303001

THE ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
WEST COAST DEPARTMENT

SECOND REPORT ON THE GROUND CHECKING OF THE AIRBORNE ANOMALIES – FINGAL AREA

by

I S Gregory

5 June 1961

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AMG REFERENCE POINTS ADDED

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED
West Coast Department

303002

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(Refer First Report No. 82)

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INTRODUCTION

R.E.M. and Vertical Force Variometer checking of the Airborne Anomalies of the Fingal area prior to August, 1959 indicated that only two of the eight anomalies recovered were worthy of further work. (see Report No. 82 - Ground Checking of the Airborne Anomalies - Fingal Area.) Additional work completed prior to and during the 1960-61 field season consisted of a gravity survey across anomaly 3/1, some additional geological mapping in both areas and Induced Polarisation surveys of one line on anomaly 3/1 and two lines on anomaly 3/6.

Anomaly 3/6 - North Scamander Area See plates (2-5)

Upon re-examination of the area after Report No. 84 was issued it was decided that the pits dug to locate the anomaly were insufficient to prove beyond doubt that the Electromagnetic Conductor was actually water laden fault gouge as stated in that report. Sphalerite and minor Galena in magnetite mineralisation was found in the dump of the shaft in block K24N. Assays of selected samples of this material were as follows:-

	Pb%	Zn%	Cu%	Ag.ozs	Au.dwts	Fe%
High grade specimens	2.5	11.8	0.67	3.4	<0.1	45.6
Medium grade specimens	0.2	5.7	0.92	2.0	<0.1	50.2
Magnetite mineralisation	0.9	1.8	0.30	1.4	0.2	60.0
Mineralised country rock	0.2	2.8	0.20	1.0	<0.1	34.2

The depth of this shaft was found to be 21 ft. and since it was waterfilled, no detailed examination could be made. The mineralisation in the adit in block K25N was disseminated pyrite only in crumpled slates. This working may not have reached the main mineralised zone.

In view of the steep nature of the terrain it was considered that the interpretation of a gravity survey of the prospect (recommended in Report 84) would prove too unreliable to be conclusive. Accordingly, two Induced Polarisation traverses were proposed for the area. Lines 20N and 24N were extended and repegged for IP and the actual survey completed during March, 1961. Additional country examined (see plate 2) was geologically similar to the rocks already mapped, being entirely sandstones and siltstones of the Mathinna group.

The IP survey confirmed the presence of the EM Conductor at 34E on lines 20N and 24N and indicated a further conductor on the western margin of the area located west of 19E on both lines.

Conclusion and Recommendation

The presence of zinc lead mineralisation in magnetite, the confirmation of the EM Conductor by the IP method and the location of an additional conductor to the westward of this prospect indicate that further examination and testing is necessary.

Dr. Hallof has recommended the extension of the grid southward for EM Survey and additional IP Survey, if geological indications are considered favourable, in order to site a test drillhole.

In conjunction with the extension of the EM Survey the K24N shaft could be dewatered to give a closer examination of the mineralisation. Alternately the mineralisation could be tested at a depth of approximately 100 ft. below the collar of the shaft by the drilling of a 150 ft. hole with an E100 diamond drill as illustrated on Plate 5.

Anomaly 3/1 - Upper Seamander River Area (See Plates 6-8)

As recommended in Report No. 82 a gravity survey was run on line 20N during December, 1959 (see appendix 2 and Plate 7). This indicated either a "density contrast arising from a contact between two rock types or a single dense mass at shallow depth below the gravity maximum. The former alternative appears to be the more likely".

During a brief re-examination of the prospect in November, 1960, additional rock types were located in the area including a high density gabbroic type which is a differentiate of the granite (see plate 6 and appendix 3). It was suggested that additional outcrops of these gabbroic rocks could be responsible for the gravity anomaly.

Between November 1960 and March 1961, the Anson's Bay Timber Company developed an access road on the ridge to the westward of the prospect and a brief examination of the exposures on the road (and on a spur road put in to the prospect) indicate that much of the ridges to the westward of the anomaly was a hybrid gabbro type resulting from the interaction between the gabbro and Mathinna group sediments (see plate 6). It is now considered possible that a large body of gabbro exists at intermediate depth to the west of the prospect.

Whilst he was in Rosebery, Dr. Hallof examined the EM profiles to lay out the most effective IP survey of the prospect. During his examination he expressed the opinion that the conductor was a poor one - probably a faulted contact. He recommended a line straight along the conductor axis. This line (20½E - see plate 6) was prepared and surveyed by IP in March 1961 with the following results (see plate 8 and appendix 1):- "The resistivity results indicate slightly lower resistivities at 24N. There is a very

small IP effect associated with this feature".

