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MINERAL EXPLORATION AND ENGINEERING CONSULTANTS

BUGGS LANE   ELLIOTT   TASMANIA 7325   PHONE 004-363143

AN EVALUATION OF

THE RIO TINTO 'EASTERN' TURAM ANOMALY

EAST TYNDALL AREA

for

THE MT. LYELL MINING AND RAILWAY COMPANY LIMITED

by

Dr. J.R. BISHOP

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SUMMARY

Several strong EM anomalies were defined by Rio Tinto in a Turam survey
over the Howard area, East Tyndall in 1958. One anomaly, referred to as
the Eastern anomaly, had a strike length of nearly 1000m. and has not been
further investigated. The anomaly has been located (on a map) with respect
to the Mt. Lyell grid (see Figure 1) and the results interpreted.

A quantitative interpretation of the results suggests a fairly conductive
body (a resistivity-thickness ratio, P/d, of .5) at a depth of between
30 and 40m. This is significantly deeper than the 6m. estimated by Rio
Tinto. The anomaly is apparently closely associated with a faulted contact
between the Owen Conglomerate and the Tyndall Group tuffs and both of these
rock types are considered barren. Most of the anomaly is over ground
covered by glacial moraine.

Magnetic and gravity surveys were carried out by Rio Tinto over the Eastern
anomaly. A 0.3 milligal. residual gravity anomaly was defined which
paralleled, but was not coincident with, the Turam anomaly. The magnetics
also responded over the area, but again the anomaly was not coincident
with the Turam response. It is suggested that either the fault or a
conductive horizon within the moraine is a likely cause of the Turam anomaly.

From the geophysical evidence and the geology as indicated, the anomaly
is not considered very prospective. However for the following reasons
it is recommended that follow up work be undertaken:

* The geology is poorly known and the rocks marked Tyndall group may
   be part of a more prospective sequence of the Mt. Read Volcanics.

* The fact that mineralisation has not previously been found in the
   Tyndall group does not mean it should not be prospected.

* A possible synclinal structure west of the fault may mean that
   prospective rocks underlying the Tyndall group may be close to the
   surface.

It will be necessary to locate the anomaly on the ground before any
further exploration is undertaken. To do this it is strongly recommended

that an EM technique is used; several reasons for this are listed at the end of the report. The method recommended is a new Slingram system used by Geoterrex. This survey should be used to evaluate the method for follow up of Dighem anomalies.

It is suggested that further evidence of the anomalies' prospectiveness is needed before drilling is warranted. This may come from the soil sampling recently carried out by Mt. Lyell. However since the area is largely covered by moraine, the results may not be very meaningful. Costeaning or augering may be the next approach and it is probable that resistivity profiling (a cheap and quick method) could be used to locate the areas with thinnest overburden.

AIMS AND INTRODUCTION

Several electromagnetic anomalies were defined by a Turam survey of the
Howard area, East Tyndall, carried out by Rio Tinto Australian Exploration
Pty. Ltd. (RTAE) in 1958.   The survey extended for a strike length of
over 4 kms. and at the southern end revealed two strong linear anomalies.
The one on the western side of the base line, referred to as the 'southern'
anomaly has been drilled by DDH HA3.   This hole was sited on a gradient
array chargeability anomaly coincident with the Turam anomaly.   There was
no resistivity anomaly.   DDH HA3 intersected a pyritic black shale
200 ft. (61m.) east of the IP response and no other polarisable or conductive
body was intersected (Stevens-Hoare, 1974/75).

The anomaly on the eastern side of the base line, referred to as the
'eastern' anomaly, has not been drilled.   RTAE conducted magnetic and
gravimetric surveys over the anomaly and a qualified recommendation for
drilling was made (Boniwell, 1959).   It is the aim of this report to show
the location of the anomaly with respect to the Mt. Lyell grid and to evaluate
the results of the survey.

GEOPHYSICAL SURVEY DESCRIPTIONS

Turam:

The RTAE Turam survey was conducted on traverses at 400 ft. (122m.) intervals,
pegged every 100 ft. (30.5m.).   The grid was controlled by two parallel
base lines, one extending from 6400S to 00, the second offset one third of
a mile to the west, extended from 800S to 7200N.   The bearing of the
base line is recorded by Boniwell (1959) as 342° (magnetic) azimuth.   The
survey recorded two frequencies, but only the results of the lower
frequency (440 Hz) were plotted.   The ratios were plotted as lines of
equi-ratio at contour intervals of .1 (RTAE map no. T.479, scale 1" = 400 ft.).
Readings were plotted as tenths above or below the norm (1.0).   The phase
differences were plotted as lines of equi-phase at contour intervals of
2° (RTAE map no. T.476, scale 1" = 400 ft.).   Readings were plotted as
tenths of a degree above or below the norm (0.0°).   The phase anomalies
are positive in RTAE's map, rather than the usual negative;   the sign has

been changed in the profiles accompanying this report (Figures 2 and 3),
but not in the contour map (Figure 1).

Readings were taken every 100 ft. and it is assumed that the spacing
between the receiving loops was also 100 ft. An earthed wire was used to
energise the ground. The phase difference contours have been used to show
the location of the anomaly with respect to the Mt. Lyell grid (Figure 1).
The grids for this Figure have been taken from a 1:6000 map by L. Newnham
showing "Rio Tinto geophysical coverage superimposed on the present East
Tyndall Rd.".

The major part of the anomaly is from lines 4800S to 2400S of the Rio Tinto
grid. However it extends to line 5600S and is still open to the south.
Thus the anomalous zone extends over 3200 ft. (975m.). Profiles over the
two most anomalous lines (Figures 2 and 3) show that the survey did not
extend sufficiently far west for proper definition and interpretation of
the conductor, no doubt because of the steep slope of the Tyndall Range
which formed the eastern limit of the grid. Also the shape of the anomaly
has been inadequately sampled; a closer station spacing in the region of
the maximum values would have been better practice. Nevertheless an
interpretation was made and this is discussed in the next section.

Magnetics:

Magnetic surveys were carried out over anomalous areas defined by the Turam
survey. On the Eastern anomaly, the coverage was from line 5200S to
3600S with readings at 100 ft. intervals. It is assumed that the vertical
field intensity was measured (RTAE map T.477, 1" = 400 ft.). Figure 1a
shows the positions of the stations read and gives the 200γ contours. As
an overlay to the phase difference contour map, it can be seen that there
is little correlation between the two, although there are magnetic anomalies
in the vicinity of the Turam conductor. The lengths of the profiles,
relative to the sizes of the anomalies, are too short for a meaningful
quantitative interpretation and none has been attempted. The data is used
here to show that the conductor causing the Turam anomaly is not magnetic.

Gravity:

Gravity surveys were also carried out over the Turam anomalies. On the Eastern anomaly the coverage was from 5200S to 2800S (missing line 3200S), with a station interval of 100 ft. RTAE map T.585, 1" = 400 ft., shows the Bouguer gravity profiles. For each line there is a strong gravity gradient decreasing to the east. RTAE map T.886, reproduced here (Figure 1b) shows the residual gravity contours. As Boniwell (1959) comments "as this (the removal of the regional) can only be an empirical procedure, uncertainties are consequent to the residual values." Figure 1b shows a weak linear anomaly parallel, but not coincident with, the Turam anomaly. No quantitative interpretation of the results has been attempted.

INTERPRETATION

Figure 4 shows the Turam anomaly superimposed on the interpretive geology map (Stevens-Hoare, 1975). This shows that the anomaly is almost coincident with a fault (the Great Lyell Fault) for most of its length. However as shown on Rio Tinto's map (Figure 5), nearly all of the contact is obscured by moraine and scree. Figure 5 also shows a considerable displacement (about 100m.) between the Turam anomaly and Rio Tinto's interpreted position of the fault (referred to there as the Tyndall Fault) at the northern end of the anomaly.

