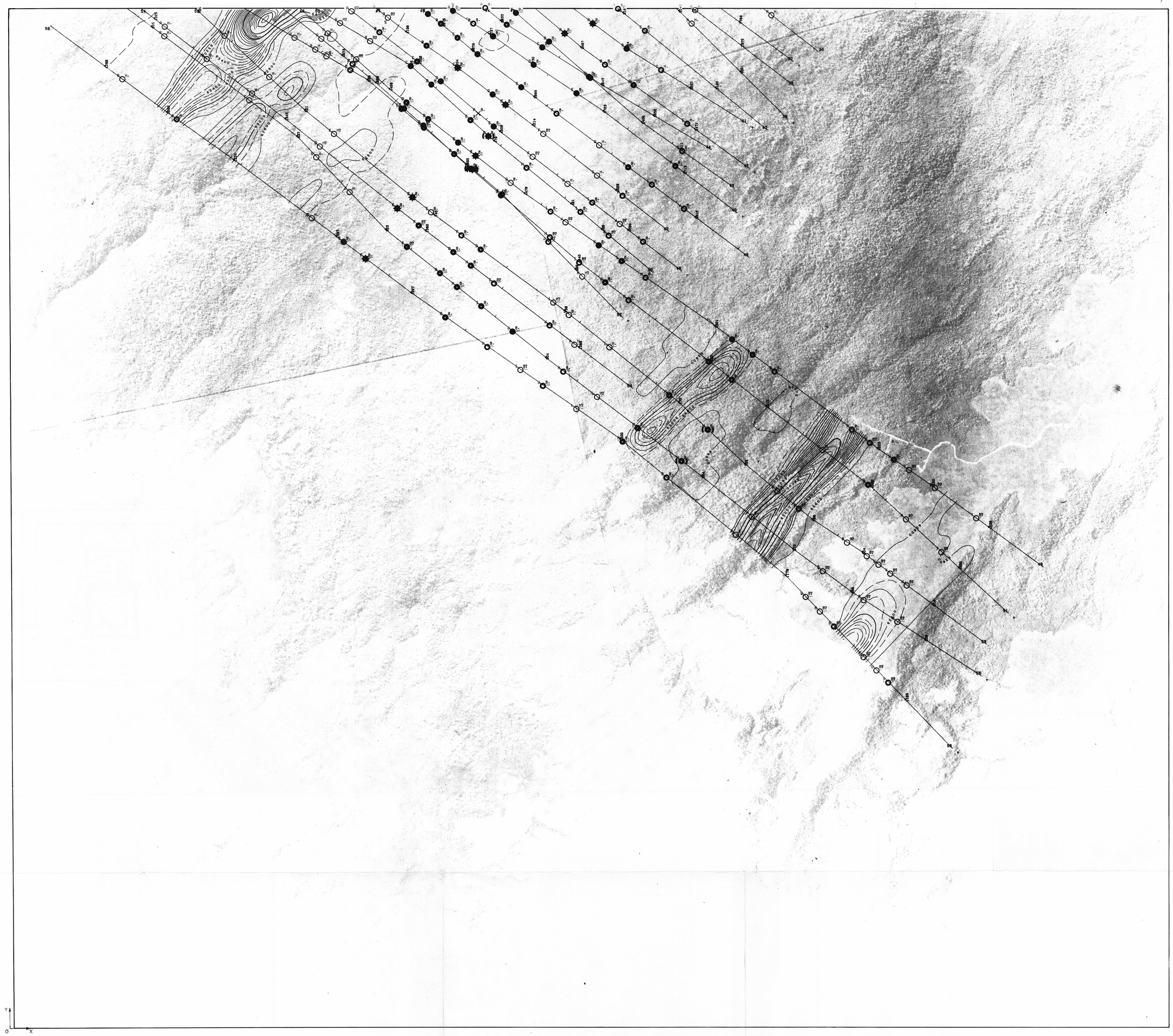
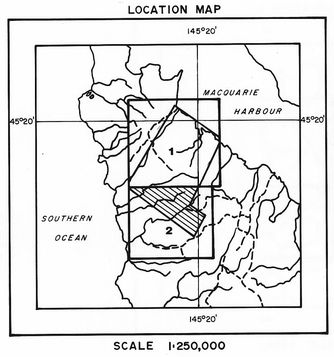
5367



LOCATION MAP



SCALE 1:250,000

343329

DIGHEM[III] SURVEY

BIRCHS INLET NORTH AREA, TASMANIA

ENHANCED MAGNETICS

FOR

AMOCO MINERALS AUSTRALIA COMPANY

5 cm

Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Accompanies Appendix 1
Amoco Report 401

SHEET 2

84-2217

Flight Line

2118 — Fiducial 2120 (Not recovered from film)
Fiducial 2118 (Recovered from film)

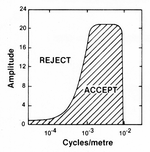
Fiducial 2110 (Not recovered from film)

2104 — Fiducial 2104 (Recovered from film)

301 — Line number and Flight direction

ISOMAGNETIC LINES
(enhanced field)

5000 — 5 000 nT
1000 — 1 000 nT
200 — 200 nT
100 nT
magnetic depression



Frequency response of magnetic operator

5367

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE, 84	S.P.	D.S. Fraser

5368

343330

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

ENHANCED MAGNETICS

FOR

AMOCO MINERALS AUSTRALIA COMPANY

8 cm

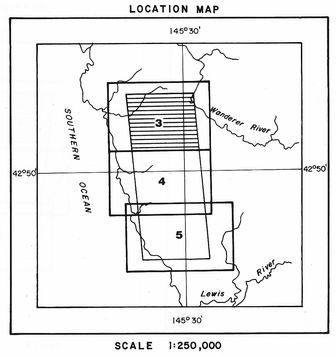
Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Accompanies Appendix 1
Amoco Report 401 84-2217 SHEET 3

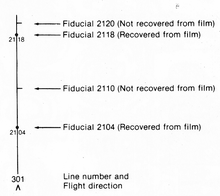
LOCATION MAP



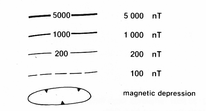
SCALE 1:250,000

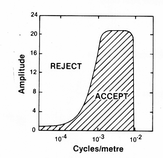
D. C. FRASER
REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

Flight Line



ISOMAGNETIC LINES
(enhanced field)



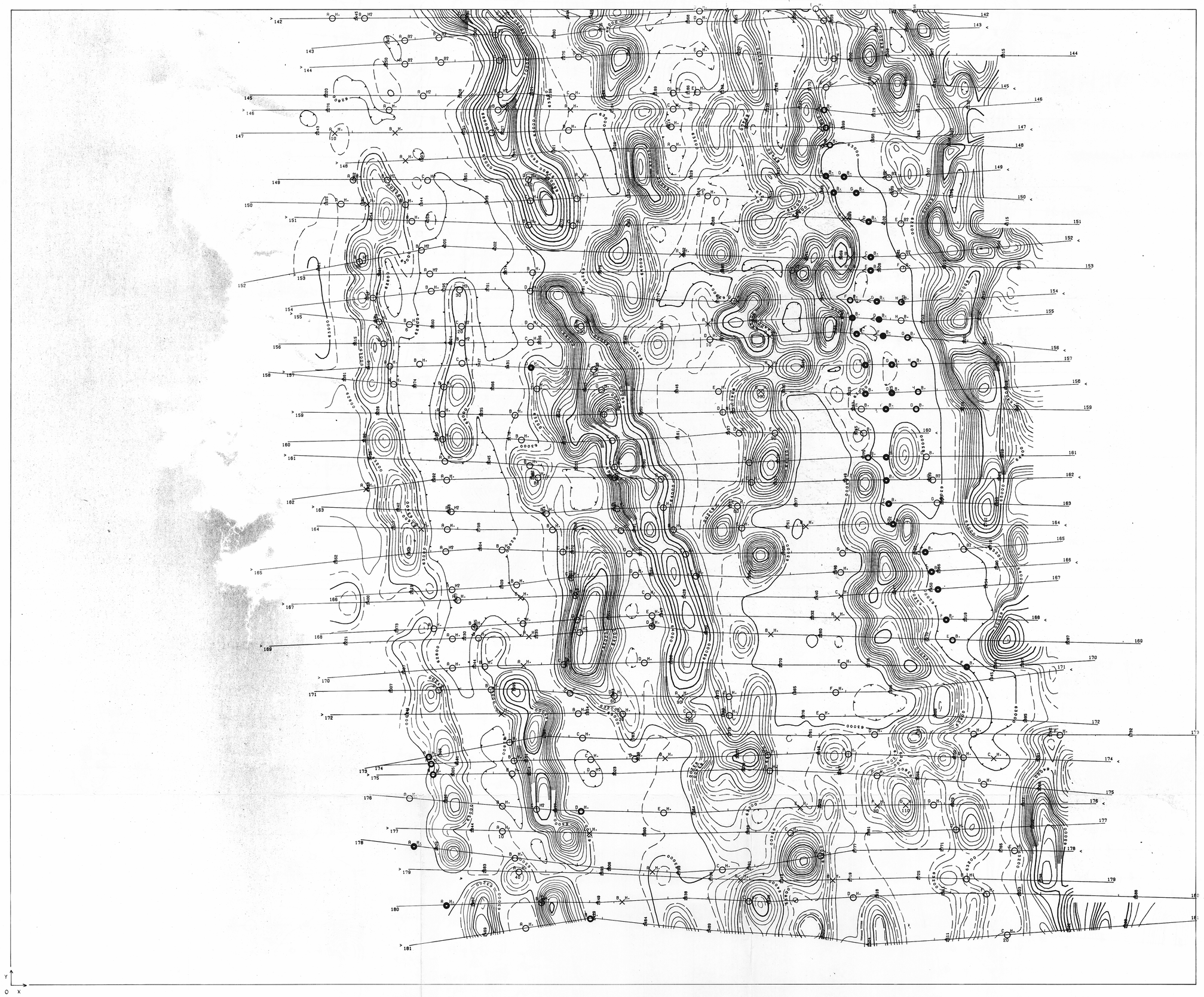


Frequency response of magnetic operator

5368

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE / 84		

5369



343331

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

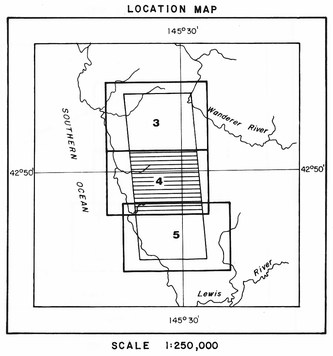
ENHANCED MAGNETICS

5 cm

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000

Scale 1:10,000

1.2 0 1.2 1 Kilometres

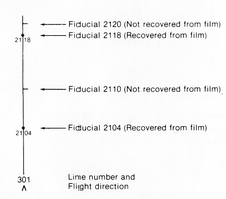
1.4 0 1.4 1.2 Miles

SHEET 4

Accompanies Appendix 1
Amoco Report 401

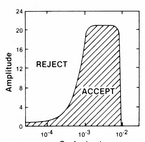
84-2217

Flight Line



ISOMAGNETIC LINES
(enhanced field)

5000	5 000 nT
1000	1 000 nT
200	200 nT
100	100 nT
	magnetic depression

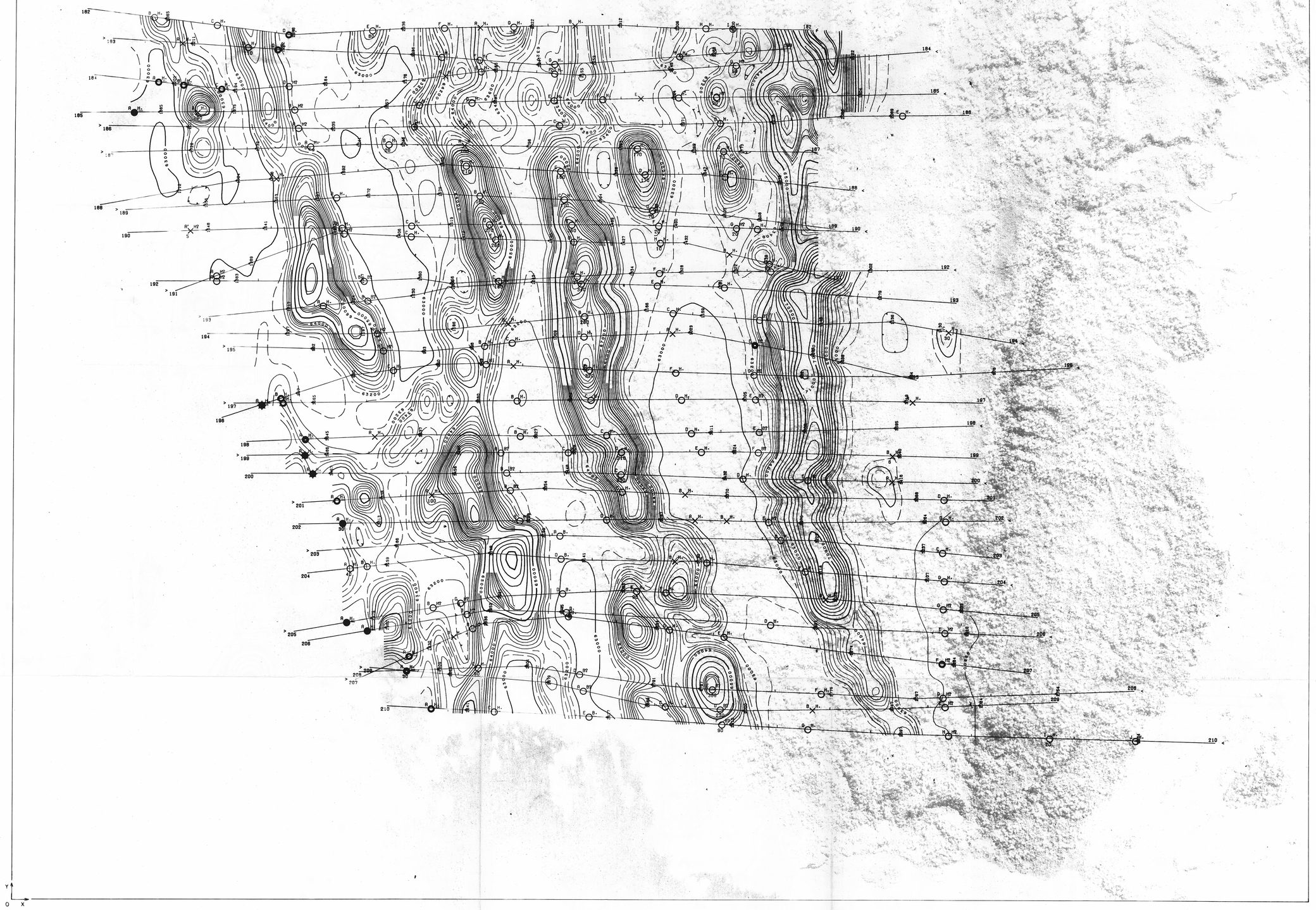


Frequency response of magnetic operator

5369

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE / 84	fly	

5370



343332

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

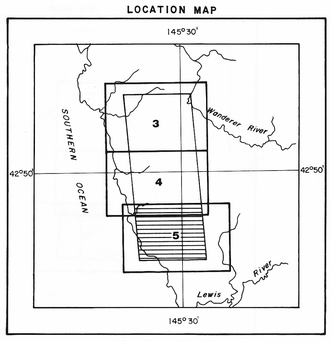
ENHANCED MAGNETICS

5 cm

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000



Scale 1:10,000

1/2 0 1/2 1 Kilometres

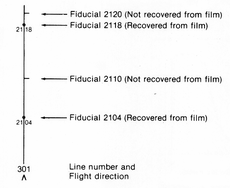
1/4 0 1/4 1/2 Miles

Accompanies Appendix 1
Amoco Report 401

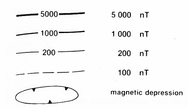
SHEET 5

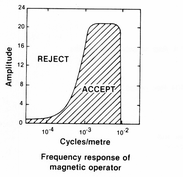
84-2217

Flight Line



ISOMAGNETIC LINES
(enhanced field)



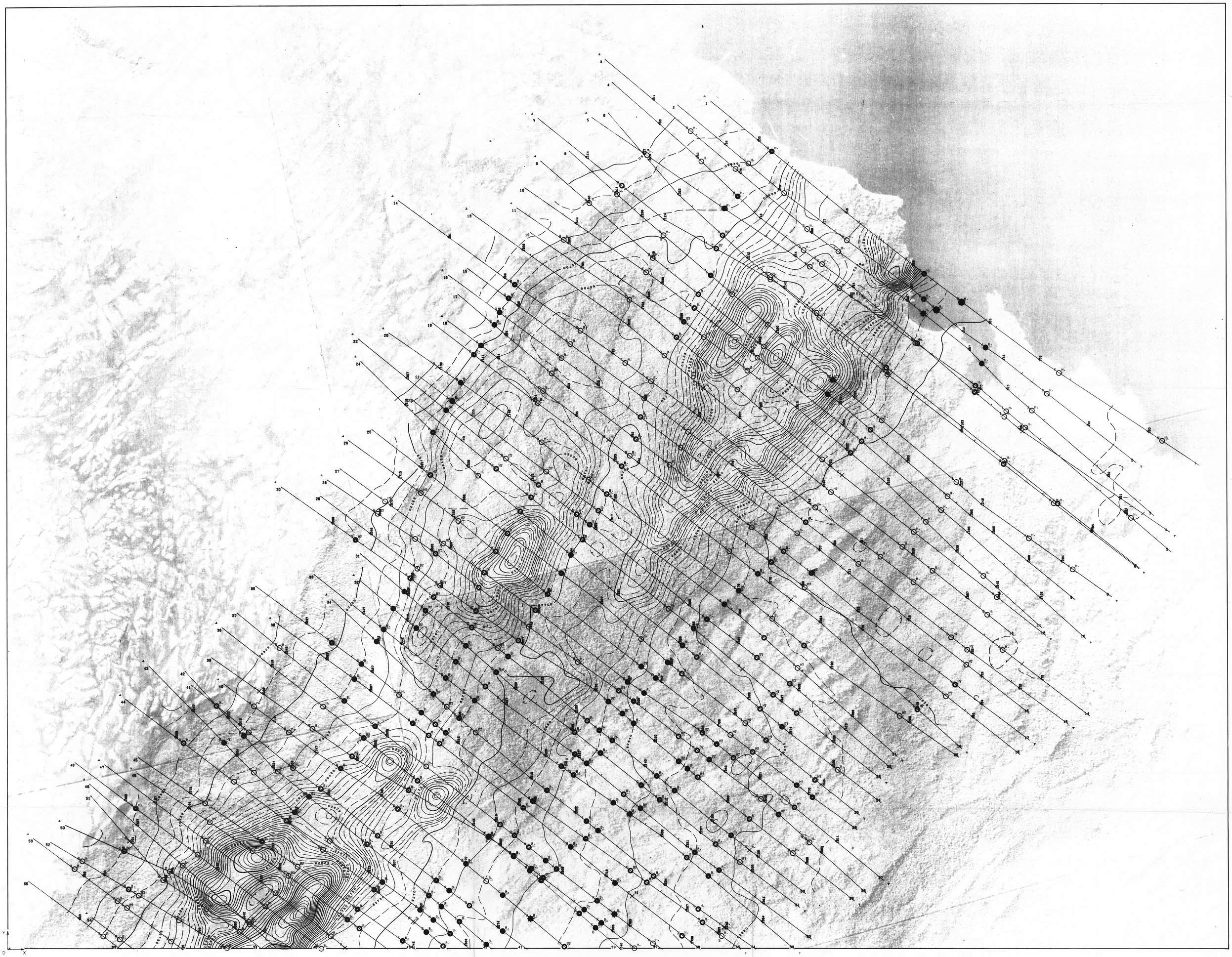


Frequency response of
magnetic operator

5370

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE/84		

5361



343333

DIGHEM^{III} SURVEY

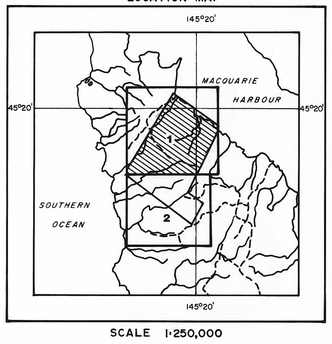
BIRCHS INLET NORTH AREA, TASMANIA

TOTAL FIELD MAGNETICS

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000



5 cm

Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Flight Line

Fiducial 2120 (Not recovered from film)
2118 Fiducial 2118 (Recovered from film)
Fiducial 2110 (Not recovered from film)
2104 Fiducial 2104 (Recovered from film)
301 A Line number and Flight direction

ISOMAGNETIC LINES (total field)

500 500 nT
100 100 nT
20 20 nT
10 10 nT
magnetic depression

Magnetic Inclination within the survey area: 73°

SHEET 1

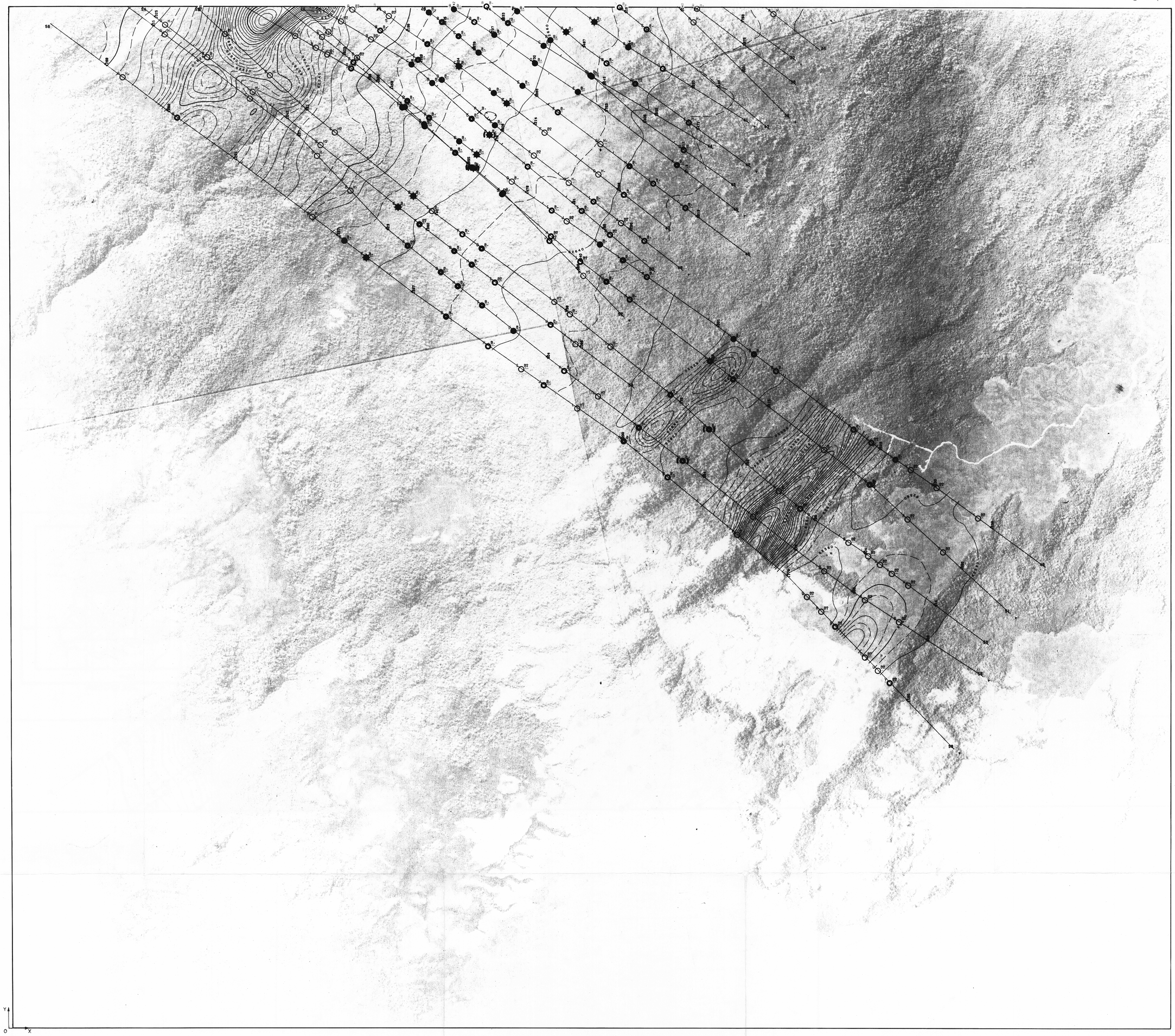
Accompanies Appendix 1
Amoco Report 401

84-2217

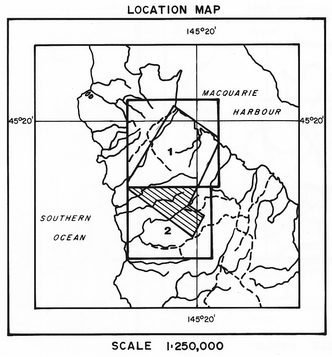
5361

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE, 84		

5362



LOCATION MAP



SCALE 1:250,000

343334

DIGHEM III SURVEY

BIRCHS INLET NORTH AREA, TASMANIA

TOTAL FIELD MAGNETICS

FOR

AMOCO MINERALS AUSTRALIA COMPANY

343335

5 cm

Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Flight Line

Fiducial 2120 (Not recovered from film)
Fiducial 2118 (Recovered from film)
Fiducial 2110 (Not recovered from film)
Fiducial 2104 (Recovered from film)
Line number and Flight direction

ISOMAGNETIC LINES
(total field)

500 — 500 nT
100 — 100 nT
20 — 20 nT
10 nT
magnetic depression

Magnetic Inclination within the survey area: 73°

REGISTERED PROFESSIONAL ENGINEER
D. C. FRASER
PROVINCE OF ONTARIO

Accompanies Appendix 1
Amoco Report 401

SHEET 2

84-2217

5362

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE, 84	B.P.	D Fraser

5363

343336

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

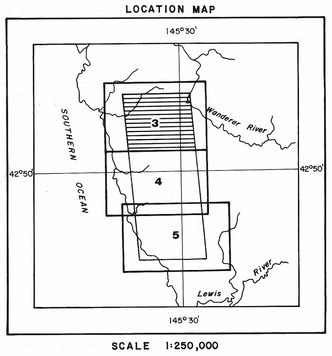
TOTAL FIELD MAGNETICS

5 cm

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000

Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Flight Line

2118 — Fiducial 2120 (Not recovered from film)
Fiducial 2118 (Recovered from film)
Fiducial 2110 (Not recovered from film)
2104 — Fiducial 2104 (Recovered from film)
301 — Line number and Flight direction

ISOMAGNETIC LINES (total field)

500 nT
100 nT
20 nT
10 nT
magnetic depression

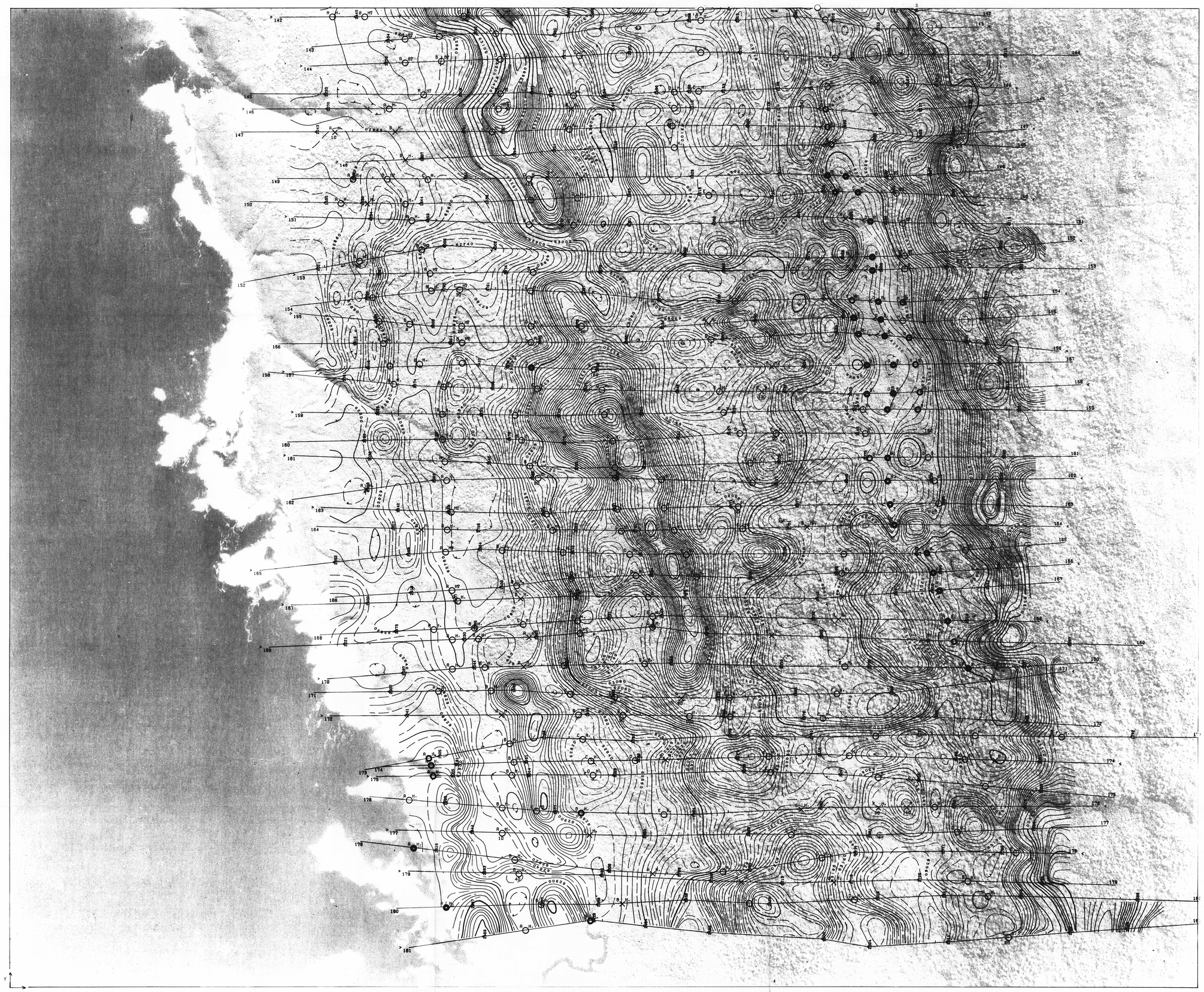
Magnetic Inclination within the survey area: 73°

Accompanies Appendix 1
Amoco Report 401 84-2217 SHEET 3

5363

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE / 84	RM	

5364



343337

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

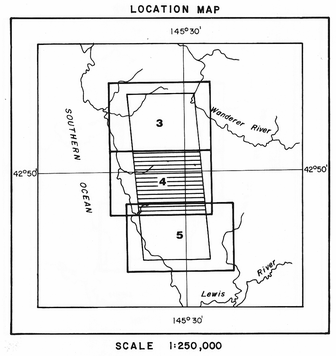
TOTAL FIELD MAGNETICS

5 cm

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000



Scale 1:10,000

1/2 0 1/2 1 Kilometres

1/4 0 1/4 1/2 Miles

Accompanies Appendix 1
Amoco Report 401

SHEET 4

84-2217

Flight Line

2118 — Fiducial 2120 (Not recovered from film)
Fiducial 2118 (Recovered from film)

Fiducial 2110 (Not recovered from film)

2104 — Fiducial 2104 (Recovered from film)

301 A — Line number and Flight direction

ISOMAGNETIC LINES
(total field)

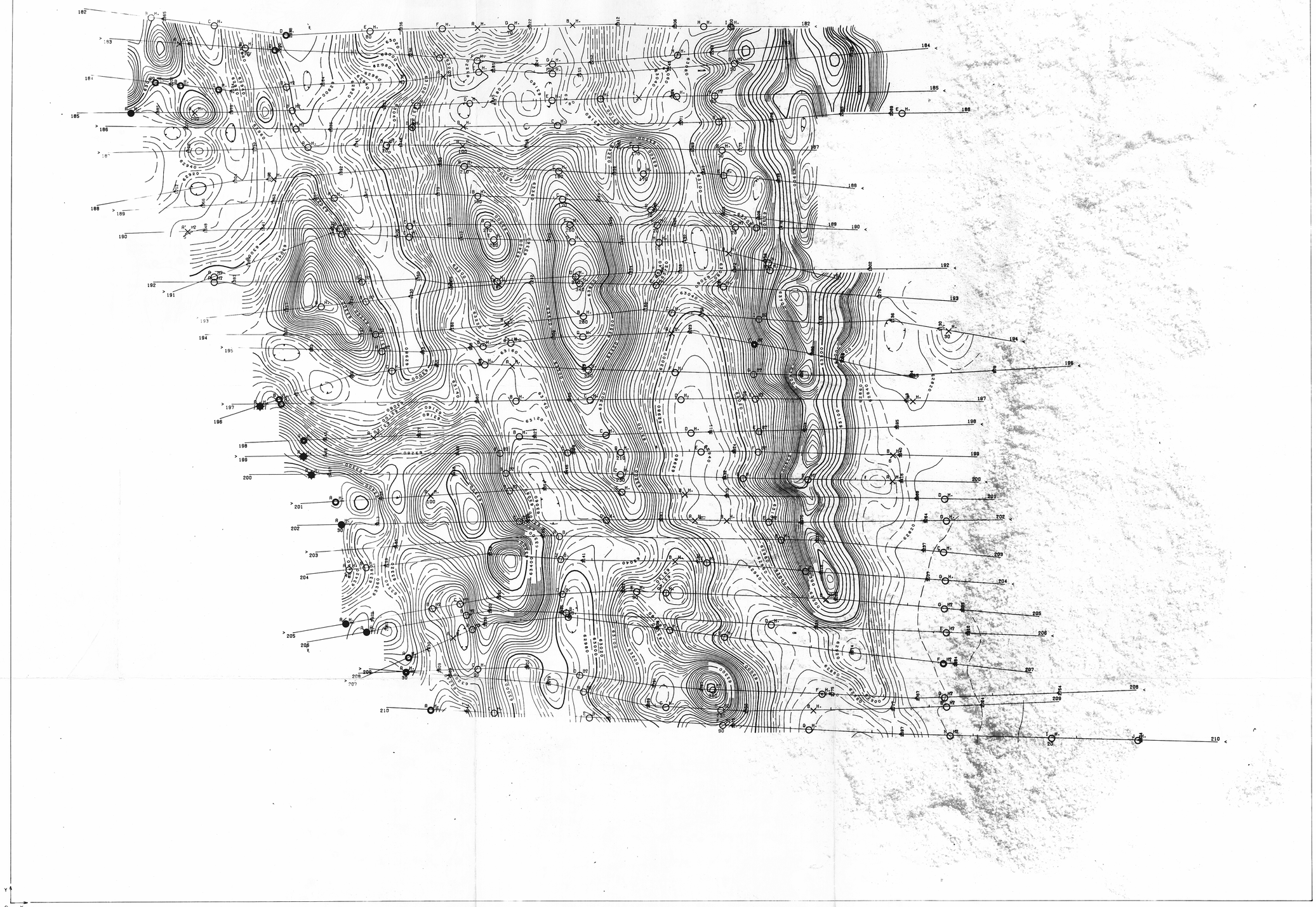
500	500 nT
100	100 nT
20	20 nT
10	10 nT
	magnetic depression

Magnetic Inclination within the survey area: 73°

5364

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE / 84	PM	

5365



343338

DIGHEM^{III} SURVEY

BIRCHS INLET SOUTH AREA, TASMANIA

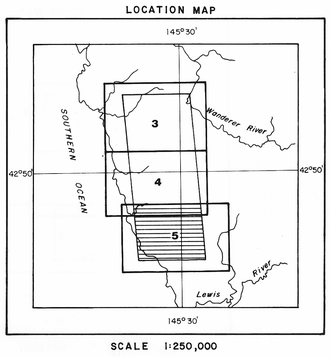
TOTAL FIELD MAGNETICS

5 cm

FOR

AMOCO MINERALS AUSTRALIA COMPANY

LOCATION MAP



SCALE 1:250,000



Scale 1:10,000

1/2 0 1/2 1 Kilometres

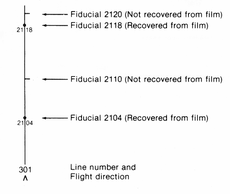
1/4 0 1/4 1/2 Miles

Accompanies Appendix I
Amoco Report 401

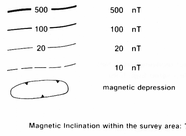
SHEET 5

84-2217

Flight Line



ISOMAGNETIC LINES
(total field)



Magnetic Inclination within the survey area: 73°

5365

JOB	DATE	DRAWN BY	CHECKED BY
369	JUNE/84		

APPENDIX 2

PETROGRAPHIC REPORT

by Pontifex & Associates

147

343148

Pontifex & Associates Pty. Ltd.

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 4360

14th August, 1984

TO:	Mr. Bret Ferris, Amoco Minerals Australia Co. PO Box 493 NORTH SYDNEY N.S.W. 2060
YOUR REFERENCE:	Despatch No. 1219
MATERIAL:	Rock samples
IDENTIFICATION:	112015 to 112985 (17 samples) 113037, 039, 040
WORK REQUESTED:	Thin section, petrographic descriptions.
SAMPLES & SECTIONS:	Returned to you with this report.

PONTIFEX & ASSOCIATES PTY. LTD.

BRIEF SUMMARY COMMENTS

The rocks in this batch have been petrographically divided into 4 lithologic groups: (and the individual descriptions are presented in this report in these groupings, and not in numerical order).

1) Schistose metavolcanic rocks, mostly "basaltic".

2) Non-schistose felsic (including acid) volcanics.

3) quartz microdiorites

4) basalts, andesites and dolerites.

1. The schistose rocks include a crystal tuff or arkosic/volcaniclastic sediment (112015), but most of this group are schistose basalts and basaltic lapilli tuffs (112628, 982; 113037, 39, 40).

The group represents a relatively low metamorphic grade, but it is distinguised by being generally strongly schistose. Sample 112972 is a non-schistose basalt, but it is tentatively included in this group because of its low-amphibolite facies metamorphic grade which is consistent with other rocks in this group but higher than the grade of the basalts in group 4 in this report.

2. The relatively undeformed felsic volcanics are rhyodacite (112072, 112365) siliceous andesite to trachyandesites (112150, 112518, 112828) and trachy to breccia (112294). These may be terrestrial flows and breccias, and are possibly more prospective for Sn - W than for Cu - Zn - Pb deposits. They are commonly reddened and rich in limonite/hematite

3. The quartz microdiorites include a potassic variety (monzodiorite) (112058), and a non-potassic variety (112475).

....2.

4. The basalts and basaltic-andesites include rocks rich in fresh to uralitised augite, with or without altered orthopyroxene (112385/2 lava; 112462 tuff) and less highly porphyritic rocks (112631, 112700) Some of these latter rocks appear to be weakly sheared. Sample No. 112304 is a potassic dolerite or micro-monzodiorite of uncertain affinities but possibly related to 112058.

As noted above, the rocks in this batch have textural differences as well as compositional differences. The schistose rocks are probably older than the massive relatively non-metamorphosed rocks. These "schists" are probably intruded by the group 3 quartz-dioritic rocks, which confirms the relationships mentioned in your covering letter.

It is also possible however, that the schistose rocks represent separate shear zones

Alteration in the schistose rocks is all basically due to metamorphism. Alteration in the relatively massive and undeformed volcanics and intrusives is generally minor to moderate and broadly confined to sericitic, uralitic saussuritic styles, with carbonate in some basalts, and these assemblages appear mainly to be due to "deuteric" and "late magmatic" related processes. There is no convincing evidence of the more intensive pervasive style of significant hydrothermal alteraion, of the type which may be a signature to the base-metal, volcanogenic mineralisation reported to be the target represented by these rocks. Accessory pyrite occurs in rare intrusive samples, and is the only evidence of sulphides.

1. SCHISTOSE META MORPHOSED VOLCANIC ROCKS

a) Acid Volcanics

112015 : quartz-sericite schist, with minor chlorite and residual biotite;
probably derived from quartz crystal tuff, or arkosic/ volcaniclastic sediment.

The constituents of this rock are:

(1) quartz grains of probable volcanic origin (35%), 0.2 - 0.8 mm in size, with undulose extinction and deformation lamellae:

(2) schistose lenses of dense fine sericite (40%), 0.2 - 1 mm long, apparently after felspar crystals or rock fragments but gradational to very fine (?pelitic) material and effectively forming a schistose matrix to this rock:

(3) detrital muscovite and partly to completely chloritised biotite (10%);

(4) leucoxenised magnetite (2 - 3%), in the matrix of schistose sericite with minor quartz.