Conclusions & Recommendation

Additional geological information tends to confirm Sefton's conclusion that the gravity anomaly on line 20N on the prospect is due to a density contrast arising from a contact between two rock types. No significant metal factors are associated with the conductor (see plate 8) and Dr. Hallofs' interpretation of the EM results - namely that the conductor is a faulted contact - is thus confirmed by the IP survey.

It is recommended that no further investigation of this prospect is warranted and that the 4 square miles including it be dropped from EL 2/59.

I.S. GREGORY

ROSEBERY, 5th June, 1961

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APPENDIX 1

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McPHAR GEOPHYSICS LIMITED

Memorandum on the Induced Polarisation Surveys on Airborne EM Anomalies on the East Coast of Tasmania.

The IP results described here are from two areas in Northeast Tasmania. The areas are of interest because of airborne EM anomalies. In each case, ground EM work has been done to locate the conductors on the ground. I do not have the ground EM results here in Toronto, but the conductors indicated were weak and it was suggested that they were caused by overburden, swamp, etc. The IP checks were made to determine the possible presence of metallic mineralisation.

Anomaly 3/1

The resistivity results on this line indicate a zone of slightly lower resistivities at 24N. There is a very small IP effect associated with this feature. Additional IP work is probably warranted, if the geology of the area is favourable. A parallel line on each side should be surveyed, and then the anomaly should be checked using d.c. and 2-1/2 cps.

Anomaly 3/6

A definite resistivity low and IP anomaly was located at 34E - 37E on Line 20N and at 31E to 34E on Line 24N. In addition, another anomaly was indicated at the extreme western end of both lines. These anomalies are quite definite, and the geology should be checked in detail. If the geologic setting is favourable, additional IP work should be carried out with the intention of locating the best location for a test drill hole.

MCPHAR GEOPHYSICS LIMITED

Phillip G. Hallof,
Chief Geophysicist.

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APPENDIX 2

GEOPHYSICAL SURVEY - FINGAL PROJECT

REPORT ON GRAVITY TEST SURVEY OF ANOMALY 3/1

A single traverse gravity test survey was carried out by the Writer on the Fingal electromagnetic anomaly No. 3/1 in December, 1959.

The instrument used was Worden gravitymeter No. 38. Reduced levels for the gravity stations were obtained by dumpy level survey carried out by I.M. Paltridge.

Observed gravity values have been corrected for latitude variations, and for the effects of elevation and terrain using two different values of the assumed density of near-surface material, 2.40 grm cm - 3 and 2.67 grm cm - 3. The terrain corrections were computed on the assumption that the topographic profile along the traverse extends unaltered for a great distance in both directions normal to the traverse.

It is emphasised that these terrain corrections are a first approximation only. A complete treatment of the corrections would require a detailed knowledge of the topography on both sides and beyond the ends of the traverse.

The results of the survey are shown on the accompanying plan No. ZO 1036.

It appears that the only significant feature on the reduced gravity profile is a westward increase in gravity values between 18E and 16E. This feature could be due to a density contrast arising from a contact between two rock types or to a single dense mass at shallow depth below the gravity maximum. The former alternative appears to be the more likely. In either case, the source of the gravity anomaly may be encountered at a depth less than 200 ft., perhaps considerably less.

(sgd.) I.M. SEFTON
for L.A. Richardson & Associates

KILLARA, N.S.W. 17/3/60

APPENDIX 3

AN OCCURRENCE OF HORNBLENDE PICRITE IN NORTH EASTERN TASMANIA

BY: M.J. Longman.

Locality

North of the Scamander River.

Hand Specimen The rock is greenish black in colour and is composed of large hornblende crystals up to 5.0 cms in length. Poikilitic inclusions of olivine break up the reflections of the hornblende clearage surfaces giving the characteristic "lustre mottling" of this rock. Other inclusions in the hornblende are magnetite, which forms irregular patches or octahedral crystals, and boitite, forming the typical brownish platy crystals.

Origin The hornblende picrite represents one of the earliest differentiates of the granite magma. It is formed by the accumulation of the early formed crystals and the settling of these crystals in the magma.

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HORNBLENDE PICRITE

303009

Mineral Composition: (approx.)