The rock types underlying the Turam anomaly are indicated in Figure 4 as Owen Conglomerate to the east of the fault and Tyndall Group tuffs to the west. The Tyndall group is part of the Mt. Read Volcanics (host to much of the mineralisation on the west coast of Tasmania), but to date no significant mineralisation has been found within these rocks. Thus the initial evidence, an anomaly situated over a faulted contact between two apparently barren rock types, is not promising, however alternative possibilities are discussed in the Conclusions and Recommendations.

As previously mentioned, the Turam anomaly was situated at the eastern extremity of Rio Tinto's grid. It is also at the end of the old Mt. Lyell lines 22N, 24N and 26N. Resistivity contours have been prepared for the n = 1 spacing of a McPhar 1967/68 dipole-dipole IP survey, and the Turam

anomaly is coincident with a weak resistivity low (1175 ohm-m) on line 26N.
However the survey did not extend to the anomaly on lines 22N and 24N.
The IP survey did cover the Southern anomaly and it is of interest to
note that the nearest resistivity low is distant some 150m. from the EM
anomaly and is at an angle to it (no investigation was made of the other
n values).   This comparison is referred to later under Recommendations.

Comparisons of the Turam anomaly and the magnetic and gravity profiles
for the two lines with the largest phase responses are shown in Figures 2
and 3.   In neither figure is there a magnetic or gravity anomaly directly
associated with the EM anomaly.   However on line 4800S there is a 0.3
milligal. anomaly 50m. to the west of the EM and a large magnetic anomaly
peaking several hundred metres to the west.   On line 4800S there is a
broader weaker gravity anomaly (0.2 mgal) again offset to the west, but
the magnetics show a small 200 gamma anomaly about 50m. to the west.
The lack of correlation between the magnetics and the Turam indicates that
the EM anomaly is not due to magnetic mineralisation.   Strong magnetic
anomalies have been recorded over this rock group (TGii, Stevens-Hoare,
1974/75).

A gravity survey over shallow economic massive mineralisation would be
expected to show a larger anomaly than the .3 milligals in this survey
(for example the Woodlawn ore body in eastern NSW, a roughly tabular body
of 10 million tonnes of massive sulphides at 25m. below the surface, gave
a residual anomaly of 0.8 milligals).   However there would be several
difficulties in extracting the best results from this gravity survey, not the
least of which is the shape of the bedrock topography and the moraine
thickness.   Boniwell (1959) stated that the magnetics were clearly not
related to the fault itself but that there was some apparent association
with the gravity results.   He postulated local concentrations in ferric
iron content within the "porphyry country rock" giving rise to increased
susceptibilities and densities.   He took this postulate further by
noting that these concentrations, being more resistent, should occur as
high spots in the topographic relief.   Whilst some profiles reinforced
this theory (e.g. 3600S), others negated it (e.g. 4800S).

Thus the follow-up magnetic survey over the EM anomaly showed that
there was no coincident magnetic mineralisation, and nor did the results
from the gravity survey indicate that the EM response might be due to
massive sulphide mineralisation.

QUANTITATIVE INTERPRETATION OF TURAM PROFILES

Depths to the conductor and conductivity-thickness products were calculated
using the method of Williams (1971) for profiles 4800S and 3600S. A
depth of 40m. was obtained for line 4800S and 30m. for 3600S. These
depths are calculated from the curve shape, which, as previously stated, is
poorly defined owing to the large station spacing. Therefore these depths
estimates may be quite inaccurate. (Undersampling gives broader anomalies
which would be interpreted as deep sources, thus the depths given here are
maximum values.) Further inaccuracy may arise from the fact that a
grounded cable was used, rather than a closed loop: this means that
primary as well as induced currents flow within the conductor, whereas
interpretation procedures assume an inductive current only.

However quite consistent estimates were obtained from the profiles (see
appendix). These depths are grossly different from Boniwell's (1959)
report, where he stated that "All these electrical disturbances arise from
bedrock sources beneath a shallow cover, 20 ft. (6m.) and less." Since
Boniwell was responsible for the survey, had access to all the data,
particularly the high frequency data which 'looks' shallower, his estimates
must be given some credence. However the report gives no information as
to how the figure of 20 ft. was arrived at.

The conductivity thickness products are found using the maximum values
of the ratios and phase differences and hence are not subject to the same
limitations of the depth estimates. There are however limitations to the
nomograms of Williams (1971) and assumptions have been made regarding the
effect of strike length on the calculations (see appendix). The conductivity
thickness products were 1.8 and 1.9 for lines 4800S and 3600S respectively.
(Although conductivity is the traditional parameter used in electromagnetic
techniques, resistivity is a more familiar quantity and Williams refers
to the resistivity thickness ratio, ρ/d). The large phase response of
the survey indicates that the causative body is not a 'good' conductor.
Boniwell (1959) estimates a thickness of 50 ft. (15m.) or less and such

a width gives a resistivity of 8 ohm-m (still fairly low, although massive sulphides are commonly 0.1 ohm-m or less).

CONCLUSIONS AND RECOMMENDATIONS

An evaluation of the geological and geophysical data associated with the Eastern anomaly has shown that a cause other than mineralisation is quite possible. It may be due to conductive ground water within the shear zone. The anomaly may also be due to a conductive horizon within the moraine. It is also possible that both of these features contribute to the cause of the anomaly (e.g. the shear zone providing excess water to a porous or clayey layer within the moraine).

It is therefore desirable to find some other evidence to increase the target's prospectiveness, for example the occurrence of mineralisation elsewhere along this contact. Rio Tinto's revised map T.712 (Figure 5) shows geochemical anomalies at the northern end of the anomaly, and Mt. Lyell has soil sampled along (extended) lines 22N, 23N, 24N, 25N. However these lines are for the most part covered by moraine and the results (Rio Tinto's and Mt. Lyell's) may not be very meaningful. Figure 5 shows the moraine not extending north of Rio Tinto line 3200S, but an inspection of the area with Mt. Lyell exploration geologist P. Kamyshan showed that the Rio Tinto map was largely based on air-photo interpretation and that although the cover probably thins to the north, several of the areas marked on Figure 5 as outcrop are actually glacial moraine.

Despite the poor prognosis for this anomaly, discussion with the Mt. Lyell exploration staff has shown that there are possibilities which suggest that the anomaly should be followed up. Firstly, it is by no means certain that the rocks marked as Tyndall group tuffs are actually this rock type; they may be part of a more prospective sequence of the Mt. Read Volcanics. Secondly, the fact that mineralisation has not previously been found in the Tyndall group does not mean it should not be prospected (perhaps it does mean that the Tyndall group is largely unexplored?). Thirdly, mapping by Corbett (1975) indicated a synclinal structure west of the fault. The Tyndall group immediately overlies prospective sequences of acid volcanics and these may be at shallow depths within the syncline.

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The anomaly will need to be relocated on the ground and since it is an EM
anomaly, an EM method is the best technique for finding it.   Other
arguments for using EM are given below.   To properly locate the body and
to determine the most conductive areas within the zone, (extended) lines
22N, 24N and 26N with intermediate lines 23N and 25N should be surveyed.
The inclusion of line 21N would help to define its southern extent.

Discussion with Mt. Lyell geologists indicated that IP was a favoured
technique for the follow-up work, presumably because it would also define
any polarisable, but not conductive, bodies in the area.   I would make
the following arguments against IP and for EM:

*   The area has been largely covered by IP dipole-dipole and gradient
    arrays.   There is not much 'room' for a sizeable polarisable body
    between the Owen Conglomerate and the IP coverage.

*   A specific target - the Eastern anomaly - is being sought.   This is
    a narrow, elongate and moderately shallow conductive zone.   Follow-up
    surveys should be designed specifically to relocate it.

*   EM will generally (always?) provide much better resolution than IP.
    If a body is known to respond to EM, then this is much the preferred
    technique for accurate location and drill siting.   The previously
    cited example of the IP survey covering the southern anomaly shows that
    an EM anomaly may be only poorly defined by IP.   (It is admitted that
    this IP survey was not designed to locate the EM anomaly.)

