

000

**SCINTREX**

682001

D of M	A.O.	C.G.	E.O.	D.S.M.L.
Received Answered				22 OCT 1982
DEPT. OF MINES				E & IL
REF. No: 8723/82				

REPORT ON  
 GRADIENT ARRAY ELECTRICAL INDUCED POLARIZATION  
 RECONNAISSANCE SURVEYS  
 LAUREL CREEK EAST AND WEST GRIDS  
 NEAR ZEEHAN, TASMANIA  
 ON BEHALF OF  
 RENISON LIMITED  
 22 OCT 1982

**OPEN FILE**

**MICROFILMED**

001

**SCINTREX**

682002

PRIVATE AND CONFIDENTIAL

REPORT ON  
GRADIENT ARRAY ELECTRICAL INDUCED POLARIZATION  
RECONNAISSANCE SURVEYS  
LAUREL CREEK EAST AND WEST GRIDS  
NEAR ZEEHAN, TASMANIA  
ON BEHALF OF  
RENISON LIMITED

BY

A.W. HOWLAND-ROSE  
MSC, DIC, FIMM, MAUSIMM, MAIG, FGS,  
GEOPHYSICIST

SYDNEY, N.S.W.

AUGUST, 1982  
TAS-097E

## CONTENTS

## Summary

## Discussion of Results

Laurel Creek West Page 1

General Comments on Rock Types and Contacts Page 17

Conclusions Page 20

Laurel Creek East Page 21

Conclusions Page 26

## Appendices

Personnel and Timing

Method and Equipment

Data Presentation

Plate 1 - Chargeability Contour Plan (1 sheet)

Plate 2 - Resistivity Contour Plan (1 sheet)

Plate 3 - Total Magnetic Field Contour Plan (2 sheets)

Plate 4 - Interpretation Plan (1 sheet)

NB an index to transparencies that may be referred to in this report will be found in TCR 85-2427.

**SCINTREX PTY. LTD.**

GEOPHYSICAL CONSULTANTS AND CONTRACTORS

INCORPORATED IN W.A.

*SUMMARY*

*The gradient array electrical induced polarization reconnaissance surveys carried out over the east and west Laurel Creek grids has revealed a series of sharp magnetic field responses on the granite/crotty quartzite boundary, with accompanying but not necessarily coincident low amplitude induced polarization responses. Often this signature is accompanied by anomalous tin in soil samples. On the whole the induced polarization responses are interpreted as being due to fine grained sulphides at shallow depths. Geological mapping implies these anomalies to be due to "magnetite and haematite alteration", but they also have the signature of skarn zones, although the amplitudes observed are less than normally seen over skarns.*

## DISCUSSION OF RESULTS

*LAUREL CREEK WEST*

Firstly an individual line by line review of the geophysical data is undertaken together with the magnetic field soil geochemistry and geology where available.

*LINE 18N (188W - 1137E)*

This line is surveyed in close proximity to and sub-parallel to the contact between the granites to the north and quartzites to the south. The background resistivity in the west is about 2500 ohm-metres, with perhaps a slightly higher background of 3000 ohm-metres in the east. A markedly lower resistivity 'outcrop' of 350 ohm-metres was defined at 237E, coincident with a local minor chargeability high (see below). This anomaly is centred some 50 metres west of the westernmost limit of a mapped skarn zone seen between 325E and 425E, and to the immediate south of 700E. The magnetic field data shows a sharp, moderate, 600 to 900 gamma magnetic field increase between 160E and 425E, and again centred at 725E (and for 50 metres either side thereof). Only at 237E and at 388E were low amplitude 6 to 8 millivolts/volt above background induced polarization effects recorded. No anomalous geochemistry values were recorded at either site. The maximum depths to source are estimated as 50 metres.

A small 6 to 7 millivolts/volt response at 037W shows no magnetic field distortion, nor resistivity decrease, nor anomalous geochemistry increases. Thus the source represents a local compositional change within the granites.

There are no other significant geophysical features.

005

682006

**SCINTREX**

Page - two

*LINE 16N (337W - 1288E)*

In the west the granite quartzite contact is centred at 360W; granites between 760E and 990E; quartzites again between 980E and 1180E, and limestones between 1180E and 1310E, with granites to the east thereof.

The western survey line does not appear to cross into the granites, but an increase to 4000 ohm-metres(+) at 350W was observed from a low of 10% of this value at 188W. Chargeabilities are a low 2 to 3 millivolts/volt within this low, which may(?) imply some more easily weathered zone within the sandstones.

The magnetic field shows some very sharp fluctuations from thousands of gamma above background (at 325W) to 200+ gamma below background at 250W. These rapid changes in magnetic field occur within slightly higher chargeabilities of 10 millivolts/volt (6 to 8 millivolts/volt above background), and relatively resistive rocks. This implies the source to be due to disseminated magnetite coming within 25 metres of surface. The decay forms are faster than normal at  $\Delta M_n = -15\%(+)$ , but not unduly so for the area. What makes this magnetically disturbed, slightly chargeable zone of interest, is the anomalous tin soil values of up to 200 ppm between 200W and 350W. These signatures could indicate the presence of tin-bearing "skarns" on the granite/quartzite contact between 200W and 350W, and as such are of primary interest in spite of the low amplitude of the chargeability response.

Moving east, a distinctly higher magnetic field level of 70 gamma(+) between 125E and 225W was recorded. This is accompanied by a slightly higher chargeability of 5 to 6 millivolts/volt above the 4 to 5 millivolts/volt background. The resistivities are about 1500 ohm-metres, 500 ohm-metres above background. This zone probably represents a zone of alteration within the crotty quartzites, with low levels of

**SCINTREX**

Page - three

magnetite and perhaps very weakly disseminated sulphides.

The most significant induced polarization responses were recorded at 625E and 700E of 14 millivolts/volt and 8 millivolts/volt above the local chargeability background. The maximum depth to these sources is about 25 metres(+). A most significant resistivity low of less than 350 ohm-metres (as against 600 ohm-metres 100 metres east and west thereof) was defined at 675E+. The resistivity low is associated with a marked chargeability low also which may be due to more *massive* sulphides or to a lower volume percent sulphides at this point. The fast decay forms suggest the latter. The magnetic field data shows a local coincident 50 gamma increase, indicating the presence of magnetite (or pyrrhotite) at this site, however, the amplitude of the chargeability anomaly suggests that magnetite or pyrrhotite is not the sole source of the anomaly. There is no geochemical signature. A further point of interest is that the decay form at 700E is one of the rare cases where a coarse grained source is indicated, which must enhance the interest of this anomaly as a sulphide source. The *form* of the anomaly suggests a west dip. This anomaly is considered of secondary to primary interest.

A 5 to 6 millivolts/volt anomaly at 362E from 1000 ohm-metre material shows no magnetic field distortion, and little geochem activity, and thus is not considered of primary interest.

## SCINTREX

Page - four

007  
LINE 14N (337W - 1962E)

The granite/crotty quartzite boundary was logged at 380W just west of the line end. The higher resistivities seen to the west of 300W may represent silicification within the quartzite and/or the proximity of the granites at shallow depth beneath this point. Of interest is the higher (but still low in absolute terms) induced polarization response seen in the area adjacent to the granites. The slightly faster than normal decay form implies a fine grain size to the source, while the absence of significant magnetic field distortion rules out magnetite. While the 'anomaly' is not defined (as it closes west of the end of the line), the area must be of interest due to the geochemical activity which takes place at about 320W.

A significant local resistivity low of perhaps 200 ohm-metres or less was defined at 250W. This coincides with a creek and can be clearly followed north and south. The resistivity low is due to the resistivity of the underlying rocks being significantly less resistive than the rocks to the east and west, rather than to the superficial Quaternary deposits. Perhaps this feature marks the presence of a significant fault or conductive marker horizon.

Geological mapping implies crotty sandstones to be present to about 800E, however, a sharp contact is inferred at 688E, which may mark the eastern crotty quartzite/granite contact. Within the quartzites the background resistivities are 800 to 1000 ohm-metres, while the chargeability varies about the 6 millivolts/volt  $\pm 2$  millivolts/volt mark. At 550E a 16 millivolts/volt response occurs against a local 4 millivolts/volt background, which *by contrast* is considered significant. Two sources at 525E and 555E are inferred, each about 50 to 60 metres deep (at most). No significant magnetic field distortion was noted, however, anomalous tin,

008

682009

# SCINTREX

Page - five

arsenic (and other) geochemistry certainly enhances the interest of this zone. The resistivity shows about a ten-fold increase from local background to 4000 ohm-metres, clearly implying the source to be disseminated, while the decay form of -14% indicates a very fine grain size to that dissemination. While the amplitude is low, the higher geochemical soil values enhance the interest of this response.

A lesser, but still significant, 8 millivolts/volt anomaly was defined at 425E. The resistivity signature is similar, however, no anomalous geochemistry was recorded. The maximum depth to source is 25 to 35 metres. Of interest is that a small, but definite 40 gamma magnetic field increase was recorded at 375E within a relative resistivity low in close proximity (325E) to a small induced polarization response of 6 millivolts/volt at 315E. This has the signature of a very weak 'skarn' type response.

The granites are interpreted from mapping to exist between 780E and 920E (but see above). Resistivity changes at 925E or 1000E could imply the eastern contact with the quartzites. Of significance is the magnetic field distortion between 700E/800E in the west to 1100E in the east. Sharp negatives at 900E and 980E and a positive at 950E indicate the presence of magnetic material. The absence of material chargeability responses clearly indicates the source to be magnetite. The lack of soil geochemistry downgrades the importance of the magnetic field distortion.

The limestones are mapped as occurring east of about 1150E to 1550E, however, no significant chargeability anomalies were defined within this section. On the other hand a significant magnetic field response of 200 gamma was defined just west at 1188E, and a sharp response of the same magnitude at 1288E. Magnetite

**SCINTREX**

is again considered to be the source, though very weak 'skarn' type mineralisation is possible at this site.

Within the eastern granites at 1700E, a weak chargeability response of 6 to 8 millivolts/volt above background was defined within relatively resistive rocks of 2000 ohm-metres(+). The disseminated source is not considered of major interest.

010

# SCINTREX

LINE 12N (412W - 1637E)

NO MAGNETICS

The western contact between granites and crotty quartzites was mapped at about 400W, which is just covered by the geophysical data. The resistivity shows a contact at about 325W(+), separating rocks of 2500 ohm-metres to the west, and of 400 ohm-metres to the east. The backgrounds across this section are of the order of 6 millivolts/volt, and superimposed thereon was a most significant *relative* anomaly of about 12 millivolts/volt at 337W. The chargeability shows a slow decay form of  $\Delta Mn = +5\%$  in contrast with the anomaly flanks where the decay forms were fast ( $-10\%$ ). The interpreted source is coarsely disseminated sulphides on, or close to the contact. The very strong associated tin (and other) geochemistry strongly supports the interest of this anomaly.

