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DKS

707001

72-0924

(58)

050

E.L. 44/70 - (A.R.A. Dodson)

REPORT ON OPERATIONS FOR THE SIX MONTHS TO

MAY 3, 1972

AND PROPOSED WORK PROGRAM TO NOVEMBER 3, 1972

AMG REFERENCE POINTS ADDED

SUMMARY

A major airborne electromagnetic survey was completed over the Exploration Licence in the first half of the period. The more significant anomalies within the reduced Licence area were followed up by gridding and ground electromagnetic and self potential surveys during the second half.

A detailed stream sediment geochemical survey covering the large block of limestone in the southern portion of the licence was completed. Several weakly anomalous trains were detected.

Bedrock soil geochemical sampling of previously obtained geophysical anomalies on the Spray grid was completed. Anomalous values indicate that mineralization is present in these areas.

Feasibility studies into mining and treating the Oonah ores continued. These were closely tied to similar studies on other mineralized bodies in the district.

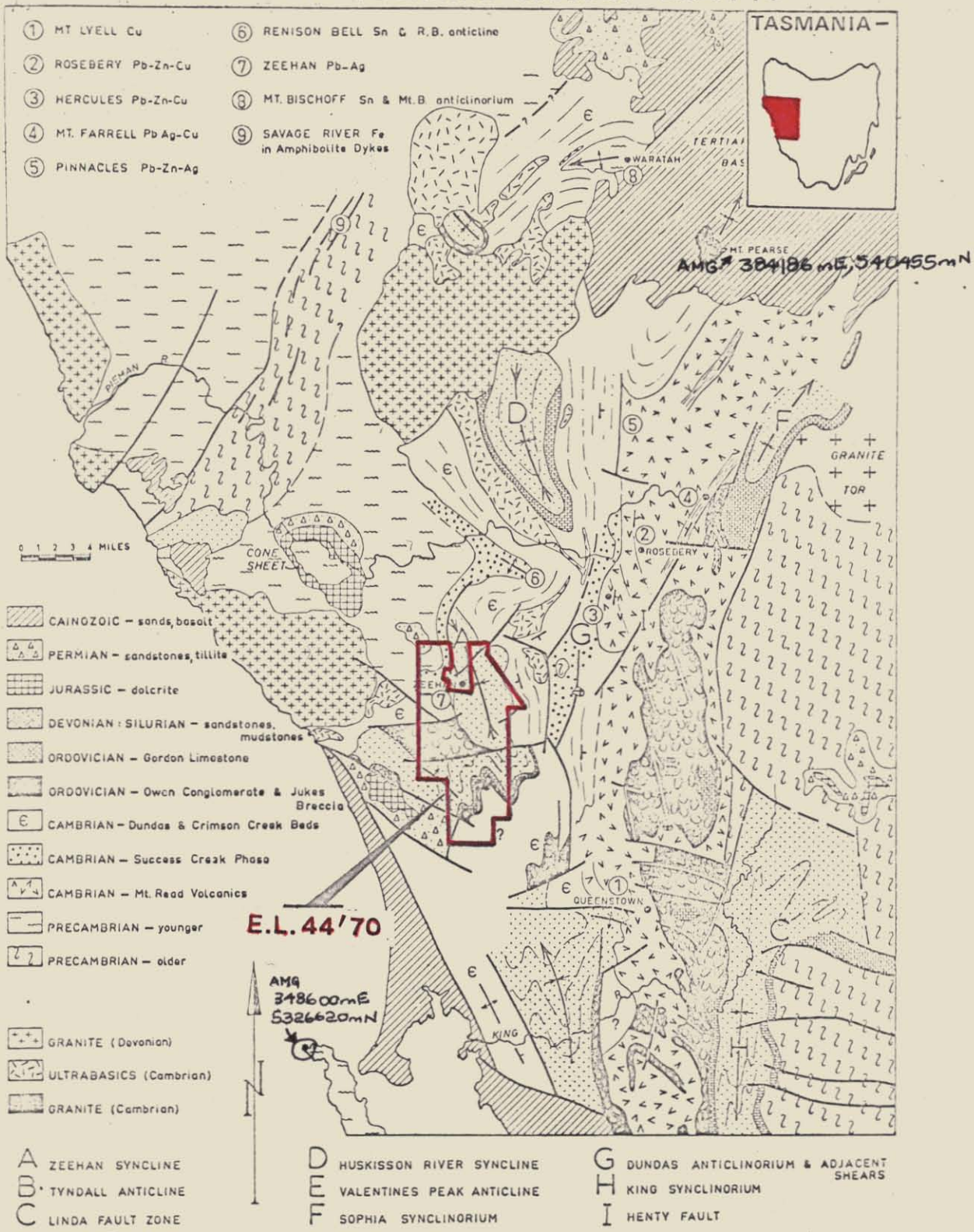
Assaying and compilation of all dump samples was completed and the final data is presented. The results indicate that the available dump material within the Licence area is below economic consideration.

003

FIG. 1.

707C04

LOCATION AND REGIONAL GEOLOGY E.L. 44'70



—Geological map of central western Tasmania, compiled from Campana and King (1963) and other sources.

5 cm

AMG REFERENCE POINTS ADDED

REPORT OF OPERATIONS

A. Limestone Project

The majority of lodes throughout the Zeehan field are small high grade bodies developed in fractures in mainly competent rocks. These host rocks are generally not acceptable for replacement by migrating fluids. The more reactive rocks are mainly confined to the Gordon Limestone member which rarely outcrops and is often covered by several feet of overburden. Exploration of limestone areas for large replacement deposits commenced during the 6 monthly period under review.

(i) Geology

The distribution of the Gordon Limestone in the Licence area is shown on figure 2.

In the Zeehan region it is rarely exposed and has decomposed into black to blue-grey clays which form swampy button-grass flats near the water-table. It is of the order of 1,000 ft. thick and varies from a light-grey finely crystalline limestone to calcareous sandstones and dolomitic shales. It is generally impure throughout with argillaceous, siliceous and carbonaceous horizons.

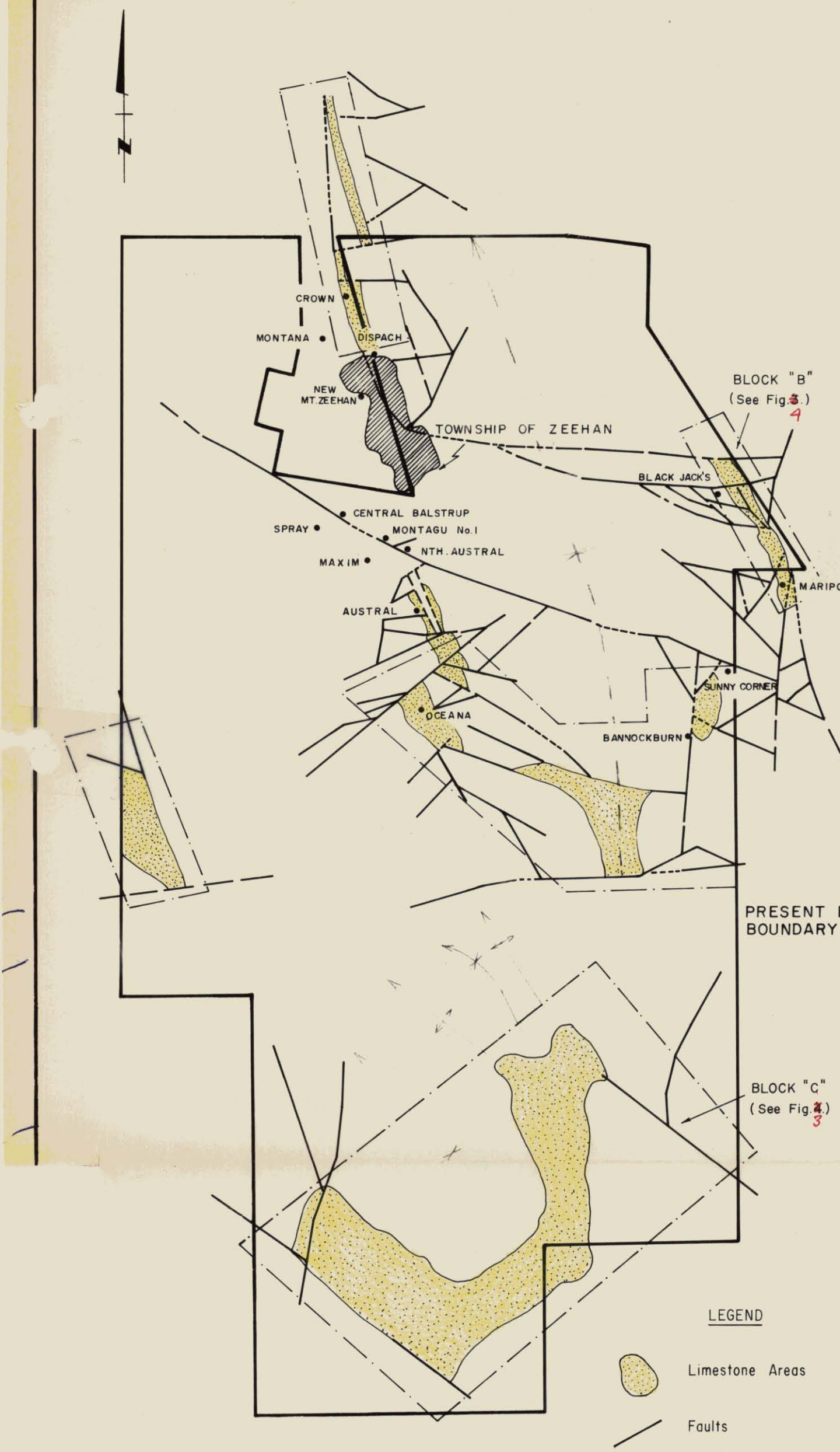
(ii) Geochemistry

All the limestone areas except the large southern block (Block "C") are contaminated by one form or another of mining activity. Stream sediments were sampled in detail throughout block "C" and the results are shown on figures 5, 6 and 7.

005

FIG. 2.

707006



TENNECO AUSTRALIA INC.

E.L. 44/70

Airborne E.M. Survey

5 cm

DATE: 6th. MARCH 1972	DRAWN BY:	DWG. Nº 600
SCALE: 1 INCH = 1 MILE	GEOLOGIST	

006

707007 FIG. 3.

LEGEND

Geological boundaries

Faults

Airborne E.M. Conductor Axis

60°

60°

60°

70°

50°

50°

Grieve Grid

Eden Grid

MOINA SANDSTONE

CROTTY QUARTZITE

GORDON LIMESTONE

S.P.L. 62
A.R. SMITH

BADGER RIVER

EMU BAY RAILWAY

5 cm

SCALE IN FEET
1000 0 1000 2000

TENNECO AUSTRALIA INC.

E.L. 44/70

Gordon Limestone Block 'C'

GEOPHYSICS

DATE: FEBRUARY 1972	DRAWN BY: E. HOLT	DWG. Nº 583
SCALE:	GEOLOGIST: R. BESLEY	

72-926

FIG. 4.

707008

Zeehan

Rosebury

CROTTY QUARTZITE

MOINA SANDSTONE

50°

Black Jack's Grid

60°

E.L. 7/68
TEXINS

E.L. 44/70
A.R. DODSON

70°

MARIPOSA

S.P.L. 46
MacINTYRE MINES

Queenstown

LEGEND

- Gordon Limestone (Alluvial covered)
- Areas of outcrop or sub outcrop
- Airborne E.M. Anomaly
- Bulldozed track
- E.L. Boundary
- D.D. Hole completed
- D.D. Hole planned

SCALE IN FEET
1000 0 1000 2000

5 cm

TENNECO AUSTRALIA INC.

E.L. 44/70

Gordon Limestone Block 'B'

NORTH MARIPOSA

DATE FEBRUARY 1972	DRAWN BY E. HOLT	DWG. Nº 584
SCALE	GEOLOGIST R. BESLEY	

72-924

707009

FIG. 5.

LEGEND

Geological boundaries

Faults

> 35 ppm

> 60 ppm

MOINA SANDSTONE

CROTTY QUARTZITE

GORDON LIMESTONE

S.P.L. 62
A.R. SMITH

BADGER RIVER

EMU BAY

RAILWAY

5 cm

SCALE IN FEET
1000 0 1000 2000

TENNECO AUSTRALIA INC.

E.L. 44/70

Gordon Limestone Block 'C'

LEAD GEOCHEMISTRY

DATE: FEBRUARY 1972	DRAWN BY: E. HOLT	DWG. Nº 581
SCALE:	GEOLOGIST: R. BESLEY	

003

707010 Fig. 6.

LEGEND

Geological boundaries

Faults

> 35 ppm

> 60 ppm

MOINA SANDSTONE

CROTTY QUARTZITE

GORDON LIMESTONE

S.P.L. 62
A.R. SMITH

BADGER

EMU BAY

RAILWAY

RIVER

5 cm

SCALE IN FEET
1000 0 1000 2000

TENNECO AUSTRALIA INC.

E.L. 44/70

Gordon Limestone Block 'C'

ZINC GEOCHEMISTRY

DATE: FEBRUARY 1972	DRAWN BY: E. HOLT	DWG. Nº 582
SCALE:	GEOLOGIST: R. BESLEY	

010

707011

FIG. 7.

LEGEND

Geological boundaries

Faults

MOINA SANDSTONE

CROTTY QUARTZITE

GORDON LIMESTONE

S.P.L. 62
A.R. SMITH

BADGER RIVER

EMU BAY

RAILWAY

5 cm

SCALE IN FEET
1000 0 1000 2000

TENNECO AUSTRALIA INC.

E.L. 44/70

Gordon Limestone Block 'C'

COPPER GEOCHEMISTRY

DATE: FEBRUARY 1972	DRAWN BY: E. HOLT	DWG. Nº 580
SCALE:	GEOLOGIST: R. BESLEY	

Although there is virtually no outcrop of limestone in the area, seepage of groundwater from any buried oxidizing ore body should be distributed into the stream system.

The minus 100 mesh fraction was analysed but this did not always represent the clay fraction as very fine quartz particles commonly constituted more than 50% of the sample. Thus the low and variable clay content of the samples would cause dilution and erratic metal values. For this reason statistical treatment of the results is not valid and the value of isolated high readings is doubtful.

The main trend of high readings was partially covered by the Grieve grid and geophysical surveys. The area of high reading in the northeast corner of limestone block is located in a swamp with very poorly defined drainage.

(iii) Geophysics

The areas covered by the helicopter E.M. survey is shown on figure 2. The full results and conclusions are given in Appendix A_1.

The ground follow-up geophysical grids and the relevant helicopter E.M. anomalies are shown on figures 3 and 4. The results of the ground Turam survey are given in Appendix A_2 and the ground self potential in Appendix A_3. Several weakly anomalous trends were detected by the ground surveys in all three grid areas. The correlation between S.P. and E.M. was, however, generally poor.

B. Spray Mine Grid

Follow-up soil sampling over electromagnetic anomalies on the Spray grid was completed during the period.

The location of the anomalies and relevant geology together with the geophysical results are given in Appendix B. The geochemical results are given in figure 8.

Soil samples were taken at the bedrock-soil interface by hand auger at 20 ft. intervals on lines 200 ft. apart. The clay fraction was analysed.

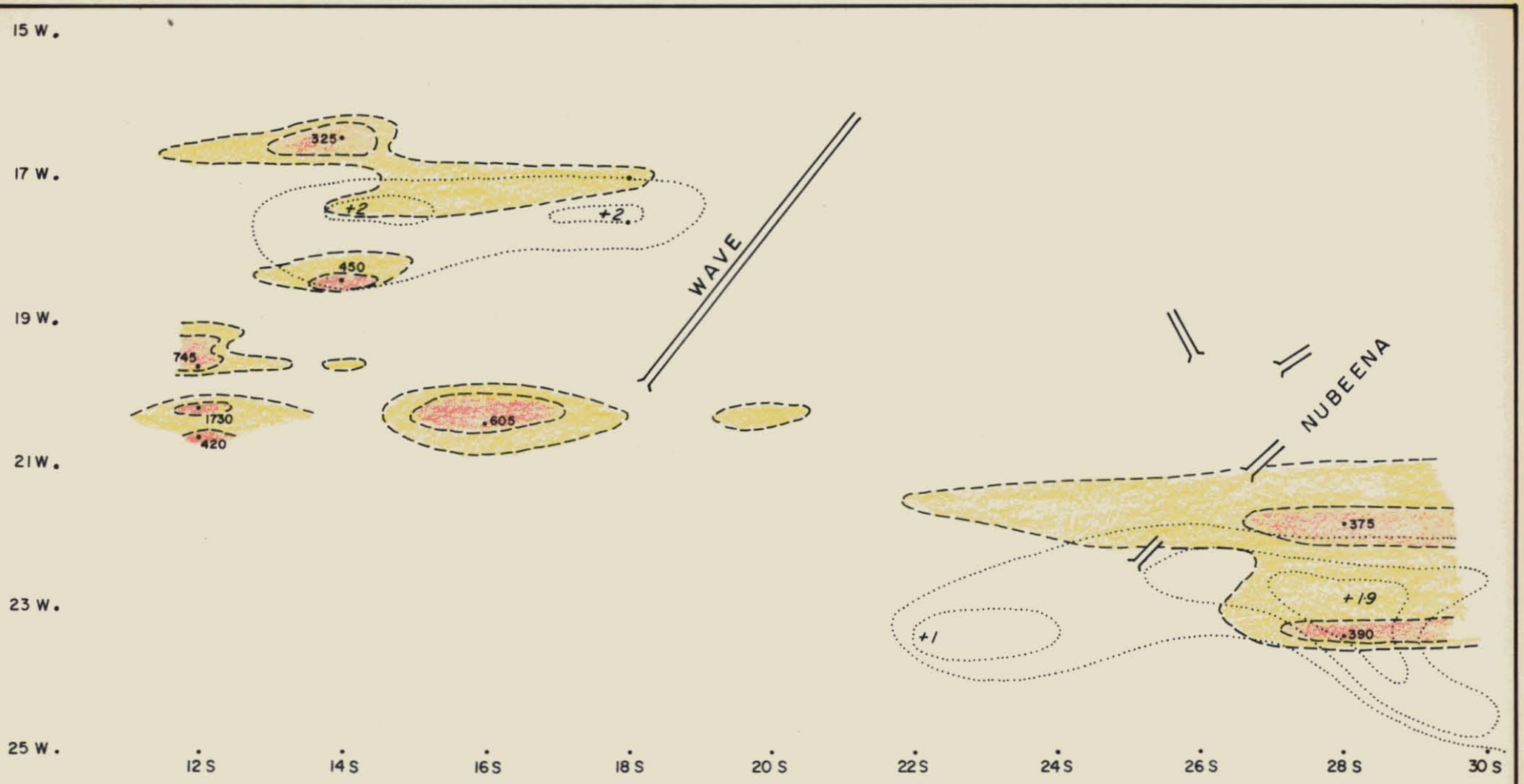
The results indicate that mineralization is present in the area of the geophysical anomalies. Several small gash and fracture fill type veins of galena were observed at the surface and intersected by old mine workings. These small veins would be sufficient to account for the geochemical results but would not be capable of producing the observed E.M. anomalies.