Hornblende	65%
Olivine	10%
Pyroxene-Hypersthene Malacolite	15%
Magnetite	5%
Labradorite	2%
Biotite	3%
Pyrite	tr.
Specific Gravity	2.8 - 3.0

Hornblende is the dominant constituent, occurring as subhedral crystals up to 2.0 cms. in length. The mineral is pleochroic with X = pale blue green, Y = pale green, Z = pale brown green and the extinction angle Z C = 27°. Most crystals are untwinned by a few smaller crystals show multiple twinning. Hornblende contains numerous poikilitic inclusions of olivine and pyroxene.

Olivine (chrysolite) forms anhedral crystals, 0.5 mm. in size, occurring as poikilitic inclusions in hornblende, sometimes surrounded by mantles of pyroxene, usually malacolite. The olivine is always fresh and shows no sign of alteration, although it is extensively fractured.

Hypersthene forms anhedral crystals up to 0.5 mms. in length which show the characteristic pleochroism in shades of pink and green. It is recognised by the straight extinction and the low interference colours (1st order orange).

Malacolite is a colourless augite which occurs as rims about olivine and as fibrous crystals interstitial to hornblende. It has an extinction angle Z C = 40° (approx.) and can be easily distinguished from hypersthene.

Labradorite occurs as anhedral crystals about 0.5 mms. in length interstitial to hornblende. The crystals are extensively altered to kaolin and sericite, but the albite twinning can still be distinguished.

Boitite forms interstitial ragged crystals up to 2.0 mms. in length, between the larger hornblende crystals. It is pleochroic with X = colourless - very pale brown, Y = pale brown, and Z = brown, indicating a magnesian biotite approaching phlogopite in composition.

Magnetite occupies about 5% of the rock and occurs as subhedral to euhedral crystals up to 0.5 mms. in size. Magnetite tends to concentrate in olivine and hypersthene indicating it was one of the first minerals to crystallise. It is distributed generally throughout all the components of the rock.

Pyrite occurs as occasional subhedral crystals in hornblende indicating a primary origin for this mineral. It probably formed at the same time as magnetite.

The lustre mottling seen in hand specimen is a characteristic feature of the rock. This is due to the reflection of light from the cleavage surface being interrupted by the poikilitic inclusions of olivine. Also the presence of a small proportion of plagioclase is typical of the picrites.

M.J. Longman
GEOLOGIST

22nd November, 1960

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PLATE 1

303011

FINGAL PROJECT

SCALE
3 miles to 1 inch
0 8 16

AMG REFERENCE POINTS ADDED

5 cm

LEGEND

Location of Anomalies ○
Anomalies recovered ●

E.Z.Co W.C.D Geol Dept Z O ~~1001~~ 1013

Tw Uw Vw W Xw Yw Zw A B C D E F G H J K L M N O P Q R S T U V W X Y Z

1,800'E 2,200'E 2,600'E 3,000'E 3,400'E 3,800'E 4,200'E 4,600'E 5,000'E

3,600 N — 3,600'N

3,200 N — 3,200'N

2,800 N — 2,800'N

Qtz and Red Slate

Red Inst

Mag

Ridge

X Crumpled Sil Mst

Ridge

Grey Mst 80

Dissem Py in Scree

2400'N 16E 18E 20E 24E 26E 28E 30E 32E 34E 36E 38E 40E 42E 44E 46E 48E 50E 52E 2400'N

Mathinna Sandstones

3000 N 16E 18E 22E 24E 26E 28E 30E 32E 34E 36E 38E 40E 42E 44E 46E 48E 50E 52E

Mag North

1,600 N — 1,600'N

1,200 N — 1,200'N

5 cm

303012

LEGEND

- Crest of Ridge
- Creek (non perennial)
- I.P. Line
- I.P. Anomaly Zone
- EM Conductor