The crotty quartzite is mapped from 400W to perhaps about 1100E, with granites appearing from 730E to 900E. The resistivity data shows a sharp contact at 900E, with high 5000 ohm-metres resistivities westwards to 700E  $\pm 100$  metres. The data suggests a steep gradient in the east with a shallow contact in the west. Both contacts are characterised by sharp changes in chargeability from the 8 millivolts/volt background, but in absolute terms the anomalies are of low amplitude. Unfortunately there is no magnetic field data on this line, and there are also no anomalous geochem samples. Nevertheless the form of the anomalies suggests disseminated sulphides on or in close proximity to the eastern and western contacts of the granites at these sites.

Two related anomalies of 9 millivolts/volt and 7 millivolts/volt above local background were defined at 1000E and 1020E. coincident with a narrow resistivity maximum of 6000 ohm-metres(+) as opposed to a local background of 300 ohm-metres. The fast decay forms indicate a fine grained source, while the form of the anomaly

011

# SCINTREX

682012

Page - eight

suggests a shallow depth of 25 metres or less to the source. The lack of any geochemical response downgrades its importance to tertiary.

LINE 10N (388W - 1388E)

The western boundary between the granites and quartzites is mapped at 420W, just west of the geophysical line. A strong resistivity contact between 6000 ohm-metres material to the west and 1000 ohm-metres (+) material to the east, was defined at about 350W. Of importance here is the sharp 14 millivolts/volt chargeability anomaly coincident with this contact at 350W. The depth to source is less than 25 metres. The associated geochemistry gives anomalous readings in several elements, but notably in tin. The high resistivity indicates a disseminated source, while the very fast decay form of  $\Delta M_n = -16.5\%$  clearly indicates a very fine average grain size to the material, or an inefficient source. Now the magnetic field in this vicinity is sharply anomalous reaching 64300 gamma at 362W, and 61950 gamma at 325W as compared to a 'background' of about 62300 gamma. Thus, at least in part, magnetite may contribute to the source. The various parameters all indicate this site at 350W+25 metres to be of at least secondary/primary interest. Follow-up is strongly recommended.

The mapping shows the whole line to be underlain by quartzites with the exception of a small section between 650E and 820E where granites (with aplite dykes) were mapped. The resistivity shows values lower than about 1000 ohm-metres (averaging perhaps 900 ohm-metres) between about 350W and 525E. At this latter site resistivity rises sharply to 4000 ohm-metres and stays high until a rapid fall at 875E. Now, this suggests a rock type change, and perhaps the granites are at very shallow levels here and perhaps also they have resulted in metamorphism of the quartzites so increasing their resistivity. The magnetic field data is most interesting as just to the west and east of the mapped position of the granites, negative distortions in the magnetic field were observed at 580E +50 metres and at 850E, implying the presence of a residual field. As there are two minor

013

# SCINTREX

682014

Page - ten

induced polarization responses at 562E and 637E, pyrrhotite *may* contribute to the response, however, magnetite also must be present in minor quantities. At 850E no change in induced polarization level was recorded, implying only magnetite to be present at this site. The geochem data shows higher tin values at and west of 575E, down slope of the anomaly at 637E, and coincident with that at 562E. The amplitudes at these sites are respectively 7 millivolts/volt and 9 millivolts/volt. Both sites should be further investigated as targets of secondary(+) interest. The maximum depths to source are about 50 metres at most, while the high resistivity indicates a disseminated source. The decay form of -9% implies a fine grain size.

Superimposed on low 4 millivolts/volt backgrounds within the crotty quartzites, some three low grade anomalies were defined of 6 millivolts/volt at 112W, 8 millivolts/volt at 025E and 4 millivolts/volt at 160E +20 metres. No significant distortions in magnetic field were noted, but some slight geochem activity was recorded in copper and zinc (to 50 ppm). These responses are considered of tertiary interest only.

The most easterly induced polarization response of note was recorded at 1288E where a 6 millivolts/volt anomaly superimposed on a 6 millivolts/volt background was logged. This is accompanied by a marked and sharp increase in resistivity from 800 ohm-metres to 3000 ohm-metres and a sympathetic increase in magnetic field of about 180 gamma. This site has no accompanying anomalous geochem, but otherwise shows the signature seen elsewhere of the crotty quartzite/granite contact. Thus this site could represent such a contact. Alternatively, it also has the signature of the 'skarn' zone, and may represent an extension (faulted?) of the limestone. The anomaly is of tertiary/secondary interest.

## SCINTREX

014

LINE 8N (012W - 425W)

The granite/crotty quartzite contact was defined west of the end of the survey line at about 420W. However, from a relative 'low' of 300 ohm-metres at 300W, the resistivity increases rapidly to 8000 ohm-metres at 425W, indicating the granite to either lie at shallow depth or have caused recrystallisation due to metamorphism within the quartzites. The 12.5 metre spacing shows short wavelength variations in the resistivity. Local relative anomalies of 16 millivolts/volt and 8 millivolts/volt above the background of 6 millivolts/volt were defined at 400W and 362W. The former is associated with a relative resistivity 'low' and the latter with a relative high, but both are associated with high absolute resistivities on the contact. The maximum depth to source in both cases is 12 metres. The decay form in both cases is fast, indicating a fine grained and/or finely disseminated source. The additional geodata provided shows "limonitic minor magnetite alteration" to the immediate south of, and on strike with 330W/340W, while a single 100 ppm tin soil sample was defined at 400W. This zone is considered of secondary(+) geophysical interest. The magnetic field data gives the contact signature seen elsewhere along the contact.

East of 125W to the end of the line at 012W, chargeabilities varied from 14 millivolts/volt to just under 20 millivolts/volt. While low in absolute terms, these values are 'high' for the area, and in the circumstances must be considered to be anomalous. The maximum depth to source at 112W is 12 metres. The low geochem levels (e.g. 10 ppm tin), together with an absence of magnetic signature, indicate only a tertiary/secondary interest for this anomaly.

**SCINTREX**

Page - twelve

*LINE 6N (012W - 700W)*

The mapped position of the granite/quartzite contact is at about 420W, and this agrees well with the sharp change in resistivity from 200 ohm-metres at 350W to 800 ohm-metres at 425W, and the inferred contact at about 388W. This profile form agrees well with the contact signature seen to the north.

The induced polarization background remains a low 6 millivolts/volt over the contact, and to the east thereof. On the contact, a definite low amplitude response of 10 millivolts/volt above background was defined at 412W, apparently within the granites. The maximum depth to source is about 50 metres. An increase on about 50 gamma in magnetic field was noted, but no significant geochem was recorded. The anomaly is considered of secondary/tertiary interest.

To the west a slightly more substantial response of 8 millivolts/volt was recorded at 488W. The maximum depth is of the order of 50 metres. The resistivity is lower over the anomaly site, inferring a slightly less resistive (but still resistive!) host to the disseminated source. The decay form indicates a fine grained source. The magnetic field data and soil geochem show no significant responses, and thus the interest of the anomaly is tertiary.

At 300W a minor 5 to 6 millivolts/volt response associated with lower resistivities of 200 ohm-metres as against 1000 ohm-metres(+) to the immediate east and west was recorded. There is no supporting data, and thus the interest of this anomaly is less than tertiary.

A somewhat more substantial anomaly showing a 10 millivolts/volt maximum at 088W and a subsidiary peak of 6 millivolts/volt at 037W is accompanied by

013

682017

# SCINTREX

Page - thirteen

markedly lower resistivities centred at 062W and east of 012W. The magnetic field over this response is flat, indicating the absence of significant magnetite. Thus the source may be due to weakly disseminated sulphides. No significant geochem response was defined. The response is of tertiary interest at best.

**SCINTREX**

LINE 4N (012W - 688W)

The granite contact is mapped to be at about 400W, and sub-parallel to the line to about 550W, south of which it trends at a sharp angle to the line. The resistivity data shows "lower" resistivities of 600 ohm-metres at 350W +25 metres with a contact at 400W, west of which the resistivities reach typical granite values of 4000 ohm-metres. Little evidence of resistivities typical of crotty quartzite (about 800 ohm-metres) is seen here. The major change in resistivities is seen at about 075W. To the east of this point resistivities are less than 700 ohm-metres, while to the west they are over 1000 ohm-metres reaching 2000 ohm-metres at 250W +50 metres. The granites are perhaps very shallow at this point.

The chargeability background is as usual at about 6 millivolts/volt. A 7 millivolts/volt response at 412W and a similar response at 112W are not considered of significance. In both cases their maximum depth to source is 50 metres.

**SCINTREX**

LINE 2N (337W - 012W)

On this line the mapped location of the granite/crotty quartzite contact is west of the end of the surveyed line at 460W.

Superimposed on the 6 millivolts/volt(+) background are two minor relative anomalies of 6 millivolts/volt at 212W and 6 millivolts/volt at 112W. The magnetic field and geochem show little significant responses, therefore these responses are of less than tertiary interest.

**SCINTREX**

010  
LINE 00 (012W - 362W)

This line was surveyed wholly over the crotty quartzites, with the resistivity data implying a more resistive unit at, or to the west of 362W - well east of the mapped granite contact.

There are no significant geophysical responses on this line.

*GENERAL COMMENTS ON ROCK TYPES AND CONTACTS*

The *granites* are characterised by high apparent resistivities generally above 1000 to 2000 ohm-metres, low chargeability backgrounds of 6 millivolts/volt(+), and low magnetic relief.

The *crotty quartzites* are characterised by lower resistivities (800 ohm-metres+), and low chargeability backgrounds of 4 to 6 millivolts/volt. The magnetic field backgrounds also show low relief except in the vicinity of contacts or where granites are thought to occur at shallow depths.

The crotty quartzites also show linear low resistivity features which represent compositional changes within the quartzites. Near the western boundary such a feature is associated with a stream in which Quaternary deposits were mapped. However, these deposits do not *cause* the resistivity low but are placed there by virtue of the greater propensity of the quartzites to weather along these horizons. Other such 'conductive' horizons such as that between 00/4N and 080E/14N are in fact associated with positive topographic features.

The *limestones* are seen with variable but generally low apparent resistivities from 300 ohm-metres to 800 ohm-metres (and sections to 1500 ohm-metres). The chargeabilities are generally low (8 millivolts/volt) and the magnetic field shows low relief except in anomalous zones.

The contact between the granites and crotty quartzites on the west of the area between 6N and 16N and between 200E and 500E, are defined by anomalous increases (and decreases) in local magnetic field levels; by low amplitude induced polarization responses, and by steep resistivity gradient into the granites.

021

# SCINTREX

These gradients often indicate a contact displaced into the crotty quartzites side of the mapped position of the crotty quartzite/granite boundary. This would be either because of silicification within the quartzites increasing their bulk resistivity in the vicinity of the granite, or/and due to the shallow depths to the granites in the vicinity of these contacts.