Trenching and possibly drilling is required to fully evaluate these coincident geochemical and geophysical anomalies.

C. Oonah Mine

Engineering investigations into the feasibility of mining and treating the Oonah ores continued. These investigations were in conjunction with studies of other mineralized bodies outside the licence area and the feasibility of extracting the Oonah ore is closely tied to the economics of these other possible mining projects.

Further detailed proving of the Oonah orebodies is dependent initially on the results of the overall mining studies of the various available mineralized bodies in the district.



LEGEND

+2 *Phase angle contours*

LEAD RESULTS

605 *100 ppm*

200 ppm

5 cm

SPRAY MINE

SOIL GEOCHEMISTRY – LEAD

OVER E.M. ANOMALIES

Feet 0 100 200 400 Feet

FIG. 8

DWG. No 740

D. Mine Dump Sampling - Final Results

A comprehensive sampling program of all the available and likely significant old mine dumps in the area was completed during the previous 6 month period. Assaying of all samples was completed during this period and the final figures compiled. The additional data is given in Appendix D. and is the final supplement to the preliminary report forwarded with the previous 6 monthly report.

A total of 20 dumps were sampled representing 103,200 tons of material averaging 2.4 oz. silver per ton, 1.4% lead and 0.85% zinc.

The overall average grade is below the economic limit for milling operations. Individual dumps of significantly high metal value represents only a small tonnage.

,15

TABLE 1. DUMP AVERAGES

707016

JMP).	TONNAGE (long tons)	AVERAGES Ag (oz/tn)	Pb%	Zn%	Ag x Tonnage	Pb x Tonnage	Zn x Tonnage
-14 ee prev. eport	70810				197,365	99,143	60,818
	(330	3.13	3.07	0.93	1,033	1,013	307
	(60	1.14	1.17	0.12	68	70	7
15	(30	1.38	0.64	0.36	41	19	11
	(3150	0.87	1.10	0.37	2,741	3,465	1,166
	(1170	0.82	0.73	0.68	959	854	796
	(6500	2.48	2.20	0.63	16,120	14,300	4,095
	(120	0.98	1.26	0.09	118	151	11
	(3550	0.48	0.24	0.07	1,704	852	249
16	(165	0.50	2.75	0.16	83	454	26
	(2850	0.66	0.44	0.09	1,881	1,254	257
	(135	3.42	3.31	0.16	462	447	22
	(60	4.46	3.86	0.17	268	232	10
	(60	4.66	4.37	0.38	280	262	23
17	3592	2.44	2.00	0.23	8,764	7,184	826
18	6150	1.11	1.31	1.42	6,827	8,057	8,733
	(1200	2.42	3.74	3.26	2,904	4,488	3,912
19	(570	1.98	3.58	3.79	1,129	2,041	2,160
	(750	0.98	1.97	1.77	735	1,478	1,328
20	1950	1.31	1.52	1.29	2,555	2,964	2,516
	103,202				246,037	148,727	87,271

20 dumps contains 103,200 tons averaging: 2.4 oz.Ag/ton
1.4 % Pb
0.86 % Zn

PROPOSED WORK PROGRAM

The next major phase of exploration planned is follow-up drilling of the geophysical anomalies obtained in the covered limestone areas. This will require a detailed bedrock sampling program with an auger or air drilling rig to outline those anomalies that have associated mineralization and warrant deep drilling. Because of the extremely wet and boggy conditions prevailing in the button grass areas during the wet winter season, it is anticipated that this program will not be feasible to carry out until towards the end of the 6 month period or early in the following period.

Significant airborne E.M. anomalies were obtained over the northern most block covered (refer figure 2) which was subsequently excluded from the Licence area. Should this become available to us follow-up programs would be carried out in this area.

Geological studies of mineralization in the district together with a detailed review and evaluation of all our exploration results to date is to be carried out during the period with a view to selecting the best additional targets for concentrated field investigation during the summer period.

Further geological mapping and trenching will be completed over anomalous geophysical and geochemical anomalies on the Spray grid. This will be followed by drilling if warranted.

Engineering and feasibility studies will continue on the Oonah lodes.

STATEMENT OF EXPENDITURES

EXPENDITURE FOR THE PERIOD $21,089

R.E. Besley
Geologist
Tenneco Australia, Inc.

APPENDIX A_1 Helicopter E.M. Results

PRIVATE AND CONFIDENTIAL

707020

REPORT ON A COMBINED HELICOPTER-BORNE ELECTROMAGNETIC AND MAGNETIC SURVEY ZEEHAN AREA, TASMANIA ON BEHALF OF TENNECO AUSTRALIA, INC.

by

R.W. Gedde, M.Sc.
Geophysicist

PERTH, WESTERN AUSTRALIA. FEBRUARY, 1972.

SUMMARY

Helicopter-borne electromagnetic and magnetic survey was carried out over four prospects near Zeehan, Tasmania. The Scintrex HEM-701 electromagnetic system, with a Scintrex MAP-2 nuclear resonance magnetometer was used. A total of 181 line miles of traverse were flown.

Electromagnetic anomalies are observed on 3 of the 4 prospects (A, B. and C). No anomalies are observed on Prospect D. The best conductors are on Prospect A, but anomalies on all three prospects warrant further investigation.

REPORT ON A COMBINED HELICOPTER-BORNE ELECTROMAGNETIC AND MAGNETIC SURVEY ZEEHAN AREA, TASMANIA ON BEHALF OF TENNECO AUSTRALIA, INC.

INTRODUCTION

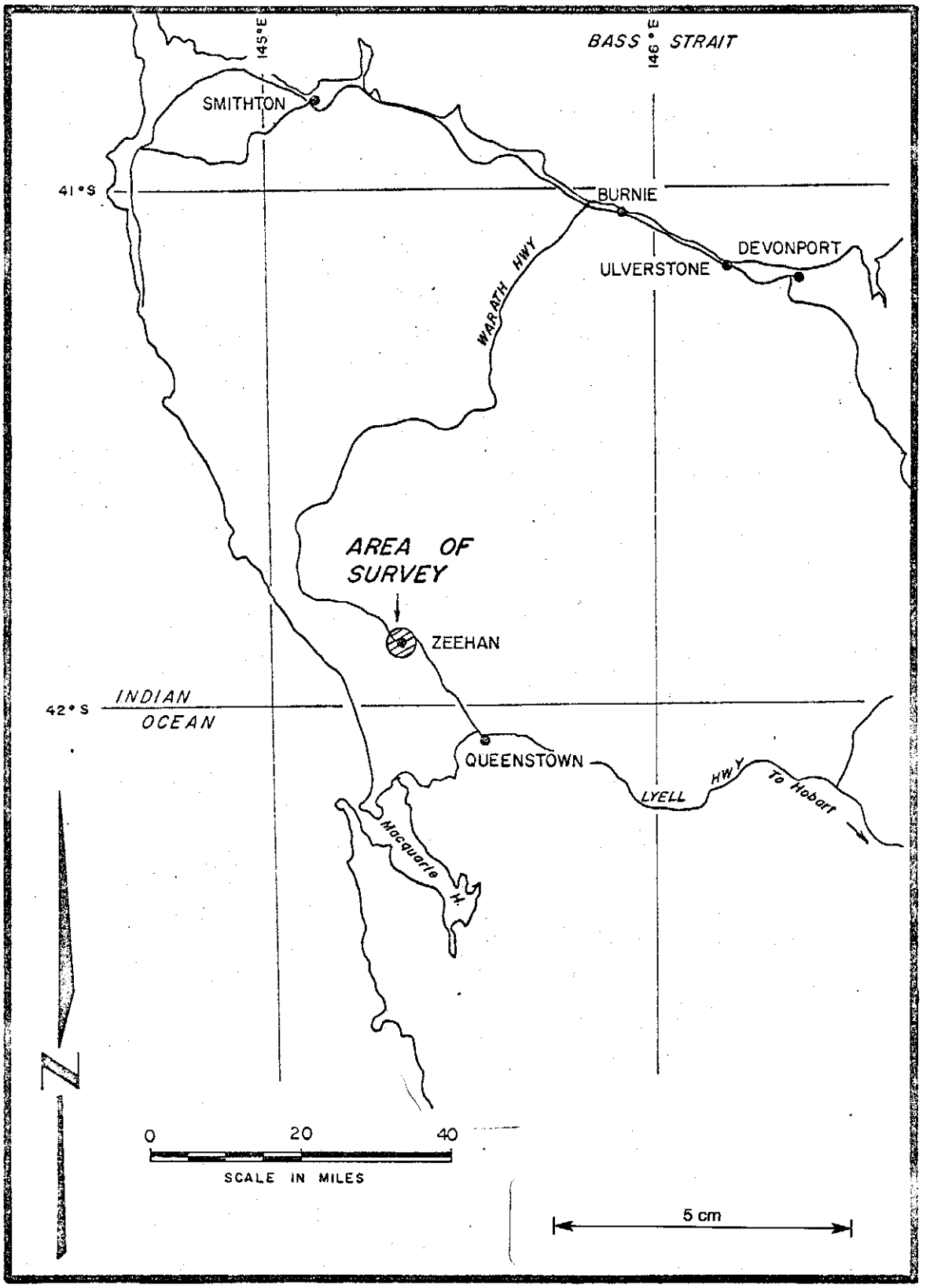
During the period December 22 to December 26, 1971 inclusive, Seigel Associates Australasia Pty. Ltd. executed a helicopter-borne Electromagnetic and Magnetic Survey in the vicinity of Zeehan, Tasmania (see Figure 1) on behalf of Tenneco Australia, Inc.

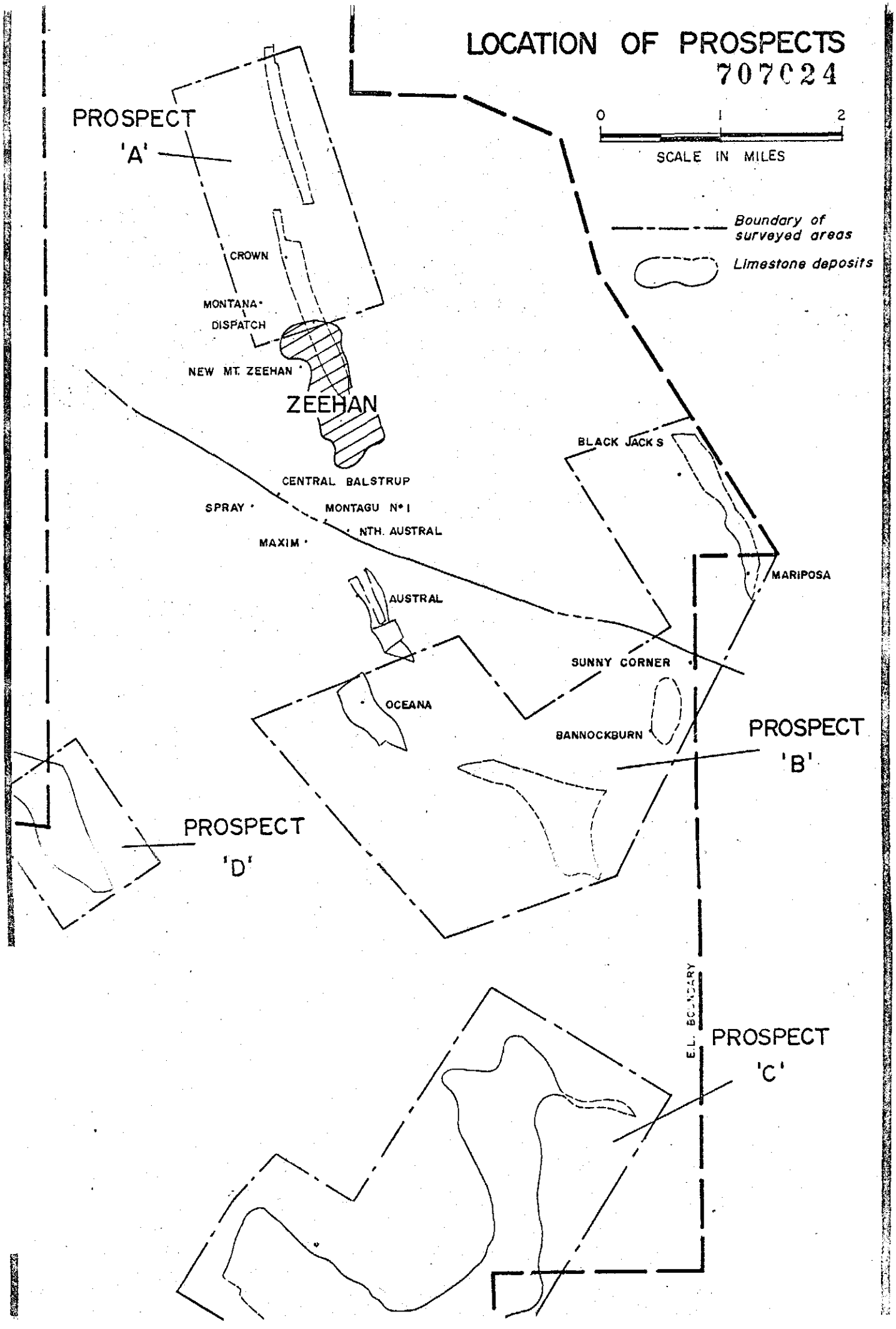
Execution of the survey was under the direction of Mr. John Irvine, B.Sc. P.Geophys, Geophysicist of the staff of Seigel Associates Australasia Pty. Ltd. Other survey personnel included an electronics technician, navigator, data compiler and the helicopter crew.

The survey involved 181 line miles of traverse on four different prospects in the Zeehan area (see Figure 2). The interline spacing was nominally 660 ft. and the mean terrain clearance of the towed EM bird was 100 ft.

707023

ZEEHAN AREA
LOCALITY PLAN




LOCATION OF PROSPECTS
707024
0
1
2
SCALE IN MILES
Boundary of surveyed areas
Limestone deposits
PROSPECT 'A'
CROWN
MONTANA
DISPATCH
NEW MT. ZEEHAN
ZEEHAN
CENTRAL BALSTRUP
SPRAY
MONTAGU N°1
NTH. AUSTRAL
MAXIM
AUSTRAL
BLACK JACKS
MARIPOSA
SUNNY CORNER
OCEANA
BANNOCKBURN
PROSPECT 'B'
PROSPECT 'D'
E.L. BOUNDARY
PROSPECT 'C'
5 cm

The geophysical instrumentation utilized was a Scintrex HEM-701 Electromagnetic system and a Scintrex MAP-2 Nuclear Resonance Magnetometer. The HEM-701 is a high resolution helicopter-borne system operating at 1600 Hz. The co-axial oriented transmitter and receiver coils are mounted in a 32 ft. bird which is towed 100 ft. below the helicopter. The in-phase and out-of-phase components of the EM field are measured. For the present survey the equipment was installed in the Bell 206A Jet Ranger helicopter. For a more comprehensive description of the airborne system the reader is referred to the Appendix.

The purpose of the present electromagnetic survey was to locate subsurface zones of above normal conductivity which may define bodies of concentrated sulphide mineralization. Normal rock types and overburden materials are generally not of sufficiently high conductivity to respond to the present electromagnetic system. Inter-connected sulphide mineralization (excluding sphalerite) and inter-connected graphite are the main geological conductors which respond to the system while fault or shear zones and conductive overburden materials may respond but generally as poor conductors.

As described in the Appendix, the electromagnetic results can be interpreted to give a quantitative parameter dependent upon the conductivity of the conductor and its thickness ($\sigma\tau$ product). This parameter is embodied in the in-phase and out-of-phase ratio. Excellent conductors such as massive sulphide usually show ratios above 3.0 while most conductive overburden material show ratios of less than 1.0. These ratios should only be used as a guide when evaluating the results as the conductivity of sulphide mineralization can fall within the complete range of conductivity from poor to excellent.

The Magnetic field data was recorded in conjunction with the EM data as an aid for interpretation. Magnetic anomalies are often related to EM anomalies as magnetite and/or pyrrhotite often occur in massive sulphide zones. When contoured, the magnetic data can also be extremely useful in the interpretation of rock types and structural features such as faults, folds etc. The magnetic data from the present survey has not been contoured.

GEOLOGY AND MINERALIZATION

Geology of the Zeehan area is complex with rock exposures from Older Proterozoic through to Teritiary. The general area is highly mineralized, the main mineral deposits found to date being tin and lead - silver. Production in the area has been primarily lead - silver from veins in the upper proterozoic to lower cambrian quartzites and shales. The gangue consists of siderite with quartz and pyrite in variable amounts.

The present survey areas are mainly underlain by Ordovician limestone. Lead - silver mineralization is known in the limestone but it has not been effectively explored as areas underlain by limestone are swamps and peaty flats with very little bedrock exposure. The survey areas and the mapped limestone occurrences are shown on Figure 2.

Terrain in the survey areas is rugged with the limestones generally forming valleys and low lying areas.

PRESENTATION OF DATA AND RESULTS

The original data records are presented in separate binders, the data being recorded on a 6 channel, heat sensitive strip chart recorder. The parameters recorded are (1) the in-phase and (2) the out-of-phase components of the electromagnetic field, (3) the magnetic field, (4) the helicopter ground clearance and (5) Fiducial marks.

The flight lines are shown on the photomosaics and on the plans accompanying this report. The flight lines were recovered with the aid of the on-board tracking camera and the laydown photomosaics. Control points are numbered with the corresponding fiducial numbers.

The electromagnetic data has been compiled and is presented on the flight path and anomaly plans, Plates 1 through 4. Plate 1 covers Prospect A, Plate 2 Prospect B, Plate 3 Prospect C, and Plate 4 Prospect D. The scale of these plans is the same as the photomosaics, approximately 1" = 1,000 ft.

Plate 1 not included 12/5/72

The system of coding electromagnetic responses is explained in the legends on the plates and in the Appendix at the back of this report. Briefly, discrete electromagnetic anomalies which are most probably the

response from a confined conductor zone are plotted as a circle positioned on the flight line at the anomaly location. This circle is fully shaded, half shaded or open depending on the amplitude of the in-phase response, the fully shaded being high amplitude, half shaded being intermediate and open circles being low amplitude. Electromagnetic anomalies exhibiting either direct or flanking magnetic correlation are shown by concentric circles. The ratio of in-phase to out-of-phase amplitude is shown for each anomaly. Each anomaly is given a number for reference. Where anomalies on adjacent lines are considered to results from a common conductive zone, the interpreted conductor axis is marked on the plans by heavy dashed line. Each one of these conductor axes is given a code letter for reference.

Broad zones of electromagnetic distortion which appears to arise from flat lying, shallow conductive zones are shown by open bars along the flight lines which show the extent of the EM distortion. Where these distortions are observed on several adjacent lines, the interpretation of an overburden or conductive rock type zone is possible and these are outlined by a heavy dashed line. Where possible discreet anomalies have been interpreted within some of the broad zones of EM distortion and these are noted on the plan by circles within the open bar notation.