Accessory small siliceous/silicified lithic fragments, zircon grains, and partly leached alkali felspar grains are also present.

This rock may have been an arkosic/volcanogenic sediment or a tuff. The presence of detrital/clastic muscovite is not entirely consistent with it being entirely of volcanic derivation however.

b) Basaltic Volcanics

112628 : schistose basaltic-lapilli-tuff;
with extremely fine compact "sericite",
carbonate, albite and leucoxene.

Relict lapilli preserved in this now quite strongly schistose rock, consists of compact extremely "sericite" clouded with leucoxene. Minor fine carbonate occurs in some lapilli, and in others there is abundant carbonate, together with leucoxene after fine to coarse titano-magnetite.

Some of the lapilli have clots of albitised plagioclase phenocrysts to 3 mm across, but others appear to have been aphyric. Traces of pyrite occur in the felspar-porphyritic lapilli.

The whole rock matrix consists of extremely fine clay-quartz aggregate with minor leucoxene.

The original rocks appear to have been a lapilli tuff derived from basalts with a porphyritic to aphyric-holocrystalline texture.

112972 : actinolite-albite metabasalt/metadolerite, with minor pyrite.

This sample is a non-schistose meta basalt (or metadolerite) with recrystallised prismatic green amphibole (actinolite or hornblende), patches of fine grained chlorite and albitised plagioclase laths generally less than 0.8 mm long.

Skeletal magnetite grains (3%) 0.4 mm in size, and slightly coarser irregular pyrite grains (3%) in clusters to 2 mm across, are all randomly scattered.

Although this rock is not schistose it is included in this group of schistose basalts because of its lower amphibolite facies grade of metamorphism, which is a higher grade than that of the basalts in group 4 in this report.

112982 : chlorite-carbonate-talc schist after ?pyroxene-phyric basalt with large vesicles (now occupied by carbonate).

This sample is strongly schistose, with a fine schistosity defined by very fine compact talc. Scattered through the talc are deformed chlorite ± talc pseudomorphs of euhedral ferromagnesian phenocrysts (25 - 30%) up to 2.5 mm in size. These were probably pyroxene but possibly olivine.

Elliptical to irregular vesicles to 6 mm long, elongate parallel to the schistosity, are filled with coarse granular carbonate and minor quartz, with disseminated fine oxidised opaque grains.

113037 : albite-epidote-actinolite schist, with minor chlorite albitised plagioclase phenocrysts; derived from porphyritic basalt.

This is a strongly schistose rock with abundant fine fibrous actinolite defining the schistosity, and several large scattered albitised plagioclase phenocrysts to 4 mm long.

Very fine albite and epidote are also disseminated through the groundmass, between the schistose actinolite fibres.

Patches of chlorite, enclosing fine granular epidote, to 5 mm long, are probably metamorphosed vesicles. Rare residual grains of clinopyroxene and accessory small skeletal magnetite grains, about 0.5 mm in size, are scattered.

113039 : "hematite" chlorite sericite schist, with disseminated leucoxene; derived from coarse tuff with scattered lapilli (of basaltic derivation).

About 70% of this rock is composed of metamorphosed, elongated/ ellipsoidal, glassy lava fragments or droplets 1 - 4 mm in length, with some over 4 mm/ lapilli). Variable concentrations of these gives rise to a macro layering on a scale of 15 to 20mm. These fragments are altered to sericite and leucoxene, with dispersed "hematitic dust", and they are set in a matrix of schistose sericite and chlorite.

Limonitised coarse grains in the fragments appear to have been carbonate, but may have been magnetite. The fragments are all surrounded by a rim of extremely fine hematitic iron oxide.

Almost certainly the clasts and matrix materials derived from a glassy basaltic source.

113040 : schistose vesicular metabasalt, with quartz, leucoxene, carbonate and "sericite" (? talc) alteration, accessory fine pyrite.

This rock was originally basaltic, dominated by primary felted felspar laths about 0.5 mm long, with abundand scattered titanomagnetite grains and interstitial pyroxene and/or glass.

During metamorphism, the felspar and interstitial material have been replaced by schistose "sericite", with some carbonate and leucoxene in the interstitial sites.

Small patches of fine grained quartz are scattered throughout and many of these may represent small vesicles. Large patches of fibrous carbonate, with minor quartz and pyrite, appear to represent larger unfilled vesicles.

Minor pyrite (3%) is scattered through the rock, as small grains 0.1 - 0.2 mm in size.

2. NON-SCHISTOSE FELSIC VOLCANICS

112072 : weakly microporphyritic rhyodacite, with weak sericite-chlorite-carbonate alteration.

This is a weakly microporphyritic rock with sparsely distributed plagioclase phenocrysts (10%) 0.5 - 2 mm, long, weakly to strongly sericitised; and lesser small quartz phenocrysts (5%) 0.5 - 2 mm in size.

The groundmass is fine grained with laths of alkali felspar and plagioclase up to 0.3 mm long, and interstitial quartz. Chlorite-epidote-sphene ± carbonate patches after biotite, also fresh to leucoxenised magnetite, with or without apatite inclusions, are scattered. Some of the biotite pseudomorphs are quite large and represent altered phenocrysts.

Fractures in the rock are variously lined by chlorite or limonite.

112150 : weakly porphyritic trachyandesite or latite with ferromagnesian phenocrysts altered to clays.

The phenocrysts in this rock are dominantly of plagioclase, with minor altered ferromagnesian phenocrysts, and accessory microphenocrysts of magnetite. The plagioclase phenocrysts are about 2 mm long and are unoriented. They are weakly sericitised and have cores altered to fine clays and/or chlorite. Sparse ferromagnesian phenocrysts about 1 mm long are altered to chloritic-clays. Minor leucoxene, and oxidised magnetite crystals, occur in these pseudomorphs. The original ferromagnesian mineral was probably a pyroxene.

The groundmass is rich in alkali-felspar and also contains chlorite, sericite, oxidised-magnetite and leucoxene. Much of the leucoxene has replaced small bladed or platy crystals, probably ilmenite, but possibly biotite. The chloritic clays in the groundmass are more probably after biotite however.

Patches to 2 mm in diameter, rimmed by quartz and filled by chlorite/smectite clays, appear to be vesicles.

112294 : altered volcanic breccia of trachyte lava, with a matrix of quartz and green to yellow clays; probable pyroclastic, (but possible flow breccia).

At least 70% of this rock consists of a loose, random aggregate of breccia clasts, maximum size 40 mm, in a relatively soft clay-rich matrix. These clasts consist essentially of massive to vesicular trachyte.

The trachyte clasts seen in the thin section contain strongly flow-oriented phenocrysts of plagioclase, 2 mm long, in a fine grained flow textured, alkali felspar-rich groundmass, with scattered ?plagioclase microphenocrysts.

Minor vesicles are variably filled by quartz chalcedony and green to orange clays, occur in the larger fragments, generally more abundant in some of the smaller fragments.

The larger fragments of about 40 mm may be primary, pyroclastic lapilli or small bombs, although this is difficult to distinguish from clasts resulting from more or less in-situ brecciation, (which may occurred during flow).

These larger fragments occur in a matrix of smaller fragments, with interstitial quartz and patches of green to yellow clays. Most of these larger fragments are cut by thin veinlets of quartz.

112365 : weakly porphyritic dacite (gradational to quartz microdiorite).

Phenocrysts of plagioclase (25%), altered biotite (7 - 10%) and quartz (3 - 5%) average size about 1 mm, are randomly disposed through a fine holocrystalline quartzofelspathic groundmass, average size 0.3 mm; (i.e. not markedly different in size from the phenocrysts).

The plagioclase is moderately sericitised and locally rich in epidote. The biotite is completely altered to fine chlorite and leucoxene, with or without ?pumpellyite or epidote. Small magnetite grains also occur in the altered biotite.

The groundmass consists of small unoriented plagioclase and rarer alkali felspar laths, with poikilitic late stage quartz. Minor magnetite, chlorite and epidote are disseminated through the groundmass.

112518 : sparsely porphyritic trachy-andesite; minor chlorite leucoxene, rare cloudy clays and hematite dust.

This sample contains small (to 1.5 mm) plagioclase phenocrysts (7%) scattered through a microcrystalline K-felspar-rich groundmass. Sparse to accessory ferromagnesian phenocrysts (1 - 2%), altered to chlorite, magnetite and rutile are also present.

The groundmass appears to be dominated by K-spar, but with subordinate plagioclase local patches of fine skeletal chlorite, accessory disseminated magnetite, and finely dispersed hematite dust.

Small possible vesicles are filled by granular quartz.

112828 : porphyritic; glassy-trachyandesite or latite; (with exceptionally well preserved perlitic texture is the glassy groundmass).

This sample contains phenocrysts, xenoliths, and xenocrysts of various kinds generally about 1 mm but up to 3 mm, all randomly disposed through an alkali-felspar rich devitrified brownish glass, with a well perlitic cracking fabric.

The phenocrysts are mostly of plagioclase, and are highly fritted (corroded). They are 0.5 - 3 mm long and in places occur in clusters to 6 mm in diameter. Chlorite-quartz pseudomorphs of ferromagnesian phenocrysts are present and locally veined by pyrite. Leucoxenised microphenocrysts of magnetite are scattered.

Small fragments of fine quartz sandstone with a fine quartz cement are also present.

The rock is cut by a subparallel network of quartz-chlorite stringers, and by later veinlets of quartz and/or chlorite.

3. QUARTZ MICRODIORITES

112058 : weakly porphyritic hornblende augite quartz-micromonaodiorite;
moderate, selective, saussuritic sericitic and chloritic alteration.

This rock has abundant large phenocrysts, mostly of plagioclase (10 - 12%) which are fairly extensively altered to sericite + epidote; and fresh brown hornblende (7%). Rare phenocrysts of apatite 1 - 2 mm long are scattered.

The groundmass consists of fine crystalline quartz alkaline felspar and plagioclase in sub-equal abundance. Chlorite $\pm$ epidote after biotite, green and brown hornblende, magnetite and apatite are also scattered through the groundmass.

The size of the phenocrysts is generally 2 - 5 mm, and the groundmass minerals are 0.2 - 0.5 mm.

112475 : weakly porphyritic (quartz) pyroxene-diorite

About 50% of this rock consists of a very "loose packed" aggregate of randomly interlocked plagioclase crystals (50%) average size about 1 mm but up to 4 mm long. Most of these crystals are weakly zoned, and clouded by sericite ± clay alteration. Fresh colourless augite-clinopyroxene (25%), of similar size, form part of this aggregate. The clinopyroxene crystals contain numerous very fine grains of magnetite and some are partly altered to fibrous amphibole.

The coarser crystals are essentially phenocrysts.

Interstitial areas ("groundmass") which forms about 25% of the rock consists of finer (to 1 mm) quartz, plagioclase, clinopyroxene and magnetite.

4. BASALTS, ANDESITES, DOLERITES

112304 : potassic dolerite (gradational to monzodiorite); moderate uralitic alteration.

This is a fairly homogeneous massive, crystalline rock with a more or less ophitic or sub-ophitic texture. It is dominated by plagioclase laths 0.5 to 2 mm long, rimmed by or with intersticies of, minor alkali felspar.

Fresh to uralitised clinopyroxene is also common (25 - 30%) enclosed in the plagioclase-lath aggregate, and minor yellow clays are interstitial.

The texture is appropriate for a leucocratic dolerite, but the abundance of alkali felspar is more typical of a mafic, fine-grained monzodiorite. A possible origin for this rock is from a highly contaminated continental tholeiitic magma.

112385/2 : uralitised, two-pyroxene-andesite

Abundant, undeformed, euhedral ferromagnesian phenocrysts in this rock have been replicated by uralitic amphibole. The uralite after clinopyroxene (25% of the rock) has broad areas of uniform orientation representing individual twin areas in the original pyroxene. The uralite after orthopyroxene (5%) has a more fibrous appearance, representing find-scale alterations of (001) orientation and is intergrown with chlorite.

Plagioclase (20%) occurs as moderately flow-oriented laths to 4 mm in length, with some alteration to sericite.

The groundmass consists of weakly to strongly sericitised plagioclase laths up to 0.3 mm long, in a finer matrix of chlorite and sericite, with small disseminated crystals of magnetite and plates of ilmenite.

112462: lapilli tuff of variously altered massive to vesicular basaltic and andesitic fragments; alteration includes epidote, chlorite, quartz, albite, carbonate.

The fragments in this rock are from 4 mm to over 25 mm in size and are thus classified as lapilli (4 - 32 mm).

Many of the fragments contain large euhedral augite phenocrysts, to 4 mm in size, partly altered to epidote, and albite-epidote pseudomorphs of plagioclase phenocrysts. Rarely, the coarse pyroxene contains abundant chlorite in addition to epidote. These fragments have fine grained fluidal groundmasses with small phenocrysts (?pyroxene or olivine) replaced by chlorite and quartz.

Other fragments have more abundant epidotised plagioclase phenocrysts, generally of small size, with a strong floor orientation.

Some of these are highly vesicular with quartz-filled vesicles.

The largest fragment in this clast has its groundmass and plagioclase phenocrysts replaced by clouded and clear epidote, respectively. It also has large clinopyroxene phenocrysts, generally fresh or with very minor epidote, and abundant oxidised and silicified crystals of olivine. The olivine crystals are up to 0.5 mm long and locally occur in crystal-clots with augite.

Abundant amoeboid vesicles to 2 mm long occur in this clast. They are largely filled by quartz with, locally, minor chlorite. Larger vesicles (2 - 4 mm long) are filled by carbonate.

112631 : sparsely porphyritic, vesicular basalt, with tremolite and chlorite throughout the groundmass and abundant vesicles filled by carbonate.

This is a vesicular basalt, with abundant vesicles 0.5 - 3 mm in diameter, largely filled by carbonate. Some of the vesicles have cores of clouded ?albite, however.

Rare felspar phenocrysts are altered to fine quartz and sericite and are set in a fine grained matrix of chlorite and leucoxene, which also contains numerous unoriented acicular crystals of tremolite. Some of the tremolite needles extend into the vesicles, and into the altered felspar phenocrysts.

A texture of fine felted felspar microlites is preserved in the groundmass in places.

112700 : altered vesicular basalt with vesicles filled variously by chlorite, smectite or quartz.

This is an altered, weakly flow-textured basalt, dominated by a groundmass of plagioclase laths about 0.1 to 0.5 mm long, in a mesostasis of altered ?glass, consisting variously of chlorite, fibrous tremolite and quartz.

Vesicles, ranging from spherical to elliptical and vein-like in shape, are 0.2 to 5 mm in size and filled variously by chlorite ?chlorite-smectite interlayered clays, chlorite + quartz, or fibrous to granular quartz. The quartz-filled vesicles have internal cavities, and appear to have originally contained chalcedony or opal.

Rare epidote occurs in some vesicles.

Limonitic veins cut the rock.

APPENDIX 3

GEOPHYSICAL INTERPRETATION

by J. Bishop

343282

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AN INTERPRETATION OF THE AEROMAGNETIC AND DIGHEM SURVEYS OVER THE CAPE SORELL PENINSULA

(E.L.'S 35/83, 36/83 & 37/83.)

for

Amoco Minerals Australia Company

by

Mitre Geophysics Pty. Ltd.

84-2217

AM/MG84/08

December, 1984

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MITRE GEOPHYSICS PTY LTD

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CONTENTS

Tables and Figures	2
Summary	3
Introduction	4
Geology and Exploration Targets	4
Exploration History	5
Interpretation of the Dighem Surveys	6
Interpretation of the Aeromagnetic Survey	8
Conclusions and Recommendations	12
References	15
Appendix: Survey Details	16



TABLES AND FIGURES

This report is an appendix to the 1984 annual report on the Sorell Peninsula by B. Ferris. The enclosures referred to in this report are those of Ferris' report.

Table 1. List of Prospects with recommended follow-up. p.17

Figure 1. Recommended exploration program (1:50,000 scale).

Figure 2. Interpretation of aeromagnetic survey (1:50,000 scale).

Figure 3. Dunes Ck (south) magnetic interpretation.

Figure 4. Butler Creek magnetic interpretation.

Figure 5. Anomaly 128 magnetic interpretation.

Figure 6. Anomaly 128 (ground traverse).

Figure 7. Birthday Bay (model 'A') magnetic interpretation.

Figure 8. Birthday Bay (model 'B') magnetic interpretation.

Figure 9. Gaps West magnetic interpretation.

Figure 10. McCarthy Creek magnetic interpretation.

Figure 11. Urquhart (north) magnetic interpretation.

Enclosure 1. Sorell Peninsula regional geology (1:50,000 scale)

Enclosure 2. Regional base map showing areas of interest (1:50,000 scale).

Enclosure 3. Sorell Peninsula aeromagnetic contours (1:50,000 scale).

Enclosures 15, 16, 17, 18 & 19. Sorell Peninsula aeromagnetic contours at (1:20,000 scale).

SUMMARY.

E.L.'s 35/83, 36/83 & 37/83 cover the Sorell Peninsula in the south west of Tasmania. The Cambrian volcanics and sediments in this region are prospective for base metal, gold and tin deposits. The area is largely unexplored (access is difficult and in recent years it has been under a government moratorium). In March 1984, a detailed aeromagnetic survey was flown over the entire licensed area. At the same time, a Dighem survey was flown over two of the five areas of volcanics.

The aeromagnetic results show excellent agreement with the known geology and structure and several changes to the present geological interpretation maps are indicated. However, the main thrust of this report has been the identification of prospects for ground follow-up. As expected, the best targets have been generated by the Dighem surveys. Although no strong bedrock responses were recorded, anomalies close to good geochem values were defined in both areas (the Double Cove and Urquhart (north) prospects). It is recommended that the remaining three areas of volcanics also be covered by Dighem.

One magnetic anomaly in an area of carbonates (Birthday Bay) has been identifed as a tin target and follow-up of strong magnetic anomalies along the PreCambrian/Cambrian contact (?ironstones) is recommended among the gold prospects (Anomaly 128 and Anomaly 129).

A broad geological and structural interpretation plan has been produced at 1:50,000 with a second plan at the same scale identifying the prospects and the traverses recommended for follow-up. A list of the 26 prospects, in order of priority and with the methods suggested for follow-up, is given in a table at the end of this report.



INTRODUCTION.

E.L.'s 35/83, 36/83 & 37/83 (Sorell Peninsula) cover an area of prospective ground in the south-west of Tasmania. The ground is held under a joint venture agreement between Amoco, Poseidon and Placer. Amoco is managing the exploration program.

In early 1984, an aeromagnetic survey was flown covering all three E.L.'s. The survey was detailed and maps have been produced at 1:20,000 scale with a two gamma contour interval and at 1:50,000 with a four gamma interval. At the same time, Dighem was flown over two areas of Cambrian volcanics within the surveyed ground.

The Sorell Peninsula is remote and has been little explored, especially over the last decade. Access on the ground is often difficult and is subject to some environmental constraints. (The latter being the reason for the government's recently lifted moratorium on exploration in this area.) Further, poor weather reduces the field season to four or five months during the summer period. However the area contains rock types which are similar to those hosting the world-class tin and base- metal mines 50 to 100kms to the north, and it is considered to be highly prospective.

The aeromagnetic survey was flown to assist geological mapping of the area as well as to locate directly, any tin replacement (ie, Renison-style) deposits. The Dighem survey was primarily carried out to locate base-metal conductors within the volcanics.

The aeromagnetic survey shows a good correlation with the areas of fact geology and some significant changes to the geological interpretation maps have been suggested. However the emphasis in this report has been identification of targets for follow up in the next field season.

GEOLOGY AND EXPLORATION TARGETS.

The Sorell Peninsula was mapped by BHP in the late 1960's. The coast and harbour boundary were mapped on foot, plus a small number of inland traverses. Thus most of the area has only been mapped by airphoto interpretation and the Cambrian and Pre-Cambrian rocks are largely undifferentiated.

PreCambrian sediments occur in the northern half of the ground and are considered unprospective (based on similar rocks elsewhere in the state), although I have recommended (see later) that two aeromagnetic anomalies within the PreCambrian be investigated.

The prospective rocks are the Cambrian sediments and volcanics. The former account for perhaps 50% of the area and are correlates of the rocks hosting the Renison tin mine. Although not a prime target, a similar deposit is sought in this area. Being a massive



pyrrhotite body, any such occurrence should be both highly magnetic and conductive.

There are five separate pockets of Cambrian volcanics and it is within these rocks that the main exploration target, a poly-metallic massive sulphide deposit, lies. The aeromagnetic survey has confirmed that the volcanics are intermediate to basic. Thus they may be more likely to host a Besshi- rather than a Kuroko-type deposit; ie, a more copper-rich deposit (eg, anomalous copper values have been obtained from creeks draining the Mainwaring Volcanics). Such a deposit should be conductive (much more so than the 'typical' Tasmanian base metal deposits) and though likely to contain magnetite, may or may not be noticeably magnetic.

An important secondary target is for an epithermal gold deposit. The role of geophysics in helping to locate such a deposit is not clear, but it is possible that on a local scale, magnetics and IP might be applicable. (The latter would detect any associated disseminated sulphides; while the former, in a magnetically active region might define areas where hydrothermal activity had altered the magnetite to other iron oxides.) VLF is also useful for defining structure and, possibly, for directly locating the ore-bearing horizons (eg, Hemlo: MacGeehan, 1984).

EXPLORATION HISTORY

The first exploration of the Sorell Peninsula was carried out by the Mt Lyell, EZ joint venture (the LEE syndicate) in the late 1950's and early 1960's. A helicopter-borne EM and magnetic survey was flown over a region including the Amoco joint venture E.L.'s. Although the results from that survey have recently been re-evaluated (Kowalczyk, 1983), they are now of little relevance: the magnetics has been replaced by Amoco's detailed survey and the EM system was very insensitive. Further, the photographic recovery was poor.

The LEE syndicate did some limited ground follow up of the air-borne anomalies using geophysical methods, however the results of these surveys have not been sighted.

The area was held by BHP from the mid 1960's to early 1970's (E.L. 13/65). Regionally, they carried out some stream sediment sampling (which did not include gold); locally they looked at magnetic anomalies 128 and 129 (defined by the LEE survey) in some detail, as well as the ultrabasic belt running through the northern part of the licence. Drilling at '129' intersected 1m of massive pyrite, and a significant resource of asbestos was found to be associated with the ultrabasics.

In 1968 a airborne scintillometer survey was flown over selected areas to test the Ordovician and PreCambrian sediments for uranium. One response was found to coincide with anomaly 129 (?potassic alteration), others were interpreted as being of no



interest (Taylor, 1968). There has been no exploration of the Sorell Peninsula since BHP's work which finished in 1971. Thus the area is largely unexplored.

INTERPRETATION OF THE DIGHEM SURVEYS

Dighem was flown over two areas of volcanics: the Lucas Creek Volcanics at the north western end of the licences and the Mainwaring Volcanics at the southern end. In both areas, the surveys overlapped onto the surrounding sediments. The results have been presented by Fraser (1984) at 1:10,000 scale (report and maps constitute Appendix 1 of Ferris, 1984).

The Lucas Creek survey defined a large number of conductive horizons within the sediments. And although a number of responses were recorded over the volcanics, *none* were interpreted as 'bedrock' conductors by Fraser (1984).

A preliminary interpretation of the Lucas Creek survey was made in the field from the analog records (by Jones and Bishop). Two discrete anomalies (one of which was recorded on two lines) and one anomalous zone were chosen for follow up. The latter was chosen since it possibly lay within the volcanics, was possibly short enough to be non-formational and was probably easy to locate (and thus a good test for the VLF method which was to be used for ground location). The discrete anomalies were chosen since they were two of the few recognisable responses within the volcanics. One (4E) was of large amplitude and the other (6C/7E) was recorded on two adjacent lines (and was thus also likely to be a genuine response). In Fraser's (1984) report, 4E was interpreted as an 'H' type response; ie, as a broad conductive unit or as thick conductive cover. 6C & 7E were interpreted as possible cultural sources (see later).

To investigate the discrete anomalies, a grid (the Double Cove grid -see Enclosure 2) of two parallel lines and one orthogonal line was cut from a helipad. Two separate VLF responses were obtained: one at the intersection of traverses 32 and 34 and the other at the eastern end of traverse 33 (see Appendix 5, Ferris, 1984). The source of the latter is likely to be the cause of the Dighem responses 6C & 7E (thus showing them to be genuine responses). The former VLF response may be a northern extension of 6B/7D or a southern extension of 4E/5E -all H type responses; however it overlies the contact between volcanics and sediments (as indicated by BHP's mapping) and may be a contact response. Whatever the causes of these Dighem anomalies, the geochemical sampling along the traverses was considered unpromising (Ferris, 1984) and no further work is recommended. There are however two other (adjacent) anomalies in the vicinity, both interpreted as possible cultural sources, which should be followed up and these are further discussed below.

The abovementioned anomalous zone (picked from the analog records) was investigated by the Lucas Creek grid (see Enclosure

2) -two lines cut parallel to and north of an old foot track. Three VLF anomalies were recorded on each of the two northern lines (traverses 26 & 27), while two were recorded along the foot track (traverse 28). These are readily correlatable with Dighem responses 31E-29E, 33F-32F/30H-29F and 33G-31F-29G. No attempt was made at correlating the responses recorded along the orthogonal line. These responses are interpreted as being due to a series of (unprospective) graphitic shales.

As was mentioned above, the final report (Fraser, 1984) did not define any anomalies of obvious interest, however two near-coincident responses were recorded off the eastern edge of the Double Cove grid. These responses, 8G and 9E, are of high grade (5 and 4 respectively) but low amplitude. Like 6C and 7E, they were interpreted as being due to cultural sources. Fraser was asked to re-examine these responses since there is no culture (ie, power lines, generators, etc) in the area. Fraser (pers. comm.) noted that the two sets of responses were near-coincident and were thus unlikely to be caused by random noise. Flexure of the 'bird' was suggested: this is sometimes encountered along a cliff top when the stress on the bird is suddenly lifted. Responses 8G and 9E are on a topographic high, but not of a sufficient magnitude to be likely to cause flexing of the bird.

By themselves, these two responses are not of great interest, however they lie immediately above a site of anomalous lead values sampled from a stream bank by BHP (McGregor, 1969). Thus ground follow up of these anomalies is recommended (named the 'Double Cove' prospect -see Figure 1).

A VLF traverse was also conducted over the old LEE aeromagnetic anomaly 128. The several responses were correlatable with the Dighem responses recorded on flight line 49 immediately to the south of the traverse. Further work will be carried out in this area in the 1984/85 season (largely on geological grounds).

The survey over the Mainwaring Volcanics in the Cypress Creek area at the southern end of the licence also recorded a large number of anomalies. These were mostly 'H' type reponses and thus not of primary interest. There has been no ground follow up of this survey.

Bedrock conductors were defined on two adjacent lines in the north western corner of the Cypress Creek survey (sheet 3 of Fraser's report). Responses 105C and 106C are of low grade (grade 1) and low amplitude and are over ground interpreted as sediments, however they are in the vicinity of a high copper stream sediment sample (within volcanics, about 500m to the east of the Dighem anomaly) and are on the flank of a magnetic response. (However the magnetic response is not dissimilar to many other magnetic highs recorded within the Cambrian sediments.) This prospect has been named 'Urquhart North' and ground follow-up of the Dighem anomaly and sampling of the two streams draining the area are recommended (see Figure 1).

Also recorded on sheet 3, were a series of formational-looking bedrock &/or possible bedrock conductors. Two of these occurred solely within sediments (with strike lengths of 800m and 1100m), but investigation of two shorter conductive zones (400m and 700m long) within the volcanics is suggested (Dighem responses 125D to 129F and 125E to 128XC -named the 'Urquhart South' prospect: see Figure 1).

A single, weak (grade 1) response (no. 112E) of moderate amplitude, lying between (and to the east of) Urquhart North and Urquhart South was interpreted by Fraser (1984) as a possible bedrock conductor. Although over ground shown as Cambrian sediments, the aeromagnetic survey suggests that the area may be underlain by volcanics. The anomaly is of little interest by itself, however it is one of the few (possible) bedrock conductors and it is not an obvious formational response. The nearby streams (which drain into the Urquhart River) have not been sampled. This lower priority target has been named 'Urquhart East' (see Figure 1).

In the central part of the survey (sheet 4), formational conductors were defined within an area mapped as sediments (but which may be volcanics) in Geopeko's Elliott Bay licence -these have little potential and are of no interest to this exploration program. In the north western corner of sheet 4, three short (two line) weak, parallel zones were defined. Although interpreted as possible bedrock conductors, they also have little potential and follow up is not recommended.

In the southern part of the survey (sheet 5), a conductive zone of 800m was defined over the Mainwaring Volcanics to the east of the E.L. boundary (again within Geopeko's licence). Weak, formational-looking conductors were defined at the southern limit of the survey (extending as far north as line 199): these are of little interest. Two weak responses (192B & 193B) occur as a north western extension of these conductors and although follow up is not recommended, it is suggested that a mapping traverse, recommended to examine the geology and test the magnetics in this area (see later), be sited to intersect the zone defined by these two anomalies.

INTERPRETATION OF THE AEROMAGNETIC SURVEY

The aeromagnetic results have been presented at 1:50,000 scale using a 4 gamma contour interval (on one sheet -Enclosure 3) and at 1:20,000 scale using a 2 gamma contour interval (on five sheets -Enclosures 15 to 19). The survey specifications are given in the Appendix. Amoco have produced a geological plan (based on BHP's mapping) at 1:50,000 scale (Enclosure 1) and the aeromagnetic map shows generally good agreement.

An interpretation map has been produced at 1:50,000 scale (Figure 2) which outlines the broad geological boundaries and structural



features. It also shows the various anomalies and 'interesting areas' which have been picked out for further work. It is best used as an overlay for the magnetic and geology maps. A detailed geological interpretation has not been undertaken although the results suggest that this would be well worthwhile (particularly if integrated with a geological photo-interpretation of the area). (BHP used black and white photographs for their interpretation. The more recent colour photography is a marked improvement.)

There are several linear magnetic features within the Cambrian sediments along the whole length of the survey. These may be due to interbedded volcanics, horizons of detrital magnetite, 'ironstones', etc. The offsets within these zones are an excellent guide to the structural features of the area.

The volcanic rocks show up as magnetically active areas, with a character similar to that often obtained over basalt (ie, short wavelength anomalies of variable amplitude and direction). At Lucas Creek, the magnetics indicate that the volcanics may extend southwards to the coast, however the many conductors defined by the Dighem survey suggest that the volcanics actually stop a little short of the (south western) limit shown on the geology map. The magnetic interpretation roughly agrees with the mapped outline of the Muddy Cove and Karnebunger Creek volcanics, although the latter may extend further to the south in an area mapped as Tertiary cover (and its western limit is not the sharp 'corner' shown on the geology map). In the Hibbs River area, the magnetics suggest that the volcanics are much more extensive than is indicated on Enclosure 1; although they apparently do not extend so far to the north. Thus a larger area of (potentially) prospective ground has been interpreted. The magnetics over the Mainwaring volcanics are in general agreement with the geology; but they may extend further to the east at their northern end and may not extend so far to the west at their southern end. At Hibbs Lagoon at the southern end of the ultrabasic belt, there is an area, mapped as sediments, with a magnetic character similar to the volcanics. A reconnaissance traverse over this ground is recommended. Although the geology map shows sedimentary sequences within some of the volcanics, these are not evident from the magnetic map.

Apart from the volcanics, there are several other areas of interest defined by the survey. A brief description of these is given below in approximate geographical order starting from the north. The names of the prospects are given in upper case and their locations are shown in Figure 1. Where appropriate, a profile across the magnetic anomaly is shown together with a simple interpretation. Because of the close contour interval (2 gammas), it was often difficult to determine the peak values of the anomalies: those indicated on the profiles may not be correct. A list of the targets arising from both the Dighem and aeromagnetic surveys (approximately in order of priority) is given in Table 1. The recommended follow-up is also given.

The northern most anomalies are within the PreCambrian at DUNES CREEK. These were interpreted by Corbett et al (1982) as being due to magnetic conglomerate within quartzites and mudstones. They have been recommended for follow-up largely because of their ease of access and because it seems unlikely that they have been previously investigated on the ground. Modelling shows that large, formational features of low susceptibility fit the observed data (Figure 3). However, alternative models of smaller dimension and higher susceptibility (ie, closer approximations to a Renison-style body) could also be forced to fit the data.

At ALBINA, an area of different magnetic character was interpreted to the south west of the Lucas Creek volcanics. Within this area (it was subsequently learnt) gold was assayed from a rock chip sample (Ferris, 1984). The area contains a small discrete magnetic high (to the south of Albina Ck) which should be investigated as part of this gold prospect.

BUTLER CREEK is a reconnaissance traverse over magnetic highs within the Cambrian sediments and over the Cambrian - PreCambrian contact. (Corbett et al suggest that the source(s) may be mafic intrusives or volcanics within Cambrian mudstone, greywacke and conglomerate.) This area is of interest because two prospects close to the contact further to the south (Anomaly 128 and Anomaly 129) are potential gold targets (see below). Figure 4 shows a change in magnetic character at the PreCambrian/Cambrian contact, with a shallow tabular body of moderate susceptibility as a possible source of the 150 gamma anomaly. (The indicated dip of the contact has been extrapolated from Anomaly 128.)

ANOMALY 128 is a magnetic anomaly (numbered by the LEE aeromagnetic survey) close to the PreCambrian/Cambrian contact. It was investigated by BHP who suggested that the anomaly was caused by a gabbro intrusive. Alternatively, Ferris (1984) has suggested that it may be due to the same ironstone horizon which was drilled at ANOMALY 129 where 0.7 metre of massive pyrite/hematite mineralisation was intersected. (Anomaly 129 should perhaps also be further investigated -despite the unpromising conclusions by BHP (Goode and Meyer, 1974).)

Figure 5 shows that the response from a narrow tabular body on the contact closely agrees with the observed data. The Figure also shows a smaller anomaly apparently within the PreCambrian. This is the only such response in this region and it should be included in the prospect. A ground magnetic traverse was made of the area in the 1983/84 field season, about 400m north of the profile shown in Figure 5. This defined the contact anomaly and the weaker source to the north west within the Cambrian sediments (see Figure 6).

The magnetic anomaly at BIRTHDAY BAY has been chosen as a possible tin target since carbonates have been mapped in the area. Further, a buried target was suggested. The anomaly was modelled and Figure 7 shows a wide (150m) tabular body of moderate suscep-

tibility (^.003cgs) dipping to the south east. Again, a smaller body of higher susceptibility; ie, a better approximation to mineralisation rather than formation, can be made to fit the data. Figure 8 shows the response over such a body, buried at a depth of about 150m below the surface. (It is noted that the model for this target (eg, Renison) has two sources contributing to the anomaly: (1) the response from a steeply dipping feeder structure and (2) the (stratabound) response from the replaced carbonates.)

The MUDDY COVE volcanics are the most acidic mapped within the three E.L.'s and are considered more prospective for poly-metallic massive sulphide deposits such as occur in the Mt Read volcanics (Ferris, 1984). It is recommended that this belt be flown with a Dighem survey. The survey should extend past the southern limit of the volcanics to include the TIMBERTOP area where weak silver/ lead anomalies have been observed in soils (adjacent to a dioritic intrusive). Coverage of the two remaining areas of volcanics -KARNEBUNYER CREEK and HIBBS RIVER is also recommended.

The deep-seated magnetic anomaly at COMMANDANT CREEK is beneath (usually non-magnetic) Ordovician sandstones (Crotty equivalent). The anomaly is a potential target for a cassiterite-pyrrhotite body. However its close proximity and similar character to the diorite response suggests that another intrusive is the likely source. Thus this prospect has a low priority.

Two short reconnaissance traverses are recommended from the Gaps helicopter pad. GAPS WEST, to the north west would examine linear magnetic anomalies within the Cambrian sediments (a profile and a model are shown in Figure 9). GAPS SOUTH would examine a local magnetic high where diorite has been recently mapped by Amoco. Collins (pers. comm.) has suggested that Gaps West may have a radiometric signature*.

Within the Hibbs River volcanics, an area of anomalous copper/ gold has been defined (on the margin of the diorite intrusive). Follow-up of this prospect -named THOMAS CREEK -should ideally await the outcome of the Dighem survey recommended above, however the timing may not be appropriate. The intersection of structural trends immediately to the west of the geochemical anomaly should be included in the follow-up (the THOMAS CREEK (WEST) prospect).

A traverse across HIBBS LAGOON was recommended above, to establish whether this area (mapped as Cambrian sediments) is actually volcanics (as suggested by the magnetics).

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* Radiometric information was recorded during the magnetic survey (since it was already installed in the aircraft), but no calibrations were done and the data has not been compiled. An attempt is being made to produce a stacked profile plan of the raw total count data.

Similar traverses (ie, for reconnaissance geology rather than a specific target) are recommended over McCARTHY CREEK, WAROUNRIM and MAINWARING SOUTH. The first and third recommendations are to examine a series of offset magnetic highs and the second to investigate an apparent fold structure -all within areas mapped as Cambrian sediments. A profile across the McCarthy Creek prospect (with an interpretation) is shown in Figure 10.

URQUHART (NORTH) was picked from the Dighem survey. A profile of the magnetics over this prospect is shown in Figure 11 (from the Dighem magnetic data). This shows the EM response on the western flank of a 250 gamma high. A large (200m wide) body of moderate susceptibility (.003cgs units), buried to a depth of 100m fits the observed data.

Several features (intersection of trends, discrete highs, etc) were interpreted along the (Noddy Ck) ultrabasic belt, however it was felt that this area had been too well examined by BHP to warrant further exploration (eg, McGregor, 1970).

CONCLUSIONS AND RECOMMENDATIONS

The Sorell Peninsula is a prospective area for gold (panned from streams and assayed from rock chips); volcanogenic massive sulphides (in Cambrian Volcanics, possibly associated with the nearby Mt Read Volcanics which host several base metal deposits) and tin (in Cambrian sediments similar to those hosting the rich replacement tin mines to the north).

The detailed aeromagnetic coverage of the Sorell Peninsula has shown good agreement with the known geology and has suggested changes of position to the geological boundaries in several places. In particular, it has clearly defined (and increased the area of) the regions of Cambrian volcanics. Two of the five areas of volcanics within the leases have been flown with Dighem and it is recommended that the remaining three areas also be covered.

The Lucas Creek Dighem survey defined a large number of very conductive formations within the adjacent sediments but no bedrock conductors were defined in the volcanics. However, one unusual response (attributed to culture, of which there is none in the area), which occurred over two lines (and therefore is more likely to be genuine) is close to a high lead geochem anomaly, recorded by BHP from a stream bank sample (the Double Cove prospect).

In the Cypress Creek area, the Dighem survey recorded a large number of responses due to weakly conductive cover -both within the Mainwaring volcanics and in the adjacent sediments -but again, no good bedrock conductors were defined within the volcanics. The best prospect in this area is the Urquhart (north) anomaly which is a short (two line) low-grade bedrock conductor, within sediments, but close to a high copper stream geochem sample (and on the flank of a magnetic anomaly).



There are several other weaker Dighem responses in both the Lucas Creek and Mainwaring volcanics. These have not been recommended for follow-up this season, since a 'broad brush' approach has been taken: several different areas are being looked at and the potential for several different types of deposits assessed. If this season's work suggests that the volcanics have a high potential for economic mineralisation, then there are several (weak) Dighem responses which could be investigated.

The most attractive type of tin target is a cassiterite-pyrrhotite replacement of carbonates. These should be strongly magnetic (eg, Renison has a response of several hundreds of gammas). Whilst no large responses have been recorded over (known) favourable geology, one anomaly of nearly 100 gammas in an area containing carbonates will be further investigated (Birthday Bay). (It is noted however, that relatively weak magnetic anomalies were recorded over Aberfoyle's possibly economic (about ?7 million tonnes at ?0.7% Sn) Zeehan deposits (Severn, Golfcourse, Montana and Queen Hill: the last being a cassiterite-pyrite deposit and non-magnetic).

Several areas have been recommended for gold exploration; either from strong magnetic anomalies hopefully indicating ironstones, (eg, Anomaly 128); from areas of known gold (by sampling) with anomalous magnetic characterisitcs (eg, Albina) or from structurally interesting areas defined by the magnetics (eg, Thomas Ck (west)).

A list of the prospects interpreted from the aeromagnetic and Dighem surveys is given in Table 1. The list is in a rough order of descending priority. The last four 'prospects' are traverses, recommended to increase our understanding of the geology.