The magnetic field data certainly shows the presence of magnetite close to the contact, and in most cases the associated low amplitude chargeability responses show fast decay forms which could be due to magnetite. However, the chargeability anomalies while being associated with the magnetic field anomalies are not often precisely coincident, the former being often more extensive. This tends to suggest the presence of sulphides on the contact also.

*Shallow granites* - The granites are considered to be somewhat more extensive than mapped either side of 800E +200 to 300 metres, or alternatively, silicification of the quartzites by shallow granites has occurred. The location of some anomalous polarization (albeit minor) together with distortions in the magnetic field, tends to suggest the contact characteristics seen to the north and west of the crotty quartzite embayment to the west.

Higher resistivities in the crotty quartzites at +300 metres of 500E on line 14N and 300 metres + of 200W on line 2N, may also be due to shallower granites and/or silicification in the quartzites. The lack of continuity of these features against the continuous nature of the resistivity lows may suggest this.

*'Skarns'* - The limestone/crotty quartzite boundary in the west may be marked by a low amplitude 200 to 300 gamma magnetic high at about 1200E on line 10N and 12N.

**SCINTREX**

Page - nineteen

On lines 12N, 14N, and to a lesser extent 10N at 1150E(+), a weak chargeability anomaly was also recorded. These signatures may be due to weakly developed skarns, for while the amplitude is low, the signature fits this interpretation.

023

682024

# SCINTREX

Page - nineteen

On lines 12N, 14N, and to a lesser extent 10N at 1150E(+), a weak chargeability anomaly was also recorded. These signatures may be due to weakly developed skarns, for while the amplitude is low, the signature fits this interpretation.

## CONCLUSIONS

- 1 The areas flanking the crotty quartzites to the north and west where the granite contact is recorded, look to be the most interesting, although the amplitude of both the magnetic field and chargeability anomalies are low. The occurrence of anomalous tin geochemistry certainly enhances this view. With one exception the decay forms observed are fast, which implies that any sulphides present have a fine grain size and thus form a low percent volume of the rock.
- 2 The granites may be more extensive, or at least at shallow depths over a broader width of line than mapped either side of 800E on lines 10N to 16N. The magnetic field and chargeability response on lines 12N and 14N gave a similar but weaker response of the type seen over the western crotty quartzite/granite contact. Thus, if the western contact proves of economic significance, this zone should be investigated also.
- 3 It is recommended that in areas where the traverse line runs semi-parallel to the granite/sediment contact, short (200 metres+) lines at right angles to the contact should be surveyed using gradient array and magnetics.
- 4 A summary of the significant anomalies defined is given in the table overleaf.

025

SIGNIFICANT ANOMALIES

<u>Line</u>	<u>Station</u>	<u>Anomaly/ Background</u>	<u>Maximum Depth</u>	<u>Mag.</u>	<u>αα</u>	<u>Geochem</u>	<u>ΔM</u>	<u>Priority</u>	<u>Comments</u>
18N	037W	6/8	50 m	-	NC	-	fine	Ty	Minor compositional change in granite
	237W	8/6	50 m	500γ	L	-	fine	Sy-	Chargeability within skarn zone?
	160E-425E	-	100 m-	300-1000γ	-	-	-	Sy	Mag associated with skarn zone?
	725E+50m	-	100 m-	130γ	-	-	-	Ty	Mag associated with skarn zone?
16N	200W-350W	6/4	25m	100-200γ	K	high Sn	fine	Py	'Skarn' on quartzite/granite contact
	625E	14/4	25m	50γ	K&L	-	fine/normal	Sy/Py	Magnetite (pyrrhotite) plus sulphides in low percent volume included
	700E	8/4	25 m	50γ	K&L	-	coarse	Sy/Py	Magnetite (pyrrhotite) plus sulphides in low percent volume included.
14N	west of 340W	10+/8	?	-		mod Sn	fine	Sy	Weak geochem. Anomaly closes west of 340°
	525E ]	11/4	50-60 m	-	R	[mod/high	V.fine	Sy+	While low absolute amplitude, anomaly has good contrast plus geochem
	555E	14/4	50-60 m	-	R	mod/high			
	425E	9/4	25-35 m	-	R	-	fine	Ty	
12N	337W	12/6	40 m	?	K	high	coarse	Sy+/Py	Strong geochem associated with granite/crotty quartzite contact
	600E		25 m-	?	K	-	fine	Ty/Sy	Shallow disseminated sulphides inferred either end of granite
	[937E		25 m-	?	K	-	fine	Ty/Sy ]	
	1000E	9/6	25 m	?	R	-	fine	Ty	May represent granite outcrop
10N	350W	11/4	25 m	-	K	high	fine	Sy/Py	Signature similar to 337W/12N
	562E	9/6	50 m	-80γ	R	mod/high	fine	Sy+	Geochem at, or down slope, contact between Sc/Dg-1

682026

020

<u>Line</u>	<u>Station</u>	<u>Anomaly/ Background</u>	<u>Maximum Depth</u>	<u>Mag.</u>	<u><math>\rho\alpha</math></u>	<u>Geochem</u>	<u><math>\Delta M</math></u>	<u>Priority</u>	<u>Comments</u>
10N	637E	7/6	40 m	-	R	-	fine	Sy-	
	112W	6/4	60 m	-	R	-	fine	Ty	Variation in composition of Sc
	025E	8/4	65 m	-	R	-	fine	Ty	Variation in composition of Sc
	160E+20m	4/4	25 m	-	R	-	fine	Ty	Variation in composition of Sc
	1288E	6/6	50 m	180 $\gamma$	R	-	fine	Ty/Sy	Skarn signature of 'minor' amplitude
8N	400W	16/6	12 m	1000 $\gamma$	K(R)	mod/high	fine	Sy/Py	'Skarn' type signature
	362W	8/6	12 m	-100 $\gamma$	K	-	fine	Sy	Sc/Dg-1 contact
	012W(open) to 112W	10/6	12m(@112W)	-	R	low		Ty/Sy	Compositional variation within quartzite?
6N	412W	10/6	50 m	50 $\gamma$	R	-	fine	Ty/Sy	Disseminated source within granites
	488W	8/6	50 m	-	L	-	fine	Ty	Finely disseminated sulphides in granite?
	088W	10/7	50 m	-	L	-	fine	Ty-	
4N	No significant responses								
2N	No significant responses								
0N	No significant responses								

Key:  $\rho\alpha$  = resistivity;  $\Delta M$  = Grain size (decay); NC = no change; R = Resistive; L = Low resistivity  
 Py = Primary; Sy = Secondary; Ty = Tertiary

682027

**SCINTREX***LAUREL CREEK EAST*

Unfortunately the gradient induced polarization survey over this section of the area was not completed. The western sections of lines 10N to 16N, and all lines south of 8N inclusive remain to be completed. At this stage the report will be confined to the areas covered by the induced polarization survey only.

*LINE 16N (762W - 012W)*

The entire line was surveyed over mapped granites. The resistivities vary about the 1500 ohm-metres  $\pm$  500 ohm-metres level, while the background chargeabilities are about 8 millivolts/volt  $\pm$  2 millivolts/volt.

Slightly anomalous values were recorded at 700W (8 millivolts/volt above local background) and at 612W (7 millivolts/volt). Both anomalies show no correlation with anomalous geochemistry and thus are of less than tertiary interest.

023  
**SCINTREX**

LINE 14N (537W - 012E)

This line was surveyed over and sub-parallel to the variable granite/crotty quartzite contact. Between 450W and 075W the resistivities are about 2000 ohm-metres which coincides with the greatest width of granite outcrop. To the east and west thereof resistivities fall substantially.

There is only one significant induced polarization response, and that was defined at 088W. The response was some 7 to 8 millivolts/volt above background and is associated with the 'contact' between resistive and less resistive rocks at 075W. The magnetic field data shows it lies on the western flank of a substantial 10,000 gamma above background response centred at about 075E. Thus the induced polarization response appears to correlate with similar responses at 150E/12N and 288E/10N. The maximum depth to source is about 50 metres, and the source itself is disseminated sulphides associated with the contact. The interest of this response may be enhanced by the presence of anomalous soil tin values at about 050W, and of the magnetite haematite alteration to the immediate south and west. The response is considered of secondary interest.

Now, as remarked above, this line lies in close proximity to, and sub-parallel to the crotty quartzite/granite contact. It would be preferable to run lines at some steep angle to that contact, preferably normal to line 14N, in order to delineate zones of interest on, or in close proximity to the contact. The magnetic field recorded here, while being anomalous, will almost certainly not be representative of the contact. Here again lines normal to the contact are required.

## SCINTREX

029  
LINE 12N (588W - 462E)

The section of this line surveyed was entirely over crotty quartzite. Between 588E and 150E the resistivities range within 200 ohm-metres of 1000 ohm-metres. Background chargeabilities are 10 millivolts/volt, with a 4 millivolts/volt(+) level between 00 and 280W.

A zone of lower apparent resistivity of about 700 to 800 ohm-metres centred at 150E and 388E was recorded. Now, the resistivity "low" referred to above coincides with a broad, marked rise in magnetic field of up to 5000 gamma. Thus a very significant change in rock type from the mapped crotty quartzites must occur between 200E and 450E in particular. Two anomalous polarization zones occur either side of this resistivity/magnetic field anomaly. The western one at 162E is about 7 millivolts/volt above background. The source is either multiple or broad and the depth is assessed as being 25 to 50 metres, while the disseminated source is inferred to have a fine grain size ( $\Delta M_n = -16\%$ ). While magnetite could contribute to the source, the magnetic field distortion is more significant to the east.

On the eastern contact of the resistivity low, a 12 millivolts/volt response was defined at 388E. The maximum depth to source is about 50 metres, and the anomaly correlates well with the highest magnetic field distortion recorded. The decay form is extremely slow at -19% which is in keeping with a fine grained sulphide source - or/and an inefficient source such as magnetite. However, while magnetite could be the whole source, the sharpness of the induced polarization anomaly as compared to the broad magnetic field response, suggests otherwise. Therefore a fine grained sulphide source within the magnetite is certainly possible.

**SCINTREX**

The geochemistry shows a significant tin response of 70 ppm at 400E, which certainly enhances the interest of this anomaly whose interest is considered to be primary/secondary. The geology map, while not mapping limestones at this site, suggests that they may be present. This further enhances this site as a possible skarn zone.

031

**SCINTREX**

*LINE 10N (588W - 388E)*

The resistivity over the entire line shows little change from a 1500 ohm-metres level, except perhaps on the eastern end east of 300E where lower resistivities may indicate a rock type change under the mapped Quaternary deposits.