The obvious method to use for the location of the Turam anomaly is a Turam
system, however this method has largely fallen out of favour, although
Scintrex fairly recently (?) introduced a five frequency Turam system.
In the open country where the anomaly is situated, one of the transient
EM methods would be most suitable.   However the geophysical contractors
Geoterrex have a modern Slingram-type system which they claim should be
ideal for the Tasmanian environment.   Apparently this 'Min-Max' system
also has better power-line rejection than their Crone PEM system (which
I would otherwise recommend) and this should be important given the proximity
of a large cross-country power line to the anomaly, sub-parallel and 100m.
to 300m. distant.   Rio Tinto's Turam anomaly was a strong one and (if real)
should not be too hard to find;   it is therefore recommended that this
'Min-Max' system be used and the experience with the method will be useful
when deciding on an EM method to use for the follow up of Dighem anomalies.

Thus the Eastern anomaly, on the basis of the geophysical evidence and the geology as it stands, is not very prospective. It is located over moraine, above a shear zone and either of these may give rise to an EM anomaly: both of the classifications for the rock types on either side of the fault are considered barren. Nevertheless the anomaly should be readily located by an EM survey and these results may be compared with the soil sampling recently undertaken. Since the area is largely moraine covered, negative geochemical results will presumably not preclude the possibility of subsurface mineralisation and the anomaly will have to be further explored. It seems unlikely that the moraine is very thick over the anomaly (i.e. probably less than 20m.) and costeaning or augering may be the next approach. It is probable that resistivity profiling (a very cheap and quick method) with a few resistivity soundings to provide spot depths would provide sites with the thinnest alluvial cover.

Drilling is not recommended at this stage but if a target is required before further follow up work, then the site given by Boniwell (1959) is probably the best; it is designed to intersect the peak of the anomaly and is close to the road. The site on the RTAE grid was "line 4800S at station 800E, bearing east along line of traverse (approximately 83°T), depression, minus 45 degrees, estimated length 1000 ft. (305m.)." In terms of the Mt. Lyell grid, this site is 450 ft. (137m.) grid north of station 300E on line 22N.

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Stevens-Hoare, N., 1974/75.   Annual report for E.L. 9/66 (Mt. Tyndall).
        Mt. Lyell report.

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        ASEG Bulletin Vol. 2 no. 1, pp. 15-28.

APPENDIX

Quantitative Interpretation of Turam Profiles - 4800S and 3600S

The results of a Turam survey may be used to give (1) the depth to a conductor and (2) the product of its thickness and conductivity, given certain assumptions. These include that the conductor is a thin steeply dipping sheet-like body in a resistive host; and that the energising field is uniform. Historically these calculations were made using the real and imaginery components of the vertical field. Williams (1971) has shown that they can be made directly from the measured values of ratio and phase difference.

Depth:

(The depth calculations actually give the depth to the current concentration (an assumed line-source), rather than the top of the body. Thus the 'depth' is frequency dependent.)

Williams gives three not-all-independent means of determining depths. These have involved further assumptions which he has verified by model testing.

(1) $a^2 = (x + c)(x - c)(d + x)$ - Williams equation no. 10. This method assumes that the conductor is directly beneath the peak ratio and phase values.

    a = depth

    x = horiz. distance from the line-source to the point where the phase difference $(\phi) = 0.0^O$, or where the ratio = 1.0.

    c = half the separation between the two receiving coils

    d = distance from the energising wire to the mid point between the receivers.

(2)   Ratio Axis method.

    The depth = half the distance between the two points where the ratio is 1.0.

(3)   Half Height method.

The depth = $\frac{1}{.98}$ x (the distance between the two points on the ratio

curve that are half the maximum value.)

Line 4800S:

(1)   x = 40m.,   c = 15m. (assumed),   d = 440m.,   a = 41m.

(2)   a = 40m.

(3)   a = 38m.

Depth to conductor on line 4800S is 40m.

Line 3600S:

(1)   x = 32.5m.,   c = 15m. (assumed),   d = 442.5m.   a = 31m.

(2)   a = 50m.   (reject as an outlier)

(3)   a = 28m.

Depth to conductor on line 3600S is 30m.

Conductivity-Thickness product:

Williams uses a series of nomograms to obtain the conductivity-thickness
product.   (Williams uses the resistivity, thickness ratio; ρ/d) from the
"phase lag function" (tan Φ)

$$\tan \Phi \simeq \frac{(RR)^2 - 1}{(RR)^2 + 1} \cdot \cot \phi$$

over the top of the body

where ϕ is the measured phase difference and RR is the reduced ratio.
Since a uniform field is assumed, RR = the measured ratio.

Line 4800S:

$$RR = 1.46 \qquad RR^2 = 2.13$$

$$\phi = 7.2^{\circ}$$

$$\tan \Phi = 2.86$$

from the nomograms $\rho/d = .54$

Line 3600S:

$$RR = 1.5 \qquad RR^2 = 2.25$$

$$\phi = 7.2^{\circ}$$
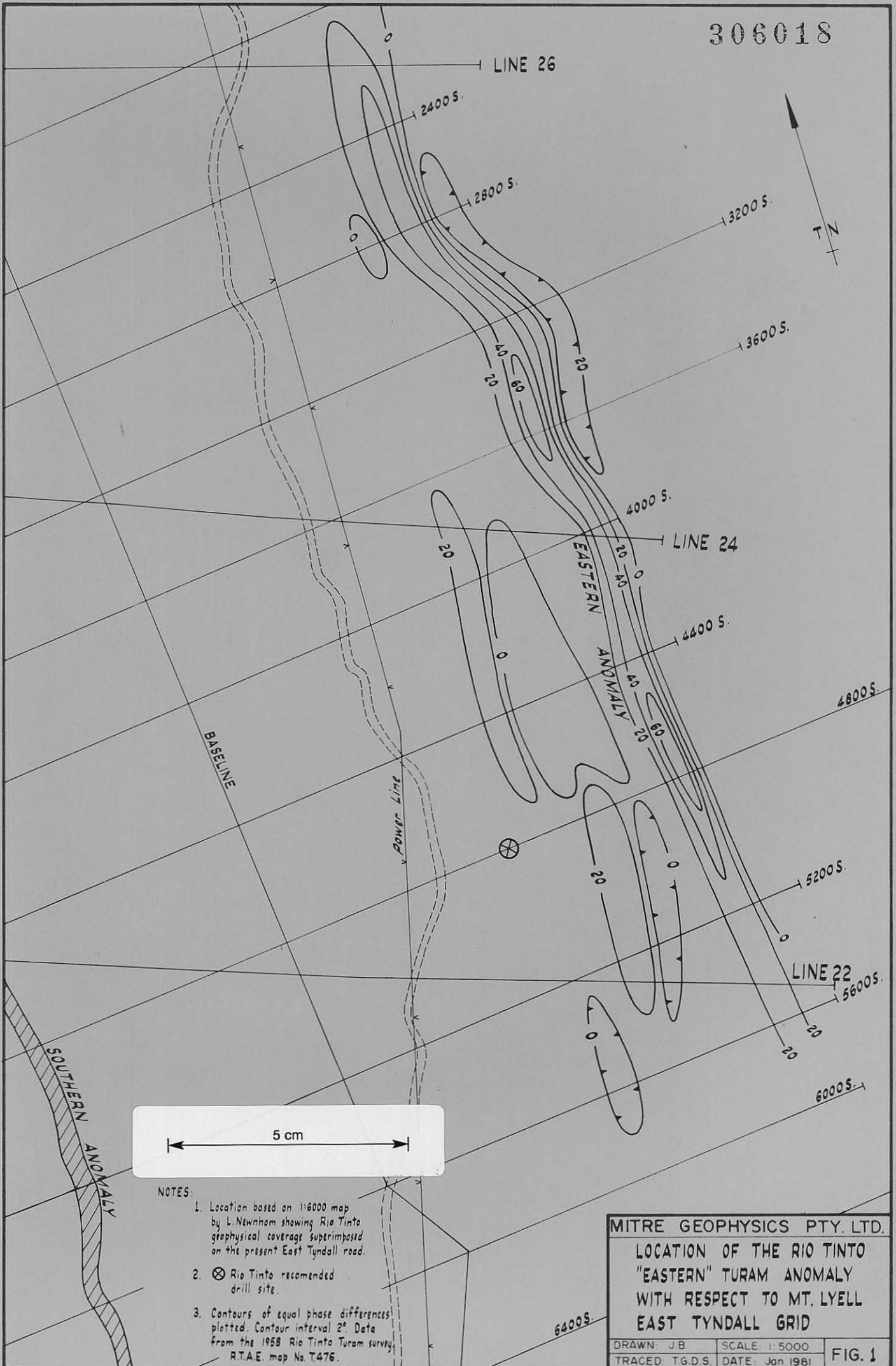
$$\tan \Phi = 3.04$$

