INTERPRETATION REPORT

AIRBORNE ELECTROMAGNETIC SURVEY

BARRINGER INPUT SYSTEM

of the

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

for

AMOCO MINERALS AUSTRALIA COMPANY

by

GEOTERREX PTY. LIMITED

(83-272)

SYDNEY, AUSTRALIA.

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TABLE OF CONTENTS

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I. INTRODUCTION

This report provides an interpretation of the INPUT data obtained in a combined airborne electromagnetic, magnetic and radiometric survey flown on behalf of Amoco Minerals Australia Company over the McArthur River area in the Northern Territory. The survey was conducted during 10 flights between the 22nd November and the 8th December, 1976 from an operational base initially at McArthur River Homestead and then at Tennant Creek.

The purpose of the survey was the exploration for metallic sulphide mineralization in conductive pyritic shale basins. Throughout the survey, lines were flown east-west. Initially line spacing was two kilometres for reconnaissance purposes, but lines spaced one kilometre and one half kilometre apart were flown in specifically responsive areas for more detailed mapping. A total of 2704.4 kilometres was surveyed.

The project was conducted with a Super Canso PBY-5A under registration VH-EXG which is operated by Executive Air Services for Geoterrex Pty Limited.

It was equipped with the Barringer Mark V INPUT system, a Geometrics 803 nuclear precession magnetometer, an Exploranium DiGRS-3001 spectrometer with 906 cubic inches of crystal, a Honeywell visicorder, an APN-1 radio altimeter, a 50 Hz monitor and a 35 mm continuous strip tracking camera.

Navigation was by visual means using airphoto mosaics at an approximate scale of 1:25,000. The aircraft was operated at a mean terrain clearance of 400 feet.

The planning and operation of the survey was carried out by R. Pedersen in consultation with W. Matthews representing Amoco Minerals Australia Company.

Complete compilation, drafting and interpretation of the data was performed in Sydney, Australia.

II. PERSONNEL

The following Geoterrex personnel participated in the field phase of this survey:-

Geophysicist and Project Manager	-	G. Butt.
Geophysicist	-	F. Bruvel.
Data Compiler	-	J. Gaw.
Electronic Operators	-	L. Williams.
	-	R. Weir.
Pilot	-	C. Moody.
Co-Pilot	-	D. Stott.
Aircraft Mechanic	-	M. Rolfe.

The base camp near McArthur River Homestead was supervised by M. Winter.

Final compilation and drafting was performed by P. Sweeney and R. Hobbs.

The electromagnetic data was interpreted in Sydney by G. Butt and F. Bruvel.

The entire project was under the direction of R. Pedersen.

III. DATA PRESENTATION

The sheet layout for the McArthur River area consists of 13 airphoto mosaics at a scale of 1:25,000, providing the base for the geophysical maps. There are two types of maps, an EM Plan Map and an EM Ratio Map. Each map is presented as a clear overlay to the airphoto mosaic and includes sufficient planimetry to allow correlation to other data maps of the area.

The EM Plan Map displays only those conductors which have been selected for further investigation and are described in detail in Section V. The INPUT survey recorded many other responses but these have not been included on the maps for reasons of simplicity.

The map portrays the key characteristics of the INPUT anomalies using our conventional symbolism. This symbolism, which is explained in the map legend, includes the following:-

- anomaly peak position
- anomaly half-peak width
- number of channels affected
- amplitudes of the first and fourth channels (ratio, in units of 1/10 inch chart deflection)
- terrain clearance of the aircraft, in feet
- amplitude of any apparently associated magnetic anomaly, in gammas
- any associated response on the 50 Hz monitor

The peak position of the response gives the approximate axis of the conductor except in the case of broad or dipping zones. A lag of 4.5 seconds is used to plot the INPUT anomalies. All amplitudes and half-peak widths are measured from true zero level.

When the profiles indicate a possibly significant correlation between an INPUT and a magnetic anomaly the amplitude of the magnetic response is shown on the EM Plan Map. If the EM anomaly is located on the flank or edge of a magnetic feature, the magnetic amplitude is affixed with an arrow pointing in the direction of the offset of the magnetic anomaly relative to the conductor.

The EM Ratio Map displays the electromagnetic data in the form of a coloured "bar" map which presents the INPUT data as a decay rate between the amplitudes of channels one and four. Sections of the profiles are allocated colours according to the logarithmic range within which their decay rate falls. The lower this value the more slowly decaying is the INPUT response. This map is presented as a suppliment to the EM Plan Map and does not include interpreted conductor boundaries. These maps are compiled for Sheets 1, 6, 7 and 10 where the Proterozoic is not covered by Bukalara Sandstone. In areas under sandstone cover the smaller amplitudes of the responses make accurate ratio calculations difficult.

Data recorded by the spectrometer has been collected to give information additional to that provided by the INPUT and magnetic data. It is presented only in profile form and has not been formally compiled or interpreted.

Two INPUT reconnaissance profiles which were flown in June 1976 to test the response over the HYC conductor are included on the data maps. They are Profiles Nos 1 and 2.

Some data recorded during Flight 18 is considered too affected by atmospheric noise to be interpretable. These lines (26A, 26B, 30B, 31E, 34A and 34B) are included on the data maps for the sake of completeness but are not charged for.

The original INPUT records containing the geophysical information are presented in two folders. The various traces are identified on Line OE, a copy of which is included in Appendix C.

The negative 35 mm tracking film is delivered in nine rolls and labelled according to flight number.

The point picking <u>airphotos</u> along with the tracking film must be consulted for accurate location of any ground followup investigation.

One can refer to the <u>flight log</u> or to the information which is noted on each of the records in order to relate the film to the geophysical records and maps.

Instrument sensitivities and settings are tabled in Appendix C attached to this report.

IV. INTERPRETATION GENERAL

The primary purpose of the airborne survey and of this interpretation is the exploration for pyritic shale basins which are known to be associated with economic base metal sulphide mineralization in the McArthur River area. The INPUT system is the prime tool and the selection of prospects is based mainly on conductor characteristics as interpreted from the INPUT data.

The apparent conductivity, as determined by the rate of decay of the INPUT response, is an important criterion in our analysis of conductors. Other important factors include:-

- the shape and size of the INPUT anomalies.
- the length and degree of isolation of the conductor.
- the pattern of conductors.
- the associated geophysical parameters.
- the position with respect to the direction of structures.
- the geological environment and the relationship of anomalies to known mineralization.
- local variation of characteristics within the conductor.

Normal interpretation methods for distinguishing between surficial and narrow bedrock conductors are not used here since the pyritic shale basins can be expected to have the larger dimensions normally associated with flat lying surficial conductors. Where surficial conductors are due to saline soil conditions conductivities are high and there is little or no contrast between the decay rates of INPUT responses from bedrock or surficial sources.

Conductive zones are thus not classed according to their probable origin but are categorised according to a simple priority system. Priority - 1 zones are those which include INPUT responses with decay rates similar or better than that recorded over the HYC orebody on Profile 2, and which have dimensions in the range expected from shale basins. Priority - 2 zones appear to be bedrock-related but do not satisfy all Priority - 1 criteria. Extensive Priority - 2 zones do not exhibit the high conductivity expected from pyritic shales. Single line anomalies with slow decay rates are not given first priority since there is no correlation on adjacent lines to suggest a basin style of occurrence. Priority - 3 targets are those which are almost certainly of surficial origin, but a small degree of uncertainty remains.

V. INTERPRETATION OF SURVEY DATA

In this section the conductors considered to have a reasonable chance of being bedrock are tabulated in zones and discussed in detail. The priority rating is given along with zone numbers, line numbers, fiducial numbers and channel one to four ratios to facilitate reference to the EM Plan Maps and geophysical tapes. The prefix code "M6" refers to "McArthur River-Sheet 6" and zones are numbered from "1" on each sheet. Where a zone crosses sheet boundaries it has a prefix code which corresponds to the sheet on which the most part of the conductor is located.

The survey area covers a large portion of the Bauhinia Downs 1:250,000 sheet and includes many different lithologies. By far the major part of the area is covered by Cambrian Bukalara Sandstone and some problems of interpretation are posed by this. Extensive areas within the sandstone are typified by very small amplitude, very slowly decaying INPUT responses. The large extent of these conductors (see Sheets 2, 3, 4, 5, 11 and 12) implies a surficial source whereas the small amplitudes suggest a source at depth (perhaps a conductive weathered layer between the Proterozoic and the Cambrian or saline groundwater conductors in the sandstone).

While these large conductive areas are not all recommended for followup, the high apparent conductivities cannot be ignored and several enhanced responses are thus zoned. They are given generally low priority ratings until some followup is completed and it is extablished whether there is any bedrock contribution to these zones.

In a number of instances, especially where the line spacing is one or two kilometres, it has been difficult to trace the extent of conductive zones. In these cases the response is zoned using a "box" and no attempt is made to correlate to adjacent lines. Sampling these conductors at the selected location should adequately explain their source.

Where large zones are drafted on the EM Plan Map subzones are generally indicated within the main zone and are rated separately. In these cases the main zone does not have a priority rating. When a large zone does have a priority rating, anomalies suggested for followup are listed in the text.

As requested by AMOCO only those zones listed in Section V of the report are included on the EM Plan Map. The EM Ratio Maps compiled for Sheets 1, 6, 7 and 10 have been used for selection of zones but are not presented as interpretation maps.

The remaining nine sheets were not compiled as ratio maps since the small anomaly amplitudes render ratio calculations inaccurate.

Zone M1-1

Line 142AW	Fid. 232.00	8/1.2
	to	
Line 168E	Fids. 046.35 to 049.06	27/3.2 to 27/3.0
	Sheet 1	

This zone defines an extensive conductive area which approximately follows the western boundary of the northern end of the survey area. It comprises generally broad six channel INPUT responses, the decay rates of which are quite variable.

It is anticipated that the majority of the responses are due to conductive surficial material (weathering products of a particular type of lithology) but the most highly conductive sections are described in more detail below. It is thought that these sections may represent potential bedrock conductors underlying the conductive surface material. Further examination of the zone is recommended if ground followup of the subzones is encouraging. Suggested locations are on Line 152E at Fid. 637.48 and on Line 162W at Fid. 193.17.

Zone M1-1A Priority - 1

Line 160E	Fids. 235.18; 235.76	17/2.0; 17/2.0
	to	
Line 168E	Fids. 048.22; 049.06	28/3.0; 27/3.0
	Sheet 1	

This subzone constitutes a highly conductive, multiple peaked section of Zone M1-1. It extends from the northern edge of the area for about four kilometres to the south. Between Lines 160 and 164 the zone is broad but appears to be continuous. North of Line 164 however there are two distinct branches of the conductor defined by fairly narrow, large amplitude responses. A discouraging feature is that these two branches correlate with alluvial "fingers" which merge at Looking Glass Creek, suggesting a surficial source.

The decreasing response amplitude towards the south suggests that the conductor may plunge in that direction. It is suggested that both branches of the zone be sampled at its northern end, and two high conductivity locations are also recommended for followup at the southern end. The locations are:-

Line 161W	Fid. 231.78	19/3.0
Line 162W	Fid. 192.59	8/1.3
Line 166W	Fids. 096.40; 097.20	32/3.2; 32/5.0

Zone M1-1B

Priority - 2

Line 162W	Fid. 194.25	22/2.7
Line 163E	Fid. 194.20	26/2.5
Line 164E	Fid. 137.26	23/2.3

Sheet 1

The main reason for selection of this subzone is the well shaped anomaly recorded on Line 164. Although it displays only an intermediate decay rate it is thought to warrant further attention.

A response showing slower decay occurs on Line 162 and could be ground checked at the same time as Line 164. Another broad conductive area is located further to the west but its apparently large extent implies that the source is surficial.

Zone Ml-2 Priority - 3

Line 164E Fid. 141.58 3/0.5

Sheet 1

This is a very weak response selected for its apparently slow decay rate. The anomaly shape is poor and there is a hint that atmospheric noise contributes to the amplitude on channel 4. Thus the priority is low and further investigation is not recommended unless geological support is present.

Zone M1-3 Priority - 3

Line 164E	Fid. 142.62	9/0.5
Line 165W	Fid. 132.00	11/0.5
Line 166W	Fid. 093.98	14/0.7

Sheet 1

This zone comprises three responses selected since their medium amplitudes are anomalous relative to those of adjacent responses. The decay rates do not indicate a highly conductive source and so the zone is not recommended for further work unless there is other supporting data.

The zone correlates with an anomalous area indicated by the integral spectrometer channel.

<u>Zone M1-4</u> <u>Priority - 3</u>

Line 157W	Fid. 036.73	10/1.0
	to	
Line 162W	Fid. 190.49	16/0.9
	Sheet 1	

This zone is similar to Zone M1-3 in that it is comprised of rather broad medium amplitude responses with intermediate to slow decay rates. The slowest decay is apparent on Line 159E at Fid. 004.70.although there is some contribution to the amplitude of channel four due to atmospheric noise. The most interesting response occurs on Line 161W at Fid. 229.17 and is the recommended position for any anticipated ground followup.

The zone is located on Looking Glass Formation which overlies the Strettan Sandstone of the McArthur Group. There is no magnetic association.

<u>Zone M1-5</u>		<u>Priority - 3</u>
Line 152E	Fid. 639.78	9/1.0
	to	
Line 156E	Fid. 043.29	9/0.4
	Sheet 1	

This zone is selected due to the anomalous amplitudes of its INPUT responses and their discrete position amongst weaker conductors. The zone has not been given a high priority rating since the apparent conductivity of the source is not high. Nevertheless the interesting shape of some responses warrants further investigation. A ground check is recommended on Line 153W at Fid. 148.48.

Zone M1-6 Priority - 3

Line 153W	Fids. 144.78; 145.80	8/0.4; 13/1.0
	to	
Line 162W	Fid. 186.45	13/0.8

Sheets 1 and 2

This zone defines an extensive area of quite variable conductivity which is probably caused by a surficial source.

The INPUT responses vary greatly in amplitude and decay rate although they mostly display moderate to large width. Larger amplitude responses are generally recorded along the edges of the zone rather than in the centre. One narrow response with fast decay is located on Line 154W at Fid. 094.17.

Further responses of interest are recorded on Line 157W at Fid. 033.31, on Line 158W at Fid. 282.09 and on Line 159E at Fid. 008.60. These anomalies have slow to intermediate decays and are considered to represent the most likely locations in which to expect bedrock sources. However the geological map shows there are no dolomitic units in this area hence pyritic shale material may not be present.

Zone M1-7 Priority - 3

Line 146AE	Fid. 214.65	6/-
Line 148AW	Fid. 633.49	11/1.2

Sheet 1

The most interesting response of this zone is situated on Line 148A. It is a broad and rounded discrete anomaly with a relatively high conductivity source. It is associated with a slight decrease in terrain clearance but this is not thought to contribute significantly to the amplitude of the anomaly. Both anomalies appear to locate at the edges of a nose of Stretton Sandstone.

Further investigation on the ground is not suggested unless support is present from additional work.

Zone M2-1

Line 151E	Fids. 163.45; 164.65	9/0.5; 9/0.3
	to	
Line 168E	Fid. 058.90	14/1.4
	Sheet 2	

This zone extends for at least eight kilometres between the lines listed above. The overall extent of the conductor is unknown owing to the lack of coverage to the north and south of these lines.

The INPUT responses are generally broad and the source appears to be only weakly conductive. There are usually two or three anomaly peaks on each line.

The zone coincides with an area of dolomitic rocks and alluvial material. Although the anomaly character suggests a surficial source the geological situation warrants more detailed discussion of some EM enhancements within the zone.

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Zone M2-1A — Priority - 3

Line 167E	Fid. 110.60	15/1.5
Line 168E	Fid. 057.78	9/0.9

Sheet 2

This subzone is selected because of the slow to intermediate decay rate indicated on both flight lines. The responses are broad with small to medium amplitudes and are rather broadly shaped.

There is no magnetic activity associated with the zone. The probable cause is a localised thickening of alluvium or increase in the surface conductivity.

Zone M2-1B — Priority - 3

Line 159E	Fid. 013.29	11/1.2
Line 160E	Fid. 246.26	14/1.2

Sheet 2

These are poorly shaped responses with no associated magnetic or altimeter activity. They are selected purely for their slightly anomalous decay rates and would only be recommended for ground investigation if Zone M2-1C is found to be encouraging.

<u>Zone M2-1C</u>		<u>Priority - 2</u>
Line 152E	Fid. 649.68	8/1.0
	to	
Line 157W	Fids. 028.13; 028.44	10/1.0; 9/1.0
	Sheet 2	

This is the subzone of most interest within Zone M2-1. As for the other subzones above, the apparent conductivity of the source looks to be higher in this section than in adjacent sections. The best locations for followup are on Line 154W at Fid. 090.34 and Line 156E at Fid. 053.70.

There is no magnetic signature apparent on any of the profiles.

Zone M2-2

Line 140W to Line 168E

Sheet 2

This is a long zone which runs along the western edge of an extensive area of high conductivity. This area consists of quite slowly decaying small amplitude responses and it covers the eastern side of the survey block between Line 80 and 168. The area is covered mainly by Bukalara sandstone, although the Proterozoic Roper Group outcrops in the north-east corner.

Zone M2-2 is a zone of small to medium amplitude responses which closely approximate the position of the Emu Fault. The zone consists of narrow bedrock-type responses between Lines 140 and 155. North of Line 155 the high conductivity source broadens to a width of approximately three kilometres. One section of this wide zone has particularly slow decay and is described separately as Zone M2-2A. The narrow section of the zone is also described separately as Zone M2-2B.

Zone M2-2A Priority - 1

Line 162W	Fid. 178.28	14/2.5
	to	
Line 168E	Fids. 061.53; 062.05	25/2.9; 34/6.0
	Sheet 2	

This is a broad section of Zone M2-2 where a shallow highly conductive source is apparent. The EM responses are broad and there are generally two peaks on each line. A flat-lying source close to surface is suspected and the high conductivity implies either a carbonaceous bedrock conductor or saline surficial material. The former is the preferred interpretation and locations for ground checking are Line 162W at Fid. 178.28, on Line 166W at Fid. 083.45 and on Line 168E at Fid. 061.53.

The section of Zone M2-2 south of Zone M2-2A may be related but the smaller amplitudes there, suggest that the source is deeper.

Zone M2-2B Priority - 2

Line 140W	Fid. 580.60	11/2.0
	to	
Line 164E	Fid. 152.90	22/4.6

Sheet 2

This zone has very consistent anomaly character along its twelve kilometre length. The responses all have six channel deflections, narrow to moderate width, very slow decay rates and medium amplitudes. The anomalies are also generally asymmetrical, with a steeply sloping western edge and a more gentle slope to the east. This suggests that the conductor may dip to the east.

The zone falls between the Borroloola road and Roper Group sediments and this position corresponds to the Emu Fault line. The conductor is possibly graphitic material in the fault plane although the position is close to the dolomitic Lynott Formation and is geologically encouraging.

Ground followup is suggested at points where the apparent conductivity is highest. These are on Line 144E at Fid. 595.36, Line 152E at Fid. 652.88 and Line 159E at Fid. 017.09. If the conductor proves to be mineralized any further testing is suggested using geochemical methods along the full length of the zone.

Other zones, such as Zone M2-9 may have the same source but appear to be unrelated due to lack of INPUT coverage outside the survey boundaries.

<u>Zone M2-3</u> <u>Priority - 3</u>

Line 155E Fid. 122.88 9/1.7

Sheet 2

This is a poorly shaped small amplitude response recorded off the end of Line 155. Its selection is based on its quite slow decay rate, although there is some doubt that the slightly anomalous amplitude is related to a localised decrease in terrain clearance.

No further investigation is warranted at this stage.

Zone M2-4 Priority - 3

Line 153W	Fid. 130.97	8/1.0
Line 154W	Fids. 082.16; 082.93	9/1.2; 9/1.2
Line 156E	Fids. 066.35; 067.06	11/1.5; 9/1.2

Sheet 2

This is a zone of weak anomalies situated within the broad area of conductivity east of the Emu Fault. The responses display slightly improved amplitudes and decay rates,relative to those of adjacent responses, although two of the anomaly peaks coincide with changes in terrain clearance.

The source of conductivity is likely to be a localised increase in thickness of the background conductivity although the generally small amplitudes suggest the source is not in the Bukalara sandstone at surface.

Zone M2-5		Priority - 3
Line 148W	Fid. 619.59	10/1.9
	to	
Line 151E	Fid. 168.82	6/1.0
	Sheet 2	

This zone is a low priority conductive feature with broad, poorly shaped, small amplitude responses. It is likely to have a similar source as that of Zone M2-4, that is an increased thickness section of conductive surficial material.

<u>Zone M2-6</u> <u>Priority - 3</u>

Line 143W	Fid. 059.43	8/1.4
Line 144E	Fid. 596.90	8/1.2

Sheet 2

This zone is a similar feature to Zones M2-4 and M2-5. Its responses are slightly enhanced in amplitude and decay rate when compared to the already highly responsive background and so a surficial source is suspected. Followup is not recommended on any of these three zones unless the geological setting is particularly encouraging.

Zone M2-7 | Priority - 3

Line 152E | Fid. 658.92 | 9/1.7

Sheet 2

A general increase in apparent conductivity, as determined by amplitude decay rate, is evident east of the Emu Fault between Lines 147 and 152. This anomaly is suggested as a place to sample the area, although it appears that its particularly slow decay rate may be due in part to a contribution from an atmospheric noise burst. Further to this, the large area covered by the conductor implies a surficial source.

Another location to check is on Line 147 at Fid. 006.62 if ground investigation of the response on Line 152 is encouraging.

Zone M2-8 Priority - 2

Line 138W	Fid. 088.04	8/1.0
Line 140W	Fid. 575.60	10/1.9
Line 142E	Fid. 070.17	8/1.0

Sheets 2 and 3

This zone marks the western edge of a broad area of six channel conductivity which extends to the eastern survey boundary. Selections of some responses have been made from within this area and are also described as zones.

Zone M2-8 may represent an edge enhancement of the broad conductive area, and this is most likely the case on Line 142. Each response in the zone however is associated with a coincident change in terrain clearance and this could well be responsible for the amplitude enhancement. Nevertheless a ground check should be considered on Line 142 to test the conductor more thoroughly.

Zone M2-9 Priority - 2

Line 132W Fid. 556.78 6/1.6

Sheet 2

Although this anomaly has poor shape due to atmospheric noise interference it has a reasonable priority rating due to its locally anomalous sixth channel amplitude. The decay rate to channel four is particularly slow, although the amplitude of that channel looks to be exaggerated due to noise. There are no similar conductivites indicated on adjacent lines however.

A surficial source is possible owing to the location in close proximity to the McArthur River drainage feature, but McArthur Group rocks may underlie the alluvium here and a ground check is suggested.

Zone M3-1 Priority - 2

Line 150W	Fid. 182.65	15/3.0
Line 151E	Fid. 179.11	13/2.7
Line 152E	Fid. 663.38	23/4.0

Sheet 3

This zone comprises medium amplitude responses which display good decay rates. The zone is located near alluvium and Roper Group sediments and so geological interest in the conductor is perhaps subdued. Nevertheless the EM data describes a relatively shallow highly conductive source and ground evaluation is recommended.

The shallowest response is recorded on Line 152, and a comparison of amplitudes on the other lines indicates a possible south-east plunge of the conductor. There is no indication of similar anomaly amplitudes on either Line 149 or 153 although highly conductive material is common in the vicinity.

<u>Zone M3-2</u>

<u>Priority - 3</u>

Line 149E

Fid. 246.52

10/1.7

Sheet 3

This anomaly is reasonably narrow and has good amplitude on the late channels. It is located outside the eastern boundary of the survey area and there is no definite indication of continuity to Lines 148 or 150. This lack of support on adjacent lines detracts from the zone's potential as a pyritic basin structure and it is thought more likely to represent a localized thickening of a surficial conductor or an increase in salinity of groundwater.

Zone M3-3 Priority - 2

Line 144E	Fid. 603.70	12/2.0
Line 145E	Fid. 039.41	10/2.1

Sheet 3

This zone is situated in a position straddling the McArthur River channel and marks the western edge of extensive six channel conductivity.

The terrain clearance is high for each response yet their amplitudes are in the medium range. Flight records from adjacent lines show much broader or smaller amplitude peaks so that this zone is selected as an enhanced location for ground checking.