DISCUSSION OF RESULTS

General

Electromagnetic anomalies are observed on Prospects A, B and C but no anomalies are observed on Prospect D. All the electromagnetic responses are relatively weak and no in-phase amplitudes greater than 50 ppm are observed although several out-of-phase amplitudes in excess of 50 ppm do occur. As a result all anomaly on the plans are shown as open circles. Broad zones of EM response, with a predominately out-of-phase component, are observed on portions of Prospects A, B and C. Geologically these zones correlate to the limestone areas but the source of the EM response is considered to be conductive overburden on the limestone and not directly related to the limestone.

The magnetics show fairly simple relief with few discreet anomalies. Area A has a relatively steep gradient with an increase of approximately 100 gammas across the prospect. Prospect B has an average of 30 gammas relief except on the north east section where the magnetics are relatively complex. A few discreet magnetic anomalies occur on Prospect B. Prospect C has a gentle gradient increasing less than 100 gammas from north to south. Prospect D has the most complex magnetic pattern with relief in excess of 150 gammas on the northern end.

Pages 8 & 9 missing 12/5/72

Prospect B

A total of 22 individual anomalies (coded 1 through 22 on Plate 1 [2?]) and the five conductor zones (coded A through E on Plate 1 [2?]) are observed on this prospect.

Conductor A lies within a zone of broad distortion probably resulting from overburden conduction. The anomalies related to this conductor are poorly defined and no quantitative interpretation can be done.

Conductor B lies to the east of A but within the same broad zone of conduction. It also is very poorly defined.

Conductors C, D & E lie in the extreme north-east section of the prospect. Anomalies associated with all three of these conductors are very weak and poorly defined and as a result no quantitative analysis has been made.

near Austral Siding on old Zeehan-Strahan Railway

Anomaly 8, near the highway on the north-west section of the prospect, is an interesting feature but probably results from a man-made source. The EM response is primarily out-of-phase and depth estimates give a position of 15 ft. above the ground surface for the source. Directly associated with the EM anomaly is a pronounced magnetic anomaly which shows a sharp

depression on either side of the magnetic high, a response which is also characteristic of a shallow source of limited depth extent.

All the remaining EM anomalies on this prospect are weak and poorly defined and no quantitative analysis has been done.

A magnetic high of approximately 15 gammas amplitude is observed on Line 18 at fiducial number 4271. There is no electromagnetic response associated with the magnetic high.

Prospect C

A total of 40 individual anomalies (numbered 1 through 40 on Plate 3) and 8 conductor zones (coded A through H on Plate 3) are observed on this prospect. Although some substantial out-of-phase responses are observed all the in-phase responses are very weak and poorly defined but some in-phase to out-of-phase ratios greater than 1 are observed (anomalies 1, 2, 31, 36, 37 and 40). These would appear to be the most promising anomalies on the prospect but definition is not sufficient to meaningfully calculate $\sigma\tau$ products and depths.

Prospect D

This prospect is relatively small involving less than 15 line miles of traverse. No significant electromagnetic anomalies are observed. In addition no broad zones of apparent overburden conduction are evident in the area either.

APPENDIX

SURVEY EQUIPMENT AND PROCEDURES

Electromagnetic System - Scintrex HEM-701

Equipment

The Scintrex HEM-701 is a solid state, fixed-configuration, electromagnetic system especially designed for helicopter transport. It consists of two coaxial coils, one serving as transmitter and the other as receiver, which are mounted, 30 ft. apart, in a rigid "bird" with their axes horizontal and in the direction of flight. The bird is towed approximately 100 ft. below the helicopter, by means of a suitable cable which also carries electrical signals and power to and from the bird.

The system operates at 1600 Hertz. Changes in the alternating magnetic field at the receiver coil are observed and these changes are converted into two components, one whose phase is the same as that of the transmitted signal (the "In-Phase" component) and the other whose phase is 90° apart (the "Out-of-Phase" component). These changes are expressed in terms of the normal undistorted primary field. They are so small as to be expressed usually in parts-per-million or p.p.m.

The In-Phase and Out-of-Phase variations are presented in graphic form on two channels or in time-shared form on a single channel of a graphic recorder. The full scale chart width employed is commonly 500 p.p.m. although in areas of low geologic noise levels 250 p.p.m. may be employed. At one or more points during each flight the scale sensitivity is checked by means of calibration signals, usually 100 p.p.m. on each trace.

The reference or "zero" level for each EM trace is an arbitrary one and is obtained empirically from the regional level of each trace. These levels may drift slowly during a flight because of temperature changes affecting the bird dimensions. These drifts are very gradual and are readily distinguishable from much quicker, local changes due to conductors of a geologic origin. Similarly, severe turbulence effects sometimes introduce low-order, primarily in-phase disturbances which are of such short period that they may also readily be distinguished from the effects of geologic conductors.

Man-made disturbances are often to be seen, including power lines, pipe lines, metal fences, railways, etc. The former are generally recognizable as such because they usually show through as cyclic noise of irregular shape and phase relationship. Non-energized, grounded power lines (e.g. 3 phase systems) may also give rise to proper conductor indications, however. Such indications, as well as those from pipe lines and metal fences, etc. are usually of short duration and can be distinguished from proper geologic sources except for very narrow, near-surface lenses. In some instances ground investigation may be necessary in order to resolve the ambiguity of possible source. Whereas the airborne geophysical crew attempts to note visible man-made conductors of the above types, the ground moves by so rapidly at the low flight elevation employed that 100% recognition of such sources cannot be expected from the air.

The normal terrain clearance of the bird is 100 ft. - 200 ft. depending on the surface topography and tree cover, etc., with the helicopter 100 ft. above. The established useful depth of detection of the system for moderate-to-large conducting bodies is about 350 ft. sub-bird under conditions of low extraneous geologic noise, i.e. where the general level of conductivity of the overburden and rock types of the area is low. The useful depth of detection of the system is therefore between 150 ft. and 250 ft. beneath the ground surface under these conditions.

Interpretation of Results

The EM records are interpreted to determine the presence of conducting bodies and to obtain some information relating to their character. The intervalometer time marks (see below) are synchronized with the positioning camera film strip (also see below) and thereby permit the relating of the conductors with appropriate ground locations. The altimeter data (see below) indicate, for each conductor, what the terrain clearance was at the time of detection.

A plan is prepared, either using a subdued photomosaic ("grayflex") or an overlay from mosaic or topographic plan as base. The flight path of each survey line is obtained by means of "tie points", which are features on the mosaic or topographic plan which are also recognizable on the positioning camera film. The flight path is interpolated between these tie points.

For each conductor the following quantities are measured and recorded.

a) Half width. This is the distance between the points of half the maximum conductor disturbance. For a very thin, steeply dipping body or pipe line, etc., the half width will be about 1.6 times its depth below the bird. If the bird is at a mean conductor clearance of 150 ft. the half width would be about 250 ft. Larger half widths reflect either more deeply buried or more likely, thicker conductors.

Flat-lying conductors (e.g. overburden) characteristically give large half widths.

The conductor half width is indicated on the plan by an open bar symbol along the flight line. In the event of very narrow conductors only the peak location may be shown (see below).

b) Peak Location. The in-phase conductor peak location is shown on the plan by a circle in the appropriate location. In the case of broad conductors or closely spaced multiple conductor zones there may be more than one peak, in which event all major peaks are shown. If a conductor is of short half width there may be no room for a half width bar and only the peak circle will be shown. A conductor which is likely man-made will be indicated by an X rather than by a circle.

c) In-Phase and Out-of-Phase Amplitudes. These amplitudes are scaled from the EM traces and noted in parts per million. The ratio of the in-phase amplitude to the out-of-phase amplitude is calculated. On the flight plan, opposite each peak location (circle) will be given the ratio of the peak in-phase and out-of-phase amplitudes (see below).

d) Conductor Coding. Conductor intersections are graded in electrical categories 1, 2, and 3, based on the in-phase amplitude but taking into account the terrain clearance. For tabular bodies such as sheet-like ore deposits, strata bound conductors and overburden, their response drops off almost in accordance with the inverse cube power of the elevation. Assuming an average 50 ft. of overburden, a category 1 conductor has a peak in-phase response equivalent to 300 p.p.m. or over at 100 ft. bird terrain clearance. A category 2 conductor has a peak in-phase response under similar conditions of between 100 p.p.m. and 300 p.p.m. A category 3 conductor has an equivalent peak in-phase response of less than 100 p.p.m.

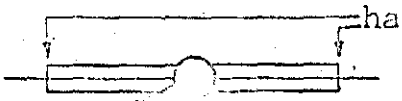
The respective peak circles are shaded to reflect their electrical category, with category 1 fully shaded, category 2 half shaded and category 3 unshaded.

The ratio of peak in-phase over peak out-of-phase amplitudes is indicative of a conductivity-size factor for the conductor. Generally high conducting bodies such as massive sulphides or graphite and sea-water, etc., have ratios of 3 or over. Moderate conductivity-size bodies will have ratios between 1 and 3. Poor conductivity bodies (e.g. most overburden and some sulphide and graphitic zones) will have ratios of less than 1. In areas where there is a clear differentiation in conductivity between the targets of potential economic interest and other possible conductors, the ratio is a diagnostic feature. In some areas, however, there is an overlap of conductivity ranges and then the ratio cannot be too rigidly relied upon.

Where magnetic data is available, preferably from a coincident recording magnetometer, any correlating magnetic activity will be noted for the pertinent conductor peak. A conductor peak with apparently direct magnetic correlation will be indicated by a double concentric circle. Although a conducting body which is appreciably magnetic is more likely to be a sulphide body than one which is non-magnetic, there are many very important base metal ore bodies which are quite non-magnetic.

Examples of conductor coding are given below.

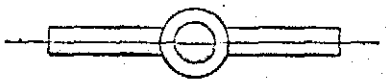
707038



Category one, no magnetic correlation.

2.5 ← In phase to out-of-phase ratio

peak location



Category two, magnetic correlation

2.0 ← In phase to out-of-phase ratio

2.0 ← In phase to out-of-phase ratio.

Category three, no magnetic correlation

X

Probably man-made conductor.

Magnetometer - Scintrex MAP-2

The Scintrex MAP-2 nuclear resonance airborne magnetometer is patterned after the Scintrex NPM-1. It is a lightweight, solid state unit with a better sensitivity and better stability than the NPM-1. The unit is also capable of either a digital BCD output or in analog form.

Its cycle period is 1.0 seconds. Each cycle it measures the total intensity of the earth's magnetic field and this quantity, in gammas, is recorded in either analog or digita form. Seigel Associates normally employs a full scale sensitivity of 1000 gammas with the magnetometer automatically stepping the recorder. In areas of very flat magnetic gradients, a full scale sensitivity of 100 gammas may be employed. Only the magnetic variations are recorded although the absolute base level may be established if desired.

The magnetic sensing head on the HEM-701 system is normally located on the EM tow cable midway between the helicopter and the EM "bird".

The intrinsic noise level of each reading is about 2 gammas.

Where it is intended to contour the MAP-2 data, it is necessary to fly two lines across the survey grid at right angles to the flight lines A fixed magnetometer is also essential to monitor any erratic magnetic diurnal variations and magnetic storms. During these periods, aeromagnetic data would be considered as unreliable and would be rejected.

If desired, the aeromagnetic data could then be compiled and contoured using a minimum contour interval of 20 gammas.

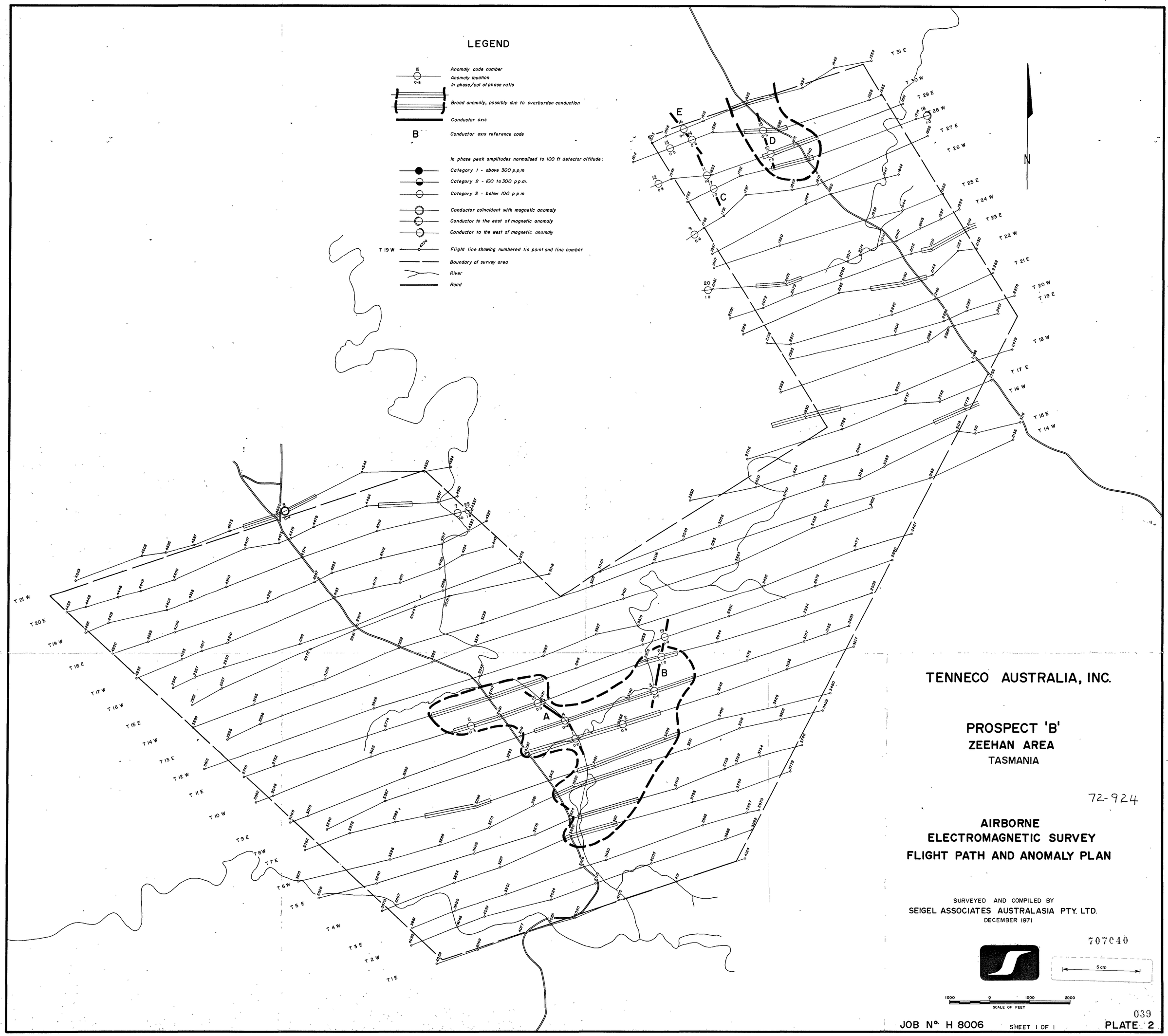
Normally, the magnetic data is used simply for the purpose of enchancing the E.M. interpretation by correlating the simultaneously obtained E.M. and magnetometer data for conductors which have magnetic character.

LEGEND

- Anomaly code number
- Anomaly location
- In phase/out of phase ratio
- Broad anomaly, possibly due to overburden conduction
- Conductor axis
- B — Conductor axis reference code

In phase peak amplitudes normalised to 100 ft detector altitude:

- Category 1 - above 300 p.p.m
- Category 2 - 100 to 300 p.p.m.
- Category 3 - below 100 p.p.m
- Conductor coincident with magnetic anomaly
- Conductor to the east of magnetic anomaly
- Conductor to the west of magnetic anomaly
- T 19 W — 4374 — Flight line showing numbered tie point and line number
- Boundary of survey area
- River
- Road



TENNECO AUSTRALIA, INC.

PROSPECT 'B'
ZEEHAN AREA
TASMANIA

72-924

AIRBORNE ELECTROMAGNETIC SURVEY FLIGHT PATH AND ANOMALY PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
DECEMBER 1971

707640

5 cm

1000 0 1000 2000
SCALE OF FEET

039

JOB No. H 8006 SHEET 1 OF 1 PLATE 2

LEGEND

- Anomaly code number
- Anomaly location
- In phase/out of phase ratio
- Broad anomaly, possibly due to overburden conduction
- Conductor axis
- B — Conductor axis reference code

In phase peak amplitudes normalised to 100 ft detector altitude :

- Category 1 - above 300 p.p.m
- Category 2 - 100 to 300 p.p.m
- Category 3 - below 100 p.p.m.
- Conductor coincident with magnetic anomaly
- Conductor to the north of magnetic anomaly
- Conductor to the south of magnetic anomaly
- T 4 S — Flight line showing numbered tie point and line number
- Boundary of survey area
- River
- Road

TENNECO AUSTRALIA, INC.