from the nomograms $\rho/d = .53$

A limitation of the nomograms is that they only go up to a strike length of 600 ft. (180m.), however the effect of strike length on the parameter in the nomograms decreases with increasing length and the values given are thought to be reasonable estimates.

If ρ/d is taken to approximate .5, this means that a 15m. wide sheet-like body will have a resistivity of 7.5Ωm., a value perhaps 10-100 times that of a massive sulphide body, but nevertheless, a good conductor (notwithstanding the remarks made in the text). A narrower body would of course be even more conductive.

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LINE 26

2400 S.

2800 S.

3200 S.

3600 S.

TN

0

0

40
60
20
20

4000 S.

LINE 24

20
40
0

EASTERN ANOMALY

4400 S.

20

40
60
20

0

4800 S.

BASELINE

Power Line

⊗

20

0

5200 S.

LINE 22

5600 S.

0

20

20

SOUTHERN ANOMALY

6000 S.

5 cm

NOTES:
1. Location based on 1:6000 map
   by L. Newnham showing Rio Tinto
   geophysical coverage superimposed
   on the present East Tyndall road.

2. ⊗ Rio Tinto recomended
   drill site.

3. Contours of equal phase differences
   plotted. Contour interval 2°. Data
   from the 1958 Rio Tinto Turam survey.
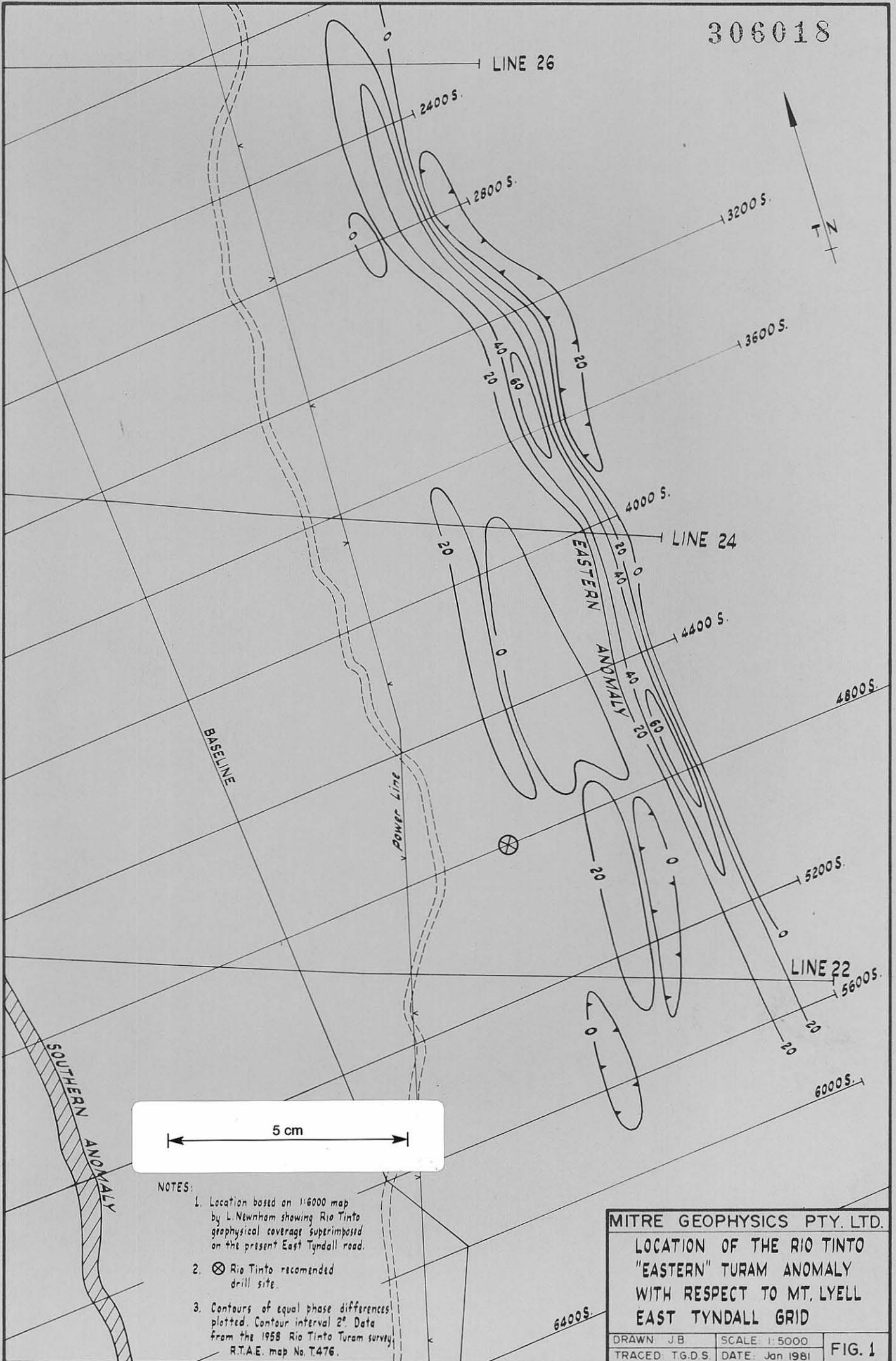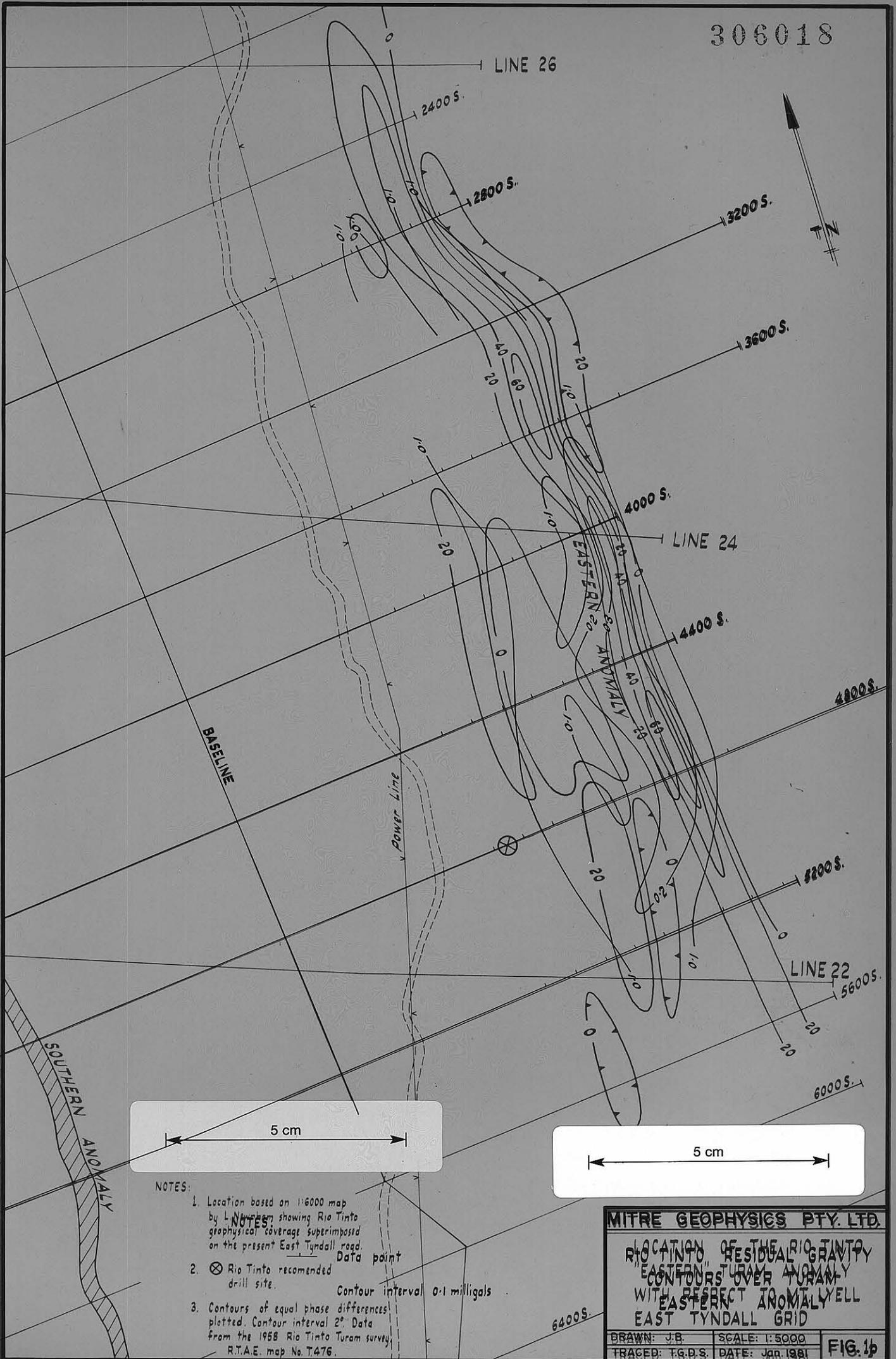   R.T.A.E. map No. T.476.