The type of follow-up recommended is also given in the table. The magnetics and geochemical sampling suggested is routine, however the type of EM method best suited for locating Dighem anomalies is a subject of some debate and it is perhaps appropriate to state here the reasons why VLF was chosen for the last field season's follow-up of Dighem anomalies and why it is recommended for some of the future follow-up.

The VLF was used since it will invariably locate a Dighem anomaly. In the traverses undertaken in the 1983/84 season, there was almost a one for one correspondence between the Dighem and VLF (see Appendix 5 in Ferris, 1984). The big advantage of VLF, is its ability to cheaply and rapidly find Dighem anomalies without the need for properly cut lines; if geology and geochemistry are unfavourable, an area can be quickly down graded (eg, the Lucas Creek prospect mentioned earlier in this report). If the results are positive, then more sophisticated techniques can be used if required. VLF's main drawback is its inability to penetrate conductive cover: in such conditions, it should not be used. (Nevertheless most, if not all, of the Dighem responses I have seen over glacials or scree, have also been due to the

overburden. The difference being that Dighem can distinguish between bedrock and surficial conductors, whereas VLF does not.)

Obviously a method which can distinguish between shallow and deep, and good and poor conductors is to be preferred. For this season's work, quantitative data is needed over prospects such as Double Cove and Birthday Bay and the Genie method has been recommended. (This method is nearly as fast as VLF in open ground and is not much more expensive. It also allows a quantitative interpretation of the data.)

The VLF method has again been recommended for reconnaissance traverses where geology and soil geochemistry will largely decide a prospect's status (eg, Urquhart (south)). (But the Genie could of course be used to advantage over these areas as well.) VLF has also been recommended over gold prospects where the expectation is not for massive sulphide conductors, but rather to help define the structure (VLF will usually do this better than conventional EM techniques).

The Sorell aeromagnetic data is a good example of the correlation which can occur between geology and structure and magnetics. The data presentation of 2 gamma contours at 1:20,000 and 4 gammas at 1:50,000 is excellent for mapping the geology. It is not so good for anomaly recognition and is very difficult to use for quantitative interpretations. To obtain the most information from this survey, it is recommended that other presentations be tried. To this end, it is hoped that the data will shortly be processed on a colour image processor. This should allow both better anomaly recognition and geological interpretation.

J.R. Bishop
Dec., 1984.

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APPENDIX

Survey Details

Aeromagnetic Survey of E.L.'s 35/83, 36/83 & 37/83).

This survey was flown by Austirex in March, 1984 using a Nomad (fixed wing) aircraft. A 'Range-Range' electronic navigation system was used for positioning. The nominal line spacing was 200m with a terrain clearance of 80m. Tie lines were spaced at 2000m. The mean interval between samples was 67.7m.

The data was processed by Pitt Research from a located data tape provided by Austirex. "The IGRF '75 component of the magnetic field was removed. Levelling corrections were made by manual adjustment. The use of least-squares adjustment of tie line to traverse intersections was insufficiently precise to achieve the final resolution required."

"Contours were generated from data interpolated to a grid resolution of 50m by 50m and then filtered with a two-dimensional low-pass filter with a cut-off period of 70m per half cycle."

Pitt Research produced a set of five maps, contoured at 2 gamma intervals, at a scale of 1:20,000. And one map, contoured at 4 gammas, at a scale of 1:50,000.

Dighem survey.

A Dighem survey was flown over the Lucas Creek (E.L. 35/83) and Mainwaring volcanics (E.L. 37/83) in March/April, 1984. The survey was flown with a traverse spacing of 150m and a nominal sensor height of 35m (plus a magnetometer at 50m). The flight line positions were recovered photographically and maps have been produced at 1:10,000 scale (Fraser, 1984).



TABLE 1

A List of Prospects arising from the 1984 Aeromagnetic and Dighem Surveys over the Sorell Peninsula (In order of priority*).

PROSPECT	COORDINATES	DESCRIPTION	TARGET	FOLLOW UP PROGRAM
Muddy Cove	5,295,000mN/368,000mE to 5,306,000mN/371,000mE	Unexplored belt of (more acidic) volcanics.	VMS	Dighem
Double Cove	5,310,500mN/361,500mE	Two Dighem anomalies (8G & 9E) (high grade but ?culture) close to BHP Pb anomaly in stream bank.	VMS	Genie, magnetics, soil geochem
Urquhart (north)	5,264,500mN/373,000mE	Bedrock Dighem anomalies (105C & 106C) on adjacent lines (grade 1), with assoc. high stream sed. Cu anomaly (500m to the east).	VMS	Genie, magnetics, soil & stream sed geochem
Thomas Ck	5,285,500mN/369,500mE	High soil Cu/Au in ?volcanics overlying diorite intrusive	gold	soil geochem, magnetics, VLF.
Albina (south)	5,305,000mN/357,500mE	Anomalous magnetic character over limonitic siltsts. Au in rk chip.	gold	soil geochem, magnetics, VLF
Anomaly 128	5,303,500mN/362,000mE	Magnetic anomaly at PreCamb-Camb. contact. Interpreted by BHP as gabbro, but area to be checked for ironstones.	gold	"
Anomaly 129	5,300,000mN/358,500mE	Magnetic anomaly drilled by BHP: ironstones with 0.7m of pyrite/ hematite.	gold	"
Hibbs River	5,280,000mN/368,000mE to 5,295,500mN/366,500mE	Largely unexplored area of intermediate to mafic volcanics.	VMS	Dighem
Karnebunyer Ck	5,287,000mN/374,000mE to 5,298,000mN/370,000mE	"	"	"
Wanderer River	5,263,500mN/378,000mE	Previously reported Pb/Zn min. in veins.	VMS	geol/geochem
Thomas Ck (west)	5,287,500mN/367,000mE	Convergence of trends on magnetic map.	gold	"
Birthday Bay	5,301,000mN/356,500mE	Magnetic anomaly + carbonates.	tin	magnetics, Genie
Timbertops	5,295,500mN/368,000mE	Weak Pb/Ag in soils adjacent to dioritic intrusive.	?	dependant on results of Dighem survey

* Not necessarily on geophysical criteria.



PROSPECT	COORDINATES	DESCRIPTION	TARGET	FOLLOW UP PROGRAM
Butler Ck	5,306,000mN/364,000mE	Possible ironstone formations similar to Anomalies 128 & 129.	gold	magnetics, VLF
Urquhart (south)	5,361,000mN/375,000mE	Dighem anomalies (125D to 129F & 125E to 128XC)in Mainwaring volcs (source likely to be formational).	VMS	magnetics, VLF or Genie
Urquhart (east)	5,263,500mN/375,500mE	Isolated Dighem anomaly (112E) (possibly bedrock) in Mainwaring volcanics.	VMS	"
Commandant Ck	5,295,500mN/372,000mE	Deep-seated magnetic anomaly beneath seds. (Diorite intrusive likely source).	tin	magnetics
Gaps (south)	5,291,000mN/368,000mE	magnetic high over diorite	?	magnetics, soil geochem
Dunes Ck	5,311,500mN/355,000mE & 5,313,000mN/357,000mE	Magnetic anomalies within Pre-Cambrian sediments.	?tin	magnetics, soil geochem
Albina (north)	5,306,500mN/357,500mE	Possible southern extension of Lucas Ck volcanics.	VMS	"
Hibbs Lagoon	5,284,500mN/362,000mE	Area mapped as seds with similar magnetic character to volcanics.	VMS	"
Lowren Hill	5,278,000mN/364,000mE	A thick plug of serpentinite	nickel & platinoids	"
McCarthy Ck	5,280,000mN/369,000mE	A series of offset magnetic highs within Cambrian seds.	geol.	magnetics, VLF
Gaps (west)	5,292,000mN/365,500mE	Linear magnetic highs within Camb. seds.	geol.	magnetics, VLF, (?scintillometer)
Mainwaring (south)	5,251,000mN/374,000mE	Weak, ?formational Dighem and magnetic highs in Camb. seds	geol.	magnetics, Genie or VLF
Waroumrim	5,274,000mN/367,000mE	Complex magnetic anomalies suggesting a fold structure.	geol.	magnetics, VLF

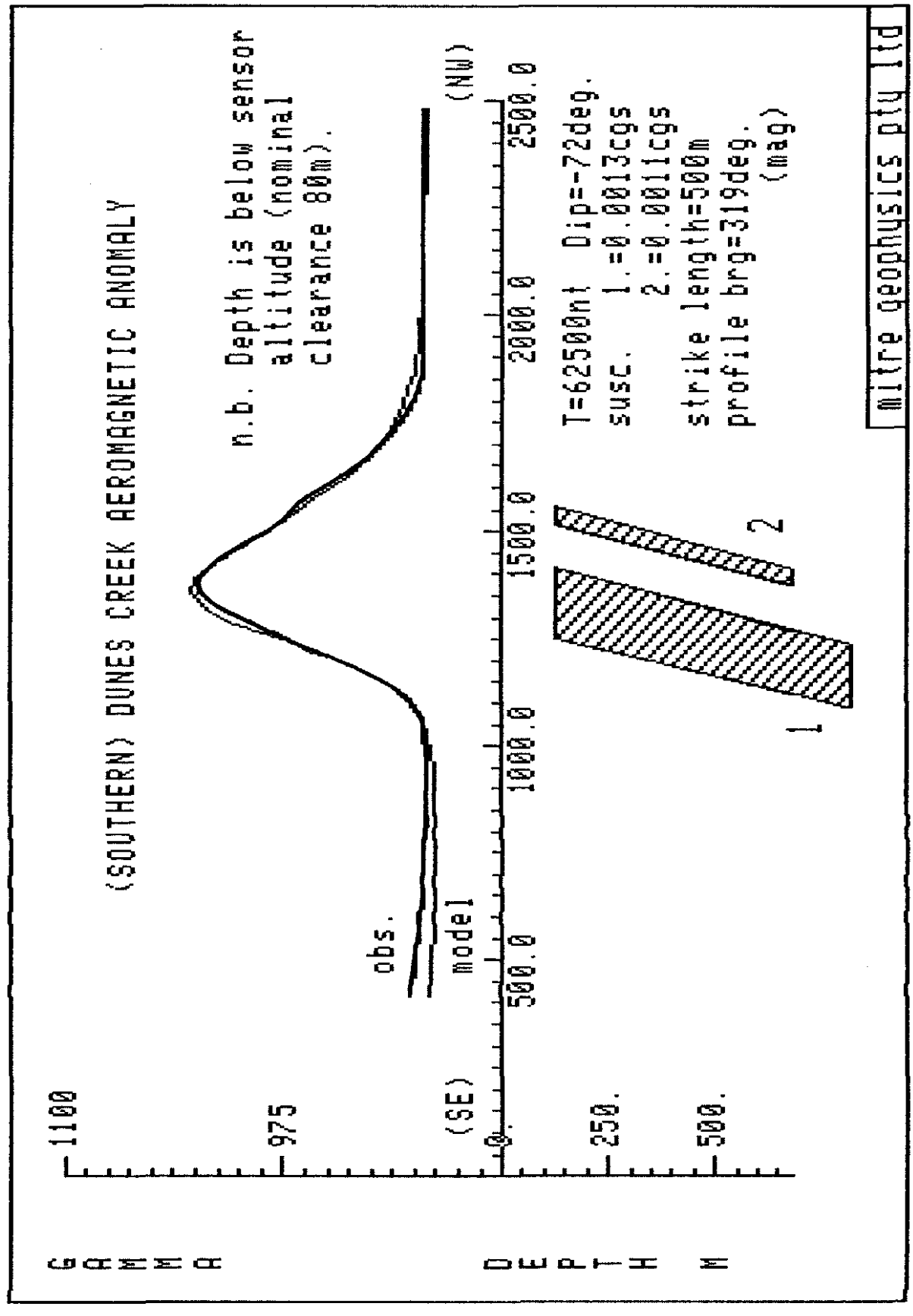
(SOUTHERN) DUNES CREEK AEROMAGNETIC ANOMALY
n.b. Depth is below sensor altitude (nominal clearance 80m).
(NW)
(SE)
obs.
model
T=62500nt Dip=-72deg.
susc. 1.=0.0013cgs
2.=0.0011cgs
strike length=500m
profile brg=319deg.
(mag)
1
2
mitre geophysics pty ltd
GAMMA
1100
975
DEPTH M
0.
500.0
1000.0
1500.0
2000.0
2500.0
250.
500.

Fig. 3



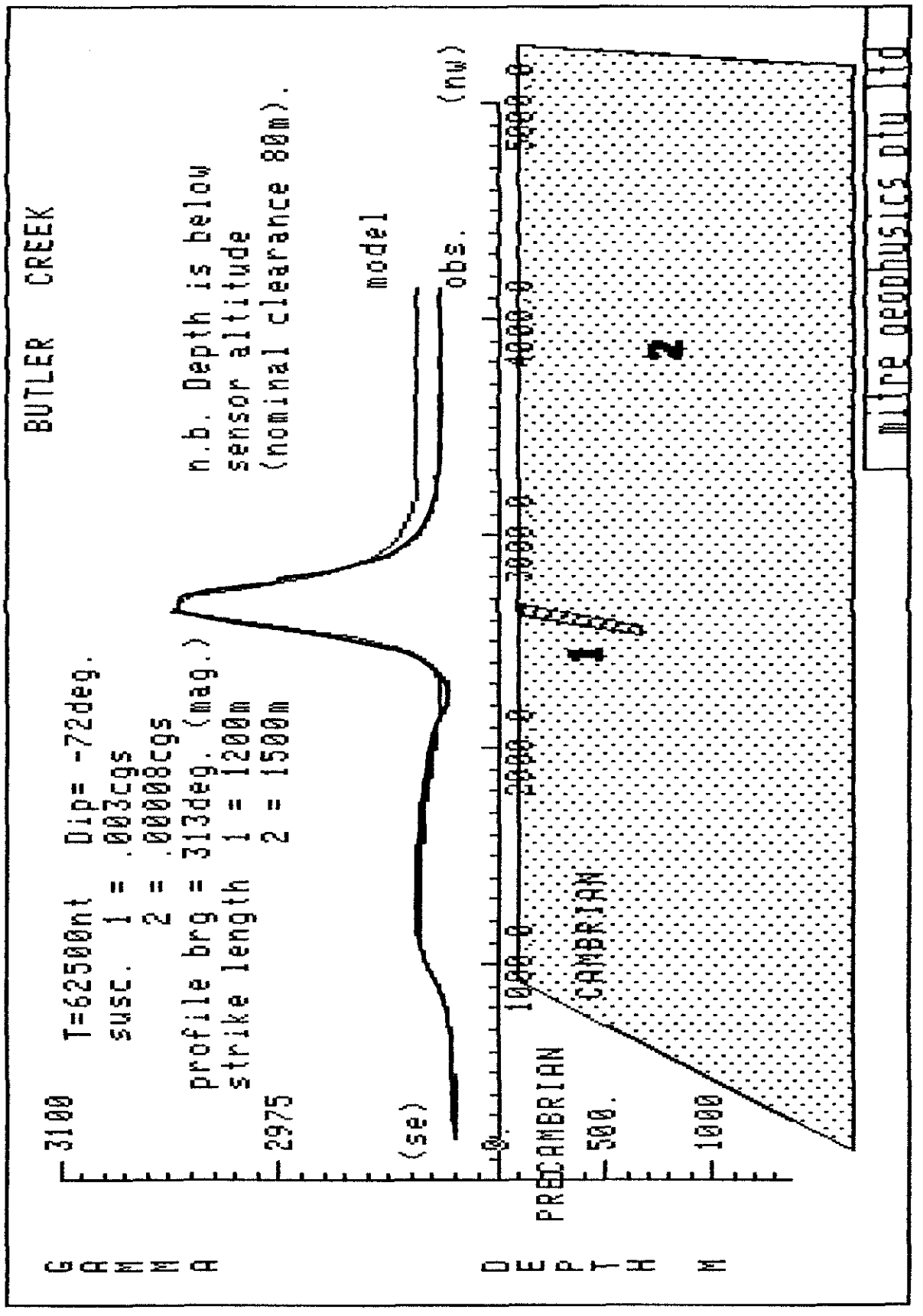
BUTLER CREEK
T=62500nt Dip= -72deg.
susc. 1 = .003cgs
2 = .00008cgs
profile brg = 313deg. (mag.)
strike length 1 = 1200m
2 = 1500m
n.b. Depth is below
sensor altitude
(nominal clearance 80m).
model
obs.
(se)
(nw)
3100
2975
0.
1000.0
2000.0
3000.0
4000.0
5000.0
500.
1000
1
2
PRECAMBRIAN
CAMBRIAN
mire geophysics pty ltd
GAMMA
DEPTH M

Fig. 4

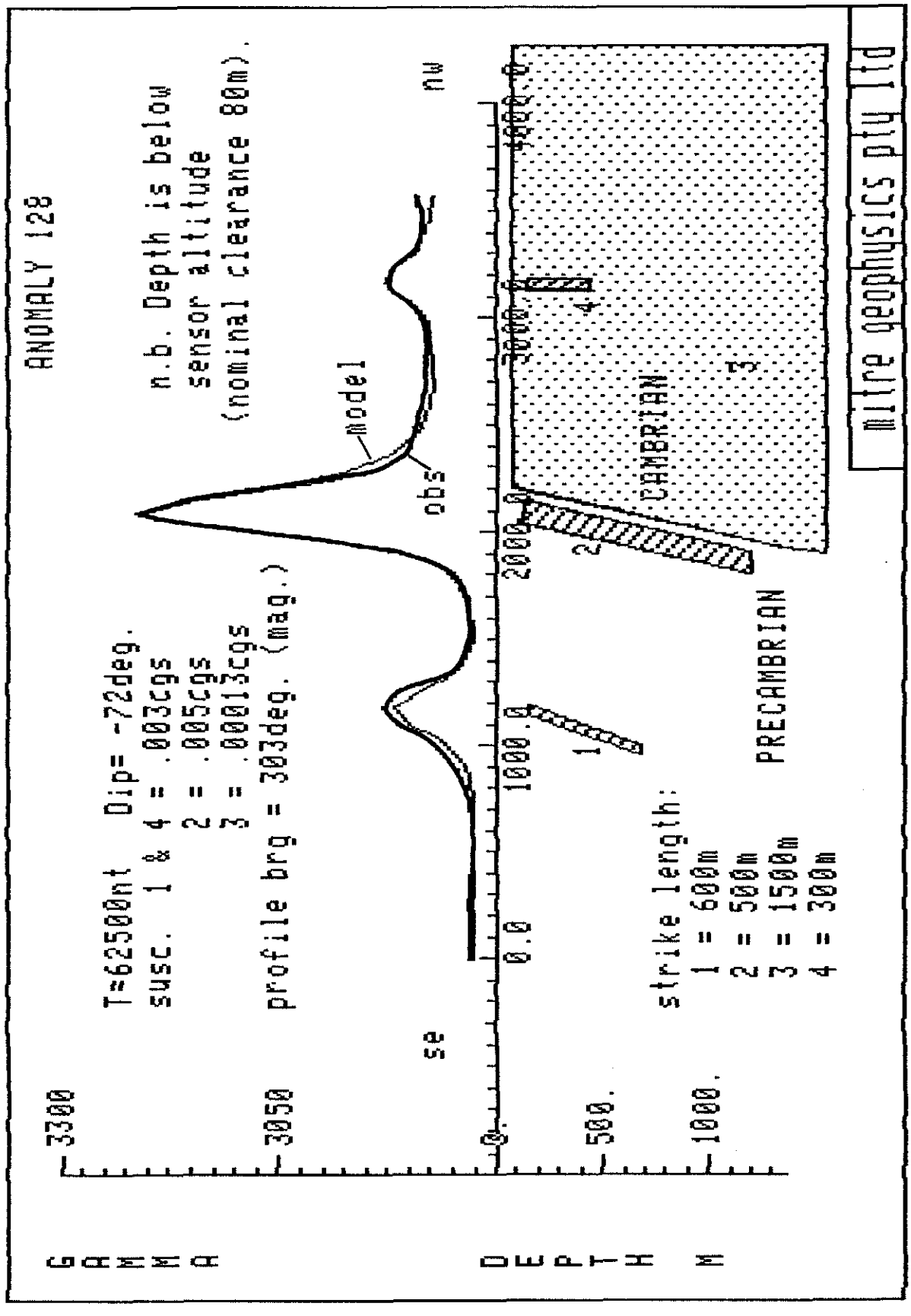
ANOMALY 128
n.b. Depth is below
sensor altitude
(nominal clearance 80m).
T=62500nt Dip= -72deg.
susc. 1 & 4 = .003cgs
2 = .005cgs
3 = .00013cgs
profile brg = 303deg. (mag.)
model
obs
se
nw
3300
3050
GAMMA
0.
500.
1000.
DEPTH M
0.0
1000.0
2000.0
3000.0
4000.0
CAMBRIAN
PRECAMBRIAN
strike length:
1 = 600m
2 = 500m
3 = 1500m
4 = 300m
mitre geophysics pty ltd

Fig. 5



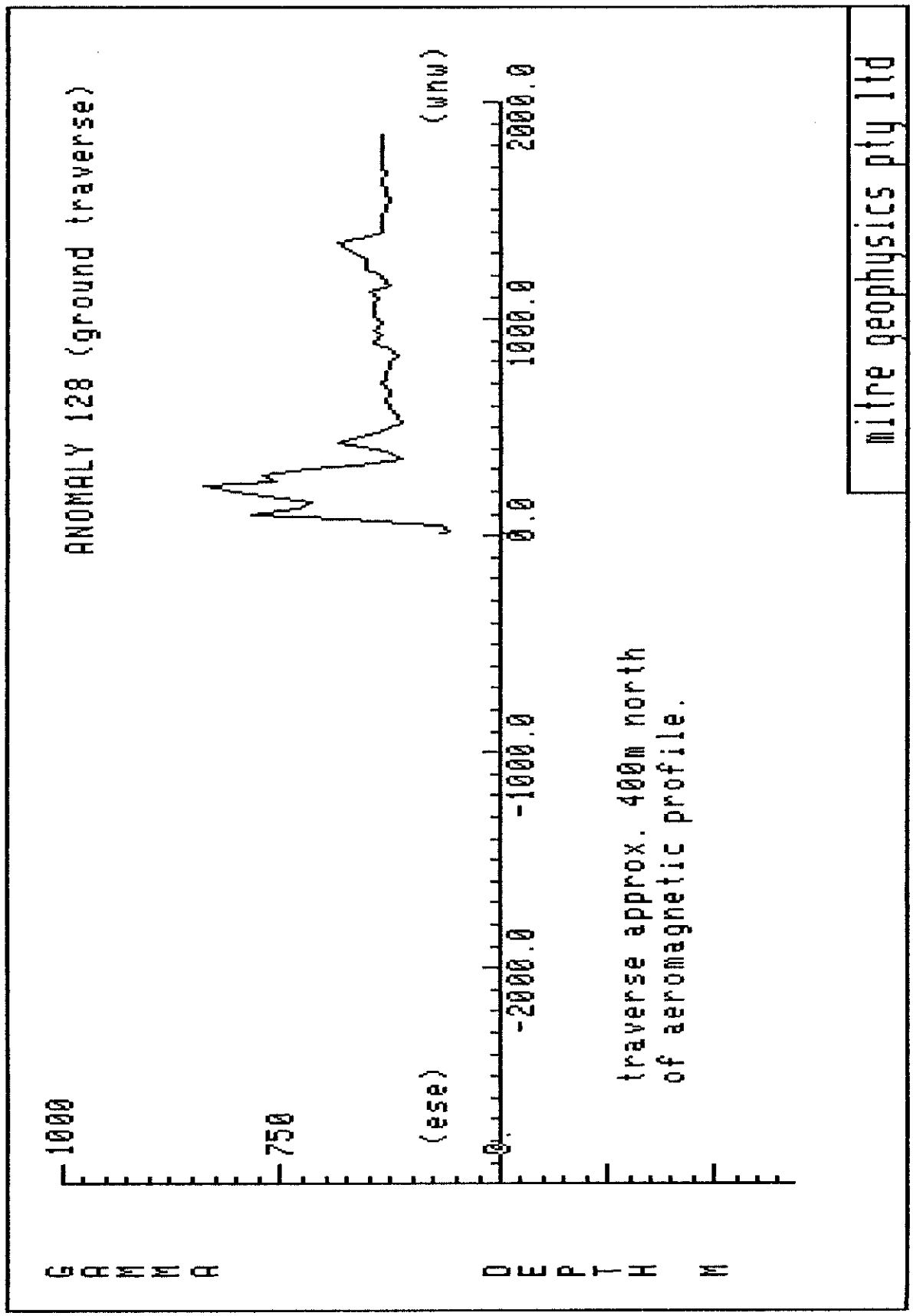
ANOMALY 128 (ground traverse)
(wnw)
(ese)
1000
750
0.
-2000.0
-1000.0
0.0
1000.0
2000.0
GAMMA
DEPTH M
traverse approx. 400m north
of aeromagnetic profile.
mitre geophysics pty ltd

Fig. 6

BIRTHDAY BAY AEROMAGNETIC ANOMALY
model 'A'
n.b. Depth is below sensor height (nominal altitude 80m).
GAMMA
1100
975
model
obs.
(SE)
(NW)
0.
500.0
1000.0
1500.0
2000.0
2500.0
DEPTH M
250.
500.
T=62500nt Dip=-72deg.
susc.=.0028cgs
strike length= 1000m
profile brg= 316deg.
(mag)
mitre geophysics pty ltd

Fig. 7

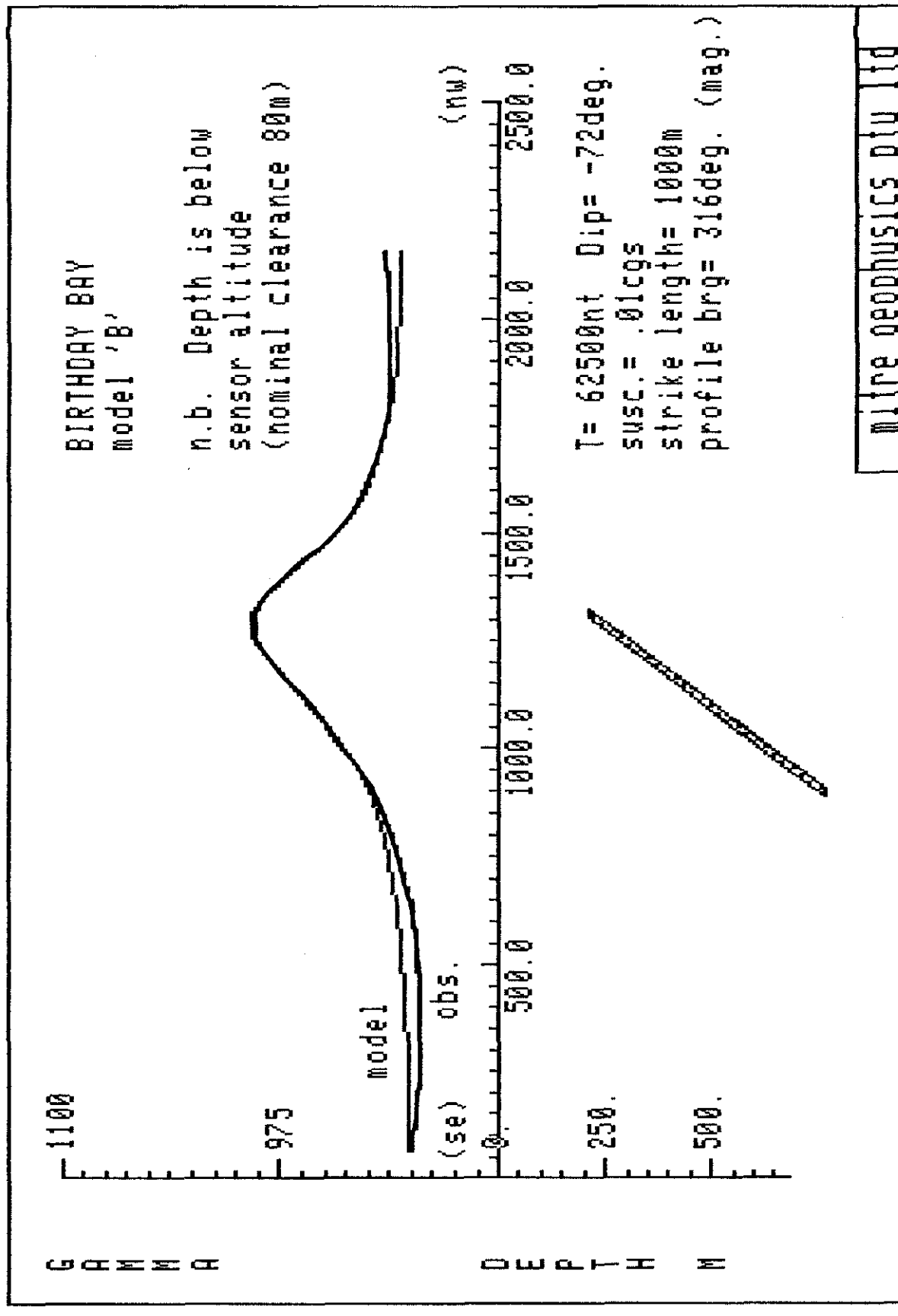
BIRTHDAY BAY
model 'B'
n.b. Depth is below
sensor altitude
(nominal clearance 80m)
T= 62500nt Dip= -72deg.
susc.= .01cgs
strike length= 1000m
profile brg= 316deg. (mag.)
mitre geophysics pty ltd
(se)
(nw)
model
obs.
1100
975
0.
500.0
1000.0
1500.0
2000.0
2500.0
250.
500.
GAMMA
DEPTH M

Fig. 8

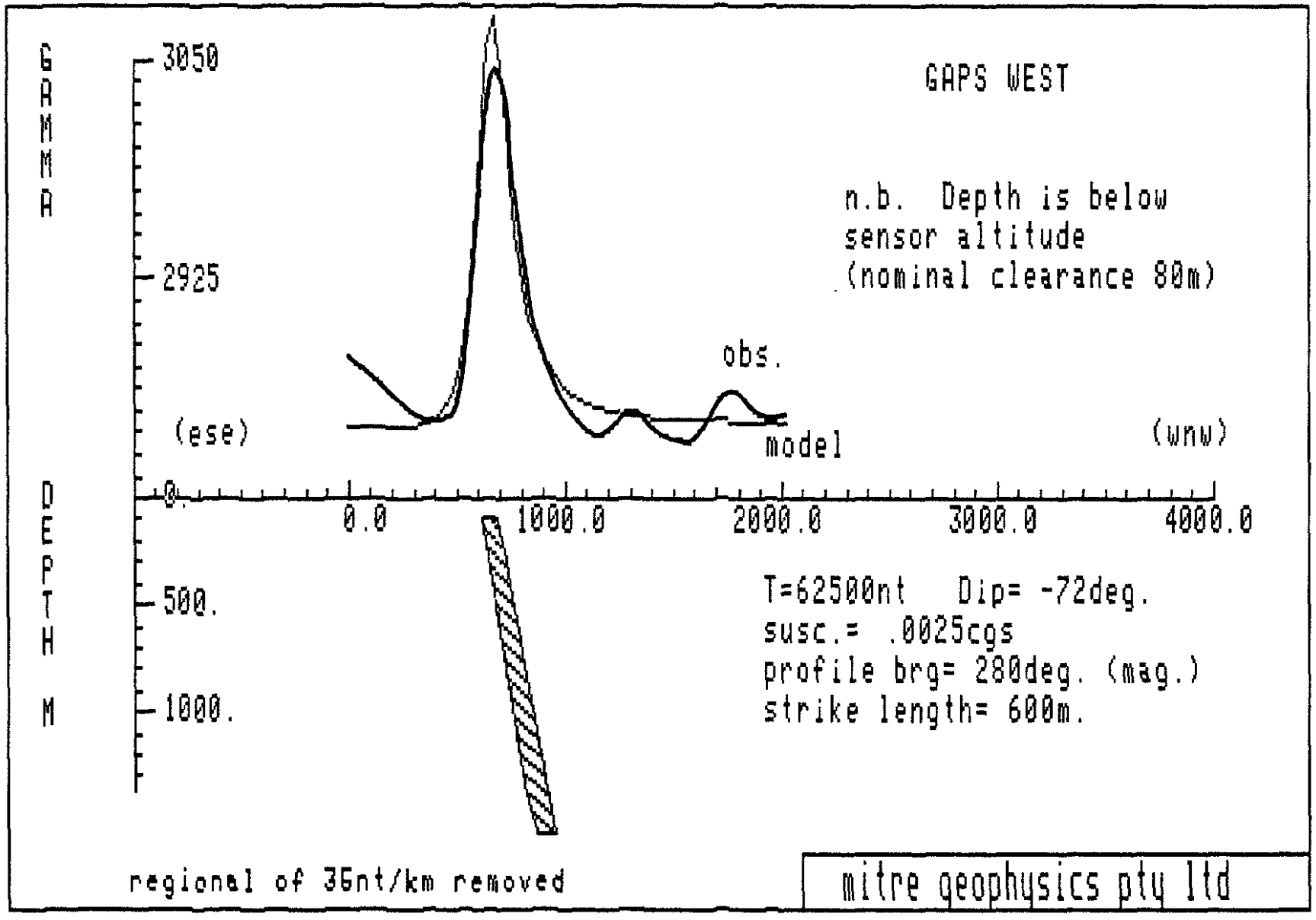
GAMMA
DEPTH M
3050
2925
0.
500.
1000.
(ese)
(wnw)
0.0
1000.0
2000.0
3000.0
4000.0
GAPS WEST
n.b. Depth is below
sensor altitude
(nominal clearance 80m)
obs.
model
T=62500nt Dip= -72deg.
susc.= .0025cgs
profile brg= 280deg. (mag.)
strike length= 600m.
regional of 36nt/km removed
mitre geophysics pty ltd

Fig. 9

GAMMA
3200
2950
DEPTH
M
500.
1000.
McCARTHY CREEK
n.b. Depth is below
sensor altitude
(nominal clearance 80m)
west
obs.
model
east
0.
1000.0
2000.0
3000.0
4000.0
5000.0
1
2
T= 62500nt Dip= -72deg.
susc: body 1= .004cgs
body 2= .001cgs
strike length:
body 1= 2000m
body 2= 400m
profile brg= 88deg. (mag.)
regional of 10nt/km removed
mitre geophysics pty ltd

Fig. 10

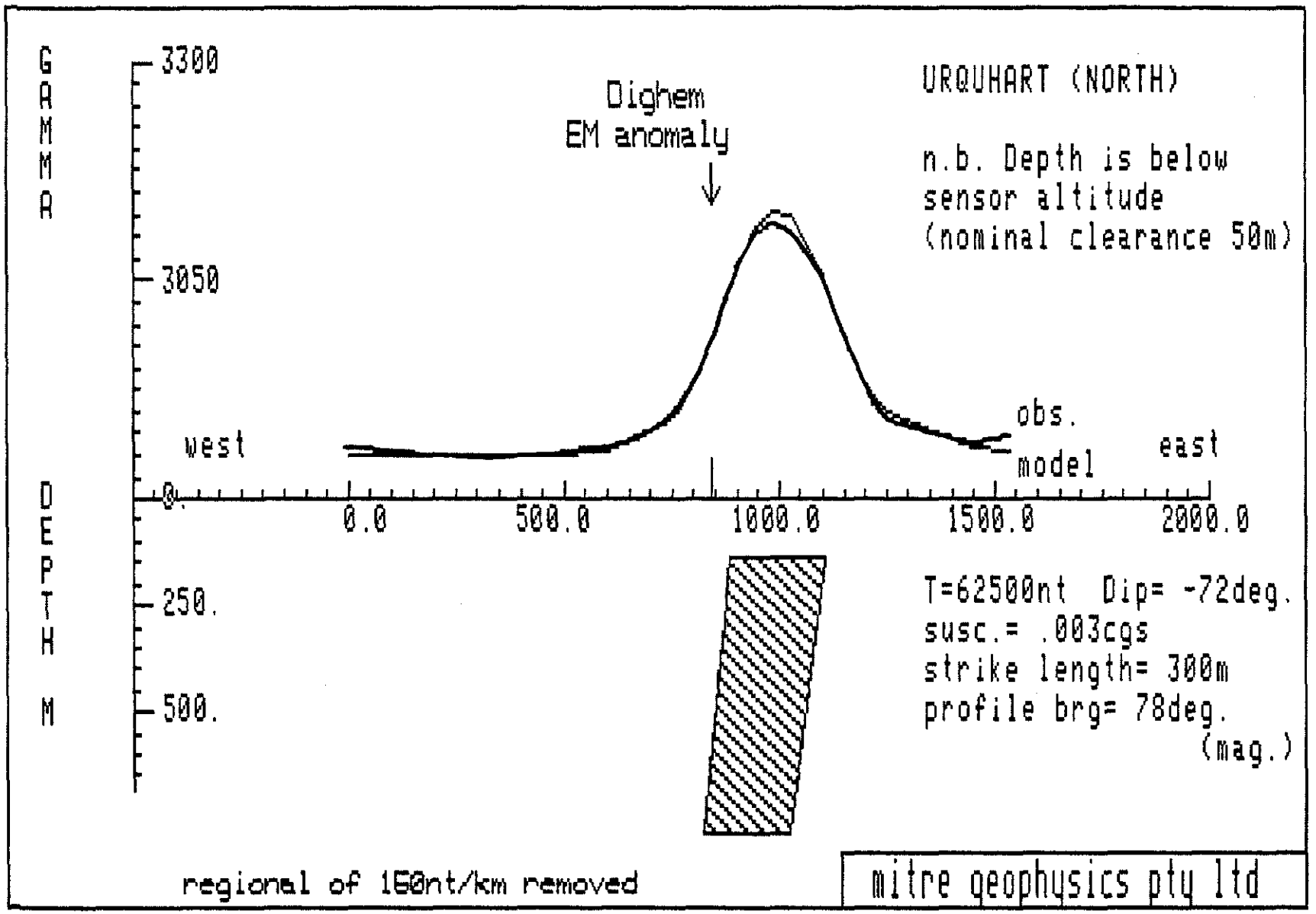
GAMMA
DEPTH M
3300
3050
0.
250.
500.
Dighem
EM anomaly
URQUHART (NORTH)
n.b. Depth is below
sensor altitude
(nominal clearance 50m)
west
east
obs.
model
0.0
500.0
1000.0
1500.0
2000.0
T=62500nt Dip= -72deg.
susc.= .003cgs
strike length= 300m
profile brg= 78deg.
(mag.)
regional of 150nt/km removed
mitre geophysics pty ltd