The zone is similar in priority to Zones M2-8 and M3-1 and it is yet to be extablished whether bedrock material is contributing to the responses or whether these zones represent only surficial enhancements.

Zone M3-4 Priority - 2

Line 136E Fid. 561.30 10/2.3

Sheet 3

The most likely cause of this anomaly is the sudden change in terrain clearance evident on the altimeter trace. The response is sufficiently enhanced however to warrant description. The shape is particularly interesting, as is the decay rate, and a massive sulphide or graphite conductor would be expected if it were not for the altitude effect.

Zone M3-5 Priority - 3

Line 132W	Fids. 548.87; 551.07	12/2.5; 17/3.0
Line 134E	Fids. 098.72; 101.20	7/0.8; 9/1.3
Line 136E	Fid. 563.30	12/2.2

Sheet 3

The anomalies in this zone are merely amplitude enhancements recorded within the large area of continuous conductivity on the Bukalara Plateau. Many anomaly peaks within this area can be explained by changing aircraft terrain clearance, but some, as in Zone M3-5,are questionable in this regard.

The responses on Line 132 in particular are suggested for ground checking but, in line with the priority of the zone, only if other information is in support.

Zone M3-6 Priority - 2

Line 128W	Fids. 535.88 to 537.20	6/1.6; 4.5/1.1
Line 130W	Fids. 112.81; 133.60	7/1.0; 6/0.7
Line 132W	Fids. 553.02 to 554.57	15/3.0; 9/1.5

Sheets 2,3 and 4

The main reasons for the selection of this zone are the responses on Line 132 as listed above. The anomaly at Fid. 553.02 has reasonably narrow, well-defined shape and good penetration to the late channels. It coincides with a slight decrease in altitude but this is not considered to be responsible. The other response has smaller amplitude and is broader but is recorded at a higher terrain clearance and so also warrants attention.

There is some suggestion of a narrow peak on Line 130 at Fid. 113.60 and this response should be checked at the same time as the peaks on Line 132. The Line 128 anomalies are noise affected and do not warrant further attention.

<u>Zone M4-1</u> <u>Priority - 3</u>

Line 116E Fids. 494.89; 495.60 12/2.7; 13/2.8

Sheet 4

These two INPUT peaks are of interest due to their lack of coincident change of altitude. In all probability they only relate to a change in thickness of conductive overburden material but the proximity of this area to the HYC deposit adds interest to the location.

The anomalies are rounded but are relatively narrow. They display a somewhat improved decay rate with respect to the surrounding continuous five and six channel response.

Zone M4-2 Priority - 3

Line 108E	Fid. 466.27	13/2.4
Line 110E	Fid. 173.90	8/1.6
Line 112W	Fid. 487.19	12/3.0

Sheet 4

This zone is selected for similar reasons to Zone M4-1. Its responses display slightly anomalous amplitudes and decay rates and the situation is relatively close to HYC. Nevertheless there is little encouragement from anomaly shapes and the conductivity contrast with background is not outstanding.

An increase in conductive overburden thickness is the interpreted cause, but the location, as mentioned above, gives the zone added interest.

Zone M4-3 | Priority - 3

Line 104W   Fid. 458.32   6/1.6

Sheet 4

This zone is selected for its particularly slow decay rate although there is a significant amount of atmospheric noise apparent on the record and this is contributing to the amplitudes on the late channels.

The anomaly also coincides with a decrease in terrain clearance and it is likely that this enhances the response.

The low rating is due to the altitude and noise effects and the zone is not recommended for followup unless the geological location is encouraging.

Zone M4-4 Priority - 2

Line 88E	Fid. 386.40	11/1.8
Line 90W	Fid. 256.38	5/0.9
Line 92W	Fid. 417.46	18/2.0

Sheet 4

This is a narrow linear zone located outside the western survey boundary. It is situated near the Glyde River immediately east of the Emu Fault system. The source of the conductivity is thought to be similar to that causing Zone M2-2B where graphite in the fault zone is suspected, although in this case the conductor appears to be located in Bukalara sandstone.

Since mineralization is located further north along the fault, and McArthur Group sediments are evident west of the fault, the conductor is thought to warrant ground checking. The best target for a ground check is on Line 88 at Fid. 386.4, but it should be kept in mind that the conductor may extend as far north as Zone M2-2B and merge with that zone. In this case a more comprehensive survey of the entire fault zone would give a better idea as to where followup could be concentrated.

<u>Zone M5-1</u> <u>Priority - 2</u>

Line 124E	Fids. 519.45 to 524.60	8/1.5; 11/2.4
Line 126E	Fids. 120.80 to 125.72	8/1.4; 9/1.4
Line 128W	Fids. 529.30 to 532.29	10/2.0; 8/1.7

Sheets 4 and 5

This is a large zone consisting primarily of small to medium amplitude six channel anomalies. In some instances the larger amplitudes are due to the effects of variable aircraft height over a generally conductive background.

Although the suspected cause of conductivity is a general increase in surficial thickness, the priority rating of the zone is intermediate to encourage its further evaluation. Four locations are suggested for investigation, Line 124E at Fids. 522.22 and 524.60 and on Line 126E at Fids. 124.10 and 125.72.

<u>Zone M5-2</u>

<u>Priority - 2</u>

Line 112W　　Fid. 481.08　　8/2.2

Sheet 5

This zone is comprised of one well defined, narrow anomaly. The response penetrates through to all six channels, although there is some effect from atmospheric noise apparent on the eastern side of the response.

A decrease in terrain clearance also coincides with the response but even taking this into consideration the amplitude is anomalous and warrants further attention.

Zone M5-3 | Priority - 3

Line 108E | Fid. 470.99 | 11/2.7

Sheet 5

This response possibly represents the western edge of a somewhat thicker section of surficial material. The response however has both enhanced decay rate and amplitude and so warrants mentioning here in the event that followup of Zone M5-2 is encouraging. There is no evidence of a connection between the two zones, although a less well shaped response occurs on Line 110E at Fid. 178.14.

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Zone M5-4 Priority - 2

Line 104W Fid. 451.98 5/1.2

Sheet 5

This zone has similar character and priority to Zone M5-4. The response is also associated with a slight change in terrain clearance but this is not considered responsible since the anomaly exhibits strong penetration to channel six.

Ground investigation is warranted especially since there is a broad four gamma magnetic high associated.

Zone M5-5 Priority - 3

Line 100E Fid. 447.23 5/1.7

Sheet 5

This zone describes a narrow anomaly peak near the eastern edge of the survey area. It is associated with a fairly sharp decrease in terrain clearance and this is the suspected reason for the slight EM enhancement. No further work is recommended at this target unless Zone M5-4 is found to have an encouraging source.

Zone M5-6 Priority - 3

Line 96E Fid. 421.10 8/1.3

Sheet 5

This response shows enhancement of amplitude and decay with no apparent explanation due to changing aircraft altitude or terrain variation. The anomaly is one of a series of responses coinciding with aircraft movement, but its amplitude and decay rate are improved to an extent not expected from the small magnitude of the altimeter movement.

Zone M5-7 | Priority - 2

Line 88E | Fid. 398.56 | 8/1.6

Sheet 5

This is a particularly enhanced response with good shape, amplitude and decay rate. It is located inside the eastern survey area boundary and is near a drainage feature.

The decay rate indicates a highly conductive source which is slightly offset from a 5 gamma magnetic high. The zone warrants followup on a high priority basis since a massive sulphide or pyritic shale bedrock source is thought to be the likely cause.

The anomaly is associated with a low terrain clearance but the aircraft movement is not severe enough to cause this narrow, slowly decaying response.

Zone M6-1

Line 30AE	Fids. 072.34; 073.99	5/0.6; 13/1.6
	to	
Line 74E	Fid. 325	

Sheets 6 and 10

This is a very large zone which extends for some twenty kilometres and approximately follows the course of the Kilgour River. The zone has quite variable width but is comprised of generally broad, medium amplitude INPUT responses which indicate an intermediate to high conductivity source along the full length of the zone. The apparent conductivity is such that if saline material is not responsible then conductors in the bedrock must be suspected.

Because of the general coincidence of the zone with alluvial material it is thought to have a surficial origin, for the most part. Certain responses with improved or different character are selected for separate discussion since they may have bedrock sources. Some further responses are listed below since they are of interest but do not warrant detailed discussion:

Line 32E	at	Fid. 399.40	7/1.0
Line 36W	at	Fid. 479.28	8/1.9
Line 40AW	at	Fid. 279.90	13/1.0
Line 48W	at	Fid. 079.14	19/3.0
Line 54AE	at	Fid. 497.27	18/2.2

Zone M6-1A Priority - 3

Line 64W	Fid. 244.59 Sheet 6	9/1.0

This is a symmetrical, well shaped response which occurs at the eastern edge of Zone M6-1, just south of its narrow northern section. The anomaly character is encouraging although the decay rate is faster than other locations in Zone M6-1.

Zone M6-1B Priority - 2

Line 56W	Fid. 166.91	29/4.8

Zone M6-1C Priority - 2

Line 56W	Fid. 168.02 Sheet 6	20/4.3

These are very discrete, large amplitude responses located in a Cainozoic soil covered area near the Kilgour River drainage system. Although the responses display very slow decay rates it is thought more likely that thick saline surface material is responsible. Hence the zones do not have a Priority - one rating, which they would warrant if the alluvium was not expected to be conductive.

Zone M6-1D		Priority - 2

Line 46AW | Fid. 306.00 | 8/1.9

Sheet 6

There is some contribution here from atmospheric noise but the anomaly peak has a particularly enhanced decay rate and warrants selection for ground checking to determine if a bedrock source underlies the surface conductors.

Zone M6-1E | Priority - 2

Line 44E | Fids. 001.89; 002.19 | 4/1.0; 7/1.3

Sheet 6

This subzone is included in Zone M6-1 but it is located over Roper Group sediments and does not appear to have a surficial source. The response is fairly broad and displays dual peaks, perhaps indicating there are conductors in both the Crawford Formation and the Abner Sandstone.

The anomaly decay rates are quite slow and the response amplitude penetrates through all six channels. If the geology is considered to be of interest this zone definitely warrants attention in the followup program. This will help determine if there are bedrock conductors in the Roper Group or perhaps whether saline groundwater in the Abner Range is responsible.

Zone M6-1F | Priority - 2

Line 30AE	Fid. 073.99	13/1.6
	to	
Line 40AW	Fids. 280.69; 281.29	16/2.5; 14/1.5
	Sheets 6 and 10	

Zone M6-1F is a highly conductive section at the southern end of Zone M6-1. Some responses exhibit particularly slow decay rates, but the zone is located completely within Kilgour River recent sediments and is most probably due to a locally thick section of these sediments. South of this zone the apparent conductivities are low. High conductivity is not indicated again until Zone M10-2 on Line 24 is reached.

The zone is nearly three kilometres wide at its maximum and includes well rounded INPUT anomalies with dual or multiple peaks. The increased amplitudes at the edges indicate the conductor is probably flat lying. Followup is suggested on Line 30A or on Line 36W at Fid. 478.38.

Zone M6-2 | Priority - 2

Line 48W | Fids. 083.31; 083.90 | 6/1.5; 15/3.0

Sheet 6

This zone includes two slowly decaying responses located well outside the western survey area boundary. The anomaly peaks locate both on outcrop and on recent sediment.

The origin of the conductivity is not clear, and ground investigation is needed to determine whether saline surficial material or bedrock is responsible. The favoured interpretation from the INPUT data is a bedrock (black shale) source and both peaks may represent edge enhancements of one broad source. The eastern peak displays peak offset through the channels which is a common feature of edge effects.

Zone M6-3 Priority - 3

Profil No.1	Fid. 211.11	5.2/0.6
Line 48W	Fid. 082.19	5/0.5

Sheet 6

This is a zone of two weak, broad responses near Beetle Spring. Both anomalies have poor shape but are clearly defined and exhibit slow decays.

Further investigation is not recommended since a surficial source is probable, yet the zone should not be discarded at least until a ground check is carried out at Zone M6-2.

Zone M6-4 — Priority - 3

Line 40AW — Fid. 284.16 — 4/0.5

Sheet 6

This EM zone is located close to Zone M6-1 and possibly reflects an outlying part of the same conductor. There is some spheric noise interference but it can be seen that the response decays to channel five slowly enough to indicate a good conductor is present.

The priority of the zone can be reappraised after ground checks of Zone M10-1 and M6-1 but at this stage it does not encourage further investigation since a surficial source is probable.

<u>Zone M7-1</u> <u>Priority - 3</u>

Line 68AE	Fid. 395.30	6/0.7
	to	
Line 80E	Fid. 356.57	5/0.3
	Sheet 7	

This is a zone of weak conductivity extending some eight kilometres approximately parallel to the Emu Fault system. It consists of both narrow and broad responses with generally surficial character. None of the INPUT responses in the zone display decay rates slow enough to be associated with conductive shales and so the conductor is considered to have a low priority for followup. Nevertheless the geological position is promising and a location for ground checking is on Line 80 at Fid. 356.57. A sharp and narrow well-defined response is located here and coincides with a five gamma magnetic high.

Zone M7-2		Priority - 3
Line 52E	Fid. 108.34	7.5/0.7
	to	
Line 62E	Fid. 452.03	4/0.4
	Sheet 7	

The EM character of this zone is quite similar to that of Zone M7-1. The responses are of variable width, sometimes dual, and have generally poor shape. There is no indication of the high conductivity expected from pyritic shale units so the zone is not expected to have a bedrock source.

If further investigation is warranted due to geological considerations then the response on Line 52 is recommended.

<u>Zone M7-3</u> | <u>Priority - 3</u>

Line 56W	Fid. 146.45	4/0.5

<u>Zone M7-4</u> | <u>Priority - 3</u>

Line 60E	Fid. 182.44	5/0.5

Sheet 7

These are one-line responses selected for their narrow shape and relatively discrete expression. Zone M7-3 is located in an area where the McArthur Group is outcropping. Although the response penetrates only to channel four it is associated with a broad six gamma magnetic high and may thus be significant.

Zone M7-4 is a very similar response but it exhibits improved penetration to channel six. It is coincident with a smooth downward movement of the aircraft but this is not responsible for the anomaly.

There is no support for either zone or adjacent lines and the zones are not interpreted as being targets for pyritic shale basin exploration. They are more typical of the narrow responses recorded over massive sulphide occurrences, except for the low apparent conductivities. It is because of the latter that the zones have low priorities.

Zone M8-1

Priority - 2

Line 68AE	Fid. 407.08	5/1.0
Line 70W	Fid. 365.27	5/1.0
Line 72W	Fid. 287.09	3.5/1.0

Sheet 8

This is a very poorly defined zone selected because of its magnetic association and the weakly enhanced anomaly amplitudes and slow decay rates. The latter are only slightly anomalous relative to the highly conductive background and it is possible that the cause of the enhancement is merely a localized increase in background conductivity.

The zone coincides with a weak, broad magnetic high which is limited to the three lines of the EM conductor. This magnetic activity could reflect a basin structure and gives the zone a priority rating higher than is warranted by the EM character alone.

<u>Zone M8-2</u> <u>Priority - 3</u>

Line 60E	Fid. 195.67	7/0.5
Line 64W	Fid. 220.68	3/0.1

Sheet 8

This zone comprises two rather isolated and discrete anomalies on adjacent two kilometre spaced lines. The anomalies are poorly shaped and have fast decays so are not considered to be indicators of a conductive shale horizon. They are selected because of their isolation and support from, say, geochemical work would be required before followup is recommended.

<u>Zone M9-1</u> <u>Priority - 2</u>

Line 72W Fid. 284.03 5/1.6

Sheet 9

This is a one-line anomaly which is situated approximately two kilometres outside the eastern survey area boundary. The response exhibits noticeably enhanced amplitude and a very slow decay rate. Ground followup is suggested to determine whether the enhancement is due to altitude effect or whether there is a real change of conductivity on the ground.

There is no indication of a similar response on adjacent lines, nor is there any associated magnetic effect.

Zone M10-1 | Priority - 2

Line 32E	Fid. 398.60	9/1.3
Line 34AW	Fids. 176.00; 177.18	7/1.0; 7/0.9
Line 36W	Fid. 481.00	5/0.8

Sheet 10

The main interest in this zone is centred on the three narrow responses which define its eastern edge. The zone straddles a synclinal structure capped with Cambrain sandstone and the responses over the axis of the syncline are broad, in keeping with the probable flat dip in this area.

The most encouraging followup target is on Line 32, although its good shape is perhaps affected by its position at the nose of the synclinal structure.

The probable source is conductive alluvial soils filling the trough, but the conductivity is in the bedrock range and this type of source should not be discounted.

Zone M10-2 — Priority - 2

Line 16E	Fids. 212.52; 214.58	7/0.9; 37/5.0
	to	
Line 32E	Fid. 396.23	2/0.5
	Sheet 10	

Like Zone M6-1, this zone is associated with the Kilgour River drainage area but, unlike the former zone, it also appears to extend outside the area boundary and is located over Roper Group geology.

The INPUT anomalies display very variable character, ranging from very small to large amplitudes and from intermediate to very slow decay rates. The amplitudes show a gradual increase from north to south, suggesting the conductor is deeper where there is outcrop. This suggests a conductor perhaps associated with a saline water table which is deeper away from the river.

For followup these locations are recommended.

Line 16	at	Fid. 214.58
Line 24	at	Fid. 313.64

<u>Zone M10-3</u>		<u>Priority - 3</u>
Line 16E	Fid. 217.80	7/0.8
Line 20W	Fid. 295.03	10/0.9
	Sheet 10	

This is a fairly isolated conductor situated immediately east of Zone M10-2. Both anomalies show penetration to the late channels but the anomaly shapes and decay rates are not indicative of a conductive shale horizon. A localised increase in surficial conductivity is the suspected cause.

Zone M10-4 | Priority - 2

Line 12W	Fids. 193.12; 194.32	5/1.5; 14/2.3
Line 16E	Fid. 209.72	8/1.1
Line 20E	Fid. 302.74	3/0.3

Sheet 10

Zone M10-4 is recorded on the three lines listed above. The responses on Lines 16 and 20 are fairly narrow discrete anomalies. The response on Line 12 is much broader although there is a narrow peak at the eastern end.

The narrow responses approximately line-up and it is suggested that they define the position of a conductive fault zone. The broad conductive section on Line 12 may be of interest however, since its source is extensive and flat lying.

Zone M10-5 Priority - 3

Line 8E	Fids. 104.80; 105.40	3/0.5; 3/0.5
Line 12W	Fid. 189.39	3.5/0.5

Sheet 10

The responses on Line 8 exhibit good decay rates and the zone is discrete and isolated. It may be a southward extension of Zone M10-2, and further investigation is not recommended unless Zone M10-2 is established as having a bedrock source.

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Zone M10-6 Priority - 3

Line 04W Fids. 094.44; 094.90 4/0.5; 4/0.4

Sheet 10

This zone consists of a double peaked small amplitude response with a slow to intermediate decay rate. It has no apparent continuity to adjacent lines.

The probable source is conductive surficial material underlying the Bukalara sandstone.

<u>Zone M10-7</u> <u>Priority - 3</u>

Line 4W Fid. 088.49 6/0.2

Sheet 10

This zone is selected for its rather sharp and narrow shape although it has a fast decay rate and is unlikely to represent a bedrock source.

The possible cause is conductive clay or groundwater in a fault zone.

SHEET 11

The area between Zones M10-2 and M12-1 is covered for the most part by flight lines spaced two kilometres apart and in consequence no attempt has been made to propose conductor continuity between flight lines. The INPUT responses here are generally weak and lack diagnostic characteristics which would allow interpolation between lines.

Zone M11-1 Priority - 3

Line 28W	Fids. 384.79; 385.50 Sheet 11	5/1.0; 6/0.3

This is a dual-peaked response approximately one kilometre wide situated just west of William Creek. The zone is clearly defined on the profiles. There are several other anomalies on adjacent lines with similar dimensions but these are four channel anomalies with less defined shape.

The anomaly at Fid. 384.79 is of most interest since it penetrates through to channel five and exhibits the slower decay rates. The response, nevertheless, is not dissimilar to many of the anomalies in Zone M12-1 and may be due to similar conductive material as causes the latter zone.

Because of this it is not highly recommended for additional investigation at this stage.

A possibly related EM peak is apparent on Line 26A at Fid. 388.34 but the atmospheric noise is too severe on this line to allow proper evaluation of the response.

Zone M11-2 Priority - 3

Line 16E Fid. 222.99 4.5/0.2

Sheet 11

This is a very weak, poorly shaped, broad anomaly which is described here because it is close to Zone M11-3 and because of its penetration to the late channels. The zone is considered to have the lowest priority in any followup program and should only be reappraised if Zone M11-3 proves promising.

<u>Zone M11-3</u> <u>Priority - 2</u>

Line 12W Fids. 183.67; 184.30 6/0.6; 6/0.7

Sheet 11

Two anomalies are included in this zone although they are separated by a narrow resistive section. Both penetrate to all six channels and have slow to medium decay rates. They have fairly narrow shape and are caused by conductors with relatively confined width.

Since the zone is partially located on William Creek it is possible that recent alluvial material is causing the conductivity rather than underlying bedrock material. This is not conclusive however, and further investigation is required to check the conductive source.

<u>Zone M11-4</u> <u>Priority - 3</u>

Line 8E Fid. 108.98 5/0.5

Sheets 10 and 11

<u>Zone M11-5</u> <u>Priority - 3</u>

Line 8E Fid. 110.40 7/0.7

Sheet 11

These zones are described together since they occur in close proximity to each other and may share a common source. Together they define a rather broad conductor with a less conductive section between the peaks. There is no obvious continuity of the zone to adjacent lines.

The apparent conductivity as indicated by the anomaly decay rate is not high and the suspected source is a localized section of conductive surficial material.

Zone M11-6 Priority - 2

Line 8E Fid. 120.64 4/0.6

Sheet 11

This is a narrow six channel response situated in a relatively isolated position with no apparent continuity to adjacent lines. The anomaly is discrete and is interesting because of the restricted dimensions of the conductor and because of the apparently slow decay rate.

There is some doubt as to the validity of the channel five and six amplitudes since the decay seems abnormal past channel four. It is assumed that the amplitude of channel four may be low and thus the late channel amplitudes are real. It should also be noted that the aircraft terrain clearance has decreased in coincidence with the anomaly.

Followup is definitely recommended at this locality and a massive sulphide rather than a shale basin source is possible.

Zone M12-1

Line 00E to Line 37E

Sheets 11 and 12

This is a both long and broad zone which extends from the southern boundary of the survey area approximately eighteen kilometres to the north west between two major faults. Although the zone is comprised of many slowly decaying five and six channel EM responses its large aerial extent detracts from its interest as a shale basin target. There are, however, several locations within Zone M12-1 where anomaly shape, amplitude or decay rate is encouraging enough to warrant further discussion and perhaps ground followup.

The general source of conductivity is the subject of speculation at this stage but it seems likely, because of the generally low amplitudes, that the conductive layer is not in the outcropping Bukalara sandstone but rather, in the underlying Proterozoic rocks. If this is the case the selected subzones described below could be significant in the search for pyritic shale basins in the McArthur Group rocks.

Zone M12-1A Priority - 3

Line 27E	Fid. 023.85	8/1.0
Line 28W	Fid. 377.10	8/1.0

Sheet 11

This zone is selected to sample the narrow northern end of Zone M12-1. The EM responses here are quite similar in character to those encountered in Zones M7-1 and M7-2 and a similar conductive source could be expected.

The apparent conductivities recorded at this end of Zone M12-1 are not particularly high, and a shale conductor is unlikely.

Zone M12-1B Priority - 3

Line 16E	Fid. 233.28	6/1.0
Line 17E	Fid. 091.61	5/0.6

Sheet 11

Both responses in this zone are located at the western edge of Zone M12-1. They are recorded on lines flown to the east and it is quite probable they are "edge effect" enhancements caused by the geometry of the conductor edge.

The zone is only recommended for further attention if followup of Zone M12-1C is encouraging.