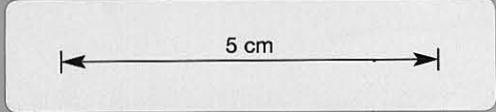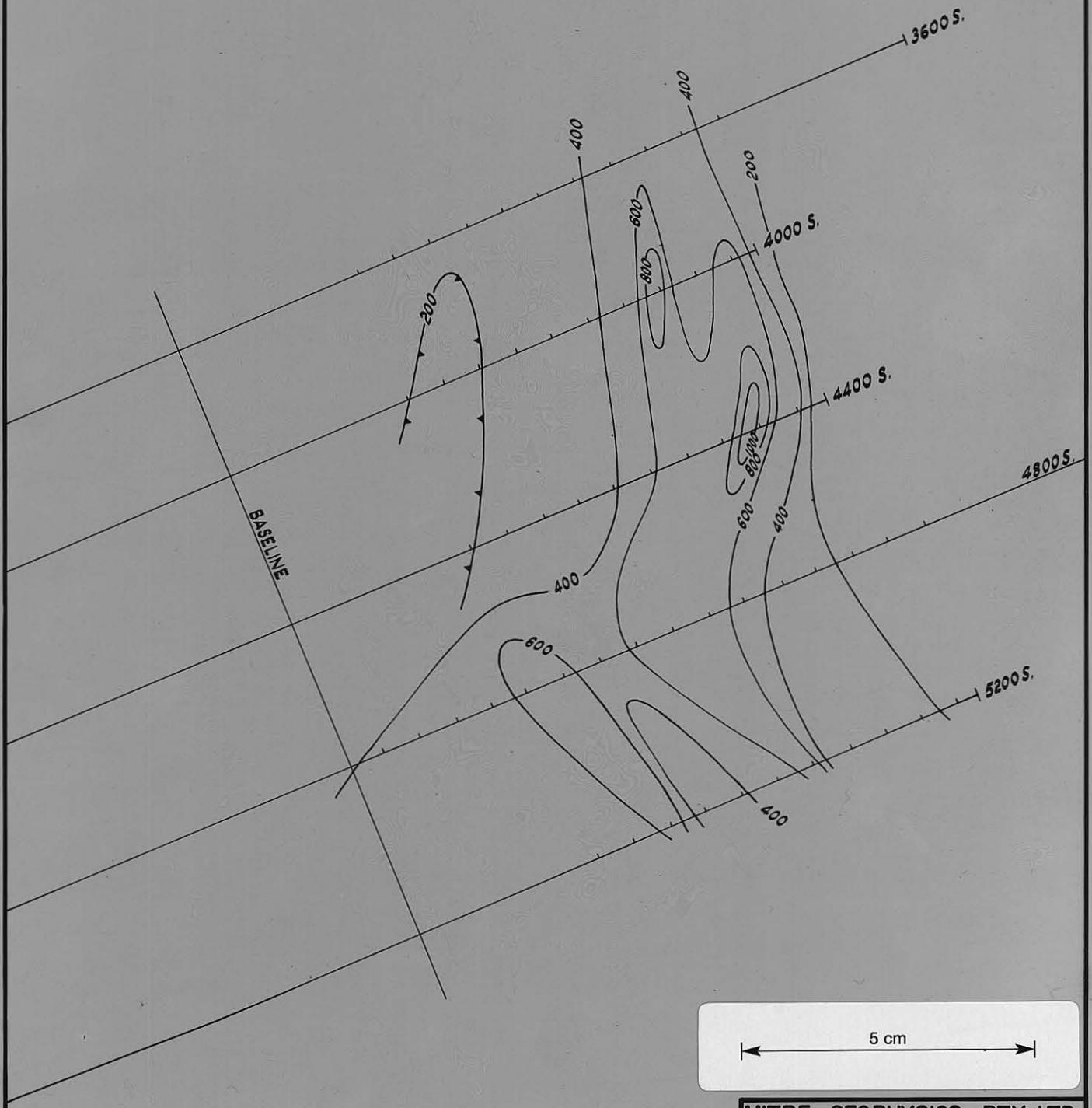6400 S.

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LOCATION OF THE RIO TINTO
"EASTERN" TURAM ANOMALY
WITH RESPECT TO MT. LYELL
EAST TYNDALL GRID

| DRAWN: J.B. | SCALE: 1:5000 | FIG. 1 |
| TRACED: T.G.D.S. | DATE: Jan 1981 | |

LINE 26

2400 S.

2800 S.

3200 S.

0

0

3600 S.

40

20

60

80

20

400

600

800

200

4000 S.

LINE 24

EASTERN

200

20

70

80

0

4400 S.

40

600

ANOMALY

400

4800 S.

60

400

BASELINE

400

Power Line

600

20

0

5200 S.

20

0

400

LINE 22

5600 S.

20

0

20

6000 S.

SOUTHERN ANOMALY

|←————— 5 cm ————→|

|←——————— 5 cm ———————→|

NOTES:

1. Location based on 1:6000 map by L. Newnham showing Rio Tinto geophysical coverage superimposed on the **NOTES**st Tyndall road.

2. ⊗ Rio Tinto recomended Data point drill site.

3. Contours of equal phase difference: interval 200 plotted. Contour interval 2°. Data from the 1958 Rio Tinto Turam survey. R.T.A.E. map No. T.476.

6400 S.

MITRE GEOPHYSICS PTY. LTD.

