



PROJECT NAME:

TITLE:

INTERPRETATION OF CHESTER AREA
DIGHEM SURVEY (~~D B TRUSSELL~~)

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MELBOURNE, VIC.

REPORT A17

Interpretation of Chester Area
DIGHEM SURVEY

By: Devin Trussell
February 1984

REPORT A17Interpretation of Chester Area
DIGHEM SURVEYSUMMARY

The DIGHEM survey produced several EM responses. However all of them were so low in amplitude that they could easily be due to air turbulence. Follow up of these targets can only be carried out by a deep probing EM system. Anomalies 120xA and 140xA are the most encouraging response since there is an IP anomaly coincident. Ground work on the other anomalies is recommended only if there is some additional supporting evidence that the anomalies are of interest.

1. INTRODUCTION

In April 1983 DIGHEM carried out an airborne EM survey over EL 5/63 area 4 except for that part located south of the Chester Mine. The line spacing was 200m. The flight line direction was northwest - southeast. The EM bird height was 35m. The magnetometer altitude was 50m. The DIGHEM system consisted of 3 coil pairs - one operating at 900 Hz, with the axis in the direction of flight and the other two operating at 900 Hz and 385 Hz with vertical coil axes. The coil separation was 9m. The EM data were recorded with a sensitivity of .25ppm. The magnetic data were recorded with a sensitivity of 1nT.

The contractor has prepared a report on the DIGHEM work. Significant anomalies were selected using objective criteria. The depth and conductivity width of horizontal and vertical sources which would generate the observed anomalies are presented in tabular form in the DIGHEM report. In addition the contractor has given descriptive comments on those anomalies believed to be due to genuine bedrock conductors. Accompanying the DIGHEM report are five 1:10,000 scale plans - Electromagnetic anomalies, probable bedrock conductors, resistivity, and two magnetic plans. All except one of the magnetic plans are plotted showing both the flight lines and the topographic base.

As can be seen by plan TAS-2-1571 much of the area has been covered by magnetic surveys and IP. These have been the subject of numerous earlier reports and will not be referred to here except as the information directly relates to DIGHEM targets.

2. DISCUSSION

A. Geology Interpreted from Geophysical Information

The DIGHEM and resistivity plans were used to prepare a geological interpretation plan. On this plan major faults, significant EM anomalies and prominent magnetic anomalies have been noted.

The area is one of unusually high resistivity. Values less than 1,000 ohm meters are uncommon. The prominent lineal shaped low resistivity anomaly in the western part of the area is due to a power line. A broad zone 600m east of Burns Peak is slightly more conductive (800 ohm meters) than the surrounding ground. The geology here is mapped as being mixed shales and tuffs. Presumably the shales are less resistive than the volcanics and so account for the minor anomaly on the resistivity plan.

A third resistivity anomaly is located in the very northwest of the survey area. This coincides with an area of glacial till which may be the cause of the anomaly.

DIGHEM notes the low resistivity zone comprising fiducial 2899 line 100 and fiducial 2541 line 110 should be examined on the ground even though there is no EM anomaly. This anomaly has been marked by diamond symbols on the plan.

The magnetic contour plan does contain quite a bit of information. Although the rock units have generally low susceptibility, there are several marker horizons in the eastern two thirds of the area. These anomalies appear to terminate to the south by a major structure at about line 250. The western part of the area has very little magnetic expression. This is possible due to thick non magnetic sediments.

B. Geophysical Targets

There are no outstanding EM responses in the survey area other than the cultural responses generated by the power line in the eastern part of the area. There are only four EM conductors selected by DIGHEM. These are all "X" type responses. They are of very low amplitude and are on the limit of detectability. They could easily be due to aerodynamic noise.

In addition to the DIGHEM selection, 9 more EM responses have been picked out for further examination. All of these were below DIGHEM's standard signal to noise requirement for an anomaly. All these anomalies have been marked on the Interpretation plan. Most have been covered by IP surveys. The only valid geophysical follow up work for the anomalies is a deep penetration EM method.

As noted by DIGHEM, 240xA is the most attractive EM anomaly in the survey area. It has not been examined by any electrical methods in previous Comstaff field work.

Other selected responses for which there is no previous electrical surveys include:-

Line 40 fid 510
Line 50 fid 304
Line 110 fid 2587
Line 131xA
Line 300 fid 908

IP work has been carried out on:-

120xA
Line 91 fid 491
Line 110 fid 2506, fid 2536
Line 160 fid 1842

There is no IP response on these lines and so encouragement to do more work must rely on geology or other factors.

