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PROJECT NAME:

MICROFILMED

TITLE:

INTERPRETATION OF ARTHUR RIVER AREA
DIGHEM SURVEY (D B TRUSSELL)

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AUTHOR/S:

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AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria

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REPORT A12
INTERPRETATION OF ARTHUR RIVER
AREA - DIGHEM SURVEY

By: D B Trussell

Dec 1983

REPORT A12INTERPRETATION OF ARTHUR RIVER AREADIGHEM SURVEY1. INTRODUCTION

In April 1983 DIGHEM carried out an airborne EM survey in the Arthur River area. The flight line direction was north west-south east. The line spacing was 200m. The EM bird height was 35m. The magnetometer altitude was 50m. The DIGHEM EM system consisted of 3 coil pairs - one operating at 900Hz, with the axis in the direction of flight and the other two operating at 900Hz and 385Hz with vertical axis. The coil separation was 9m. The EM data were recorded with a sensitivity of .25 ppm. The magnetic data were recorded with a sensitivity of 1nT.

The contractor has prepared a report on the DIGHEM work. All 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.

2. WORK DONE

Other than the data collected by the DIGHEM survey the only geophysical information available over the area is the 1:50 000 Tasmanian Mines Department aeromagnetic plan and an aeromagnetic survey carried out by Georex. The Georex survey was rendered obsolete by the DIGHEM work.

The DIGHEM plan maps and the profiles were examined in detail for anomalies which appear to merit further investigation.

3. DISCUSSIONA. Geology Interpreted From Geophysical Information

Tertiary basalts have a distinctively low resistivity and are clearly mapped by the resistivity plan. Values as low as 80 ohm metres are common. The magnetic susceptibility of the basalts is usually quite high. They typically give rise to a highly contorted magnetic contour pattern having an average peak to peak amplitude of 300nT. Areas similar in magnetic character to the Tertiary basalts but without any anomalous resistivity response have been labelled as metamorphosed sediments on the geological interpretation plan.

Precambrian sediments of the Mt Bischoff series are characterised by very low magnetic susceptibility. Other areas similar in nature have thus been interpreted to have the same geology. Three areas of Precambrian sediment not shown on government maps have been identified in this way.

The magnetic contour maps and to a lesser extent the resistivity plan have been useful in identifying numerous faults in the area.

A major magnetic anomaly (1km x 1½km) is located in the extreme southeast part of the survey area. It is located in an area mapped as Tertiary basalt. A basic intrusion is a more likely rock type.

The gabbros on the west side of the Magnet River can be readily discerned on the resistivity plan because of their very low resistivity (less than 100 ohm metres). Other gabbro bodies shown on the regional mapping have no resistivity response. They must be either quite thin or else significantly different in composition.

The magnetic data is useful in establishing the geometry of the granite body in the very southern part of the survey area. However it would not have been identified, as a granite, by the use of the magnetics alone.

B. Geophysical Targets

The DIGHEM survey has presented a very clear picture of the area around Mt Bischoff. There appears to be at least 6 individual targets which should be examined in detail. Only one of these, namely that due to the known mineralisation, has apparently been studied by the present occupiers of the ground.

Another group of anomalies appear quite prospective. These are located in the southern part of the area and have been given the collective name of the "Bulters Road Anomalies". This group of anomalies is located on the northern end of a granite body so the environment should be considered attractive for tin mineralisation. Specific anomalies in the Bulters Road group include:-

?
Bulters
See plans

2710B
2710C
2730E
2740G

Other EM conductors which are sufficiently attractive to warrant ground follow up include:-

2180A
2190B
2200B
2210A
2210B
2280B
2290C
2320B
2343B (in Metals Ex EL)
2400AB
2730C