The only significant induced polarization feature is a 5 to 6 millivolts/volt above background response situated at about 288E, west of a material increase in magnetic field which takes place at, or east of 500E. This relatively minor induced polarization response would appear to correlate with that seen at 150E on line 12N. The disseminated source in the absence of any geochem anomalies, must be considered of tertiary interest only.

It is recommended that this line be surveyed eastwards to cover the possible strike extension of the 'skarn' type anomaly defined at 388E on 12N.

034

682033

# SCINTREX

Page - twenty six

## CONCLUSIONS

It is most unfortunate that the survey could not be completed over the eastern section of the grid. Again the anomalies defined are of small magnitude, and of rapid decay, implying finely disseminated and/or inefficient sources.

It is quite apparent that the granite/sediment contact is characterised by strong magnetic field distortions due to magnetite, and associated with small induced polarization anomalies which *may* imply minor quantities of sulphides in disseminated form to be present. The geochemistry shows correlation with the limited anomalies in similar style to that seen on the westernmost section of the Laurel Creek grid.

It is recommended that the survey be completed as planned, and that lines 14N and 10N be extended for some 300 metres east of the present survey limits.

The significant anomalies defined are summarised in the table overleaf.

SIGNIFICANT ANOMALIES

<u>Line</u>	<u>Station</u>	<u>Anomaly/ Background</u>	<u>Maximum Depth</u>	<u>Mag.</u>	<u><math>\rho\alpha</math></u>	<u>Geochem</u>	<u><math>\Delta M</math></u>	<u>Priority</u>	<u>Comments</u>
16N	No significant anomalies								
14N	088W		50 m	-	K(R)	mod	fine	Sy	Associated with magnetite and haematite alteration to west and south
12N	150E		25-50 m	-	K(R)	-	fine	Ty/Sy	Situated on western edge of mag high
	388E		50 m	5000 $\gamma$	K(R)	strong	fine	Sy/Py	Possible skarn zone
10N	288E		35 m	-	K?	-	fine	Ty	Situated on western edge of mag high

Key:  $\rho\alpha$  = resistivity;  $\Delta M$  = grain size (decay); K = contact; R = resistive; Py = primary; Sy = secondary; Ty = tertiary

**SCINTREX**

Respectfully submitted on behalf of:

SCINTREX PTY. LTD.

A.W. HOWLAND-ROSE

MSc, DIC, FIMM, MAusIMM, MAIG, FGS.

Geophysicist

035

682036

# SCINTREX

## PERSONNEL AND TIMING

The work was carried out under the direction of Scintrex crewleader Mr. P. List assisted by second operator Mr. G. Kennedy and field hand Mr. S. Dunmill. The survey was completed between 24th February and 6th March, 1982.

**SCINTREX**

## METHOD AND EQUIPMENT

The method employed was the gradient array. Energisation was effected by a large spaced current dipole placed across strike powered by a Scintrex time domain transmitter employing a 2 second square wave. The power unit was an 8HP 400 Hz motor generator.

The resultant primary (resistivity) and secondary (chargeability) electric fields were measured using Scintrex IPR-8 time domain receivers on a two second programme measuring three separate slices under the decay curve as follows:

Slice 1 ( $M_1$ )	130 to 650 milliseconds
Slice 3 ( $M_3$ )	650 to 1170 milliseconds
Slice 5 ( $M_5$ )	1170 to 1430 milliseconds

Note: each section is of 520 milliseconds duration

Each integration has been normalised with respect to the standard induced polarization decay curve established by Newmont Exploration Limited (Dolan, W.M., McLaughlin, G.H. (1967) "Consideration Concerning Measurement Standards and Design of IP Equipment" Proceedings of the Symposium on Induced Polarization, Berkley, University of California, pp. 2-31)

The gradient blocks which were employed were as follows:

Laurel Creek West

Electrodes at 800W and 1400E on 12N

18N 188W to 988E

037  
**SCINTREX**

16N 337W to 988E  
 14N 337W to 988E  
 12N 412W to 988E  
 10N 388W to 988E

Electrodes at 475E and 2375E on line 12N

18N 962E to 1137E  
 16N 962E to 1288E  
 14N 912E to 1962E  
 12N 962E to 1637E  
 10N 912E to 1388E

Electrodes at 1100W and 700E on line 4N

8N 425W to 012W  
 6N 688W to 012W  
 4N 688W to 012W  
 2N 337W to 012W  
 00 362W to 012W

Laurel Creek East

Electrodes at 1470W and 830E on 12N

16N 762W to 012W  
 14N 537W to 012E  
 12N 588W to 462E  
 10N 588W to 388E

The potential dipole was in all cases 25 metres moved at 25 metres along lines but

033

682039

# SCINTREX

at 12.5 metre intervals in zones of high chargeability gradient.

## SCINTREX

## APPENDIX

BRIEF SIMPLE COMMENTS ON THE GRADIENT, DIPOLE-DIPOLE AND POLE-DIPOLE ARRAYS  
AND ON DECAY FORM

## INTRODUCTION

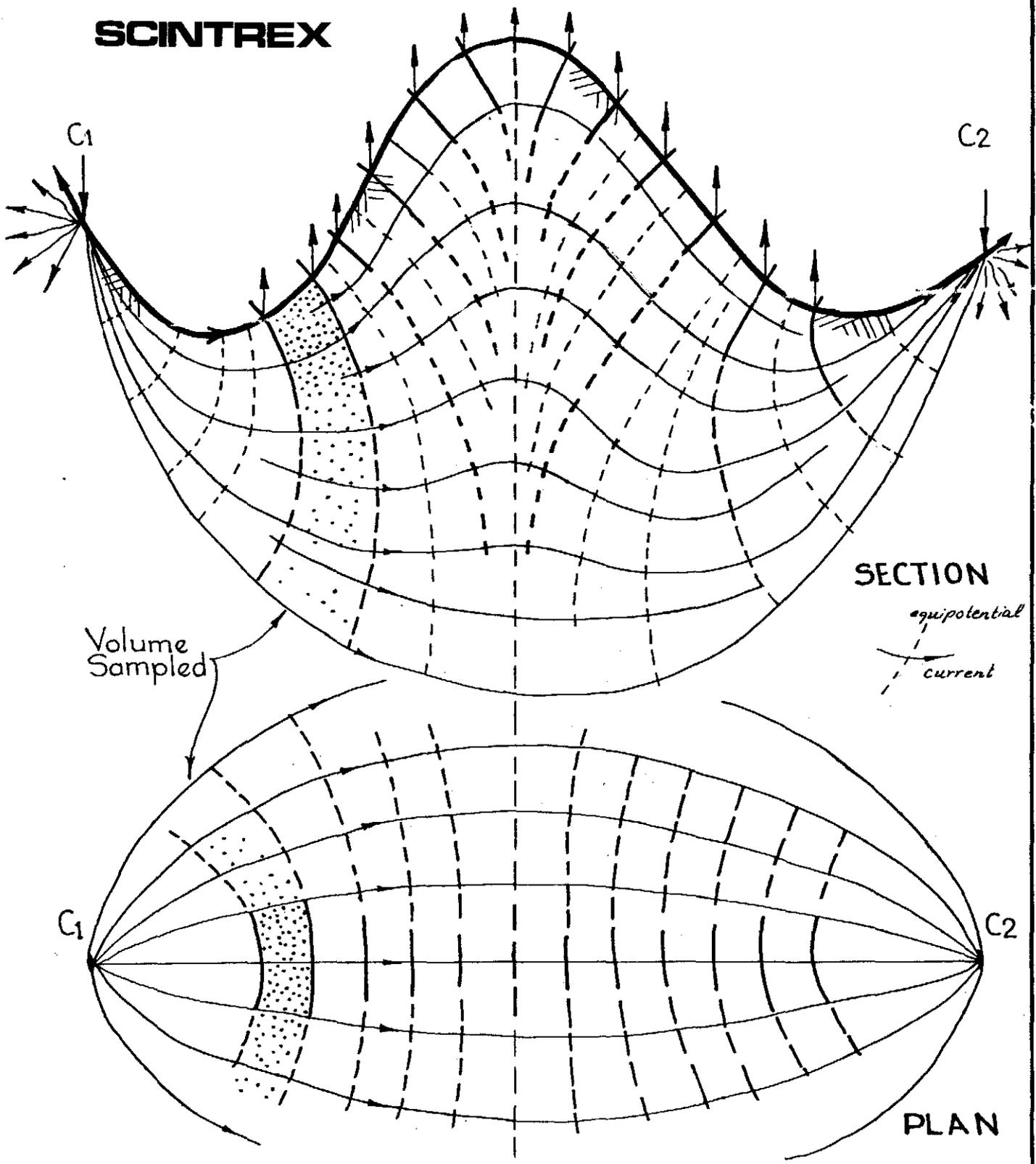
In the case of the surveys discussed in this report, it is important that the geologist can relate the geophysical data to the underlying geology if he is to make the best use of this data. It is the author's opinion that *only* the geologist will be able to relate the data to geology. For this reason brief, simple comments follow on the salient features of the gradient, dipole-dipole and pole-dipole arrays. These comments show how the data relates to the volume of underlying rock which influences it. Comments are also made on the decay form.

## DISCUSSION

*Gradient Array:-* In this array both current electrodes are distant from the potential dipole. Figure 1 displays the salient features of the *primary* current flow and primary equipotential field generated during energisation and shows the influence of terrain on the current paths. From this diagram it can be seen that the *apparent resistivity* measurement is a summation of a volume of material normal to the local slope, *beneath* the surface and at *right angles* to the line.

The apparent resistivity will be *biased by* the influence of each current electrode, but the *relative* values of *adjacent* readings can be considered to be *reliable*. As each electrode is approached, the readings become *increasingly biased by* that electrode.

**SCINTREX**



Diagrammatic Representation of Primary Current and Potential Field in Steep Topography.

