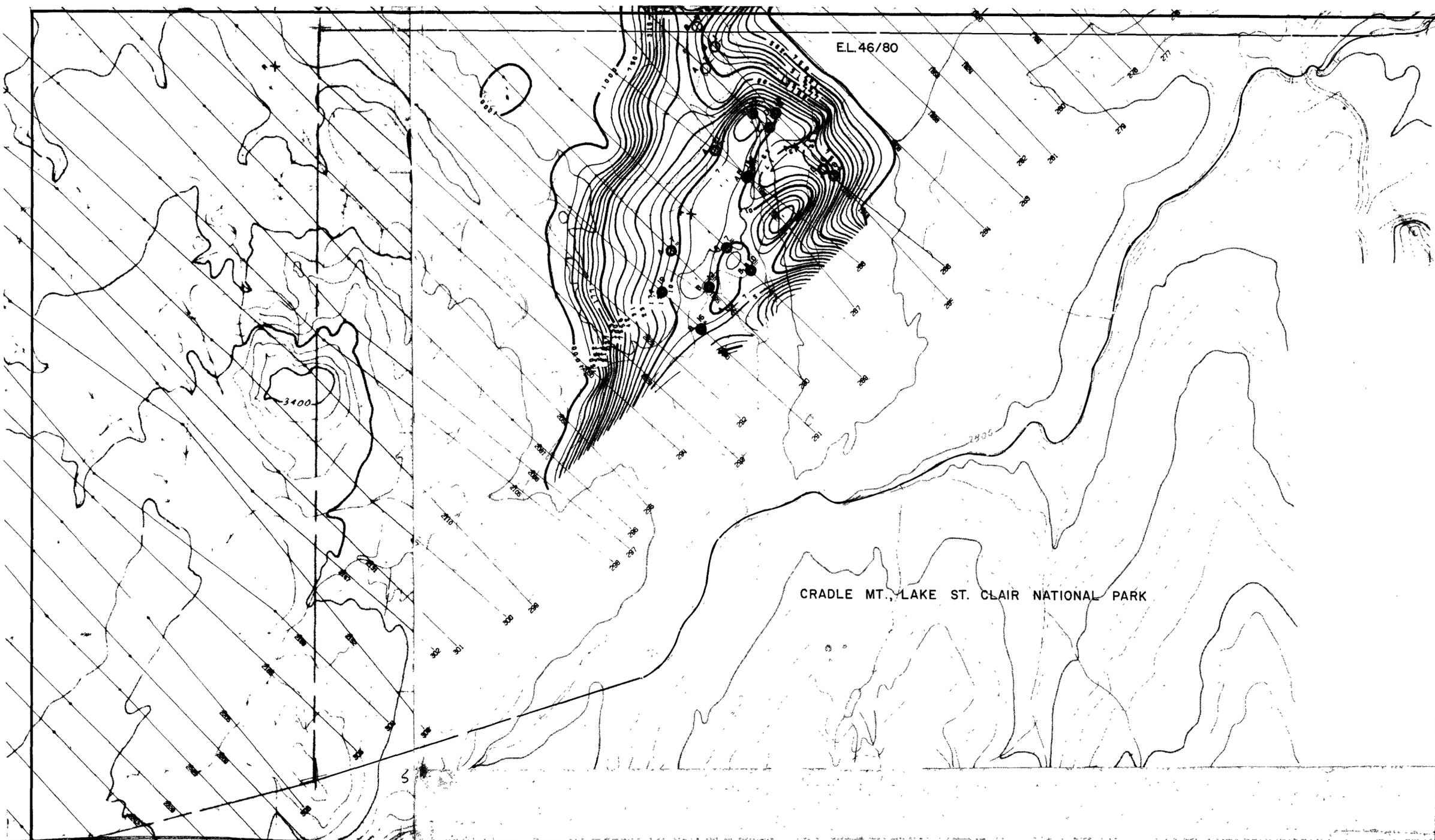
SHEET 3

664020

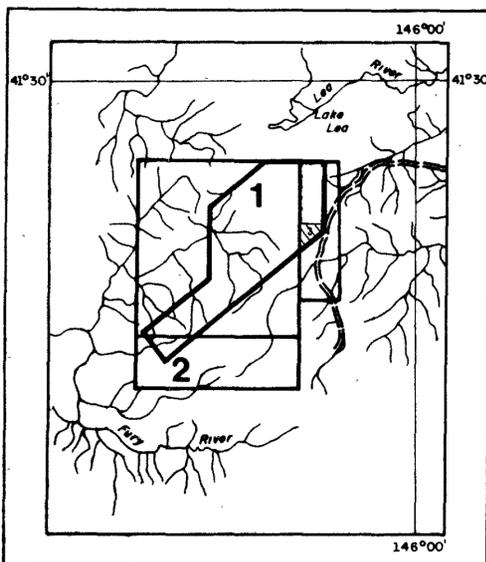
Flight line

Fiducials and numbers

ANOMALY GRADE	EM GRADE SYMBOL	MHO RANGE	DIGHEM anomalies are divided into six grades of conductivity - thickness product. This product in mhos is the reciprocal of resistance in ohms. The mho is a measure of conductance, and is a geologic parameter. Most swamps yield Grade 1 anomalies but highly conducting clays can give Grade 2 anomalies. The multi-coal anomaly shapes often allow surface conductors to be recognized, and these are indicated by the letter S on this map. The remaining Grade 1 and 2 anomalies could be weak bedrock conductors. The higher grades indicate increasingly higher conductances. Examples: The ore bodies of the Magog River camp yield Grade 4 anomalies, while Maffab and Whistler give Grade 5 graphite and sulphides can span all grades but, in this survey area, field work may show that the different grades indicate different types of conductors.
6	●	> 100	The actual mho value is plotted beside the EM grade symbol. The letter is the anomaly identifier. The horizontal rows of dots indicate anomaly amplitude on the flight record, and the vertical column gives the estimated depth. This depth may be unreliable because the strongest part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or conductive overburden effects.
5	●	50 - 99	
4	●	20 - 49	
3	●	10 - 19	
2	○	5 - 9	
1	○	< 4	
	X	Possible conductor	
			<p>Depth is greater than:</p> <ul style="list-style-type: none"> 50 feet 5 ppm 100 feet 10 ppm 150 feet 15 ppm 200 feet 20 ppm <p>Refer to list of anomalies in survey report for the actual ppm values for all cells, and for conductor depths.</p>
			<p>Conductor axis</p> <ul style="list-style-type: none"> S Probable surface response SP Possible surface response L Probable line (power, telephone, pipe, or fence) LP Possible line ? Questionable anomaly AO Apparent thickness > 10m Dip 100+ Direct magnetic correlation of 100 gamma <p>DIGHEM maps are designed to provide a correct impression of conductor quality by means of the conductance grade symbols. The symbols can stand alone with geology when planning a followup program. The actual mho values are plotted for those who wish quantitative data. The anomaly ppm and depth are indicated by inconspicuous dots which should not distract from the conductor patterns, while being helpful to those who wish this information. The map provides an interpretation of all conductors in terms of length, strike direction, conductance and depth. The accuracy is comparable to an interpretation from a ground EM survey having the same line spacing.</p>