Fig. 11

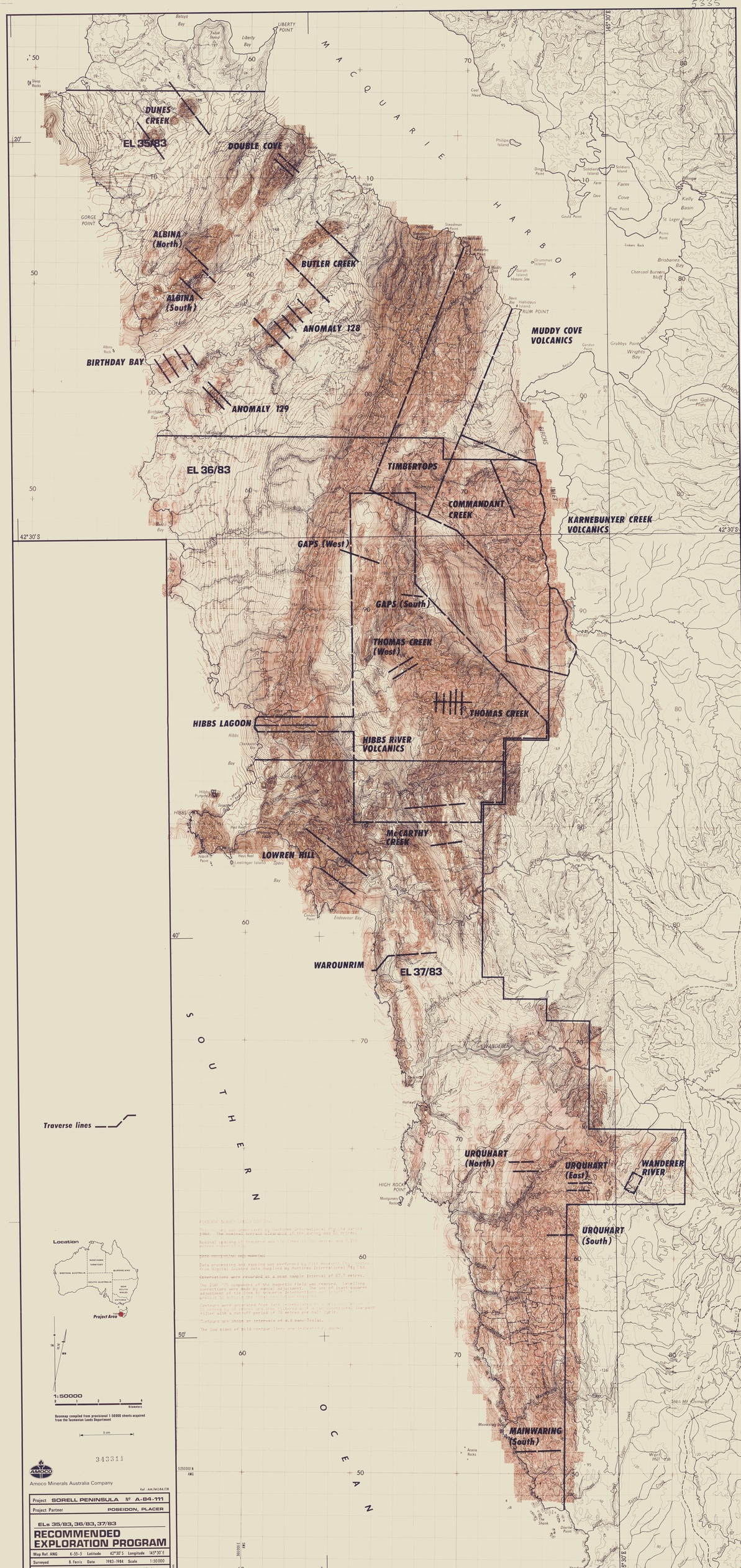
DUNES CREEK
EL 35/83
DOUBLE COVE
ALBINA (North)
BUTLER CREEK
ALBINA (South)
ANOMALY 128
BIRTHDAY BAY
MUDDY COVE VOLCANICS
ANOMALY 129
EL 36/83
TIMBERTOPS
COMMANDANT CREEK
KARNEBUNYER CREEK VOLCANICS
GAPS (West)
GAPS (South)
THOMAS CREEK (West)
THOMAS CREEK
HIBBS LAGOON
HIBBS RIVER VOLCANICS
McCARTHY CREEK
LOWREN HILL
WAROUNRIM
EL 37/83
URQUHART (North)
URQUHART (East)
WANDERER RIVER
URQUHART (South)
MAINWARING (South)
MACQUARIE HARBOUR
SOUTHERN OCEAN
42°30'S
145°30'E
Traverse lines
Location
Project Area
1:50000
Basemap compiled from provisional 1:50000 sheets acquired from the Tasmanian Lands Department
343311
Amoco Minerals Australia Company
Ref. AM/MG84/08
Project SORELL PENINSULA Nº A-84-111
Project Partner POSEIDON, PLACER
ELs 35/83, 36/83, 37/83
RECOMMENDED EXPLORATION PROGRAM
Map Ref. ANG K-55-5 Latitude 42°30' S Longitude 145°30' E
Surveyed B. Ferris Date 1983-1984 Scale 1:50000
Drawn S. Fowler Date 1984 Drawing Nº M84-
Report 401, APPENDIX 3

Figure 1

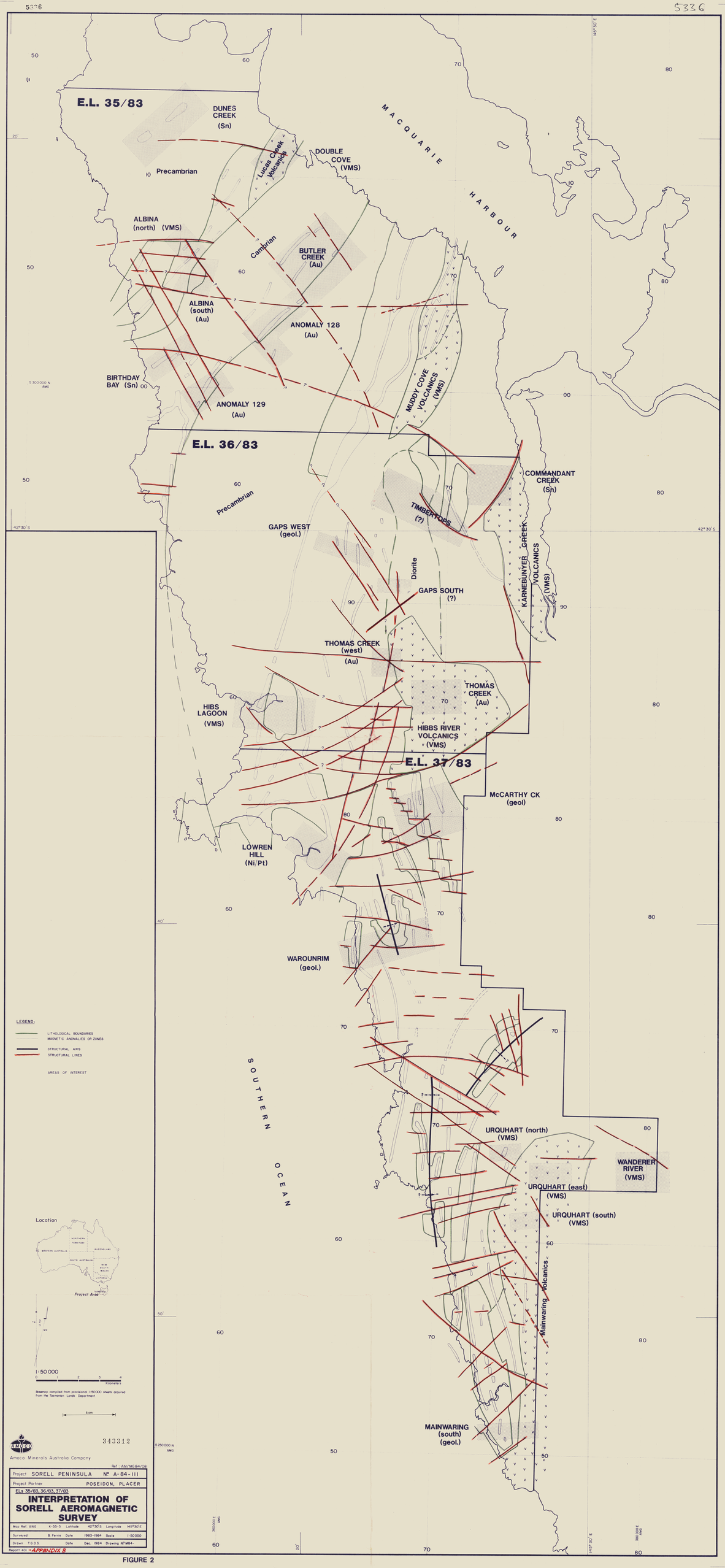
E.L. 35/83
DUNES CREEK (Sn)
Precambrian
Lucas Creek Volcanics
DOUBLE COVE (VMS)
MACQUARIE HARBOUR
ALBINA (north) (VMS)
Cambrian
BUTLER CREEK (Au)
ALBINA (south) (Au)
ANOMALY 128 (Au)
BIRTHDAY BAY (Sn)
ANOMALY 129 (Au)
MUDDY COVE VOLCANICS (VMS)
E.L. 36/83
COMMANDANT CREEK (Sn)
Precambrian
TIMBERTOPS (?)
GAPS WEST (geol.)
Diorite
GAPS SOUTH (?)
KARNEBUNYER CREEK VOLCANICS (VMS)
THOMAS CREEK (west) (Au)
THOMAS CREEK (Au)
HIBS LAGOON (VMS)
HIBBS RIVER VOLCANICS (VMS)
E.L. 37/83
McCARTHY CK (geol)
LOWREN HILL (Ni/Pt)
WAROUNRIM (geol.)
SOUTHERN OCEAN
URQUHART (north) (VMS)
WANDERER RIVER (VMS)
URQUHART (east) (VMS)
URQUHART (south) (VMS)
Mainwaring Volcanics
MAINWARING (south) (geol.)
LEGEND
LITHOLOGICAL BOUNDARIES
MAGNETIC ANOMALIES OR ZONES
STRUCTURAL AXIS
STRUCTURAL LINES
AREAS OF INTEREST
Location
Project Area
1:50 000
Kilometers
Basemap compiled from provisional 1:50000 sheets acquired from the Tasmanian Lands Department
343312
Amoco Minerals Australia Company
Ref: AM/MG/84/08
Project SORELL PENINSULA Nº A-84-III
Project Partner POSEIDON, PLACER
ELs 35/83, 36/83, 37/83
INTERPRETATION OF SORELL AEROMAGNETIC SURVEY
Map Ref. ANG K-55-5 Latitude 42°30'S Longitude 145°30'E
Surveyed R. Ferris Date 1983-1984 Scale 1:50000
Drawn T.G.S. Date Dec. 1984 Drawing Nº M84-
Report Nº →APPENDIX 8

FIGURE 2

APPENDIX 4

ANALYTICAL RESULT SHEETS

DN.4907

343174

173

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COMPUTERISED ANALYTICAL LABORATORIES

Head Office and Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: AA89323

NATA REGISTERED No. 1526

OUR REF.: COM 840947

YOUR REF.: Des. 4907 O/N E 12063

Mr. J. Suppree,
Amoco Minerals Aust. Co.,
61 Counsel Street,
ZEEHAN TAS 7469,

31.5.84

Dear Jonathon,

RE: JOB COM 840947

Enclosed are the assays for the samples delivered to our laboratory on the 15th May 1984.

Many of the Cr values were rechecked, and it appears that a fusion attack would be required to totally dissolve the chromite which is present.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: Mr. B. Roxburgh

343175

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr	
112002	110	10	46	36	10	85	
112004	22	6	32	26	8	130	
112006	20	8	36	28	8	330	
112007	28	14	26	24	8	130	
112017	20	46	100	90	28	380	
112021	8	12	32	38	14	85	
112024	14	6	38	125	44	570	
112025	18	6	38	200	65	940	
112027	6	6	14	6	<4	20	SS
112030	8	6	8	4	<4	14	
112036	10	6	18	8	6	16	
112044	6	10	34	10	10	18	
112046	6	12	14	6	<4	14	
112055	14	8	65	150	55	520	* SS
112075	20	6	55	170	38	1150	
112077	18	8	38	140	38	820	
112078	8	4	16	38	12	400	
112081	8	6	24	60	16	400	
112088	16	30	24	12	<4	40	- SS
112090	10	16	10	10	<4	28	SS
112091	10	10	38	150	30	530	SS
112093	26	18	110	340	140	870	SS
112094	14	12	24	100	14	430	SS
112095	16	16	48	95	28	340	SS
112096	6	8	36	95	36	400	SS

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
112099	6	4	8	4	<4	12
112109	80	8	50	38	24	100
112115	50	6	60	34	22	75
112120	32	<4	26	24	16	75
112122	44	<4	55	34	16	75
112124	18	<4	20	20	6	100
112128	10	<4	6	6	<4	16
112131	8	<4	4	6	<4	18
112136	8	<4	4	6	<4	8
112140	200	<4	22	55	32	14
112142	18	<4	6	8	<4	26
112148	80	<4	24	30	20	30
112207	8	<4	14	55	6	32
112212	8	<4	32	24	6	80
112215	6	6	10	10	<4	12
112226	<2	<4	10	18	<4	200
112228	6	6	36	65	24	800
112231	8	<4	12	16	<4	65
112238	2	<4	6	6	<4	32
112247	12	6	55	65	20	180
112254	16	<4	26	18	10	30
112268	34	80	150	55	22	65
112275	6	14	38	36	20	90
112278	6	<4	20	32	16	640
112283	10	14	65	6	8	16

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr	
112296	2	<4	8	8	<4	60	
112302	6	<4	34	75	28	510	
112309	8	8	36	16	14	28	
112312	40	20	100	12	14	30	
112338	26	<4	44	210	50	1000	
112346	6	<4	12	6	<4	22	
112383	40	<4	22	32	26	44	
112386	60	<4	40	55	24	80	
112389	34	6	36	40	28	46	
112391	30	<4	14	22	10	36	
112399	38	<4	10	12	4	24	SS
112402	26	<4	12	10	4	20	
112404	20	<4	8	10	4	22	
112407	18	<4	22	12	8	20	
112411	10	<4	50	20	12	20	
112415	12	6	100	34	24	44	SS
112416	22	20	34	20	16	100	SS
112456	55	<4	6	10	<4	10	
112469	18	<4	140	46	48	36	
112471	12	<4	110	48	22	34	
112474	26	<4	48	28	22	24	
112479	4	<4	4	6	<4	10	
112501	10	<4	40	38	8	95	
112505	20	<4	50	48	28	110	
112508	16	<4	22	36	10	46	

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
112509	8	<4	8	12	<4	6
112514	18	18	14	30	<4	46
112515	14	<4	10	22	4	55
112517	20	<4	10	18	6	42
112521	24	<4	18	26	22	80
112523	10	<4	16	18	8	36
112526	20	<4	22	22	16	40
112527	46	<4	48	38	18	75
112528	28	6	28	30	44	390
112530	18	<4	8	12	<4	40
112531	16	<4	55	44	28	85
112533	22	<4	20	24	16	55
112534	22	<4	38	34	18	65
112542	4	<4	4	8	<4	12
112552	4	<4	14	6	<4	630
112555	8	<4	4	10	<4	24
112558	6	<4	6	6	<4	110
112560	20	<4	4	6	<4	46
112564	16	<4	50	50	8	70
112567	50	10	75	65	20	220
112595	8	<4	12	12	6	22
112599	10	<4	10	8	<4	34
112613	46	<4	38	38	10	26
112618	8	<4	18	6	<4	8
112621	26	<4	24	100	30	140

178

343179

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ANALYTICAL REPORT

55

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
112623	46	<4	65	220	44	350
112624	24	<4	26	100	16	140
112626	16	<4	18	75	12	140
112630	20	<4	24	95	14	150
112632	40	<4	44	130	28	230
112634	26	<4	30	100	20	140
112635	36	<4	40	100	22	160
112637	75	<4	110	200	65	380
112638	36	<4	48	80	22	95
112639	30	<4	34	90	26	180
112642	80	<4	85	140	55	170
112643	38	<4	40	95	24	160
112645	36	<4	40	90	24	160
112646	36	<4	48	100	30	170
112647	32	<4	40	80	26	160
112648	36	<4	55	100	28	160
112663	50	<4	60	200	32	760
112665	50	<4	75	400	46	960
112668	48	<4	95	290	32	1050
112672	55	<4	46	330	34	900
112674	44	8	85	230	46	580
112678	110	8	95	46	32	46
112683	55	4	110	130	32	410
112685	50	<4	95	320	65	620
112686	40	<4	100	170	38	350

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
112689	115	<4	60	110	46	190
112691	42	<4	44	70	24	130
112694	40	<4	42	70	26	120
112697	140	<4	95	100	40	150
112699	75	6	75	90	36	155
112701	120	6	100	110	44	180
112703	80	<4	110	80	38	150
112705	50	<4	80	110	32	140
112706	95	<4	90	140	42	190
112707	110	<4	110	150	50	180
112708	60	<4	80	180	42	220
112710	60	<4	75	180	38	240
112712	70	12	85	170	42	280
112753	34	<4	28	24	6	55
112757	8	<4	8	8	<4	14
112761	10	<4	10	10	<4	30
112767	18	<4	22	16	<4	38
112772	20	<4	14	12	<4	70
112774	8	<4	10	12	<4	70
112776	110	<4	130	75	28	100
112779	34	<4	90	60	30	95
112780	24	<4	44	34	8	70
112783	16	<4	12	14	<4	32
112786	4	<4	8	6	<4	6
112788	10	<4	22	8	<4	10

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Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
112789	16	<4	16	12	6	18
112791	16	<4	18	10	6	18
112793	10	<4	24	16	12	24
112806	8	<4	18	50	14	1250
112827	6	<4	28	65	26	4000
112840	8	<4	22	85	16	470
112844	6	<4	8	10	<4	26
112854	14	<4	16	16	6	60
112855	440	<4	14	14	4	60
112859	4	<4	16	12	4	32
112865	18	<4	26	20	14	60
112888	2	<4	8	8	<4	22
112896	6	<4	36	14	12	32
113006	30	20	38	30	10	85
113011	16	<4	42	26	18	24
113019	16	<4	16	60	12	90
113022	20	<4	22	75	12	130
113024	530	<4	10	12	4	75
113026	55	<4	75	320	55	520
113027	34	<4	46	200	36	360
113028	34	<4	40	95	24	120
113030	16	<4	18	55	10	110
113032	18	<4	26	70	18	120
113033	32	<4	36	130	28	280
113035	32	<4	34	80	26	130

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cr
113036	30	<4	40	85	30	140
113051	20	<4	48	26	20	36

Method of Analysis : Cu Pb Zn Ni Co : AAS1
Cr : AAS2

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112002	<1	<1	<4	<0.01
112004	<1	<1	<4	<0.01
112006	<1	<1	<4	<0.01
112007	<1	<1	<4	<0.01
112017	<1	<1	<4	<0.01
112021	<1	<1	<4	<0.01
112024	<1	<1	<4	<0.01
112025	<1	<1	<4	<0.01
112027	<1	<1	<4	<0.01
112030	<1	<1	<4	<0.01
112036	<1	<1	<4	<0.01
112044	<1	<1	<4	<0.01
112046	<1	<1	<4	<0.01
112055	<1	<1	<4	<0.01
112075	<1	<1	<4	<0.01
112077	<1	<1	<4	<0.01
112078	<1	<1	<4	<0.01
112081	<1	<1	<4	<0.01
112088	<1	<1	<4	<0.01
112090	<1	<1	<4	<0.01
112091	<1	<1	<4	<0.01
112093	<1	<1	<4	<0.01
112094	<1	<1	<4	<0.01
112095	<1	<1	<4	<0.01
112096	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112099	<1	<1	<4	<0.01
112109	<1	<1	<4	<0.01
112115	<1	<1	<4	<0.01
112120	<1	<1	<4	<0.01
112122	<1	<1	<4	<0.01
112124	<1	<1	<4	<0.01
112128	<1	<1	<4	<0.01
112131	<1	<1	<4	<0.01
112136	<1	<1	<4	<0.01
112140	<1	<1	<4	<0.01 SS
112142	<1	<1	<4	<0.01 SS
112148	<1	<1	<4	<0.01 SS
112207	<1	<1	<4	<0.01
112212	<1	<1	<4	<0.01
112215	<1	<1	<4	<0.01
112226	<1	<1	<4	<0.01
112228	<1	<1	<4	<0.01
112231	<1	<1	<4	<0.01
112238	<1	<1	<4	<0.01
112247	<1	<1	<4	<0.01
112254	<1	<1	<4	<0.01
112268	<1	<1	<4	<0.01
112275	<1	<1	<4	<0.01
112278	<1	<1	<4	<0.01
112283	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112296	<1	<1	<4	<0.01
112302	<1	<1	<4	<0.01
112309	<1	<1	<4	<0.01
112312	<1	<1	<4	<0.01
112338	<1	<1	<4	<0.01
112346	<1	<1	<4	<0.01
112383	<1	<1	<4	<0.01
112386	<1	<1	<4	<0.01
112389	<1	<1	<4	<0.01
112391	<1	<1	<4	<0.01
112399	<1	<1	<4	<0.01
112402	<1	<1	<4	<0.01
112404	<1	<1	<4	<0.01
112407	<1	<1	<4	<0.01
112411	<1	<1	<4	<0.01
112415	<1	<1	<4	<0.01
112416	<1	<1	<4	<0.01
112456	<1	<1	<4	<0.01
112469	<1	<1	<4	<0.01
112471	<1	<1	<4	<0.01
112474	<1	<1	<4	<0.01
112479	<1	<1	<4	<0.01
112501	<1	<1	<4	<0.01
112505	<1	<1	<4	<0.01
112508	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112509	<1	<1	<4	<0.01
112514	<1	<1	<4	<0.01
112515	<1	<1	<4	<0.01
112517	<1	<1	<4	<0.01
112521	<1	<1	<4	<0.01
112523	<1	<1	<4	<0.01
112526	<1	<1	<4	<0.01
112527	<1	<1	<4	<0.01
112528	<1	<1	<4	<0.01
112530	<1	<1	<4	<0.01
112531	<1	<1	<4	<0.01
112533	<1	<1	<4	<0.01
112534	<1	<1	<4	<0.01
112542	<1	<1	<4	<0.01
112552	<1	<1	<4	<0.01
112555	<1	<1	<4	<0.01
112558	<1	<1	<4	<0.01
112560	<1	<1	<4	<0.01
112564	<1	<1	<4	0.25
112567	<1	<1	<4	<0.01
112595	<1	<1	<4	<0.01
112599	<1	<1	<4	<0.01
112613	<1	<1	<4	<0.01
112618	<1	<1	<4	<0.01
112621	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112623	<1	<1	<4	<0.01
112624	<1	<1	<4	<0.01
112626	<1	<1	<4	<0.01
112630	<1	<1	<4	<0.01
112632	<1	<1	<4	<0.01
112634	<1	<1	<4	<0.01
112635	<1	<1	<4	<0.01
112637	<1	<1	<4	<0.01
112638	<1	<1	<4	<0.01
112639	<1	<1	<4	<0.01
112642	<1	<1	<4	<0.01
112643	<1	<1	<4	<0.01
112645	<1	<1	<4	<0.01
112646	<1	<1	<4	<0.01
112647	<1	<1	<4	<0.01
112648	<1	<1	<4	<0.01
112663	<1	<1	<4	<0.01
112665	<1	<1	<4	<0.01
112668	<1	<1	<4	<0.01
112672	<1	<1	<4	<0.01
112674	<1	<1	<4	<0.01
112678	<1	<1	<4	<0.01
112683	<1	<1	<4	<0.01
112685	<1	<1	<4	<0.01
112686	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112689	<1	<1	<4	<0.01
112691	<1	<1	<4	<0.01
112694	<1	<1	<4	<0.01
112697	<1	<1	<4	<0.01
112699	<1	<1	<4	<0.01
112701	<1	<1	<4	<0.01
112703	<1	<1	<4	<0.01
112705	<1	<1	<4	<0.01
112706	<1	<1	<4	<0.01
112707	<1	<1	<4	<0.01
112708	<1	<1	<4	<0.01
112710	<1	<1	<4	<0.01
112712	<1	<1	<4	<0.01
112753	<1	<1	<4	<0.01
112757	<1	<1	<4	<0.01
112761	<1	<1	<4	<0.01
112767	<1	<1	<4	<0.01
112772	<1	<1	<4	<0.01
112774	<1	<1	<4	<0.01
112776	<1	<1	<4	<0.01
112779	<1	<1	<4	<0.01
112780	<1	<1	<4	<0.01
112783	<1	<1	<4	<0.01
112786	<1	<1	<4	<0.01
112788	<1	<1	<4	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
112789	<1	<1	<4	<0.01
112791	<1	<1	<4	<0.01
112793	<1	<1	<4	<0.01
112806	<1	<1	<4	<0.01
112827	<1	<1	<4	<0.01
112840	<1	<1	<4	<0.01
112844	<1	<1	<4	<0.01
112854	<1	<1	<4	<0.01
112855	<1	<1	<4	<0.01
112859	<1	<1	<4	<0.01
112865	<1	<1	<4	<0.01
112888	<1	<1	<4	<0.01
112896	<1	<1	<4	<0.01
113006	<1	<1	<4	<0.01
113011	<1	<1	<4	<0.01
113019	<1	<1	<4	<0.01
113022	<1	<1	<4	<0.01
113024	<1	<1	<4	<0.01
113026	<1	<1	<4	<0.01
113027	<1	<1	<4	<0.01
113028	<1	<1	<4	<0.01
113030	<1	<1	<4	<0.01
113032	<1	<1	<4	<0.01
113033	<1	<1	<4	<0.01
113035	<1	<1	<4	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cd	Ag	Mo	Au
113036	<1	<1	<4	<0.01
113051	<1	<1	<4	<0.01

Method of Analysis : Cd : AAS1
Ag Mo : AAS3
Au : FAS1

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112002	7	6	12	<10	105
112004	<2	4	10	15	180
112006	4	6	12	<10	210
112007	2	6	<4	10	160
112017	9	6	4	10	170
112021	6	8	6	<10	185
112024	3	<4	4	<10	30
112025	12	<4	<4	<10	80
112027	5	4	6	<10	140
112030	2	<4	4	<10	170
112036	6	4	<4	<10	230
112044	2	6	4	10	290
112046	6	<4	<4	15	260
112055	2	<4	<4	<10	70
112075	7	4	6	10	70
112077	7	<4	6	<10	85
112078	4	8	<4	<10	165
112081	2	4	<4	<10	165
112088	7	6	4	<10	500
112090	7	8	4	<10	115
112091	3	4	<4	10	85
112093	4	6	4	<10	55
112094	2	<4	<4	10	25
112095	<2	6	4	15	75
112096	<2	10	<4	15	130

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112099	<2	6	8	<10	185
112109	8	<4	8	<10	440
112115	8	4	<4	10	420
112120	5	6	6	<10	410
112122	12	8	4	15	420
112124	4	8	<4	<10	590
112128	3	4	<4	<10	165
112131	3	4	4	15	260
112136	6	10	6	15	75
112140	12	6	10	20	270
112142	6	<4	4	<10	440
112148	34	6	<4	25	250
112207	12	6	8	<10	195
112212	2	4	<4	<10	180
112215	2	6	4	10	190
112226	5	<4	<4	<10	240
112228	3	4	6	<10	165
112231	3	8	4	<10	195
112238	2	<4	10	<10	180
112247	14	6	4	<10	165
112254	3	4	<4	<10	300
112268	48	6	6	10	220
112275	10	6	6	<10	155
112278	5	<4	<4	<10	115
112283	8	4	4	<10	125

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112296	5	4	4	<10	70
112302	<2	6	8	<10	95
112309	7	8	<4	<10	310
112312	4	<4	4	<10	640
112338	8	6	4	<10	90
112346	10	4	4	<10	340
112383	10	6	4	<10	380
112386	5	4	4	10	260
112389	4	4	4	<10	390
112391	4	8	<4	<10	320
112399	4	4	6	<10	610
112402	8	<4	6	<10	490
112404	6	4	6	<10	530
112407	4	4	<4	10	500
112411	6	4	4	10	260
112415	16	<4	6	<10	450
112416	6	<4	4	<10	330
112456	8	<4	<4	25	1050
112469	7	6	8	<10	460
112471	6	<4	<4	<10	500
112474	7	6	4	10	500
112479	<2	6	6	<10	140
112501	10	<4	<4	10	240
112505	5	4	4	15	260
112508	7	4	6	<10	125

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112509	6	8	6	<10	70
112514	2	6	6	<10	130
112515	2	4	6	10	105
112517	3	<4	4	<10	135
112521	7	10	6	<10	430
112523	3	<4	<4	10	440
112526	8	<4	4	<10	410
112527	12	<4	<4	10	250
112528	3	4	<4	10	440
112530	5	6	<4	10	640
112531	3	<4	4	<10	280
112533	5	8	<4	<10	500
112534	4	<4	<4	<10	400
112542	2	4	<4	<10	35
112552	<2	6	16	<10	50
112555	2	4	<4	<10	70
112558	<2	<4	6	15	55
112560	2	6	6	15	35
112564	3	<4	6	<10	420
112567	2	<4	<4	<10	70
112595	6	<4	6	<10	45
112599	<2	4	4	<10	35
112613	6	6	<4	<10	970
112618	<2	6	6	<10	35
112621	4	<4	4	20	80

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112623	<2	4	6	15	70
112624	5	8	<4	<10	90
112626	5	6	<4	10	70
112630	3	<4	<4	<10	85
112632	3	8	<4	<10	85
112634	6	6	4	<10	70
112635	7	4	<4	<10	70
112637	5	8	<4	<10	40
112638	3	<4	4	<10	75
112639	2	6	6	<10	75
112642	12	4	<4	<10	35
112643	<2	6	4	<10	65
112645	<2	6	<4	<10	80
112646	8	4	<4	<10	90
112647	12	4	<4	<10	105
112648	14	4	<4	<10	115
112663	<2	4	<4	<10	105
112665	<2	8	4	20	30
112668	<2	4	4	<10	40
112672	<2	<4	<4	<10	20
112674	4	6	<4	<10	85
112678	8	<4	4	10	140
112683	5	4	<4	<10	105
112685	3	<4	<4	<10	85
112686	3	4	6	<10	195

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112689	8	4	4	<10	160
112691	6	<4	<4	<10	125
112694	10	4	<4	<10	130
112697	14	6	4	<10	70
112699	4	<4	4	<10	110
112701	12	6	<4	<10	70
112703	5	<4	4	<10	95
112705	7	8	<4	15	60
112706	5	4	4	<10	50
112707	7	4	<4	<10	45
112708	6	6	6	15	50
112710	8	<4	<4	<10	55
112712	4	4	4	<10	60
112753	<2	4	4	<10	105
112757	<2	<4	4	<10	50
112761	4	6	4	10	65
112767	<2	6	<4	<10	95
112772	<2	8	4	<10	90
112774	4	8	<4	<10	150
112776	3	<4	<4	15	160
112779	4	4	6	<10	300
112780	4	6	<4	10	290
112783	6	6	4	<10	190
112786	<2	<4	4	<10	20
112788	3	6	<4	<10	20

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
112789	<2	4	<4	<10	95
112791	4	6	<4	<10	65
112793	<2	10	8	<10	145
112806	<2	6	4	<10	50
112827	<2	<4	4	<10	50
112840	6	<4	6	<10	175
112844	3	<4	4	20	290
112854	10	4	<4	<10	170
112855	10	6	4	<10	170
112859	3	<4	<4	<10	200
112865	5	6	<4	<10	185
112888	<2	<4	6	<10	260
112896	<2	4	<4	<10	330
113006	10	4	<4	<10	290
113011	4	<4	<4	<10	55
113019	<2	<4	<4	<10	50
113022	4	<4	4	<10	45
113024	12	6	<4	15	100
113026	5	8	6	<10	35
113027	4	4	<4	<10	55
113028	8	6	<4	<10	70
113030	2	4	4	<10	120
113032	9	4	<4	<10	80
113033	7	<4	<4	15	70
113035	8	8	<4	<10	100

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	W	Ba
113036	16	8	<4	<10	100
113051	9	<4	4	<10	80

Method of Analysis : As Sb Sn W Ba : XRF1

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112008	120	28	65	24	<1	<0.01
112028	18	8	24	20	<1	<0.01
112029	24	14	28	14	<1	<0.01
112031	50	10	34	18	<1	<0.01
112032	55	6	36	18	<1	<0.01
112033	44	20	100	36	<1	<0.01
112034	65	12	38	34	<1	<0.01
112038	26	30	260	22	<1	<0.01
112039	22	14	60	20	<1	<0.01
112040	26	20	50	18	<1	<0.01
112041	20	16	50	14	<1	<0.01
112043	18	14	34	18	<1	<0.01
112048	14	14	8	16	<1	<0.01
112049	100	10	95	12	<1	<0.01
112050	14	8	55	12	<1	<0.01
112054	14	4	28	16	<1	<0.01
112059	12	12	44	12	<1	<0.01
112060	10	18	26	8	<1	<0.01
112061	14	10	14	12	<1	<0.01
112062	LNR	LNR	LNR	LNR	LNR	LNR
112063	10	8	8	12	<1	<0.01
112064	34	8	8	14	<1	<0.01
112067	10	<4	6	16	<1	<0.01
112068	12	<4	4	16	<1	<0.01
112069	10	<4	6	14	<1	<0.01

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343200
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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112073	14	<4	32	250	<1	<0.01
112074	20	14	22	60	<1	<0.01
112076	14	6	28	130	<1	<0.01
112083	24	10	44	290	<1	<0.01
112101	14	<4	8	16	<1	<0.01
112102	26	12	55	60	<1	<0.01
112103	80	8	60	46	<1	<0.01
112104	180	8	32	50	<1	<0.01
112105	150	<4	40	80	<1	<0.01
112106	180	<4	24	26	<1	<0.01
112107	160	<4	26	24	<1	<0.01
112111	160	<4	28	110	<1	<0.01
112112	60	6	26	46	<1	<0.01
112113	80	6	24	34	<1	<0.01
112117	50	<4	60	70	<1	<0.01
112118	60	<4	40	48	<1	<0.01
112119	100	<4	32	34	<1	<0.01
112127	2000	10	12	28	1	0.97
112130	160	<4	38	32	<1	<0.01
112132	190	<4	38	42	<1	<0.01
112133	200	<4	28	50	<1	<0.01
112134	80	<4	14	30	<1	<0.01
112135	46	<4	10	12	<1	<0.01
112139	100	6	14	32	<1	<0.01
112141	100	6	14	20	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112144	390	6	24	170	<1	<0.01
112145	60	<4	30	90	<1	<0.01
112146	100	14	170	70	<1	<0.01
112147	80	6	12	38	<1	<0.01
112201	6	<4	6	14	<1	<0.01
112204	12	6	16	10	<1	<0.01
112206	30	65	28	14	<1	<0.01
112208	8	<4	8	16	<1	<0.01
112210	85	55	230	150	1	<0.01
112214	20	24	50	42	<1	<0.01
112221	14	4	6	16	<1	<0.01
112222	28	16	10	60	<1	<0.01
112223	18	<4	12	34	<1	<0.01
112224	22	<4	14	60	<1	<0.01
112232	30	8	12	24	<1	<0.01
112233	36	24	42	80	<1	<0.01
112234	10	18	8	8	<1	<0.01
112235	10	<4	8	18	<1	<0.01
112236	10	4	8	20	<1	<0.01
112239	16	22	32	32	<1	<0.01
112240	8	6	16	18	<1	<0.01
112241	16	6	16	70	<1	<0.01
112242	12	6	8	24	<1	<0.01
112243	34	18	24	55	<1	<0.01
112244	10	6	10	18	<1	<0.01

343202

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112245	10	<4	8	38	<1	<0.01
112248	36	30	130	32	<1	<0.01
112250	10	26	32	38	<1	<0.01
112251	18	24	60	14	<1	<0.01
112252	8	8	12	18	<1	<0.01
112255	8	8	14	28	<1	<0.01
112256	10	6	14	20	<1	<0.01
112257	14	14	16	48	<1	<0.01
112258	10	4	12	22	<1	<0.01
112259	8	14	28	32	<1	<0.01
112260	10	6	14	28	<1	<0.01
112261	8	8	295	34	<1	<0.01
112262	8	10	34	20	<1	<0.01
112263	12	22	130	170	<1	<0.01
112264	10	10	16	28	<1	<0.01
112265	16	16	24	32	<1	<0.01
112266	18	60	65	32	<1	<0.01
112269	18	60	100	30	<1	<0.01
112270	20	55	36	34	10	<0.01
112272	24	8	28	32	1	<0.01
112273	10	8	50	30	<1	<0.01
112276	16	20	24	70	<1	<0.01
112280	10	10	75	10	<1	<0.01
112281	12	8	80	8	<1	<0.01
112284	8	8	42	6	3	<0.01

343203

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112285	6	6	10	18	<1	<0.01
112286	8	6	14	26	<1	<0.01
112287	6	6	18	14	<1	<0.01
112288	12	10	16	38	<1	<0.01
112289	28	14	12	34	<1	<0.01
112290	12	8	10	44	<1	<0.01
112291	10	8	10	18	<1	<0.01
112292	6	8	10	12	<1	<0.01
112293	6	20	20	6	<1	<0.01
112299	8	8	12	36	<1	<0.01
112300	8	6	8	22	<1	<0.01
112301	70	14	34	48	<1	<0.01
112305	10	8	36	26	<1	<0.01
112306	8	10	95	32	<1	<0.01
112307	4	10	44	12	<1	<0.01
112308	4	12	28	10	<1	<0.01
112314	6	8	20	6	<1	<0.01
112315	8	20	48	14	<1	<0.01
112316	14	18	30	20	<1	<0.01
112317	10	12	50	14	<1	<0.01
112318	20	20	100	16	<1	<0.01
112319	60	135	28	32	<1	<0.01
112320	50	10	24	140	<1	<0.01
112321	200	30	65	190	<1	<0.01
112322	20	<4	55	390	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112323	20	26	75	18	<1	<0.01
112324	16	18	36	14	<1	<0.01
112325	10	14	18	8	<1	<0.01
112326	10	6	22	16	<1	<0.01
112327	12	8	22	14	<1	<0.01
112328	6	10	26	12	<1	<0.01
112329	8	10	12	10	<1	<0.01
112330	6	<4	20	14	<1	<0.01
112331	6	4	12	10	<1	<0.01
112332	18	6	16	12	<1	<0.01
112333	18	8	14	10	<1	<0.01
112334	16	4	16	14	<1	<0.01
112335	10	4	12	12	<1	<0.01
112336	32	6	28	90	<1	<0.01
112337	28	<4	32	240	<1	<0.01
112339	40	4	60	400	<1	<0.01
112340	14	<4	20	120	<1	<0.01
112341	24	36	50	85	<1	<0.01
112342	12	14	130	10	<1	<0.01
112344	8	12	60	10	<1	<0.01
112347	18	22	60	26	<1	<0.01
112348	8	8	10	8	<1	<0.01
112349	10	6	10	6	<1	<0.01
112350	8	<4	8	<4	<1	<0.01
112351	14	<4	8	<4	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112352	18	12	6	8	<1	<0.01
112353	20	8	34	10	<1	<0.01
112354	8	<4	4	<4	<1	<0.01
112355	8	<4	22	100	<1	<0.01
112356	42	20	90	230	<1	<0.01
112357	8	<4	10	18	<1	<0.01
112358	10	10	26	12	<1	<0.01
112359	6	<4	8	8	<1	<0.01
112360	8	<4	6	8	<1	<0.01
112361	24	<4	36	100	<1	<0.01
112362	10	<4	6	8	<1	<0.01
112363	10	<4	8	6	<1	<0.01
112364	14	<4	6	4	<1	<0.01
112366	8	<4	6	8	<1	<0.01
112367	18	<4	14	14	<1	<0.01
112368	36	8	14	18	<1	<0.01
112369	310	16	42	185	<1	<0.01
112370	36	8	12	50	<1	<0.01
112371	55	<4	20	50	<1	<0.01
112372	390	<4	16	36	<1	<0.01
112373	120	4	20	40	<1	<0.01
112374	350	<4	18	44	<1	<0.01
112375	110	10	24	26	<1	<0.01
112376	160	<4	14	65	<1	<0.01
112377	60	18	42	36	<1	<0.01