**FIGURE 1.**

041

# SCINTREX

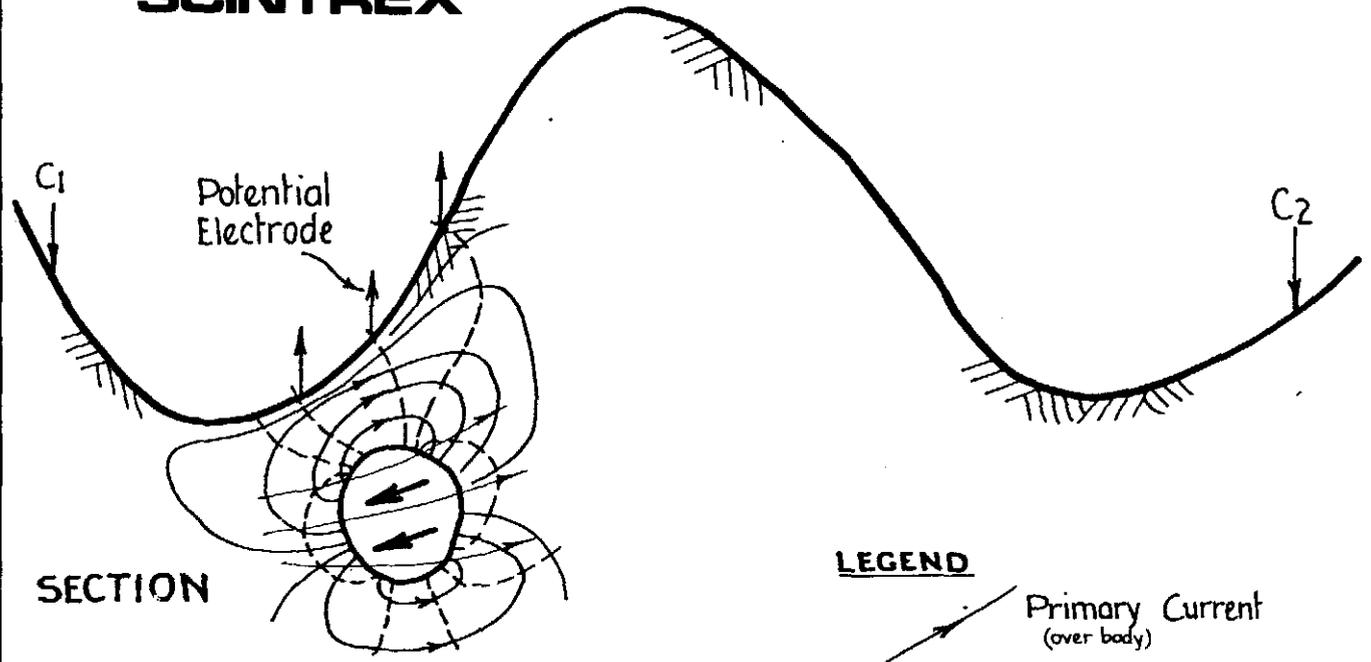
Note particularly that the *source volume is normal to slope* and not vertically beneath the potential dipole. Therefore all maximum depths refer to depths below surface *normal to the slope*.

Note also that the volume of material *closest to the potential electrodes* will influence the data most. It is difficult to easily quantify the complex relationship between the volume of material sampled and its distance from the potential dipole.

Figure 2 displays the secondary current pattern generated from the decay of induced polarization effect *within* a chargeable sulphide source, together with the equipotential field generated by that decay. Note that due to the necessarily curved nature of the current flow outside the body, the on-surface manifestation is *wider than the source width*. Note also that the volume sampled in the primary potential field (apparent resistivity  $\rho_a$ ) is not necessarily the same volume as is the secondary potential field (apparent chargeability  $Ma$ ). This is, of course, true for *any* array.

*Dipole-Dipole:-* In this array the current dipole is generally small, generally 20 to 100 metres. Figure 3 displays the current pattern in section and in plan for a dipole-dipole array. The equipotential  $P_1$  and  $P_2$  tap a volume as shown in this diagram whose characteristics are read on the  $n = 1$  station and plotted as a single point midway between the transmitting dipole  $C_1$  to  $C_2$  and the potential dipole  $P_1$  to  $P_2$ . As progressively higher  $n$  values are read, a deeper and wider volume of material is sampled, this always being plotted midway between the transmitting and receiving dipole, and at a deeper level in the pseudo-section presentation used in this report. It is *vital* to realise that this data point

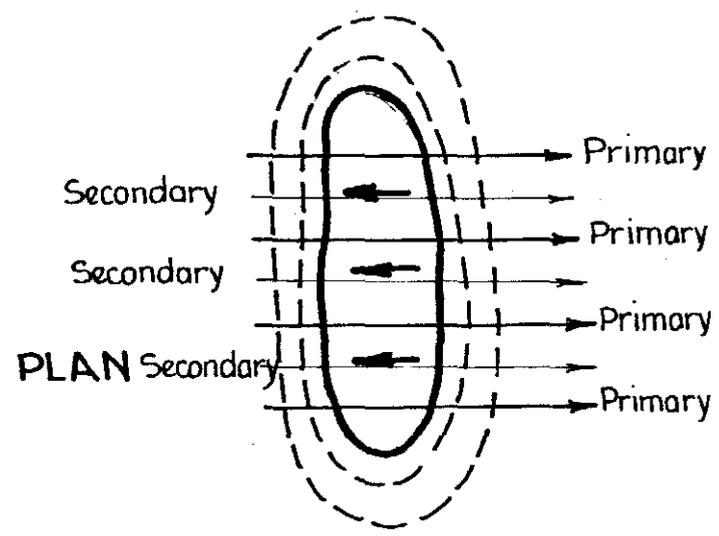
# SCINTREX



SECTION

### LEGEND

-  Primary Current (over body)
-  Internal Polarization (at depth within body)
-  Secondary Current (I.P)
-  Secondary Potential Field



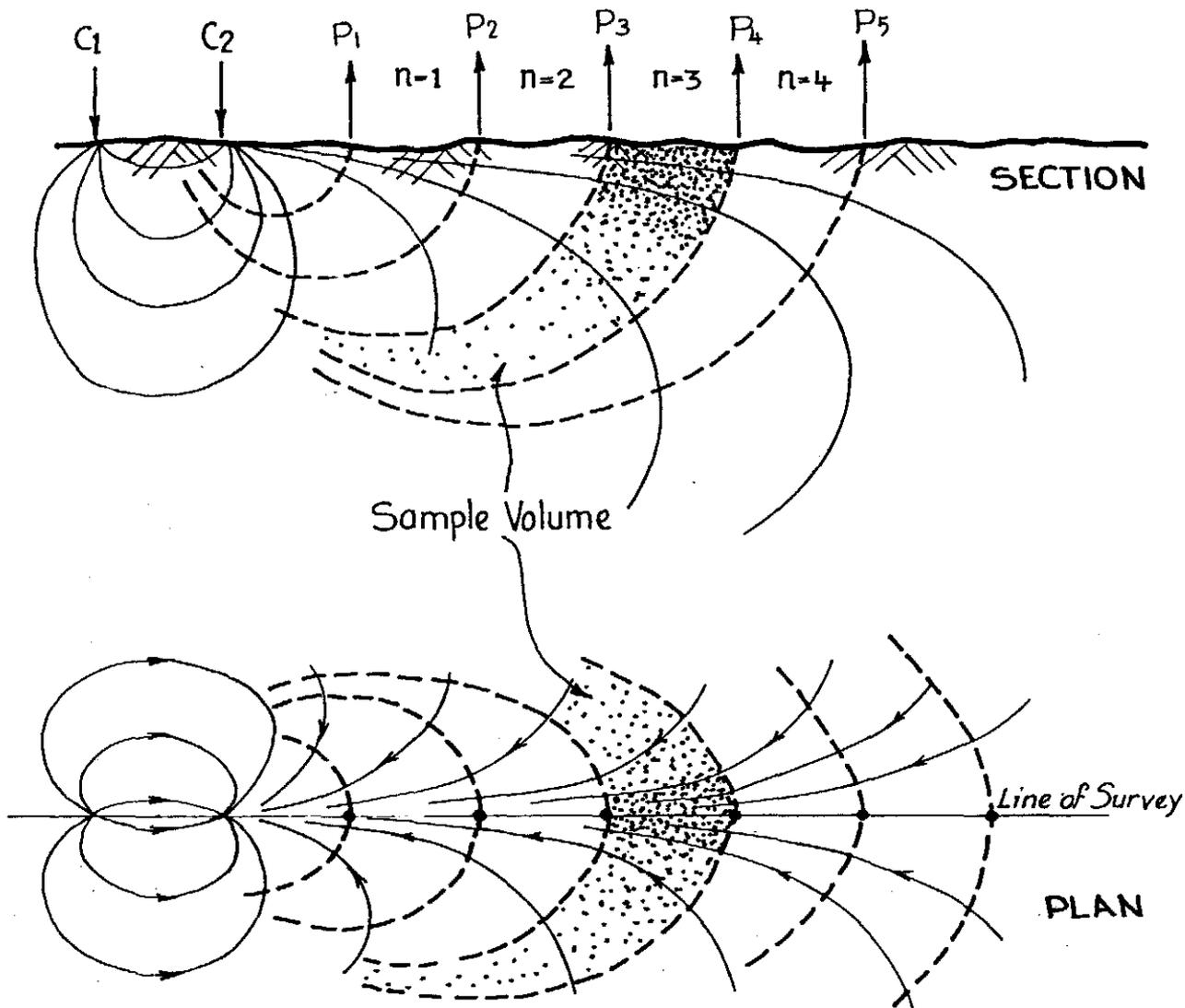
PLAN Secondary

Diagrammatic representation of secondary current (I.P.effect) and secondary potential field in steep terrain.

## FIGURE 2.

0.93

# SCINTREX



Dipole - Dipole Array  
Primary current paths and equipotential field  
Showing volumes sampled

FIGURE 3

# SCINTREX

044

does not represent the characteristics of the ground at the point plotted, but that of the *total volume* sampled.

A further characteristic of the array is that where the effective spacing ( $n \times a$ ) is greater than the depth to the source, a 'high' (or 'low', depending on characteristics) will occur as each of the dipoles (i.e. transmitting  $C_1$  and  $C_2$  and potential  $P_1$  and  $P_2$ ) pass over the source of that anomaly. The resultant  $45^\circ$  patterns on the pseudo-section DO NOT represent dip, or even depth extent, but merely represent a complex interference pattern over the source due to the potential and current dipoles. For a single source, this *double peak effect* can be recognised as it tends to have two maxima displaced by  $(n \times a + w)$  where  $w$  is the width of the source. For multiple bodies this is difficult if not impossible to resolve by dipole-dipole arrays alone.

The enclosed Figure 4 shows the discharge of the energy stored in the body. As can be seen, the area sampled in section is tapped between the equipotentials generated by the discharge of the stored energy. These will not necessarily be of the same form as those for the resistivity data, although they are, for convenience, plotted in the same format as for resistivity. Again, it is vital to note that they represent the volume sampled as shown in Figure 4, *and not* the characteristics of the point at which they are plotted. Double peaks also occur as each of the two sets of electrodes pass over a source, where  $n \times a$  is greater than the depth to source. Where  $n \times a$  is less than the depth to source, a single maximum will be produced midway between the energising and measuring dipoles  $C_1/C_2$  and  $P_1/P_2$ .