004

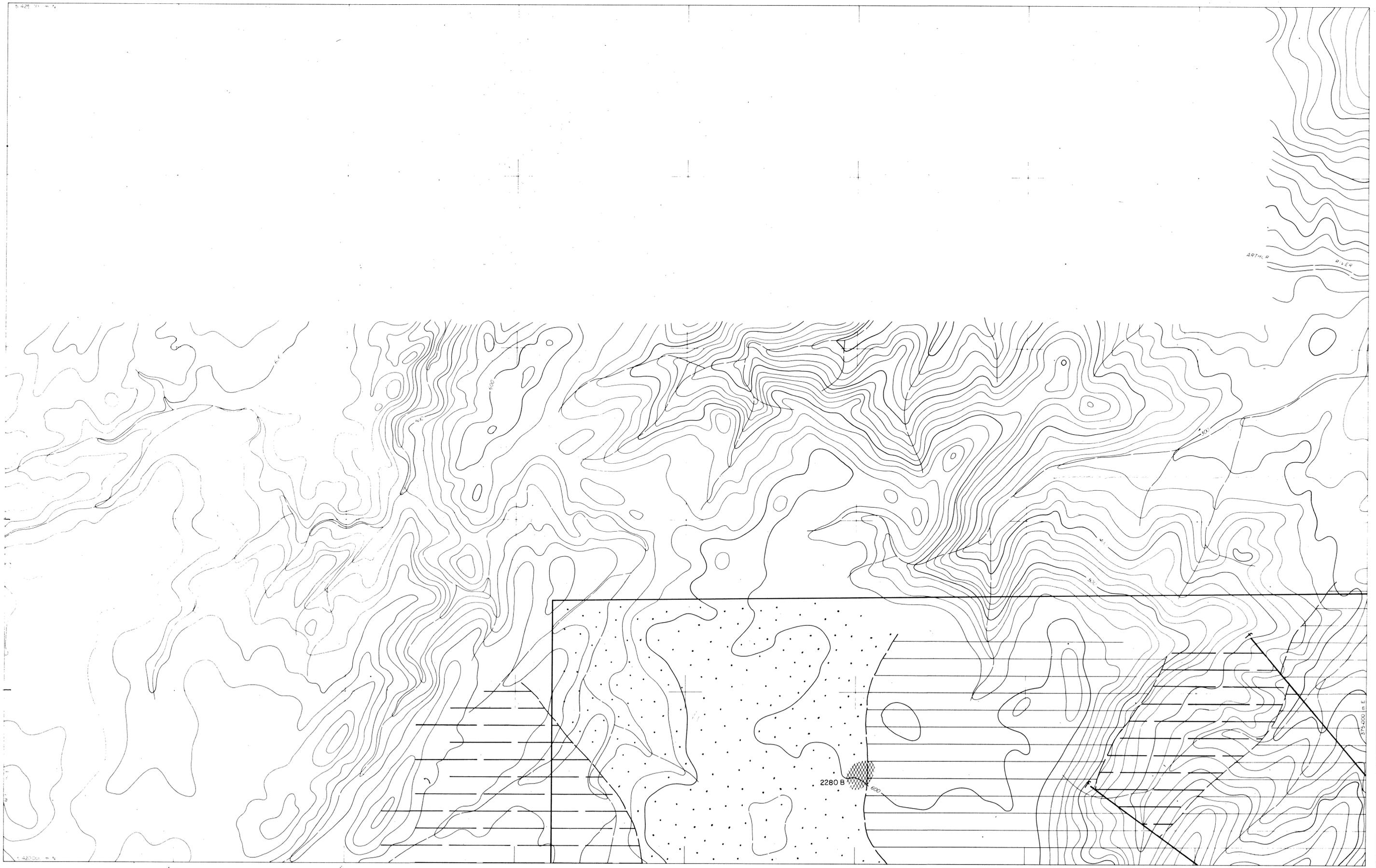
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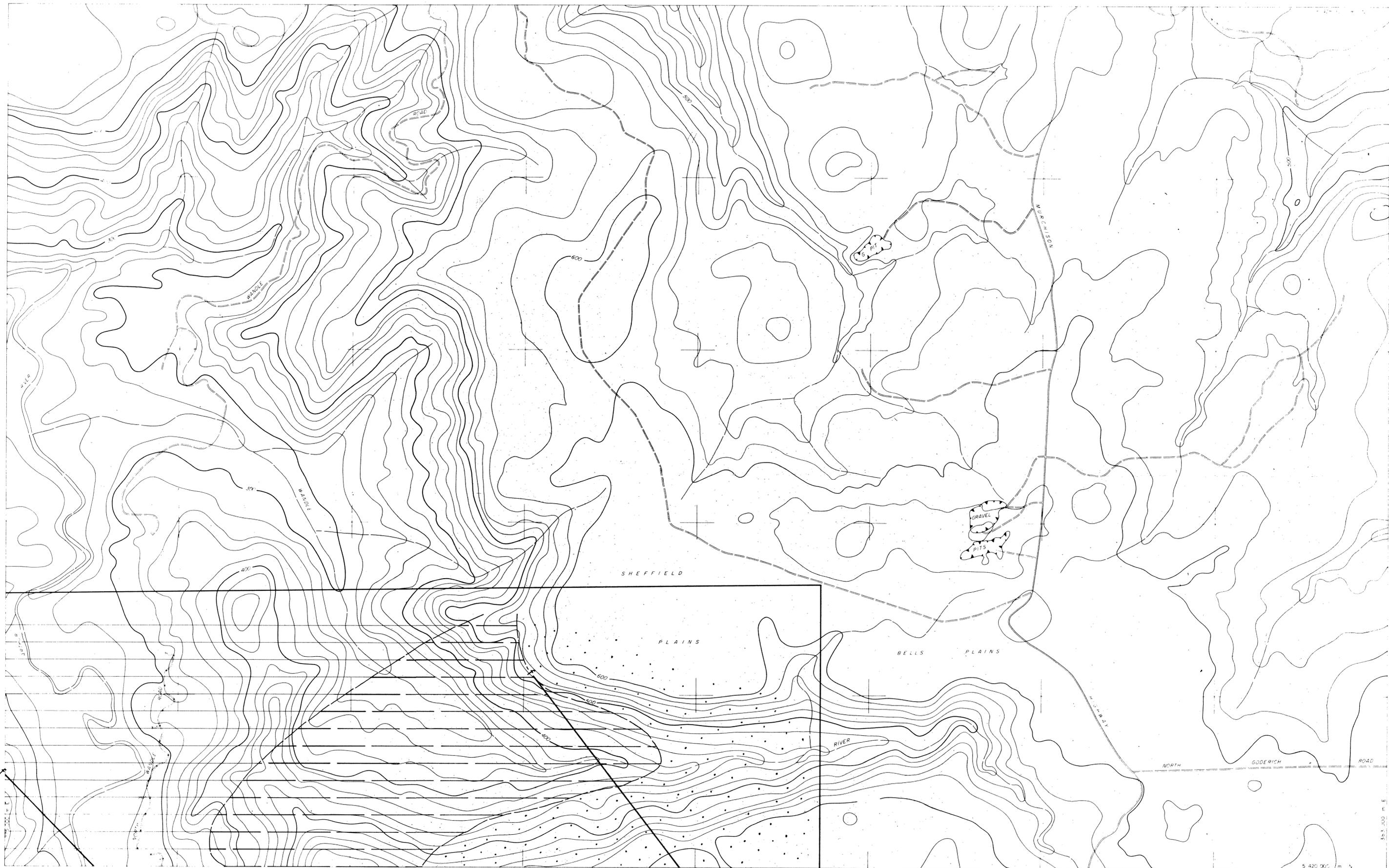
All these responses have been marked on the geological interpretation plan. An isolated magnetic anomaly in the Magnet River area on line 2640 at fid 3289 should also be followed up on the ground.