IP work has also been carried out on:-

120xA
140xA
Line 160 fid 1842

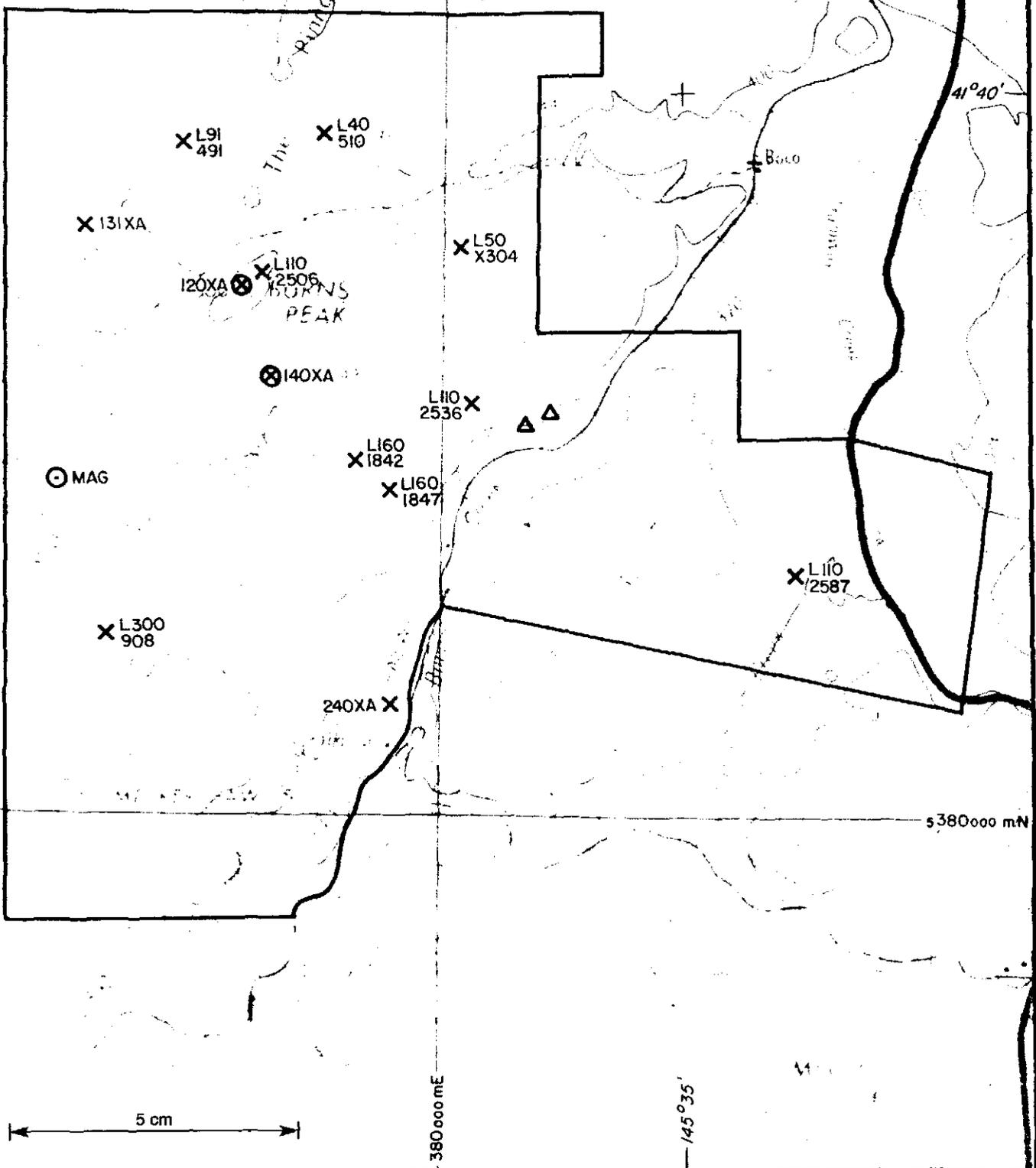
There is an IP anomaly at 1550 W on line 2950 S. This is near anomaly 120xA. The anomaly should therefore be investigated with a deep penetration EM technique.

There is a poorly defined IP anomaly at 900 W on line 2950 S. This is near 140xA. The anomaly should therefore be investigated with a deep penetration EM technique.

There is a near surface IP response on line 2750 S at 300 E. This is near line 160 fid 1842. The source of the IP should have a geochemical response if the anomaly is worth further investigation.

3. CONCLUSIONS

There are no prominent airborne EM anomalies in the Chester EL area DIGHEM Survey. Of the weak anomalies which were selected to be of interest a deep probing EM survey is recommended on two. These are 120xA and 140xA. The other anomalies require supporting geochemical and/or geological information before a ground geophysics programme can be justified.



- ANOMALY RECOMMENDATIONS**
- ⊗ EM follow up
 - X Inspection only
 - ⊙ inspection - magnetic anomaly
 - Δ Resistivity target

COMSTAFF PROPRIETARY LIMITED

EL 5/63 AREA 4
CHESTER / PINNACLES

DIGHEM ANOMALIES

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| COMPILED D B Trussell | DRAWN January 1984 | SCALE 1:50000 | TAS/2/3816 |
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