*Pole-Dipole*:- This array is similar in principle to the dipole-dipole array,

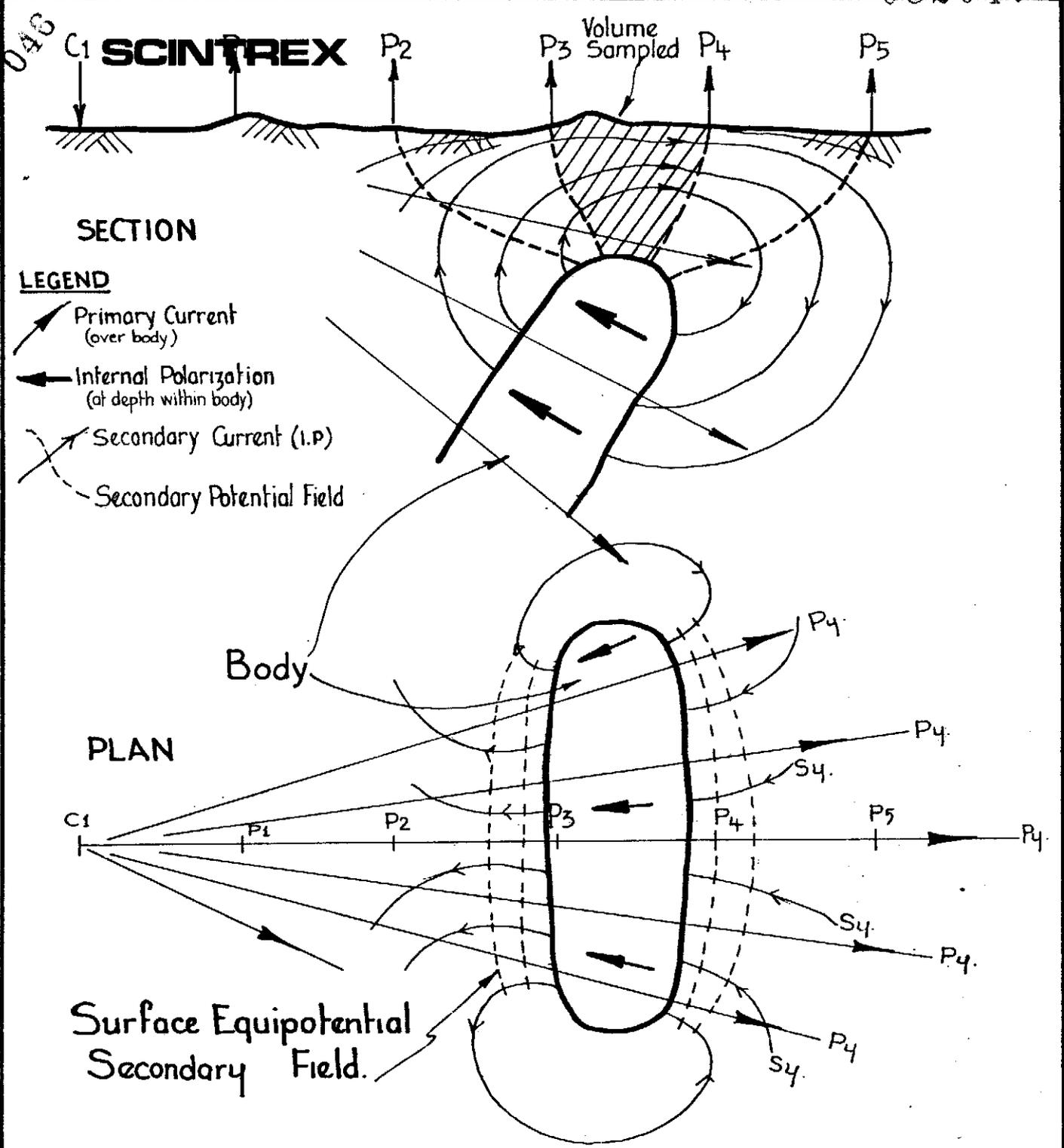
**SCINTREX**

Page - four

except that a single electrode is placed 'close' to the potential dipole, with an 'infinite' electrode placed  $10 \times n \times a$  away from the 'pole-dipole' set-up, and, where practical, at right angles to it. The enclosed Figure 5 shows the distribution of current flow in section and in plan, about the pole source  $C_1$ . The potential electrodes  $P_1$  and  $P_2$  tap off the volume between them, which is contained between spheres whose centres are the pole source. The primary current reading is normalised for the geometry and plotted in profile or pseudo-section format as per dipole-dipole, namely, midway between the closest potential and current dpoles, which in the pseudo-section format is  $45^\circ$  towards the pole source. The chargeability reading is generated in a similar fashion to that described for dipole-dipole (Figure 4).

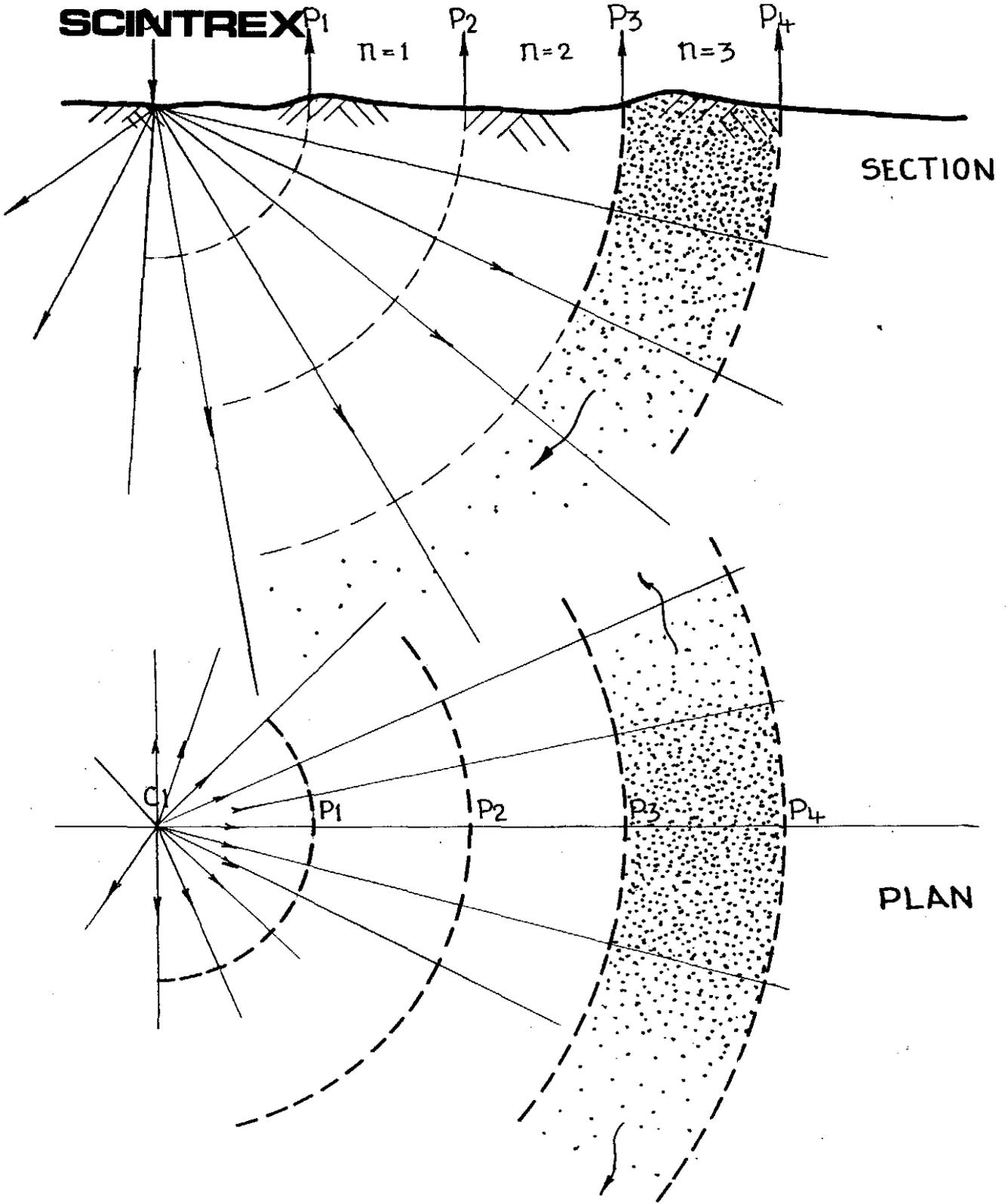
As with the dipole-dipole array, a double peak will result when  $n \times a$  is greater than the depth to source, however, with pole-dipole it will be asymmetric. This will be true for both major resistivity features as well as for chargeability features. An example of this asymmetry for different depth to spacing arrays is shown for the three-array. (The three-array is a pole-dipole array when  $n = 1$  and the  $a$  spacing is varied.)

*The Choice Between Arrays:-* Even after some thirty years of active use of gradient, dipole-dipole and pole-dipole arrays, controversy still reigns as to the relative merit of the various arrays. Much depends on the object of the programme, the terrain, the type of source sought, the type and complexity of the overburden/oxidation. Table 1 shows a comparison between arrays which may be helpful, taken from a fairly recent Canadian Geological Survey publication. In resistive mountainous terrain the author prefers the gradient array as the prime reconnaissance method due to the high productivity (2 to 5 times that for



Current path and secondary equipotential field due to discharge of stored energy (I.P. effect) in the case of Pole-Dipole or Dipole-Dipole.

**FIGURE 4.**



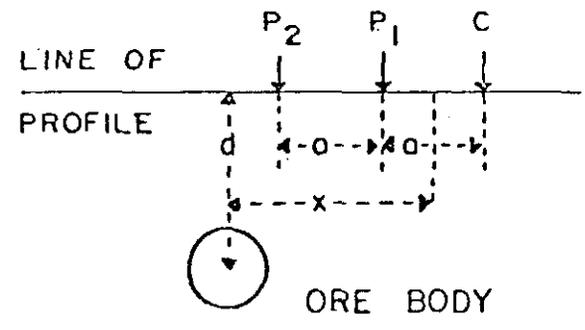
Current Path and Primary Equipotential Field from Pole-Dipole Array