D B Trussell



	68	69	70	71	72	73	74																																								
<table border="0"> <tr><td></td><td>Anomaly (M = Magnetic)</td></tr> <tr><td></td><td>Tertiary Basalt</td></tr> <tr><td></td><td>Thin Basalt</td></tr> </table>		Anomaly (M = Magnetic)		Tertiary Basalt		Thin Basalt	<table border="0"> <tr><td></td><td>Magnetic Sediments</td></tr> <tr><td></td><td>Metamorphosed Sediments</td></tr> <tr><td></td><td>Gabbro</td></tr> </table>		Magnetic Sediments		Metamorphosed Sediments		Gabbro	<table border="0"> <tr><td></td><td>Granite</td></tr> <tr><td></td><td>Magnetic Intrusive</td></tr> <tr><td></td><td>Pre-Cambrian Sediments</td></tr> </table>		Granite		Magnetic Intrusive		Pre-Cambrian Sediments	<table border="1" style="font-size: small;"> <tr><td></td><td>TAS/2/1143</td><td>TAS/2/1144</td></tr> <tr><td></td><td>TAS/2/1145</td><td>TAS/2/1146</td></tr> <tr><td></td><td>TAS/2/1147</td><td>TAS/2/1148</td></tr> <tr><td></td><td>TAS/2/1149</td><td>TAS/2/1150</td></tr> </table>		TAS/2/1143	TAS/2/1144		TAS/2/1145	TAS/2/1146		TAS/2/1147	TAS/2/1148		TAS/2/1149	TAS/2/1150			<p style="margin: 0;">COMSTAFF PROPRIETARY LIMITED</p> <p style="margin: 0;">EL 5/63 AREA I 005</p> <p style="margin: 0;">ARTHUR RIVER / MAGNET</p> <p style="margin: 0;">GEOLOGICAL INTERPRETATION</p> <p style="margin: 0;">OF DIGHEM SURVEY</p>	<p style="margin: 0;">420606</p> <p style="margin: 0;">84-2135</p> <table border="1" style="font-size: x-small;"> <tr><td>COMPLETED</td><td>D B TRUSSELL</td></tr> <tr><td>DRAWN</td><td>DATE 11/83</td></tr> <tr><td>AMENDED</td><td></td></tr> <tr><td>SCALE</td><td>1:10 000</td></tr> <tr><td>PLAN No</td><td>TAS/2/3740</td></tr> </table>	COMPLETED	D B TRUSSELL	DRAWN	DATE 11/83	AMENDED		SCALE	1:10 000	PLAN No	TAS/2/3740
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- Anomaly (M=Magnetic)
- Tertiary Basalt
- Thin Basalt
- Magnetic Sediments
- Metamorphosed Sediments
- Gabbro
- Granite
- Magnetic Intrusive
- Pre-Cambrian Sediments