PROSPECT 'C'
ZEEHAN AREA
TASMANIA

72-924

AIRBORNE ELECTROMAGNETIC SURVEY FLIGHT PATH AND ANOMALY PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
DECEMBER 1971

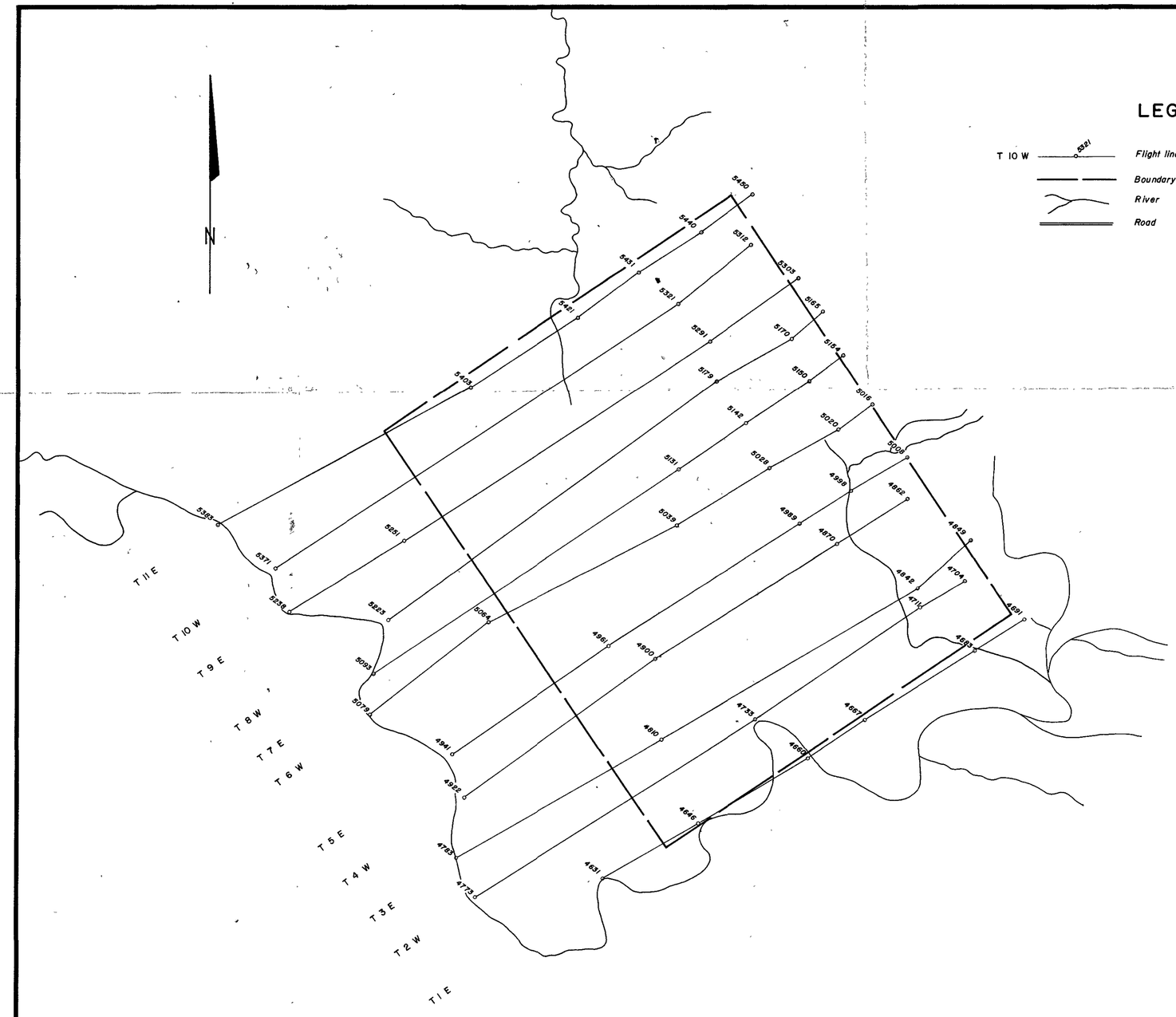
707041

5 cm

1000 0 1000 2000
SCALE OF FEET

040

JOB N° H 8006 SHEET 1 OF 1 PLATE 3



LEGEND

T 10 W — 5321 — Flight line showing numbered tie point and line number

Boundary of survey area

River

Road

TENNECO AUSTRALIA, INC.

PROSPECT 'D'
ZEEHAN AREA
TASMANIA

72-924

AIRBORNE
ELECTROMAGNETIC SURVEY
FLIGHT PATH AND ANOMALY PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
DECEMBER 1971

707642

5 cm

1000 0 1000 2000
SCALE OF FEET

041

JOB N°. H 8006 SHEET 1 OF 1 PLATE 4

APPENDIX A_2 Ground Turam Results

43

707044

PRIVATE AND CONFIDENTIAL

REPORT ON
TURAM ELECTROMAGNETIC SURVEYS
IN THE ZEEHAN AREA, TASMANIA

ON BEHALF OF

TENNECO AUSTRALIA INC.

BY

A.W. HOWLAND-ROSE
M.Sc.,DIC,AMAusIMM,FGS.
GEOPHYSICIST

SYDNEY, N.S.W.

MARCH, 1972
TAS - 003

CONTENTS

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
GEOPHYSICAL CONSULTANTS AND CONTRACTORS
234 ROCKY POINT ROAD, RAMSGATE, N.S.W 2217
TELEPHONES: 529 7336 AND 29 2684
AFTER HOURS 451 1330
TELEX – AA21417 TELEGRAMS: SCINTREX, SYDNEY

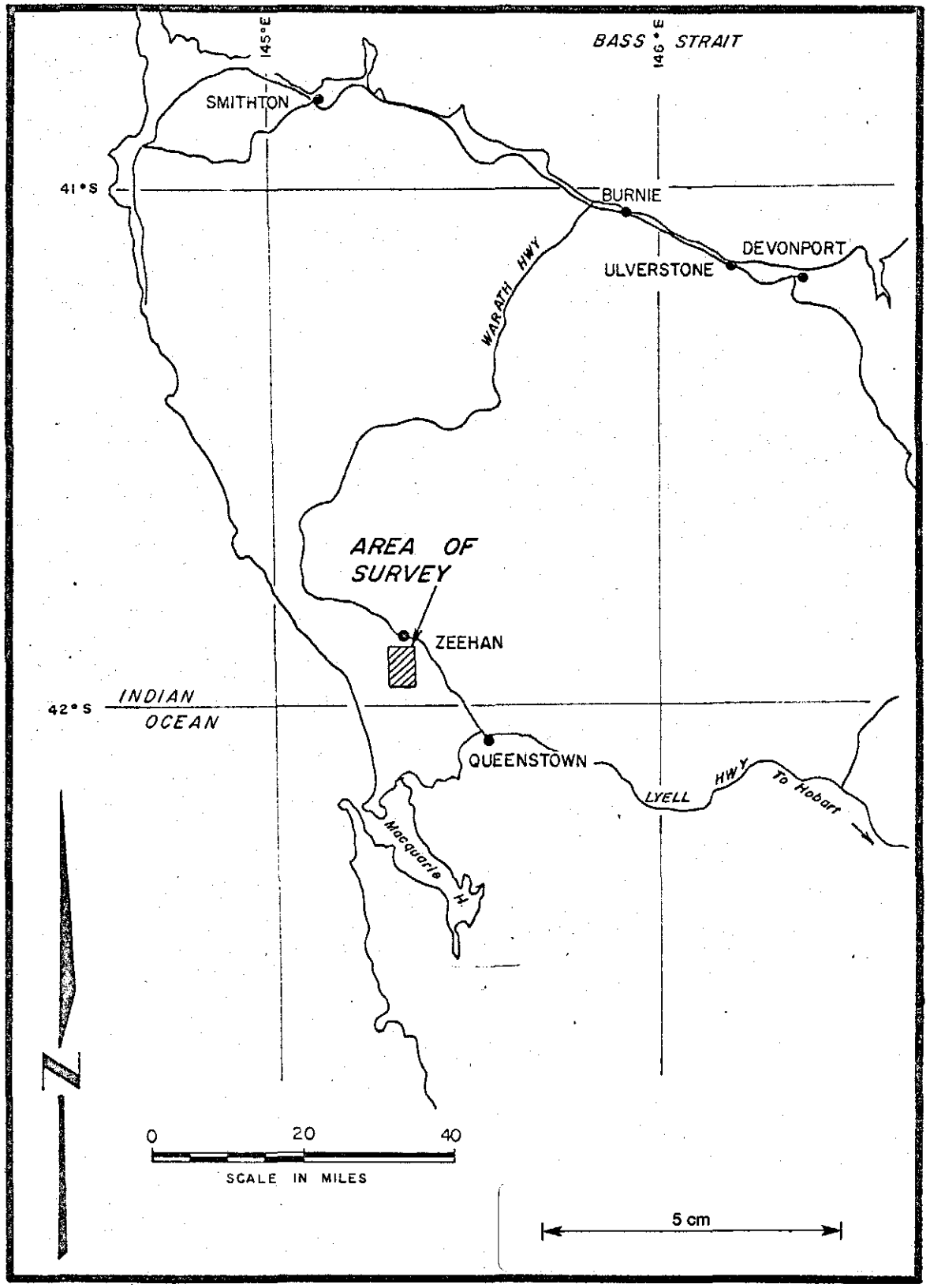
SUMMARY

Weak to moderate electromagnetic conductors located on the three properties on behalf of Tenneco Australia Inc., require additional limited auger sampling in an attempt to ascertain their possible economic interest, prior to any detailed drilling recommendations being made. However, since this may be impractical, tentative drilling recommendations have been made on most conductors.

Figure 1

707647

ZEEHAN AREA
LOCALITY PLAN



REPORT ON
TURAM ELECTROMAGNETIC SURVEYS
IN THE ZEEHAN AREA, TASMANIA
ON BEHALF OF
TENNECO AUSTRALIA INC.

INTRODUCTION

At the request of Mr. A. Rugg of Tenneco Australia Inc., Seigel Associates Australasia Pty. Ltd. executed Turam Electromagnetic surveys over three areas in the Zeehan area, north-western Tasmania. The field work was under the immediate direction of Mr. J. Walters, with Mr. A.W. Howland-Rose providing technical supervision.

The survey comprised three grids within E.L. 44/70, all of which were accessible by road transport from Zeehan township.

The object of the survey was to follow-up electromagnetic anomalies located on a HEM-701 helicopter Electromagnetic survey carried out by Seigel Associates Australasia Pty. Ltd. in December, 1971.

The attached appendix 'T' briefly discusses the techniques employed in the present survey.

DISCUSSION OF RESULTS

All plates are presented at a horizontal scale of 1 inch = 200 feet and the data profiles have vertical scales of 1 inch = 10° phase shift and 1 inch = 0.2 normal and field strength ratio. (F.S.R.)

1 - BLACK JACKS PROSPECT

Plate 1, sheet 1 displays the turam conductor axes plan together with their respective conductivity width values and maximum depths. Plate 2 depicts the data profiles.

The test survey delineated a series of north to north-north-~~west~~ east trending, shallow, weak conductors, designated 'A' to 'D'. The conductors could represent the same geologic horizons faulted by approximately north-easterly trending sinistral dislocations along 4S and 11S.

CONCLUSIONS AND RECOMMENDATIONS

Prior to any contemplated drilling, I recommend that limited auger sampling be carried out over each of the above conductors 'A', 'B', 'C' and 'D' at 20 foot intervals for 100 feet either side of the conductor axes positions on lines 14S (A), 8S (B), 4N (C) and 6N (D). Should a positive geochemical indication be obtained, drilling can be undertaken on any section of the conductor on

which the response is located. Should drilling be contemplated without positive geochemical follow-up, I recommend that initial investigation be carried out on the anomalies located at 030E on line 8S and 090E on line 4N. Holes should be drilled at an angle against dip to intersect targets vertically below th above positions at depths of 10% greater than the calculated depths of 55 feet and 60 feet respectively.

2 - NORTH GRIEVE

Plate 1, sheet 2 displays the grid plan and conductor axes map, and plate 3 the data profiles.

Two grids were surveyed using the same 2000 x 2800 feet energising loop.

North - South Grid

Three lines, 12W, 16W and 20W were surveyed utilising an energising frequency of 400Hz. A moderate conductor designated 'A' was defined at 12W/6270N, 16W/6360N and 20W/6270N. The anomaly is still open to both the east and west. Conductivity thicknesses of 7, 12, and 10 mhos were obtained at maximum depths of 70 feet, 60 feet, and 70 feet on lines 12W, 16W and 20W respectively.

East - West Grid

The conductors 'C', 'D', 'E' and 'F' have very low conductivity width values, the majority lying in the range from 2 mhos to 4 mhos. The area defined by these conductors on lines 36N to 52N shows broad surface conduction, which could be due to either surface conductivity or weakly conducting shale or mineralised members of the sequence. It is perhaps significant that line 32N which was surveyed at the lower frequency of 400 Hz shows only minor, background values, inferring surface conductivity.

Conductor 'B' is seen on line 56N at 350W (@ 400 Hz) and on line 52N at 250W (@ 800 Hz), where the conductivity widths are 7 and 4 mhos respectively.

Conductor 'G' shows weak conductivity widths of 4 mhos at 430W and 220W on lines 40N and 36N, although the anomaly is well defined on line 36N.

Three well defined moderate conductors open to the south were defined at 400 Hz on line 28N. Conductivity widths of 8, 12 and 12 were defined at 600W, 020E and 560E respectively at maximum depths of 75 - 80 feet. These anomalies have been designated 'J', 'I' and 'H' on plate 1, sheet 2.

CONCLUSIONS AND RECOMMENDATIONS

My thoughts on the above anomalies are similar to Black Jacks' prospect, namely that some additional indication of possible economic importance would be required prior to any recommended drilling. I therefore suggest a geochemical auger follow-up programme, with particular attention being paid to conductors 'A', 'B', 'C', 'G', 'H', 'I' and 'J' in that order.

3 - EDEN PROSPECT

The turam conductor axes plan together with their respective maximum depths in feet, and conductivity thicknesses in mhos, are presented on plate 1, sheet 3. The data profiles are presented on plate 4.

Conductor 'A' has been defined on lines 12W, 8W, 4W and 0 and perhaps 8E at 100S, 060N, 030N, 150S and 250S, where the depths and conductivity widths are 60 feet, 70 feet, 60 feet, 60 feet and 50 feet - 6 mhos, 4 mhos, 2 mhos, 2 mhos and 1 mho respectively.

Conductor 'B' (line 12W at 630N) has only one expression on the grid, and therefore the limited strike length may exaggerate its importance. Nervertheless the high conductivity thickness value of 30 mhos, necessitates very careful follow-up on this anomaly.

Conductor 'C' can be found on lines 8W, 4W, 0 and perhaps 4E at 450N, 530N, 530N and 390N respectively, where the maximum depths to the top of the conductor have been calculated to be 40 feet, 60 feet, 90 feet and 70 feet respectively. The conductivity is weak everywhere.

Conductor 'D' has only one expression on this grid at 080S on line 8E, where the conductivity width of 8 mhos indicates it to be a weak to moderate conductor. The maximum depth has been calculated to be 75 feet.

CONCLUSIONS AND RECOMMENDATIONS

As on the other two prospects, geochemical auger sampling is recommended for follow-up prior to any drilling programmes. Those anomalies recommended for particular attention are conductor 'B' line 12W, conductor 'A' line 8W and conductor 'C' line 0.

GENERAL CONCLUSIONS

The known mineralisation in the area consists of galena sphalerite, pyrite and chalcopyrite in massive lenses. This mode of mineralisation both in north-western Tasmania and New South Wales, gives very variable conductive responses dependent upon the mode and relative distribution of the constituent mineralisation. For this reason I feel that a correlation between good conductivity expressed as high

conductivity width products and ore grade (and thus possible economic potential) is not possible. Therefore all conductors having good definition should receive equal attention regardless of conductivity, providing they are not obviously due to surface conduction.

Should it prove impractical to obtain additional information on any of the conductors, the following targets are recommended for drilling. All targets should be drilled against dip to intersect a target at the vertical depth listed below. Shallow angle - 50° - 60° - declinations are suggested.

* Denotes second targets

1 - Black Jacks Prospect

Conductor	Line	Position	Depth
A	14S	040W	55 feet
B *	8S	015E	60 feet
C	2S	080W	80 feet

2 - North Grieve

Conductor	Line	Position	Depth
A	20W	6270N	75 feet
B	52N	250W	100 feet
C	44N	500E	125 feet

Conductor	Line	Position	Depth
D *	44N	00	95 feet
E *	40N	200E	80 feet
G	36N	220W	75 feet
I	28N	020E	80 feet
J	28N	600W	85 feet

No recommendations on 'F' or 'H'.

3 - Eden Prospect

Conductor	Line	Position	Depth
A *	00	150S	65 feet
C *	00	530N	95 feet

No recommendations on 'B' or 'D'.

I would be pleased to be able to review this report when additional information becomes available.

Respectfully submitted on behalf of:

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.

A.W. HOWLAND-ROSE, M.Sc.,DIC,AMAusIMM,FGS.

GEOPHYSICIST

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.

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APPENDIX 'T'

APPENDIX "T"
BRIEF DESCRIPTION OF THE
TURAM ELECTROMAGNETIC SYSTEM

GENERAL

The Turam method can be classified as a fixed source compensation method. The primary or source field consists of a large energizing layout in the form of a long wire or a large loop laid out on the terrain, to which an audio frequency alternating current is fed by means of a motor generator. The resulting current pattern is investigated inductively, with two identical receiving coils connected to a bridge compensator which compares the signal received in each coil in relative phase and amplitude. When grounded cable is used, the energization is both galvanic and inductive; when the primary layout consists of a closed loop, the energization is purely inductive. Under most conditions the presence of galvanic current is undesirable and inductive energization is, as a rule, preferred.

Although the system allows the comparison of any two components of the resultant field, it is standard procedure in systematic surveys to measure the gradient of the vertical component.

The pattern for a typical Turam survey is shown in Fig. 1. A large rectangular loop is used as primary layout and the field gradients are measured with horizontal receiving coils along profiles perpendicular to a long side of the transmitting loop.

DATA REDUCTION

The relative strength of the undisturbed primary field is dependent on the loop dimensions and the location of the observation points, and can be determined by calculation. The measured field strength ratios are normalized through division by these calculated free space ratios.

The primary field causes eddy current to flow in subsurface conductors. As a result the resultant field will be distorted in both amplitude and phase. The presence of conductors will thus be indicated by abnormal strength ratios and phase differences.

PRESENTATION

The measuring results are usually presented in profile form as (reduced) field strength ratio and phase difference curves, with the observed values plotted at the midpoint between coil positions.

Occasionally one of the two parameters is presented in contour form, but contour plans are generally inadequate to express the full significance of the data.

INTERPRETATION

Where field distortion occurs the curves indicate the location and the depth of burial of the main current flow. The "current axis" is well defined when the current is concentrated as, for instance, in thin, steeply dipping conductors. In wide, banded conductors or in horizontal conductors such as, for instance, overburden, the current is usually more dispersed and the anomalies will yield less positive information.

As a rule the current axis is located right below the maximum field strength ratio deflection or the maximum negative phase shift. Its depth under the traverse is indicated by the shape of the anomaly.

The relative amplitudes of field strength and phase distortions are a measure of the conductivity of the conducting bodies, i.e. good conductors are characterized by field strength distortion combined with relatively little phase shifting, whereas poor conductors affect the phase, rather than the strength of the resultant field.