FIGURE 5

048

682049

# SCINTREX SPHERE RESPONSE THREE ELECTRODE ARRAY



$$z = x/d$$

$$\alpha = a/d$$

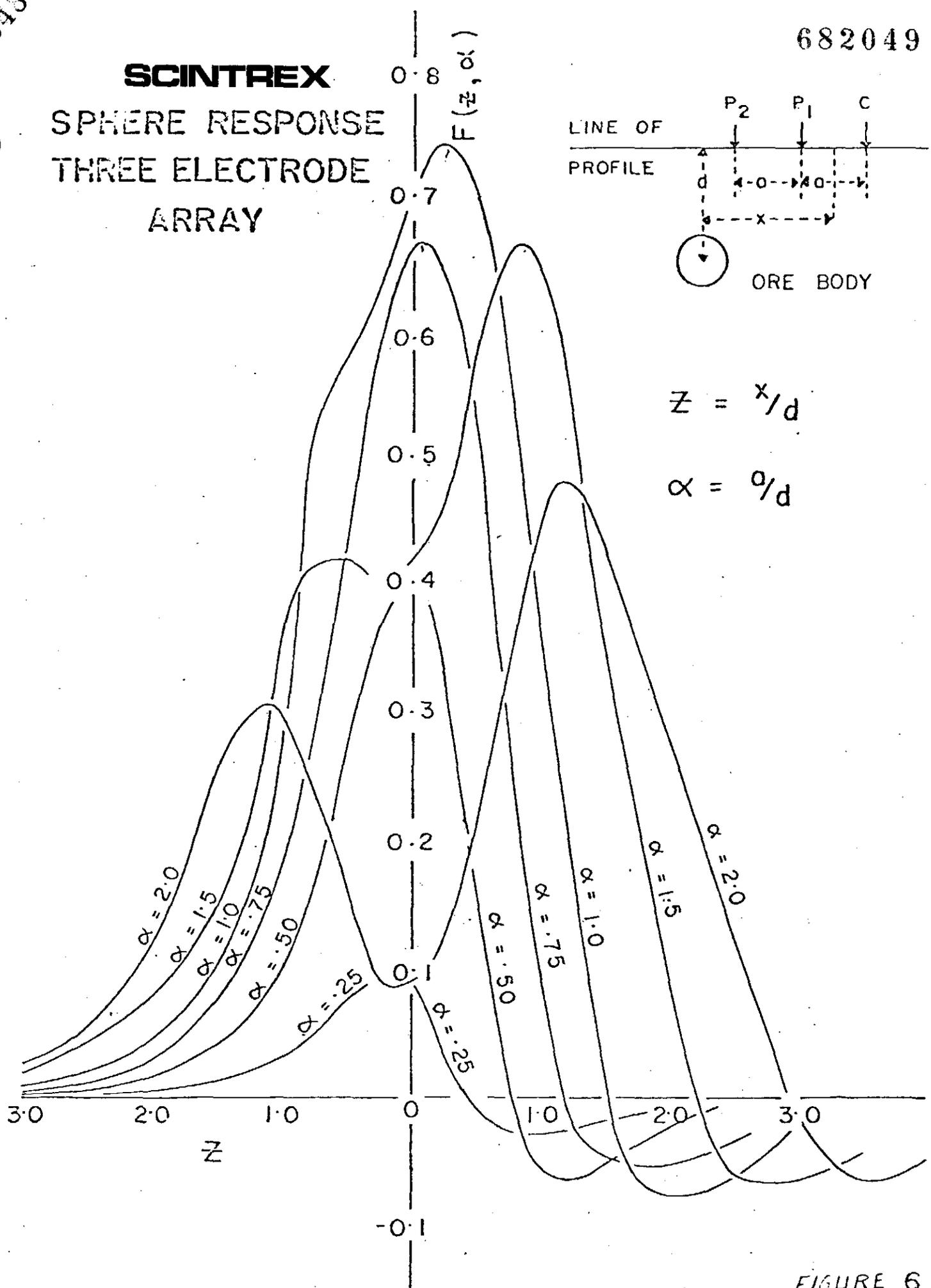


FIGURE 6

dipole-dipole), but this should be followed-up by detailed dipole-dipole or pole-dipole surveys as the gradient array, while giving 'maximum depths', cannot give 'minimum depths' as moving source arrays can. Similarly pole- or dipole-dipole surveys which have complex or multiple sources can very often be resolved by use of limited gradient array detail. While pole-dipole is more efficient to apply in mountainous terrain, it tends to yield asymmetric double peak anomalies, however, to the trained observer, this is no disadvantage.

*Brief Comments on Decay Form:-* In most surveys three 'slices' of the decay form for the induced polarization response are acquired for each station as shown in Figure 7. While six slices are capable of being measured ( $M_1$  to  $M_6$ ), they are normally combined into pairs  $M_1 + M_2 = M_1$  etc. as shown in Figure 7(C). Each of the slices  $M_1$  to  $M_6$  is normalised for a 'normal' decay form such that should the decay form be 'normal'  $M_1 = M_3 = M_5$ . Thus the operator can immediately recognise any anomalous decay forms which may arise from one of two major sources. Firstly the type of the source can influence the decay form. Coarse grained efficient sources such as sulphides show *slow* decay forms, magnetic and fine grained sulphides often show *fast* decay forms. This can be shown as  $\Delta M = M_5 - M_1$ , where positive  $\Delta M$  infers *slow* decay form and negative  $\Delta M$  *fast* decay form. A superior parameter is  $\Delta M_n$  where

$$\Delta M_n = \frac{M_5 - M_1}{M_3} \times 100 \text{ (in percent)}$$

which is essentially  $\Delta M$  normalised for the amplitude of the decay.  $\Delta M$  and  $\Delta M_n$  are merely short hand ways to profile changes in decay form and are essentially qualitative and relative.

Decay forms can also demonstrate the presence of electromagnetic coupling as Figure 7 shows. This is a regional effect as shown on Figure 7(b). This will

000

# SCINTREX

*normal decay*

7(a)

*decay curve modified by coupling*

7(b)

*electromagnetic coupling*

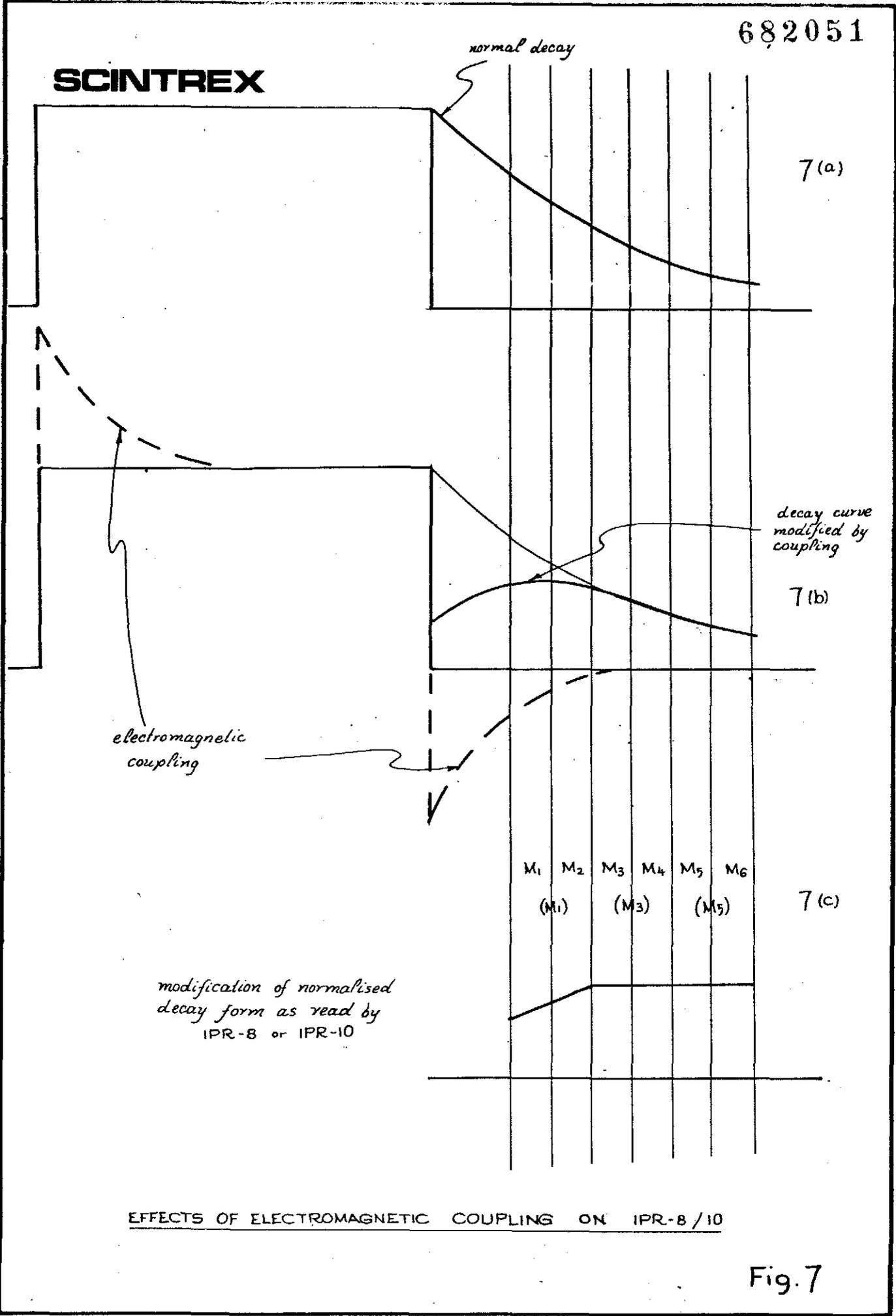
M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>
(M <sub>1</sub> )		(M <sub>3</sub> )		(M <sub>5</sub> )	

7(c)

*modification of normalised decay form as read by IPR-8 or IPR-10*

EFFECTS OF ELECTROMAGNETIC COUPLING ON IPR-8/10

Fig.7



051

TABLE 1  
(Table 3.1)

682052

**SCINTREX** Comparison of IP Survey Electrode Arrays

(after Sumner, 1972)

	Advantages	Disadvantages	Survey Speed	Signal to-Noise	EM Coupling Rejection
Parallel Field Arrays Wenner	Anomalies symmetrical Synchronous detector possible Many case histories available	Requires more wire: larger field crew Poor resolution Unfavourable in capacitive coupling situations	Fair	Good	Fair
Schlumberger	Symmetrical array Synchronous detection possible Fewer men required Works well in layered earth Type curves available	Less horizontal resolution Unsuitable for horizontal profiling Capacitive coupling possible	Fair	Fair	Fair
Gradient	Map interpretation easier Less masking by conductive overburden Penetration good; safer Communications easier Can use two or more receivers Less topographic effect Data easily contoured in plan Useful where difficulty in making good current contacts	Poor resolution with depth Poor in low resistivity areas Geometric factor varies complexly	Good	Fair	Poor
Potential-About-a-Point Three-Array	Good reconnaissance array Fairly good resolution	Asymmetrical More wire needed	Fair	Good	Good
Pole-Dipole, Collinear	Good resolution Good subsurface coverage	Asymmetrical Asymmetrical	Fair	Fair	Fair
Perpendicular Three-Array, Pole-Dipole, Pole-Pole Pole-Pole (Two-Array)	Virtually eliminates EM coupling	More wire needed	Fair to Poor	Fair	Very Good
PDR (Potential Drop Ratio)	Smaller crew needed Less wire needed than for some arrays Good penetration in nonconductive overburden Sensitive to lateral variations "Common mode" noise rejection	Susceptible to masking by conductive over-burden Complex interpretation	Good	Fair	Poor
Dipole Field Array					
Dipole-Dipole Collinear	Symmetrical, good resolution Good penetration Less survey wire needed	Slow unless equipment is portable Resistivity topographic effects Interpretation somewhat involved	Fair	Poor	Fair
Dipole-Dipole, Parallel	Special use for EM coupling interpretation	Not used for routine surveying	Poor	Poor	Fair
Down-the-Hole Arrays					
Azimuthal Array (One Potential Electrode Down the Hole)	Fair for exploration purposes Useful in finding the best search direction	Interpretation complex Negative anomalies Strong geometric effects Mainly measures changes in resistivity	Fair	Good	Good
Radial Array (One Current Electrode Down the Hole, mise-à-la-masse)	Good for exploration purposes Useful in finding the best search direction Hole need not stay open	Interpretation complex Negative anomalies Not good for obtaining rock properties	Fair	Good	Good
In-Hole Arrays (More than One Electrode in the Hole)	Good for obtaining rock properties Good for assaying Interpretation simple	Current densities may be too large Possible capacitive coupling problems Not designed for exploration purposes Special equipment, expensive	Good	Fair	Good

Extract from: Geological Survey of Canada - Paper 75-31 "Borehole Geophysics Applied to Metallic Mineral Prospecting: A Review"

**SCINTREX**

Page - six

produce a normalised  $M_1$  smaller than either  $M_3$  or  $M_5$ .