TAS/2/114	TAS/2/115
TAS/2/116	TAS/2/117
TAS/2/118	TAS/2/119
TAS/2/120	TAS/2/121



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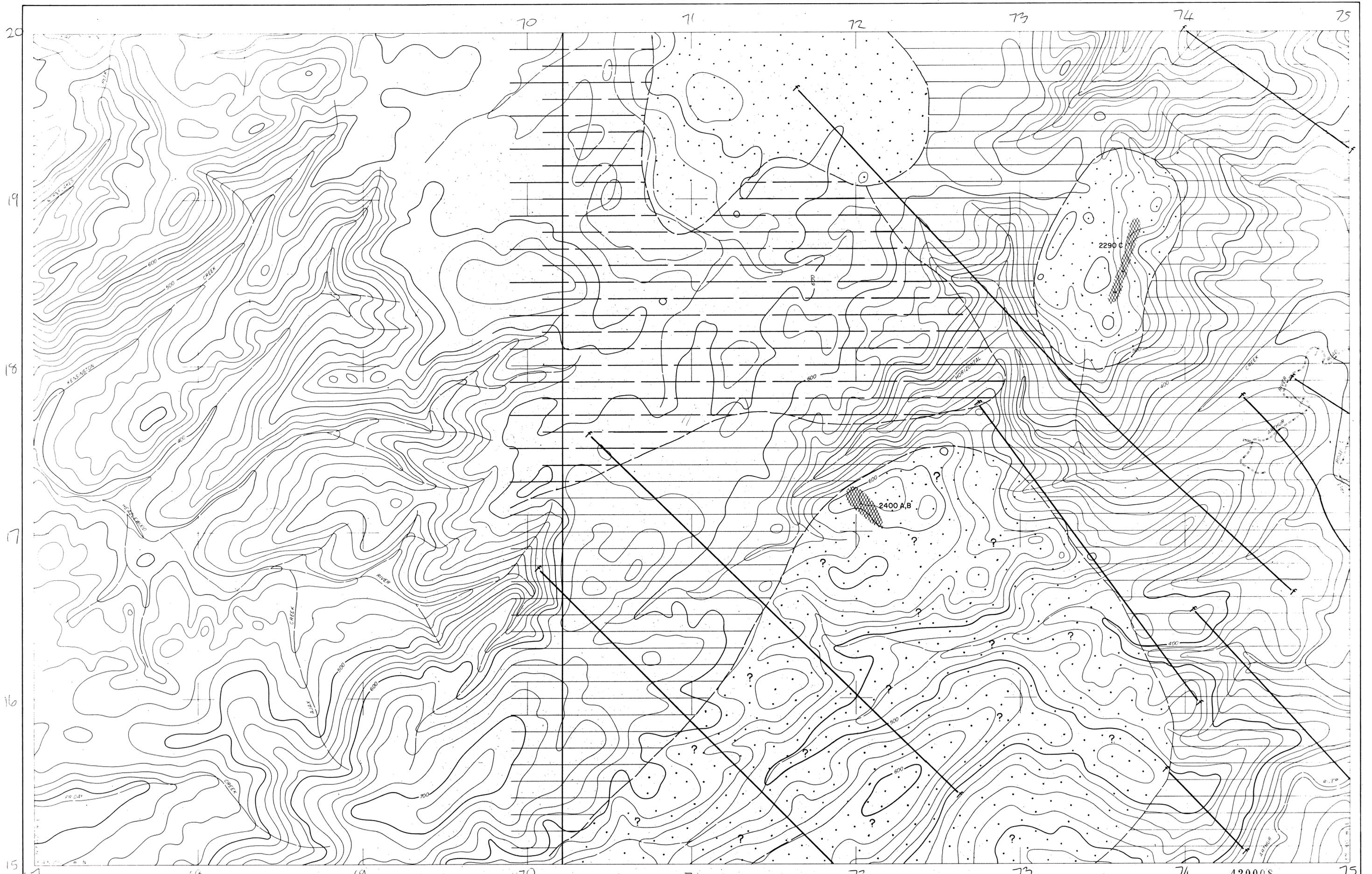
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EL 5/63 AREA 1 006

ARTHUR RIVER / MAGNET

GEOLOGICAL INTERPRETATION
OF DIGHEM SURVEY

DRAWN	DATE
AMENDED	11/83
SCALE	1 : 10 000
PLAN NO.	TAS/2/374



-  Anomaly (M = Magnetic)
-  Tertiary Basalt
-  Thin Basalt
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-  Gabbro
-  Granite
-  Magnetic Intrusive
-  Pre-Cambrian Sediments