LOCATION OF THE RIO TINTO
RIO "EASTERN" MAGNETIC CONTOURS
WITH RESPECT TO MT. LYELL
OVER TURAM EASTERN ANOMALY
EAST TYNDALL GRID

| DRAWN: J.B. | SCALE: 1:5000 | |
| TRACED T.G.D.S.S | DATE: Jan 1958 | FIG. 16 |

LINE 26

2400 S.

2800 S.

3200 S.

3600 S.

T N

4000 S.

EASTERN ANOMALY

LINE 24

4400 S.

4800 S

5200 S.

LINE 22

5600 S.

6000 S.

6400 S.

BASELINE

Power Line

SOUTHERN ANOMALY

5 cm

NOTES:

1. Location based on 1:6000 map by L. Newnham showing Rio Tinto geophysical coverage superimposed on the present East Tyndall road.

2. ⊗ Rio Tinto recomended drill site.

3. Contours of equal phase differences plotted. Contour interval 2°. Data from the 1958 Rio Tinto Turam survey. R.T.A.E. map No. T.476.

MITRE GEOPHYSICS PTY. LTD.

LOCATION OF THE RIO TINTO "EASTERN" TURAM ANOMALY WITH RESPECT TO MT. LYELL EAST TYNDALL GRID

DRAWN: J.B	SCALE: 1:5000	FIG. 1
TRACED: T.G.D.S.	DATE: Jan 1981	

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LINE 26

2400 S.

2800 S.

3200 S.

3600 S.

4000 S.

LINE 24

4400 S.

4800 S.

5200 S.

LINE 22

5600 S.

6000 S.

6400 S.

EASTERN ANOMALY

SOUTHERN ANOMALY

BASELINE

Power Line

T.N.

0
1.0
20
40
60

5 cm

5 cm

NOTES:

1. Location based on 1:6000 map by L Newnham showing Rio Tinto geophysical coverage superimposed on the present East Tyndall road.
Data point

2. ⊗ Rio Tinto recomended drill site.
Contour interval 0·1 milligals

3. Contours of equal phase differences plotted. Contour interval 2°. Data from the 1958 Rio Tinto Turam survey. R.T.A.E. map No. T.476.

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LOCATION OF THE RIO TINTO
"EASTERN" TURAM ANOMALY
WITH RESPECT TO MT LYELL
EAST TYNDALL GRID

RIO TINTO RESIDUAL GRAVITY
CONTOURS OVER TURAM
EASTERN ANOMALY

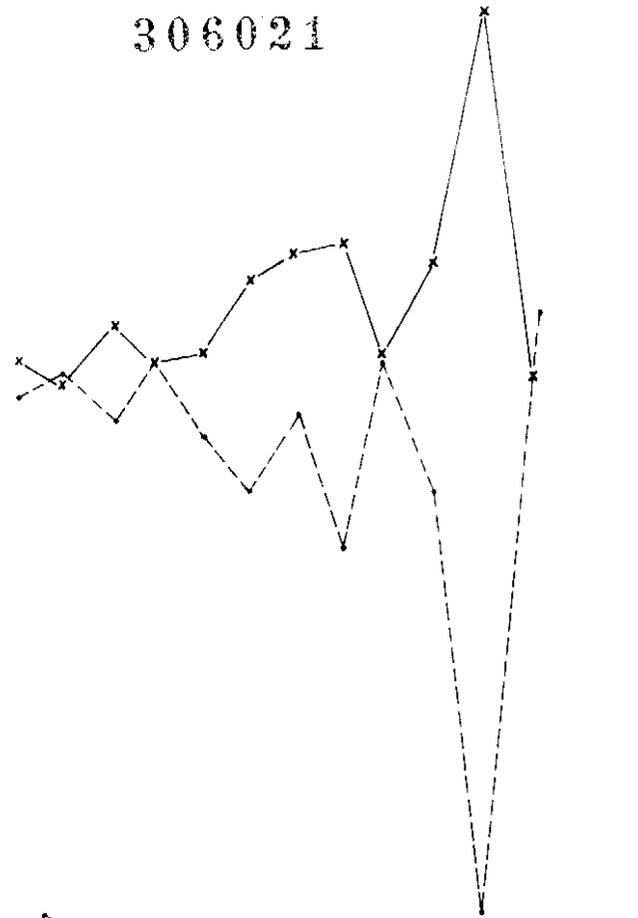| DRAWN: J.B. | SCALE: 1:5000 | |
| TRACED: T.G.D.S. | DATE: Jan. 1981 | FIG. 1b |

306020

2800 S.
3200 S.
3600 S.
4000 S.
4400 S.
4800 S.
5200 S.

0·1
0·2
0·3

BASELINE

TN

5 cm

MITRE GEOPHYSICS PTY. LTD.

RIO TINTO RESIDUAL GRAVITY
CONTOURS OVER TURAM
EASTERN ANOMALY
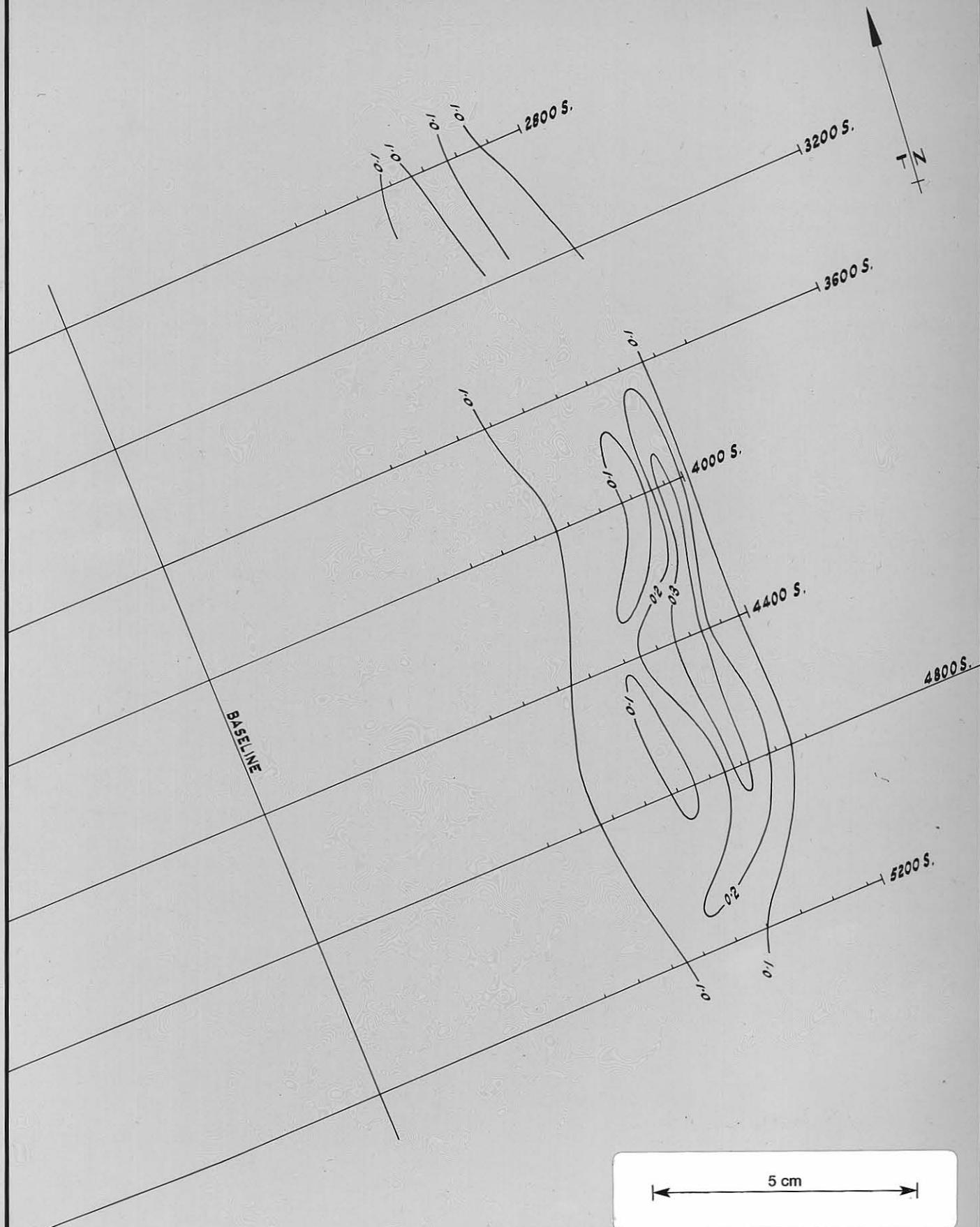
NOTES:

Data point

Contour interval 0·1 milligals

| DRAWN: J.B. | SCALE: 1:5000 | FIG. 1b |
| TRACED: T.G.D.S. | DATE: Jan. 1981 | |

306021

RATIO
×———×

PHASE
DIFFERENCE
(degrees)
- - - -

MAGNETICS
GAMMAS

GAMMAS
(milligals)

TOPOGRAPHY
(metres)

00   500'E.   1000'E.   1500'E.