Zone M12-1C   Priority - 1

Line 10W	Fid. 027.35	7/0.9
Line 14E	Fids. 064.27; 065.10	7/1.0; 10/1.5

Sheets 11 and 12

This zone is located immediately south of Zone M12-1B and consists of small to medium amplitude, well-rounded anomalies on five flight lines. It is apparent that this zone does not represent a series of edge effects since the better responses are recorded on lines flown west rather than east.

The anomalies exhibit slightly slower decays than are recorded outside the zone. There is no consistent relation between amplitude and terrain clearance, but the best location for followup, on Line 12W at Fid. 174.42, falls on the eastern side of a ridge.

A conductive shale horizon could be responsible for the conductivity and followup is definitely recommended.

Zone M12-1D | | Priority - 2

Line 16E	Fid. 236.30	6/1.0

Zone M12-1E | | Priority - 3

Line 16E	Fid. 237.08	5/0.7

Sheet 12

These are two INPUT zones located adjacent to each other on one flight line. They are situated towards the centre of Zone M12-1 and although they straddle a narrow "resistive" section, they are unlikely to be edge effects.

Zone M12-1D has a second priority rating since its decay rate is enhanced and the anomaly displays good symmetrical anomaly shape. Zone M12-1E has less interesting shape and its penetration to the late channels is less.

There is no support on adjacent lines for a continuation of the conductors and a pyritic shale conductor of the size of HYC is not indicated here. A more feasible interpretation would be of narrower massive sulphide conductors if it is proven that surficial material is not responsible.

Zone M12-1F		Priority - 2

Line 02E	Fid. 037.15	11/1.8
	to	
Line 06W	Fid. 072.97	6/1.0
	Sheet 12	

This zone consists of responses recorded on five flight lines in the south-eastern corner of Zone M12-1. The anomalies are rather broad and poorly shaped and suggest a surficial source, but they have somewhat anomalous amplitudes when compared to other nearby responses. One sharp anomaly is apparent on Line 04W at Fid. 070.34.

The best location for ground investigation is on Line 2E where the source would be closest to surface, but the priority of the conductor is not as high as for Zone M12-1C. The latter zone is more clearly defined and has a better chance of being due to a bedrock source.

Zone M12-1G Priority - 3

Line 24E Fid. 333.78 4/0.8

Sheet 12

This subzone consists of a poorly defined increase in amplitude within Zone M12-1. It displays a relatively slow decay rate when compared with adjacent responses and so is mentioned here. It does not encourage enough interest to warrant investigation at this stage, especially since it is located in the Glyde River channel.

Zone M12-2 Priority - 2

Line 28W	Fid. 362.75	6/0.6
	to	
Line 42W	Fid. 227.20	7/0.5

Sheets 8, 12 and 13

Zone M12-2 defines a long conductor with its width averaging from two to three kilometres. The EM responses indicate quite variable conductivity and conductor character. Some lines have recorded only one anomaly peak whereas others, notably Lines 34B and 36, display multiple peaking.

The zone is well defined with respect to background along most of its length except at its extremities where it either terminates laterally or thins. In any case the source is thought to be one more or less flat lying conductor rather than a series of separate steeply dipping conductors.

The high conductivity in places, and the location in a Proterozoic "window" in the Cambrian cover combine to give this zone a high priority. Suggested places for followup are on Line 36W at Fids. 450.08 and 450.76; on Line 38E at Fid. 209.16 and on Line 40E at Fid. 530.40.

Zone M13-1		Priority - 3
Profile 1	Fid. 259.38	3/0.2
Line 24E	Fid. 353.34	5/0.6
Line 26BW	Fid. 358.15	8/0.5

Sheet 13

The anomaly recorded on Line 24E is the most encouraging in this zone although none of the responses exhibit very slow decay rates or good shape.

The zone is selected mainly for the well defined nature of the anomalies (except on Line 26B where there is a significant noise contribution) and their relative isolation. The INPUT character is such that the followup priority is very low and it is only recommended if the geologist feels the area has potential

<u>Zone M13-2</u>		<u>Priority - 3</u>
Line 08E	Fid. 142.02	5/0.6
<u>Zone M13-3</u>		<u>Priority - 3</u>
Line 08E	Fid. 146.31	11/0.9

Sheet 13

In this south-east section of the survey area the line spacing is such that it is not wise to assume conductor continuity between lines. In consequence, anomalies of interest are described individually and no attempt has been made to correlate similar responses on adjacent lines.

Zone M13-2 is a broad anomaly with poor definition and small amplitude. It is selected for its fairly slow decay and reasonable penetration but is not recommended for further work at this stage.

Zone M13-3 has similar priority because of its faster decay rate but it has medium amplitude and stands out for this reason.

Zone M13-4 Priority - 2

Line 00E Fids. 054.99; 055.79 9/1.0; 9/1.1

Sheet 13

At the eastern end of Lines 00 and 04 there is a wide conductor marked by medium amplitude, dual peaked INPUT responses. The section indicating the highest apparent conductivity has been selected here for discussion and is suggested for ground investigation. The responses have surficial character but a medium conductivity, flat lying shale horizon could be responsible.

If followup is encouraging, the responsive area recorded between Fids. 057 and 058 on Line 04 should also be looked at. It is also possible that the conductor extends south of Line 00, although there is no airborne EM coverage here to confirm this.

The zone locates over a broad 30 gamma magnetic high,

VI. TABLE I - Summary of Selected Conductors

Priority - 1	Priority - 2	Priority - 3
M1-1A	M1-1B	M1-2
M2-2A	M2-1C	M1-3
M12-1C	M2-2B	M1-4
	M2-8	M1-5
	M2-9	M1-6
	M3-1	M1-7
	M3-3	M2-1A
	M3-4	M2-1B
	M3-6	M2-3
	M4-4	M2-4
	M5-1	M2-5
	M5-2	M2-6
	M5-4	M2-7
	M5-7	M3-2
	M6-1B	M3-5
	M6-1C	M4-1
	M6-1D	M4-2
	M6-1E	M4-3
	M6-1F	M5-3
	M6-2	M5-5
	M8-1	M5-6
	M9-1	M6-1A
	M10-1	M6-3

TABLE I - Summary of Selected Conductors Cont'd

Priority - 2	Priority - 3
M10-2	M6-4
M10-4	M7-1
M11-3	M7-2
M11-6	M7-3
M12-1D	M7-4
M12-1F	M8-2
M12-2	M10-3
M13-4	M10-5
	M10-6
	M10-7
	M11-1
	M11-2
	M11-4
	M11-5
	M12-1A
	M12-1B
	M12-1E
	M12-1G
	M13-1
	M13-2
	M13-3

VII. CONCLUSIONS AND RECOMMENDATIONS

1. Table I summarizes our interpretation of the conductors in the McArthur River area. The selected conductors are given priorities according to the probability that the source will be in the bedrock and will consist of pyritic shale material.

2. Three Priority - 1 selections have been made and are recommended for thorough ground followup in order to evaluate them fully.

3. Thirty-one Priority - 2 zones are listed. All of these zones are recommended for further investigation but the targets of most interest for initial followup are listed below :

Zone	M1-1B	Zone	M8-1
	M2-2B		M10-2
	M3-1		M12-1D
	M3-3		M12-2
	M4-4		M13-4
	M5-7		
	M6-1B		
	M6-1C		
	M6-1F		

4. The remaining selections are placed in the Priority - 3 category. They should not be the subject of further work unless they are associated with areas on interesting geology or until initial followup of other zones determines that certain of these conductors warrant ground evaluation.

5. Anomalies which have not been zoned and are deemed to be of little interest are, at the request of AMOCO, not included on the EM Plan Maps. Four EM Ratio Maps have been compiled and were used for the interpretation but they do not show interpretation information.

6. Magnetic associations are mentioned where they occur, but their significance in this province is not clear.

7. Further review of this interpretation is recommended after initial ground followup helps to establish the cause of the extensive conductivity recorded within the Bukalara sandstone. This extensive conductivity is apparent east of the Emu fault north of Line 92 and in the area enclosed by Zone M12-1. The high conductivity apparent in these areas may make discrimination between conductors of bedrock and surficial origin less reliable than in other areas.

Respectfully submitted,

G. Butt,
Geophysicist.

APPENDIX A

INPUT EQUIPMENT AND PROCEDURES

I. BARRINGER INPUT SYSTEM

a) General:

The INPUT (INduced PUlse Transient) method is based upon the study of the decay of secondary electromagnetic fields created in the ground by short pulses generated from an aircraft. The time-varying characteristics of the decay curve are analyzed and interpreted in terms of information concerning the conductivity characteristics of the terrain.

The principle of separation in time between the production of the primary field and the detection of the measured secondary signal gives rise to an excellent signal-to-noise ratio and an increased depth of penetration compared to conventional continuous wave electromagnetic systems. It also makes the INPUT system relatively independent of air turburlence.

At a normal survey altitude of 400 feet (120 metres) above terrain, the typical effective depth penetration is estimated at about 400 feet (120 metres) below surface, depending on the conductivity contrast between the conductive body and surrounding rocks, the size and attitude of the conductor and the presence or lack of conductive overburden. In optimum conditions a penetration of 600 feet (185 metres) subsurface can be achieved.

INPUT SIGNAL

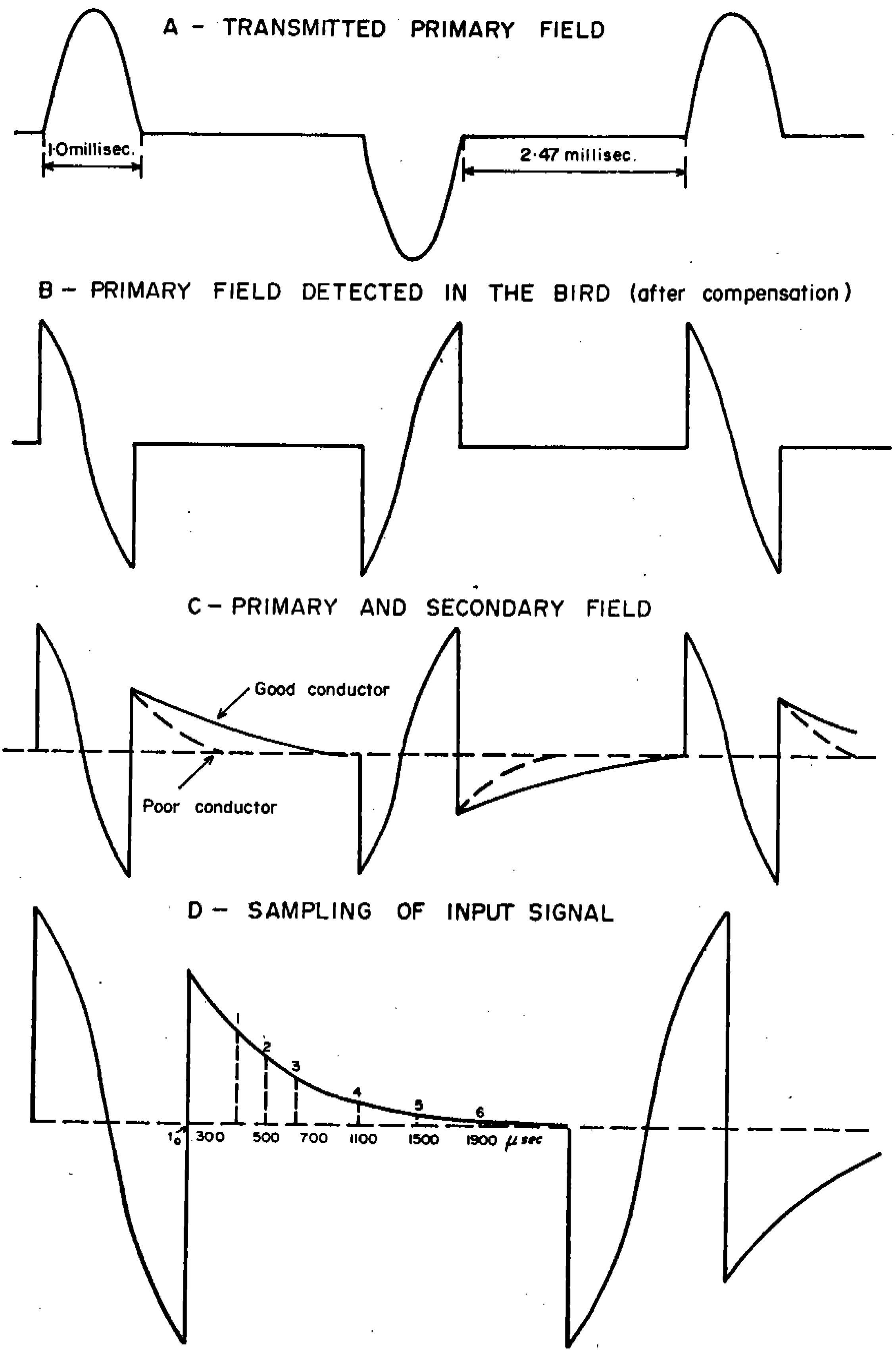


FIGURE 1.

geoterrex

One of the major advantages of the INPUT method lies in good differentiation between flat-flying surface conductors and bedrock conductors so that the latter can be detected even under a relatively thick overburden such as glacial or pedological formations (laterite, weathered zone, etc.).

However, the application of the airborne INPUT electromagnetic method is limited to the solution of problems that are characterized by a reasonable resistivity contrast. The method is not considered to be applicable to the direct search for disseminated mineralization, except where this resistivity contrast exists.

b) Equipment:

The INPUT system has been developed by Barringer Research Limited of Toronto, Canada.

The transmitted primary field is discontinuous in nature (Fig. 1A) with each pulse lasting one millisecond; the pulse repetition rate is 288 per second. The electromagnetic pulses are created by means of powerful electrical pulses fed into a 3-turn shielded transmitting loop surrounding the survey aircraft and fixed to the nose and tail of the fuselage and to the wing tips.

TYPICAL INPUT RECORDING

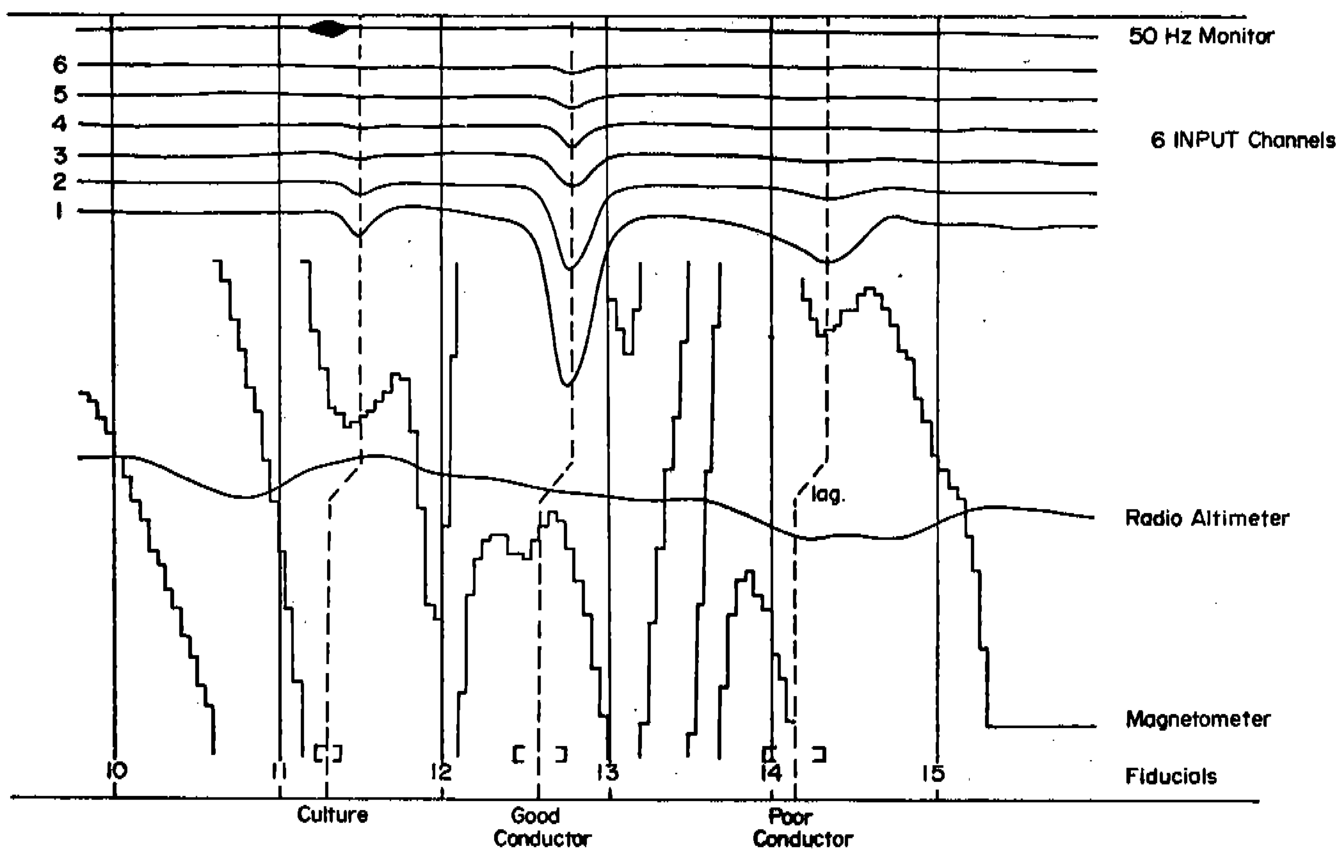


FIGURE 2.

geoterrex

The secondary field reception is made by means of a receiving coil wound on a ferrite rod and mounted in a "bird" towed behind the aeroplane on a 500 foot (150 metre) co-axial cable. The axis of the pick-up coil is horizontal and parallel to the flight direction. Gaps of two and a half milliseconds between successive primary pulses (Fig. 1B) are used for detecting the INPUT voltage, which is a transient voltage (Fig. 1C) corresponding in time to the decay of the eddy currents in the ground.

The analysis of the signal is made in the INPUT receiver by sampling the decay curve at several points or gates, the centre and width of which have a fixed relationship with respect to time zero (t_0) corresponding to the termination of the pulses. There are six sampling gates, the centres of which are commonly at a mean delay of 300, 500, 700, 1100, 1500 and 1900 microseconds after time zero (Fig 1D).

The signals received at each sampling gate are processed in a multi-channel receiver to give six analogue voltages recorded as six continuous analogue traces (Fig. 2) on a Honeywell Visicorder direct-reading optical galvanometer recorder. Each trace represents the coherent integration of the transient sample, the time constant of integration being about three seconds on the Mark V unit.

This integration delay plus the separation between the receiving bird and tracking camera installed in the aircraft introduces a delay which has to be taken into consideration and corrected prior to correlating the electromagnetic data with the other simultaneously recorded data.

Other recorded data are:

- Fiducial marks
- Altimeter trace
- Earth's total magnetic field
- Hz monitor
- Radiometric levels (optional)

An eddy current is induced in the airframe by the primary field. To compensate for this effect a special device is used which feeds into each channel of the INPUT receiver a signal equal in amplitude and waveform but opposite in polarity to the signal induced by the airframe eddy current. The compensation signal is derived from the voltage induced in the receiving coil by the primary field. It is constantly proportional to the inverse cube of the distance between the bird and the aircraft. Thus, swinging of the bird and changes of coupling are automatically corrected. The compensation adjustment is a simple procedure carried out during flight at a terrain clearance of 2,000 feet (600 metres) to eliminate the interference of ground conductors.

II. MAGNETOMETER

The magnetometer is a Geometrics G-803 nuclear precession unit (with high performance option) especially adapted to operate in conjunction with the INPUT equipment. Readings are taken every 1.0 second with a sensitivity of plus or minus 2 gammas and recorded at a full scale of 5 inches for 200 gammas. The coarse trace is recorded at a full scale of 5 inches for 2,000 gammas. The sensing head is mounted at the end of a 3-metre stinger, on the tail of the PBY aircraft. The magnetometer record is also shown in Figure 2.

III. OTHER EQUIPMENT

The tracking camera is a 35 mm Aeropath AS-5 continuous strip camera equipped with a wide-angle lens. The 35 mm film is synchronized with the geophysical record by means of fiducial marks printed every 20 seconds; the counter of the intervalometer being driven by the clock of the magnetometer.

An APN-1 Altimeter is used, and its output is recorded on the chart.

In most cases a Hz monitor is employed to assist in the detection of power lines.

Optional equipment can include a Doppler navigation system, frame camera (in addition to the strip camera), spectrometer and a digital recorder.

IV. PROCEDURES

a) Field Operations:

The flight line spacing is normally in the range of 1/8 mile to ¼ mile. During survey flights, the altitude of the aircraft is maintained at approximately 400 feet (120 metres) above the ground with the bird flying about 200 feet (60 metres) below the aircraft.

The heading of the aircraft is such that two adjacent lines are normally flown in opposite directions. Visual navigation is based on airphoto mosaics or in some cases on topographic maps of suitable scale.

Just after take-off, the calibration of the altimeter is checked by flying straight and level over the runway at a barometric altitude AGL of 400 feet (120 metres). The compensation adjustment is checked during ferry from the base to the survey area.

b) Compilation:

At the end of each flight, all records and films are developed, edited and all synchronized fiducial marks are checked. Then, the actual flight path recovery is made by picking visible marks common to both 35 mm film and photo mosaics.

Identified points with their fiducial number are plotted on the mosaic. Then, the electromagnetic anomalies are transferred from the records onto the mosaic overlay by interpolation according to their own fiducial number.

The position of the INPUT anomalies must be corrected to take into account the separation between the bird and the aircraft as well as the delay introduced in the integration circuitry. This offset, or lag, is plotted towards the smaller fiducial numbers (to the left on the record).

The INPUT anomalies are represented on a map by means of symbols that condense the most significant characteristics: the location of the centre and half-peak width of the electromagnetic anomaly; the number of INPUT channels affected by a noticeable deflection; the peak amplitudes of the first and fourth channels. Shown also are the altitudes at which the anomalies were recorded, the amplitude of any magnetic features which coincide with INPUT anomalies and any associated response on the Hz monitor.

The only subjective elements introduced by this processing are in the decision as to whether a deflection corresponds to a genuine anomaly or to a noise source (electrostatic atmospheric discharge, compensation noise, etc.) and in the correlation of the anomalies from line to line to delineate a conductive zone.

APPENDIX B

INPUT INTERPRETATION

I. INTRODUCTION

Although the approach to interpretation varies from one survey to another depending upon local conditions, the following generalizations may provide the reader with some helpful background information.

The main purpose of the interpretation is to determine the probable origin of the conductors detected during the survey and to suggest recommendations for a further exploration programme by taking into account a limited amount of available geophysical data. This is possible through an objective analysis of all characteristics of the different types of conductors and correlating magnetics, if any. Then, the maps of electromagnetic results are compared to the available geological maps. A certitude is seldom reached, but a high probability is obtained in the appreciation of the conductive causes in most cases. One of the most important problems is usually the differentiation between non-economic surface conductors and bedrock conductors.

II. TYPES OF CONDUCTORS

a) Bedrock Conductors:

The different types of bedrock conductors that are normally encountered are the following:

1. <u>Graphites</u> (including a large variety of carbonaceous rocks) occur in the sedimentary formations of the Precambrian as well as in volcanic tuffs, often concentrated in shear zones. They correspond generally to long, multiple conductors lying in parallel bands. They are not magnetic unless associated with pyrrhotite or magnetite. Their conductivity is variable but generally high.

2. <u>Massive sulphides</u>. Syngenetic sulphides often correspond to long multiple conductors and their conductivity,which varies considerably,may be very high, as for graphites. Pyrrhotite, often associated with other sulphides may be the cause of coincident magnetic anomalies. Generally, sulphides are not as frequently encountered as is graphite.

Isolated orebodies of massive sulphides give rise to short conductors of high conductivity. They present quite often a direct magnetic anomaly and are easily recognized. However, some sulphide orebodies are not magnetic, some are not very conductive (discontinuous mineralization), and they can be located among formational conductors so that one must not be too dogmatic in the selection of the prospects.

3. <u>Magnetite and some serpentinized ultra-basic</u> rocks are conductive and very magnetic.

4. Manganese oxides may give a weak electromagnetic response.

b) Surface Conductors:

1. Clayey alluvium or residual soils, some swamps and brackish groundwater are usually poorly conductive to medium conductive.