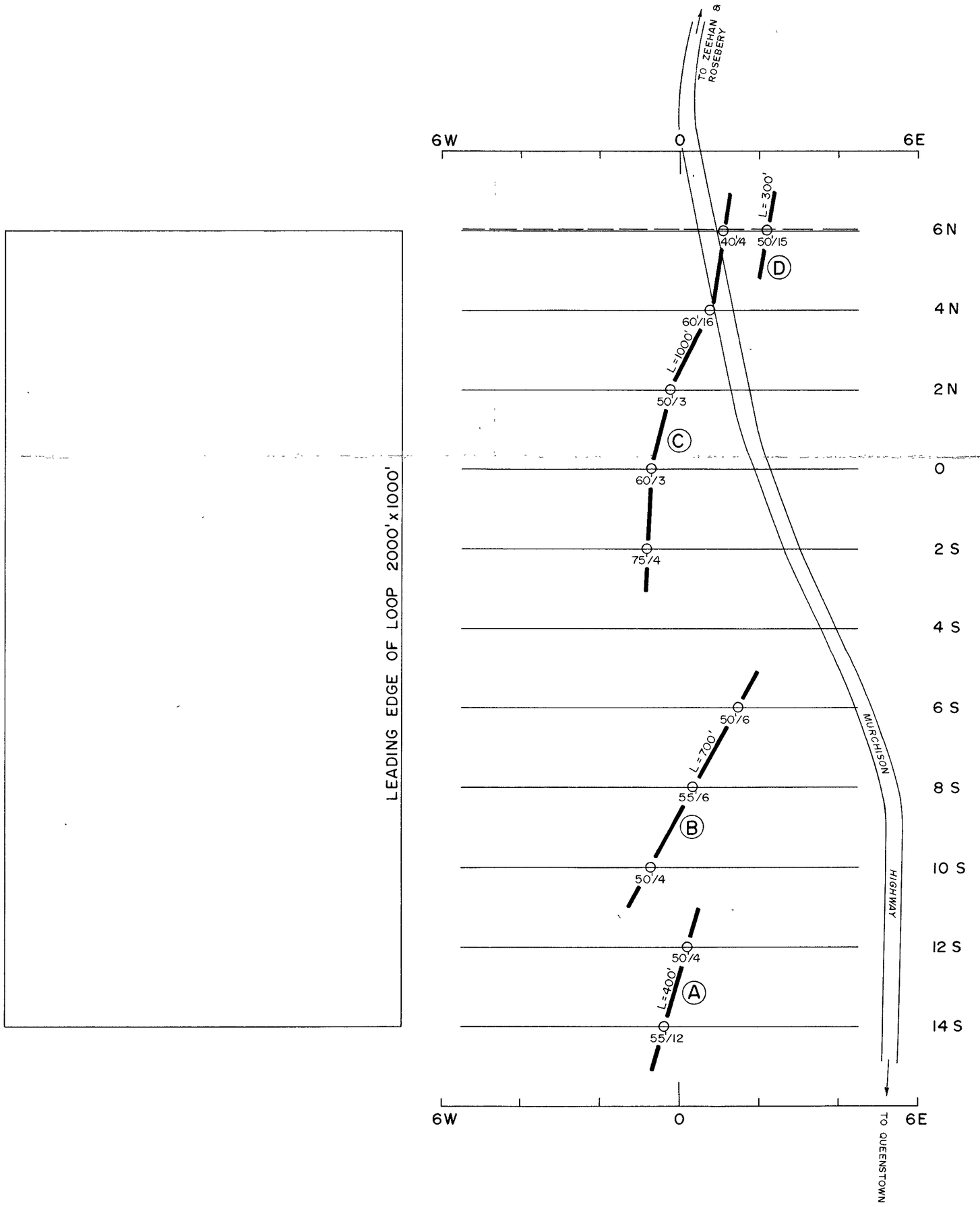
For an accurate grading the resistivity thickness (r/d) ratio of the individual conductors can be derived from the calculated in-phase and out-of-phase components, taking further into consideration the exciting frequency and the strike length of the conductor. The relations are shown in Fig.2 and Fig.3. The obtained r/d values are marked on the upper right side of the anomalies, in units of ohmcm/m. On the lower left side the depth of the current axis (ft.) is marked. It is normally located 30-40 ft. within the body and the indicated depth should be regarded as the maximum depth to the upper surface of the conductor.

To obtain the projection of the current pattern, the anomalies are connected between lines, whereby depth and r/d values, as well as other characteristics of the curves are used as criteria. The strike of the formations, if known, is also taken into consideration.

Fig. 4 and Fig. 5 show a plan and section of a typical Turam survey and interpretation.

REFERENCES: 1937 Hedstrom, E.H. Phase Measurements in Electrical prospecting. AIME Techn. Publ. 827.

1964 Bosschart, R.A. Analytical Interpretation of Fixed Source Electromagnetic Prospecting data. Delft.



LEGEND

- LINES SURVEYED AT 400 Hz
- LINES SURVEYED AT 800 Hz
- ANOMALY LOCATION — DEPTH TO CURRENT AXIS IN FEET / CONDUCTIVITY THICKNESS IN MHOS (e.g. 60/3)
- CONDUCTOR AXIS AND REFERENCE CODE (e.g. B)

MAG NORTH

TENNECO AUSTRALIA, INC.

BLACK JACKS PROSPECT
ZEEHAN AREA
TASMANIA

72-924

TURAM ELECTROMAGNETIC TEST SURVEY
GRID AND INTERPRETATION PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

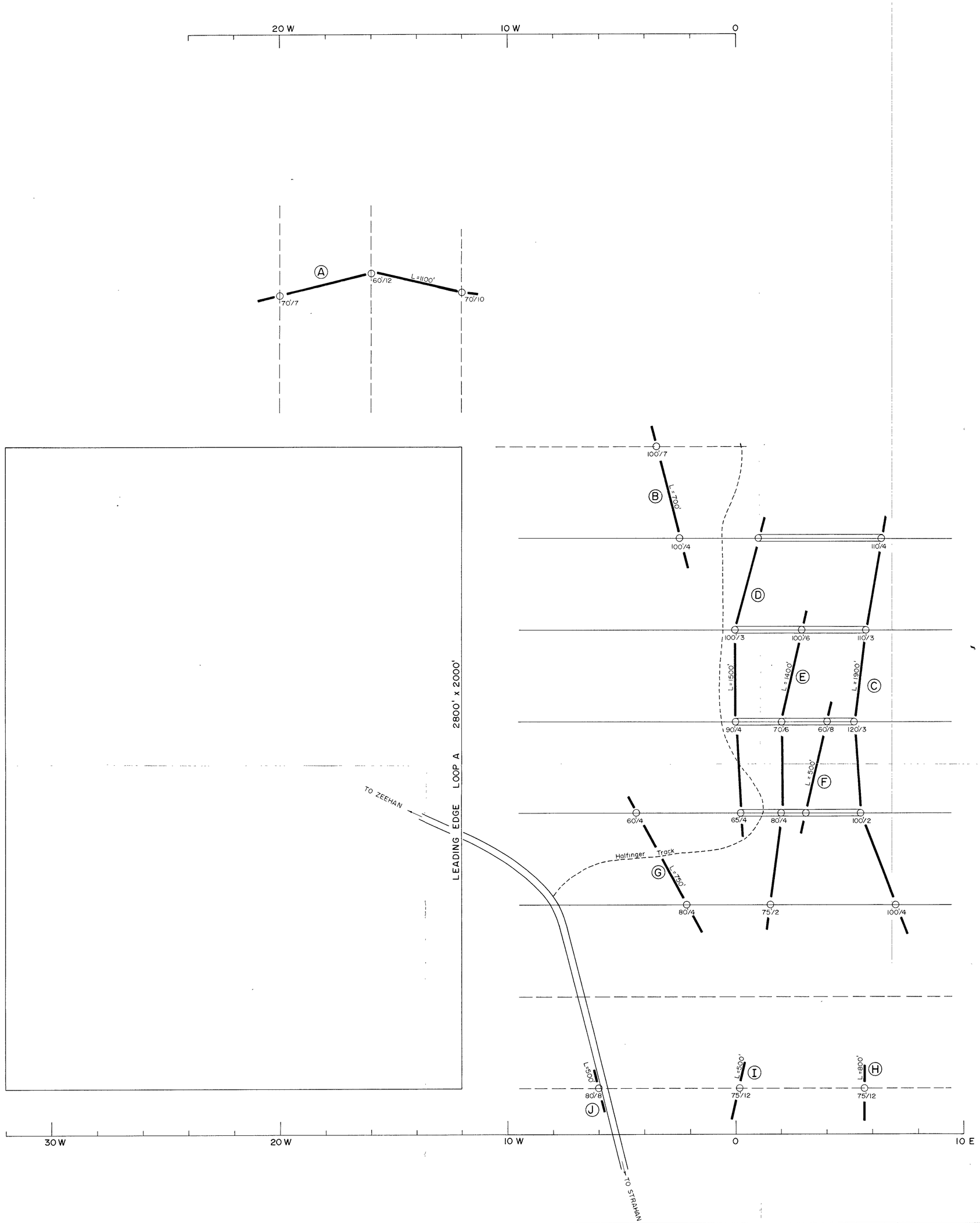
707060

5 cm

200 0 200 400
SCALE OF FEET

2278

JOB N° TAS. 003 SHEET 1 OF 3 PLATE 1



LEGEND

- LINES SURVEYED AT 800 Hz
- LINES SURVEYED AT 400 Hz
- 120/3 — ANOMALY LOCATION DEPTH TO CURRENT AXIS IN FEET / CONDUCTIVITY THICKNESS IN MHOS
- CONDUCTIVE REGION
- (B) — CONDUCTOR AXIS AND REFERENCE CODE

TENNECO AUSTRALIA, INC.

NORTH GRIEVE PROSPECT
ZEEHAN AREA
TASMANIA

72-924

TURAM ELECTROMAGNETIC TEST SURVEY
GRID AND INTERPRETATION PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

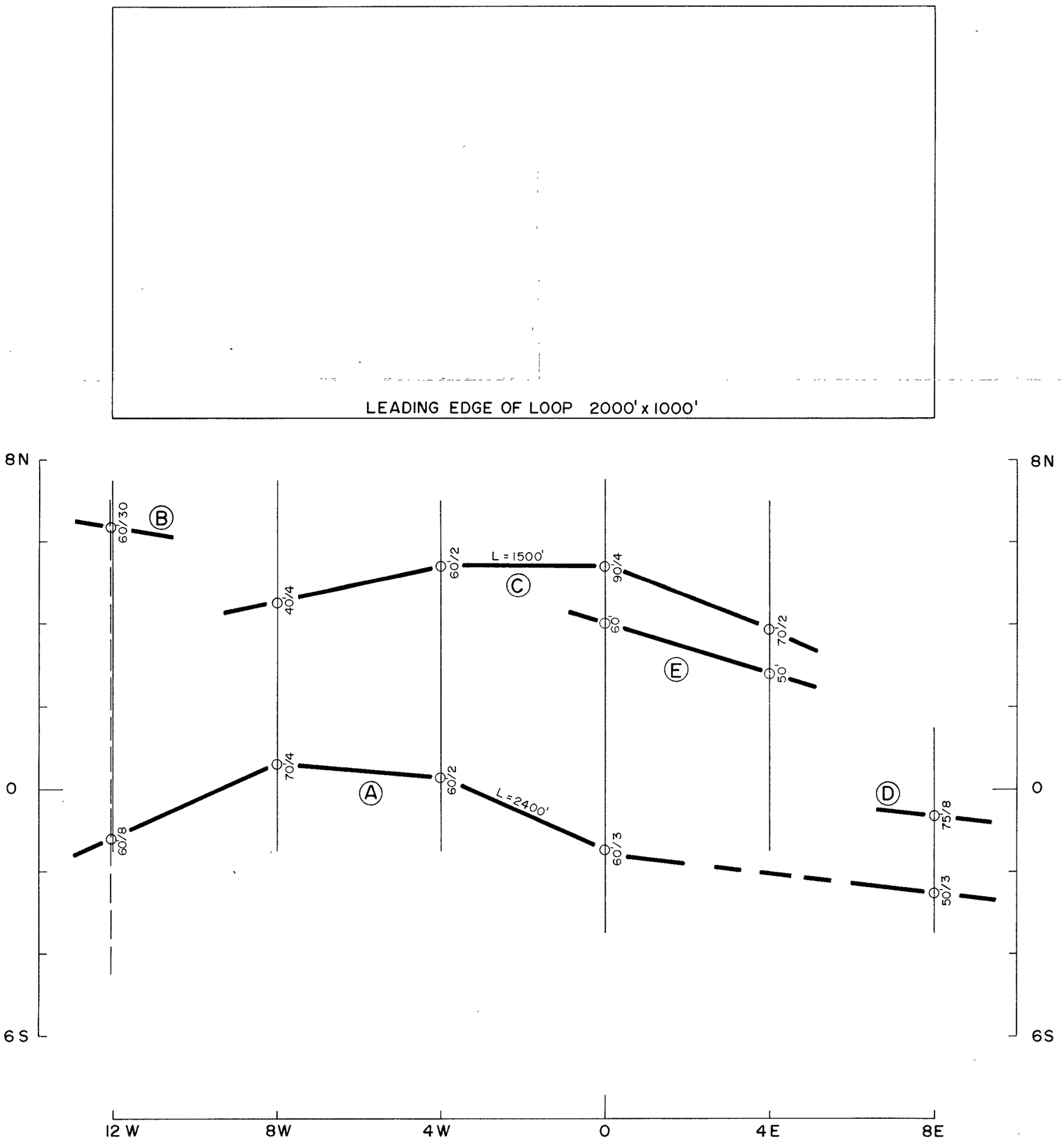
707061

5 cm

200 0 200 400
SCALE OF FEET

2279

JOB N°. TAS. 003 SHEET 2 OF 3 PLATE 1



LEGEND

- LINES SURVEYED AT 800 Hz
- LINES SURVEYED AT 400 Hz
- ANOMALY LOCATION — DEPTH TO CURRENT AXIS IN FEET / CONDUCTIVITY THICKNESS IN MHOS (e.g. 70/2)
- CONDUCTOR AXIS AND REFERENCE CODE (B)

TENNECO AUSTRALIA, INC.

EDEN PROSPECT
ZEEHAN AREA
TASMANIA

72-924

TURAM ELECTROMAGNETIC TEST SURVEY
GRID AND INTERPRETATION PLAN

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

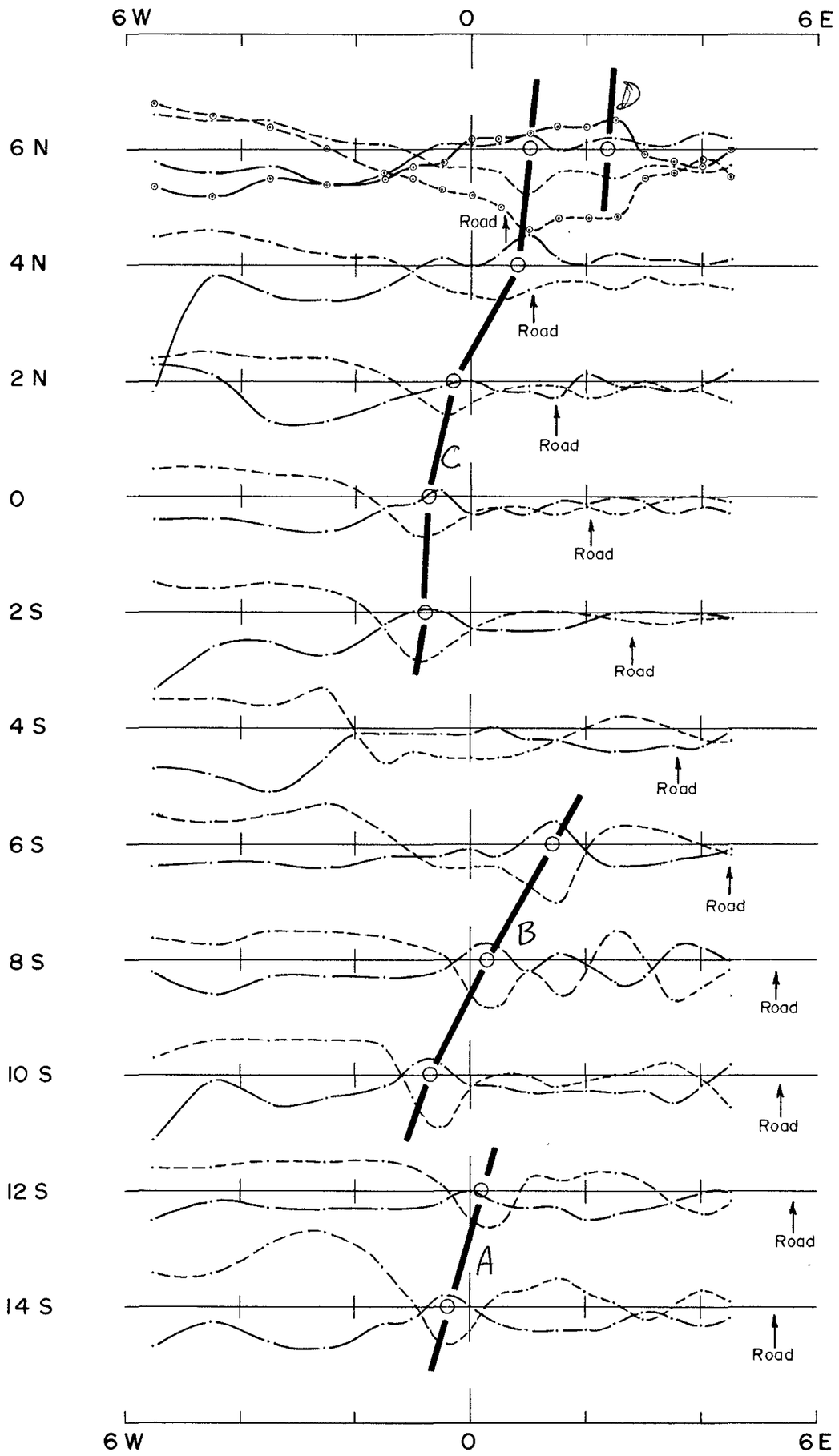
707062

5 cm

200 0 200 400
SCALE OF FEET

2280

JOB N°. TAS. 003 SHEET 3 OF 3 PLATE 1



LEGEND

FS R | FREQUENCY | PHASE

800 Hz

400 Hz

1·2 +10°

1·0 0° BASE LEVEL

0·8 -10°

ANOMALY LOCATION

CONDUCTOR AXIS

TENNECO AUSTRALIA, INC.