TYNDALL   GROUP
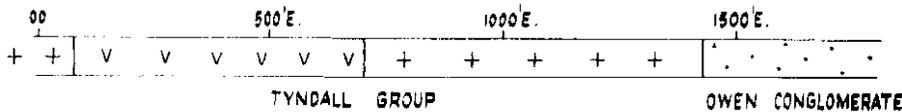
OWEN CONGLOMERATE

Comstock
tuffs
agglomerates,
tuffs

Autobrecciated   lavas

Comstock tuffs,
agglomerates, tuffs

GEOLOGY (from geochem anomalies & interp. geology
by N Stevens-Hears 1975 1:6000)

5 cm

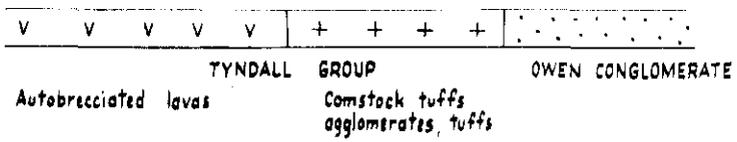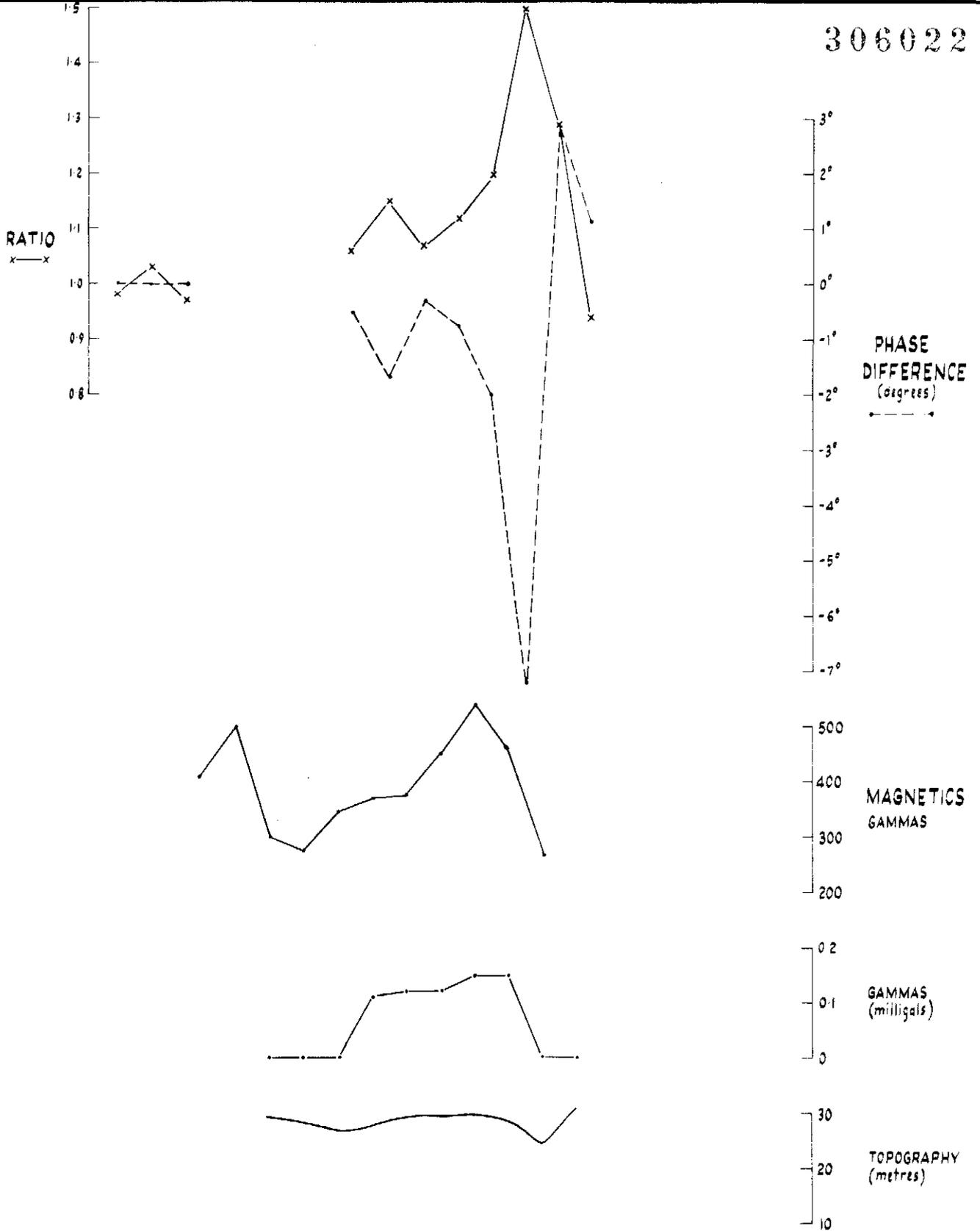MITRE GEOPHYSICS PTY. LTD.

TURAM, MAGNETIC AND GRAVITY

PROFILES OVER LINE 4800 S.

DRAWN: J.B.	SCALE: 1:5000	FIG. 2
TRACED: TGDS	DATE: Jan 1981	

TURAM, MAGNETIC AND GRAVITY
PROFILES OVER LINE 3600 S.