TAS/2/1	TAS/2/2
TAS/2/3	TAS/2/4
TAS/2/5	TAS/2/6



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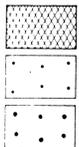
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EL 5/63 AREA I 007

ARTHUR RIVER / MAGNET

GEOLOGICAL INTERPRETATION
OF DIGHEM SURVEY

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TAS/2/374



Anomaly (M=Magnetic)

Tertiary Basalt

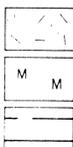
Thin Basalt



Magnetic Sediments

Metamorphosed Sediments

Gabbro



Granite

Magnetic Intrusive

Pre-Cambrian Sediments

5 cm

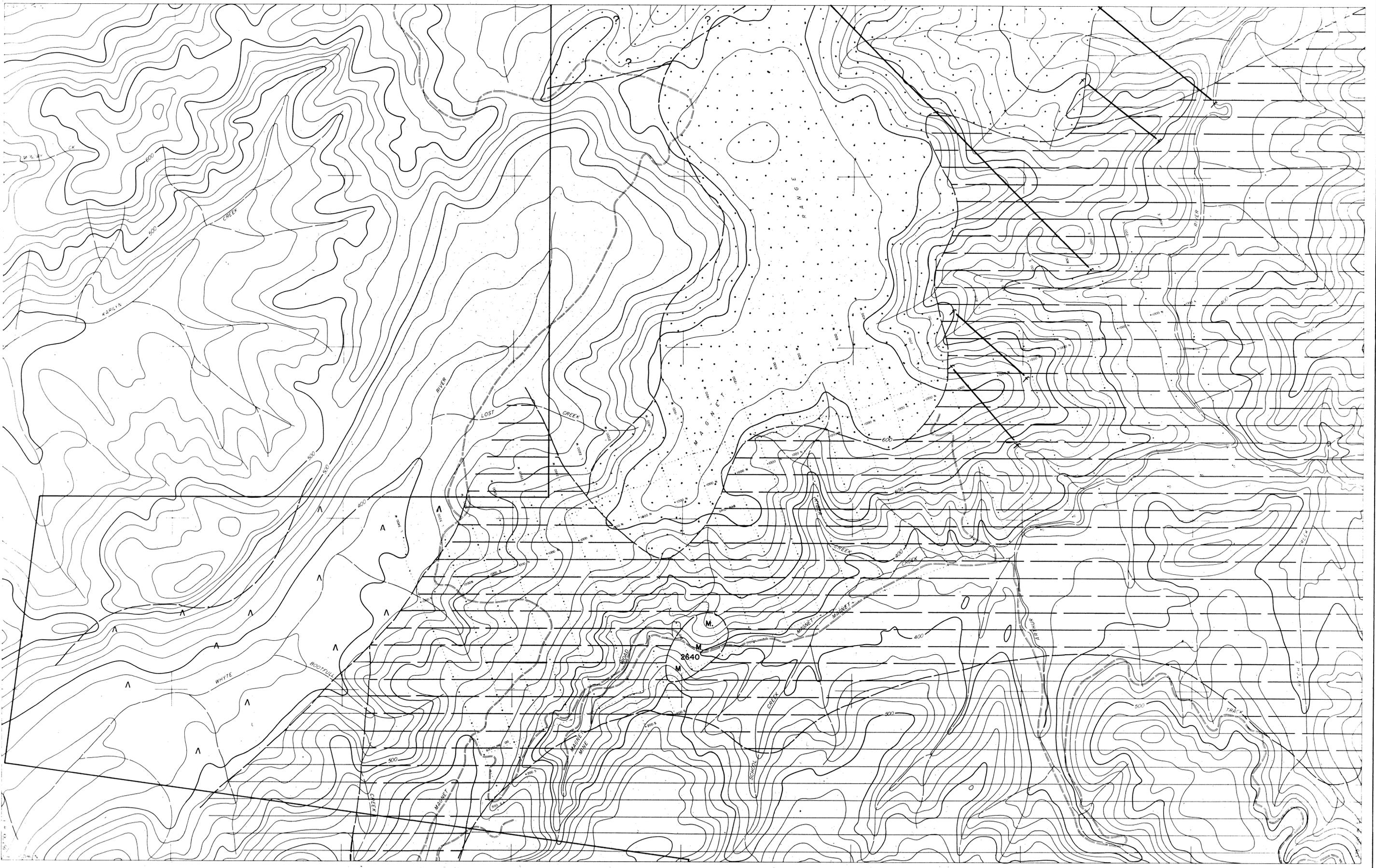
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TAS/2/1	TAS/2/1