BLACK JACKS PROSPECT
ZEEHAN AREA
TASMANIA

72-924

TURAM ELECTROMAGNETIC TEST SURVEY
DATA PROFILES
LINES 6N - 14S

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

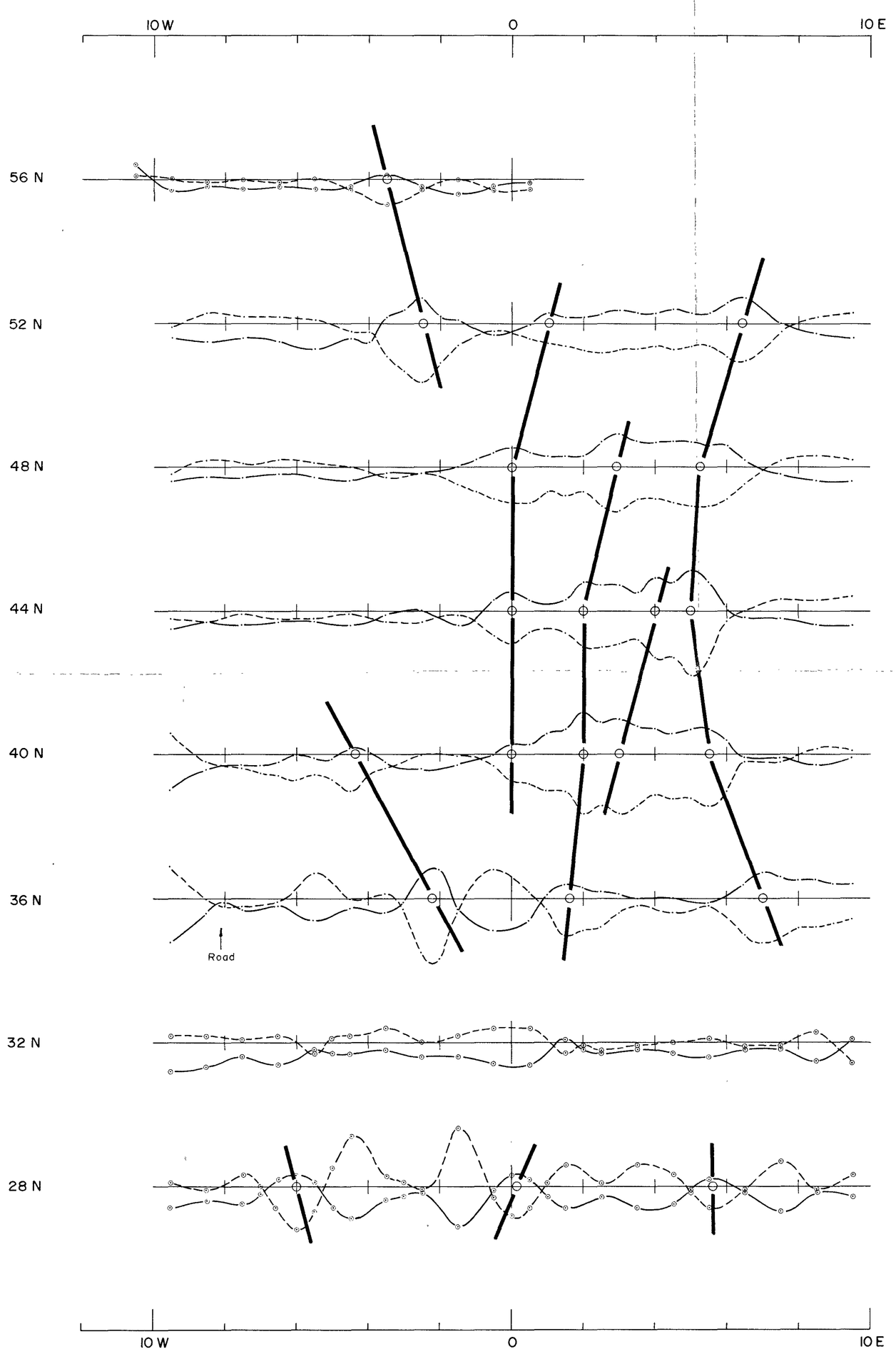
707063

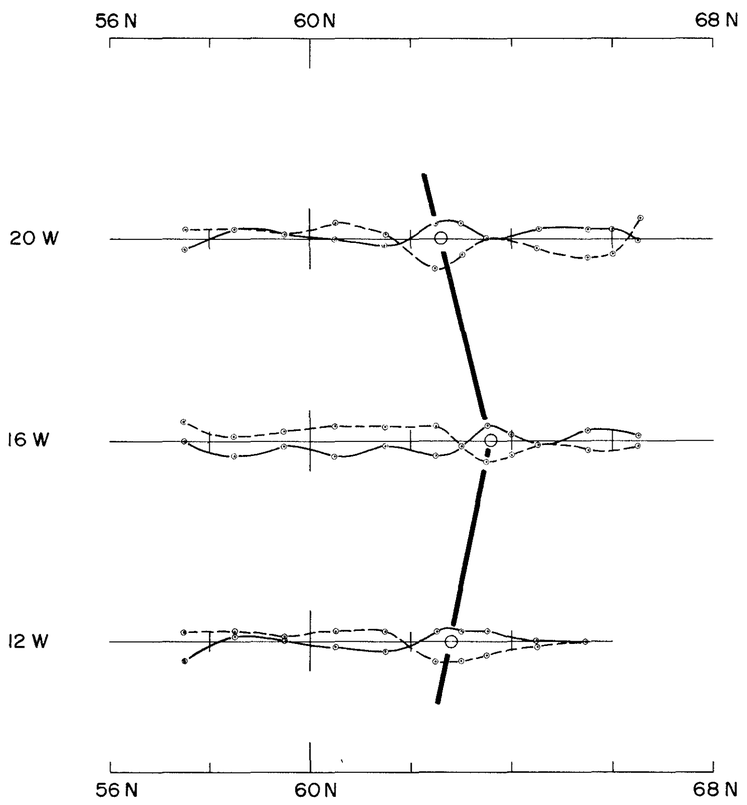
5 cm

200 0 200 400
SCALE OF FEET

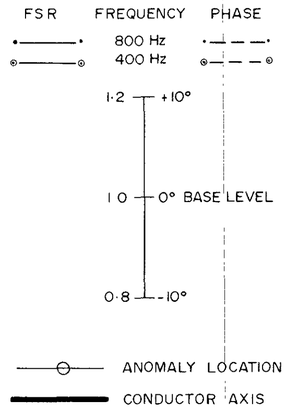
2281

JOB N°. TAS. 003 SHEET 1 OF 1 PLATE 2





LEGEND



TENNECO AUSTRALIA, INC.

NORTH GRIEVE PROSPECT

ZEEHAN AREA

TASMANIA

72-924

TURAM ELECTROMAGNETIC TEST SURVEY
DATA PROFILES
LINES 56 N - 28 N AND 20 W - 12 W

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

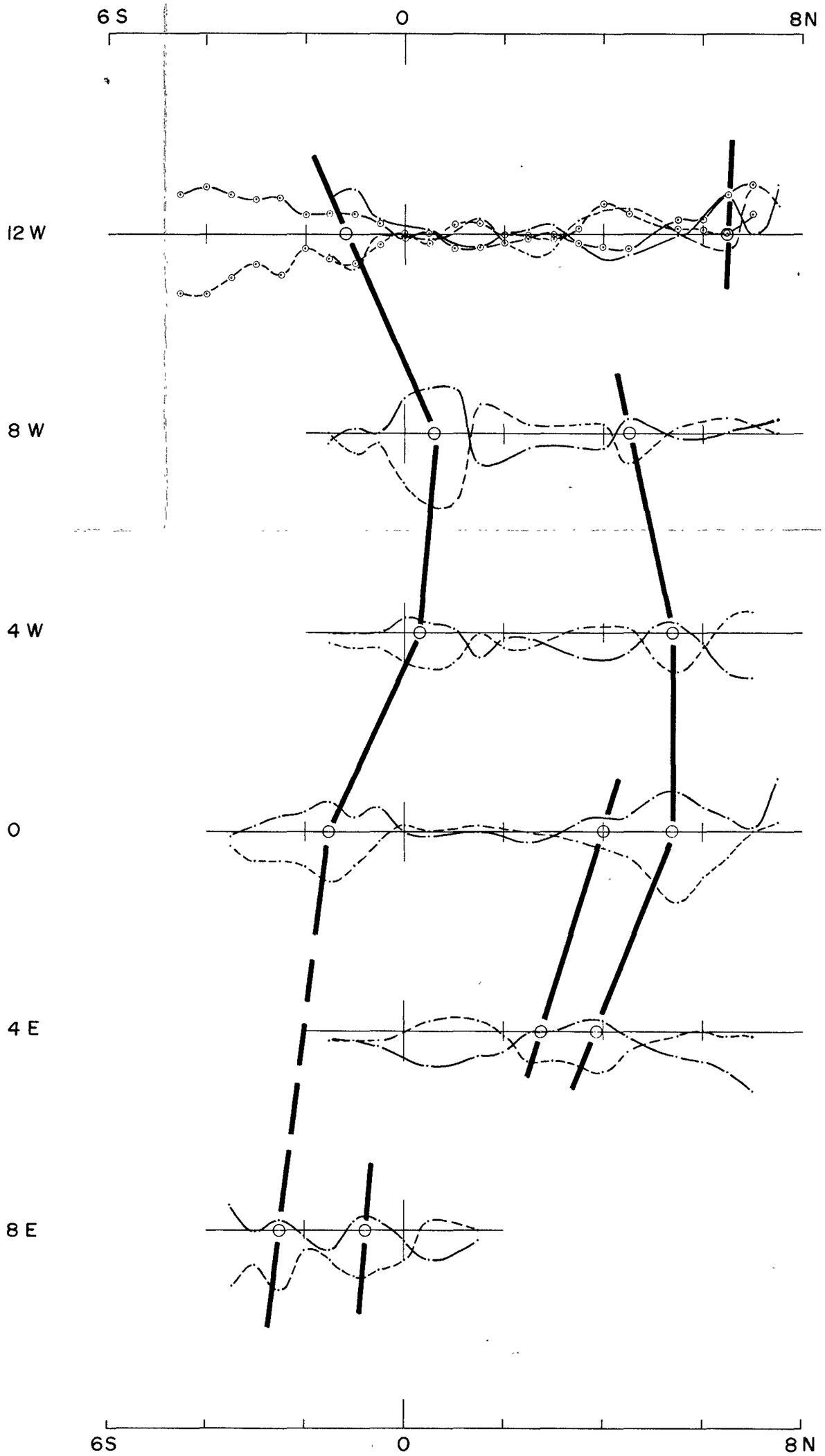
707064

5 cm

200 0 200 400
SCALE OF FEET

2282

JOB N°. TAS. 003 SHEET 1 OF 1 PLATE 3



LEGEND

FSR FREQUENCY PHASE

800 Hz

400 Hz

1·2 +10°

1·0 0° BASE LEVEL

0·8 -10°

ANOMALY LOCATION

CONDUCTOR AXIS

TENNECO AUSTRALIA, INC.

EDEN PROSPECT
ZEEHAN AREA
TASMANIA

TURAM ELECTROMAGNETIC TEST SURVEY
DATA PROFILES
LINES 12 W - 8 E

SURVEYED AND COMPILED BY
SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.
FEBRUARY 1972

707065

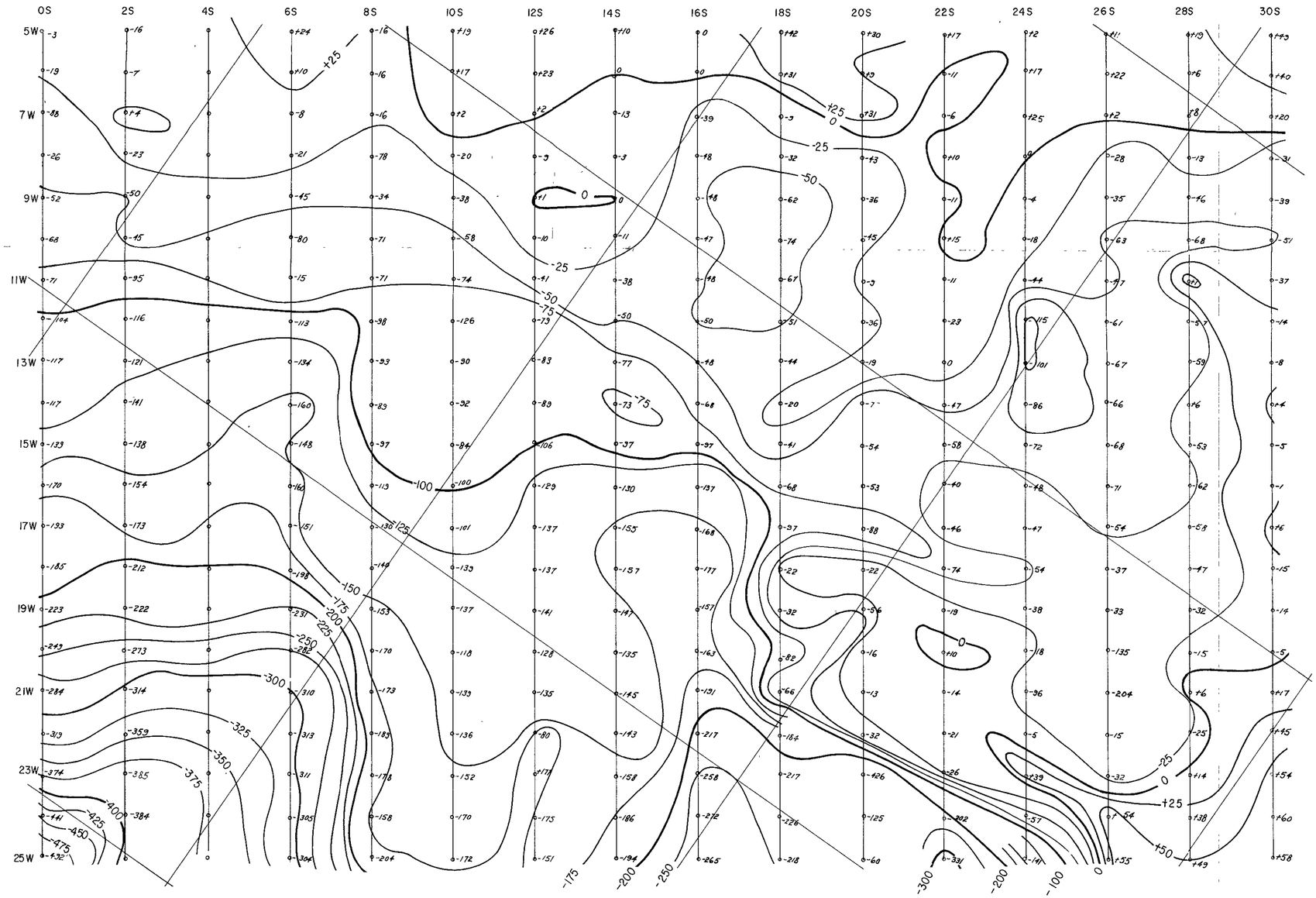
5 cm

200 0 200 400
SCALE OF FEET

2283

JOB N°. TAS. 003 | SHEET 1 OF 1 | PLATE 4

APPENDIX A_3 Self Potential Results



5 cm

DATE	DRAWN BY	CHECKED

72-924

TENNECO AUSTRALIA INC.

SPRAY MINE AREA TASMANIA

APPENDIX A3

SELF POTENTIAL SURVEY 2286

Compilation R E Besley

Drafted by J Curnow

Contour Interval 150 mv

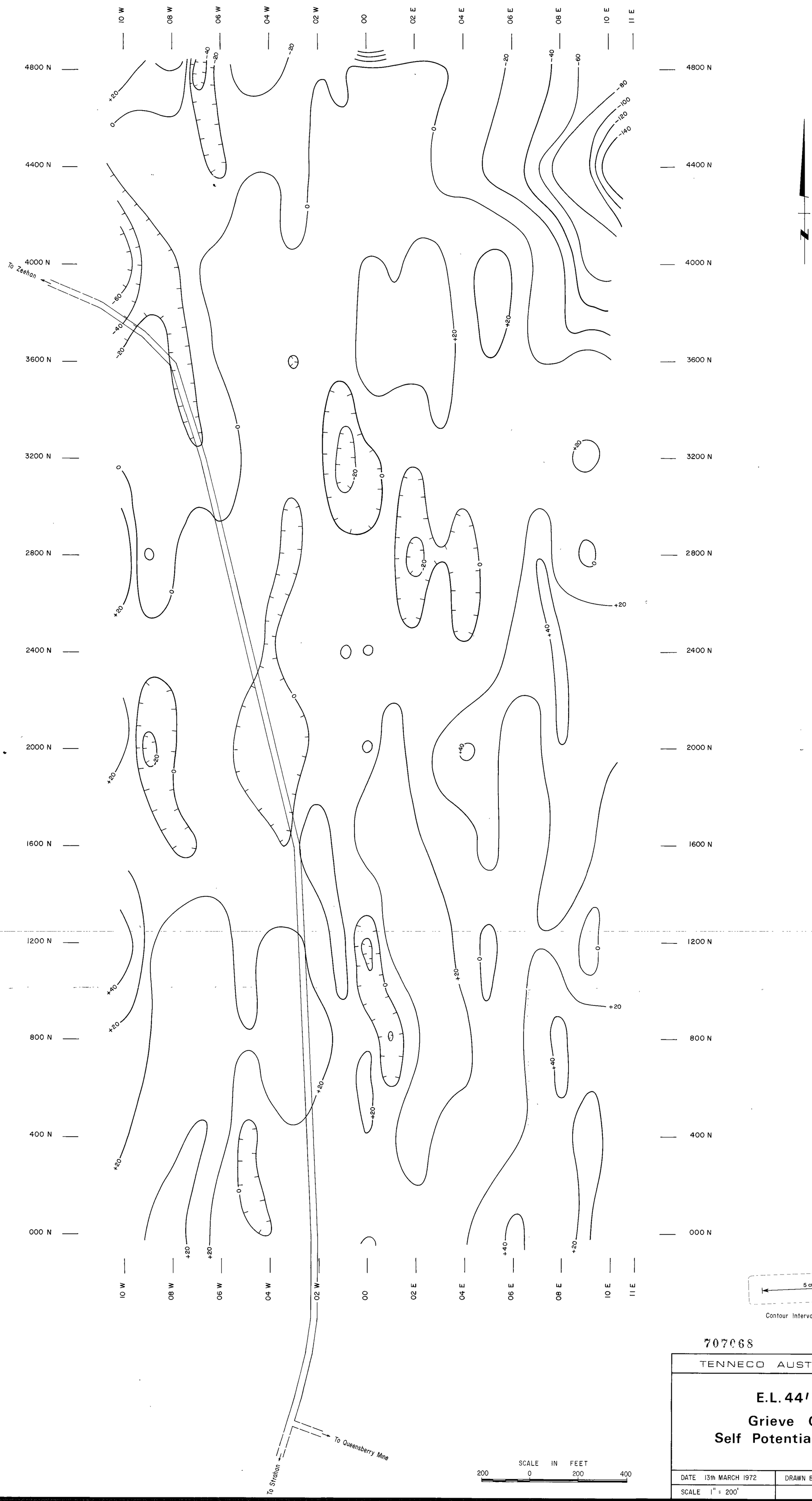
Date 16 / 4 / 71

0 200 400

Scale in feet

Dwg no 159

707067



707068

72-924

TENNECO AUSTRALIA INC.