FIG. 3

306023

LEGEND

OWEN CONGLOMERATE

    Sediments sandstone shale
    oligmict conglomerate

TYNDALL GROUP
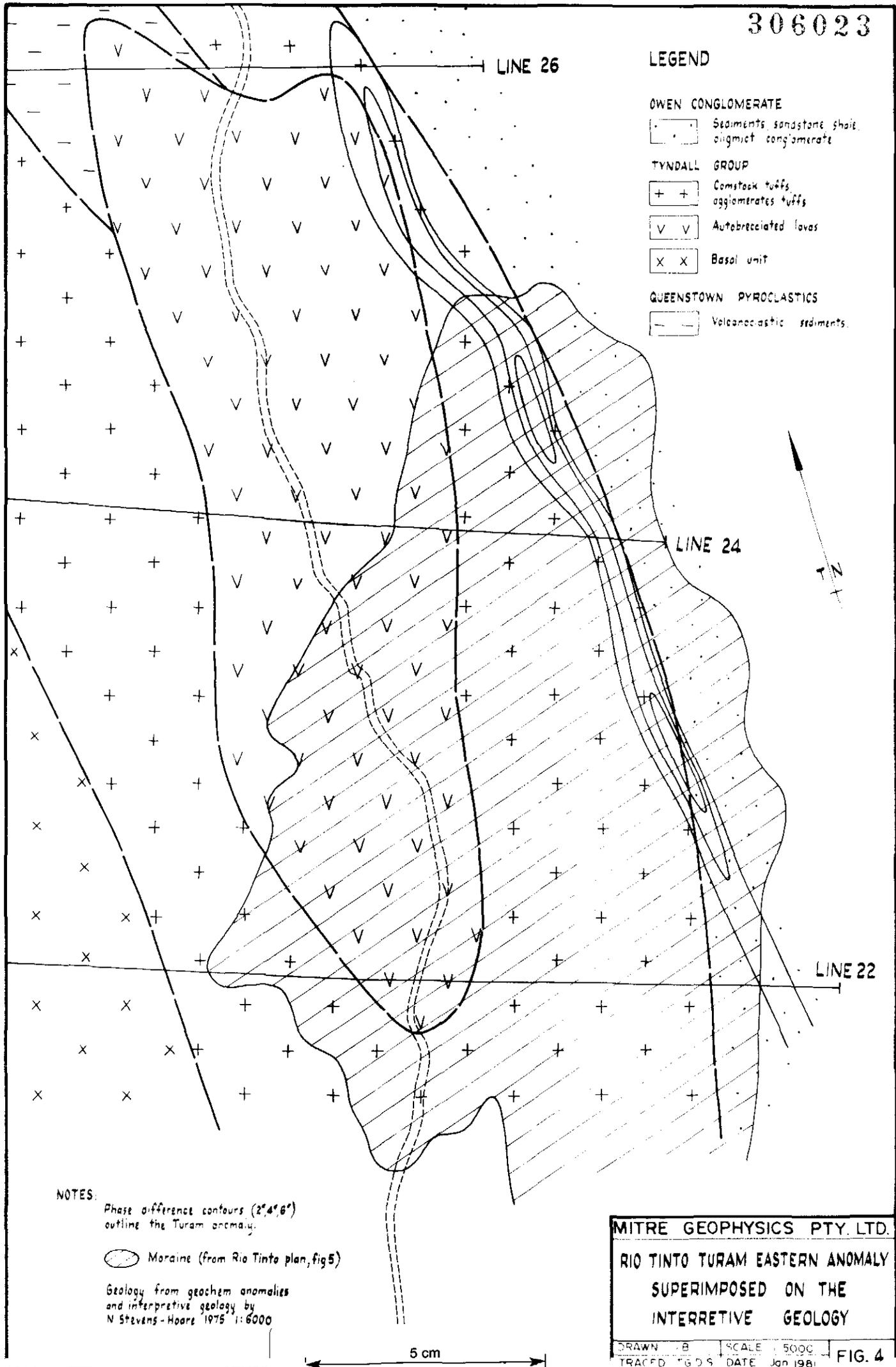
    Comstock tuffs
    agglomerates tuffs

    Autobrecciated lavas

    Basal unit

QUEENSTOWN PYROCLASTICS

    Volcanoclastic sediments

LINE 26

LINE 24

N

LINE 22

NOTES:

Phase difference contours (2°,4°,6°)
outline the Turam anomaly.

Moraine (from Rio Tinto plan, fig 5)

Geology from geochem anomalies
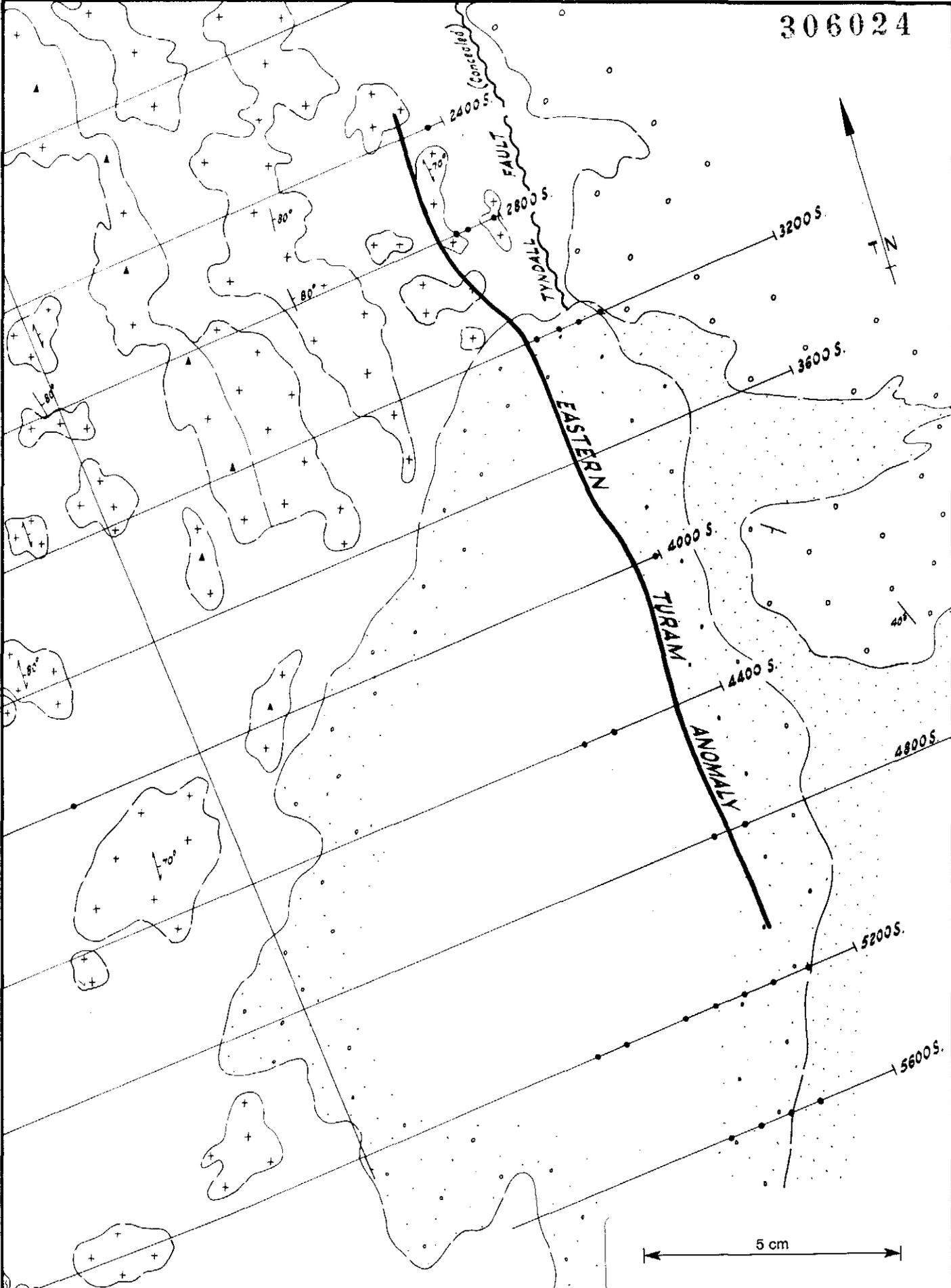and interpretive geology by
N Stevens-Hoare 1975 1:6000

5 cm

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RIO TINTO TURAM EASTERN ANOMALY
SUPERIMPOSED ON THE
INTERRETIVE GEOLOGY

| DRAWN | B | SCALE | 5000 | FIG. 4 |
| TRACED | G.D.S | DATE | Jan 1981 | |

306024

LEGEND

QUATERNARY
Glacial moraine
Scree

ORDOVICIAN
Owen conglomerate

CAMBRIAN
Massive porphyroidal lavas
Agglomerate and tuff

• Rio Tinto geochem anomalies

FAULT (concealed)

TYNDALL FAULT

EASTERN TURAM ANOMALY

2400 S
2800 S
3200 S
3600 S
4000 S
4400 S
4800 S
5200 S
5600 S

T N

5 cm

MITRE GEOPHYSICS PTY. LTD.

RIO TINTO GEOLOGICAL PLAN

DRAWN J B	SCALE 5000	FIG. 5
TRACED T G D S	DATE Jan 1981	