343206

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112378	12	<4	12	8	<1	<0.01
112379	10	<4	8	8	<1	<0.01
112381	44	<4	16	42	<1	<0.01
112454	150	6	38	40	<1	<0.01
112455	290	<4	10	14	<1	<0.01
112457	36	6	10	4	<1	<0.01
112458	28	<4	4	8	<1	<0.01
112459	85	<4	48	100	<1	<0.01
112460	80	38	48	60	<1	<0.01
112461	38	10	44	70	<1	<0.01
112463	34	16	30	44	<1	<0.01
112465	22	12	34	18	<1	<0.01
112466	10	12	46	20	<1	<0.01
112468	16	12	40	20	<1	<0.01
112473	40	14	24	10	<1	<0.01
112476	300	<4	32	200	<1	<0.01
112477	6	<4	4	<4	<1	<0.01
112478	10	<4	22	6	<1	<0.01
112480	195	<4	60	55	<1	<0.01
112481	320	<4	34	75	<1	<0.01
112482	340	<4	24	32	<1	<0.01
112483	60	<4	14	22	<1	<0.01
112484	46	<4	26	34	<1	<0.01
112485	200	<4	26	42	<1	<0.01
112507	34	28	34	44	<1	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112510	10	<4	18	40	<1	<0.01
112511	140	4	46	38	<1	<0.01
112512	90	<4	90	130	<1	<0.01
112513	4	<4	20	34	<1	<0.01
112519	16	<4	12	20	<1	<0.01
112537	22	<4	6	8	<1	<0.01
112538	115	6	40	34	<1	<0.01
112539	180	20	46	42	<1	<0.01
112562	190	70	30	30	<1	<0.01
112563	400	10	75	60	<1	<0.01
112567	110	<4	75	95	<1	<0.01
112568	6	<4	2	4	<1	<0.01
112569	6	<4	10	6	<1	<0.01
112570	4	<4	2	6	<1	<0.01
112571	12	<4	14	12	<1	<0.01
112572	10	<4	36	10	<1	<0.01
112573	8	<4	6	10	<1	<0.01
112574	10	<4	8	18	<1	<0.01
112575	22	<4	42	130	<1	<0.01
112576	10	<4	6	6	<1	<0.01
112577	20	12	4	4	<1	<0.01
112578	18	8	6	6	<1	<0.01
112579	4	<4	8	<4	<1	<0.01
112580	4	<4	<2	4	<1	<0.01
112581	60	<4	150	120	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112582	180	<4	110	50	<1	<0.01
112583	240	<4	55	110	<1	<0.01
112585	240	<4	38	50	<1	<0.01
112586	190	6	55	46	<1	<0.01
112590	85	14	200	500	<1	<0.01
112591	32	10	12	8	<1	<0.01
112592	4	<4	8	12	<1	<0.01
112593	6	<4	4	4	<1	<0.01
112594	16	<4	6	10	<1	<0.01
112601	210	4	48	42	<1	<0.01
112602	330	6	60	44	<1	<0.01
112603	270	6	60	42	<1	<0.01
112605	340	6	65	50	<1	<0.01
112607	280	6	60	36	<1	<0.01
112608	90	10	26	24	<1	<0.01
112610	320	8	50	32	<1	<0.01
112611	210	14	50	50	<1	<0.01
112616	10	<4	2	<4	<1	<0.01
112619	6	<4	2	<4	<1	<0.01
112651	70	70	44	240	<1	<0.01
112652	120	<4	55	200	<1	<0.01
112653	90	<4	50	270	<1	<0.01
112654	140	<4	65	460	<1	<0.01
112657	44	<4	48	230	<1	<0.01
112658	60	<4	55	270	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112659	40	10	26	40	<1	<0.01
112661	230	6	46	42	<1	<0.01
112662	60	<4	26	90	<1	<0.01
112664	100	<4	65	460	<1	<0.01
112667	100	<4	65	360	<1	<0.01
112669	16	8	10	12	<1	<0.01
112670	130	<4	65	300	<1	<0.01
112671	100	<4	65	300	<1	<0.01
112677	250	<4	40	24	<1	<0.01
112680	220	<4	65	50	<1	<0.01
112681	85	10	36	105	<1	<0.01
112751	30	<4	18	42	<1	<0.01
112752	4	<4	6	<4	<1	<0.01
112754	6	<4	12	95	<1	<0.01
112755	4	<4	<2	4	<1	<0.01
112756	6	<4	4	10	<1	<0.01
112760	6	<4	4	8	<1	<0.01
112763	8	<4	2	4	<1	<0.01
112764	20	<4	16	44	<1	<0.01
112765	8	20	4	4	<1	<0.01
112766	6	<4	4	4	<1	<0.01
112770	10	<4	4	14	<1	<0.01
112771	6	<4	2	<4	<1	<0.01
112796	6	<4	2	4	<1	<0.01
112797	4	<4	<2	4	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112798	8	<4	4	10	<1	<0.01
112799	10	<4	8	12	<1	<0.01
112800	6	<4	4	6	<1	<0.01
112801	8	<4	2	6	<1	<0.01
112802	6	<4	<2	4	<1	<0.01
112803	8	<4	44	300	<1	<0.01
112804	36	<4	34	320	<1	<0.01
112808	10	<4	24	140	<1	<0.01
112809	8	<4	18	140	<1	<0.01
112811	16	<4	20	170	<1	<0.01
112812	125	<4	22	160	<1	<0.01
112814	8	<4	18	150	<1	<0.01
112816	28	<4	55	410	<1	<0.01
112817	14	<4	20	140	<1	<0.01
112818	38	<4	32	160	<1	<0.01
112819	18	<4	55	430	<1	<0.01
112820	18	<4	42	220	<1	<0.01
112823	32	<4	48	200	<1	<0.01
112824	34	<4	50	220	<1	<0.01
112829	6	<4	4	<4	<1	<0.01
112830	4	<4	4	4	<1	<0.01
112831	28	12	30	34	<1	<0.01
112834	12	<4	8	14	<1	<0.01
112835	10	<4	26	230	<1	<0.01
112841	6	10	34	30	<1	<0.01

210
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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112842	6	<4	4	<4	<1	<0.01
112847	22	<4	22	16	<1	<0.01
112850	8	<4	6	8	<1	<0.01
112851	10	<4	16	16	<1	<0.01
112856	65	24	38	50	<1	<0.01
112861	4	<4	10	4	<1	<0.01
112862	4	<4	4	4	<1	<0.01
112867	10	20	18	16	<1	<0.01
112868	12	<4	26	8	<1	<0.01
112870	6	<4	18	8	<1	<0.01
112871	10	<4	8	24	<1	<0.01
112872	4	<4	12	4	<1	<0.01
112873	4	<4	8	10	<1	<0.01
112874	12	<4	14	40	<1	<0.01
112875	10	<4	14	20	<1	<0.01
112876	4	<4	4	6	<1	<0.01
112877	4	<4	4	6	<1	<0.01
112878	6	<4	4	6	<1	<0.01
112881	8	<4	40	34	<1	<0.01
112882	18	<4	38	22	<1	<0.01
112883	14	<4	60	55	<1	<0.01
112884	6	<4	110	34	<1	<0.01
112885	30	<4	110	75	<1	<0.01
112886	20	<4	85	50	<1	<0.01
112889	4	<4	12	4	<1	<0.01

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
112890	6	10	26	12	<1	<0.01
112891	6	8	18	8	<1	<0.01
112892	16	<4	350	65	<1	<0.01
112893	160	80	100	42	<1	<0.01
112894	36	18	30	160	<1	<0.01
112898	8	12	18	8	<1	<0.01
112899	22	6	250	65	<1	<0.01
112900	6	<4	<2	5	<1	<0.01
112904	24	<4	16	175	<1	<0.01
112908	60	<4	36	270	<1	<0.01
112909	32	<4	48	360	<1	<0.01
112992	10	<4	80	450	<1	<0.01
112995	8	<4	4	8	<1	<0.01
112996	6	<4	4	16	<1	<0.01
112997	LNR	LNR	LNR	LNR	LNR	LNR
112998	10	4	30	170	<1	<0.01
112999	8	<4	26	100	<1	<0.01
113001	44	8	14	28	<1	<0.01
113002	24	<4	30	34	<1	<0.01
113003	6	<4	4	<4	<1	<0.01
113004	120	12	24	34	<1	<0.01
113005	42	<4	55	36	<1	<0.01
113008	130	<4	70	65	<1	<0.01
113016	4	<4	<2	4	<1	<0.01
113017	6	<4	<2	4	<1	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Ag	Au
113018	6	<4	<2	4	<1	<0.01

Method of Analysis : Cu Pb Zn Ni : AAS1
Ag : AAS3
Au : FAS1

343214

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112008	16	8	8	50
112028	<2	<4	8	280
112029	2	<4	<4	480
112031	5	<4	<4	360
112032	5	10	<4	250
112033	<2	<4	6	340
112034	9	6	4	190
112038	9	<4	<4	440
112039	5	<4	<4	220
112040	9	<4	10	105
112041	10	<4	<4	145
112043	5	<4	4	320
112048	3	4	4	60
112049	2	6	6	620
112050	70	12	<4	35
112054	<2	<4	<4	610
112059	7	<4	<4	460
112060	7	6	6	160
112061	2	10	<4	420
112062	LNR	LNR	LNR	LNR
112063	3	6	6	140
112064	3	6	4	380
112067	2	4	<4	10
112068	<2	<4	4	10
112069	2	4	<4	<10

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112073	<2	4	4	<10
112074	5	6	<4	55
112076	<2	6	<4	50
112083	28	4	<4	25
112101	3	6	<4	420
112102	14	10	<4	500
112103	9	<4	<4	690
112104	22	8	<4	600
112105	24	<4	6	650
112106	130	10	<4	40
112107	24	4	4	290
112111	8	8	<4	145
112112	12	6	<4	85
112113	26	8	4	145
112117	28	8	<4	45
112118	22	6	8	115
112119	16	<4	<4	980
112127	18	8	30	1050
112130	3	6	<4	230
112132	10	6	<4	310
112133	3	<4	6	260
112134	2	4	6	220
112135	4	<4	4	240
112139	18	4	<4	95
112141	18	10	6	370

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JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112144	3	6	8	380
112145	6	8	<4	300
112146	2	6	6	990
112147	20	4	<4	60
112201	<2	4	<4	20
112204	3	6	<4	220
112206	3	6	<4	410
112208	3	4	<4	10
112210	26	4	<4	210
112214	3	4	<4	430
112221	<2	<4	8	120
112222	2	6	4	60
112223	<2	<4	8	210
112224	3	4	6	260
112232	<2	6	<4	45
112233	9	4	8	130
112234	3	<4	4	15
112235	4	4	8	130
112236	4	<4	4	70
112239	8	6	4	110
112240	<2	8	<4	140
112241	<2	6	8	35
112242	4	6	4	310
112243	5	4	6	30
112244	2	6	<4	310

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343217
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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112245	<2	<4	<4	105
112248	13	4	4	380
112250	12	6	4	60
112251	9	7	<4	120
112252	<2	<4	<4	480
112255	4	<4	10	210
112256	3	6	4	360
112257	4	4	4	110
112258	<2	4	<4	70
112259	6	12	4	560
112260	5	4	6	110
112261	6	4	<4	380
112262	6	<4	<4	75
112263	5	<4	<4	145
112264	4	<4	6	125
112265	5	6	<4	220
112266	12	8	<4	290
112269	20	6	<4	75
112270	26	4	8	105
112272	10	<4	6	50
112273	<2	4	4	120
112276	18	4	6	60
112280	6	6	8	90
112281	9	8	6	90
112284	9	4	4	130

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112285	3	<4	4	40
112286	2	4	<4	210
112287	<2	4	<4	45
112288	6	<4	4	95
112289	2	4	8	60
112290	4	6	<4	25
112291	2	6	4	70
112292	4	<4	<4	60
112293	6	<4	4	60
112299	5	4	4	230
112300	<2	4	<4	120
112301	20	8	<4	85
112305	20	<4	6	45
112306	2	8	<4	490
112307	16	<4	<4	610
112308	8	<4	<4	440
112314	4	8	<4	570
112315	16	<4	<4	480
112316	10	<4	6	145
112317	9	6	6	240
112318	<2	6	<4	400
112319	18	12	<4	230
112320	12	8	<4	210
112321	<2	6	<4	60
112322	<2	4	<4	20

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112323	7	6	6	610
112324	16	10	<4	430
112325	4	4	<4	240
112326	2	6	<4	85
112327	2	8	6	250
112328	6	12	4	340
112329	5	<4	6	290
112330	<2	4	<4	400
112331	5	4	4	290
112332	5	8	4	380
112333	5	6	<4	350
112334	7	4	<4	330
112335	4	<4	10	240
112336	<2	<4	<4	30
112337	<2	<4	4	10
112339	60	<4	4	10
112340	3	<4	4	<10
112341	8	6	<4	145
112342	<2	4	<4	540
112344	4	<4	<4	660
112347	3	8	<4	580
112348	<2	6	4	510
112349	<2	10	4	870
112350	2	6	6	1400
112351	<2	6	4	20

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112352	2	4	6	45
112353	12	4	<4	700
112354	<2	4	8	20
112355	5	<4	<4	45
112356	110	12	6	85
112357	3	<4	<4	95
112358	8	<4	8	95
112359	<2	4	6	20
112360	<2	8	4	20
112361	3	<4	6	15
112362	5	10	6	480
112363	3	<4	4	780
112364	2	4	6	135
112366	2	<4	8	1150
112367	5	6	6	650
112368	16	6	8	360
112369	24	<4	<4	55
112370	14	<4	4	85
112371	12	4	8	30
112372	10	6	4	290
112373	12	<4	6	820
112374	14	<4	<4	290
112375	16	6	<4	155
112376	24	8	4	95
112377	26	4	4	420

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112378	4	<4	<4	410
112379	2	<4	<4	210
112381	14	<4	<4	45
112454	26	10	<4	400
112455	14	12	<4	360
112457	4	6	6	680
112458	3	<4	8	1400
112459	18	6	<4	55
112460	16	4	<4	75
112461	12	4	<4	85
112463	12	4	<4	25
112465	14	<4	4	10
112466	12	<4	<4	40
112468	12	<4	6	50
112473	6	<4	<4	35
112476	10	8	4	680
112477	2	4	6	90
112478	3	<4	4	80
112480	7	4	4	300
112481	3	8	<4	195
112482	14	<4	<4	90
112483	12	4	6	185
112484	<2	<4	4	155
112485	12	12	4	330
112507	6	8	<4	105

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112659	6	4	6	380
112661	6	10	8	30
112662	4	<4	<4	20
112664	<2	6	<4	15
112667	<2	<4	<4	60
112669	5	4	4	180
112670	<2	6	6	10
112671	2	<4	<4	30
112677	8	<4	<4	30
112680	<2	4	<4	20
112681	3	6	<4	70
112751	2	8	6	15
112752	<2	8	8	490
112754	4	4	6	240
112755	<2	6	10	250
112756	2	8	4	135
112760	<2	<4	<4	110
112763	<2	8	8	300
112764	<2	6	<4	460
112765	<2	4	8	400
112766	<2	<4	10	400
112770	<2	<4	<4	30
112771	<2	4	6	460
112796	4	4	8	25
112797	<2	10	4	10

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112510	6	<4	4	100
112511	7	<4	4	260
112512	8	4	<4	400
112513	<2	<4	<4	570
112519	7	6	6	35
112537	6	<4	8	150
112538	14	6	10	500
112539	10	6	4	580
112562	8	4	4	25
112563	8	4	<4	35
112567	5	4	<4	150
112568	<2	4	4	220
112569	<2	8	6	155
112570	<2	<4	6	330
112571	<2	4	4	15
112572	<2	4	4	15
112573	2	<4	<4	25
112574	<2	6	6	10
112575	5	<4	<4	210
112576	4	<4	6	420
112577	3	<4	6	410
112578	4	8	4	920
112579	<2	4	8	15
112580	<2	<4	<4	30
112581	3	<4	8	860

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112582	18	<4	<4	1000
112583	7	12	6	40
112585	<2	8	6	15
112586	7	4	4	15
112590	28	6	<4	55
112591	12	4	4	270
112592	<2	4	8	30
112593	2	4	4	<10
112594	6	4	10	155
112601	8	4	<4	40
112602	9	6	4	40
112603	9	4	<4	30
112605	<2	8	<4	30
112607	<2	<4	6	50
112608	2	6	6	30
112610	2	<4	<4	15
112611	4	8	4	55
112616	3	8	8	25
112619	<2	4	4	20
112651	<2	<4	<4	160
112652	10	4	<4	115
112653	6	6	<4	30
112654	<2	<4	<4	15
112657	2	<4	<4	10
112658	<2	4	4	10

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112659	6	4	6	380
112661	6	10	8	30
112662	4	<4	<4	20
112664	<2	6	<4	15
112667	<2	<4	<4	60
112669	5	4	4	180
112670	<2	6	6	10
112671	2	<4	<4	30
112677	8	<4	<4	30
112680	<2	4	<4	20
112681	3	6	<4	70
112751	2	8	6	15
112752	<2	8	8	490
112754	4	4	6	240
112755	<2	6	10	250
112756	2	8	4	135
112760	<2	<4	<4	110
112763	<2	8	8	300
112764	<2	6	<4	460
112765	<2	4	8	400
112766	<2	<4	10	400
112770	<2	<4	<4	30
112771	<2	4	6	460
112796	4	4	8	25
112797	<2	10	4	10

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112798	<2	4	6	50
112799	4	6	4	10
112800	5	6	<4	75
112801	3	4	8	<10
112802	<2	<4	4	10
112803	<2	8	8	25
112804	2	<4	<4	<10
112808	<2	4	4	35
112809	3	6	<4	<10
112811	<2	<4	4	<10
112812	5	8	6	45
112814	2	4	<4	15
112816	2	<4	<4	<10
112817	<2	<4	4	<10
112818	3	6	<4	15
112819	<2	6	6	<10
112820	<2	<4	6	10
112823	<2	<4	<4	15
112824	3	4	<4	210
112829	2	<4	<4	290
112830	4	<4	4	115
112831	14	<4	<4	80
112834	3	6	6	130
112835	2	8	10	60
112841	10	<4	<4	220

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112842	2	4	4	85
112847	6	12	4	1100
112850	2	<4	6	150
112851	3	<4	<4	170
112856	16	<4	6	45
112861	3	8	<4	280
112862	<2	8	4	210
112867	<2	<4	4	230
112868	4	<4	<4	460
112870	<2	8	<4	480
112871	<2	<4	4	15
112872	<2	6	4	430
112873	<2	8	6	170
112874	<2	<4	4	20
112875	2	8	4	130
112876	<2	8	6	60
112877	2	6	4	155
112878	<2	6	<4	210
112881	<2	6	<4	390
112882	2	<4	<4	290
112883	<2	<4	<4	185
112884	5	<4	<4	410
112885	2	4	12	370
112886	8	<4	<4	390
112889	4	8	<4	85

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
112890	14	10	4	190
112891	2	6	4	420
112892	7	4	8	850
112893	<2	<4	<4	980
112894	14	<4	4	115
112898	3	4	<4	670
112899	6	4	4	210
112900	2	<4	<4	10
112904	5	4	4	<10
112908	<2	<4	4	15
112909	<2	<4	4	25
112992	4	<4	4	<10
112995	2	<4	<4	10
112996	3	6	<4	<10
112997	LNR	LNR	LNR	LNR
112998	7	4	4	15
112999	2	6	4	130
113001	14	<4	4	1200
113002	18	4	<4	700
113003	2	4	8	15
113004	4	4	<4	100
113005	10	4	<4	155
113008	10	4	6	80
113016	<2	<4	6	<10
113017	<2	6	<4	105

343229

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ANALYTICAL REPORT

JOB COM840947 O/N : 4907

Results in ppm

SAMPLE	As	Sb	Sn	Ba
113018	<2	6	6	220

Method of Analysis : As Sb Sn Ba : XRFl

343230

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ANALYTICAL REPORT

JOB COM840947 O/N : 4909

Results in ppm

SAMPLE	Sn	W	Cr	Au
112018	6	25	600	<0.01
112022	<4	10	400	<0.01
112026	<4	15	6500	<0.01
112037	4	15	200	<0.01
112045	<4	45	100	<0.01
112056	<4	25	600	<0.01
112079	<4	15	700	<0.01
112082	<4	10	1600	<0.01
112087	4	45	200	<0.01
112092	4	25	5000	<0.01
112097	<4	10	600	<0.01
112108	<4	10	3500	<0.01
112114	4	<10	800	<0.01
112121	<4	<10	450	<0.01
112137	6	20	50	<0.01
112143	4	45	100	<0.01
112149	6	20	50	<0.01
112213	<4	50	200	<0.01
112216	<4	25	50	<0.01
112225	<4	15	350	<0.01
112227	6	20	4.80%	<0.01
112230	8	45	300	<0.01
112237	<4	15	6000	<0.01
112246	<4	<10	100	<0.01
112253	4	10	100	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4909

Results in ppm

SAMPLE	Sn	W	Cr	Au
112267	<4	<10	150	<0.01
112274	<4	<10	3000	<0.01
112277	<4	10	1.50%	<0.01
112282	<4	<10	200	<0.01
112295	<4	<10	1.30%	<0.01
112303	6	<10	1300	<0.01
112310	<4	<10	100	<0.01
112313	<4	<10	70	<0.01
112384	6	10	150	<0.01
112387	6	15	180	<0.01
112390	<4	10	100	<0.01
112392	<4	<10	100	<0.01
112400	<4	25	600	<0.01
112403	6	<10	350	<0.01
112406	8	15	350	<0.01
112408	4	15	280	<0.01
112412	4	10	180	<0.01
112470	8	<10	320	<0.01
112472	<4	<10	200	<0.01
112504	<4	<10	90	<0.01
112520	<4	<10	150	<0.01
112522	<4	<10	1000	<0.01
112525	4	<10	400	<0.01
112529	<4	<10	200	<0.01
112532	<4	10	270	<0.01

231

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ANALYTICAL REPORT

JOB COM840947 O/N : 4909

Results in ppm

SAMPLE	Sn	W	Cr	Au
112535	4	<10	170	<0.01
112553	4	<10	220	<0.01
112556	<4	<10	170	<0.01
112557	<4	<10	150	<0.01
112561	8	<10	200	<0.01
112565	6	10	200	<0.01
112588	<4	<10	220	<0.01
112600	<4	35	120	<0.01
112614	<4	55	120	<0.01
112617	<4	30	110	<0.01
112620	4	20	200	<0.01
112625	<4	25	300	<0.01
112633	<4	15	250	<0.01
112636	<4	30	180	<0.01
112640	<4	10	250	<0.01
112673	8	25	2600	<0.01
112682	4	25	1700	<0.01
112688	4	20	190	<0.01
112693	<4	20	160	<0.01
112696	4	10	120	<0.01
112698	<4	10	180	<0.01
112702	<4	20	150	<0.01
112704	4	<10	130	<0.01
112709	4	15	220	<0.01
112711	<4	<10	220	<0.01

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343233

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ANALYTICAL REPORT

JOB COM840947 O/N : 4909

Results in ppm

SAMPLE	Sn	W	Cr	Au
112759	<4	35	80	<0.01
112762	10	35	140	<0.01
112768	6	45	140	<0.01
112773	6	35	150	<0.01
112781	<4	15	100	<0.01
112787	6	<10	90	<0.01
112790	4	40	100	<0.01
112792	<4	35	150	<0.01
112794	<4	45	110	<0.01
112805	4	15	2.50%	<0.01
112826	<4	35	3.00%	<0.01
112832	6	10	60	<0.01
112837	<4	15	1000	<0.01
112839	<4	10	2500	<0.01
112843	4	45	120	<0.01
112853	<4	40	150	<0.01
112858	6	20	100	<0.01
112864	<4	30	270	<0.01
112879	4	20	90	<0.01
112887	6	30	130	<0.01
112895	<4	15	150	<0.01
113012	<4	20	80	<0.01
113020	<4	20	200	<0.01
113023	4	35	150	<0.01
113025	<4	45	300	<0.01

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ANALYTICAL REPORT

JOB COM840947 O/N : 4909

Results in ppm

SAMPLE	Sn	W	Cr	Au
113029	<4	30	130	<0.01
113031	4	25	150	<0.01
113034	<4	15	180	<0.01
113052	<4	20	110	<0.01

Method of Analysis : Sn W : XRF1
Cr : AAS2
Au : FAS1

234

343235

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Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: AA89323

NATA REGISTERED No. 1526

OUR REF.:

YOUR REF.:

D/A 4909
Sorell

Mr. B Ferris,
Amoco Minerals Australia Co.,
P.O. Box 493,
North Sydney,
NSW 2060,

26.7.84

Dear Bret,

Enclosed are the check assays for the samples originally analysed on our Job COM840947. There apeears to be very little difference between the two sets of values.

There is no charge for these check assays.

Yours sincerely,
COMLABS PTY LTD

per :

235

343236

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ANALYTICAL REPORT

JOB COM840947 O/N : Check Assays

Results in ppm

SAMPLE	Au
112026	0.07
112230	<0.01
112237	<0.01
112588	0.12
112633	0.15
112682	0.15
112762	<0.01

Method of Analysis : Au : Fire Assay of total remaining sample

COMLABS Pty. Ltd.
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Head Office and Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: AA89323

NATA REGISTERED No. 1528

18/38 MAYDENA
20/38 SORELL

OUR REF.: COM 841326

YOUR REF.: Order No. 12081 Des. 4914

Mr. J. Suppree,
Amoco Minerals Aust. Co. ,
61 Counsel Street,
ZEEHAN TAS 7469,

4.7.84

Dear Johnathan,

RE: JOB COM 841326

Enclosed are the assays for the samples delivered to our laboratory on the 29th June 1984.

Yours sincerely,
COMLABS PTY LTD

per :

c.c.: Mr. B. Roxburgh

COMLABS Pty. Ltd.
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ANALYTICAL REPORT

JOB CON841326 C/N : 4914

Results in ppm

SAMPLE	Cu	Pb	Zn	Ag	Au
112010	16	90	300	<1	<0.05
112012	95	120	42	<1	0.25
112019	16	12	22	<1	<0.05
112070	8	370	350	<1	<0.05
112297	6	<4	4	<1	<0.05
112385	14	10	8	<1	<0.05
112566	4	<4	2	<1	<0.05
112598	4	<4	4	<1	<0.05
112612	6	<4	4	<1	<0.05
112641	160	18	310	<1	<0.05
112777	6	<4	2	<1	<0.05
112778	6	<4	4	<1	<0.05
112785	4	8	12	<1	<0.05
112846	6	<4	4	<1	<0.05
112922	24	12	26	<1	<0.05
112298	4	8	20	<1	<0.05
112775	4	<4	4	<1	<0.05
113014	6	18	110	<1	<0.05
113040	220	10	60	<1	<0.05
113053	6	<4	2	<1	0.15

COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

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ANALYTICAL REPORT

JOB COM841326 C/N : 4914

Results in ppm

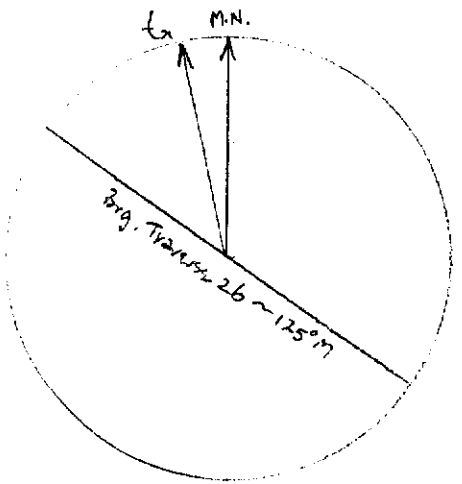
SAMPLE	Sn	Ba	As	Sb
112010	<4	1300	10	4
112012	8	2300	50	6
112019	<4	140	3	<4
112070	<4	<10	195	6
112297	<4	15	3	4
112385	28	85	80	10
112566	4	50	5	<4
112598	8	10	4	8
112612	<4	55	3	<4
112641	<4	45	1550	12
112777	6	10	6	4
112778	4	<10	8	<4
112785	<4	10	5	4
112846	6	45	20	4
112922	<4	170	5	<4
112298	<4	90	18	<4
112775	6	35	5	8
113014	<4	130	55	8
113040	<4	105	14	<4
113053	<4	<10	10	<4

APPENDIX 5

GROUND MAGNETIC PROFILES

t_z - Direction Japan transmitter

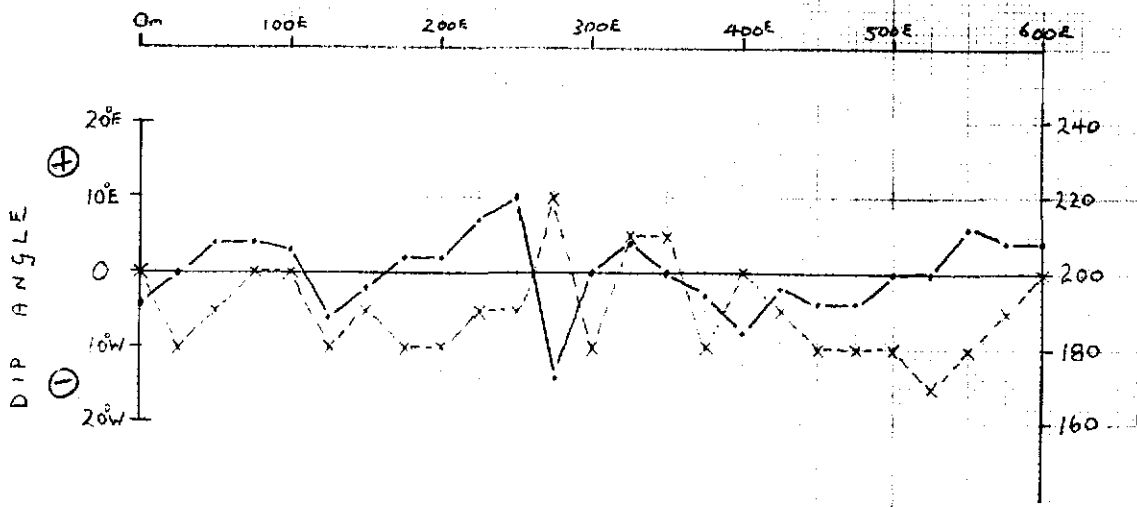
M.N. - Magnetic North

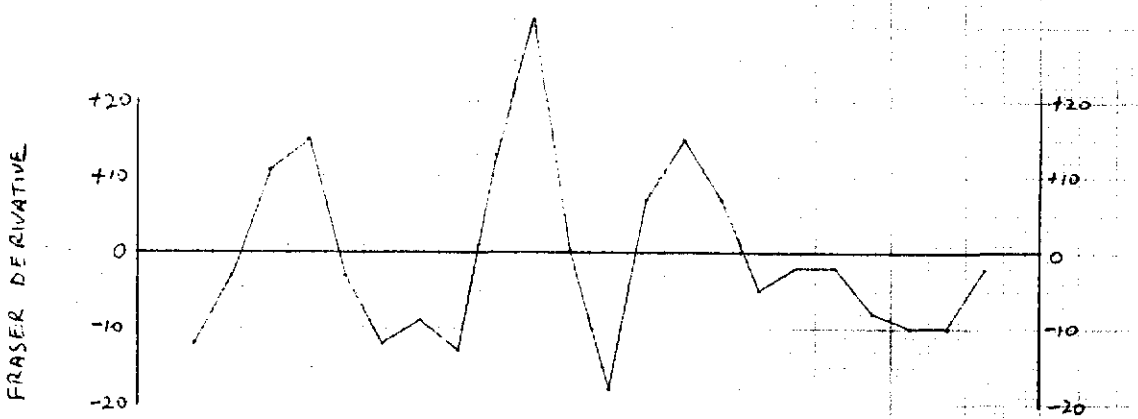


x-- x-- x Field strength

•—•—• Dip Angle

———— Fraser Derivative

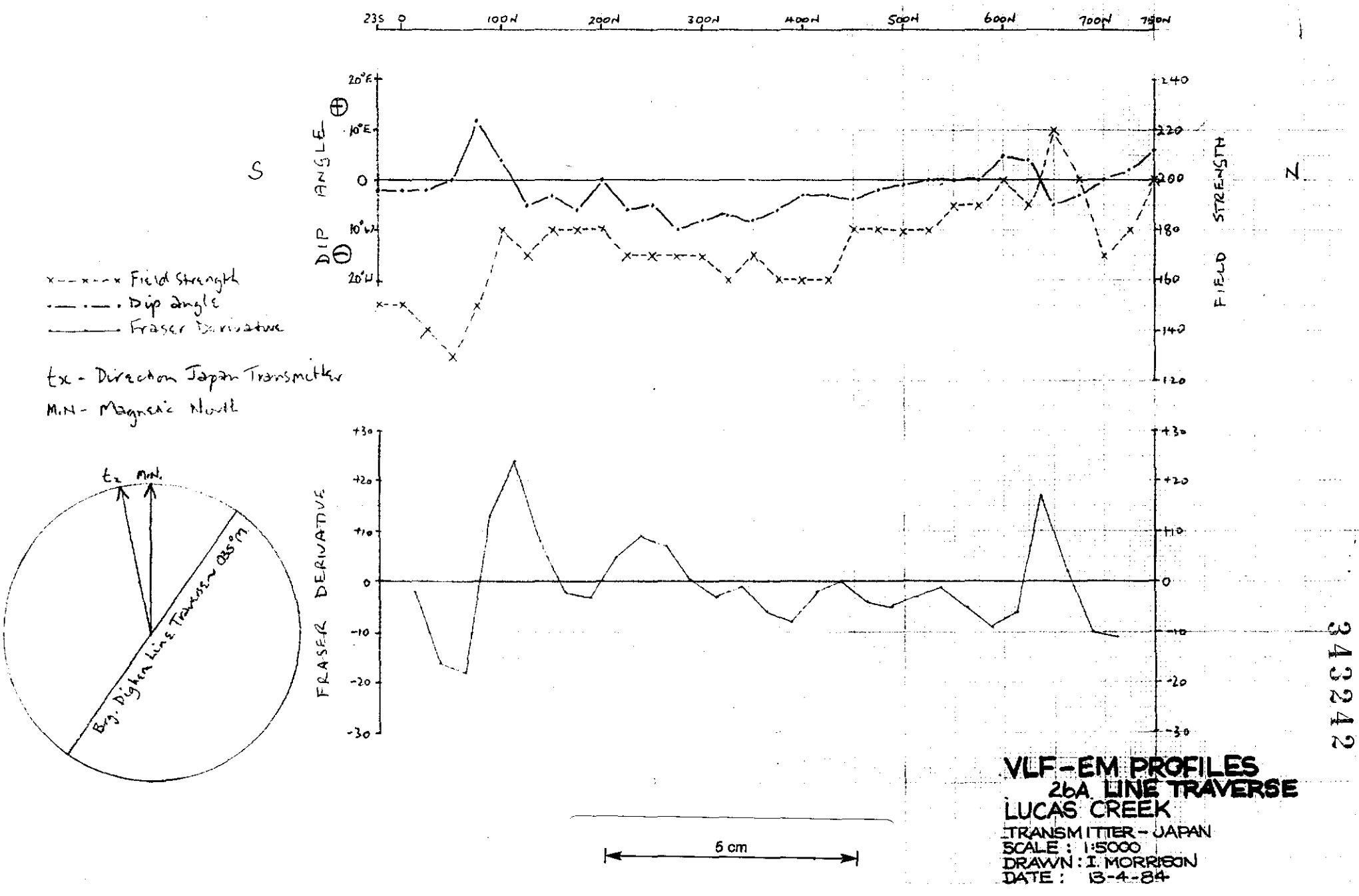




5 cm

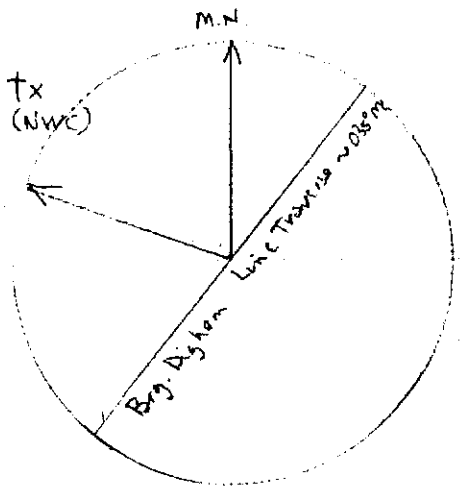
VLF - EM PROFILES
TRAVERSE 26 - LUCAS CREEK
TRANSMITTER: JAPAN
SCALE: 1:5000
DRAWN: I. MORRISON
DATE: 13-4-84