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 ARTHUR RIVER/MAGNET
 GEOLOGICAL INTERPRETATION
 OF DIGHEM SURVEY

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- Anomaly (M = Magnetic)
- Tertiary Basalt
- Thin Basalt
- Magnetic Sediments
- Metamorphosed Sediments
- Gabbro
- Granite
- Magnetic Intrusive
- Pre-Cambrian Sediments

5 cm → 420010

84-2139

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EL 5/63 AREA I 009

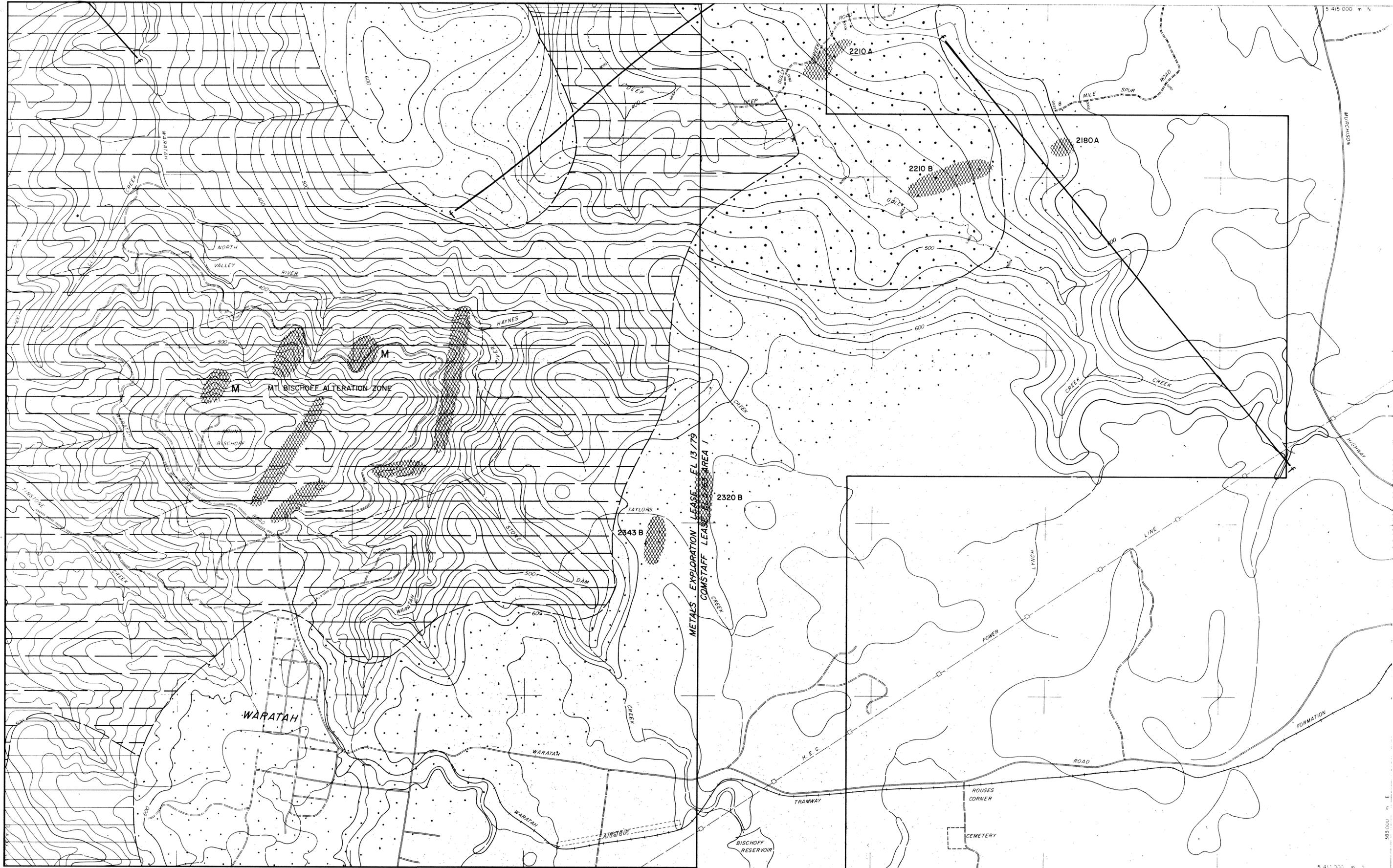
ARTHUR RIVER / MAGNET

GEOLOGICAL INTERPRETATION
OF DIGHEM SURVEY

DB TRUSSELL
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TAS/2/1/14	TAS/2/1/14





-  Anomaly (M = Magnetic)
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-  Granite
-  Magnetic Intrusive
-  Pre-Cambrian Sediments