FINGAL PROJECT
ANOMALY 3/6
GEOLOGY

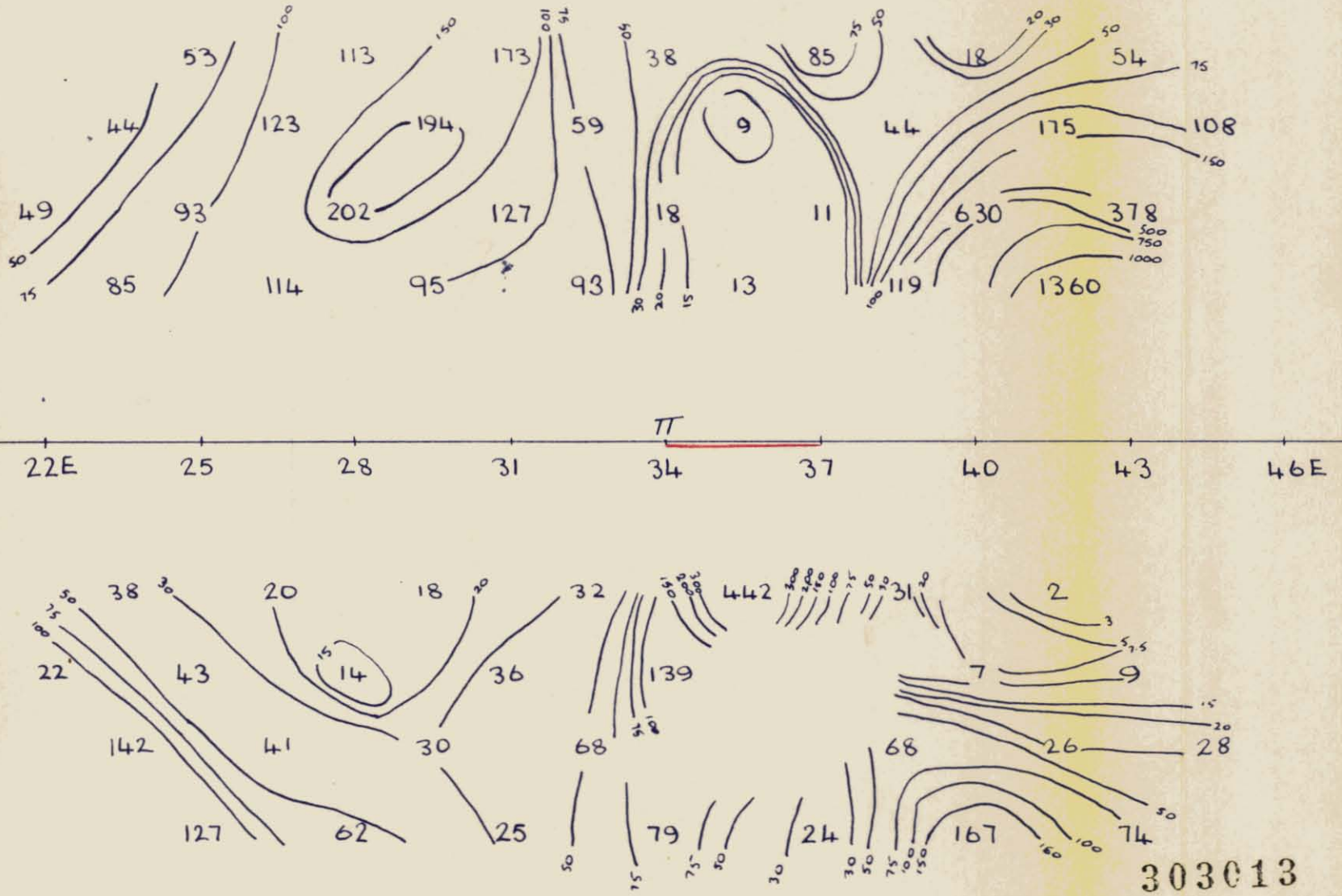
Scale = 200ft to 1inch

Geology
Grid North = 310° M

E.Z.Co.W.C.D. Geol.Dept XO 157

PLATE 2. 015

PLATE 3



303013

I. P. SURVEY

Finqal Area

Line 20N Anomaly 3/6 Grid

300 ft Spreads