2. In unglaciated areas lateritic formations, residual soils and the weathered layer of the bedrock often cause surface anomalous zones, the conductivity of which is generally low to medium but can occasionally be high. Their presence is often related to the lithology of the underlying bedrock.

c) Man-made Conductors (Cultural):

1. Power Lines. These frequently, but not always produce a conductive type response on the INPUT record. In the case of direct radiation of their field, the anomaly shows phase changes with the different channels which are recognized easily. In the case of a grounded wire, or steel pylon, the anomaly may look very much like a bedrock conductor.

2. Grounded fences or pipelines. These will invariably produce responses much like a bedrock conductor. Whenever they cannot be identified positively a ground check is recommended.

3. General Culture. Metal barns or houses, tailings ponds, dumps, etc., may produce INPUT anomalies. However, their instances are rare and can generally be verified by identification on the path recovery film.

III. ANALYSIS OF THE CONDUCTORS

The apparent conductivity alone is not generally a decisive criterion in the diagnosis, and other factors are also very important:

- the pattern of conductors
- the shape and size
- the associated geophysical parameter (aeromagnetics)
- the position with respect to the direction of structures
- the geological environment
- the local variations of characteristics within conductive zones.

The first objective of the interpretation, then, is to classify each zone under one of three categories, according to its most likely origin. The categories are cultural, surficial, and bedrock. A second objective is to give each zone a rating as either good, fair or poor, according to its potential as a sulphide prospect if it were considered as a bedrock conductor.

The characteristics of each of the three major classifications are discussed below in subsections a, b and c.

For any particular anomaly or zone the criteria used to analyze it are applied as rigorously and consistently as possible in order to establish the correct classification. In the vast majority of zones finally selected, the evidence is never totally conclusive. Consequently, the ultimate class selection is the one which appears to be the most probable, bearing in mind that every zone which is discussed in detail has some chance of being a bedrock conductor.

The experience of handling a large amount of INPUT data and observing the ground followup results over a large portion of this data has confirmed the validity of our interpretational criteria.

a) Cultural Conductors

The vast majority of cultural anomalies occur along roads and are accompanied by a 50 Hz response. Power lines are clearly the most common source. Although some power lines are recognised immediately on the records by virtue of phase reversals or an abnormal rate of decay, most yield INPUT anomalies of a normal "high conductivity" character which would be mistaken for bedrock responses. There are also many power lines which cause no INPUT response whatsoever.

Fences, pipelines, communciation lines, railways and other man-made conductors can give rise to INPUT repsonses, the strength of which will obviously depend on the grounding of these objects.

Our analysis of suspected cultural anomalies is helped a great deal by the 50 Hz monitor. It is important to note, however, that the 50 Hz response must be sharply peaked in order to be a reliable indicator and it is equally noteworthy that the 50 Hz response along a power line will occasionally vanish on one or more lines.

The exact location of an INPUT anomaly with respect to the associated 50 Hz response is important. In cases where a definite cultural conductor is known, the lag between the monitor and INPUT responses is consistnet from line to line. Any departure of the lag interval from the "normal" would raise suspicion of an additional conductor being present.

The direction of the power line must also be considered, as the inductive response diminishes, sometimes markedly, with reduced coupling when the power line makes a shallow angle with the flight line. In other cases, the shallow angle results in a broadening of the anomaly shape and of the 50 Hz response.

Geological conductors often carry 50 Hz response in the vicinity of power lines but these usually have the appearance of broad swells on the monitor record rather than sharp peaks.

Invariably, there are a few borderline cases which are uncertain; hence the "Hz?" nomenclature appears occasionally on the maps.

It is also necessary to utilize the tracking film. The exact positions of all anomalies, with the exception of the obvious broad surficial features, are checked on the film and possible cultural sources, or the lack thereof, are noted on the work sheets. In this way, cultural features are located which may not be apparent on the planimetric maps, as are small offsets from cultural features which can be very significant in the interpretation of the data.

Another facet of this analysis is the line-to-line comparison of anomaly character along suspected man-made conductors. In general, cultural anomalies should be very narrow, sometimes exhibiting small negatives on their leading edge, and the lag for plotting is often slightly greater than for geological conductors. The INPUT amplitude, the rate of decay, and the anomaly width should not vary a great deal along any one man-made conductor, except for the variation in amplitude related to terrain clearance variation. A marked departure from the average response character along any given feature gives rise to the possibility of a second conductor.

Any monotonous string of narrow anomalies along a road with a sharp 50 Hz response can be discarded immediately. Even the more localized narrow anomalies can usually be eliminated if a potential cultural source is evident on the tracking film and there is a sharp 50 Hz response. A response over a farm or a farm laneway can be eliminated with confidence if the source of power to the farm is obvious. Similarly, an apparently isolated response along a road can often be discarded by checking for feeble, unplotted anomalies on adjacent lines or for 50 Hz responses with no INPUT anomalies.

Anomalies identified as cultural with a very high degree of reliability (designated by "C") can be ignored in the followup programme. In those cases where any reasonable element of doubt remains as to the type of source and/or where the anomalies have sufficiently favourable character to be considered sulphide prospects, a "C?" is shown and the conductive zone is outlined and a ground check is usually recommended.

In most cases a visual examination of the site will suffice as it is only necessary to verify the presence of a man-made conductor. In a few instances we know already that one cultural conductor is present and the object of the ground check is to determine if there is a second cultural source, a variation in the construction of the single source, a change in the grounding conditions, or perhaps a bedrock source. This type of check is obviously more difficult to accomplish.

b) Surficial Conductors

This term is used for geological conductors in the overburden, either glacial or residual, and in the weathered layer of the bedrock. Most surficial conductors are probably caused by clay minerals. In some environments, sälty deposits give rise to highly conductive surficial features.

Other possible electrolytic conductors are residual soils, swamps, brackish groundwater and lake or river-bottom deposits.

Fortunately, most conductive surficial features have low, or at best, intermediate conductivity so they are not easily mistaken for highly conducting bedrock features. Many of them are very broad features and their anomaly shapes are typical of broad horizontal sheets.

When the conductivity is higher, it is usually still possible to identify a flay-lying surficial conductor, thanks to a typical asymmetry in the INPUT responses observed on both edges of the conductor (edge effect) when flying adjacent lines in opposite directions (Figure 1). Flying from A to B, the coupling between the transmitting coil and the flat-lying conductor AB is maximum when the coil is over the leading edge A and minimum when the coil is over the edge B. The INPUT response appears stronger over Point A than over Point B. The phenomenon is reversed when

EDGE EFFECT

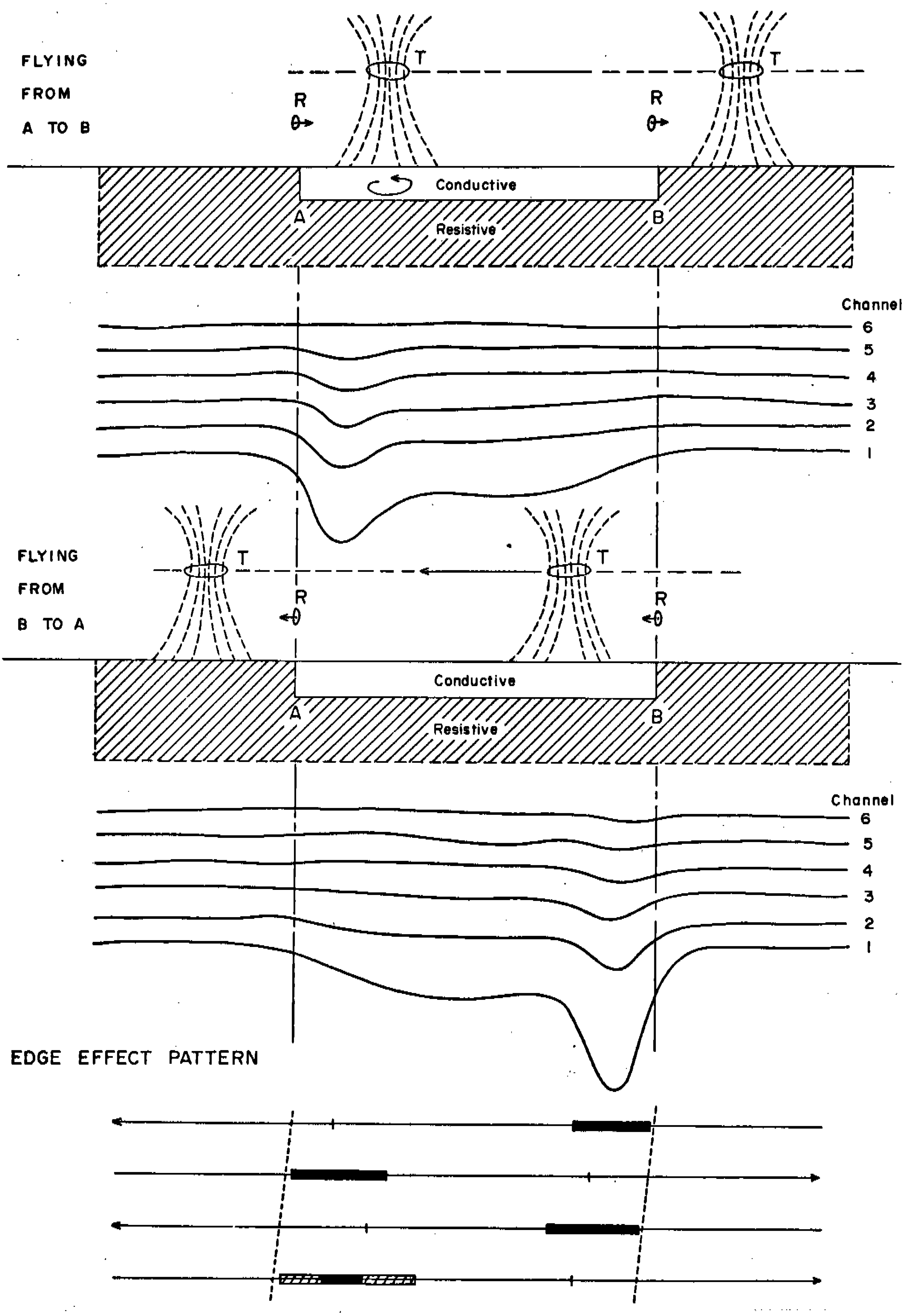


FIGURE 1.

geoterrex

flying from B to A. The actual limits of the conductive zone correspond, in fact, to the envelope of the leading edges of staggered anomalies. In practice there are many variations on this basic pattern caused by variations in width, thickness and conductivity.

Other surficial conductors may be recognized by analyzing the radio-altimeter trace, e.g. conductive deposits in the valleys or increased thickness of the weathered zone on top of the hills. Also, a comparison to the altimeter profile is essential when flying over a surface layer of apparently high conductivity where a sudden dip of short duration (or small hill) can cause an apparent anomaly which is quite sharp.

However, the existence of surficial conductors related to bedrock lithology does introduce ambiguities into the interpretation. There are instances where we cannot distinguish between weakly conductive serpentine or poorly developed graphite within the bedrock and weakly conducting soils or weathered layer above the bedrock. This does not generally detract from the prime purpose of the survey which is the location of highly conducting massive sulphides, but it does complicate the overall analysis of the data.

If the anomaly shapes show a dependence on line direction, a surficial source is probable; if they show multiple peaking and a lack of dependence on line direction a bedrock source is probable; but in the weaker anomalies the shape is often insufficiently clear for a reliable interpretation.

Formational surficial conductors seem to be most commonly related to rocks of intermediate to basic composition, as they tend to follow magnetic highs. (This is also true of most of the formational bedrock conductors.) However, there are also examples of formational surficial conductors in acidic environments.

Surficial conductors are not always portrayed completely on the EM Map because weaker INPUT responses are not usually plotted. Sometimes, the distribution of this type of conductor is indicated by the stronger sections which are plotted and by the conductor outline which delineates the entire zone.

Any outlined conductive zones which are not assigned an identification number can be taken as interpreted surficial features. Similarly, any isolated anomalies which bear no zone number and no "C" designation are interpreted as surficial.

c) Bedrock Conductors

This category is comprised of those anomalies which do not fit the criteria laid down for classifications a and b. It is difficult to assign a specific set of values which signify bedrock conductivity because any individual zone or anomaly might exhibit some, but not all, of these values and still be a bedrock conductor.

The criteria considered as favourable pointers to a bedrock conductor are:

1. Intermediate to high conductivity. Channels five and six are generally affected. Where the conductivity drops (i.e. first to fourth channel ratios greater than 15) it is difficult to distinguish narrow surficial conductors from bedrock ones.

2. Good anomaly shape. Narrow, relatively symmetrical, anomalies with well defined peaks are preferred to wider anomalies with rounded peaks. The leading flank should show a gradual increasing response with no abrupt change in slope or tendency to go negative.

3. No serious displacement of anomaly peak position with line direction, i.e. edge effect. Some displacement can be expected from a wide bedrock source or banded bedrock source which is not resolved into more than a single peak. However, major displacements in peak position appears to be associated with surficial conductors only.

4. Small to intermediate amplitude. Large amplitudes do occur but, generally, the amplitude of the response is smaller than for thick, extensive surficial conductors. The amplitude varies according to the depth of the source.

5. A degree of continuity. Maintenance of any, or all, of characteristics 1, 2, 3 and 4 is strong evidence in favour of a bedrock conductor.

6. Associated magnetic response with similar strike. A related magnetic response is usually interpreted as signifying a lithologic unit carrying the magnetic and conductive material.

However, as discussed in subsection b, some basic rocks which weather to produce a conductive upper layer will possess this magnetic association. In the absence of characteristics 1, 2, 3 or 4, the related magnetic response does not help to distinguish between surficial conductivity related to a bedrock feature and genuine bedrock conductivity.

Interference, then, with a conductive overburden can make the identification of a bedrock conductor somewhat difficult but a careful and consistent comparison of residual responses to the above criteria results in a high level of success.

Residual anomalies, basically, are those which, in comparison to other deflections, appear to be located "on" rather than "part of" the already deflected traces.

Most obvious bedrock conductors occur in long, relatively monotonous, sometimes multiple zones following formational strike. Graphitic material is usually the most probable source. Massive syngenetic sulphides running for many miles are known in nature but, in general, they are not common.

Other sources of bedrock conductivity are massive magnetite and serpentine. We rely heavily on the amplitude and dimensions of the associated magnetic activity plus the geological setting of the conductor to distinguish these cases.

The criteria used for selection of a bedrock conductor which is considered to have a good chance of being due to a massive sulphide are:

- high conductivity,
- good anomaly shape,
- small to intermediate amplitude,
- isolation,
- short strike length,
- preferable with a localized, small amplitude magnetic anomaly of the same width.

If the magnetic anomaly has similar lateral dimensions, has an amplitude of the order of 20 to 400 gammas, and correlates directly with the EM response, there is a strong possibility of pyrrhotite being present.

We must consider, however, the possibility of localized occurrences of massive sulphides within or near formational conductors. The selection of targets from within these extensive belts is a difficult problem. They are singled out primarily on the basis of a marked local increase in conductivity and/or amplitude or some evidence for a relatively localized occurrence. Variations within the conductive formations themselves can account for these characteristics so the reliability of this type of selection is considered to be low.

Localized magnetic correlations within long formational conductors can be taken as evidence of pyrrhotite. In some environments, however, this criterion is very difficult to apply due to the prevalent association of conductors to magnetically active rock types. The compilation of the magnetic data into isomagnetic contour maps assists this type of selection.

APPENDIX C : INSTRUMENT SPECIFICATIONS

MARK V INPUT SYSTEM

TRANSMITTER : Repetition Rate: 288 pulses / sec.

Pulse Width : 1.0 msec.

Pulse Separation: 2.47 msec.

RECEIVER:

CHANNEL	GATE CENTRE (usec)	GATE WIDTH (usec)
1	400	200
2	600	200
3	800	400
4	1200	400
5	1700	600
6	2100	600

Time Constant : 2.5 secs.

Calibration : 2mV at cable amplifier = 1.5" trace deflection.
Sensitivity of received signal, as ppm/0.1"
of peak-peak primary field, measured during
straight and level flight.
Rx signal = 1.0V.

MAGNETOMETER : GeoMetrics Model 803

		Sensitivity	Scale
Fine Scale	: 200γ Full Scale	± 2γ	inch = 40γ
Course Scale	: 2000γ Full Scale	± 20γ	inch = 400γ

Total field increases downwards.

Magnetometer reads every 1.05 sec.

SPECTROMETER : Exploranium DiGRS 3001

4 channel Differential Gamma Ray Spectrometer

906 cubic inches of NaI (Th) crystals (temp. stabilized)

Integral : 0.5 - 2.82 MeV

Potassium : 1.35 - 1.57 MeV

Uranium : 1.63 - 1.89 MeV

Thorium : 2.42 - 2.82 MeV (Window widths = 15% of MeV value of element peak)

Analogue Settings

	K	U	Th	Integral	
Flight 7 -	200	100	100	999 x 16	CPS
Flights 9→18 -	200	100	100	999 x 8	CPS

Reading Time : 1.5 secs.

150 CPS calibrations, zero levels, background at 2000' and subtractions are monitored before and after each flight.

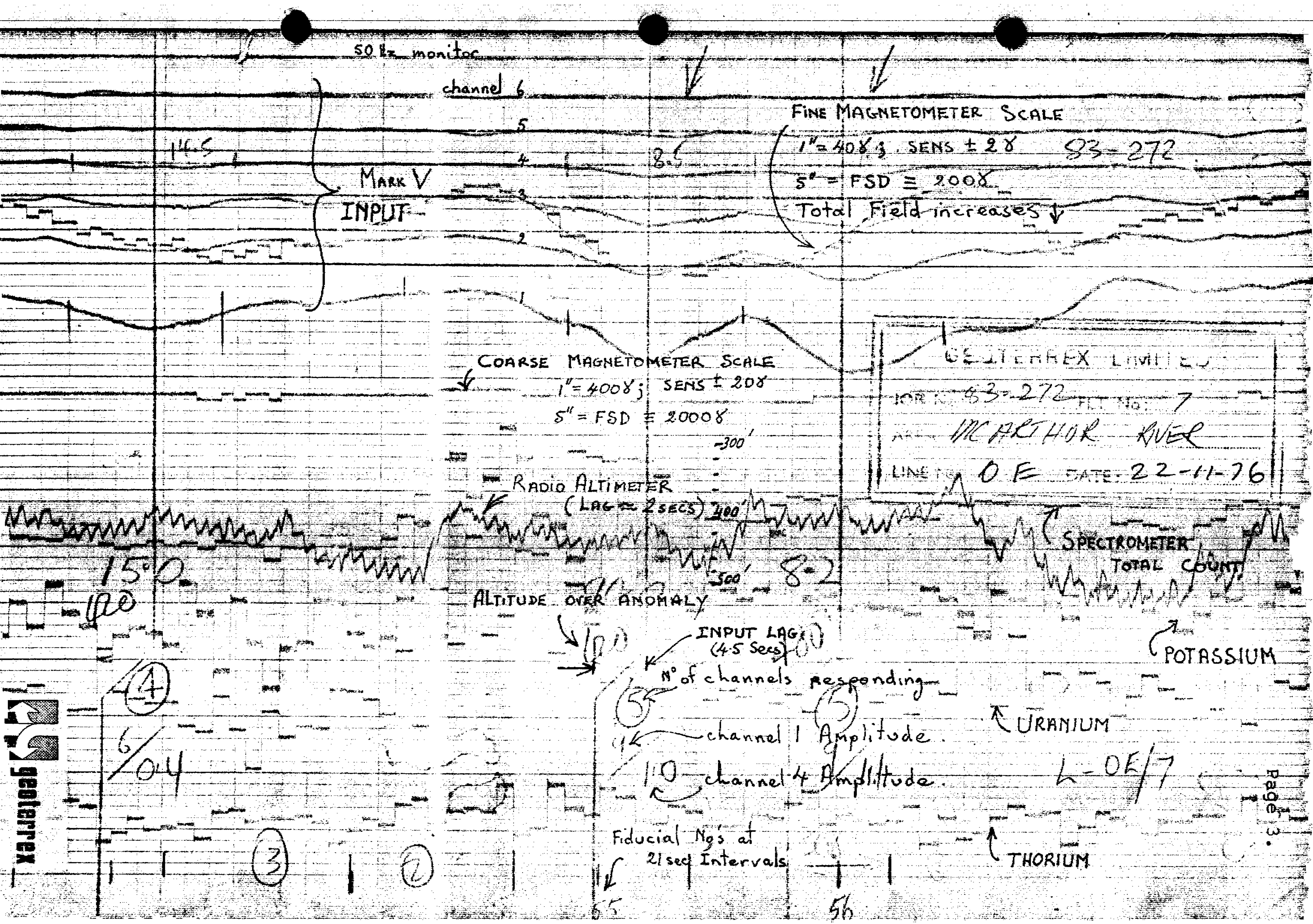
ALTIMETER : Model APN-1

Approximate scale : 1 inch = 200 feet

Height increases downwards.

FIDUCIAL SYSTEM : 1 fiducial = 21 secs = 20 magnetometer readings.

INPUT lag = 4.5 secs = .21 fiducials.