LOCATION MAP



Scale 1:250,000

Plan No. 5587 S/B



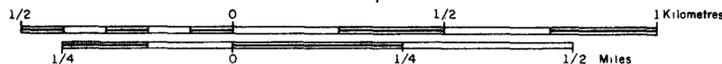
PLAN HR 46/80-5

DIGHEM^{II} SURVEY

MACKINTOSH EAST, TASMANIA

RESISTIVITY 664021
 FOR
 GEOPEKO LIMITED

SCALE 1:10,000



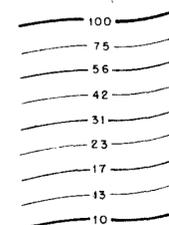
SHEET 3

Flight line

Fiducials and numbers

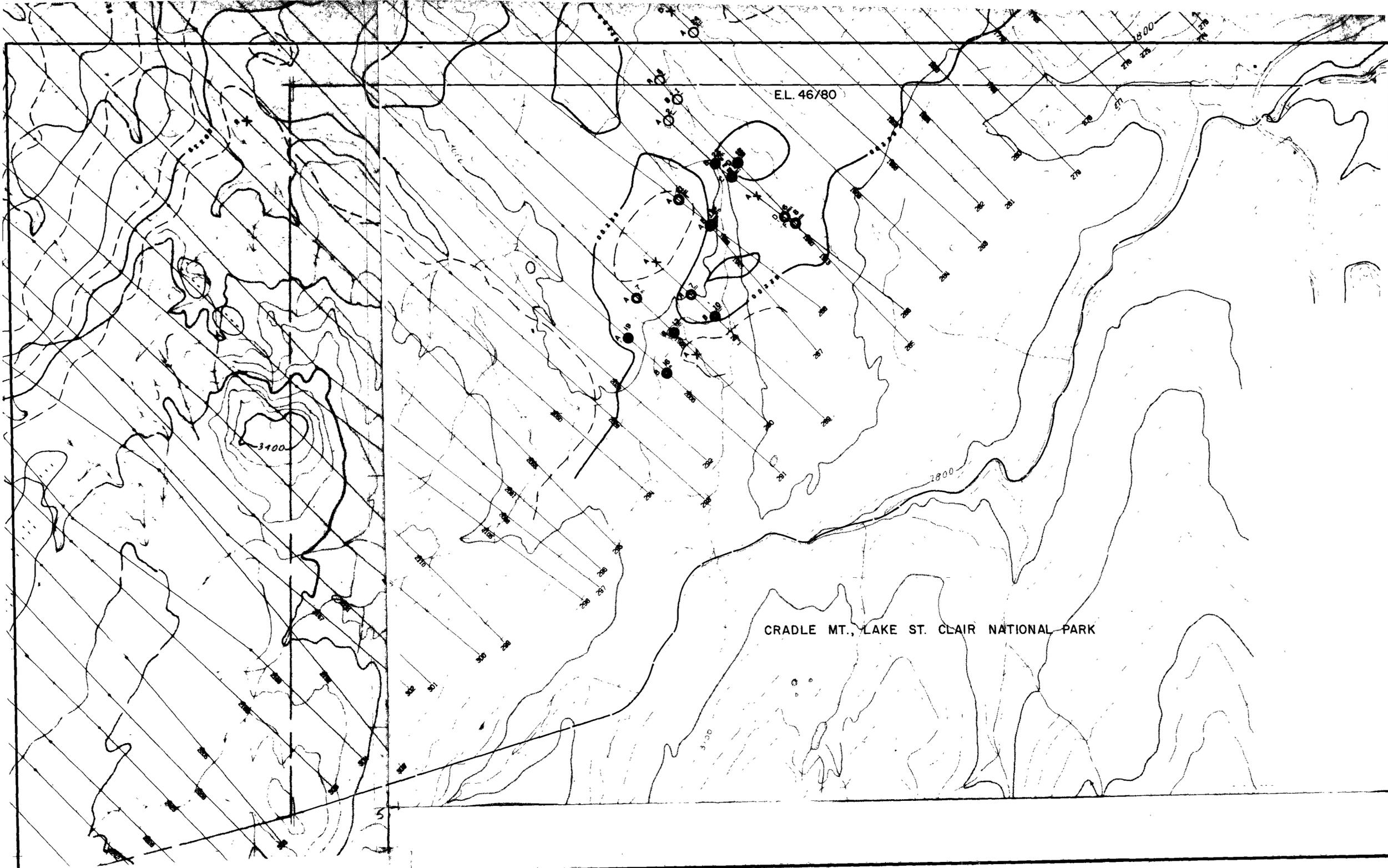
LEGEND

Contours in ohm - m
 at eight intervals per decade



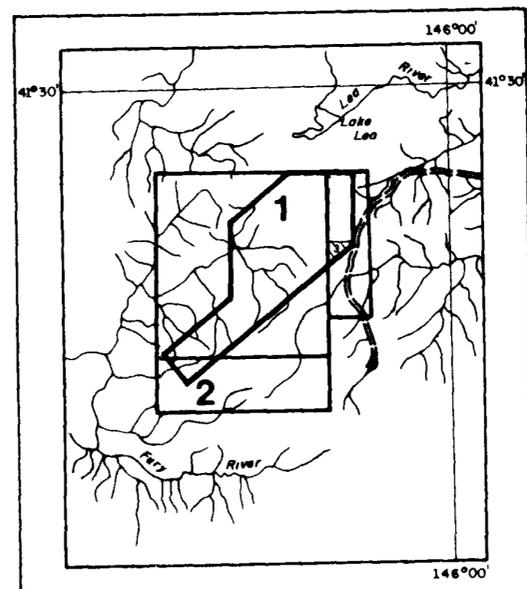
Note

The numbers face in the direction of increasing value



CRADLE MT., LAKE ST. CLAIR NATIONAL PARK

LOCATION MAP



Scale 1: 250,000

PLAN HR 46/80-6

DIGHEM^{II} SURVEY

MACKINTOSH EAST, TASMANIA

MAGNETICS
FOR
GEOPEKO LIMITED

664022

5 cm

ISOMAGNETIC LINES

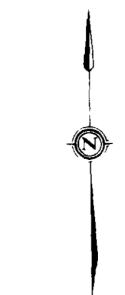
(total field)