343241



VLF-EM PROFILES
26A LINE TRAVERSE
LUCAS CREEK

TRANSMITTER - JAPAN
SCALE : 1:5000
DRAWN : I. MORRISON
DATE : 13-4-84



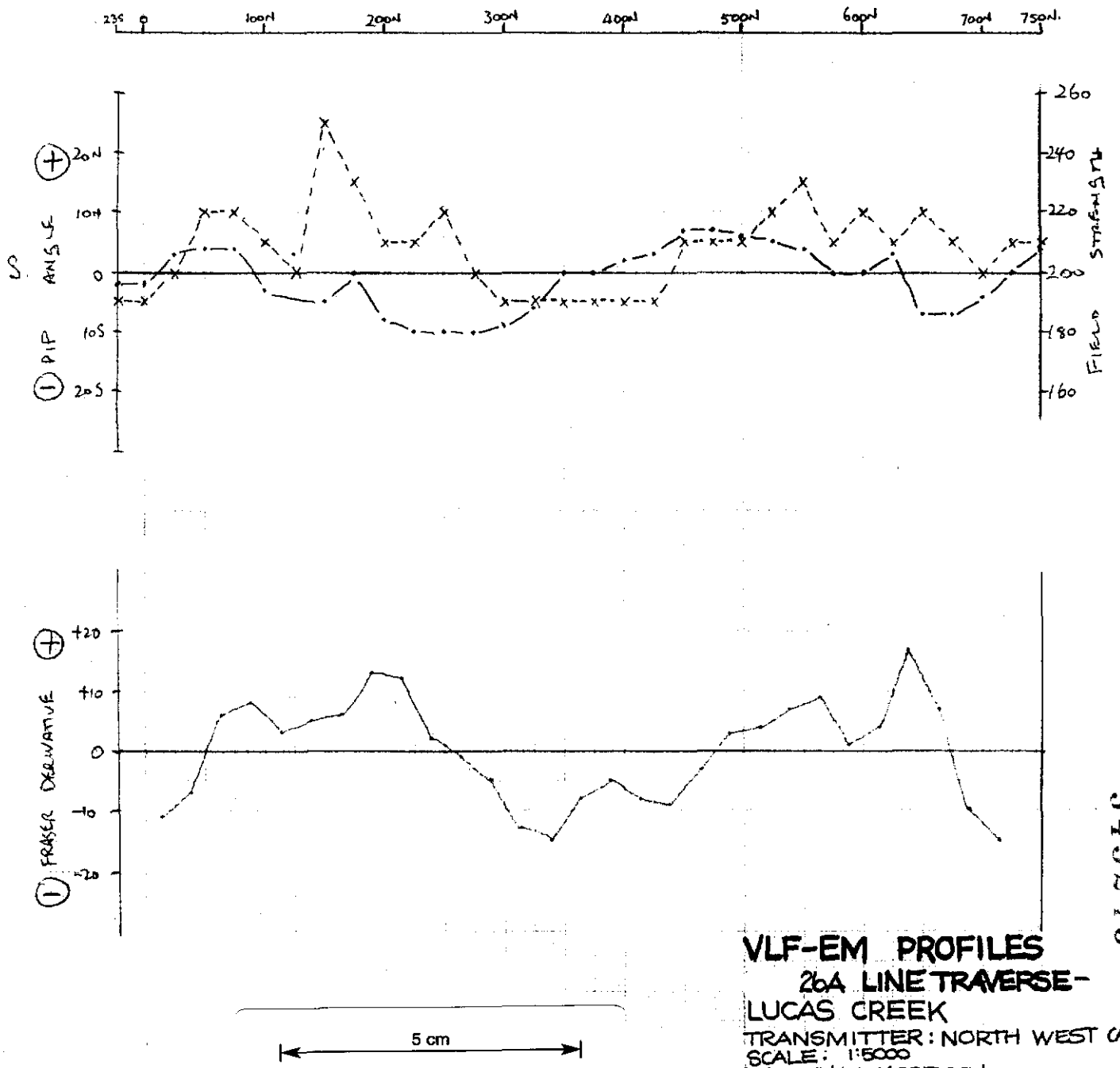
t_x(NWC) - Direction North West Cape

M.N. - Magnetic North

x--x--x Field Strength

·—·—· Dip Angle

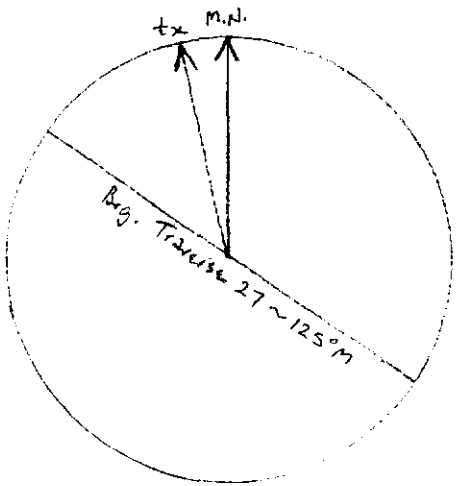
——— Fraser Derivative



VLF-EM PROFILES
26A LINE TRAVERSE-
LUCAS CREEK

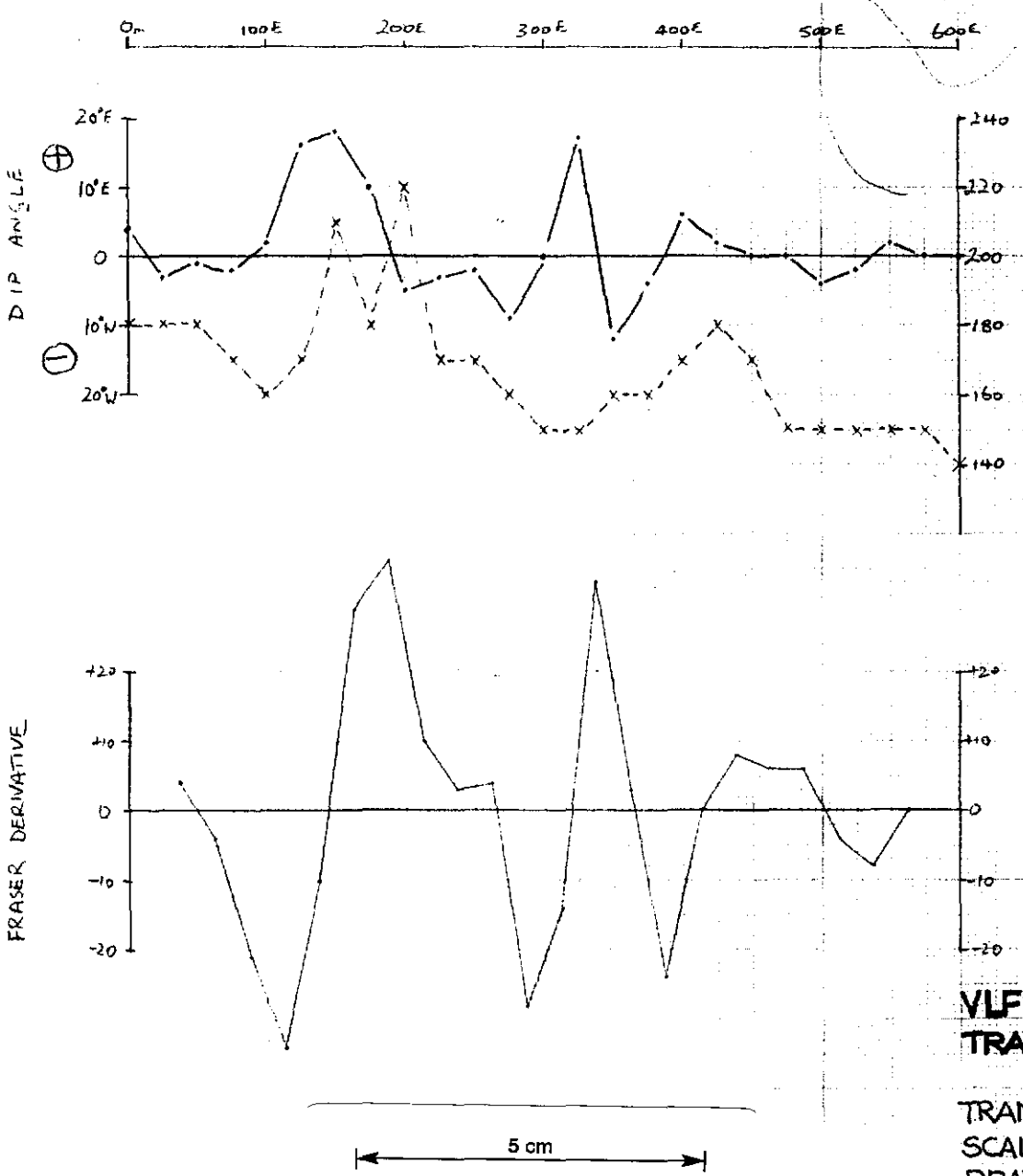
TRANSMITTER: NORTH WEST CAPE
SCALE: 1:5000
DRAWN: I MORRISON
DATE: 13-4-84

343243



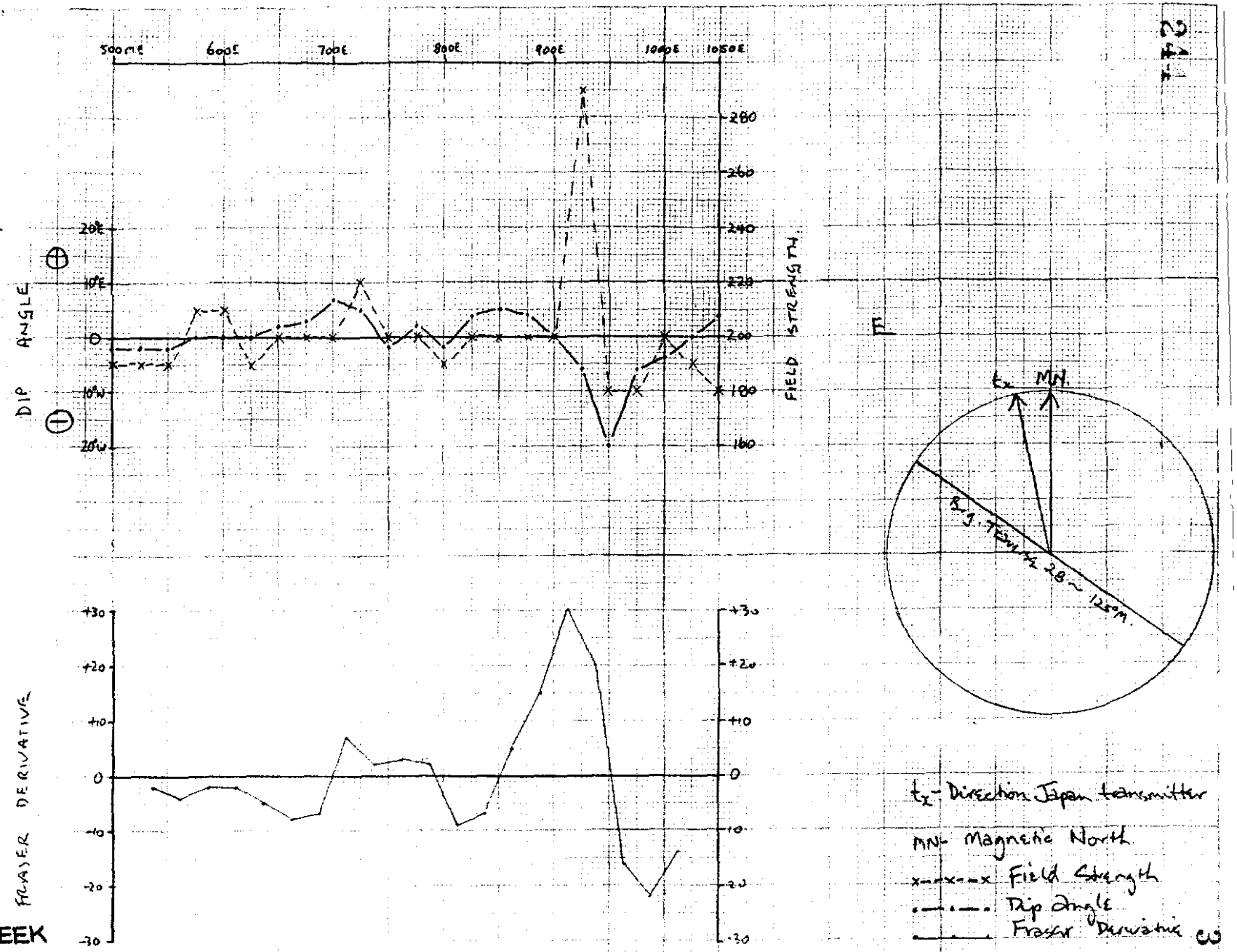
tx - Direction Japan Transmitter
MN - Magnetic North

x--x--x Field Strength
.—.—. Dip Angle
——.—— Fraser Derivative



VLF-EM PROFILES
TRAVERSE 27-LUCAS CREEK

TRANSMITTER: JAPAN
SCALE: 1:5000
DRAWN: I. MORRISON
DATE: 13-4-84



VLF-EM PROFILES
TRAVERSE 28 - LUCAS CREEK

TRANSMITTER : JAPAN
SCALE : 1:5000
DRAWN : I. MORRISON
DATE : 13-4-84

t_x - Direction Japan transmitter
MN - Magnetic North
x---x---x Field Strength
•—•—• Dip Angle
——— Fraser Derivative

343243

245

343240

245

FIELD STRENGTH
DIP ANGLE
FRASER DERIVATIVE

850mW 1700W 1600W 1500W 1400W 1300W 1200W 1100W 1000W 900W 800W 700W 600W 500W 400W 200W 100W 0

W

DIP ANGLE

20E
10E
0
10W
20W

260
240
220
200
180
160
140

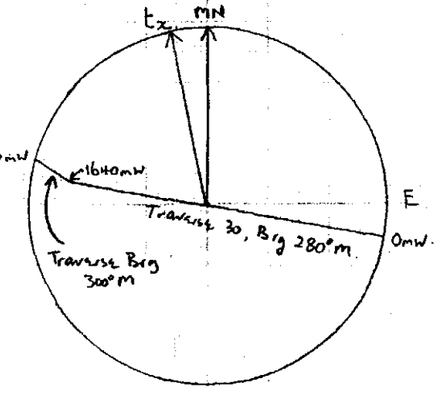
FIELD STRENGTH

FRASER DERIVATIVES

+30
+20
+10
0
-10
-20
-30

W E

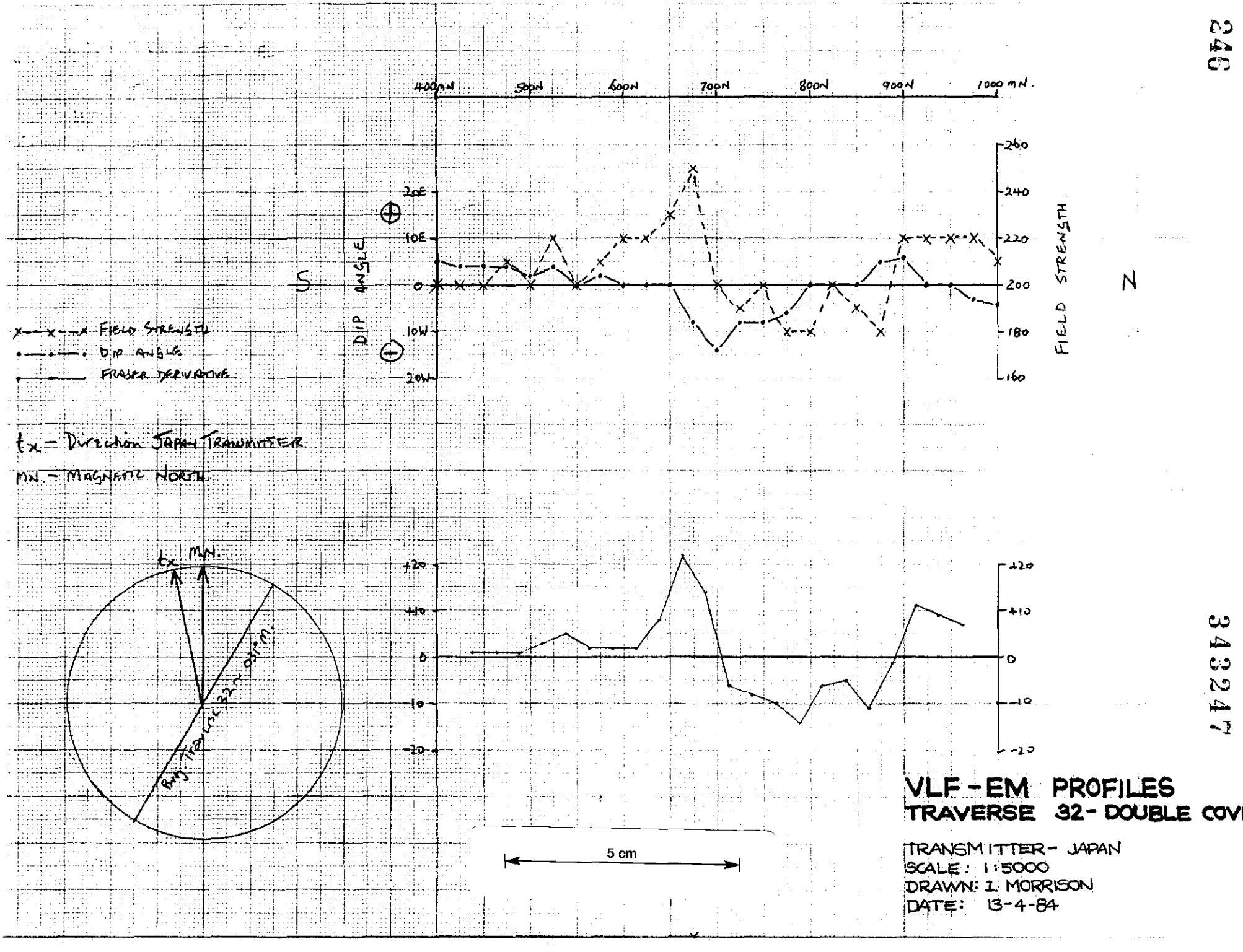
t_x = Direction of Japan transmitter



VLF-EM-ANOMALY 128-TRAVERSE 30

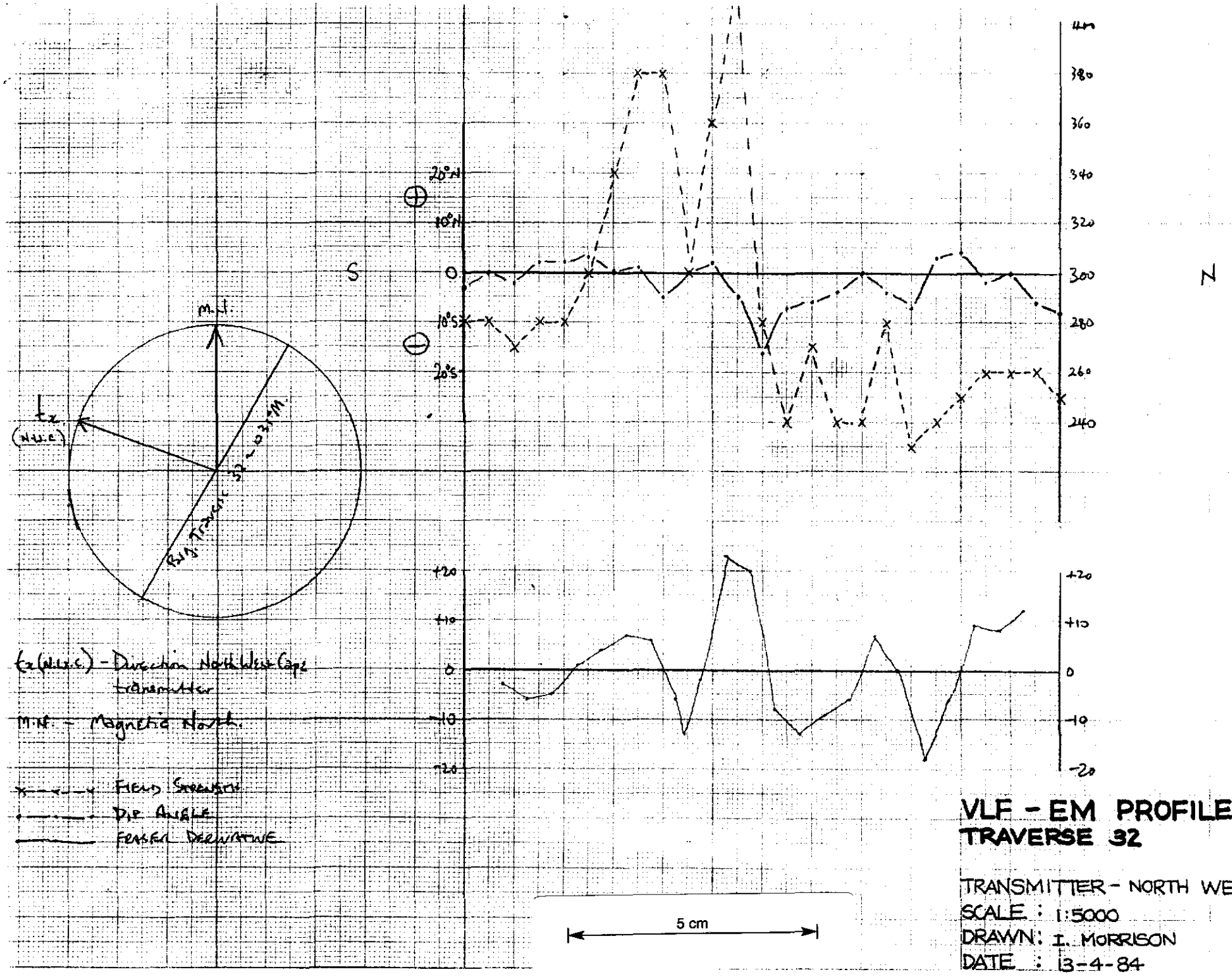
TRANSMITTER: JAPAN
SCALE : 1:5000
DRAWN: I. MORRISON
DATE: 13-4-84

5 cm



VLF-EM PROFILES
TRAVERSE 32- DOUBLE COVE

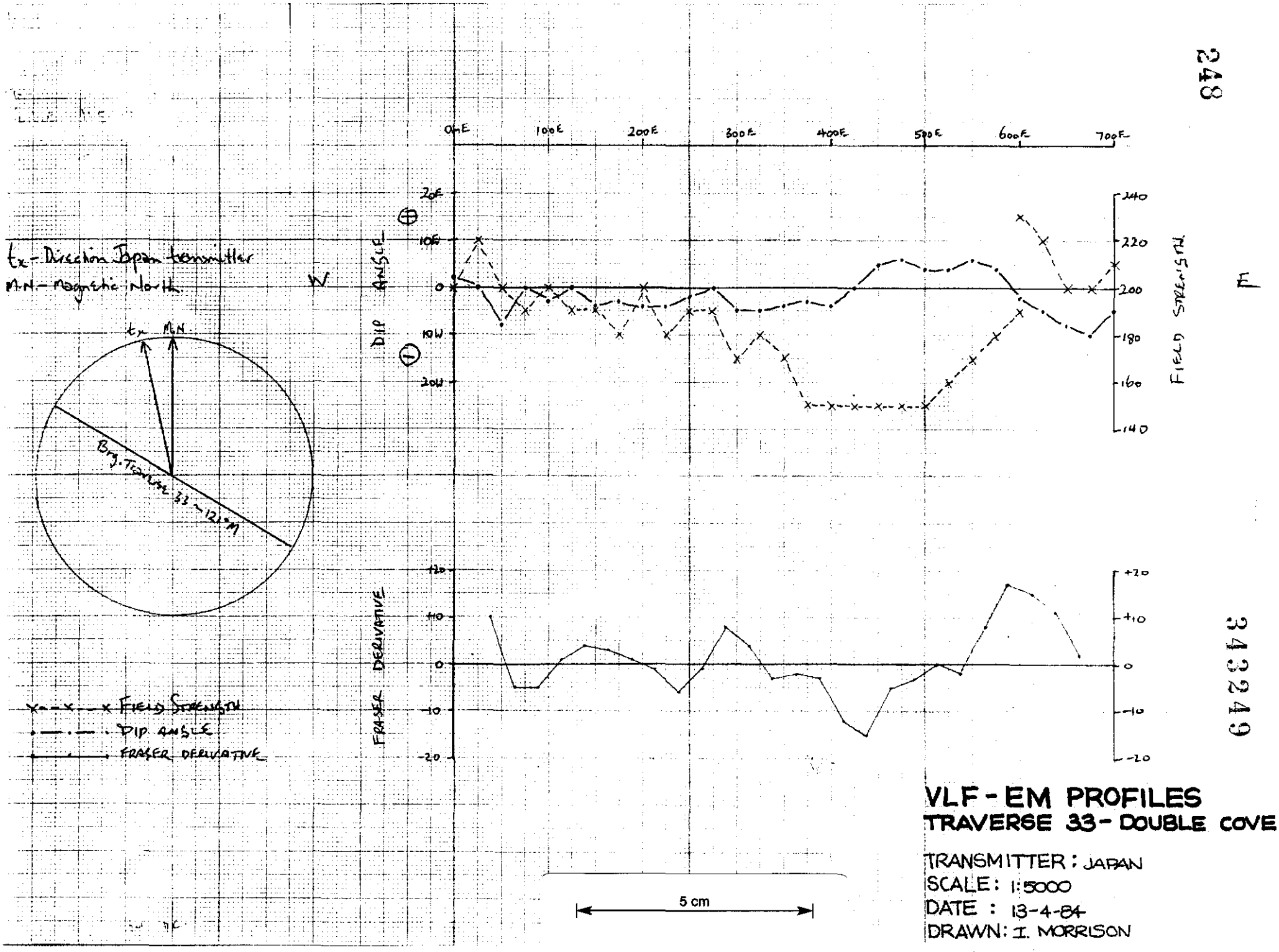
TRANSMITTER- JAPAN
SCALE: 1:5000
DRAWN: I. MORRISON
DATE: 13-4-84



VLF - EM PROFILES
TRAVERSE 32

TRANSMITTER - NORTH WEST CAPE
SCALE : 1:5000
DRAWN: I. MORRISON
DATE : 13-4-84

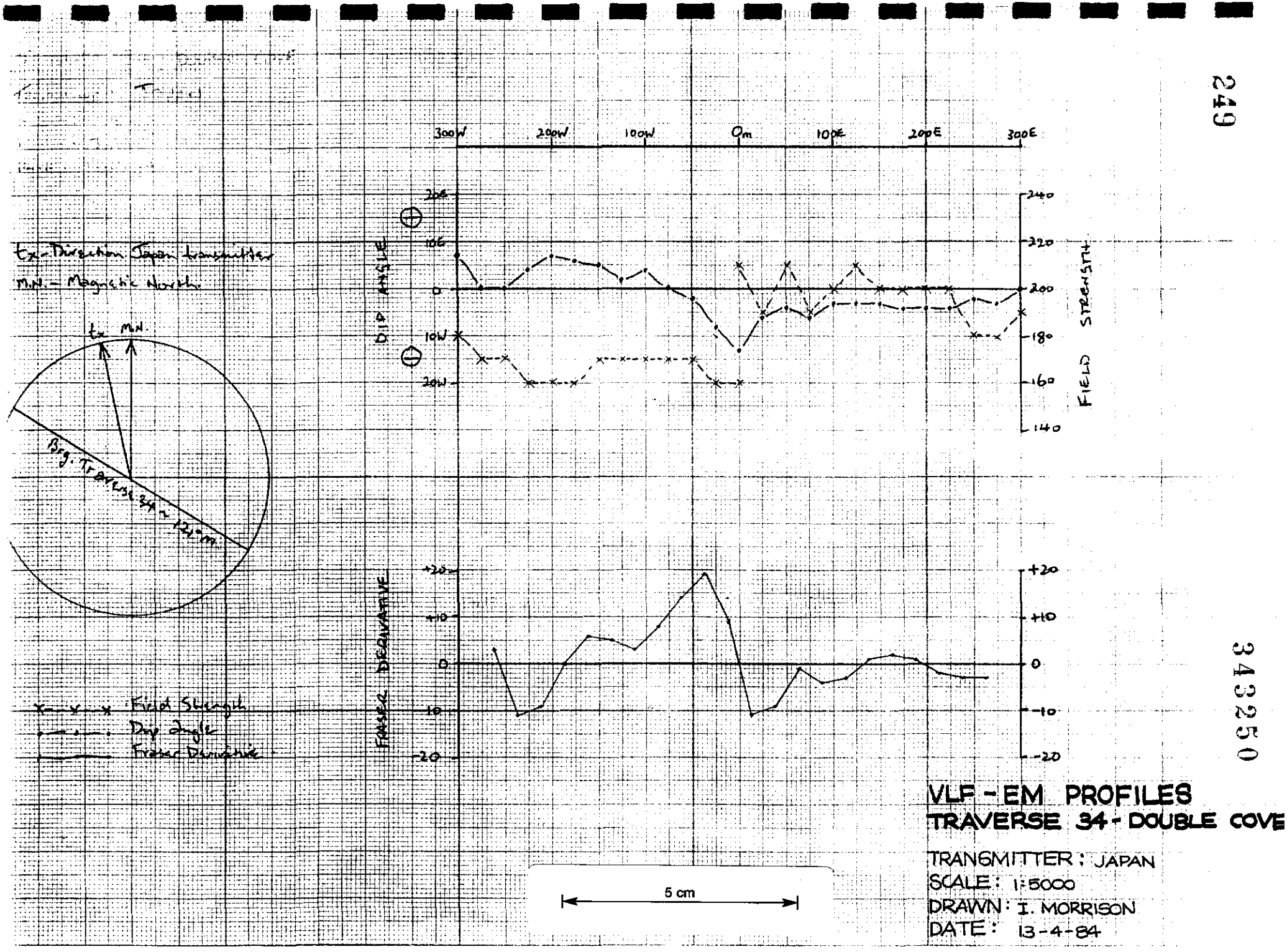
248



VLF-EM PROFILES
TRAVERSE 33 - DOUBLE COVE

TRANSMITTER : JAPAN
SCALE : 1:5000
DATE : 13-4-84
DRAWN : I. MORRISON

343249



VLF - EM PROFILES
TRAVERSE 34 - DOUBLE COVE

TRANSMITTER : JAPAN
SCALE : 1:5000
DRAWN : I. MORRISON
DATE : 13-4-84

250

343251

250

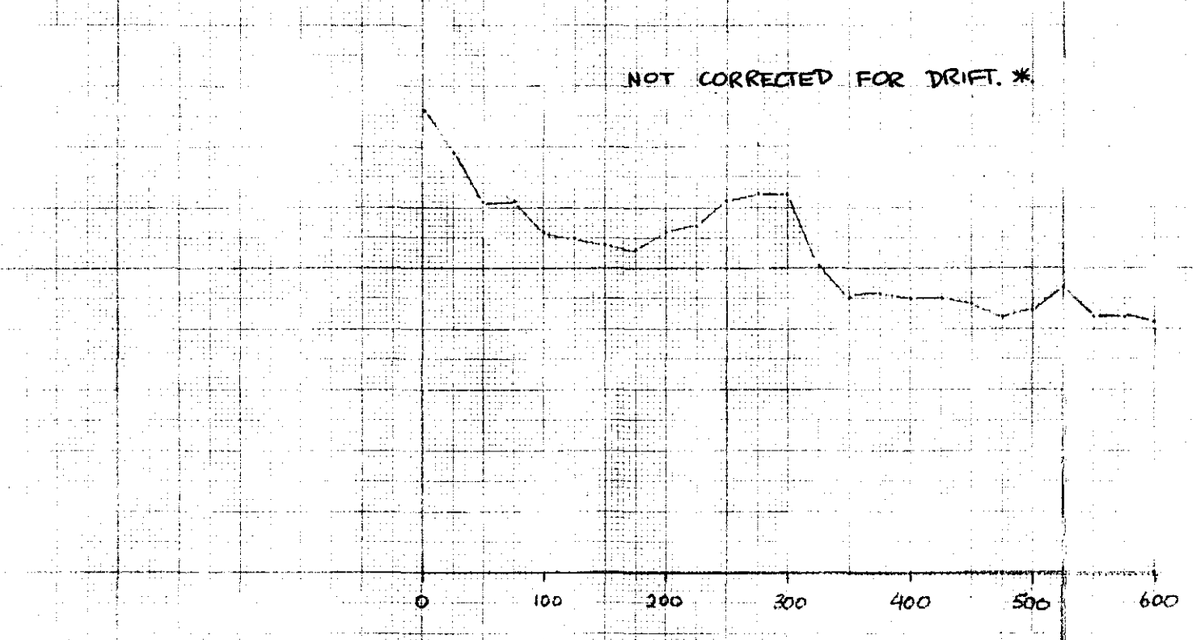
TRAVERSE 26

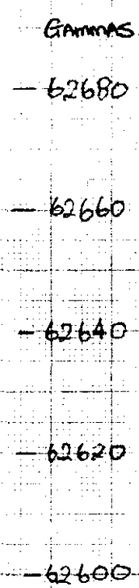
MAGNETIC PROFILES

PLOTTED: PETER SILVERSMITH.

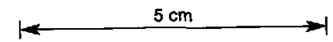
1:5000.

NOT CORRECTED FOR DRIFT. *

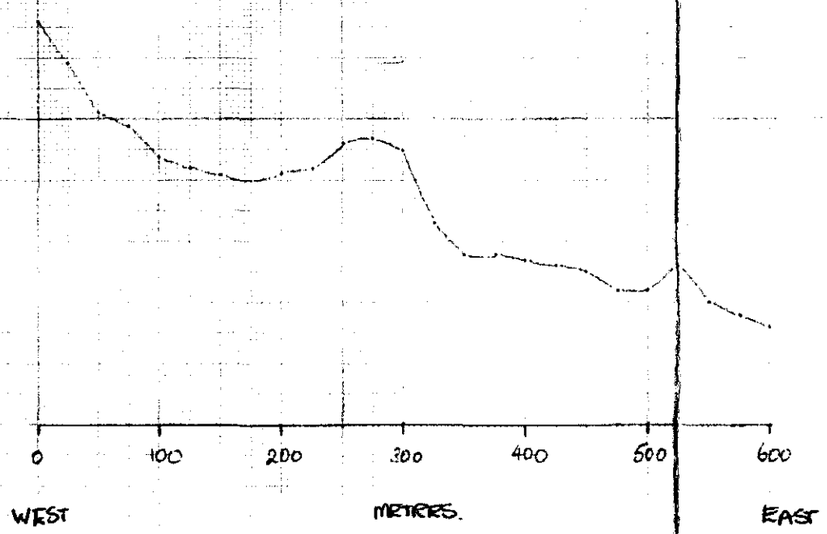


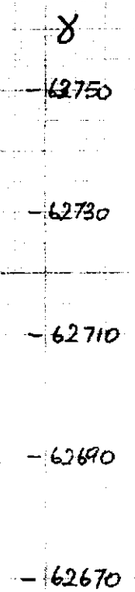


*. BASE STN READING TAKEN ≈ 3 HOURS BEFORE SURVEY START. SURVEY TIME 56 minutes.



CORRECTED FOR DRIFT.





NOT CORRECTED FOR DRIFT.

DRIFT: +11γ OVER 2HR 59M

62740

62720

62700

62680

62660

0 23S

100N

200N

300N

400N

500N

600N

700N

750N

SOUTH.

NORTH

METRES

5 cm

GROUND MAGNETICS
26A LINE - LUCAS CREEK
PLOTTED - P. SILVERSMITH
SCALE 1:5000

NOT CORRECTED FOR DRIFT.

DRIFT: +6 γ OVER 1h

γ

-62680

-62660

-62640

-62620

-62600

EAST.

600

500

400

300

200

100

0

METRES.

WEST

5 cm

MAGNETIC DATA TRAVERSE 27

PLOTTED: P. SILVERSMITH

SCALE 1:5000

253

343254

NOT CORRECTED FOR DRIFT.

DRIFT: +15γ OVER 1hr 30

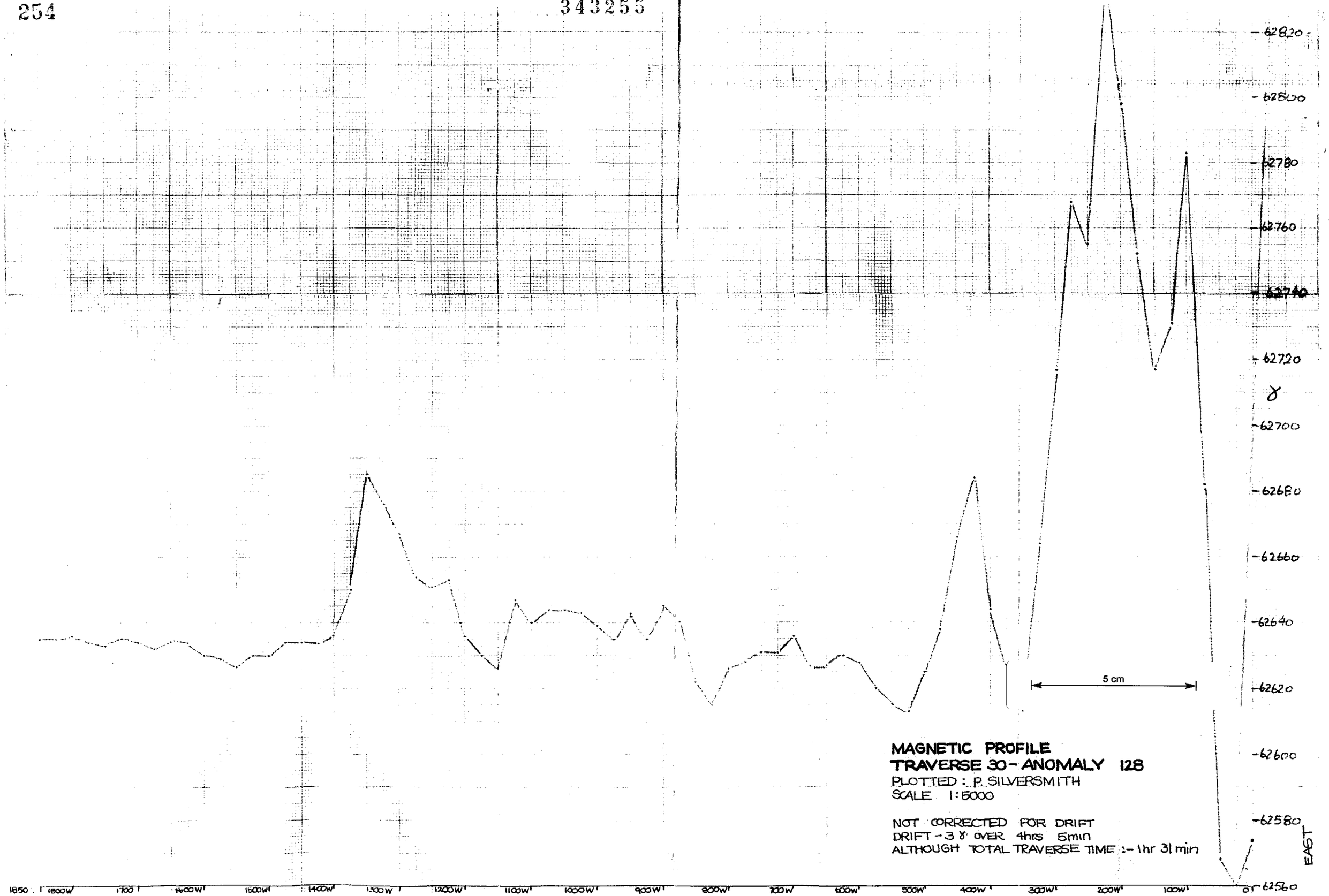
γ

- 62720
- 62700
- 62680
- 62660

5 cm

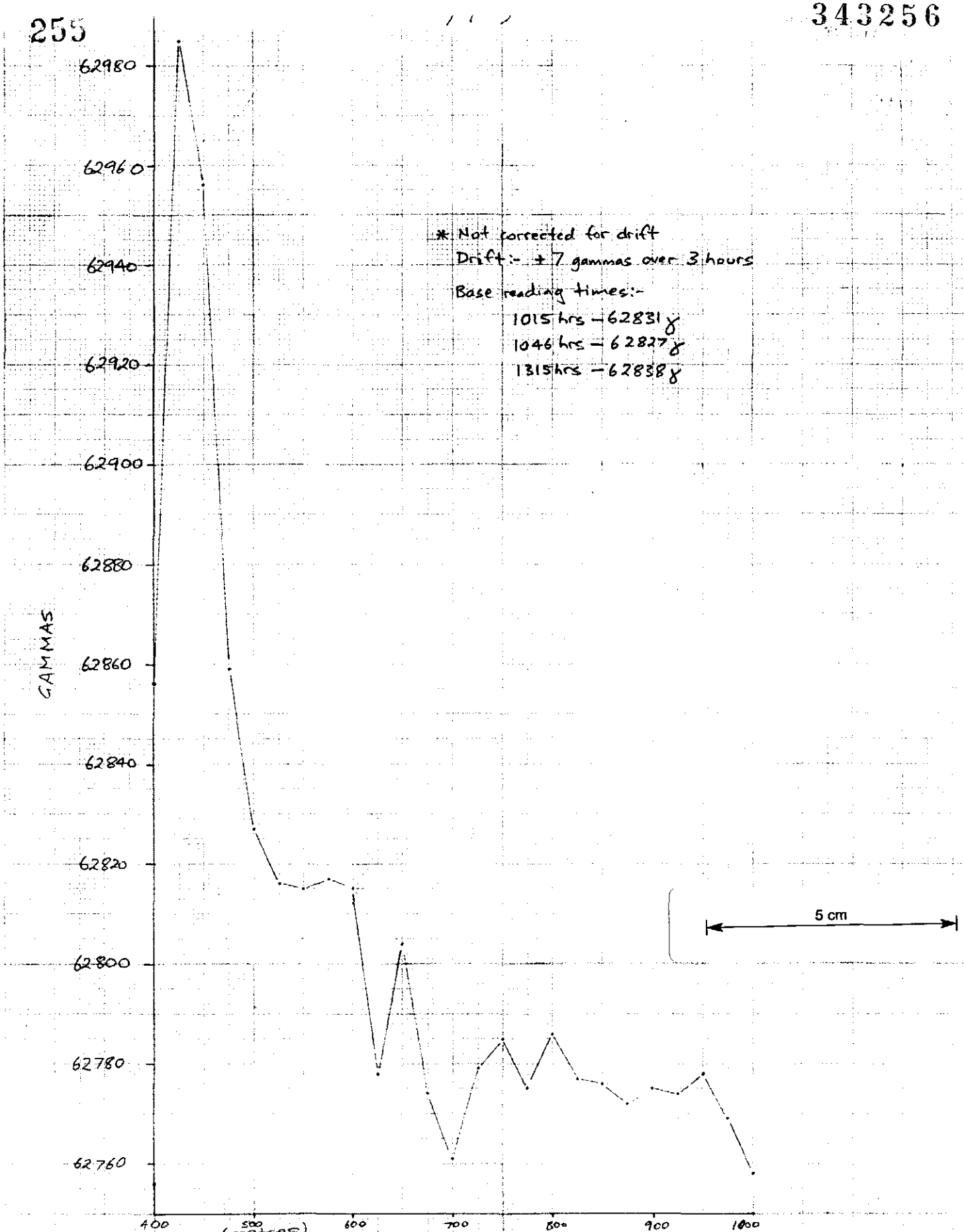
MAGNETIC DATA
TRAVERSE 28
LUCAS CREEK
PLOTTED- P. SILVERSMITH
SCALE 1:5000

343255



MAGNETIC PROFILE
TRAVERSE 30 - ANOMALY 128
PLOTTED : P. SILVERSMITH
SCALE 1:5000

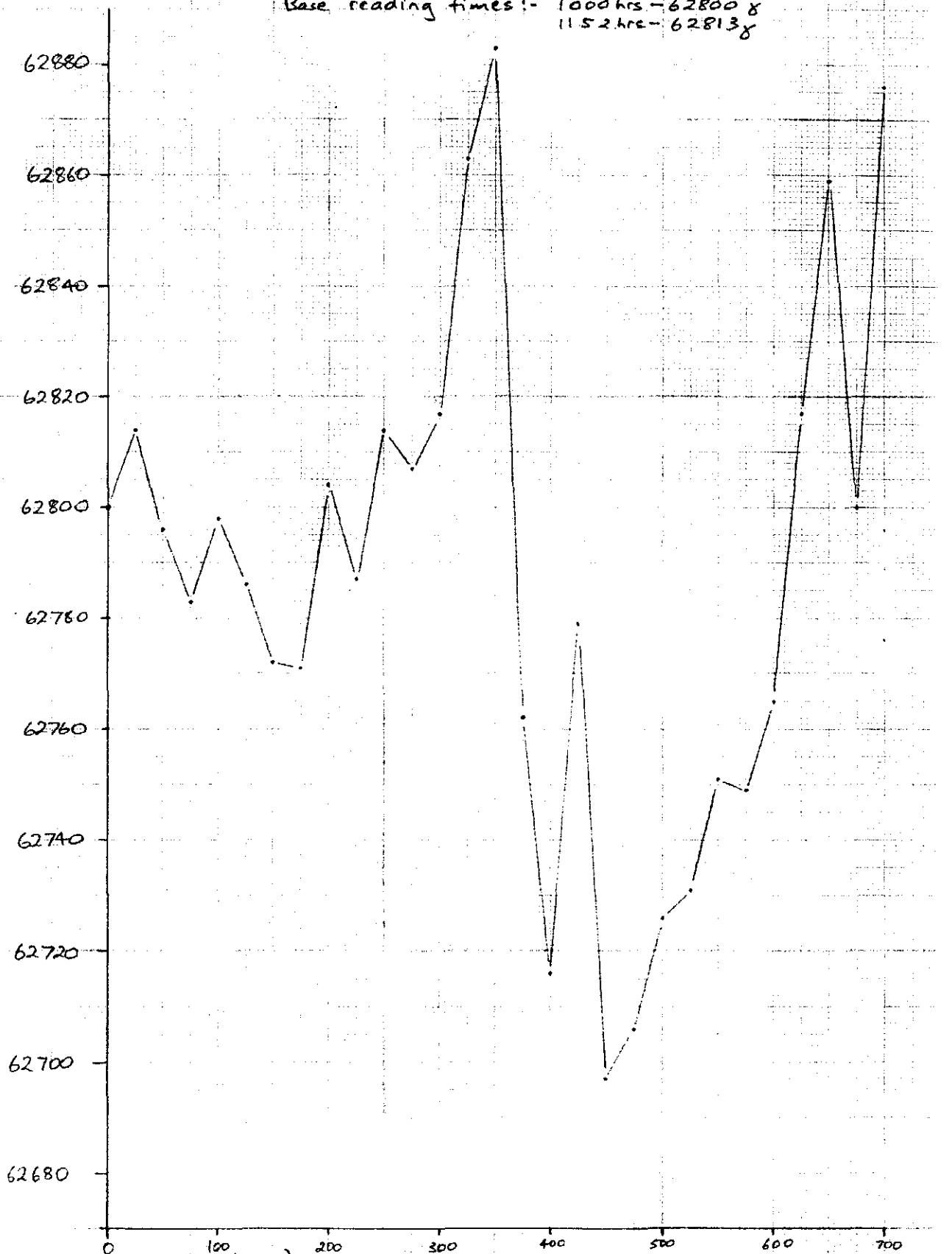
NOT CORRECTED FOR DRIFT
DRIFT - 3 γ OVER 4hrs 5min
ALTHOUGH TOTAL TRAVERSE TIME :- 1hr 31 min