*Conclusion:-* The above comments are indeed simplistic, and should be considered as a guide only. The author would be pleased to supply references on additional reading on any of the points commented upon.

A.W. HOWLAND-ROSE, MSc, DIC, AMAusIMM, FGS.

053

682054

# SCINTREX

## DATA PRESENTATION

The chargeability and resistivity data has been plotted (by Renison) together with the topographic profile, magnetic field, geology and geochemistry at the scale of 1:5000 and is not included with this report.

The chargeability, resistivity and total magnetic field have been contoured onto the standard Renison sheets covering the survey areas (Corinna B4-3 and B4-4). In addition, an interpretation plate has been prepared emphasising the main geophysical trends.

5 394 000 N

5 395 000 N

5 392 000 N

5 391 000 N

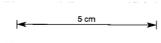
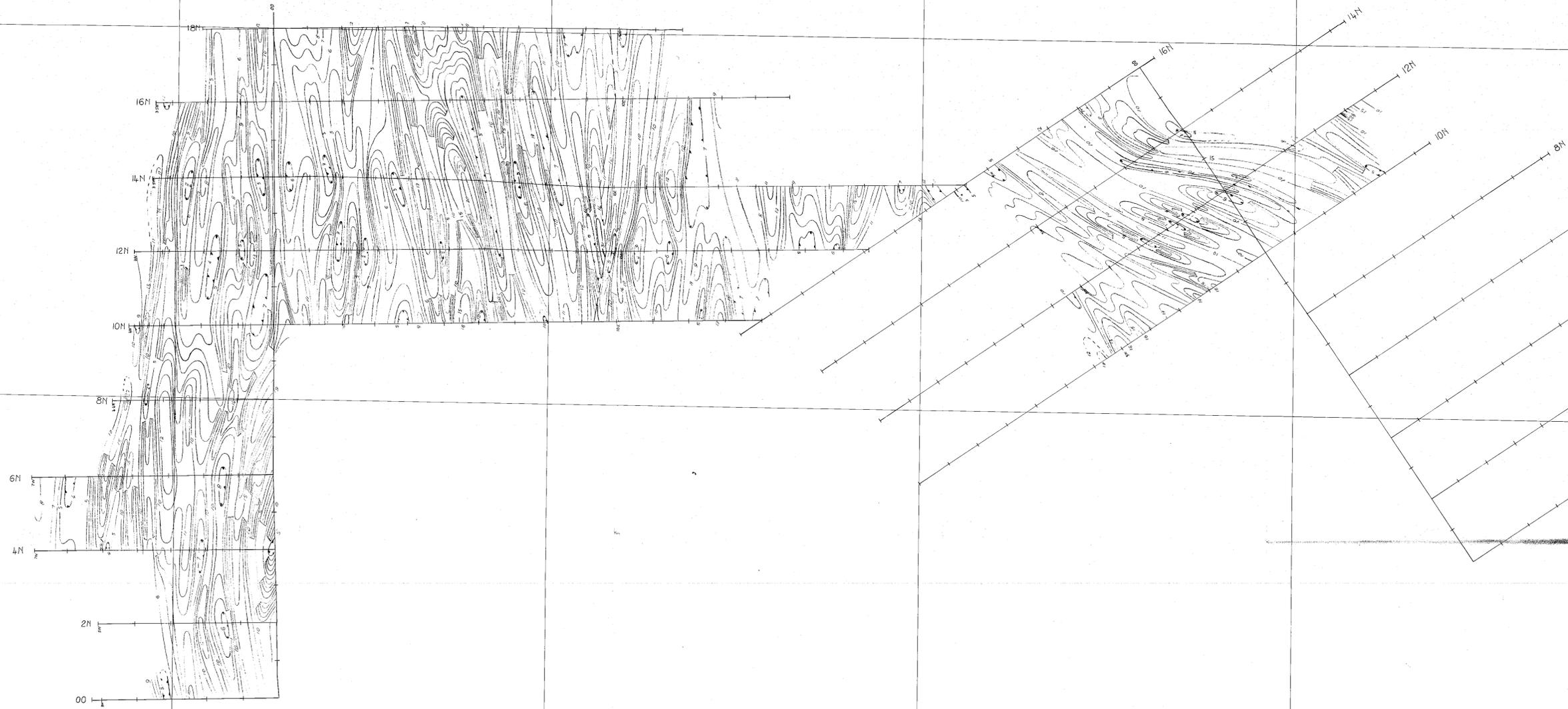
365 000 E

366 000 E

367 000 E

368 000 E

369 000 E



682055 LAUREL CREEK  
 CHARGEABILITY CONTOURS  
 SURVEYED & SCINTREX  
 COMPILED BY [Logo] Job # 7A3-087-E  
 PLATE 1

CORINHA B4-3	B4-4
D2-1	D2-2

RENISON LIMITED

CORINHA B4-3

1304

SCALE 1:5000m

82-1862





NOTE  
No data on  
line 12N

	CORINNA B4-3
	CORINNA B4-4
	CORINNA DS-1
	CORINNA DS-2

LAUREL CREEK  
TOTAL MAGNETIC FIELD CONTOURS  
COMPILED BY SCITEK  
DATE 12/1/83  
JOB NO. TR-83-091E  
PLATE 3  
SCALE 1:5000 METRES

RENISON LIMITED  
CORINNA B4-3  
1305  
682057  
SCALE 1:5000  
DRAWN  
TRACKED  
DATE  
SCALE 1:5000  
DRAWING NO.

5.394.000N

5.393.000N

5.392.000N

5.391.000N

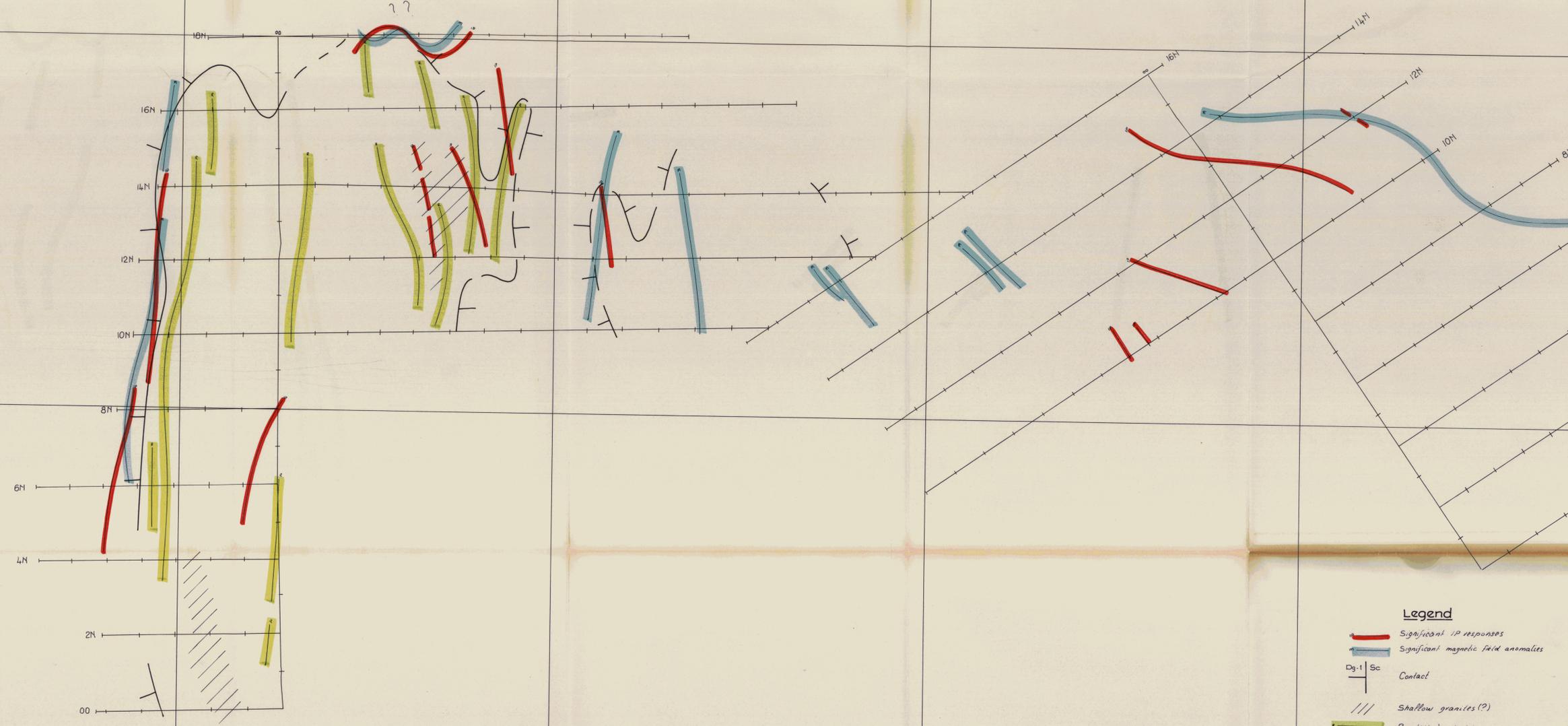
365.000E

366.000E

367.000E

368.000E

369.000E



- Legend**
- Significant IP responses
  - Significant magnetic field anomalies
  - Dg-1 Sc Contact
  - /// Shallow granites(?)
  - Resistivity marker lows within Sc

LAUREL CREEK  
 INTERPRETATION PLAN  
 SURVEYED & COMPILED BY SCINTREX Job # TAS-097-E  
 PLATE L

682058  
 RENISON LIMITED

CORINNA B4-3  
 1307

CORINNA B4-3	B4-4
D2-1	D2-2



82-1862