Scale: 300 ft to 1 inch

Frequency: 2½ + ¼ cps

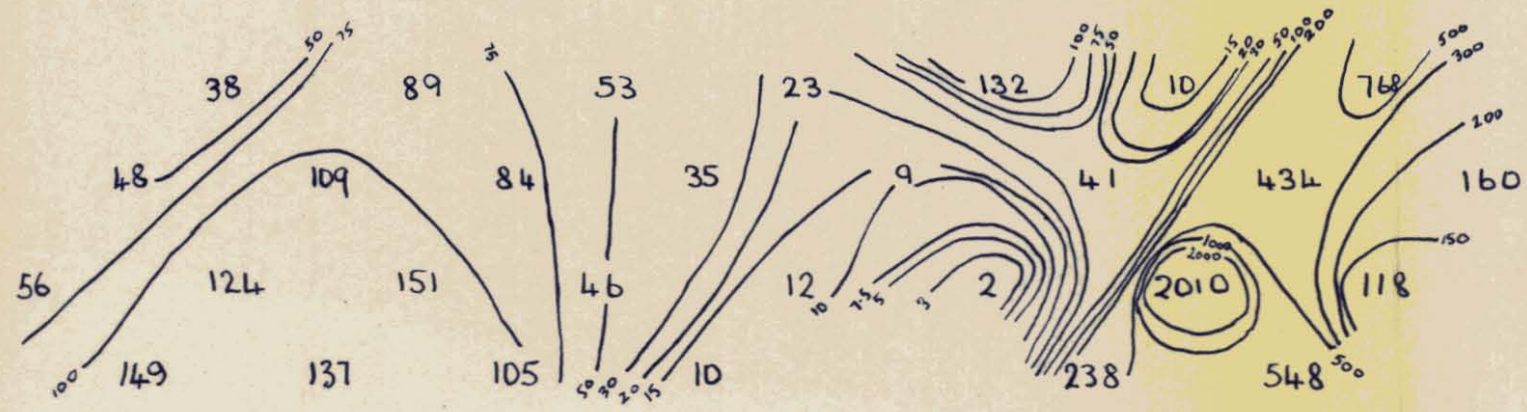
Survey: B.H. & N.J.

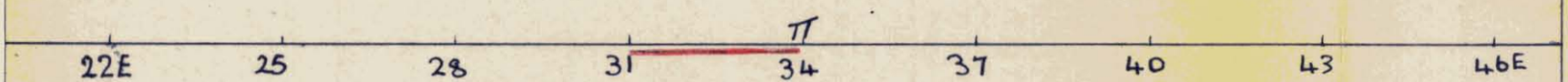
Traced: V.T. Date: 3/61

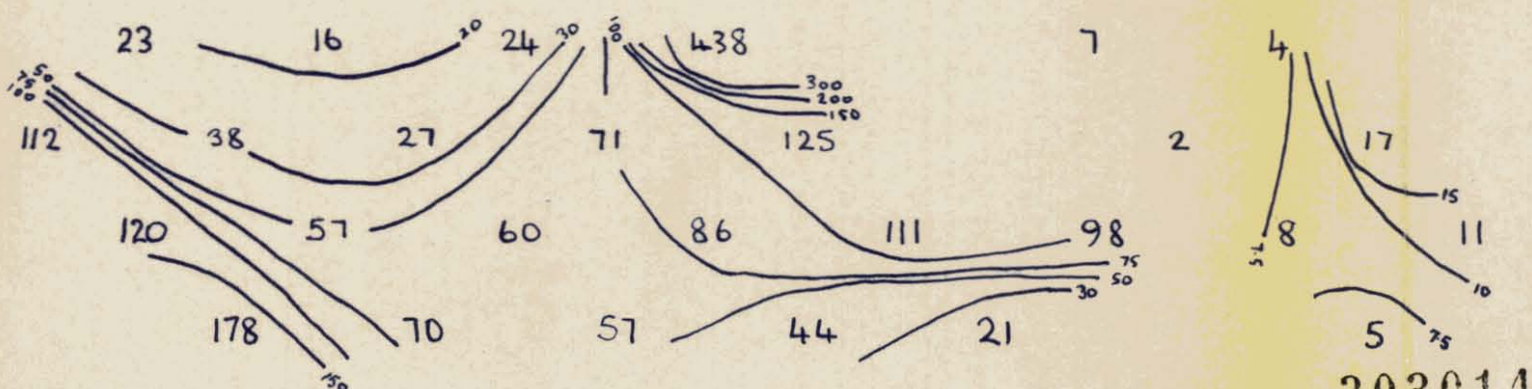
5 cm

E.Z.Co. W.C.D. Geol. Dept. Y.O. 249.