50 Hz monitor
channel 6
5
4
3
2
1
MARK V INPUT
14.5
8.5
FINE MAGNETOMETER SCALE
1" = 40γ ; SENS ± 2γ
5" = FSD ≡ 200γ
Total Field increases ↓
83-272
COARSE MAGNETOMETER SCALE
1" = 400γ ; SENS ± 20γ
5" = FSD ≡ 2000γ
300'
RADIO ALTIMETER
(LAG ≈ 2 SECS)
400'
300'
15.0
8.2
120
ALTITUDE OVER ANOMALY
INPUT LAG (4.5 Secs)
N° of channels responding
channel 1 Amplitude.
channel 4 Amplitude.
Fiducial No's at 21 sec Intervals
4
6/04
3
2
5
5
19
65
56
SPECTROMETER TOTAL COUNT
POTASSIUM
URANIUM
THORIUM
L-0E/7
GEOTERREX LIMITED
JOB No. 83-272 FLT. No. 7
MCARTHUR RIVER
LINE No. 0 E DATE 22-11-76
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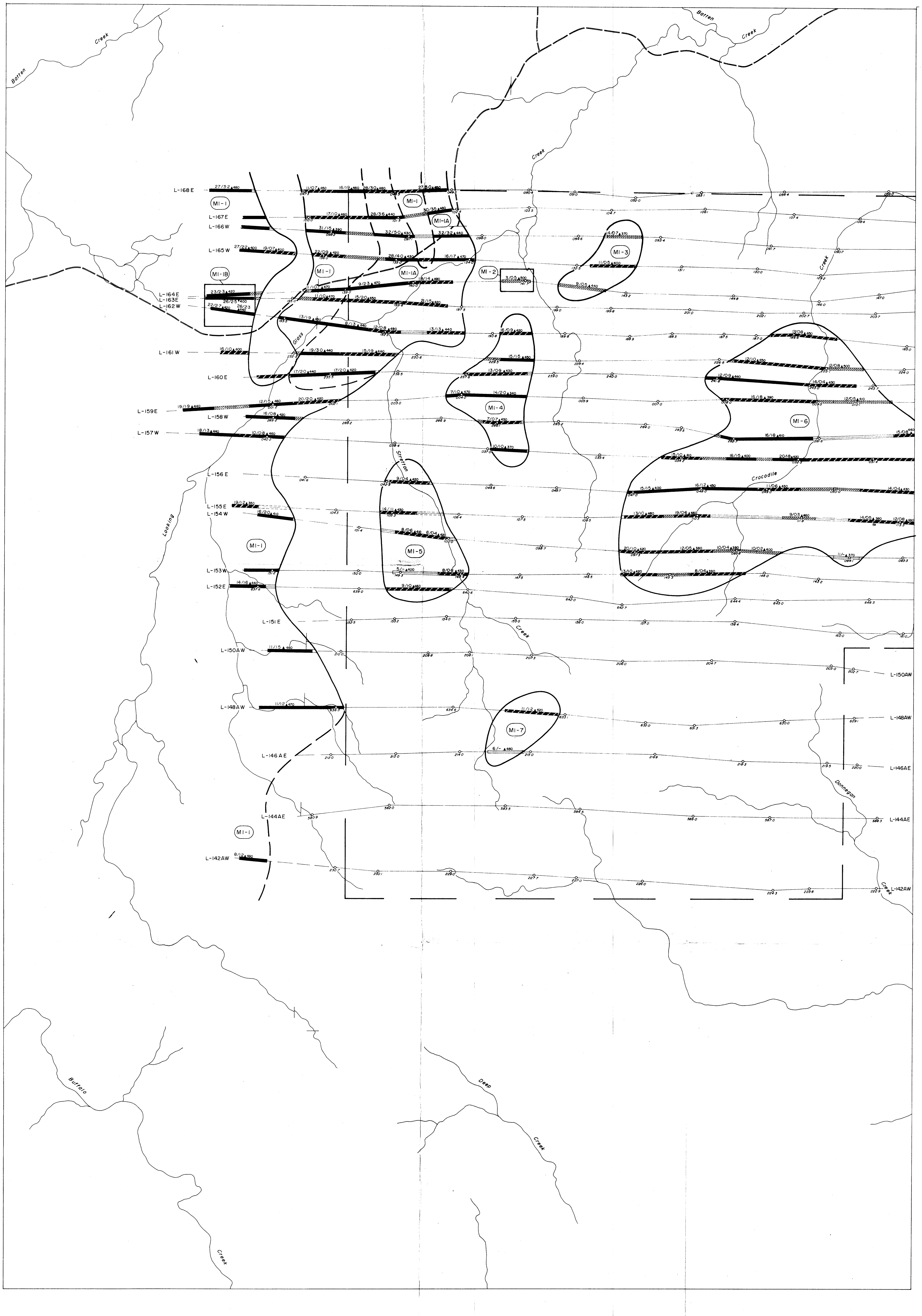


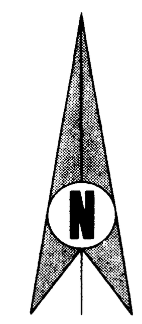
INPUT LEGEND

6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

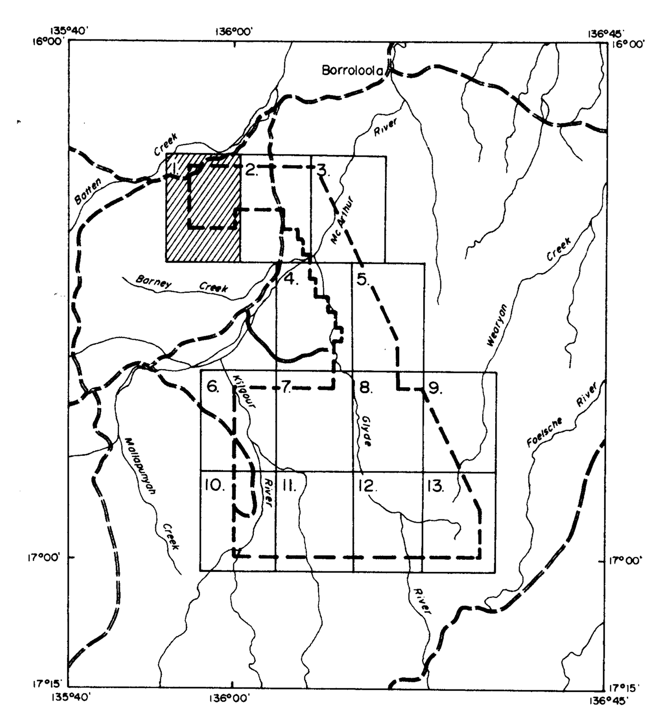
PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES — 18/2.5
ALTITUDE (FEET) — 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) — 60γ
OFFSET MAGNETIC ANOMALY — 60γ

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER — MI-2
SELECTED CONDUCTOR



LOCATION MAP
SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 1.

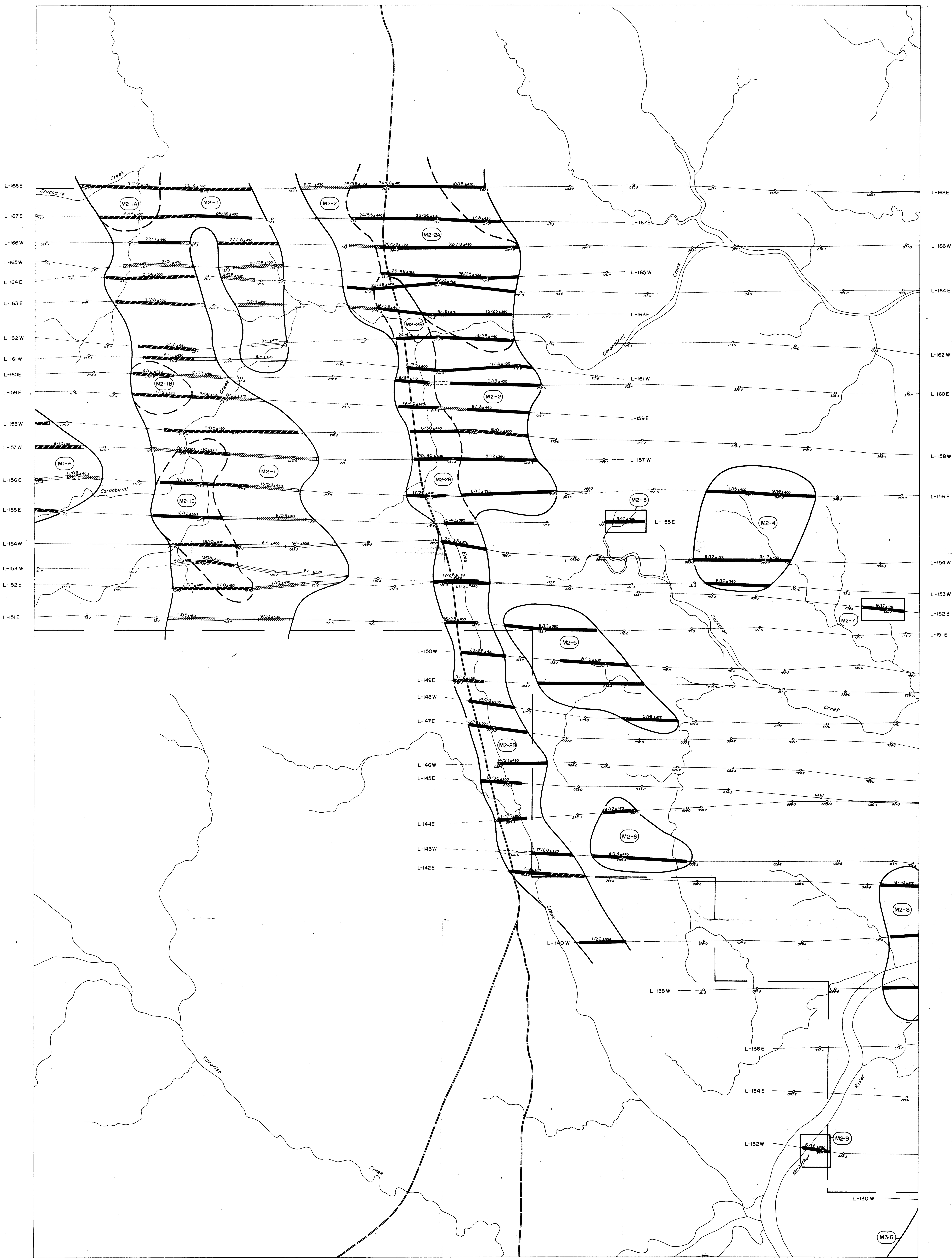
SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

6 CHANNEL ANOMALY . . . .
5 CHANNEL ANOMALY . . . .
4 CHANNEL ANOMALY . . . .
3 CHANNEL ANOMALY . . . .
2 CHANNEL ANOMALY . . . .
1 CHANNEL ANOMALY . . . .

PEAK POSITION . . . .
1st. and 4th. CHANNEL AMPLITUDES 18/2.5
ALTITUDE (FEET) 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) 60
OFFSET MAGNETIC ANOMALY 60

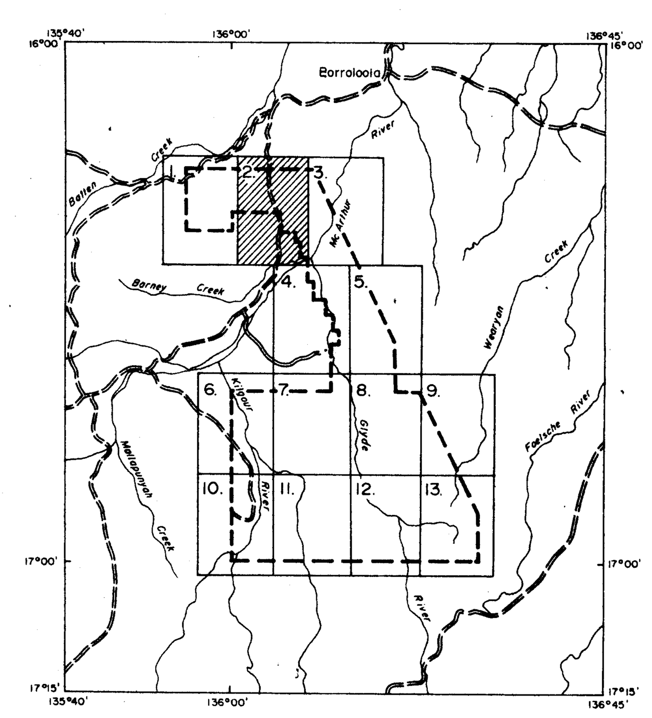
INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER. M2-2
SELECTED CONDUCTOR . . . .

N

LOCATION MAP

SCALE 1 : 1,000,000



CR 1192.

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 2

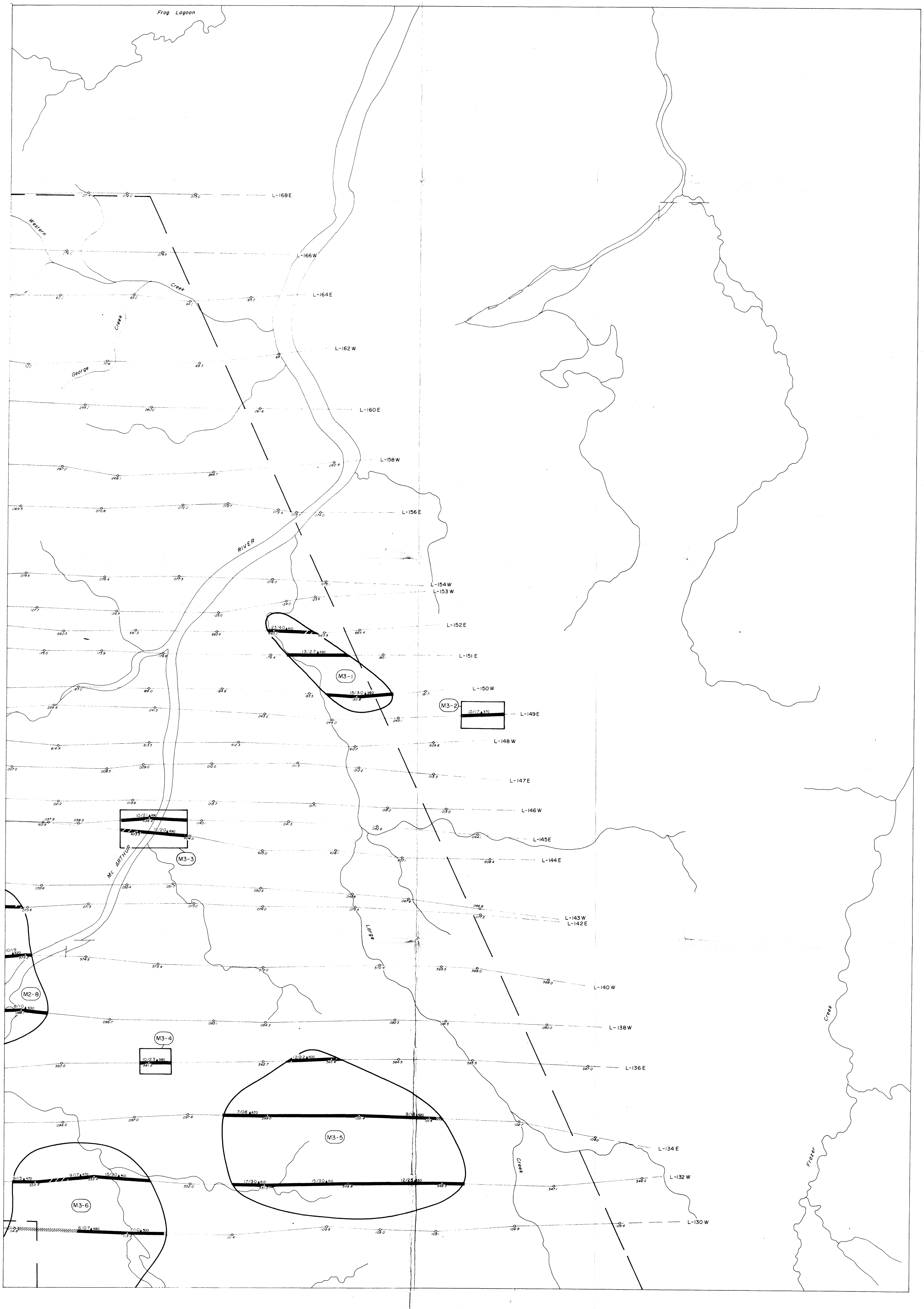
SCALE 1 : 25,000
APPROXIMATE

0 0.5 1.0 1.5 2.0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

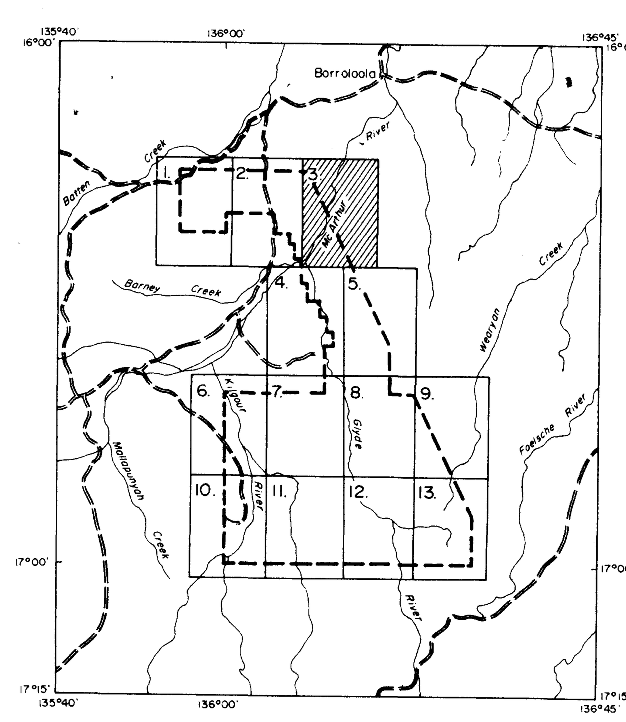
PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES 18/2.5
ALTITUDE (FEET) 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) 60γ
OFFSET MAGNETIC ANOMALY 60γ

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER M3-2
SELECTED CONDUCTOR

N

LOCATION MAP
SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 3.

SCALE 1 : 25,000
APPROXIMATE
0 0.5 1.0 1.5 2.0
KILOMETRES

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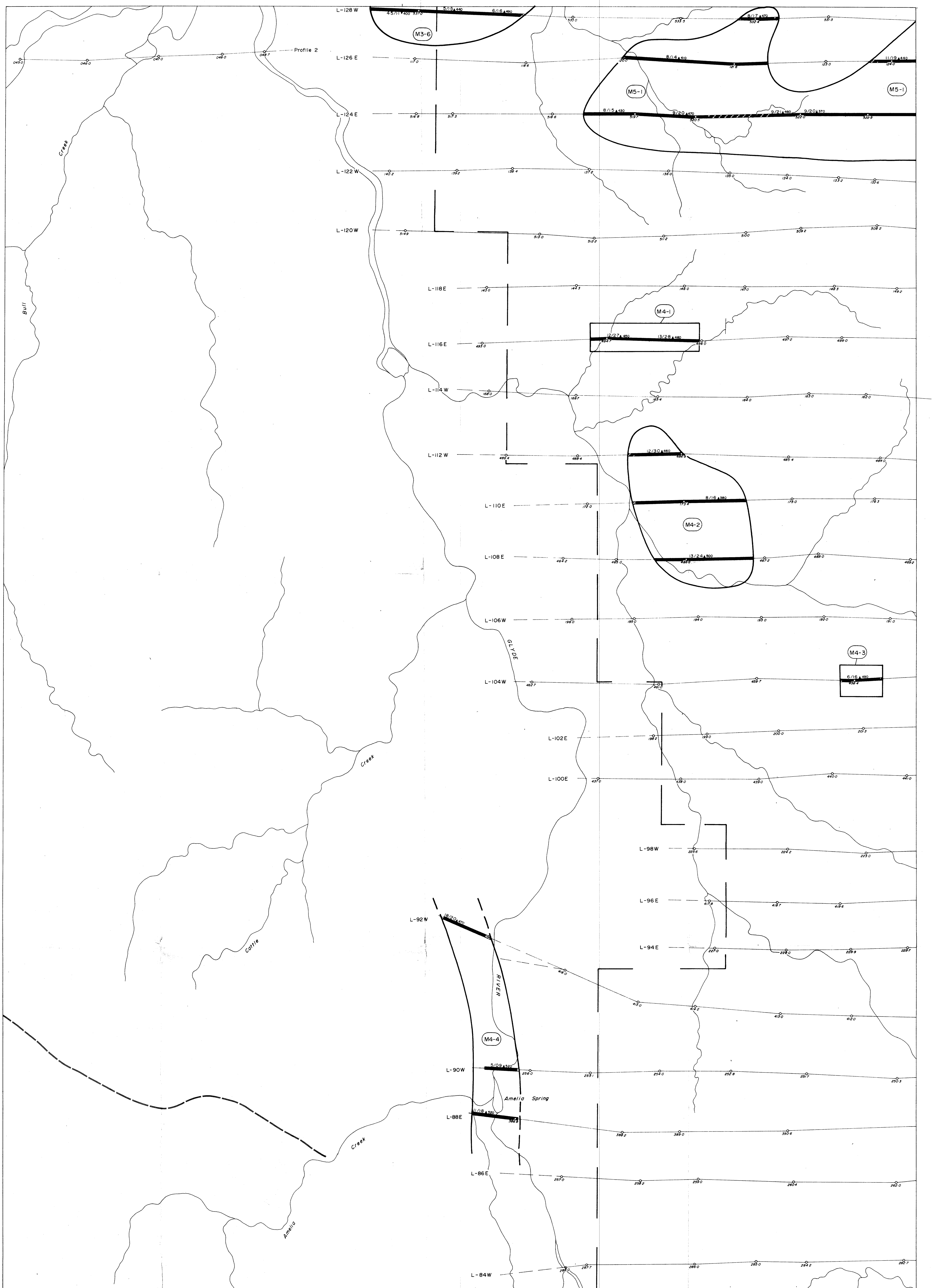
geoterrex limited
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272(N.T.)



INPUT LEGEND

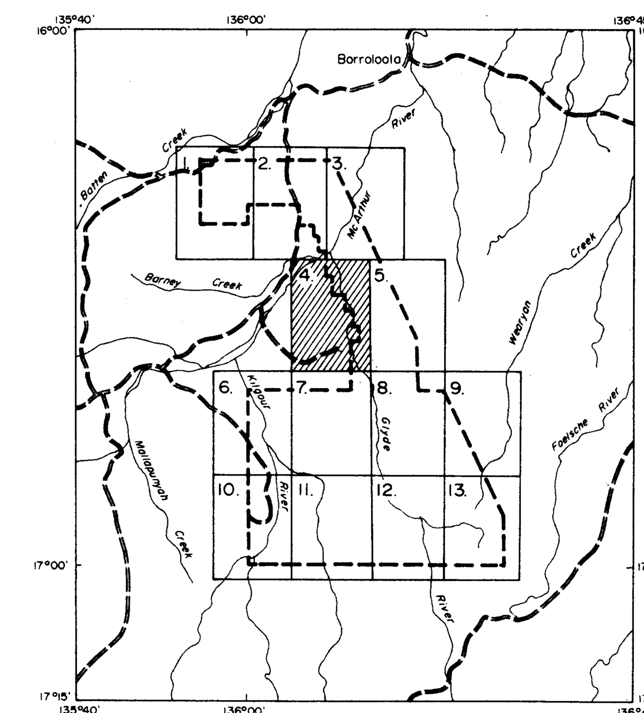
6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES
ALTITUDE (FEET)
COINCIDENT MAGNETIC ANOMALY (GAMMAS)
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER
SELECTED CONDUCTOR

LOCATION MAP
SCALE 1:1,000,000



CR 78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 4

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
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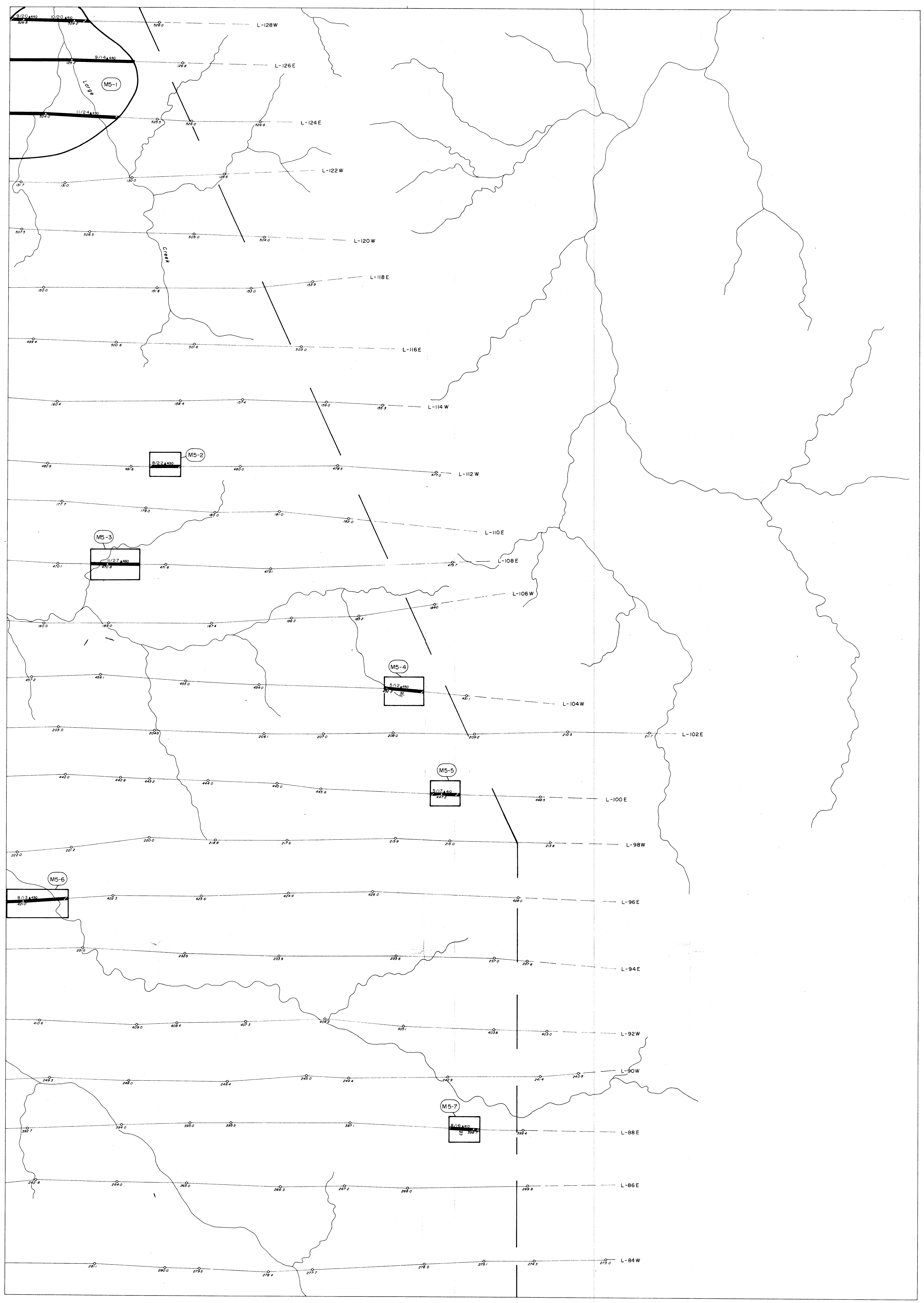
FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272(N.T.)