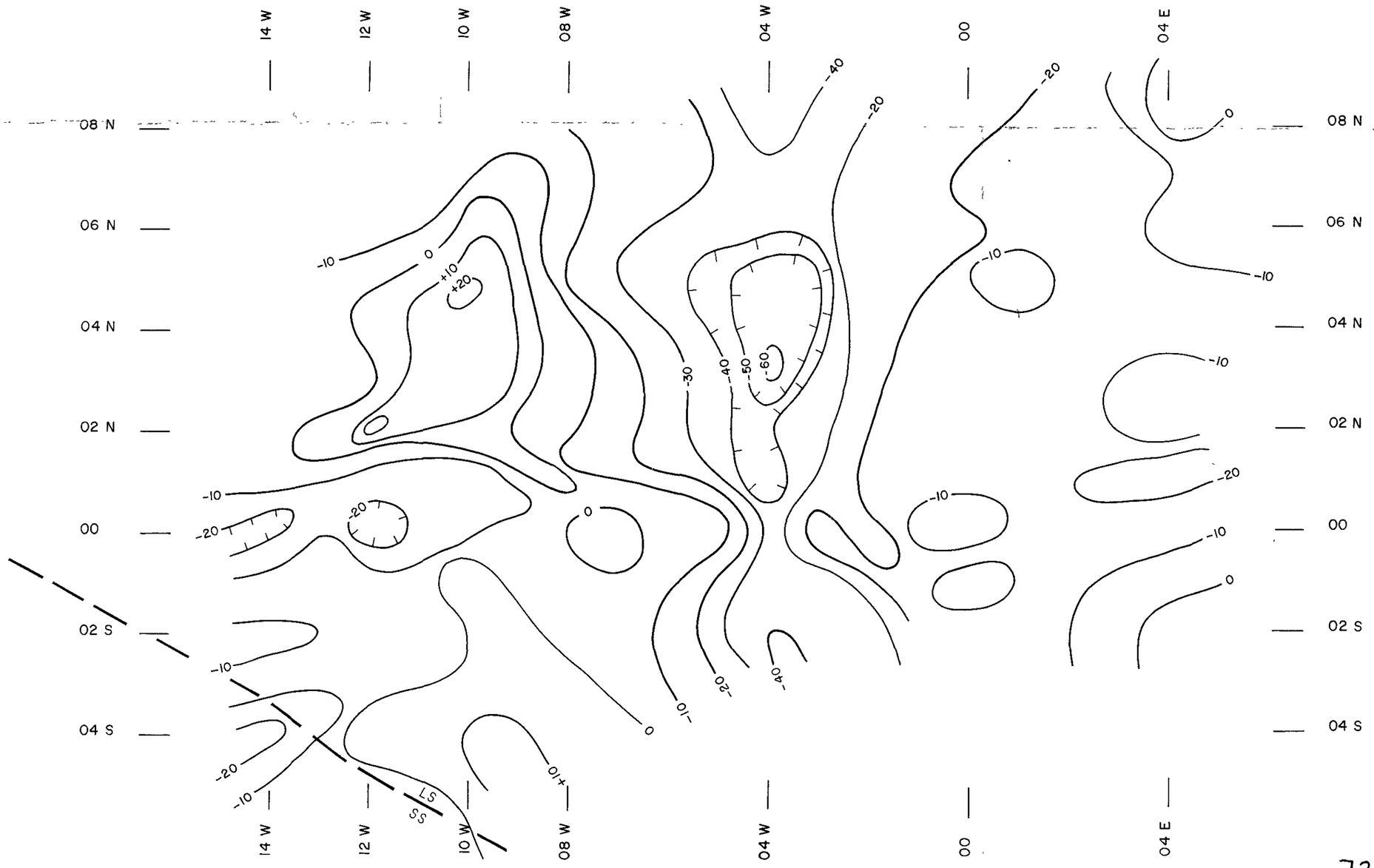
Appendix B3.

E.L. 44/70

2287

Grieve Grid
Self Potential Survey

DATE 13th MARCH 1972	DRAWN BY E HOLT	DWG N° 625
SCALE 1" = 200'		



LEGEND

Approximate Faulted Boundary between Gordon Limestone and Moina Sandstone

Contour Interval 10 MV

5 cm

707069

SCALE IN FEET

200 0 200 400

72-924

TENNECO AUSTRALIA INC.

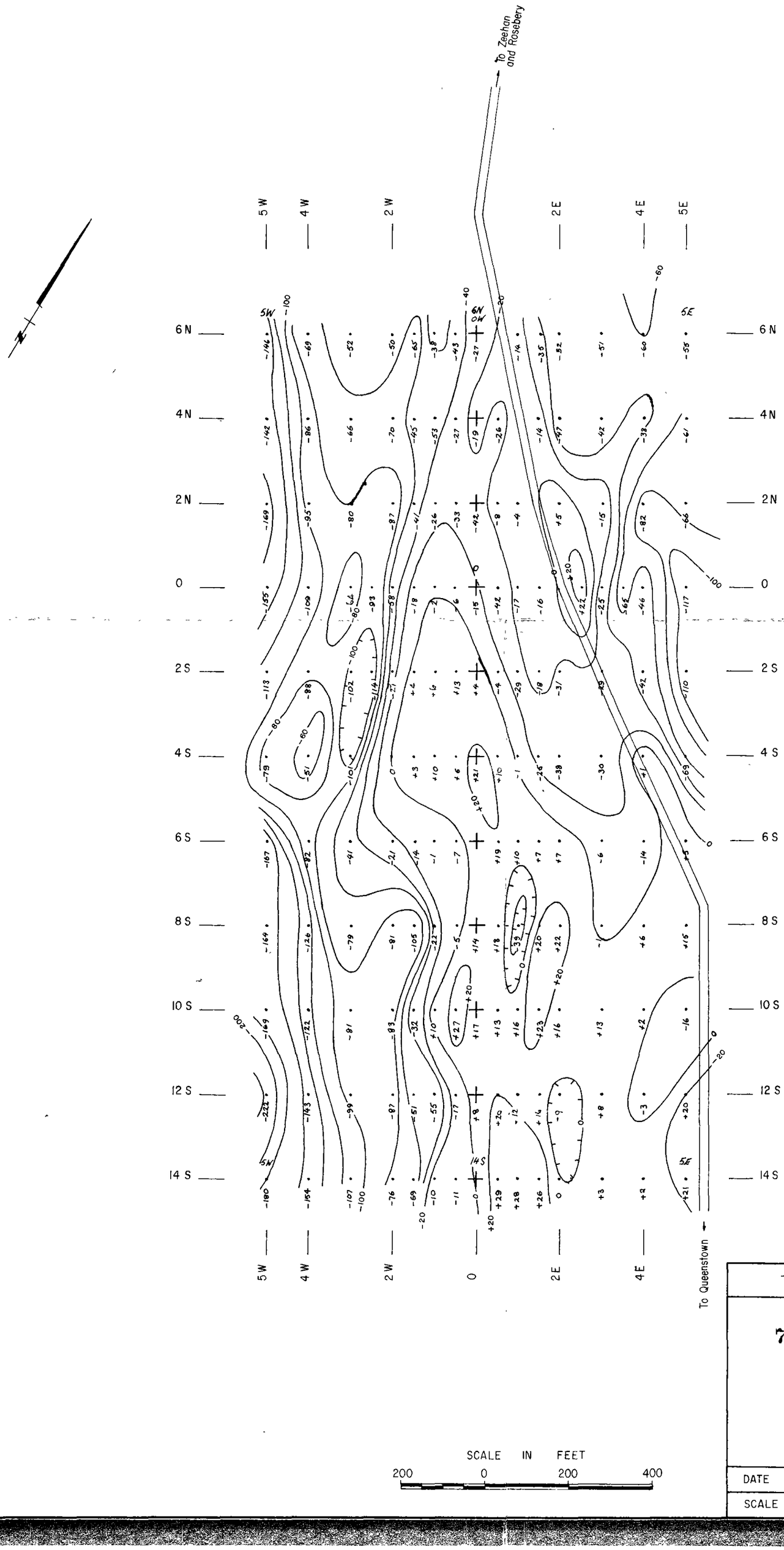
APPENDIX A3

E.L. 44/70

Eden Grid
Self Potential Survey

2285

DATE. 15th MARCH 1972	DRAWN BY. E HOLT	DWG Nº 680
SCALE. 1" = 200'		



Contour Interval 20MV

SCALE IN FEET

200 0 200 400

72-924

TENNECO AUSTRALIA INC.

APPENDIX A3

707070 E.L. 44/70

Black Jacks Grid
Self Potential Survey

2284

DATE 10th MARCH 1972	DRAWN BY E HOLT	DWG Nº 682
SCALE 1" = 200'		

APPENDIX B Spray Grid area and Geophysical Results

PRECAMBRIAN QUARTZITE AND SLATE

CAMBRIAN SEDIMENTS

CAMBRIAN SEDIMENTS

CAMBRIAN SEDIMENTS

MANGANESE HILL FAULT

BALSRUP FAULT

75°

MAIN SHAFT

'E' ADIT

LOWER ADIT

MINOPS DDH

SPRAY MINE

NO 2 SHAFT

A ADIT

GOVT DDH

B ADIT

UPPER ADIT

MIDDLE ADIT

TENN DDH

№2 LODE

D ADIT

№4 LODE

№1 LODE

№3 LODE

PRECAMBRIAN QUARTZITE AND SLATE

PRECAMBRIAN QUARTZITE AND SLATE

LINE 0S

LINE 2S

LINE 4S

LINE 6S

LINE 8S

LINE 10S

LINE 12S

LINE 14S

LINE 16S

LINE 18S

LINE 20S

LINE 22S

LINE 24S

LINE 26S

LINE 28S

LINE 30S

1000 N

00

1000 S

2000 S

3000 S

4000 S

5000 S

1000W

00E

1000E

2000E

3000E

COL. NORTHS

deep pit

Adit

Limits of graphitic slates not determined, poor exposure

Shaft

Pit

Waste dump

Waste dump

Waste dump

FOAM

Quartzite with numerous irregular quartz veins (gash-m m type)

Soil covered with quartz and quartzite scree

No outcrop

Outcrops of quartzite in the creek

Dump material indicates thin galena veins were main mineralisation. No lode formation observed. Sharp veins cut mostly siltstone, shale.

Waste dump

ADIT

WAVE

Trig

Dense scrub

Dump material highly graphitic. Galena on thin joint

Main dump: Thin fracture veins and fillings of Ga in siltstone-shale. Some quartz veins with Py. Last material on dump is highly graphitic

Solid waste dump

NUBEENA

Trenches on Ga-Qz filled fractures in quartzite

Soil and scree covered

Trench contains Py-Ga in quartz breccia 1' wide

5W

10W

15W

20W

25W

N TRUE

"Iron-Jasper Breccia" in quartzite (Goethite and Manganese Oxides)

Recrystallised quartzites with quartz gash veins

Quartzite

Banded slates and quartzites

Graphitic slates

Quartzite scree and soil

E M contours in anomalous areas

5 cm

72-924 707072

FIGURE 5

TENNECO AUSTRALIA INC.

APPENDIX B.

ZEEHAN TASMANIA

SPRAY MINE AREA

GEOLOGICAL SKETCH MAP

2289

DATE: 31st March, 1971	Surveyed: G. FISHER
SCALE: 1" = 200 feet	Drawn by: R. FLEETON

DWG NO 349

400 H_2 generator (not at scale)

1000'

1000'

500'

0S 2S 4S 6S 8S 10S 12S 14S 16S 18S 20S 22S 24S 26S 28S 30S

5W 7W 9W 11W 13W 15W 17W 19W 21W 23W 25W

3·0 2·0 5·0 4·0

CONTOUR INTERVAL
- 5·0 degrees
- 1·0 degrees
- 0·5 degrees

5 cm

DATE	DRAFTED BY	CHECKED

72-924

707073

TENNECO AUSTRALIA INC

SPRAY MINE AREA TASMANIA

APPENDIX B

ELECTROMAGNETIC SURVEY

2288

Compilation: A.M. Rugg
Phase angle / 100 feet

Drafted by: J. Curnow
Date: 28/2/71

0 200 400
Scale in feet

Dwg no 160

APPENDIX D Dump Sampling - Final Results

050

NORMAN BROS. PTY. LTD. 10 COLUMN STOCK DISSECTION BLOCK

707075

ASSAY REF. No.		Cu %	Ag. ozs/TON	Pb. %	Zn. %	Sb. %
DA 0373		< 0·01	0·65	0·06	0·10	< 0·05
4		< 0·01	0·41	0·11	0·28	< 0·05
5		0·01	4·08	6·00	0·25	< 0·05
6		< 0·01	< 0·41	0·03	0·07	< 0·05
7		< 0·01	0·82	0·58	0·14	0·05
8		0·01	0·41	0·07	0·10	0·05
9		0·01	0·65	1·1	0·90	< 0·05
80		< 0·01	< 0·41	0·02	0·11	< 0·05
1		0·01	1·14	0·47	1·60	0·05
2		< 0·01	1·47	1·20	0·14	0·05
3		< 0·01	0·41	0·26	0·07	< 0·05
4		< 0·01	< 0·41	0·05	< 0·05	< 0·05
5		0·01	1·14	0·85	0·25	< 0·05
6		0·01	0·82	0·10	0·43	< 0·05
7		< 0·01	1·47	1·0	0·10	< 0·05
8		0·01	0·82	0·99	0·14	< 0·05
9		< 0·01	0·65	0·40	0·23	< 0·05
90		0·01	1·47	0·88	0·43	< 0·05
1		< 0·01	1·14	1·6	0·11	< 0·05
2		< 0·01	< 0·41	0·05	0·05	< 0·05
3		< 0·01	0·82	0·51	0·14	< 0·05
4		0·02	1·47	2·3	3·30	< 0·05
5		0·01	0·82	1·1	0·53	< 0·05
6		< 0·01	0·65	0·20	0·07	< 0·05
7		< 0·01	0·65	0·04	0·10	< 0·05
8		0·01	0·65	0·08	1·15	< 0·05
9		0·01	2·12	1·23	0·67	< 0·05
400		< 0·01	0·65	0·05	< 0·05	< 0·05
1		< 0·01	0·65	0·16	0·37	< 0·05
2		< 0·01	< 0·41	0·34	0·37	< 0·05
3		< 0·01	< 0·41	0·07	1·00	< 0·05
4		< 0·01	0·41	0·46	0·90	< 0·05
5		< 0·01	0·41	0·24	0·50	< 0·05
6		< 0·01	0·65	0·65	0·15	< 0·05
7		0·01	1·63	1·7	0·10	< 0·05
8		0·01	4·1	~~3·28~~	~~0·15~~	< 0·05
9		< 0·01	1·47	1·4	0·45	< 0·05
10		0·03	6·05	5·75	2·75	0·05
1		0·01	2·45	1·78	0·53	< 0·05
2		< 0·01	2·61	4·85	0·63	< 0·05
3		0·01	2·70	2·54	1·26	0·03
4		0·01	2·20	1·86	0·72	0·03
5		0·04	3·20	2·57	4·87	0·03

INV 664 - 18/3/71

CHECKED - 24/3/71.

707076

	Assay Ref No.		Cu. %	Ag. ozs/ton	Pb. %	Zn. %	Sb. %	
	DA.0411		0·01	3·20	3·15	0·76	0·04	

062

707077

NORMAN BROS. PTY. LTD. 18 COLUMN STOCK DISSECTION BLOCK

ASSAY REF. No.		Cu. %	Ag. ozs/ton	Pb. %	Zn. %	Sb. %
DA 01-17		<0.01	0.35	<0.05	<0.05	<0.02
8		<0.01	<0.35	<0.05	<0.05	<0.02
9		<0.01	<0.35	<0.05	<0.05	0.02
20		<0.01	1.60	2.05	<0.05	<0.02
1		<0.01	<0.35	<0.05	<0.05	<0.02
2		<0.01	<0.35	<0.05	<0.05	<0.02
3		<0.01	<0.35	<0.05	<0.05	<0.02
4		<0.01	0.35	<0.05	<0.05	<0.02
5		<0.01	<0.35	<0.05	<0.05	<0.02
6		<0.01	<0.35	0.08	0.24	<0.02
7		<0.01	1.10	1.05	<0.05	<0.02
8		<0.01	<0.35	<0.05	0.15	<0.02
9		0.01	1.30	1.20	0.33	<0.02
30		0.01	1.75	1.33	0.15	<0.02
1		<0.01	0.65	0.55	0.28	0.03
2		<0.01	<0.35	4.95	<0.05	<0.02
3		<0.01	3.35	2.60	<0.05	<0.02
4		<0.01	<0.35	0.15	0.05	<0.02
5		<0.01	<0.35	0.13	<0.05	<0.02
6		<0.01	<0.35	<0.05	<0.05	<0.02
7		<0.01	<0.35	<0.05	<0.05	<0.02
8		<0.01	<0.35	<0.05	<0.05	<0.02
9		<0.01	<0.35	<0.05	<0.05	<0.02
40		<0.01	<0.35	<0.05	0.05	0.02
1		<0.01	<0.35	<0.05	<0.05	<0.02
2		<0.01	<0.35	<0.05	<0.05	<0.02
3		<0.01	0.65	0.55	0.06	<0.02
4		<0.01	0.50	0.23	<0.05	<0.02
5		<0.01	0.50	0.20	<0.05	<0.02
6		<0.01	<0.35	0.05	<0.05	<0.02
7		<0.01	<0.35	0.10	<0.05	<0.02
8		<0.01	<0.35	<0.05	<0.05	<0.02
9		<0.01	<0.35	<0.05	<0.05	<0.02
50		<0.01	<0.35	<0.05	<0.05	<0.02
1		<0.01	0.35	0.15	<0.05	<0.02
2		<0.01	0.50	0.33	<0.05	<0.02
3		<0.01	0.65	0.43	<0.05	<0.02
4		<0.01	<0.35	<0.05	<0.05	<0.02
5		0.01	1.90	1.48	0.58	0.03
6		<0.01	0.20	0.13	<0.05	0.03
7		<0.01	0.20	0.15	0.08	0.03
8		<0.01	<0.20	<0.05	<0.05	0.03
9		<0.01	<0.20	<0.05	<0.05	0.03

063 RECEIVED - 4/4/71.

707078

ASSAY REF. NO.	Cu. %	Ag. OZS/TON	Pb. %	Zn %	Sb %
DA 0460	<0.01	<0.20	<0.05	<0.05	0.03
1	<0.01	<0.20	0.15	0.10	0.03
2	<0.01	<0.20	0.10	<0.05	0.02
3	<0.01	0.20	<0.05	<0.05	0.05
4	0.02	2.75	2.45	0.40	0.04
5	0.06	1.80	1.20	0.65	0.02
6	0.02	1.96	1.28	0.78	0.02
7	0.03	2.28	1.45	0.63	0.02
8	0.05	1.50	1.25	0.85	0.03
9	0.01	1.80	1.23	0.25	0.03
70	0.01	3.59	3.73	0.68	0.03
1	0.03	1.63	1.28	0.75	0.02
2	0.02	0.98	0.98	0.35	0.03
3	0.01	2.28	2.00	0.60	0.04
4	0.01	1.50	1.78	0.40	0.03
5	0.02	4.42	4.35	0.63	0.03
6	0.02	3.27	2.98	1.13	0.04
7	0.01	0.98	0.68	0.78	0.04
8	0.01	1.31	0.85	0.30	0.02
9	0.02	2.75	2.48	0.80	0.05
80	0.04	3.76	3.85	1.40	0.04
1	0.02	2.12	1.83	0.80	0.04
2	0.01	3.10	3.55	0.15	0.04
3	0.01	3.59	3.75	0.20	0.02
4	0.01	3.59	2.63	0.13	0.02
5	0.02	4.42	3.75	0.68	0.04
6	0.01	3.76	3.05	0.20	0.04
7	0.01	3.43	3.05	0.13	0.02
8	0.01	6.20	5.50	0.18	0.05
9	0.02	4.42	4.15	0.53	0.04
90	0.01	4.90	4.60	0.23	0.04
1	<0.01	0.98	1.03	0.13	0.02
2	<0.01	0.98	1.50	<0.05	0.03
3	0.02	5.55	5.75	0.53	0.04
4	0.01	2.78	2.23	0.40	0.02
[illegible]	0.02	2.78	2.33	0.30	0.04
[illegible]	0.01	1.96	2.13	0.28	0.04