PLATE 4







303014

I. P. SURVEY

Fingal Area

Line 24N Anomaly 3/6 Grid

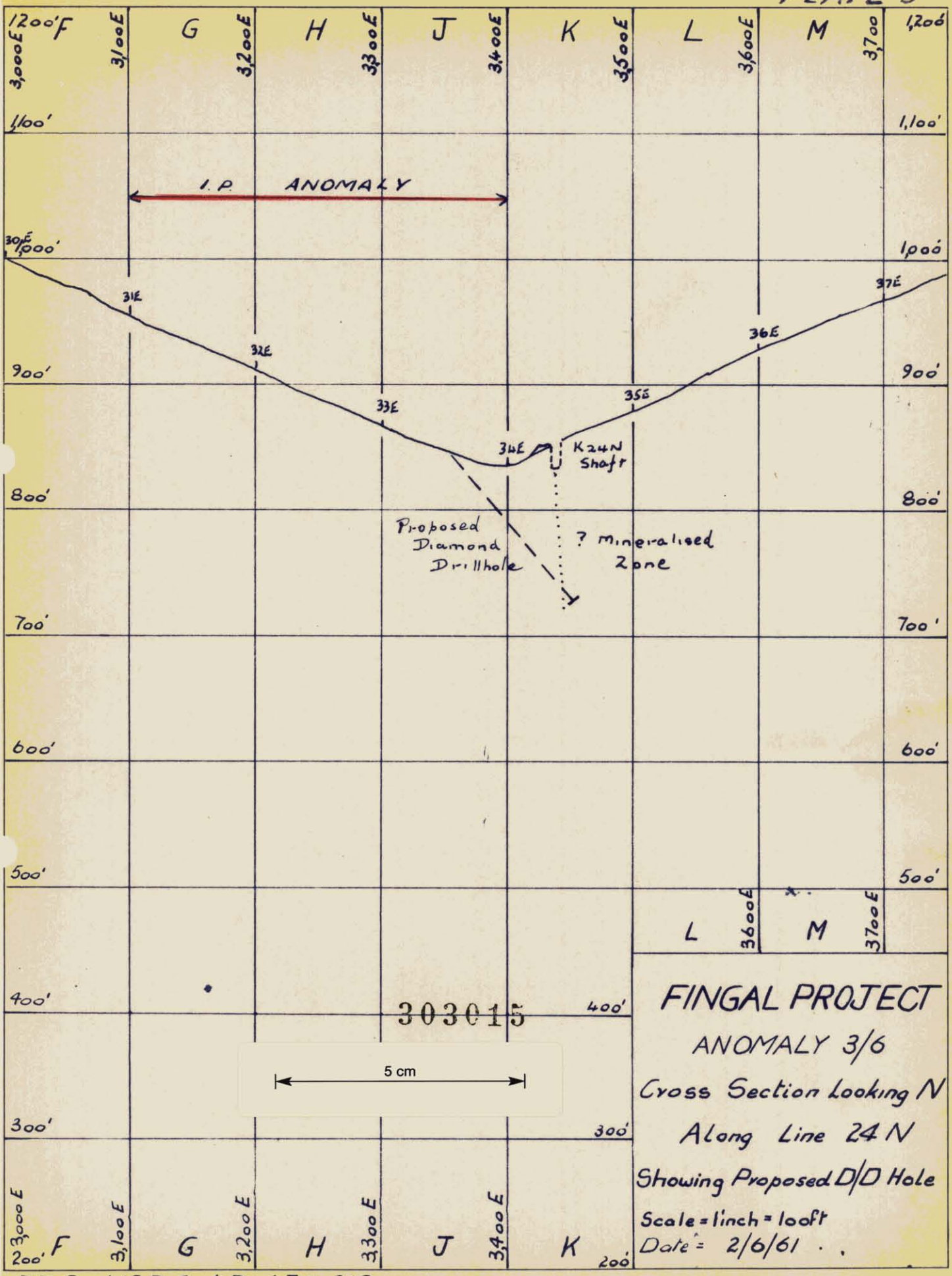
300 ft Spreads

Scale: 300 ft to 1 inch
Frequency: 2½ and ¼ cps
Survey: B.H. & N.J.
Traced VT Date 3/61

5 cm

E.Z.Co.W.C.D. Geol Dept YO 250.

PLATE 5



FINGAL PROJECT

ANOMALY 3/6

Cross Section Looking N

Along Line 24N

Showing Proposed D/D Hole

Scale = 1 inch = 100 ft

Date = 2/6/61

E.Z.Co. W.C.D. Geol. Dept Z.O. 219

36 N
35 N
34 N
33 N
32 N
31 N
30 N
29 N
28 N
27 N
26 N
25 N
24 N
23 N
21 N
20 N
19 N
18 N
17 N
16 N
15 N
14 N
13 N
12 N

Mathinna Qtzites

Gr. frag

Metased frag

Gr. frag

Gr. frag

28 N

Baseline

Gr. & mst. frag

Qte. frag

Gr. & Sm. frag

Xenoliths

80

65

50

24 N

Qte.

Mathinna Group

Granite

Metased frag

Qte. frag

Gr.

20 N

MN

Grid North 25° Mag

X Hornblende Picrite Outcrop (see appendix 3)

I.P. Line 20½ E

Access Road

Hybrid Gabbro

Rocks here and west-ward.