INPUT LEGEND

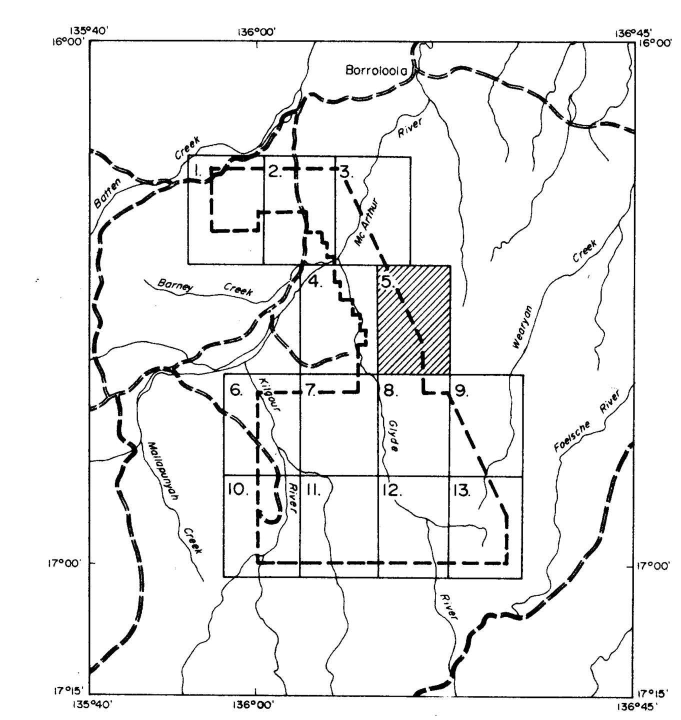
6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

PEAK POSITION
1st and 4th CHANNEL AMPLITUDES
ALTITUDE (FEET)
COINCIDENT MAGNETIC ANOMALY (GAMMAS)
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER
SELECTED CONDUCTOR

LOCATION MAP
SCALE 1 : 1,000,000



CR 78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 5

SCALE 1 : 25,000
APPROXIMATE

0 0.5 1.0 1.5 2.0
KILOMETRES

SURVEYED COMPILED & INTERPRETED BY
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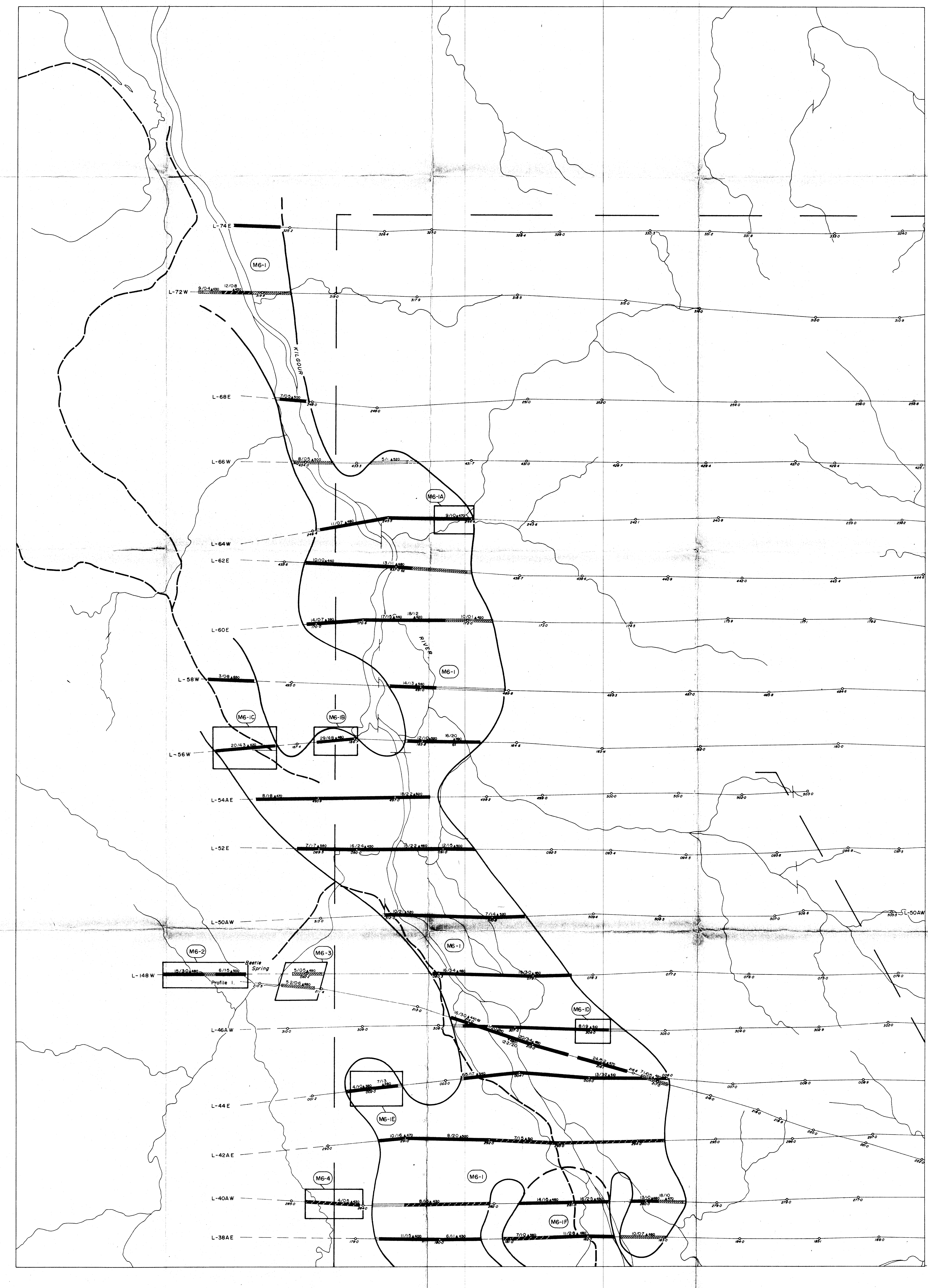
SYDNEY

FLOWN IN NOVEMBER - DECEMBER 1976

GEOTERREX PROJECT No. 83-272(NT)



INPUT LEGEND

6 CHANNEL ANOMALY . . . .
5 CHANNEL ANOMALY . . . .
4 CHANNEL ANOMALY . . . .
3 CHANNEL ANOMALY . . . .
2 CHANNEL ANOMALY . . . .
1 CHANNEL ANOMALY . . . .

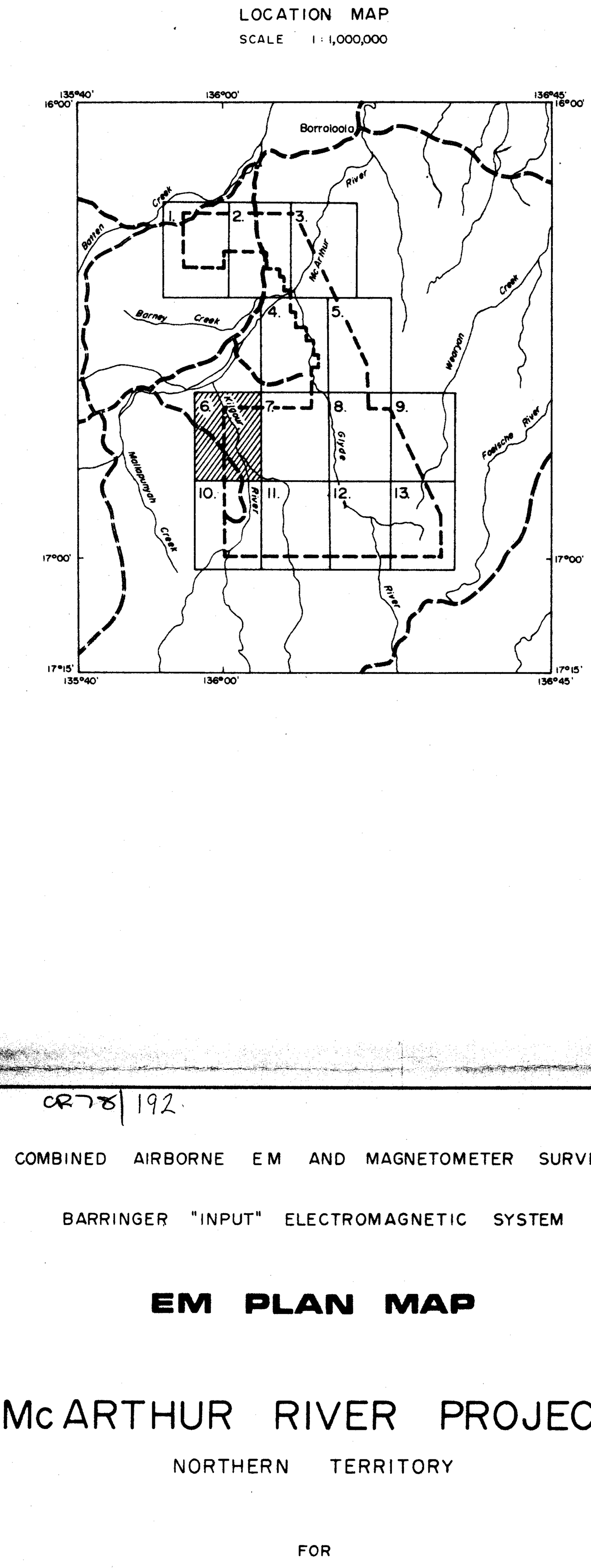
PEAK POSITION . . . .
1 st. and 4th. CHANNEL AMPLITUDES 18/2.8
ALTITUDE (FEET) 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) 60γ
OFFSET MAGNETIC ANOMALY 60γ

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND . . . . .
IDENTIFICATION NUMBER M6-2
SELECTED CONDUCTOR . . . .

LOCATION MAP

SCALE 1:1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 6.

SCALE 1 : 25,000
APPROXIMATE

0 0.5 1.0 1.5 2.0
KILOMETRES

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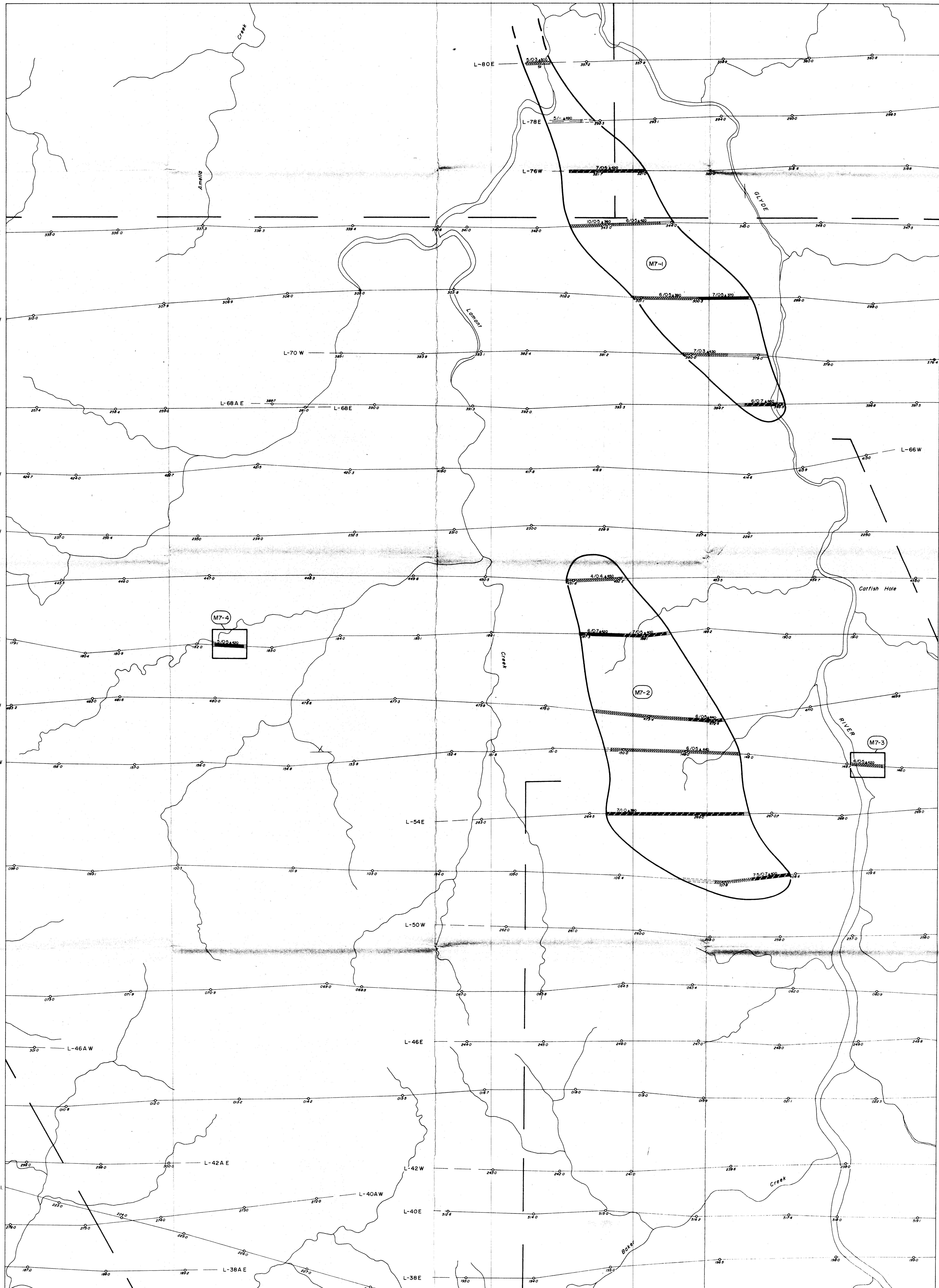
FLOWN IN NOVEMBER - DECEMBER 1976

GEOTERREX PROJECT No 83-272 (NT)



INPUT LEGEND

6 CHANNEL ANOMALY

5 CHANNEL ANOMALY

4 CHANNEL ANOMALY

3 CHANNEL ANOMALY

2 CHANNEL ANOMALY

1 CHANNEL ANOMALY

PEAK POSITION

1st. and 4th. CHANNEL AMPLITUDES

ALTITUDE (FEET)

COINCIDENT MAGNETIC ANOMALY (GAMMAS)

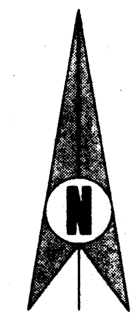
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND

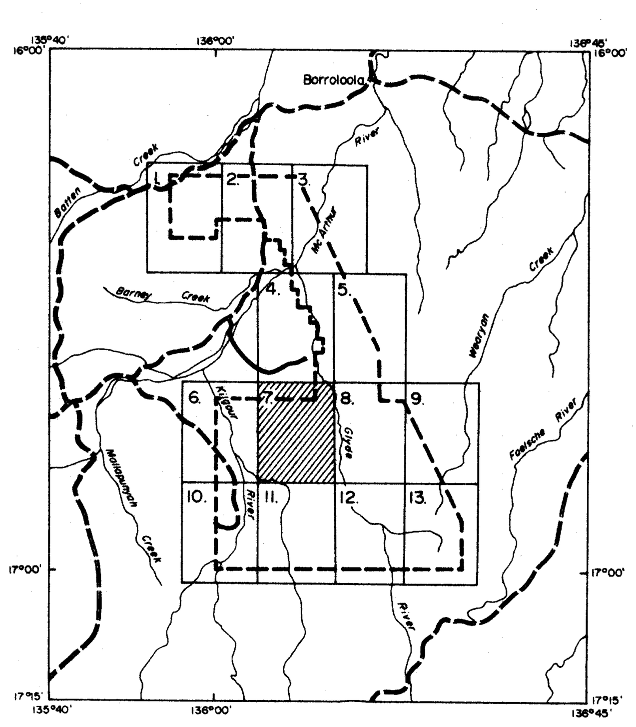
IDENTIFICATION NUMBER

SELECTED CONDUCTOR



LOCATION MAP

SCALE 1:1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 7

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

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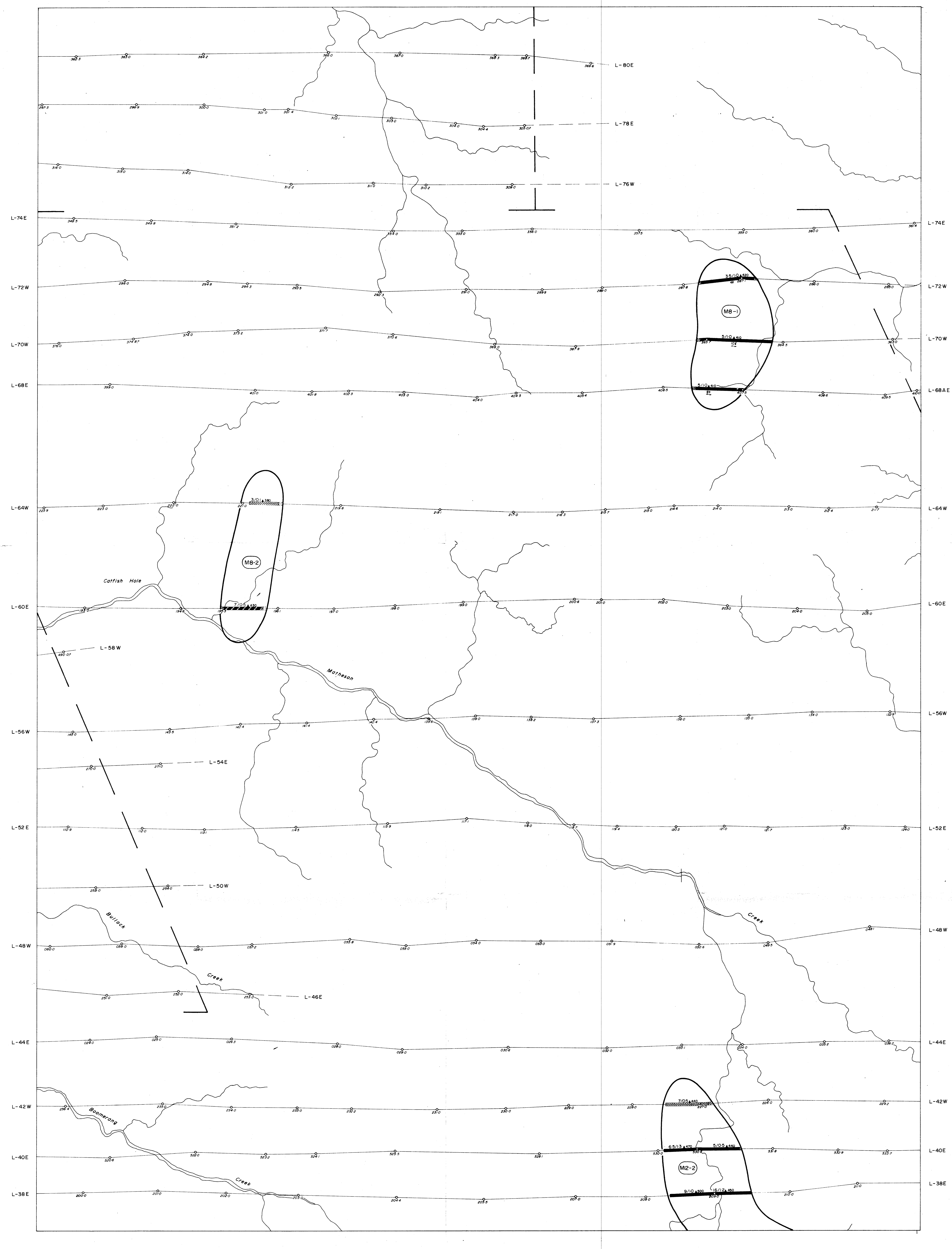


INPUT LEGEND

6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

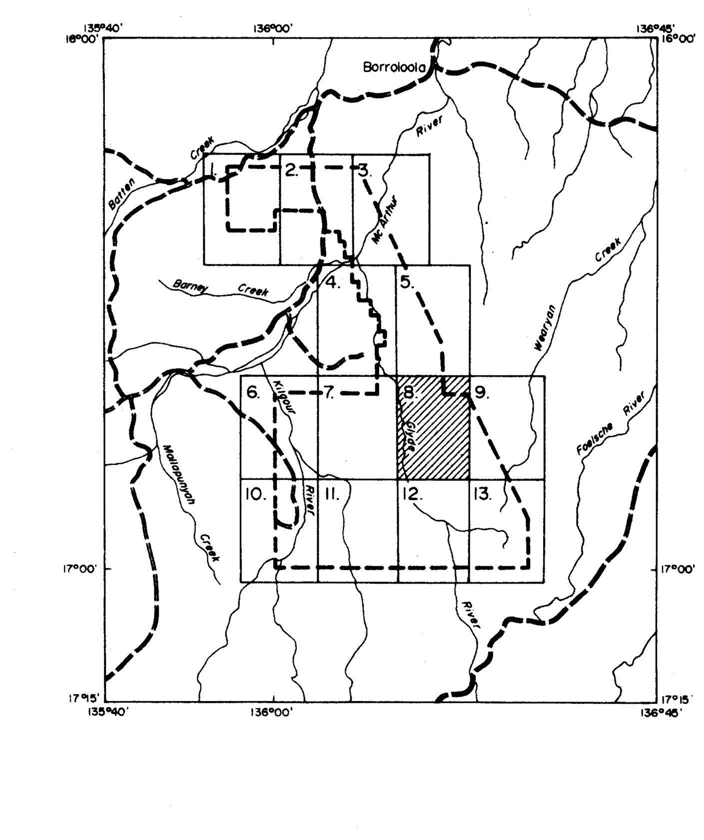
PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES 18/2.5
ALTITUDE (FEET) 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) 60γ
OFFSET MAGNETIC ANOMALY 60γ

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER M8-2
SELECTED CONDUCTOR

N

LOCATION MAP
SCALE 1:1,000,000



CR88 | 192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 8

SCALE 1 : 25,000
APPROXIMATE
0 0.5 1.0 1.5 2.0
KILOMETRES

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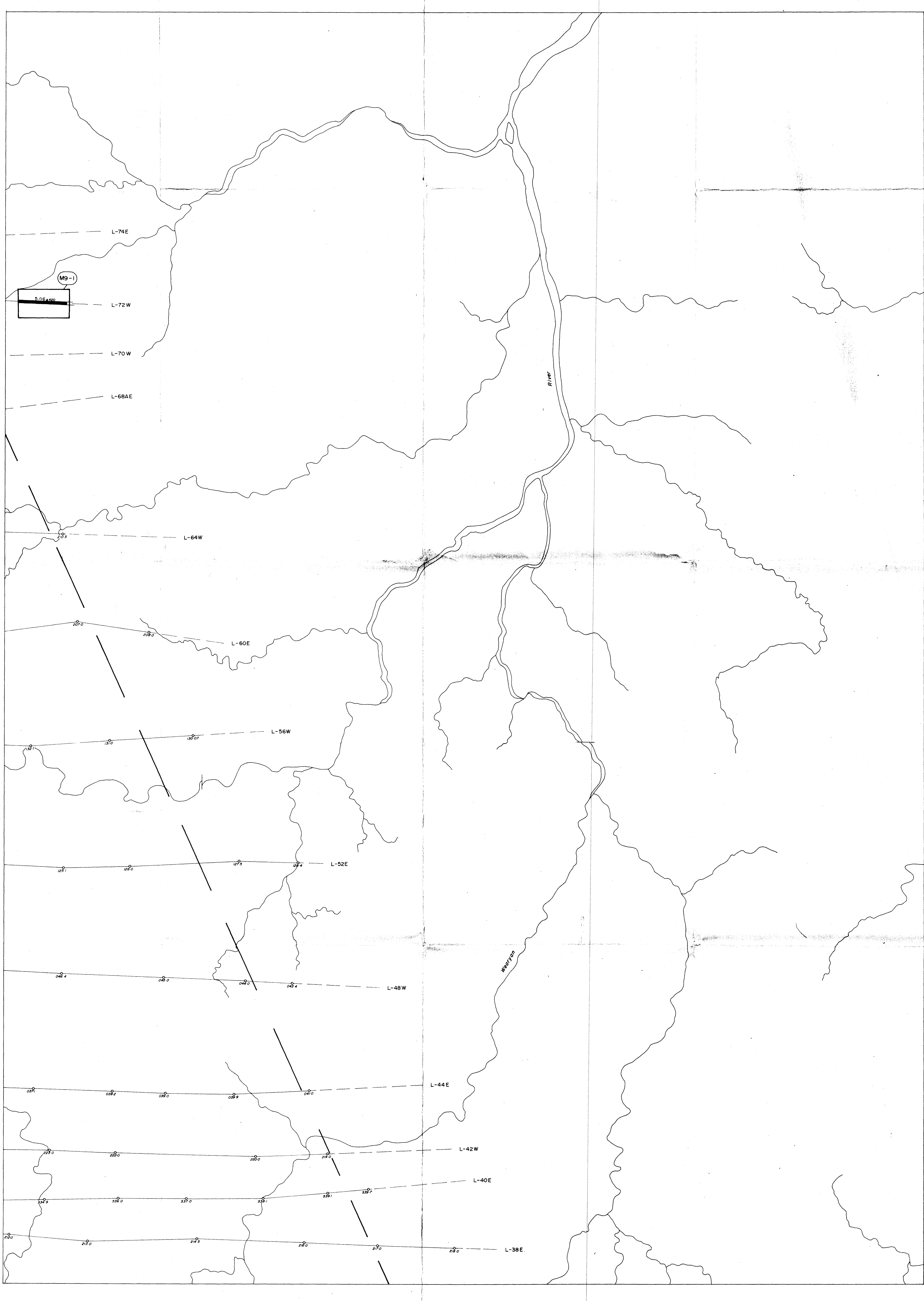
GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