* Not corrected for drift
Drift:- ± 7 gammas over 3 hours
Base reading times:-
1015 hrs – 62831 γ
1046 hrs – 62827 γ
1315 hrs – 62838 γ

TRAVERSE 32
GROUND MAGNETICS
AMOCO MINERALS
SORELL PENINSULA, SW TASMANIA
DOUBLE COVE AREA
SCALE 1:5000

* Not corrected for drift
Drift :- + 13 gammas over 1 hr 52 mins.
Base reading times :- 1000 hrs - 62800 γ
11.52 hrs - 62813 γ



5 cm

TRAVERSE 33
GROUND MAGNETICS
AMOCO MINERALS
SORELL PENINSULA, S.W. TASMANIA
DOUBLE COVE AREA
SCALE 1:5000

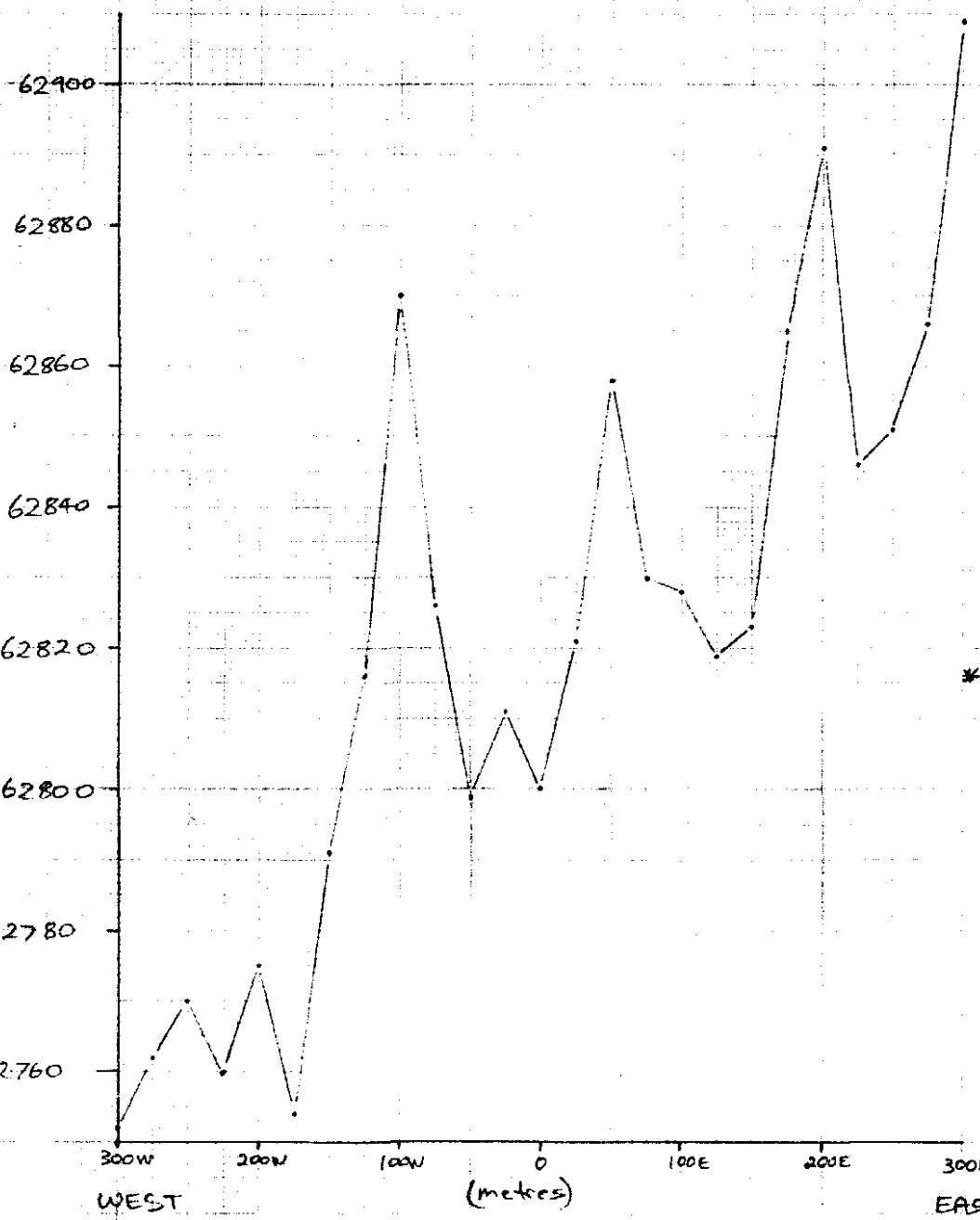
257

343258

AMOCO MINERALS

SORELL PENINSULA, S.W. TASMANIA

DOUBLE COVE AREA



* NOT CORRECTED FOR DRIFT

DRIFT:- 55 gammas over 4hrs 10min

BASE READING TIMES:-

1330 hrs - 62843 γ

1623 hrs - 62863 γ

1740 hrs - 62897 γ

5 cm

GROUND MAGNETICS

TRAVERSE 34

DOUBLE COVE AREA

SCALE: 1:5000

DATE: 4-4-84

5337

EL 35/83

EL 36/83

MACQUARIE HARBOUR

145° 30' E

42° 30' S

LIBERTY POINT

Betsys Bay

Liberty Bay

Table Head

Sleep Rocks

Sleep Point

GORGE POINT

Birthday Bay

Varna Bay

Coal Head

Philips Island

Dingy Point

Soldiers Island

Farm Cove

Pine Point

Gould Point

Kelly Basin

St Leger Point

Bryans Bay

Steadman Beach

Steadman Point

Richardsons Bay

Asbestos Point

Grummet Islands

Surah Island Historic Site

Davis Bay

Hallidays Island

RUM POINT

Brisbane Bay

Charcoal Burners Bluff

Gruboys Point

Wrights Bay

Gordon Point

Birchs Beach

Shamrock Point

Tuan Gabbi Flats

BIRCHS INLET

Pelias Cove

Hugan Cove

Double Cove

Hibbs Pyramid

Meerim Beach

Clearwater Bay

Thames

Jones

Hibbs River

Sorell River

Low Rocky Point Track

Legend

TERTIARY – QUATERNARY

Gravel, alluvium

JURASSIC

Dolerite

PERMIAN

Undifferentiated sediments

DEVONIAN

Spera Bay Group

Dol = dolomite

ORDOVICIAN

Gordon Limestone

Caroline Creek Sandstone (Crotty Equivalent)

CAMBRIAN – Dundas Group

Undifferentiated

I = ironstone

Greywacke, conglomerate

Argillite, siltstone

Unditferentiated
I = ironstone
Greywacke, conglomerate
Argillite, siltstone

Igneous Rocks associated with Dundas Group

Quartz diorite
Hornblende diorite
Gabbro
Pyroxenite serpentinite
Lucas Creek Volcanics
Noddy Creek Volcanics
Mainwaring Volcanics
Elliot Bay Volcanics

Birthday Group

Argillite, schist, phyllite
Limestone

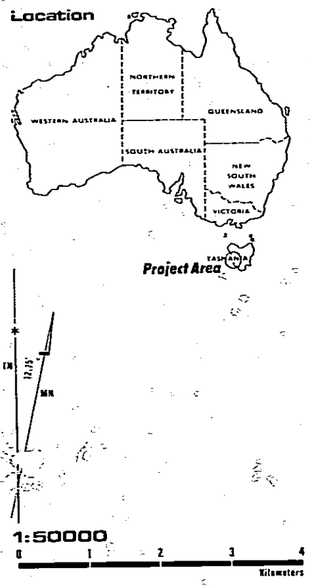
PROTEROZOIC

Modder Group
Varner Group

Geology from BHP and Mines Department 1:250000 geology sheet

Inferred fault
Geological contact
Unconformity

Location



1:50000
0 1 2 3 4 Kilometers

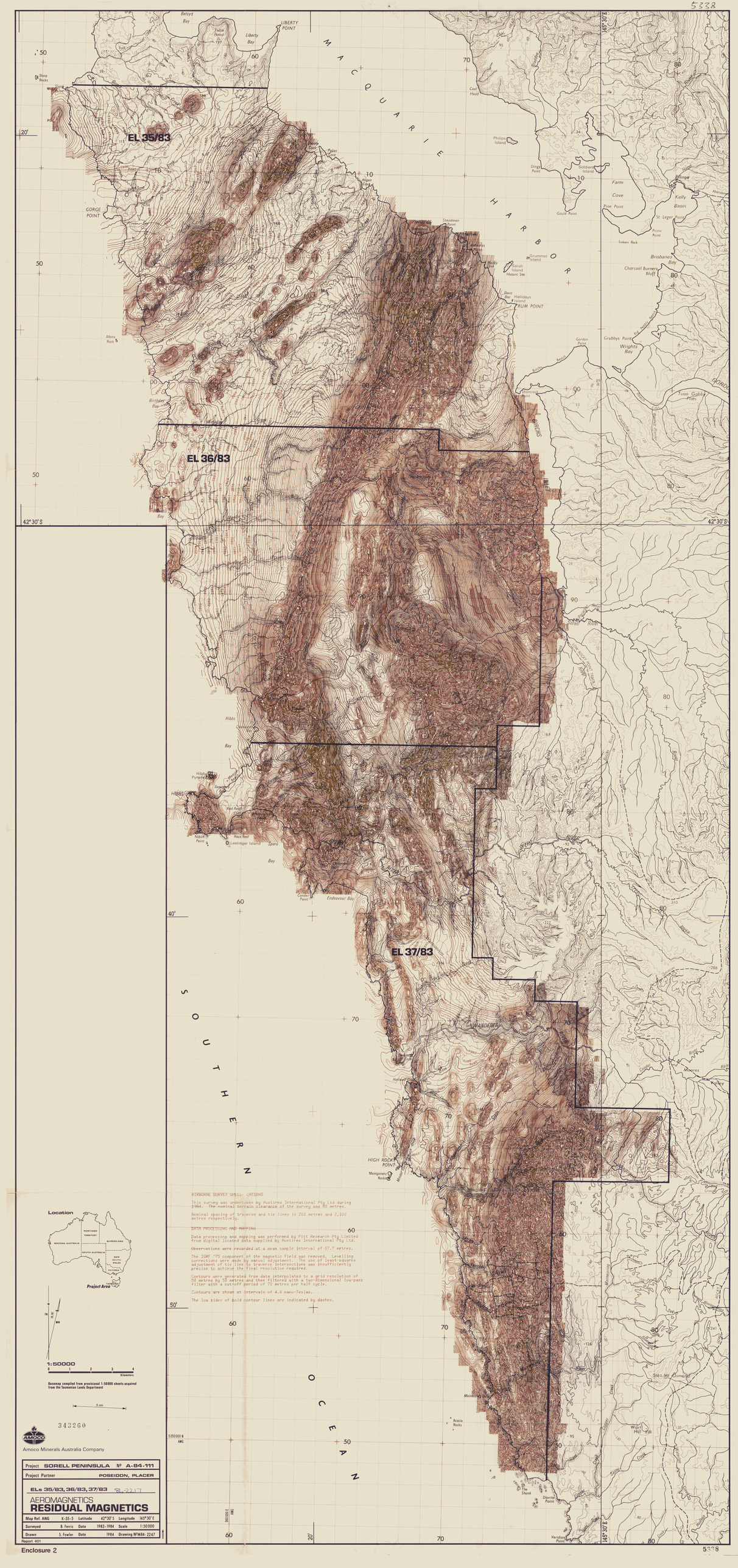
Basemap compiled from provisional 1:50000 sheets acquired from the Tasmanian Lands Department

Amoco Minerals Australia Company

Project	SORELL PENINSULA		Nº	A-84-111	
Project Partner	POSEIDON, PLACER				
ELs 35/83, 36/83, 37/83					
REGIONAL GEOLOGY	8L-2217				
Map Ref. ANG	K-55-5	Latitude	42°30' S	Longitude	145°30' E
Surveyed	B. Ferris	Date	1983-1984	Scale	1:50000
Drawn	S. Fowler	Date	1984	Drawing Nº	M84-2248

Report 401

Enclosure 1



AIRBORNE SURVEY SPECIFICATIONS

This survey was undertaken by Austirex International Pty Ltd during 1984. The nominal terrain clearance of the survey was 80 metres.

Nominal spacing of traverse and tie lines is 200 metres and 2,000 metres respectively.

DATA PROCESSING AND MAPPING

Data processing and mapping was performed by Pitt Research Pty Limited from digital located data supplied by Austirex International Pty Ltd.

Observations were recorded at a mean sample interval of 67.7 metres.

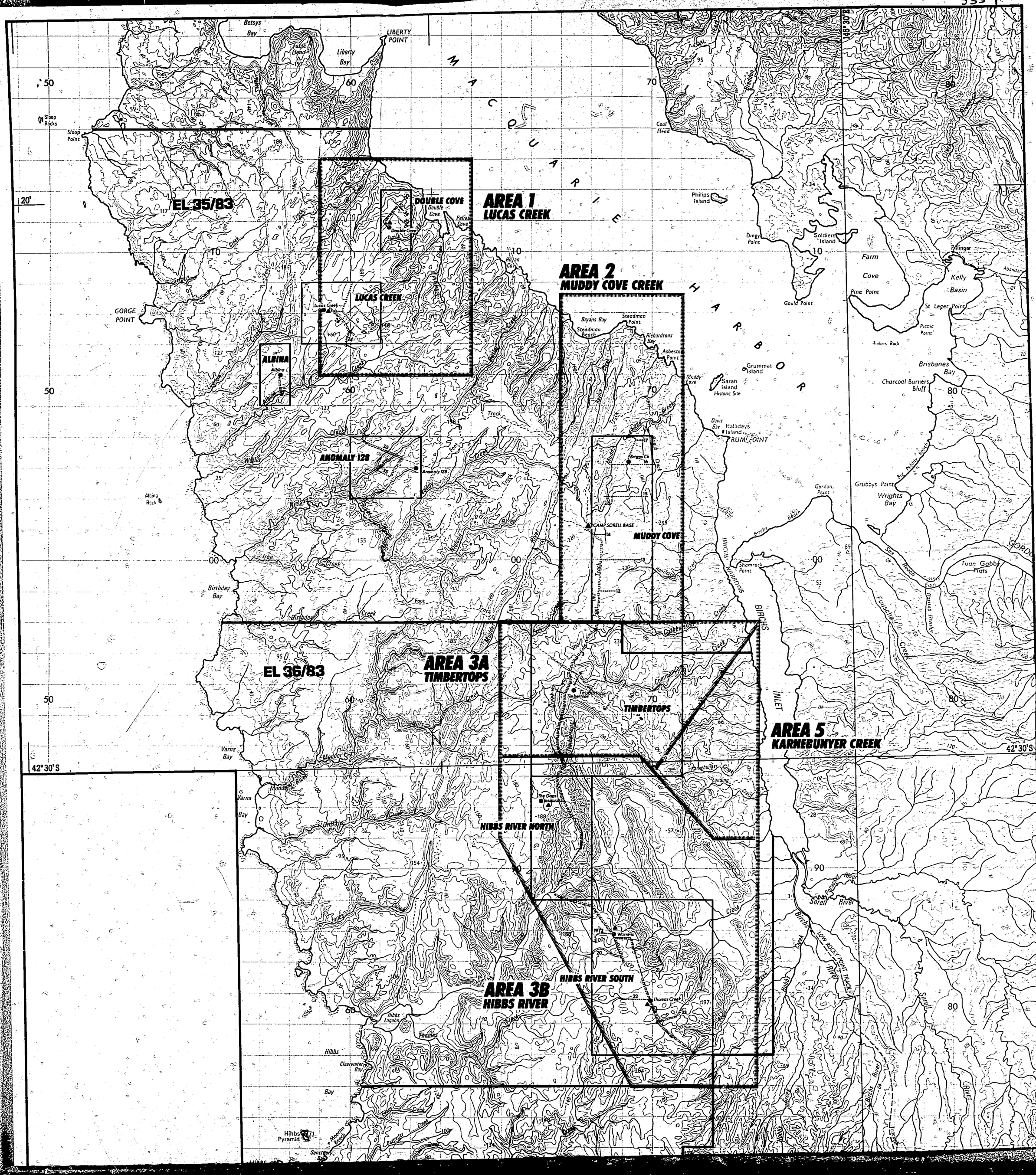
The IGRF '75 component of the magnetic field was removed. Levelling corrections were made by manual adjustment. The use of least-squares adjustment of tie line to traverse intersections was insufficiently precise to achieve the final resolution required.

Contours were generated from data interpolated to a grid resolution of 50 metres by 50 metres and then filtered with a two-dimensional low-pass filter with a cut-off period of 70 metres per half cycle.

Contours are shown at intervals of 4.0 nano-Teslas.

The low sides of bold contour lines are indicated by dashes.

Enclosure 2


AREA 1
LUCAS CREEK
AREA 2
MUDDY COVE CREEK
AREA 3A
TIMBERTOPS
AREA 3B
HIBBS RIVER
AREA 5
KARNEBUNYER CREEK
EL 35/83
EL 36/83
ANOMALY 128
DOUBLE COVE
LUCAS CREEK
MUDDY COVE
TIMBERTOPS
HIBBS RIVER NORTH
HIBBS RIVER SOUTH
ALBINA
CAMP SORELL BASE
MACQUARIE HARBOUR
BIRCHS INLET
LIBERTY POINT
RUM POINT
Betsys Bay
Liberty Bay
Sloop Rocks
Sloop Point
Albina Rock
GORGE POINT
Coal Head
Philips Island
Dingy Point
Soldiers Island
Farm Cove
Pine Point
Gould Point
Kelly Basin
St Leger Point
Picnic Point
Timbers Rock
Brisbanes Bay
Charcoal Burners Bluff
Grummet Island
Sarah Island Historic Site
Bryans Bay
Steadman Point
Steadman Beach
Richardsons Bay
Asbestos Point
Muddy Cove
Davis Bay
Hallidays Island
Gordon Point
Grubbys Point
Wrights Bay
Birchs Beach
Shamrock Point
Tuan Gabbi Flats
Birthday Bay
Varna Bay
Hibbs Lagoon
Hibbs Bay
Clearwater Bay
Hibbs Pyramid
Sanctuary Bay
Low Rocky Point Track
Sorell River
Pleasant River
42°30'S
145°30'E

Legend

Cut foot track .....

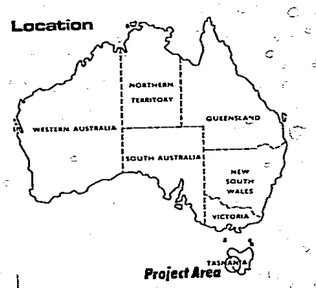
Foot traverses 26

Camp .....

Helipad ..... The Gaps

Ground reconnaissance areas ..... ALBINA

Location



1:50000

0 1 2 3 4 Kilometers

Basemap compiled from provisional 1:50000 sheets acquired from the Tasmanian Lands Department

AMOCO

Amoco Minerals Australia Company

Project	SORELL PENINSULA		Nº A-84-111		
Project Partner	POSEIDON, PLACER				
ELs 35/83, 36/83, 37/83					
REGIONAL BASEMAP AREAS OF INTEREST					
Map Ref. ANG	K-55-5	Latitude	42°30'S	Longitude	145°30'E
Surveyed	B. Ferris	Date	1983-1984	Scale	1:50000
Drawn	S. Fowler	Date	1984	Drawing NºM84-2249	

84-2217

Report 401

Enclosure 3

HIBBS

SPERO

HIGH ROCKY POINT

WANDERER

EL 37/83

AREA 4
CYPRESS CREEK

CYPRESS CENTRAL

MAINWARING NORTH

URQUHART

Hibbs Pyramid 271

Sanctuary Bay

Meerlim Beach

Red Reef Cliff

Whitehorses Beach

Hobsons Cave

Niblin Point

Hays Reef

Leelinger Island

Spero Bay

Endeavour Hill

Cander Point

Endeavour Bay

Warounrim Creek

Plains

Christmas Cave

Hartwell Cove

Hartwell Creek

Montgomery Rocks

Urquhart West

Urquhart South

Cypress Creek

Mainwaring North

Mainwaring Inlet

Acacia Rocks

The Shank

Diorite Point

Veridian Point

Wort Hill 238

368 Mt Osmund

Moores Valley

Hale River

Maxwell River

Mainwaring River

Cooper Creek

Sassy Creek

Hudson Creek

Waterloo Creek

Spero River

Wanderer River

Fletcher Creek

Tubby Creek

Minder Creek

Warounrim Creek

Christmas Creek

Hartwell Creek

Cypress Creek

Mainwaring River

Cooper Creek

Sassy Creek

Hudson Creek

Waterloo Creek

Spero River

Wanderer River

Maxwell River

Hale River

Moores Valley

OCEAN

SOUTHERN

40'

50'

20'

60

70

80

5250000 N AMG

380000 E AMG

145°30'E

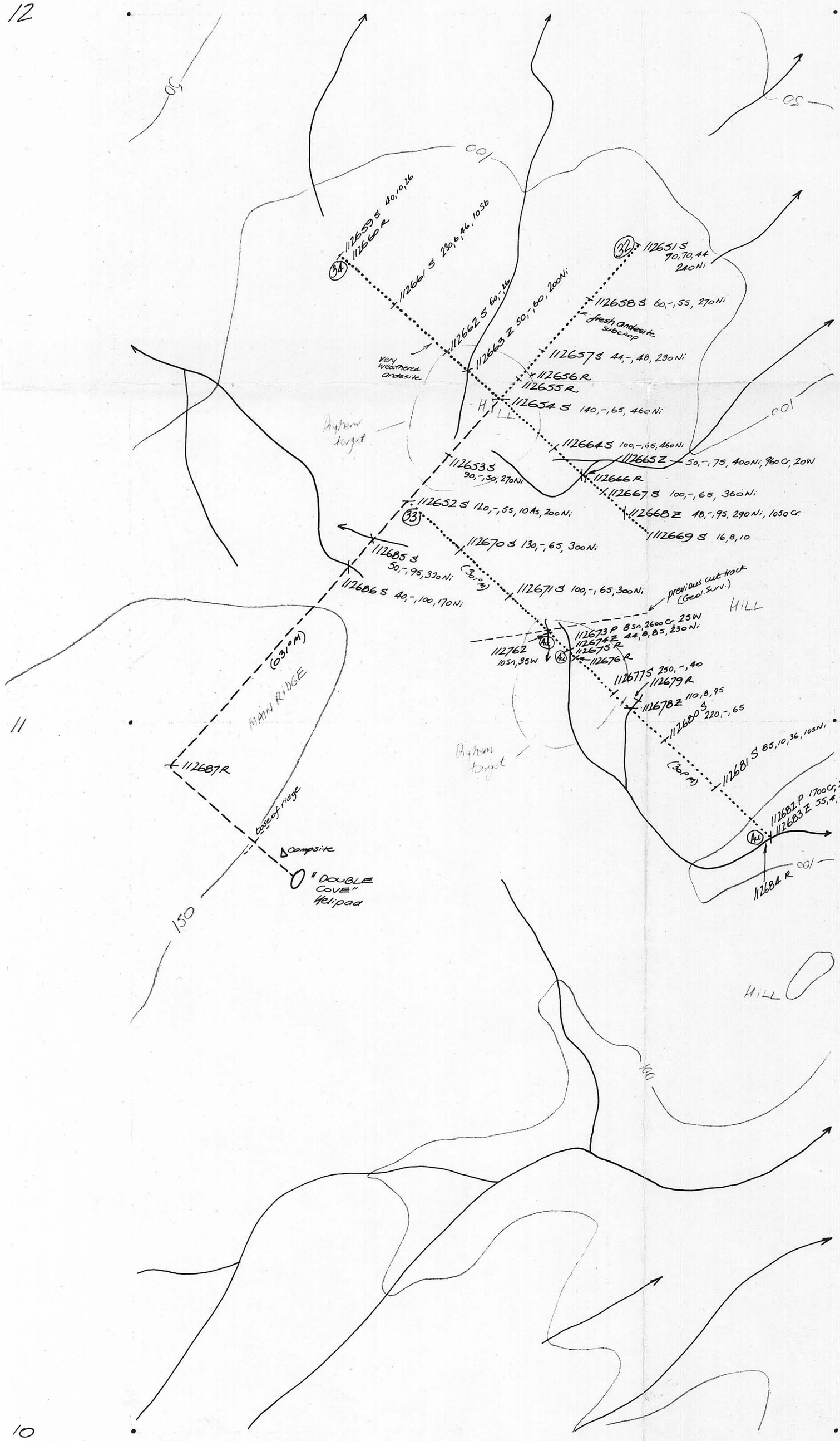
5339

61

62

12

12



GN MN

11.8°

Cut Track (Amoco 1984) helipad, campsite

112789 R
Foot traverse (Amoco 1984)

R = Rockchip Sample
S = Soil
Z = Stream sediment
P = panned concentrate

Assay order
Cu, Pb, Zn ppm.

Others as noted
Where significant.

343261

AMOCO/POSEIDON/PLACER J/V

SORELL PROJECT

DOUBLE COVE
RECCONAISSANCE

Scale 1:5000

5 cm

10

10

62

5350

61

AMOCO REPORT 401 ENCLOSURE 4

84-2217

59 60 61

09 08 07

To Macquarie Harbour 5 km.

170 150 180

MAIN RIDGE

"Lucas Creek" Helipad

KNOLL

SPUR

112587 Z 50/0.75
112586 P

112586 S 190/0.55
112585 S 240/1.35
112584 R
112583 S 240/1.55
112582 S 190/0.50
112581 S 400/1.75
112580 S 180/1.70, 880/1.80m
112579 S 80/1.20m
112578 S 60/1.40/0.80m
112577 S 50/1.40
112576 S 6/1.4
112575 S 6/1.4
112574 S 10/1.8
112573 S 6/1.4
112572 S 10/1.34
112571 S 10/1.74
112570 S 6/1.4
112569 S 6/1.0
112568 S 6/1.4
112567 S 6/1.4
112566 S 6/1.4
112565 S 6/1.0
112564 S 6/1.4
112563 S 6/1.4
112562 S 6/1.4
112561 P 85m
112560 Z 20/1.8
112559 R
112558 Z 6/1.4
112557 P
112556 P
112555 Z 6/1.4
112554 R
112553 R
112552 Z 4/1.4, 165m, Chloc
112551 R
112550 R
112549 P 30m
112548 S 6/1.4
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112539 S 6/1.4
112538 P 30m
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112536 S 6/1.4
112535 S 6/1.4
112534 S 6/1.4
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111863 S 6/1.4
111862 S 6/1.4
111861 S 6/1.4
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111832 S 6/1.4
111831 S 6/1.4
111830 S 6/1.4
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111822 S 6/1.4
111821 S 6/1.4
111820 S 6/1.4
111819 S 6/1.4
111818 S 6/1.4
111817 S 6/1.4
111816 S 6/1.4
111815 S 6/1.4
111814 S 6/1.4
111813 S 6/1.4
111812 S 6/1.4
111811 S 6/1.4
111810 S 6/1.4
111809 S 6/1.4
111808 S 6/1.4
111807 S 6/1.4
111806 S 6/1.4
111805 S 6/1.4
111804 S 6/1.4
111803 S 6/1.4
111802 S 6/1.4
111801 S 6/1.4
111800 S 6/1.4
111799 S 6/1.4
111798 S 6/1.4
111797 S 6/1.4
111796 S 6/1.4
111795 S 6/1.4
111794 S 6/1.4
111793 S 6/1.4
111792 S 6/1.4
111791 S 6/1.4
111790 S 6/1.4
111789 S 6/1.4
111788 S 6/1.4
111787 S 6/1.4
111786 S 6/1.4
111785 S 6/1.4
111784 S 6/1.4
111783 S 6/1.4
111782 S 6/1.4
111781 S 6/1.4
111780 S 6/1.4
111779 S 6/1.4
111778 S 6/1.4
111777 S 6/1.4
111776 S 6/1.4
111775 S 6/1.4
111774 S 6/1.4
111773 S 6/1.4
111772 S 6/1.4
111771 S 6/1.4
111770 S 6/1.4
111769 S 6/1.4
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111756 S 6/1.4
111755 S 6/1.4
111754 S 6/1.4
111753 S 6/1.4
111752 S 6/1.4
111751 S 80/1.8
111750 S 6/1.4
111749 S 6/1.4
111748 S 6/1.4
111747 S 6/1.4
111746 S 6/1.4
111745 S 6/1.4
111744 S 6/1.4
111743 S 6/1.4
111742 S 6/1.4
111741 S 6/1.4
111740 S 6/1.4
111739 S 6/1.4
111738 S 6/1.4

57 58

07 07

001

GN MN

11.8°

"Albina" I

112015 R TS

112005 R

112004 Z 22,6,32

MAIN RIDGE

112006 Z 20,8,36

112003 R

112002 Z 110,10,46

112008 S 120,28,65,16As

112001 R

06 06

150 100

112014 R

112013 R

112012 R

93,120,42

0.25Au, 2300Ba

16,90,300

10As, 1300Ba

112010 R

112007 Z

28,14,26

112009 R

Albina Creek

50

05 05

"Albina" Helipad

Cut Track (Amoco 1984)

112001 R Foot Traverse with Sample Sites

R = rock chip

S = soil

Z = stream sediment

P = panned concentrate

Assay Order

· Cu, Pb, Zn ppm

· Others where significant

TS = petrographic description

84-2217

AMOCO/POSEIDON/PLACER J/V

SORELL PROJECT

ALBINA RECCONAISSANCE

Scale 1:5000

B Ferris duly 84

5 cm

343263

5852

57 58

AMOCO REPORT 401 ENCLOSURE 6

04

03

02



GN MN

11.8°

Cut Track (Amoco 1984)

Helipad

Old Vehicular Track - overgrown (BHP)

Foot Traverse (Amoco 1984)

R = rockchip
S = Soil
Z = Stream sediment
P = panned concentrate

Assay order
Au, Pb, Zn ppm
- others where significant

343264

AMOCO/POSEIDON/PLACER J/V

SORELL PROJECT

ANOMALY "12B" AREA

RECONNAISSANCE

Scale 1:5000

84-2217

Artemis Sept 84

5 cm

5353

68 69 70 04 03 02 01 00 99 98

TO ASBESTOS POINT 3 km.

TO ANOMALY 128 7 km

TO CAMP SORELL 2 km

Muddy Cove Creek

Briggs Creek Helipad

Briggs Creek

Henrietta Creek

112880 R

112879 P 20W

112872 TS

"Camp Sorell"

1. To Anomaly 128 10 km
2. Iron Creek 12 km

TO TIMBER TOPS 3 km.

SSE 972 ft

inter-tuffs, lavas

200

250

30

189

GN MN 11.8°

0 "Briggs" Helipad (1984)

Old Vehicular Tracks - Overgrown (B.H.P.)

7 112999 P Foot Traverse with Sample location

R = rock chip
S = soil
Z = stream sediment
P = panned concentrate
Au ∠ gold sighting

Assay Order
· Cu, Pb, Zn ppm.
· others where significant

TS = petrographic description

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT
AREA 2.
MUDDY COVE RECCONNAISSANCE

Scale 1:5000

5 cm

Beams dept 84

343265

AMOCO REPORT 401 ENCLOSURE 8 84-2217

5355

67 68 69 70 71

98 97 96 95 94 93

To Camp Sorell 3 km.

Timbertops Creek

Cumberlson Creek

Commandant Creek

To Wibbs Lagoon 18 km

"Timbertops" Helipad (formerly Exp Tent 1)

Old helipad

hill knoll

5 cm

GN MN

11.8°

Old Vehicular Track (BHP) – Overgrown.

Foot Traverse and Sample Site.
R = Rock Chip
Z = Stream Sediment
S = Soil
P = Panned Concentrate
TS = Petrographic description

Cut Foot Track (Amoco 1984)

Assay Order
· Cu, Pb, Zn ppm
· others were significant

343266

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT

TIMBERTOPS RECCONAISSANCE

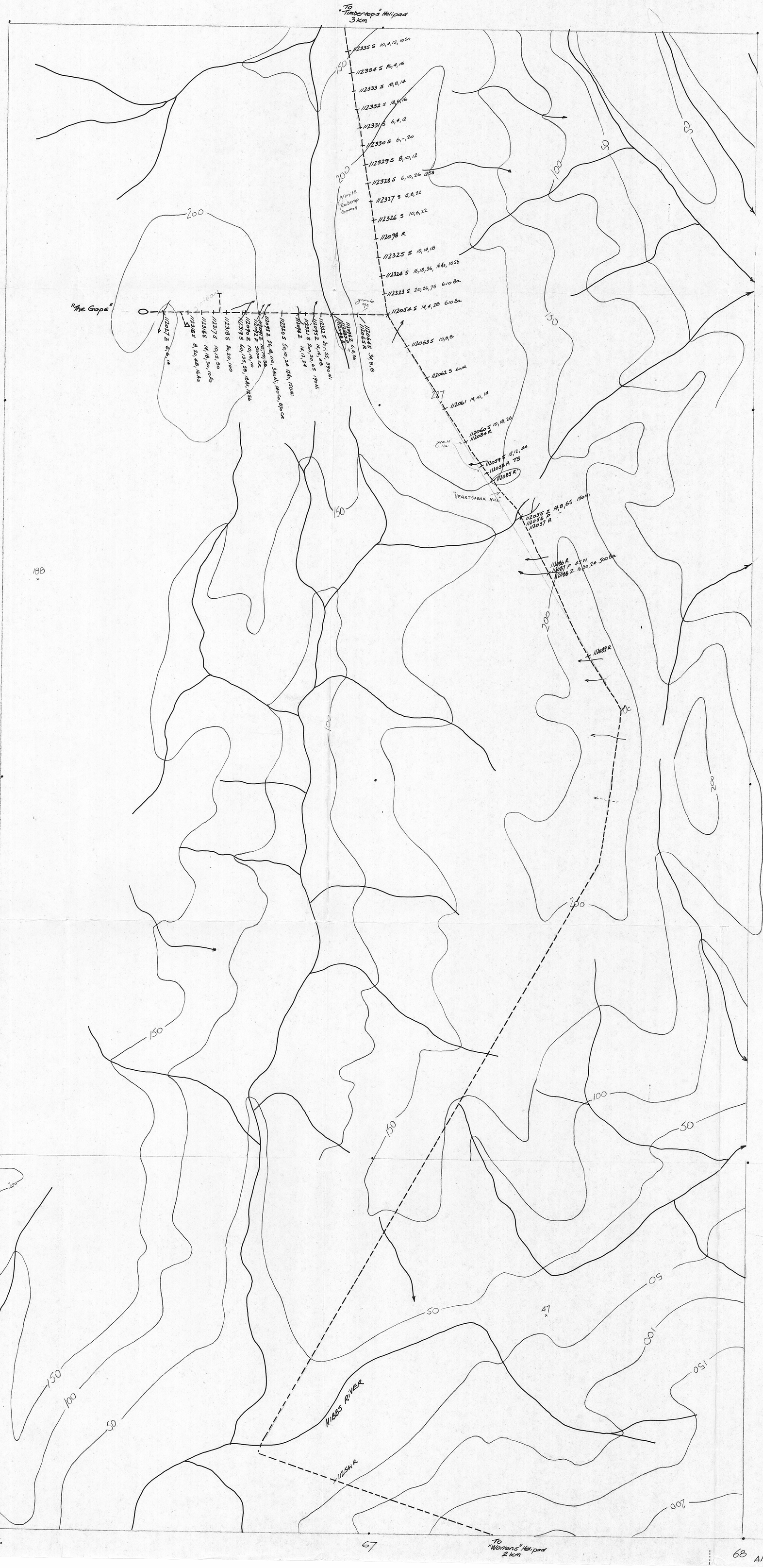
Scale 1:5000

5 cm

Brian's Jap84

5355

AMOCO REPORT 401 ENCLOSURE 9 84-2217



93

92

GN MN
11.8°

91

90

(1984)
Cut Foot Track and Sample site.
R = rock chip
S = Soil
Z = stream sediment
P = panned concentrate

"The Gaps" Helipad (1984)

Composite

Assay Order
· Au, Pb, Zn ppm
· others where significant

TS = petrographic description

343267

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT
HIBBS RIVER RECCONNAISSANCE
Sheet 1 (North)
Scale 1:5000

5 cm

Stems, June 84

89

5357

68 69 70 71 72 89 88 87 86 85 84

To "The Gaps" 5km
"Timbertops" 8km
Helipads

"Warrens" Helipad

"Thomas Creek" Helipad

Timbertops Creek

Feen Creek

GN MN
118°

Cut Foot-Track

Foot-Traverse and Sample Site
K = rock chip
S = Soil
Z = Stream sediment
P = panned concentrate
TS = petrographic description

Assay Order
Cu, Pb, Zn ppm
others where significant

Helipad

Campsite

343268

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT
HIBBS RIVER RECCONNAISSANCE
Sheet 2 (South)
Scale 1:5000

5 cm

Bfem's Jun.84

AMOCO REPORT 401 ENCLOSURE 11 84-2217

5357

5358

"Urquhart West" Helipad

"Urquhart South" Helipad

"Urquhart" Helipad (1984)

Cut Foot Track (AMOCO 1984)

Foot Traverse and Sample location
R = Rock chip
S = Soil
Z = Stream sediment
P = panned concentrate
(Au) = alluvial gold sighting
Assay Order
Cu, Pb, Zn ppm
others where significant

TS = petrographic description

343269

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT
CYPRESS NORTH (URQUHART)
RECCONNAISSANCE

Scale 1:5000

5 cm



"Cypress" Helipad (1984)

Campsite

Old Vehicular Track - Overgrown (BHP)

112666 Z Foot Traverse and Sample site

R = rockchip
S = Soil
Z = stream sediment
P = panned concentrate
TS = petrographic description

343270

AMOCO/POSEIDON/PLACER J/V

SORELL PROJECT

CYPRESS CENTRAL RECCONNAISSANCE

Scale 1:5000

5 cm

BFerris June 84

5359

AMOCO REPORT 401 ENCLOSURE 13 84-2217

73 74 75

56

To Cypress Creek 2 km.

"Mainwaring North" Helipad.