TAS/2/3741	TAS/2/3742
TAS/2/3743	TAS/2/3744
TAS/2/3745	TAS/2/3746



5 415 000 m N

5 412 000 m N

5 415 000 m E

5 412 000 m E

420011

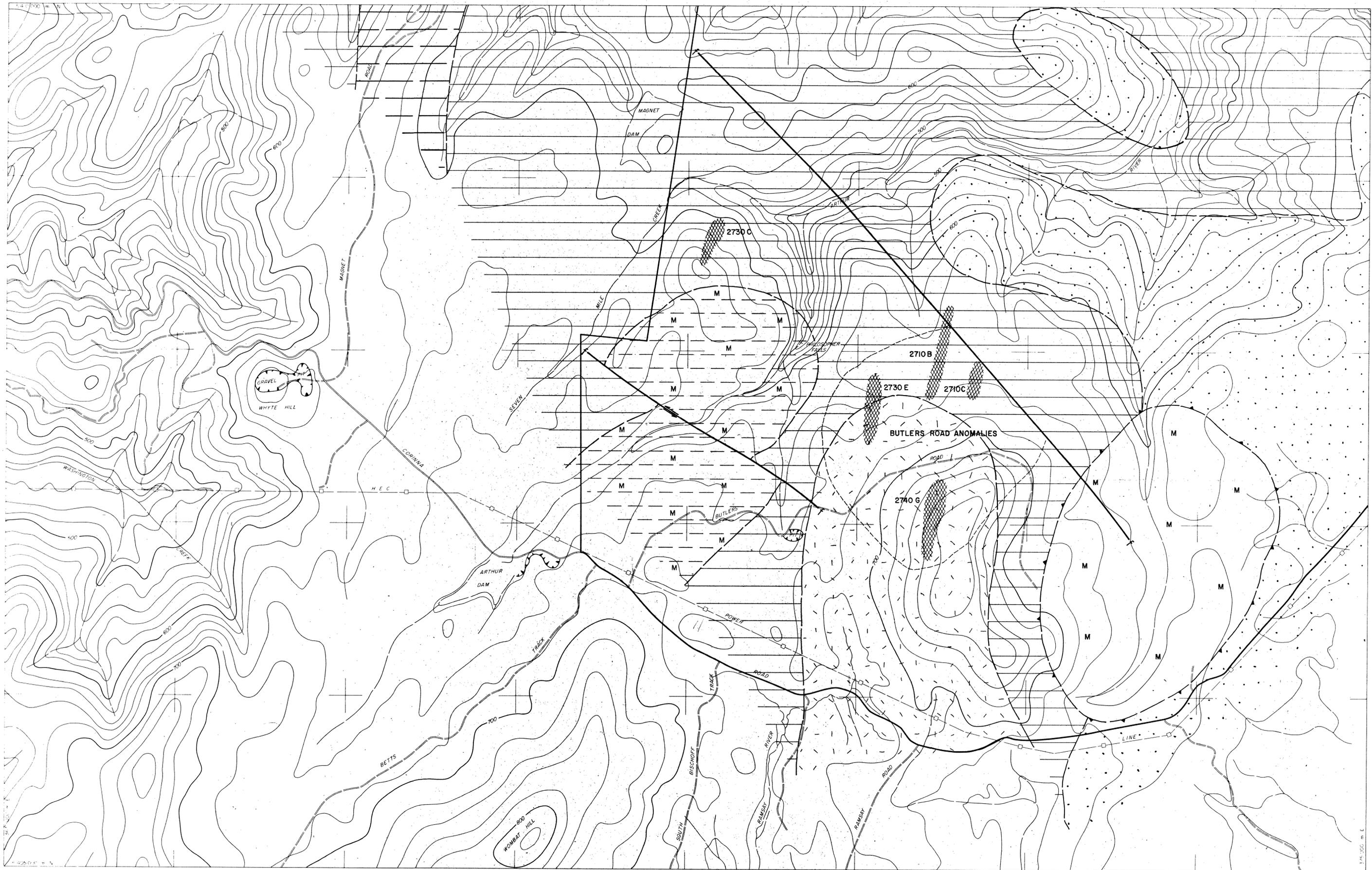
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EL 5/63 AREA I
ARTHUR RIVER / MAGNET
GEOLOGICAL INTERPRETATION
OF DIGHEM SURVEY

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D B TRUSSELL
DATE 11/83
SCALE 1 : 10 000
TAS / 2 / 3745



-  Anomaly (M = Magnetic)
-  Tertiary Basalt
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-  Gabbro
-  Granite
-  Magnetic Intrusive
-  Pre-Cambrian Sediments