- 1000 gammas
- 200 gammas
- 50 gammas
- 25 gammas
- magnetic depression

Flight line

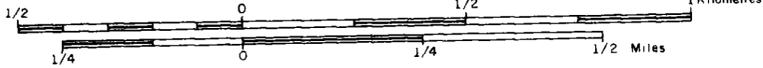
Fiducials and numbers

Magnetic Inclination within the survey area 72°

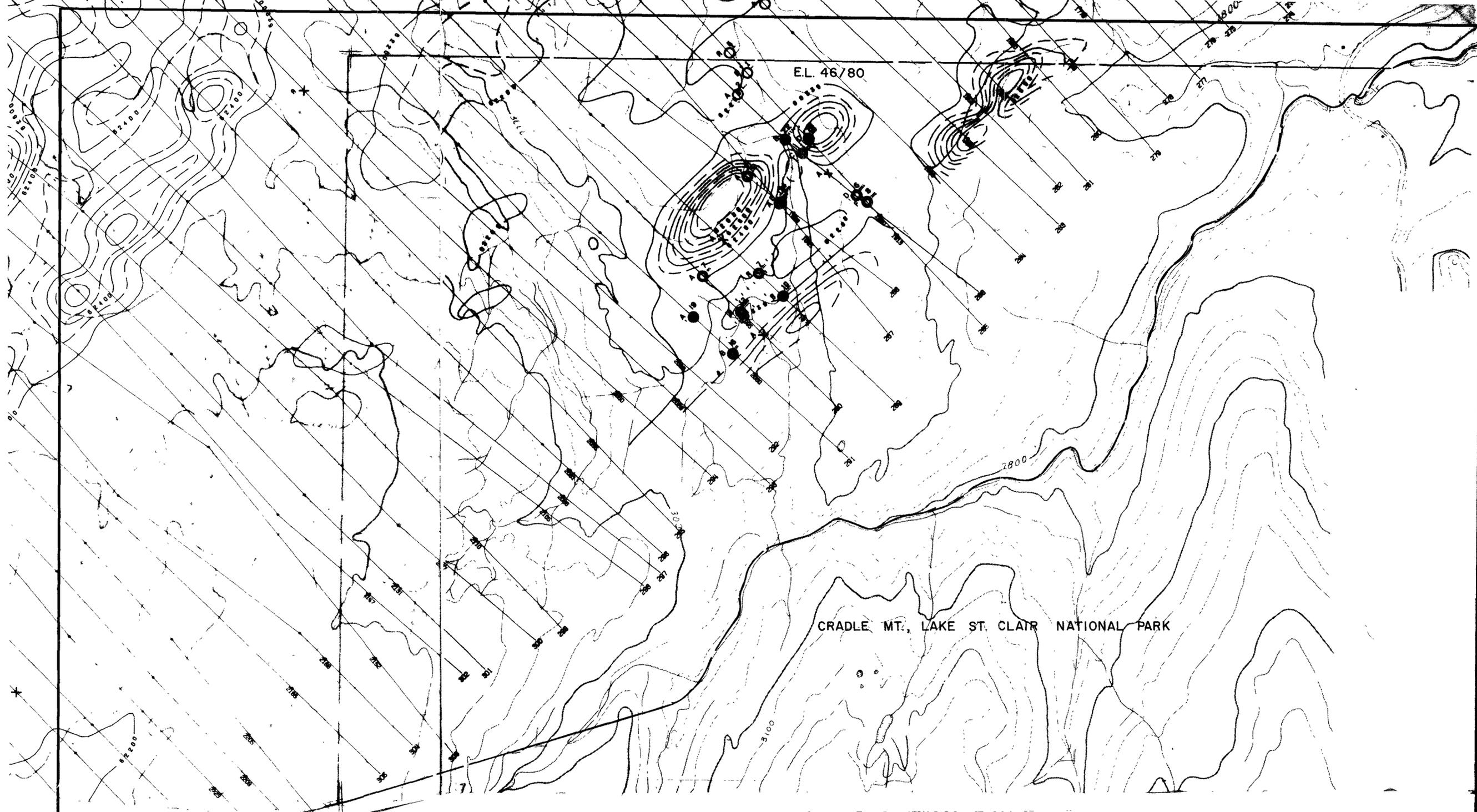


Plan No. 5585 S/B

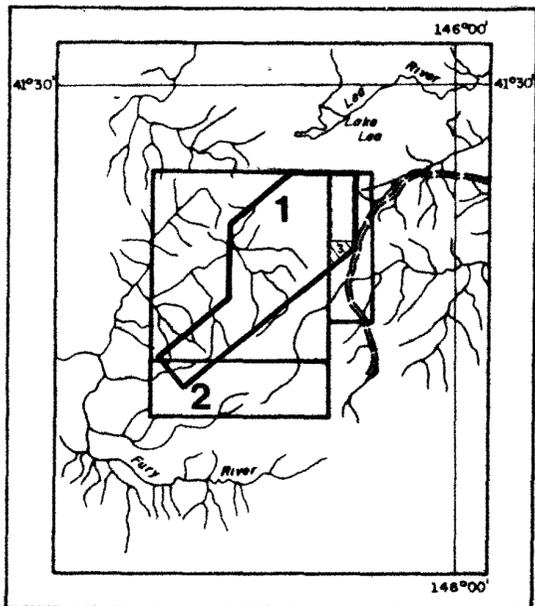
SCALE 1:10,000



SHEET 3



LOCATION MAP



Scale 1: 250,000

Plan No. 5586 S/B



PLAN HR 46/80 -7

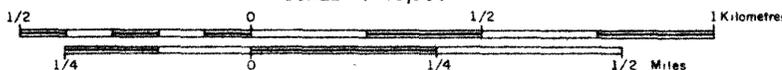
DIGHEM^{II} SURVEY

MACKINTOSH EAST, TASMANIA

ENHANCED MAGNETICS

664023 FOR
GEOPEKO LIMITED

SCALE 1:10,000

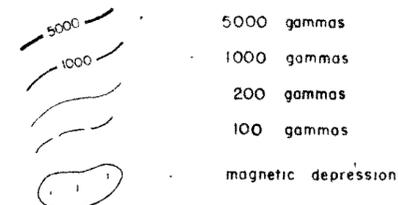


SHEET 3

2462

ISOMAGNETIC LINES

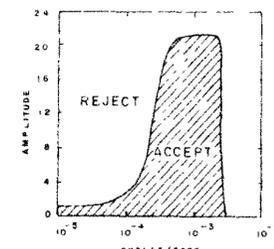
(enhanced field)