707079

NORMAN BROS. PTY. LTD. 18 COLUMN STOCK DISSECTION BLOCK

ASSAY REF No.		Cu. %	Ag ozs/TONS	Pb. %	Zn. %	Sb. %
DA 6197		< 0.01	1.35	0.89	0.08	0.13
8		0.01	3.30	2.58	0.38	0.03
9		< 0.01	3.30	2.23	0.05	< 0.03
500		< 0.01	< 0.35	0.03	0.02	0.04
1		0.01	2.00	1.31	0.13	0.07
2		0.01	2.00	1.63	0.15	0.03
3		< 0.01	< 0.35	< 0.05	< 0.01	< 0.03
4		< 0.01	< 0.35	0.08	0.02	< 0.03
5		0.01	0.70	0.35	0.55	0.08
6		0.01	2.20	1.70	0.07	0.05
7		< 0.01	0.80	0.86	0.10	< 0.03
8		< 0.01	< 0.35	0.23	0.04	0.04
9		0.02	9.20	8.65	1.00	0.08
510		0.02	8.80	7.50	2.17	0.06
11		< 0.01	3.15	2.45	0.07	0.11
12		< 0.01	3.65	3.35	0.15	0.35
13		< 0.01	1.80	1.85	0.15	0.10
14		< 0.01	0.80	0.86	0.07	0.03
15		0.01	4.30	3.16	0.20	0.04
16		0.01	2.20	2.91	0.15	0.06
17		< 0.01	3.00	2.31	0.15	0.10
18		< 0.01	< 0.35	< 0.05	< 0.01	< 0.03
19		0.01	3.60	3.03	0.29	0.01
520		< 0.01	0.80	0.94	0.12	< 0.03
21		< 0.01	1.00	0.70	0.12	0.03
22		< 0.01	1.80	0.96	0.37	< 0.03
23		< 0.01	0.50	0.42	0.25	< 0.03
24		< 0.01	2.50	2.02	0.09	0.05
25		< 0.01	2.50	0.96	0.02	0.05
26		< 0.01	3.30	3.39	0.19	0.16
27		< 0.01	5.60	4.80	0.05	0.05

C30

NORMAN BROS. PTY. LTD. 10 COLUMN STOCK DISSECTION BLOCK

ASSAY REF. No.		Cu. %	Ag. oz/s/TONS	Pb %	Zn. %	Sb %
DA 0528		0·01	0·50	1·21	0·96	0·03
29		0·04	3·65	3·90	2·44	0·04
530		0·03	2·50	3·03	3·13	0·06
31		<0·01	<0·35	0·28	0·14	0·04
32		0·02	1·20	1·35	4·41	0·04
33		0·01	1·00	1·65	1·80	<0·03
34		0·01	1·20	1·50	1·17	0·05
35		0·01	<0·35	0·18	0·17	0·03
36		<0·01	0·35	0·30	0·93	0·03
37		0·01	<0·35	0·23	0·10	<0·03
38		0·01	0·35	0·43	0·21	<0·03
39		0·01	1·50	1·60	0·14	<0·03
40		0·02	1·00	1·30	0·16	<0·05
41		0·02	1·00	1·38	0·81	<0·05
42		0·03	1·70	1·67	2·60	<0·05
43		0·01	0·70	0·74	0·32	0·05
44		0·02	0·70	0·47	0·60	<0·05
45		0·02	0·35	0·58	0·60	<0·05
46		0·01	0·70	0·89	0·57	<0·05
47		0·05	4·50	4·95	7·22	0·05
48		0·01	0·70	0·97	1·41	<0·05
49		0·01	0·35	0·37	0·12	<0·05
50		0·01	<0·35	0·46	0·26	<0·05
51		0·02	1·35	1·79	3·65	<0·05

NORMAN BROS. PTY. LTD. 10 COLUMN STOCK DISSECTION BLOCK

707081

ASSAY REF. NO.	Cu. %	Ag. OZS/TONS	Pb. %	Zn. %	Sb %
DA.0552	0·01	<0·03	0·14	0·17	<0·05
3	0·01	0·50	0·83	0·35	<0·05
4	<0·01	<0·35	0·12	0·21	<0·05
5	0·01	<0·35	0·34	0·30	<0·05
6	0·01	<0·35	0·14	0·28	<0·05
7	0·01	<0·35	0·03	0·04	<0·05
8	<0·01	<0·35	0·54	0·11	<0·05
9	0·01	<0·35	0·01	0·02	<0·05
60	0·01	<0·35	0·07	0·17	<0·05
1	0·02	0·50	0·58	0·30	<0·05
2	0·01	<0·35	0·07	0·04	<0·05
3	<0·01	<0·35	0·66	0·10	<0·05
4	0·01	<0·35	0·07	0·10	<0·05
5	0·01	<0·35	0·21	0·14	0·05
6	0·01	0·35	0·11	0·24	<0·05
7	0·02	3·00	2·85	0·07	0·05
8	0·01	0·50	0·34	0·21	<0·05
9	0·01	1·50	1·79	0·20	<0·05
70	0·04	1·85	1·32	1·47	0·05
1	0·03	1·70	1·02	1·60	0·05
2	0·04	2·20	1·16	1·72	0·05
3	0·03	1·60	1·43	0·49	<0·05
4	0·01	<0·30	0·08	0·12	<0·05
5	0·01	<0·30	0·08	0·27	<0·05
6	0·01	0·65	0·55	0·40	<0·05
7	0·02	0·65	0·65	0·40	<0·05
8	0·01	0·50	0·40	0·16	0·05
9	<0·01	<0·30	0·25	0·39	0·05
80	0·04	1·95	1·88	4·05	0·05
1	<0·01	<0·30	0·23	0·64	0·05
2	0·01	0·50	0·45	1·23	<0·05
3	0·01	1·10	1·05	0·40	<0·05
4	0·01	<0·30	0·60	0·50	<0·05
5	0·02	2·75	1·95	1·08	0·05
6	0·04	3·70	5·00	4·20	0·05
7	0·01	<0·30	0·15	0·33	<0·05
8	<0·01	<0·30	0·18	0·16	<0·05
9	0·01	1·00	1·00	0·25	<0·05
90	0·01	<0·30	<0·05	0·06	0·05
1	<0·01	<0·30	0·08	0·14	<0·05
2	<0·01	<0·30	0·55	0·19	<0·05
3	0·01	<0·30	0·05	0·05	<0·05
4	0·02	0·80	1·35	0·80	0·05

057

707082

MPLE PROGRAMME: TASMANIA (NEW MT. ZEEHAN DUMP No 2)

ORDER No. 569-5/4/71.

LAB. CHECKED - JANUARY 1972.

ASSAY REF No	Cu %	Ag ozs/tons	Pb. %	Zn. %	Sb. %
DA 0595	<0.01	<0.30	0.53	0.20	<0.05
6	0.01	1.00	1.78	0.96	0.05
7	0.01	<0.30	0.33	0.25	0.05
8	0.02	<0.30	0.75	0.80	0.05
9	0.02	0.65	0.85	0.49	0.05
600	0.02	1.30	1.43	0.57	0.05
1	0.02	<0.30	0.60	0.45	0.05
2	0.02	1.10	1.15	2.25	0.05
3	0.01	<0.30	0.98	1.37	0.05
4	0.11	23.20	13.35	2.70	0.18
5	<0.01	<0.30	0.23	0.18	0.05
6	0.01	<0.30	0.35	0.29	0.05
7	0.06	2.60	1.68	1.84	0.05
8	0.01	0.30	0.20	0.18	<0.05
9	0.03	1.30	1.25	5.58	0.08
10	0.07	2.60	2.72	10.00	0.08
11	0.02	<0.30	0.18	0.21	0.05
12	<0.01	<0.30	0.45	0.54	0.08
13	<0.01	<0.30	0.33	0.71	0.08
14	<0.01	<0.30	0.50	0.47	0.05
15	0.01	<0.30	0.83	0.37	0.05
16	<0.01	<0.30	0.30	0.20	<0.05
17	<0.01	<0.30	0.15	0.23	<0.05
18	0.01	<0.30	0.05	0.11	<0.05
19	0.01	<0.30	0.18	0.16	<0.05
20	<0.01	2.45	2.90	0.38	<0.05
21	0.01	<0.30	0.08	0.13	<0.05
22	0.01	<0.30	0.33	0.33	<0.05
23	0.01	<0.30	0.05	0.13	<0.05
24	0.01	1.00	1.33	0.75	<0.05
25	<0.01	0.50	0.25	0.16	<0.05
26	0.01	<0.30	<0.05	0.15	<0.05
27	<0.01	0.30	0.13	0.10	<0.05
28	0.01	0.30	0.20	0.38	<0.05
29	<0.01	0.50	0.65	0.45	0.05
30	0.02	1.30	1.20	0.63	0.05
31	0.08	4.85	2.22	2.10	0.10
32	0.08	5.50	2.26	0.75	0.15
33	0.20	5.50	1.70	1.27	0.10
34	0.19	6.15	1.73	0.93	0.15
35	0.06	5.35	3.30	0.28	0.20
36	0.04	6.00	2.20	0.15	3.30

063

707083

NORMAN BROS. PTY. LTD. 19 COLUMN STOCK DISSECTION BLOCK

ASSAY REF. No.		Cu. %	Ag. OZS/TONS	Pb. %	Zn. %	Sb. %
DA 0438		0·06	10·20	4·50	1·30	0·50
39		0·25	5·35	2·16	5·60	0·08
40		0·04	2·95	1·65	2·31	0·05
41		0·03	3·90	2·50	0·18	0·05

707084

NORMAN BROS. PTY. LTD. 18 COLUMN STOCK DISSECTION BLOCK

ASSAY REF. NO.		Cu. %	Ag. OZS/TONS	Pb. %	Zn. %	Sb. %
DA.0642		<0.01	<0.30	0.75	0.16	0.05
3		0.05	7.45	9.90	8.98	<0.05
4		0.02	1.45	2.46	1.65	<0.05
5		0.01	0.50	1.86	2.28	<0.05
6		0.02	1.30	2.75	0.99	<0.05
7		0.02	0.65	0.93	1.06	<0.05
8		0.06	2.75	5.30	6.47	<0.05
9		<0.01	<0.30	0.50	0.23	<0.05
50		0.08	3.90	7.40	8.65	0.05
1		0.08	2.60	4.75	3.65	<0.05
2		0.04	2.40	3.43	5.50	<0.05
3		<0.01	<0.30	0.40	0.35	<0.05
4		<0.01	0.30	0.83	0.65	<0.05
5		<0.01	0.50	0.53	0.91	0.05
6		0.01	0.50	1.03	0.50	<0.05
7		0.01	<0.30	1.10	1.33	<0.05
8		<0.01	<0.30	0.85	0.40	<0.05
9		<0.01	<0.30	0.50	0.43	<0.05
60		<0.01	0.60	1.95	0.70	<0.05
1		0.09	4.10	5.20	8.95	0.08
2		0.03	2.60	7.60	3.50	0.05

070

707085

NORMAN BROS. PTY. LTD. 16 COLUMN STOCK DISSECTION BLOCK

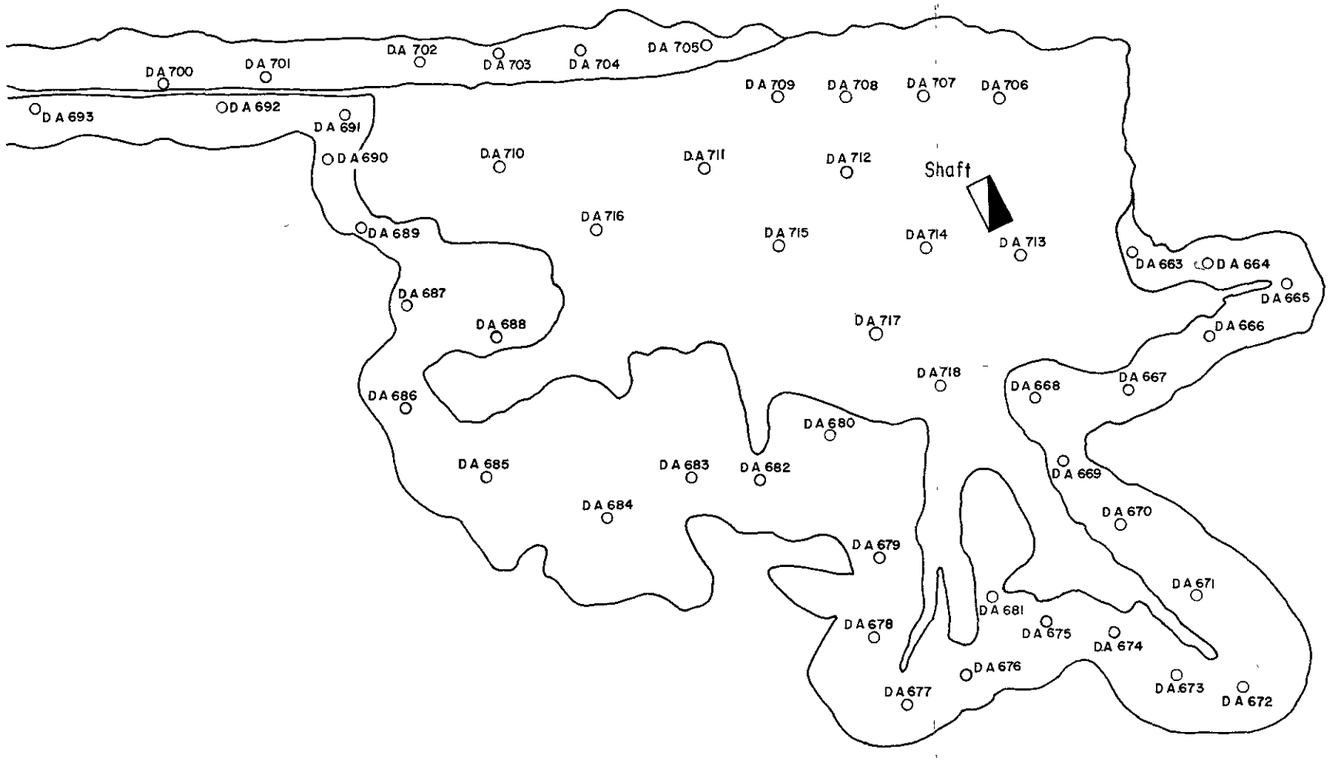
ASSAY REF. NO.		Cu. %	Ag. OZS/TONS	Pb. %	Zn. %	Sb. %
DA.0663		0·03	2·45	1·60	0·65	<0·05
4		<0·01	<0·30	0·30	0·34	<0·05
5		0·04	2·45	2·50	0·65	<0·05
6		0·01	1·30	1·73	1·34	<0·05
7		<0·01	0·30	0·40	0·50	0·05
8		0·01	1·00	2·00	0·89	<0·05
9		<0·01	<0·30	<0·05	<0·03	<0·05
70		<0·01	<0·30	0·23	0·16	<0·05
1		<0·01	<0·30	<0·05	0·03	<0·05
2		<0·01	<0·30	<0·05	0·03	0·05
3		0·01	2·00	2·50	0·80	0·05
4		0·01	0·45	0·63	1·84	<0·05
5		0·01	0·45	0·65	1·84	0·05
6		0·01	0·45	0·28	0·28	<0·05
7		<0·01	<0·30	0·53	0·10	<0·05
8		<0·01	<0·30	0·58	1·30	0·05
9		0·01	0·80	2·28	0·78	<0·05
80		<0·01	<0·30	0·13	0·23	<0·05
1		<0·01	1·80	3·33	1·39	<0·05
2		<0·01	0·60	1·68	1·20	<0·05
3		0·01	0·80	1·78	3·10	<0·05
4		0·01	2·30	3·56	0·95	<0·05
5		<0·01	1·15	1·38	0·41	<0·05
6		0·03	1·80	1·58	4·62	<0·05
7		0·05	2·90	4·60	1·85	<0·05
8		0·02	0·80	2·03	2·72	<0·05
9		<0·01	<0·30	<0·05	<0·03	<0·05
90		<0·01	<0·30	0·10	0·10	<0·05
1		0·05	3·45	5·20	4·35	<0·05
2		0·02	1·60	2·85	2·58	<0·05
3		0·05	3·70	1·93	1·74	0·05
4		0·01	1·00	1·40	1·14	<0·05
5		0·01	1·00	1·15	1·48	0·05
6		<0·01	<0·30	0·38	0·40	<0·05
7		0·03	2·00	2·50	6·55	<0·05
8		[illegible]	[illegible]	[illegible]	0·38	<0·05
9		<0·01	0·50	0·93	1·85	<0·05
0700		0·01	0·50	0·45	0·70	0·05
1		<0·01	<0·30	0·35	0·36	0·05
2		<0·01	0·50	0·53	0·53	0·05
3		<0·01	<0·30	<0·05	0·05	0·05
4		<0·01	<0·30	<0·05	0·05	<0·05
5		<0·01	<0·30	0·05	0·10	<0·05

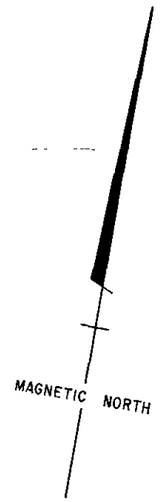
077

707086

ED – JANUARY, 1972.

ASSAY REF. No.	Cu. %	Ag. oz/TON	Pb. %	Zn. %	Sb. %
DA0706	<0.01	0.30	0.38	0.23	<0.05
7	<0.01	0.80	0.98	0.45	<0.05
8	<0.01	<0.30	0.13	0.05	0.05
9	0.01	1.10	3.48	1.27	<0.05
10	<0.01	0.65	0.60	0.21	<0.05
1	0.02	1.80	3.55	1.80	0.05
2	0.01	1.30	4.10	8.70	<0.05
3	<0.01	<0.30	0.10	0.10	<0.05
4	<0.01	<0.30	0.65	0.28	<0.05
5	0.14	11.25	14.30	5.75	0.13
6	0.01	0.80	2.58	0.73	<0.05
7	<0.01	0.50	0.45	0.73	<0.05
8	0.01	0.50	1.28	1.78	<0.05





5 cm

707087

72-924

FIGURE 20

SCALE IN FEET

20 0 20 40

TENNECO AUSTRALIA INC.

E.L. 44/70

Sunrise Mine Dump

072

DATE 16th MARCH 1972	DRAWN BY E HOLT	DWG Nº 681
SCALE 1" = 20'		

072