5 cm 420012

TAS/2/1142	TAS/2/114
TAS/2/1141	TAS/2/114
TAS/2/1140	TAS/2/114
TAS/2	TAS/2



84-2134

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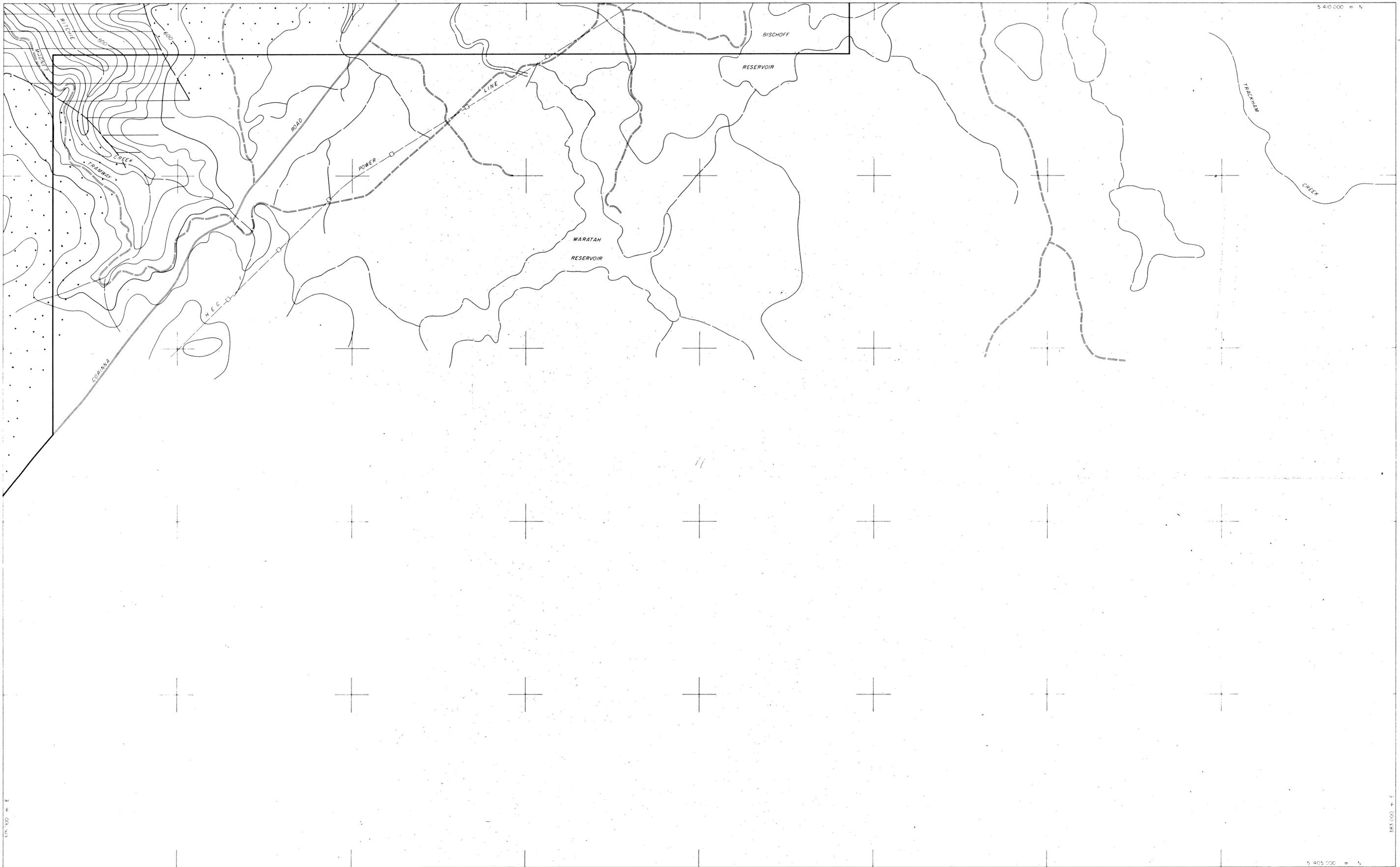
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ARTHUR RIVER / MAGNET

GEOLOGICAL INTERPRETATION

OF DIGHEM SURVEY

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SCALE	1 : 10 000
PROJECT	TAS / 2 / 3746



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TAS/2/1/1	TAS/2/1/2
TAS/2/1/3	TAS/2/1/4
TAS/2/1/5	TAS/2/1/6
TAS/2/1/7	TAS/2/1/8



5 cm → 420013 84-2135

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EL 5/63 AREA I 012
ARTHUR RIVER / MAGNET
GEOLOGICAL INTERPRETATION
OF DIGHEM SURVEY

COMPILED BY	DB TRUSSELL
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SCALE	1 : 10000
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