Flight line



Fiducials and numbers



Frequency response of magnetic operator

Standard environmental monitor ch. 28
 Whaletail environmental monitor ch. 29
 1st. anomaly recognition function ch. 35
 2nd anomaly recognition function -ch. 36

200
100
0
Bird altitude ch. 21

100
0
Magnetometer ch. 20
gammas

10
0
Standard - inphase ch. 22
ppm

10
0
Standard - quadrature ch. 23
ppm

10
0
Whaletail - inphase ch. 24
ppm

10
0
Whaletail - quadrature ch. 25
ppm

Conductance ch. 37

Difference - inphase ch. 33

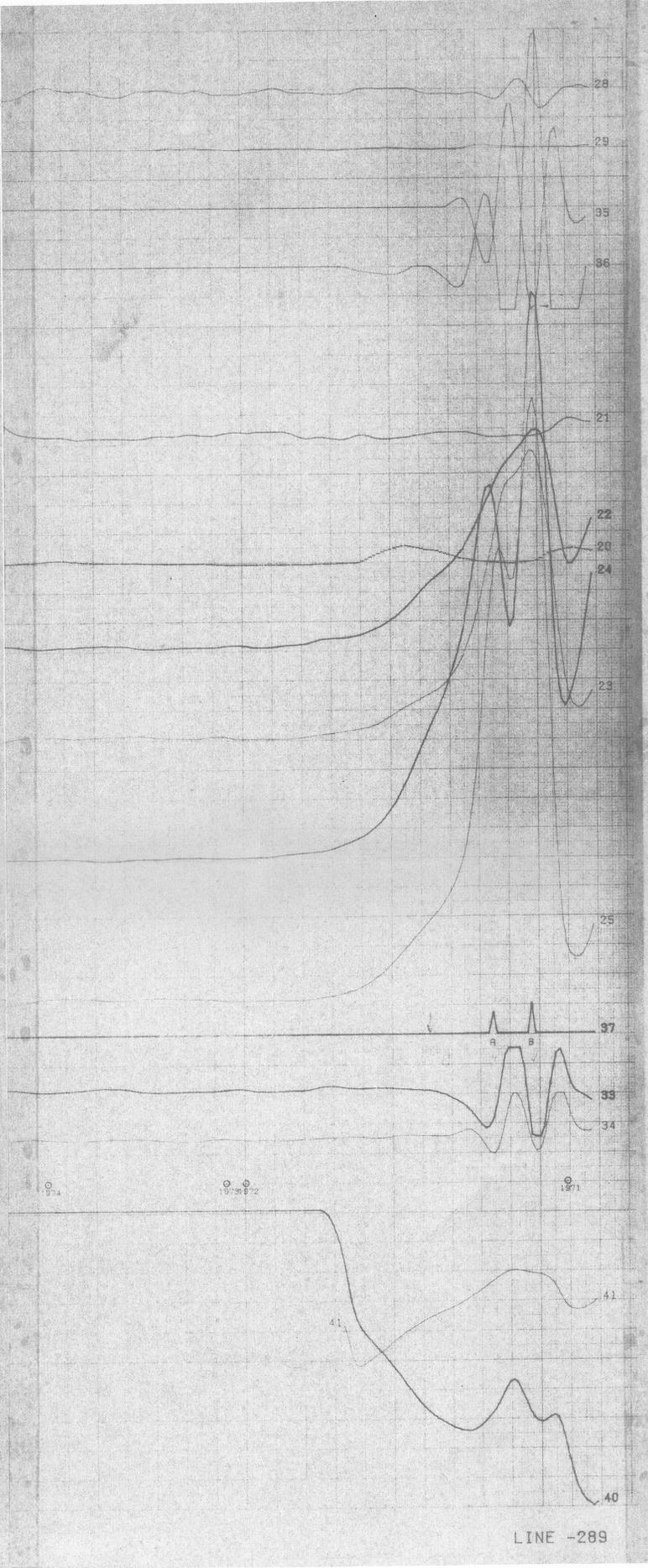
Difference - quadrature ch. 34

1000
100
10
1
ohm-m

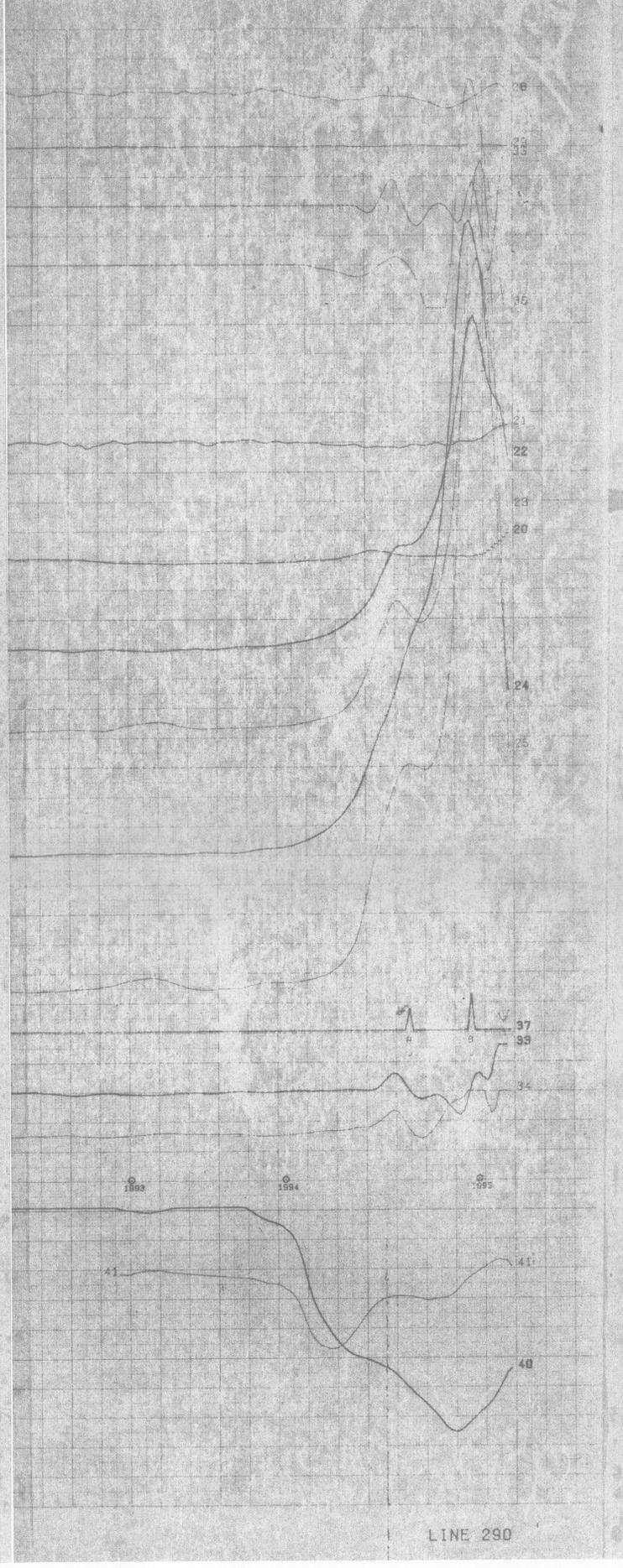
Apparent depth ch. 41
30m

Resistivity ch. 40

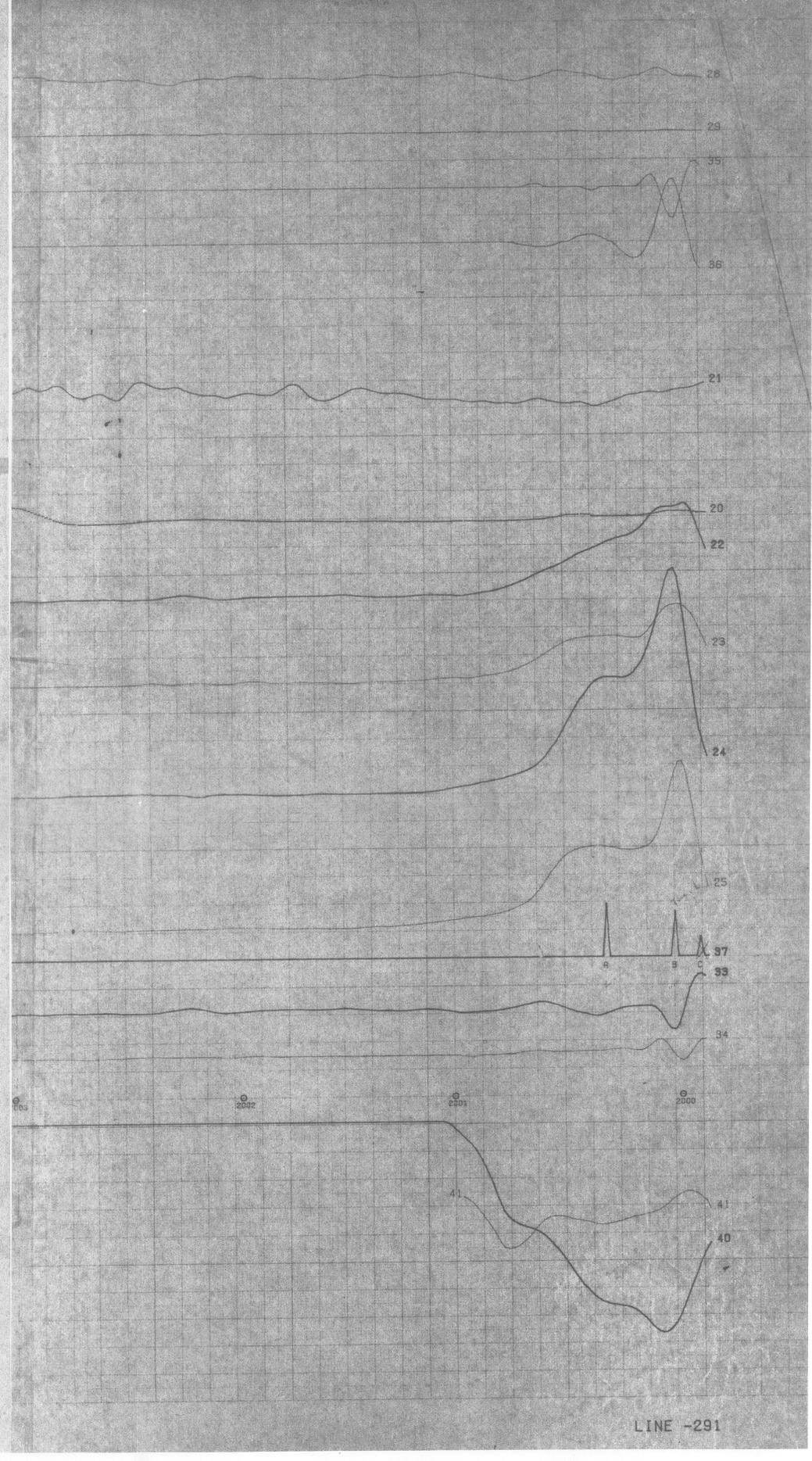
HR 46/80-8



LINE -289



LINE 290



LINE -291

Standard environmental monitor ch. 28
 Whaletail environmental monitor ch. 29
 1st anomaly recognition function ch. 35
 2nd anomaly recognition function ch. 36

200
100
0
Bird altitude ch. 21

100
0
Magnetometer ch. 20
gammas

10
0
Standard - inphase ch. 22
ppm

10
0
Standard - quadrature ch. 23
ppm

10
0
Whaletail - inphase ch. 24
ppm

10
0
Whaletail - quadrature ch. 25
ppm
Conductance ch. 37

Difference - inphase ch. 33

Difference - quadrature ch. 34

1000
100
0
ohm-m
Apparent depth ch. 41
30m

Resistivity ch. 40

10
0
ohm-m
HR 46/80-8b

ohm-m