303016

5 cm

LEGEND

E.M. Line

I.P. Line along EM conductor Axis

FINGAL PROJECT

ANOMALY 3/1

GEOLOGY

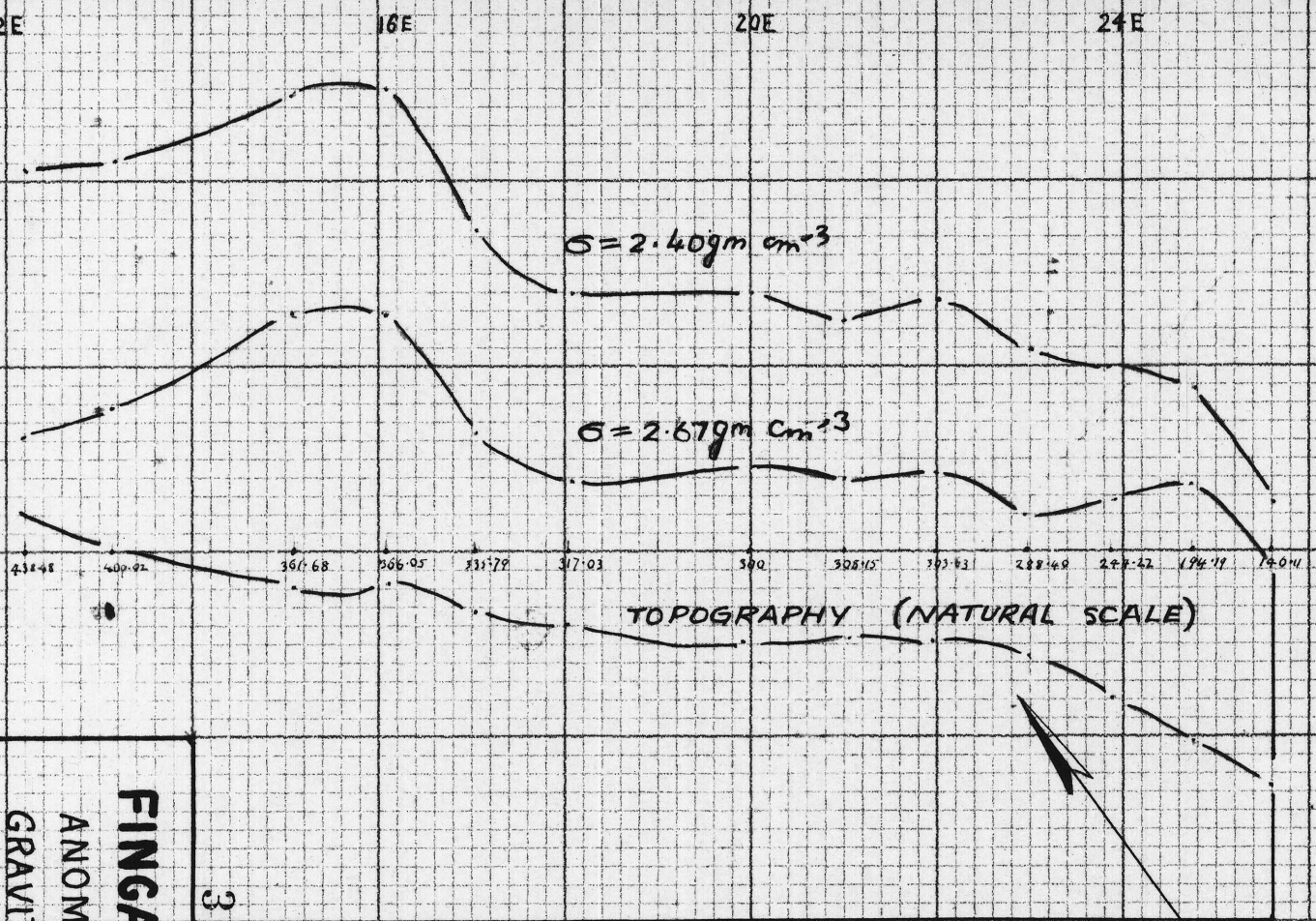
Scale 200 feet to 1 inch

Date 3.8.61

016

E.Z.Co. W.C.D. Geol. Dept XO 158

PLATE 6



FINGAL PROJECT

ANOMALY 3/1

GRAVITY SURVEY

SCALE 1in = 200 ft.

J - I mgal.

GEOPHYSICS J MS.