100

112702 P
112703 Z 20W 60,-,110

Olivine basalt

113037R TS

112708 Z 60,-,80,100Ni; 15W
112709 P 15W

112704 P –
112705 Z 50,-,80,110Ni; 15W

87

basalt ridge

112706 Z 95,-,90,140Ni

112710 Z 60,-,75,180Ni

100

112707 Z 110,-,110,150Ni

112711 P –
112712 Z 70,12,85,170Ni

50

55

52 54

374 E

50

Mainwaring River

50

89

53

GN MN

11.8

O "Mainwaring North" Helipad (1984)

Cut Foot Track (Amoco 1984)

112788 Z Foot Traverse and Sample Site

R = rock chip
S = soil
Z = stream sediment
P = panned concentrate
TS = petrographic description

343271

AMOCO/POSEIDON/PLACER J/V
SORELL PROJECT
MAINWARING NORTH
RECONNAISSANCE

Scale 1:5000

Brems Jun84

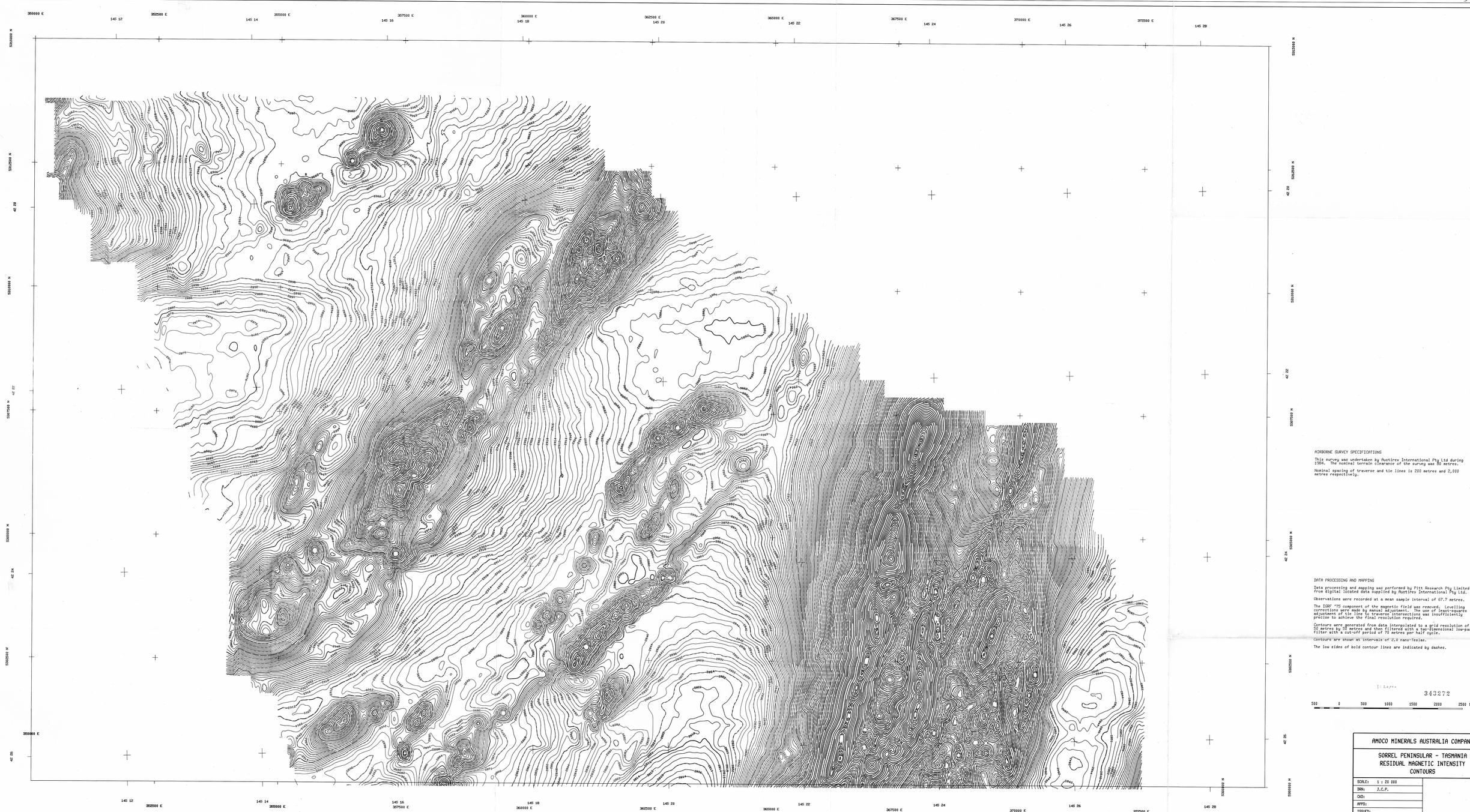
5 cm

5360

AMOCO REPORT 401 ENCLOSURE 14 84-2217

5340

5340



AIRBORNE SURVEY SPECIFICATIONS

This survey was undertaken by Austirex International Pty Ltd during 1984. The nominal terrain clearance of the survey was 80 metres.

Nominal spacing of traverse and tie lines is 200 metres and 2,000 metres respectively.

DATA PROCESSING AND MAPPING

Data processing and mapping was performed by Pitt Research Pty Limited from digital located data supplied by Austirex International Pty Ltd.

Observations were recorded at a mean sample interval of 67.7 metres.

The IGRF '75 component of the magnetic field was removed. Levelling corrections were made by manual adjustment. The use of least-squares adjustment of tie line to traverse intersections was insufficiently precise to achieve the final resolution required.

Contours were generated from data interpolated to a grid resolution of 50 metres by 50 metres and then filtered with a two-dimensional low-pass filter with a cut-off period of 70 metres per half cycle.

Contours are shown at intervals of 2.0 nano-Teslas.

The low sides of bold contour lines are indicated by dashes.

343272

500 0 500 1000 1500 2000 2500 Metres

AMOCO MINERALS AUSTRALIA COMPANY

SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
CONTOURS

SCALE: 1 : 25 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 1

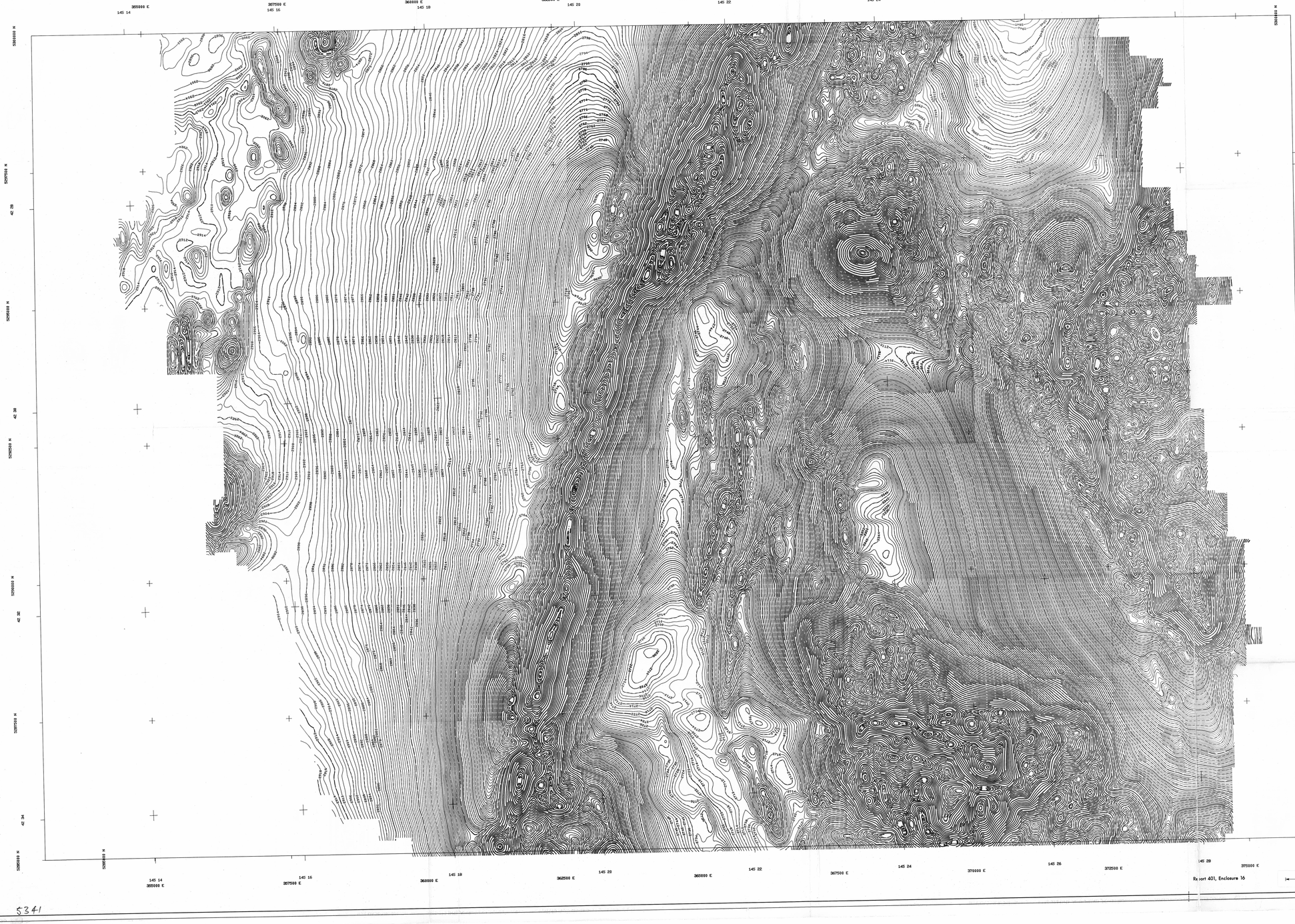
High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

Report 401, Enclosure 15

5340

5340

5341



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500 0 500 1000 1500 2000 2500 Metres

340273 5341

AMOCO MINERALS AUSTRALIA COMPANY

SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
CONTOURS

SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 2 (84-2217)

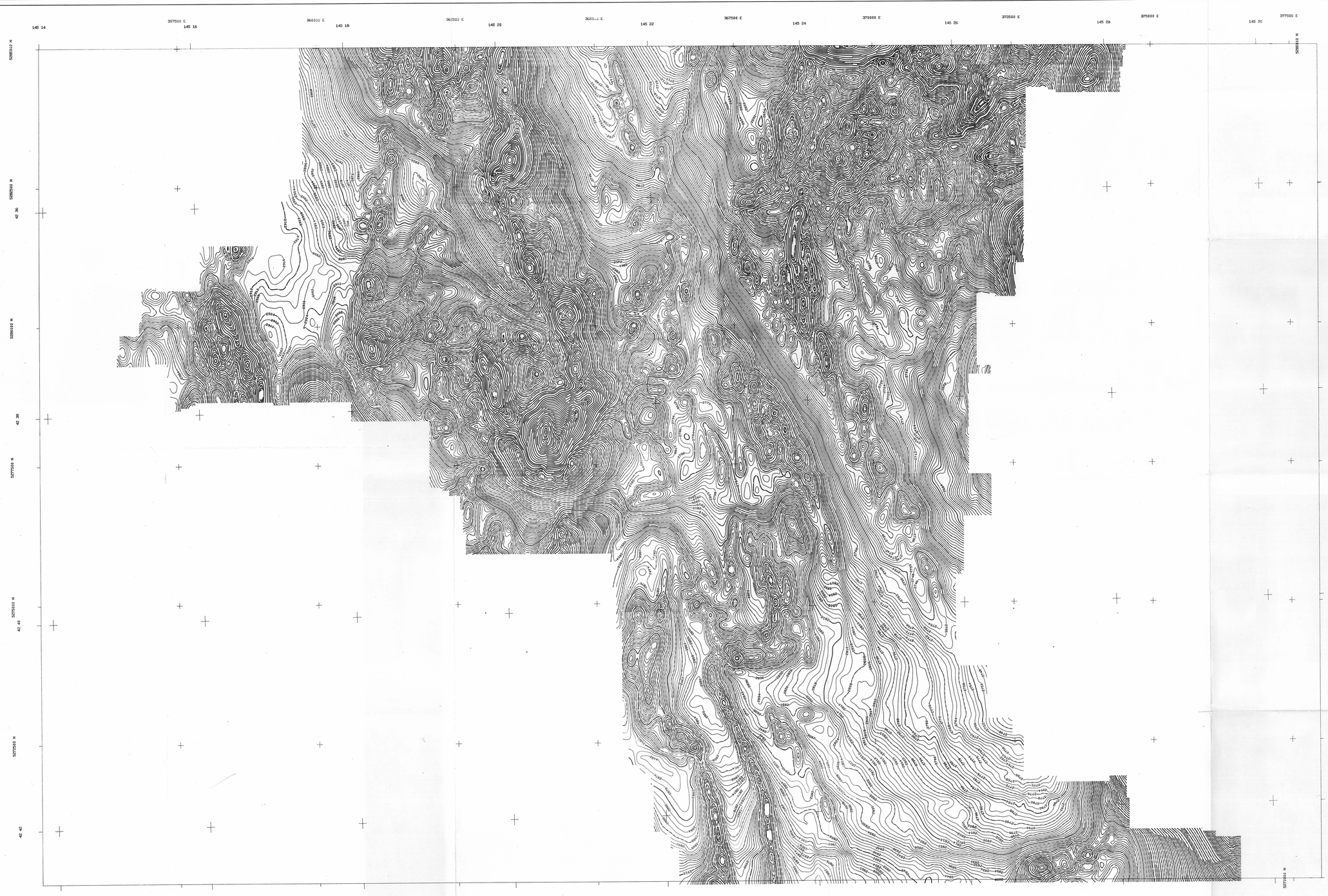
High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

5 cm

5341

5342

5342



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500 0 500 1000 1500 2000 2500 Metres

342374

5342

AMOCO MINERALS AUSTRALIA COMPANY

SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
CONTOURS

SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 3 84-221

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

Report 401, Enclosure 17

5cm

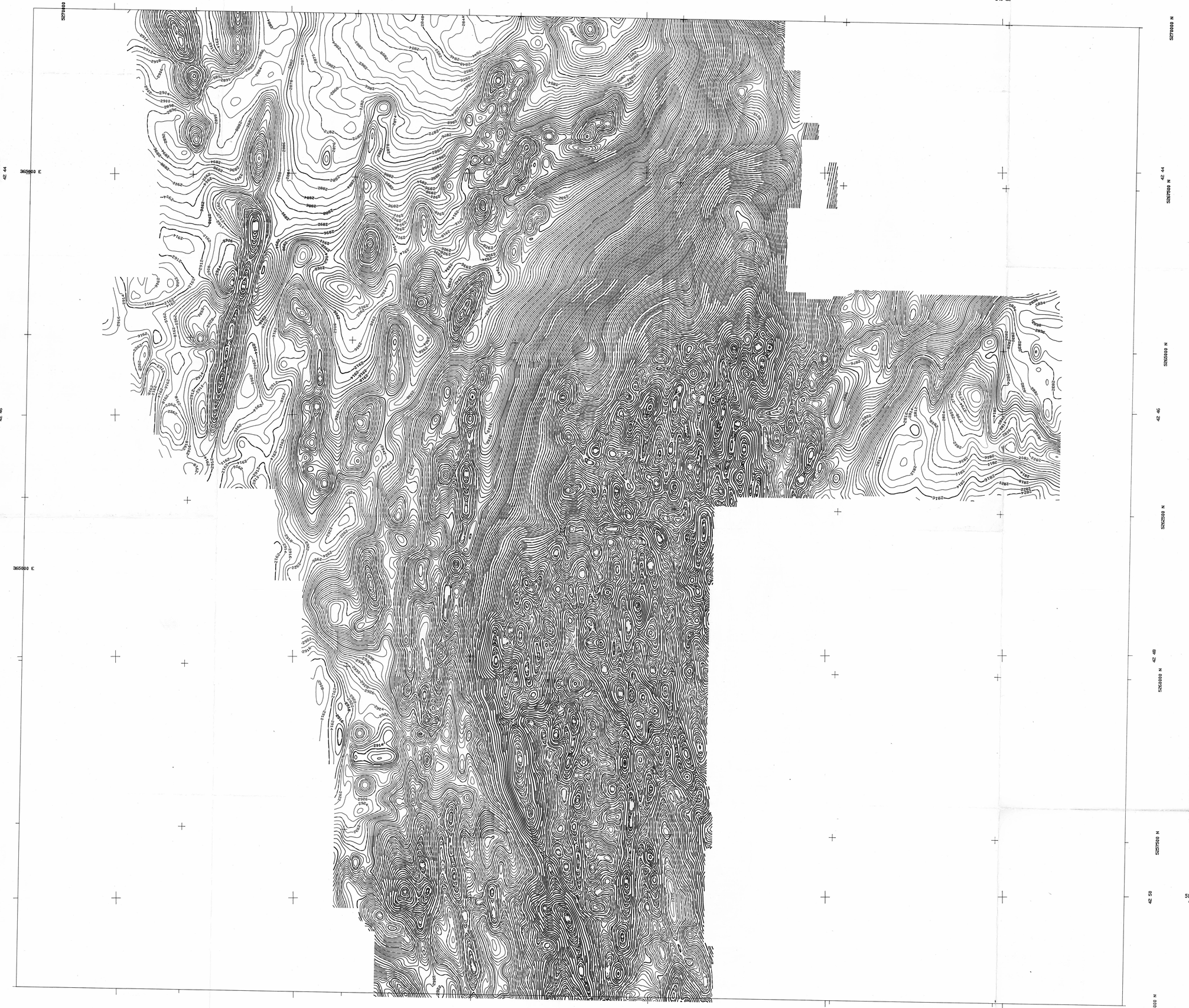
5342

5343

145 22 367500 E 145 24 370000 E 145 26 372500 E 145 28 375000 E 145 30 377500 E 145 32 380000 E

5270000 N 42 44 5267500 N 42 46 5265000 N 42 48 5262500 N 42 50 5260000 N

365000 E



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500 0 500 1000 1500 2000 2500 Metres

343275

5343

AMOCO MINERALS AUSTRALIA COMPANY

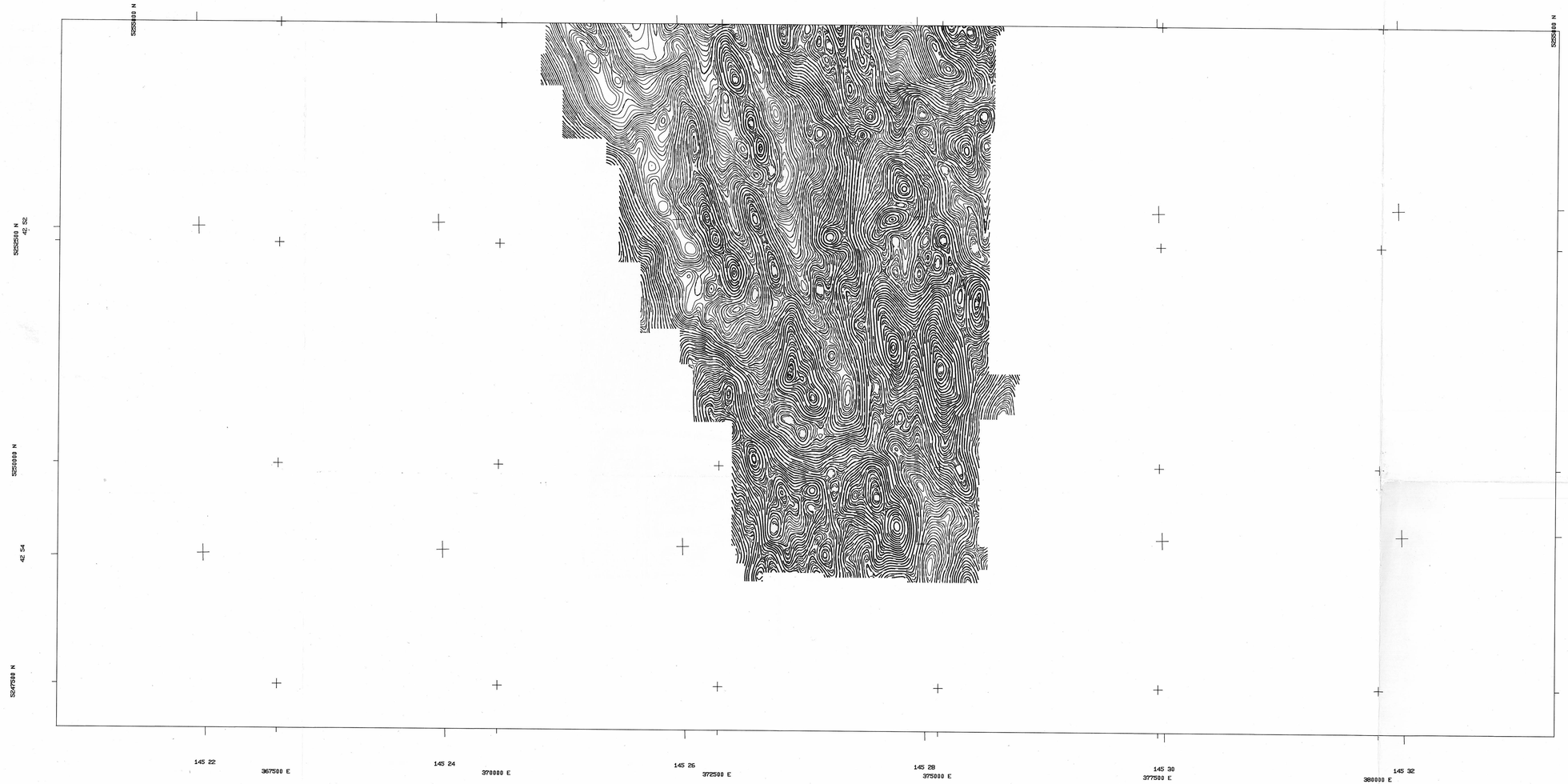
SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
CONTOURS

SCALE:	1 : 20 000	
DRN:	J.C.P.	
CKD:		
APPD:		
ISSUED:		
DATE:	4th June 1984	SHEET: 4 84-2217

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

Report 401, Enclosure 18

5 cm



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500 0 500 1000 1500 2000 2500 Metres

343276

5344

AMOCO MINERALS AUSTRALIA COMPANY

SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
CONTOURS

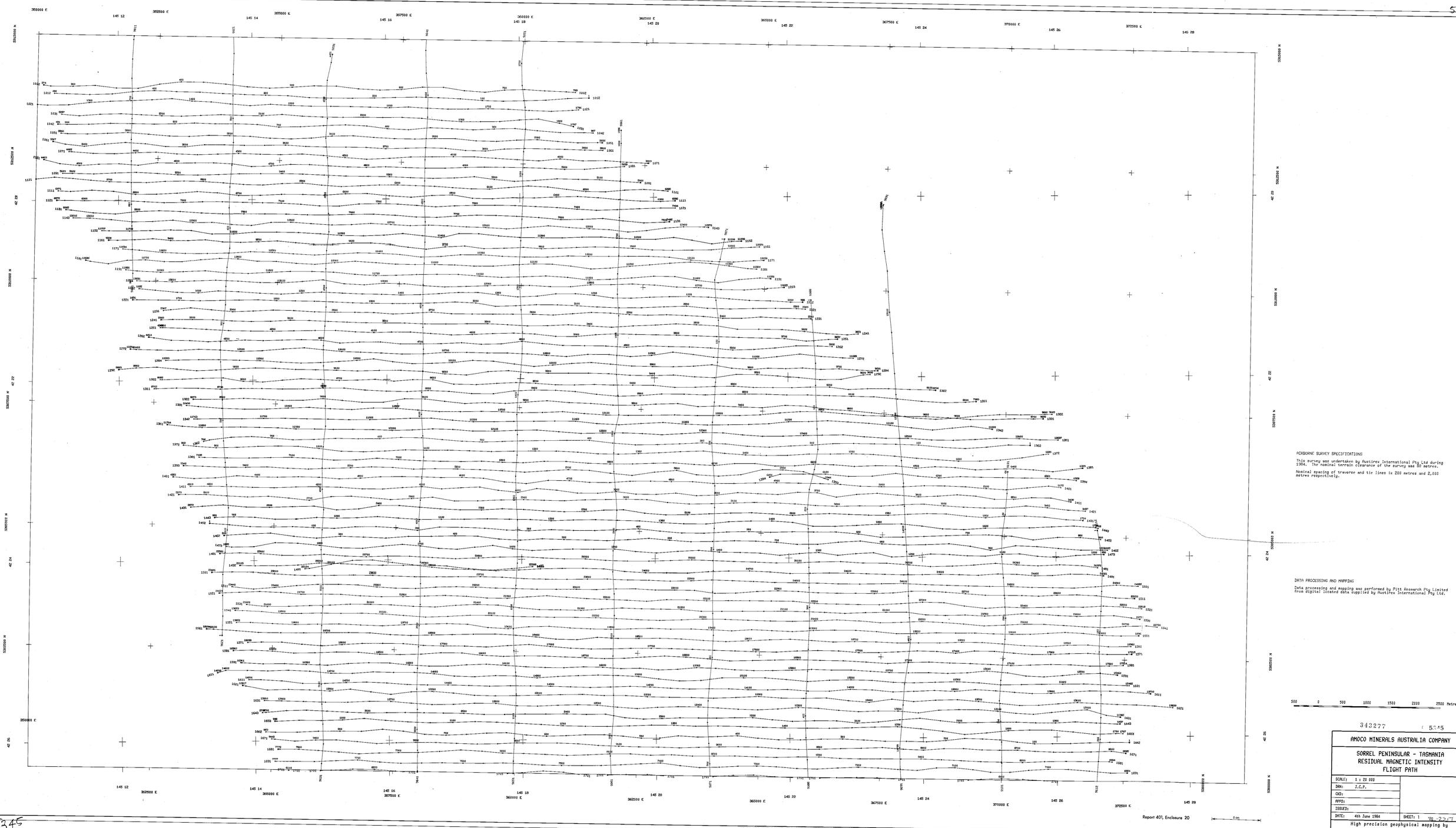
SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 5 84-2217

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

Report 401, Enclosure 19

5 cm

5345



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500 0 500 1000 1500 2000 2500 Metres

Report 401, Enclosure 20

0 5cm

342277 : 5345

AMOCO MINERALS AUSTRALIA COMPANY

SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
FLIGHT PATH

SCALE:	1 : 20 000
DRN:	J.C.P.
CKD:	
APPD:	
ISSUED:	
DATE:	4th June 1984
SHEET:	1

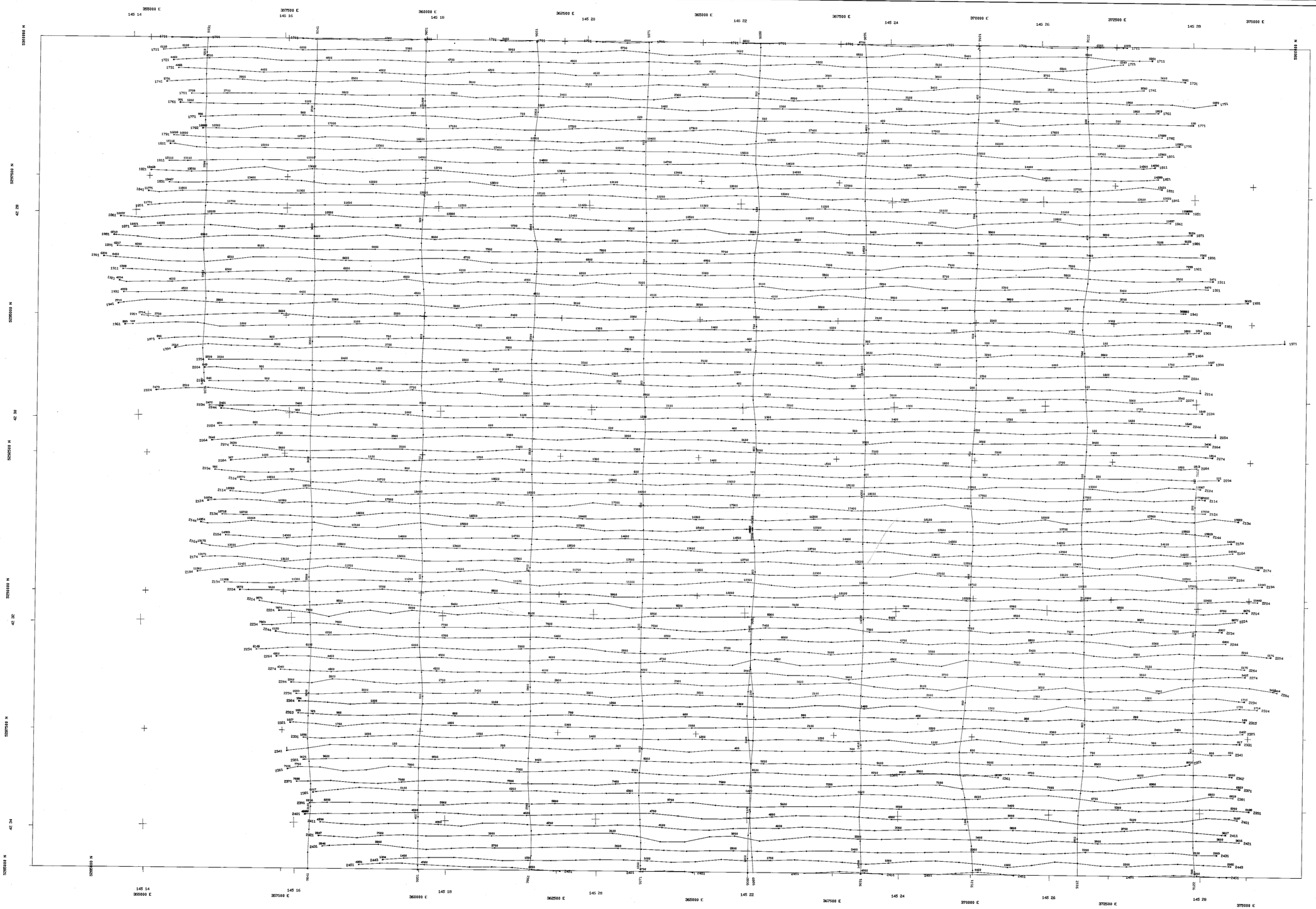
SR-2277

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

5345

5346

5346



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500 0 500 1000 1500 2000 2500 Metres

Report 401, Enclosure 21

6 cm

342278

5346

AMOCO MINERALS AUSTRALIA COMPANY

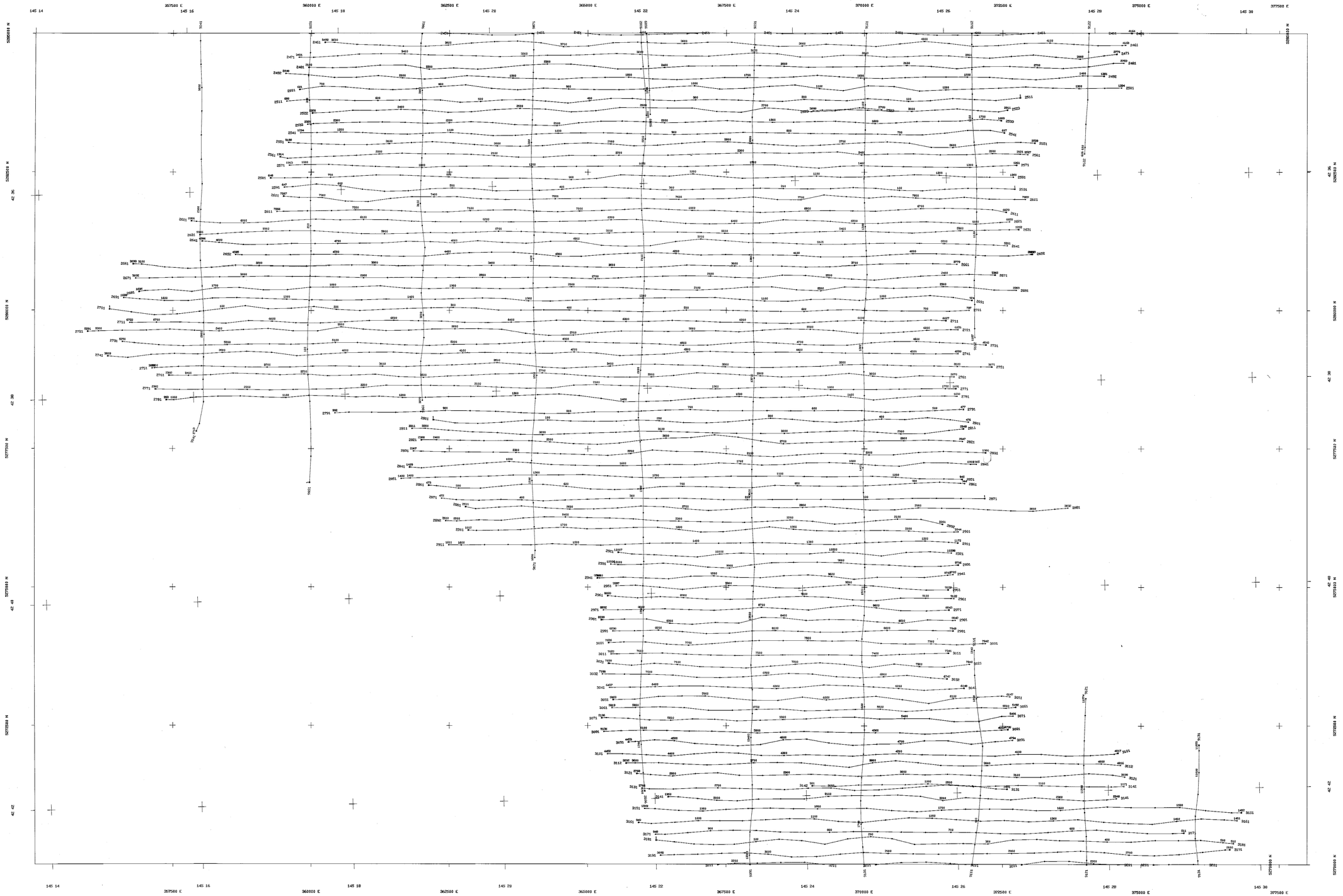
SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
FLIGHT PATH

SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 2 82-2217

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

5346

5347



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500 0 500 1000 1500 2000 2500 Metres

343279

5347

Report 401, Enclosure 22

5 cm

AMOCO MINERALS AUSTRALIA COMPANY

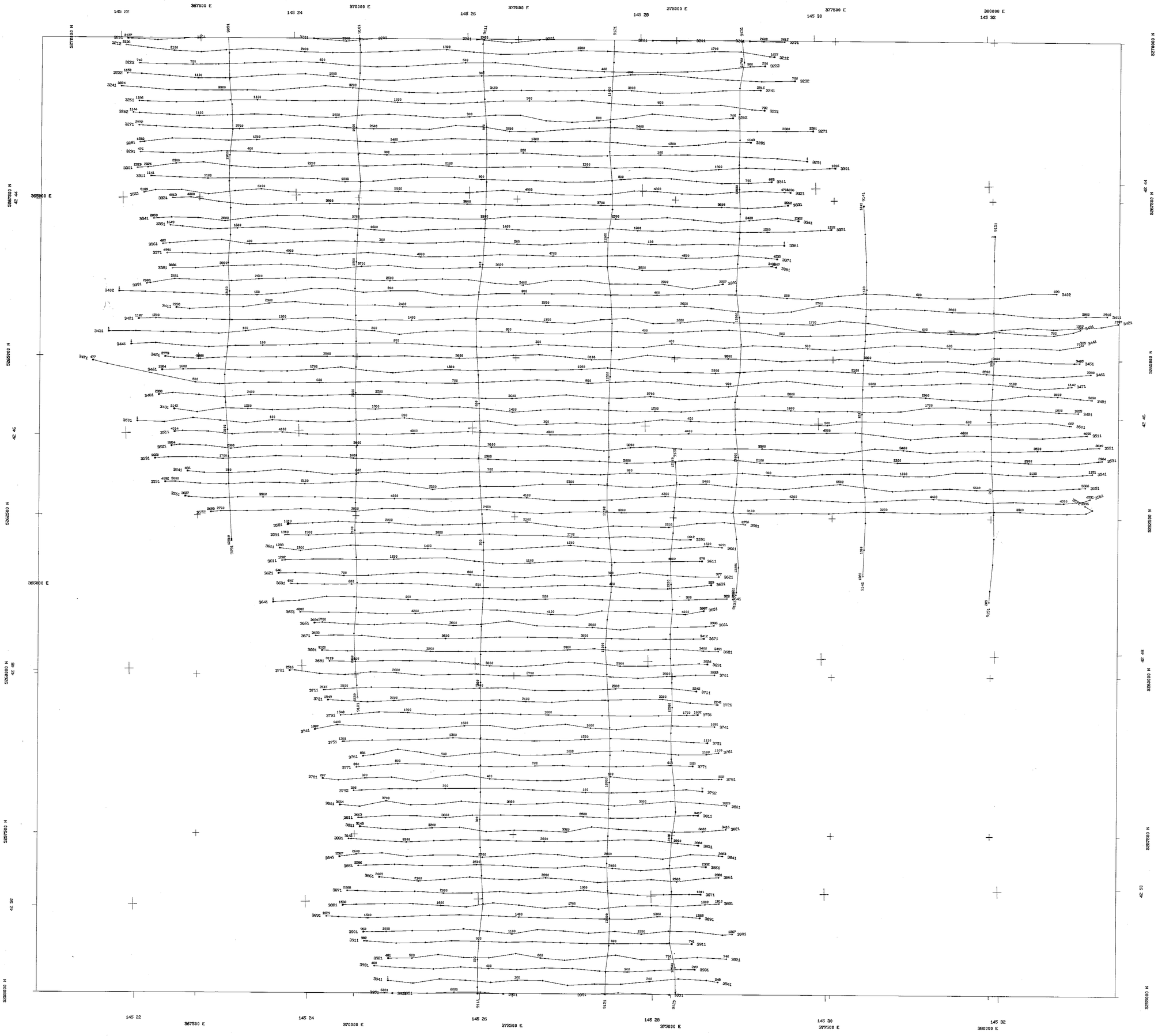
SORREL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
FLIGHT PATH

SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 3 RL-2217

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED

5347

5348



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500 0 500 1000 1500 2000 2500 Metres

Report 401, Enclosure 23

6 cm

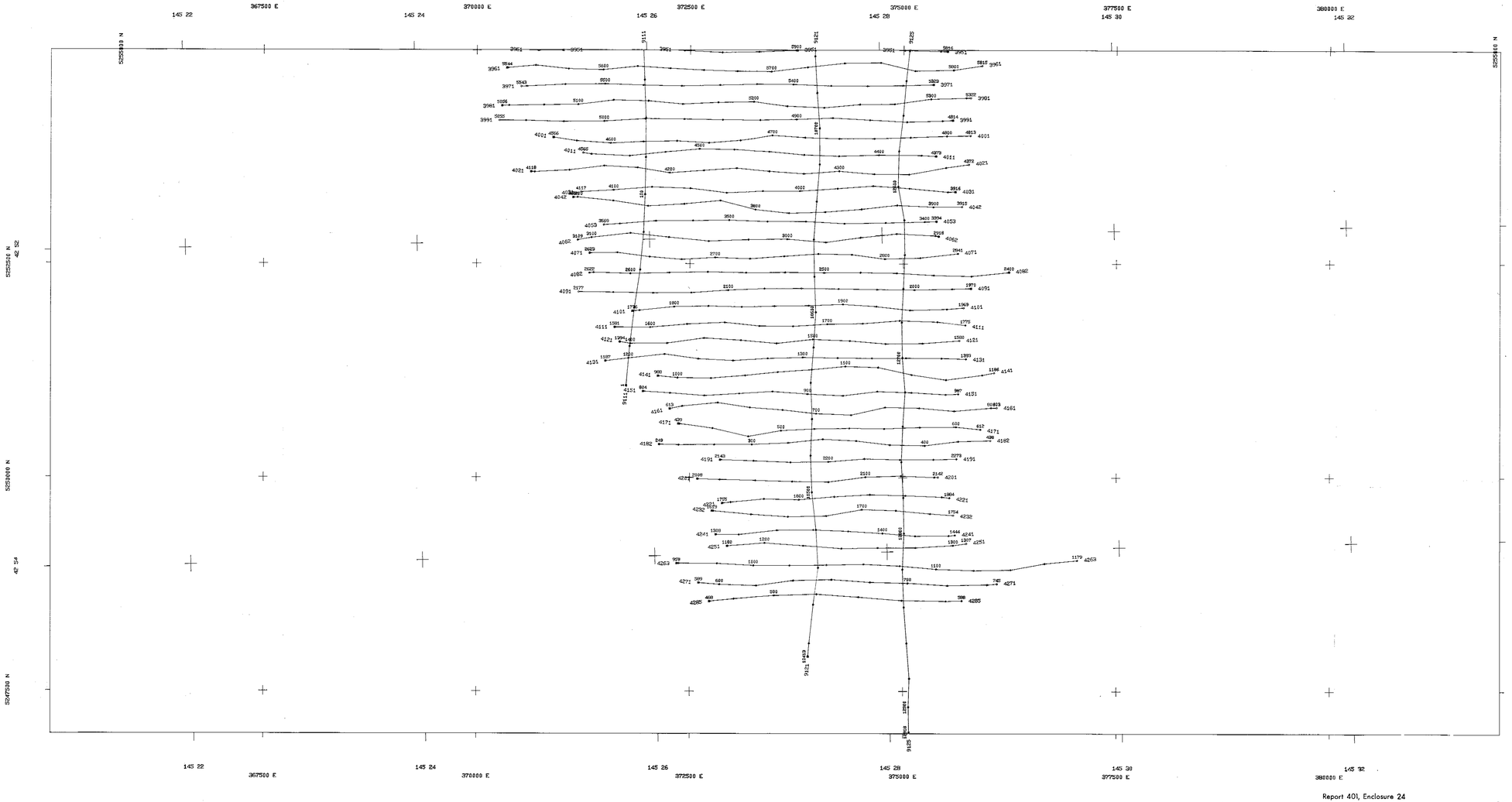
343280 5348

AMOCO MINERALS AUSTRALIA COMPANY

SORRELL PENINSULAR - TASMANIA
RESIDUAL MAGNETIC INTENSITY
FLIGHT PATH

SCALE: 1 : 20 000	
DRN: J.C.P.	
CKD:	
APPD:	
ISSUED:	
DATE: 4th June 1984	SHEET: 4 84-227

High precision geophysical mapping by
PITT RESEARCH PTY LIMITED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9125
15429
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