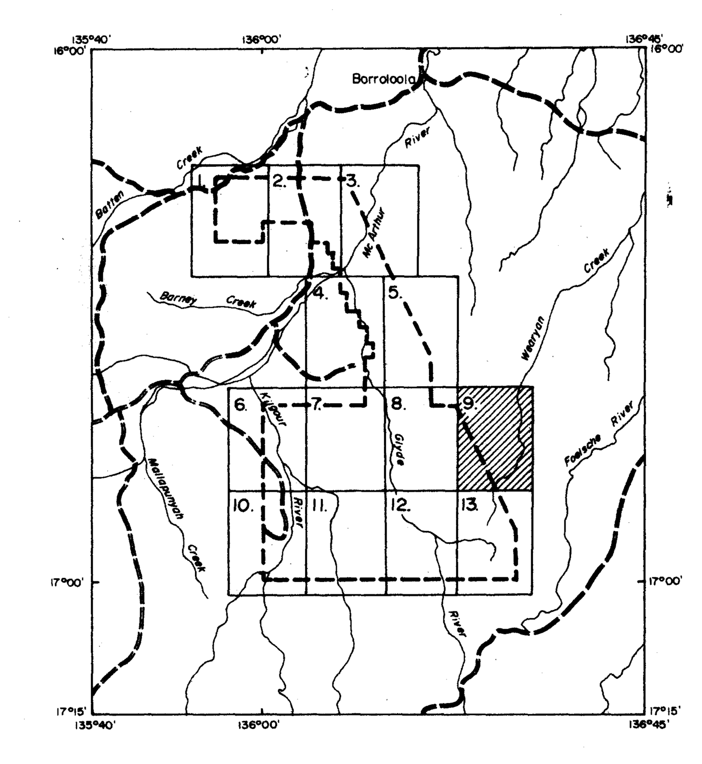
PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES
ALTITUDE (FEET)
COINCIDENT MAGNETIC ANOMALY (GAMMAS)
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER ... M9-1
SELECTED CONDUCTOR

N

LOCATION MAP
SCALE 1:1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 9.

SCALE 1 : 25,000
APPROXIMATE
0 0.5 1.0 1.5 2.0
KILOMETRES

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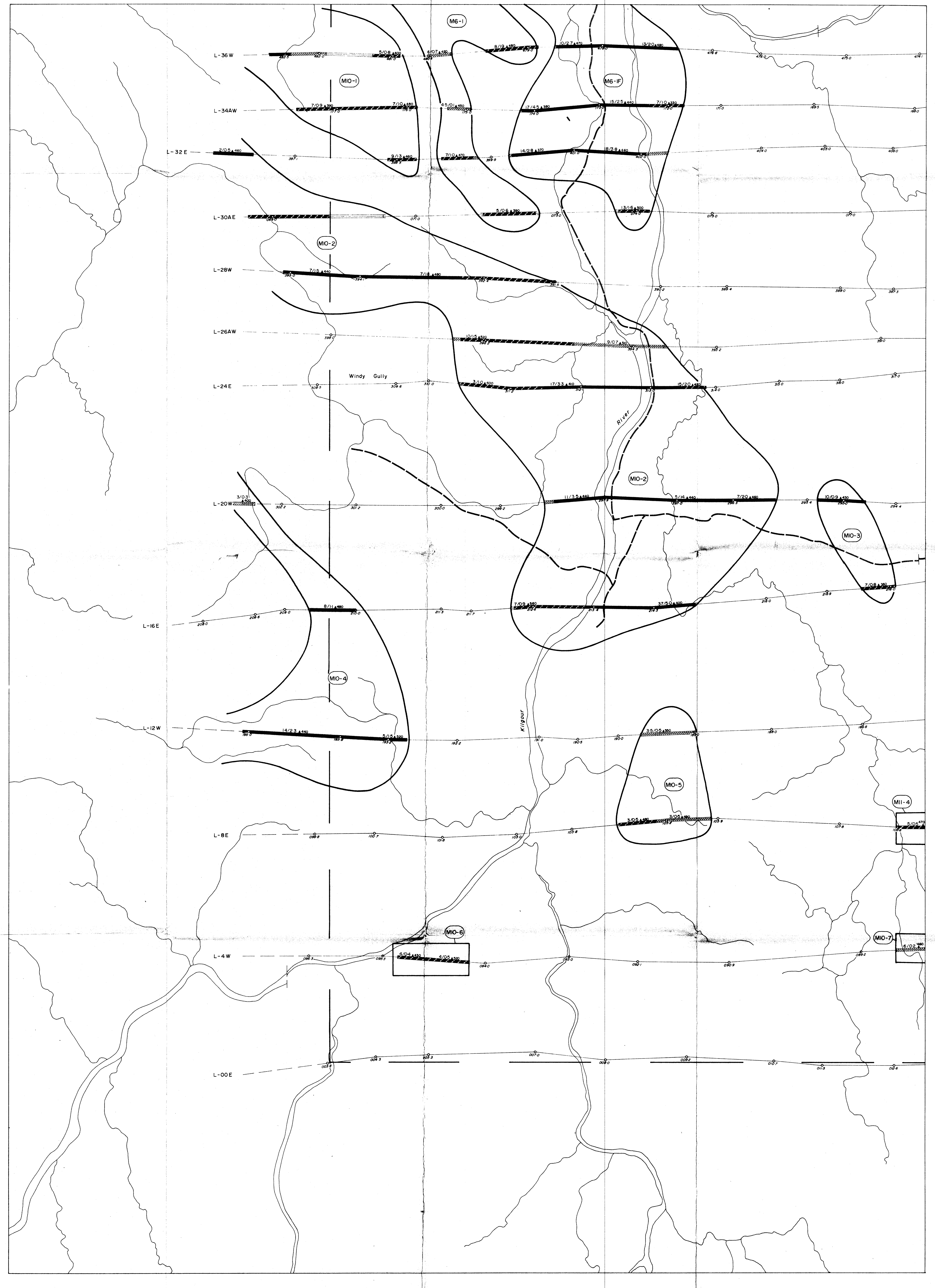


INPUT LEGEND

6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

PEAK POSITION
1st. and 4th. CHANNEL AMPLITUDES 18/2.5
ALTITUDE (FEET) 420
COINCIDENT MAGNETIC ANOMALY (GAMMAS) 60γ
OFFSET MAGNETIC ANOMALY 60γ

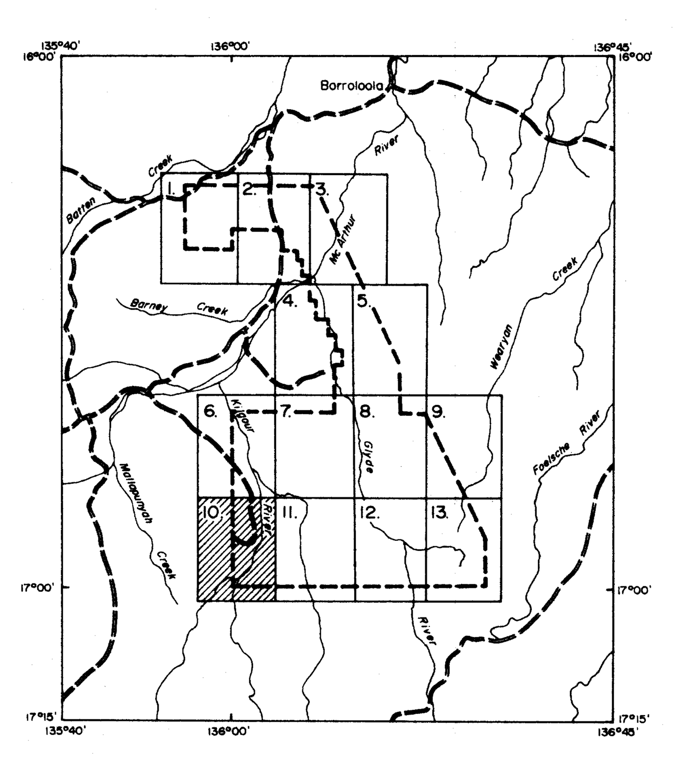
INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER M10-2
SELECTED CONDUCTOR

N

LOCATION MAP

SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 10

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

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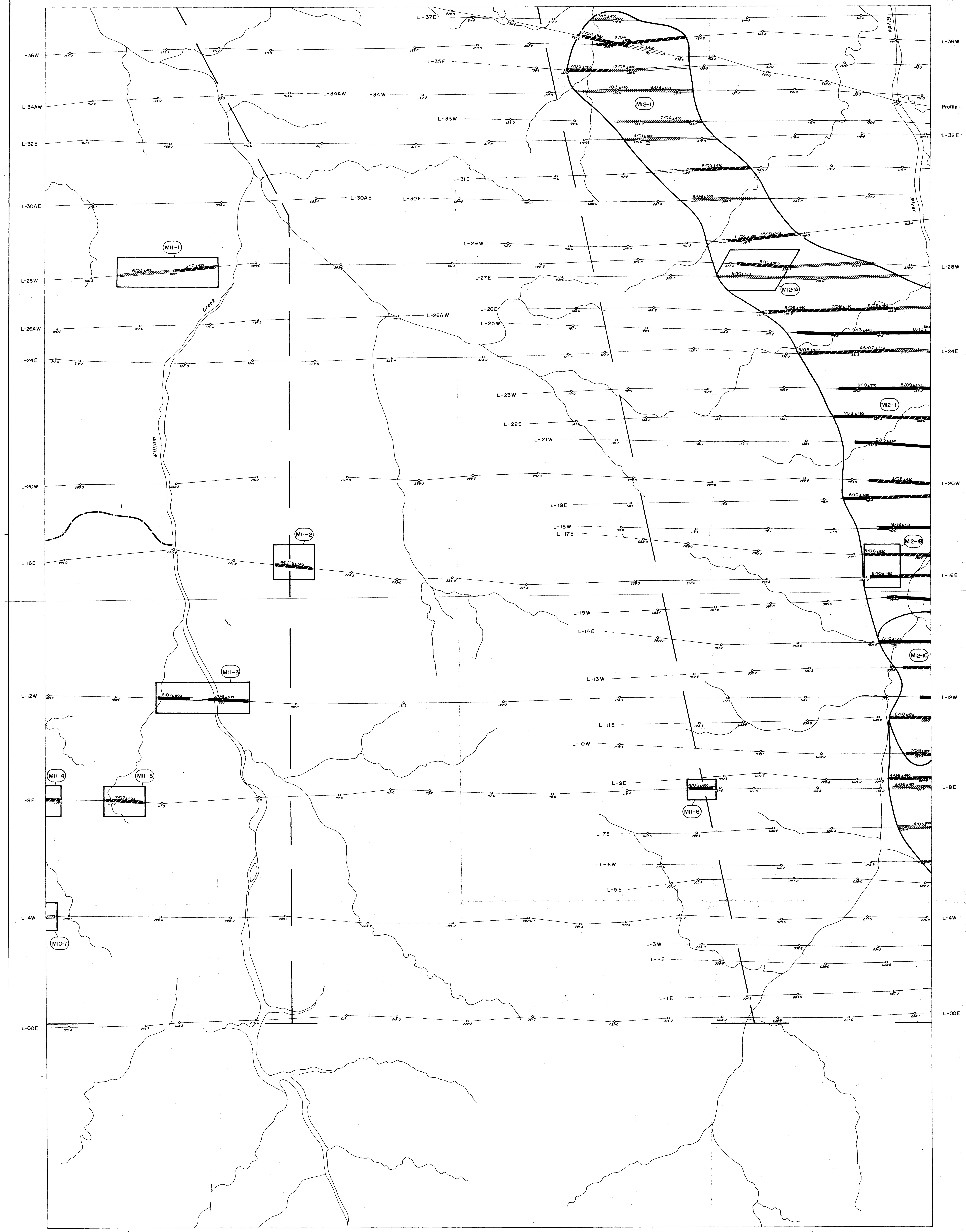
GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

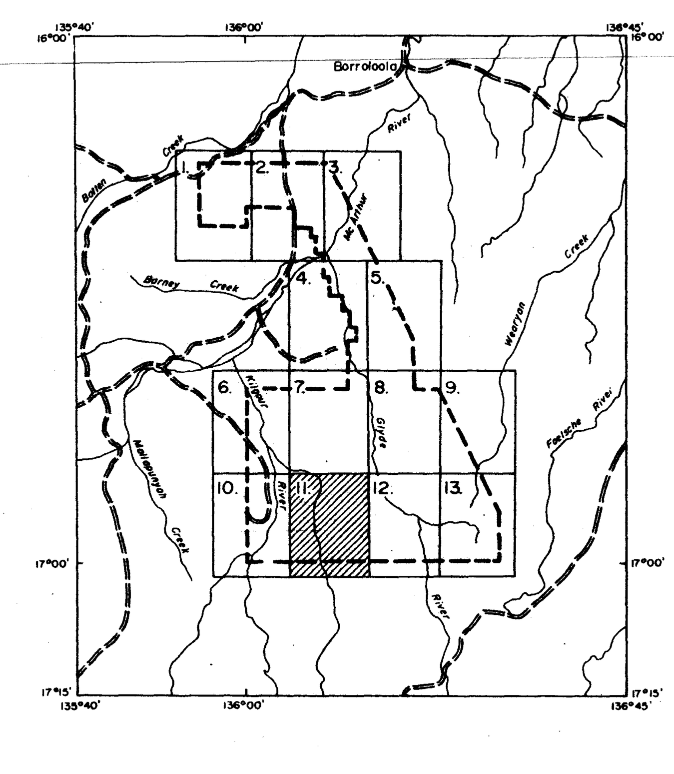
6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

PEAK POSITION
1 st. and 4th. CHANNEL AMPLITUDES
ALTITUDE (FEET)
COINCIDENT MAGNETIC ANOMALY (GAMMAS)
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER
SELECTED CONDUCTOR

LOCATION MAP
SCALE 1:1,000,000



02781 192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 11

SCALE 1 : 25,000
APPROXIMATE
0 0·5 1·0 1·5 2·0
KILOMETRES

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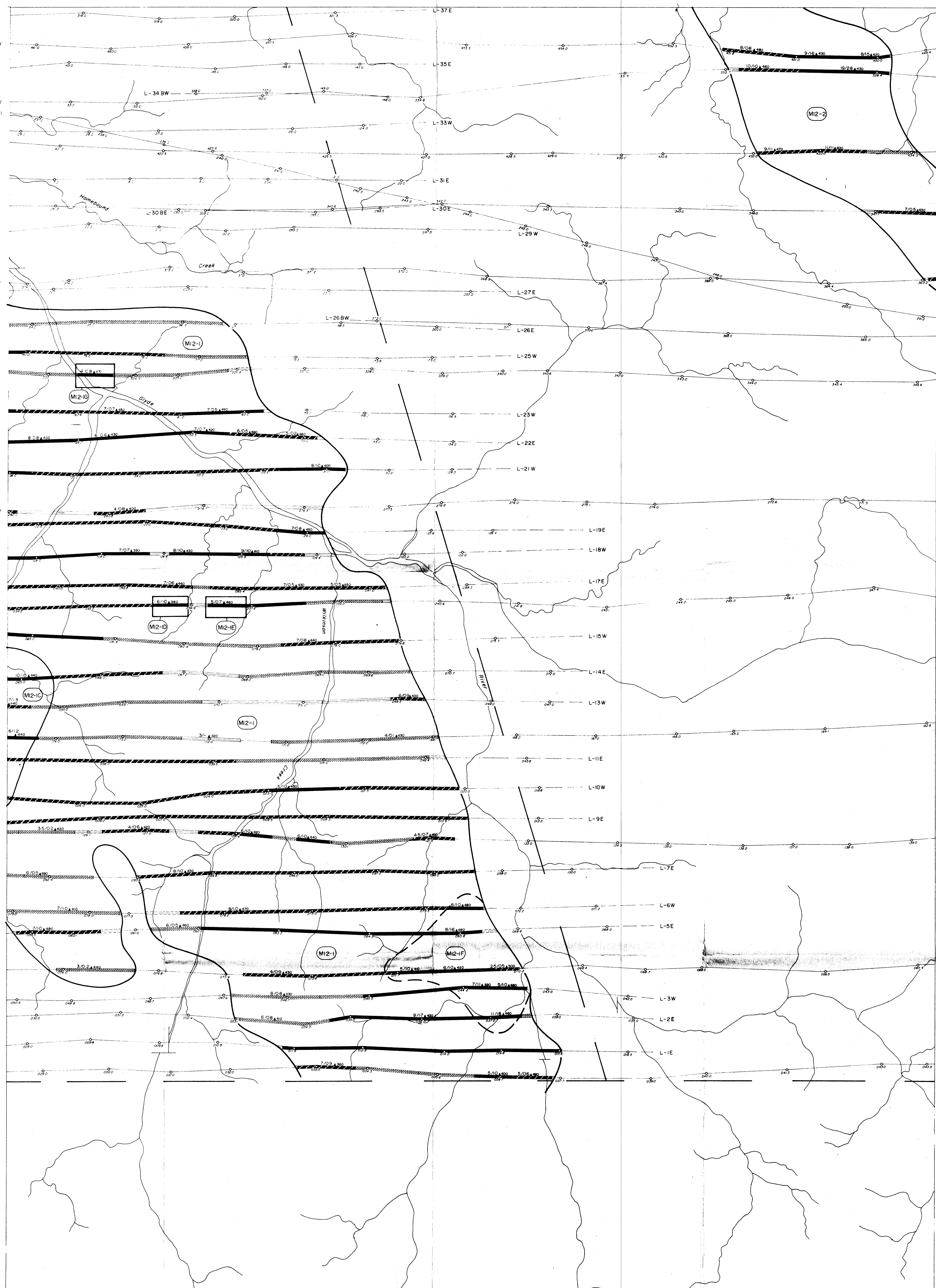
GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

6 CHANNEL ANOMALY

5 CHANNEL ANOMALY

4 CHANNEL ANOMALY

3 CHANNEL ANOMALY

2 CHANNEL ANOMALY

1 CHANNEL ANOMALY

PEAK POSITION

1st. and 4th. CHANNEL AMPLITUDES

ALTITUDE (FEET)

COINCIDENT MAGNETIC ANOMALY (GAMMAS)

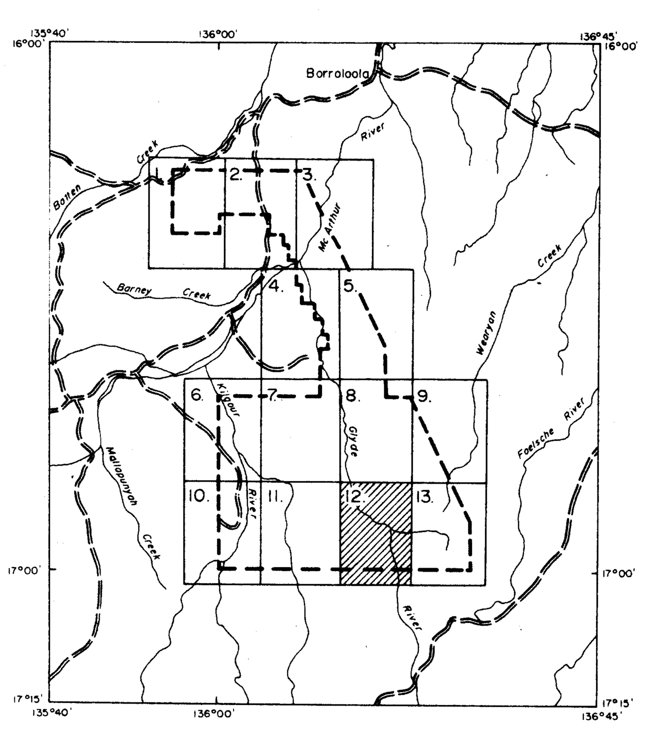
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND

IDENTIFICATION NUMBER — M12-2

SELECTED CONDUCTOR



LOCATION MAP

SCALE 1:1,000,000

CR 78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 12

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

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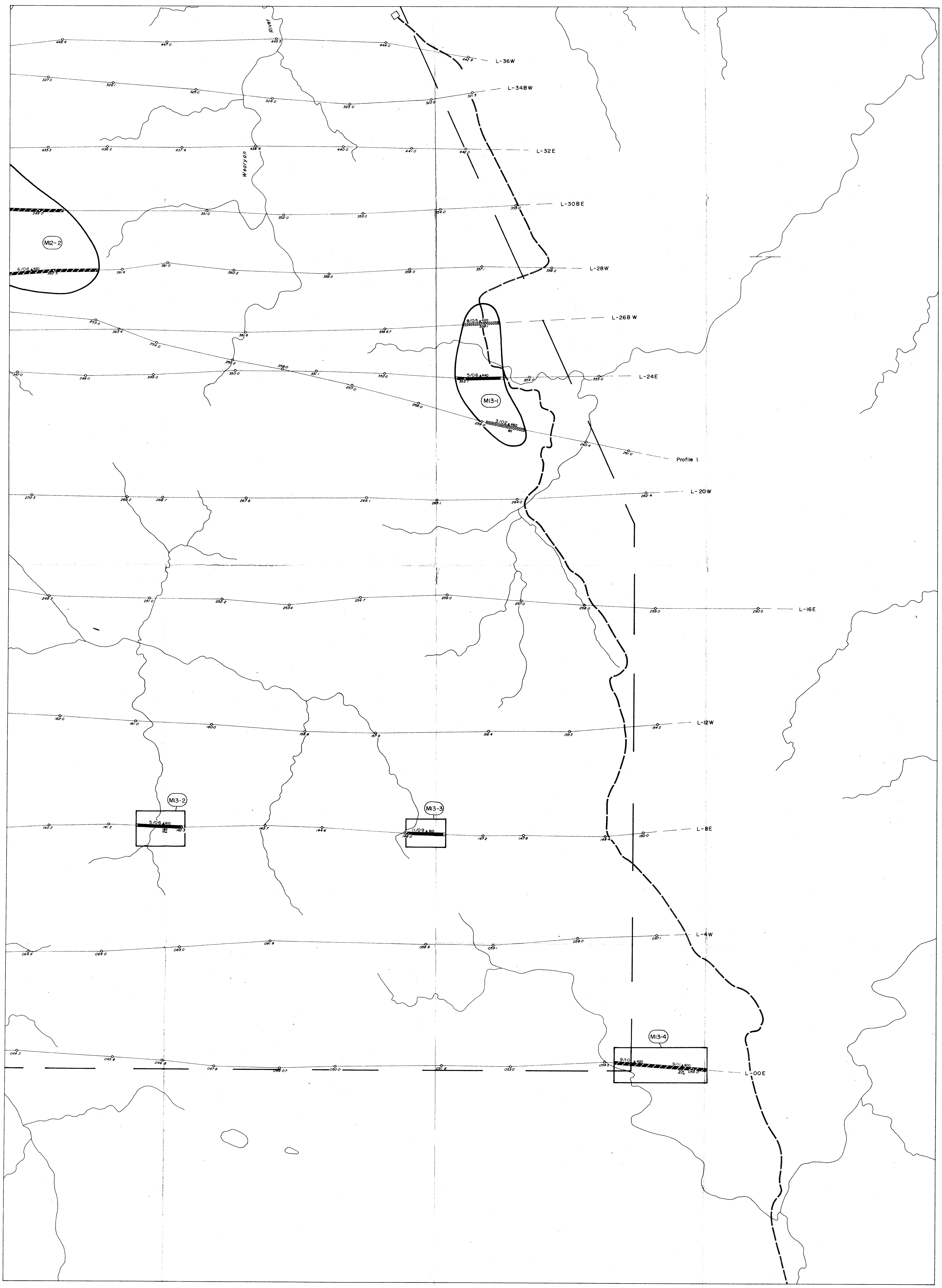
GEOTERREX PROJECT No. 83-272 (N.T.)