SURVEY IMP

30017

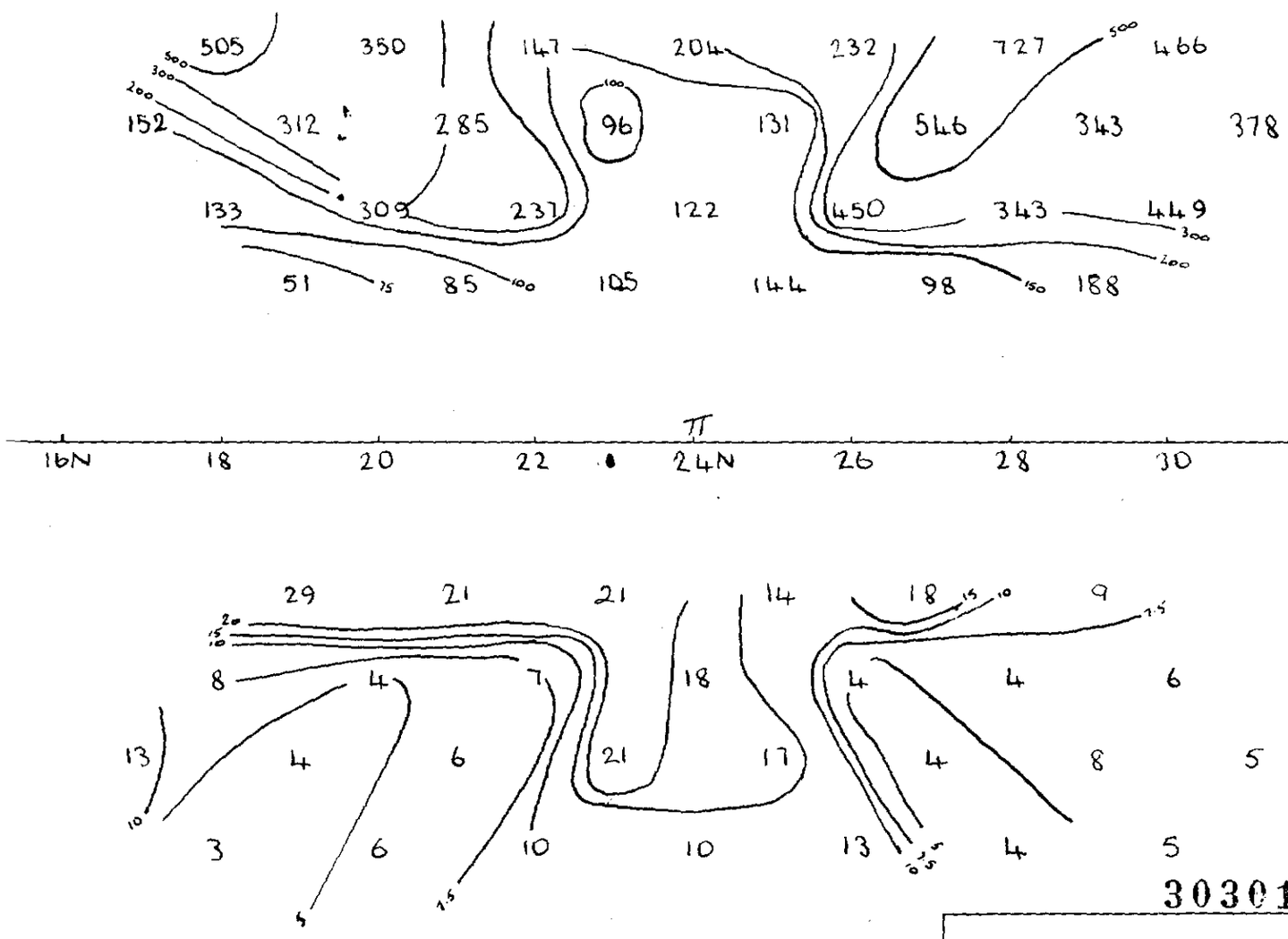
013

5 cm

PROFILES OF REDUCED GRAVITY FOR TWO DIFFERENT VALUES OF ASSUMED NEAR-SURFACE DENSITY, σ

TERRAIN CORRECTIONS CONDUCTED USING A TWO-DIMENSIONAL APPROXIMATION

PLATE 7



303018

I. P. SURVEY.

Finqal Area

Line 20½E Anomaly 3/1 Grid

200 ft Spreads

Scale: 200 ft to 1 inch
Frequency: 2½ and ⅛ cps
Survey: BH - NJ
Traced VT Date 3/61.

5 cm