INPUT LEGEND

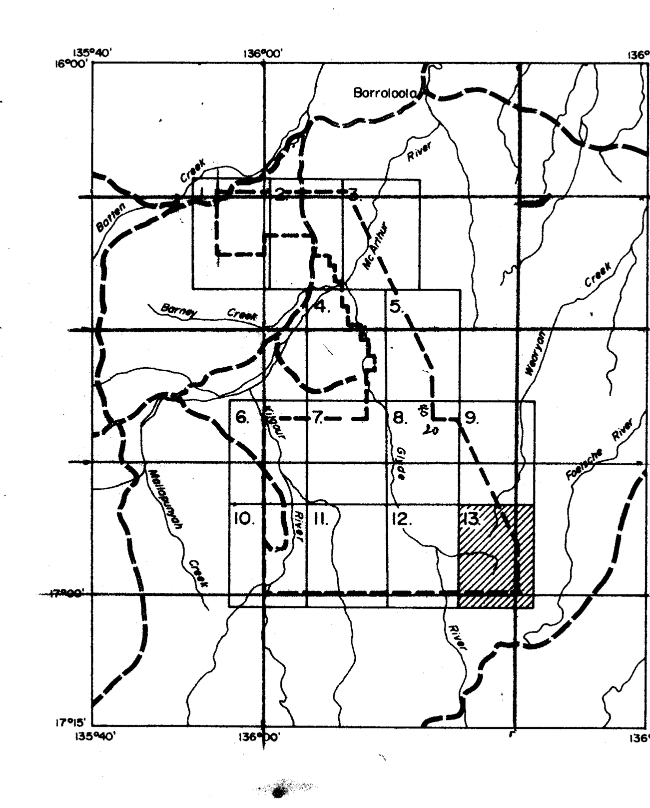
6 CHANNEL ANOMALY
5 CHANNEL ANOMALY
4 CHANNEL ANOMALY
3 CHANNEL ANOMALY
2 CHANNEL ANOMALY
1 CHANNEL ANOMALY

PEAK POSITION
1 st. and 4th. CHANNEL AMPLITUDES
ALTITUDE (FEET)
COINCIDENT MAGNETIC ANOMALY (GAMMAS)
OFFSET MAGNETIC ANOMALY

INTERPRETATION LEGEND

CONDUCTOR OUTLINE AND
IDENTIFICATION NUMBER (M13-2)
SELECTED CONDUCTOR

LOCATION MAP
SCALE 1:1,000,000



CR 78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM PLAN MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 13.

SCALE 1 : 25,000
APPROXIMATE
0 0·5 1·0 1·5 2·0
KILOMETRES

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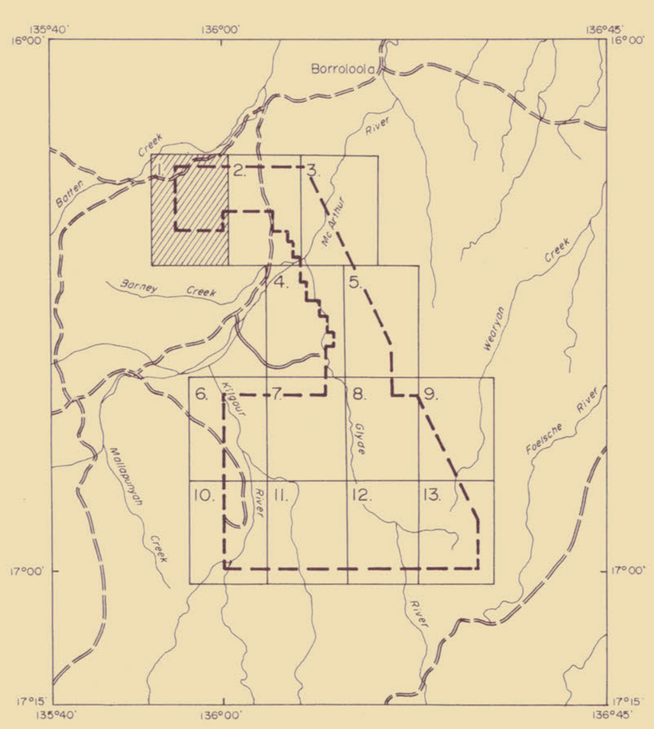
CHANNEL I / CHANNEL 4 RATIO

	>50
	25 - 49
	16·7 - 24·9
	12·5 - 16·6
	10·0 - 12·4
	8·3 - 9·9
	7·1 - 8·2
	6·3 - 7·0
	5·6 - 6·2
	5·0 - 5·5
	<4·9

N

LOCATION MAP
SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM RATIO MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 1.

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
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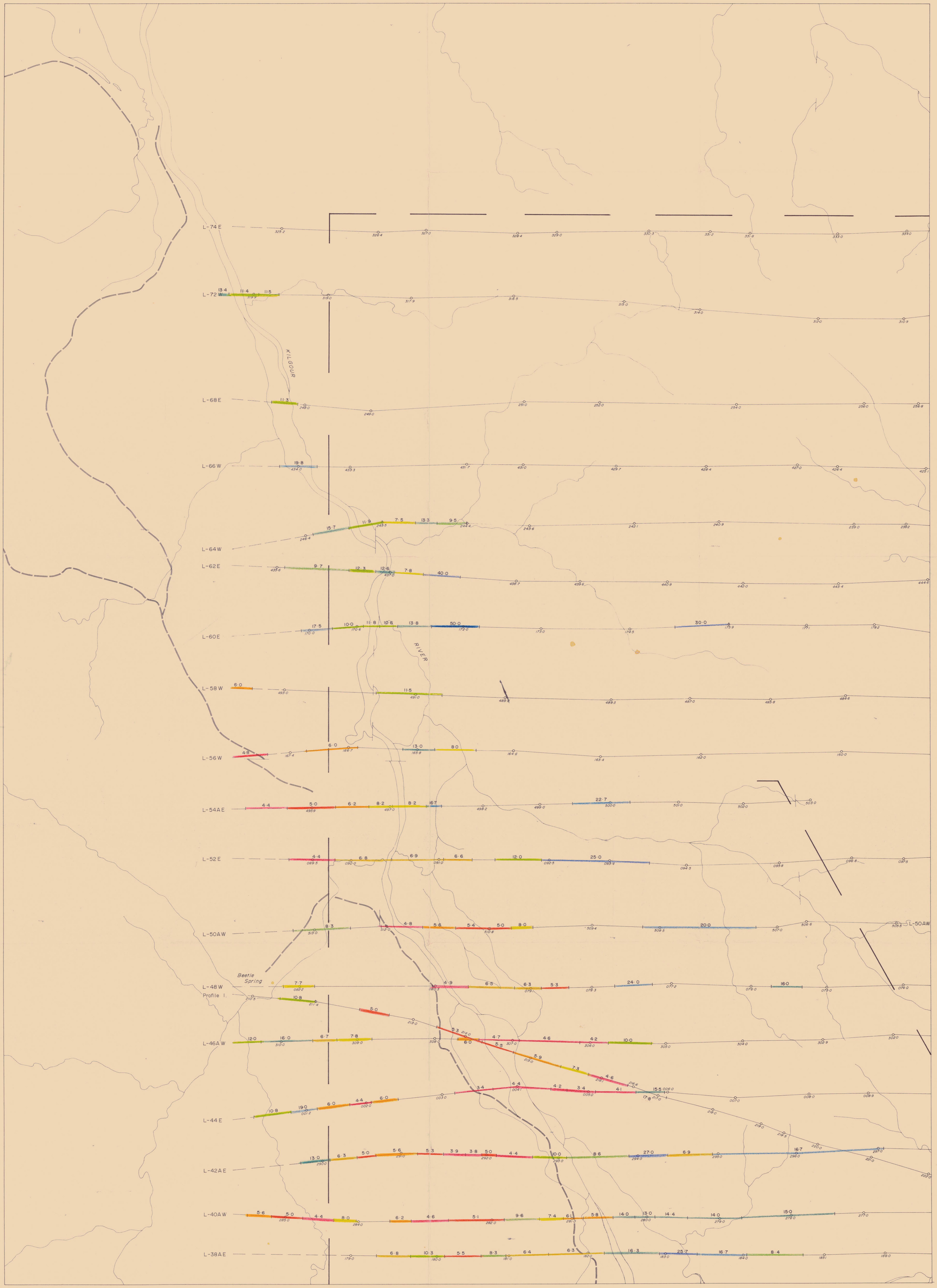
SYDNEY

FLOWN IN NOVEMBER - DECEMBER 1976

GEOTERREX PROJECT No. 83-272 (N.T.)



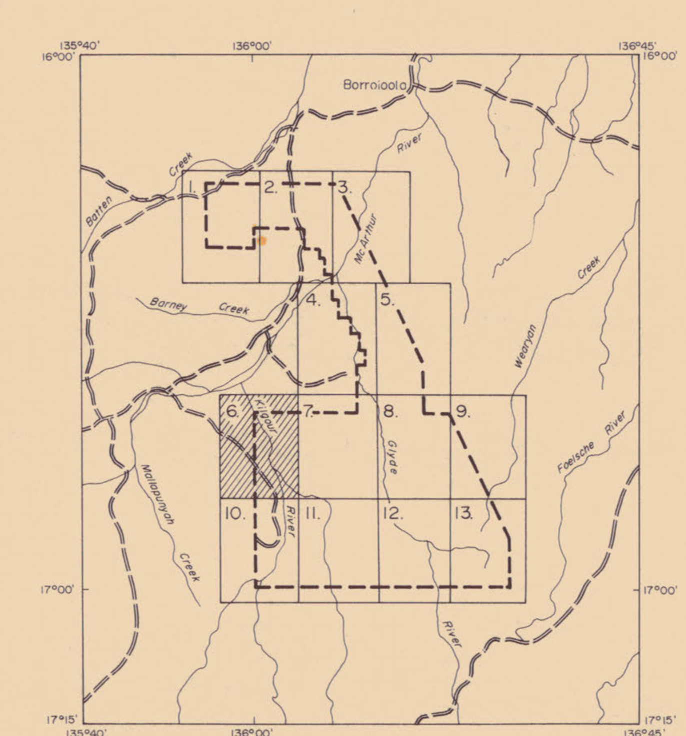
CHANNEL 1 / CHANNEL 4 RATIO

(blue)	>50
(blue-violet)	25 - 49
(light blue)	16·7 - 24·9
(blue-green)	12·5 - 16·6
(yellow-green)	10·0 - 12·4
(green)	8·3 - 9·9
(yellow)	7·1 - 8·2
(light orange)	6·3 - 7·0
(orange)	5·6 - 6·2
(red-orange)	5·0 - 5·5
(pink)	<4·9

N

LOCATION MAP

SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM RATIO MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 6.

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
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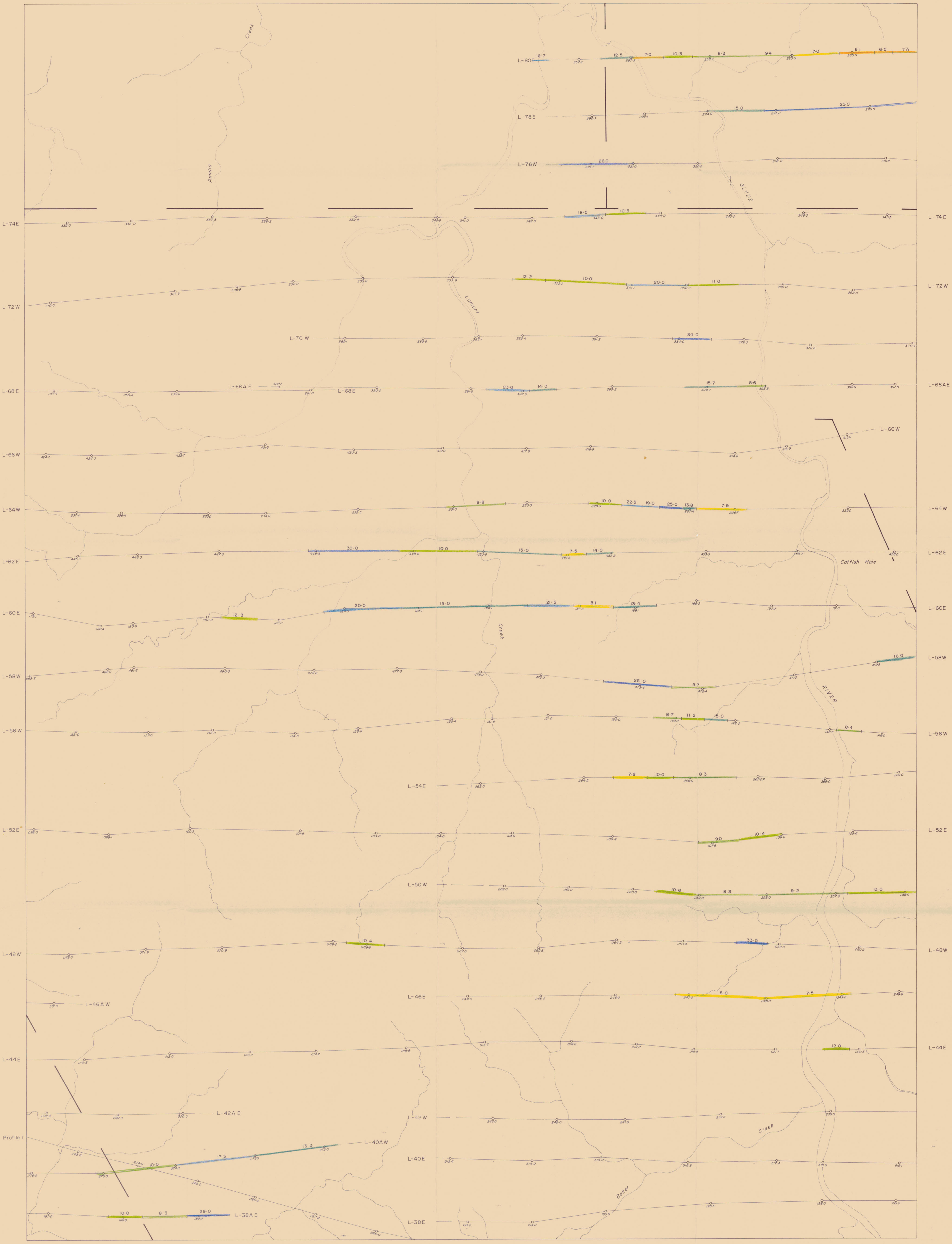
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

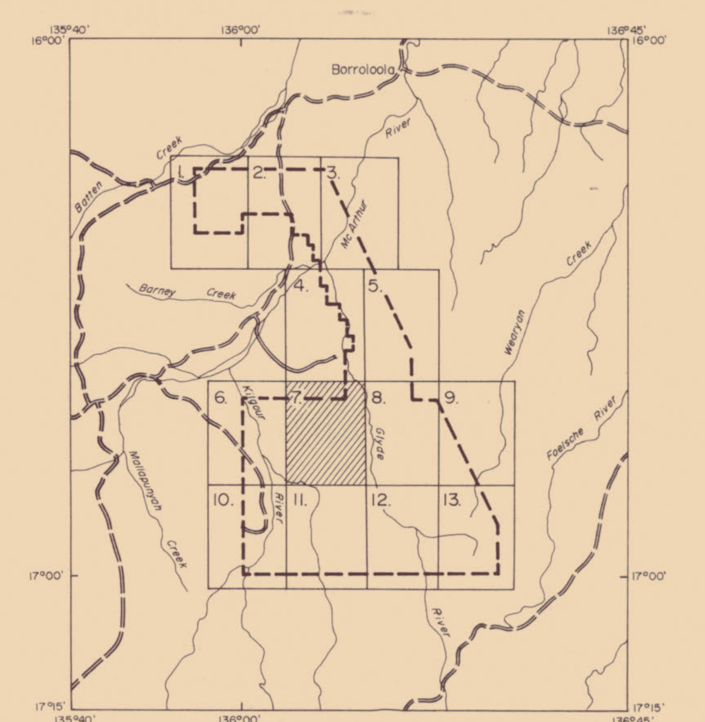
GEOTERREX PROJECT No. 83-272(N.T.)

CHANNEL I / CHANNEL 4 RATIO

(blue)	>50
(violet-blue)	25 - 49
(light blue)	16·7 - 24·9
(blue-green)	12·5 - 16·6
(light green)	10·0 - 12·4
(green-yellow)	8·3 - 9·9
(yellow)	7·1 - 8·2
(light orange)	6·3 - 7·0
(orange)	5·6 - 6·2
(red)	5·0 - 5·5
(pink)	<4·9



LOCATION MAP
SCALE 1:1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM RATIO MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 7

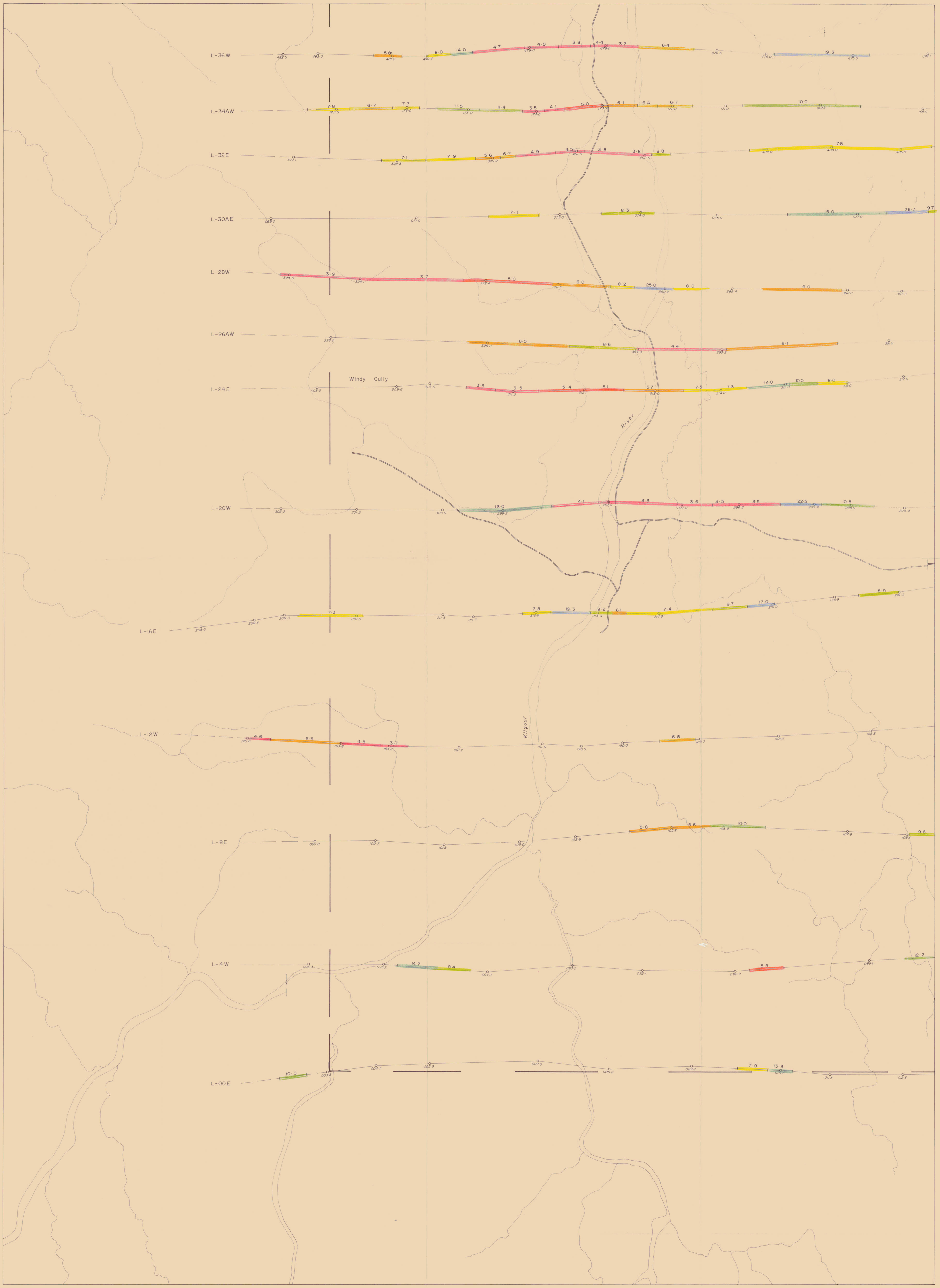
SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272 (N.T.)



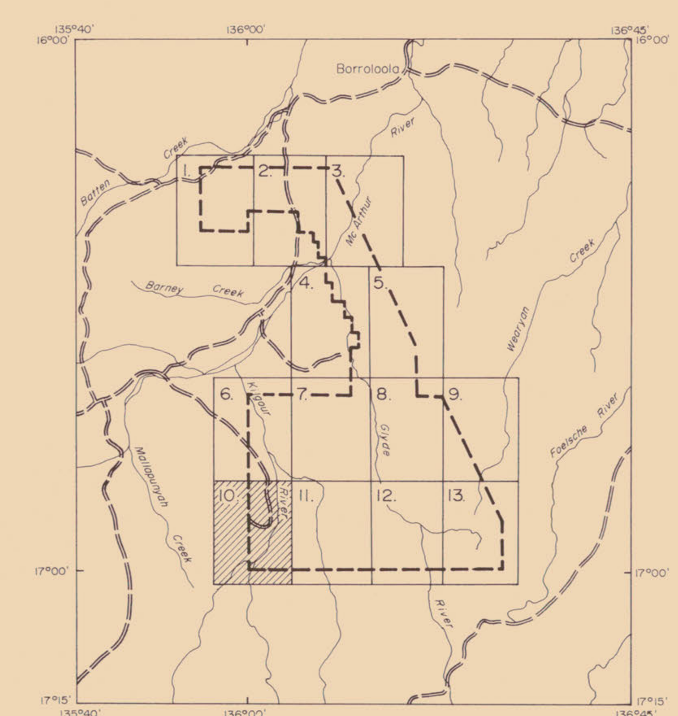
CHANNEL 1 / CHANNEL 4 RATIO

(blue)	>50
(violet)	25 - 49
(light blue)	16·7 - 24·9
(green)	12·5 - 16·6
(light green)	10·0 - 12·4
(yellow-green)	8·3 - 9·9
(yellow)	7·1 - 8·2
(yellow-orange)	6·3 - 7·0
(orange)	5·6 - 6·2
(red)	5·0 - 5·5
(pink)	<4·9

N

LOCATION MAP

SCALE 1 : 1,000,000



CR78/192

COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY

BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM

EM RATIO MAP

McARTHUR RIVER PROJECT

NORTHERN TERRITORY

FOR

AMOCO MINERALS AUSTRALIA COMPANY

SHEET 10

SCALE 1 : 25,000
APPROXIMATE

0 0·5 1·0 1·5 2·0
KILOMETRES

SURVEYED, COMPILED & INTERPRETED BY
geoterrex limited
SYDNEY

FLOWN IN NOVEMBER-DECEMBER 1976

GEOTERREX PROJECT No. 83-272 (N.T.)