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78-1244

PACMINEX PTY. LIMITED

FINAL REPORT: E.L. 18/74

PIEMAN RIVER

TASMANIA

PMR 120/77

MICROFILMED

001

281002

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I GEOCHEMICAL ANALYSES

LIST OF ILLUSTRATIONSFIGURESFACING PAGE NO.

1 LOCATION MAP : E.L. 18/74

1

PLANS (IN POCKET)PMX DWG NO.SCALEK555-5 GEOCHEMICAL TRAVERSES OF AEROMAGNETIC/
E.M. ANOMALIES

1:9,000

KEYWORDS

ELECTROMAGNETIC

TASMANIA

9E L 18/74

REVIEW

TIN

GEOCHEMISTRY

EXPLORATION

GEOLOGY

SURVEY

1977

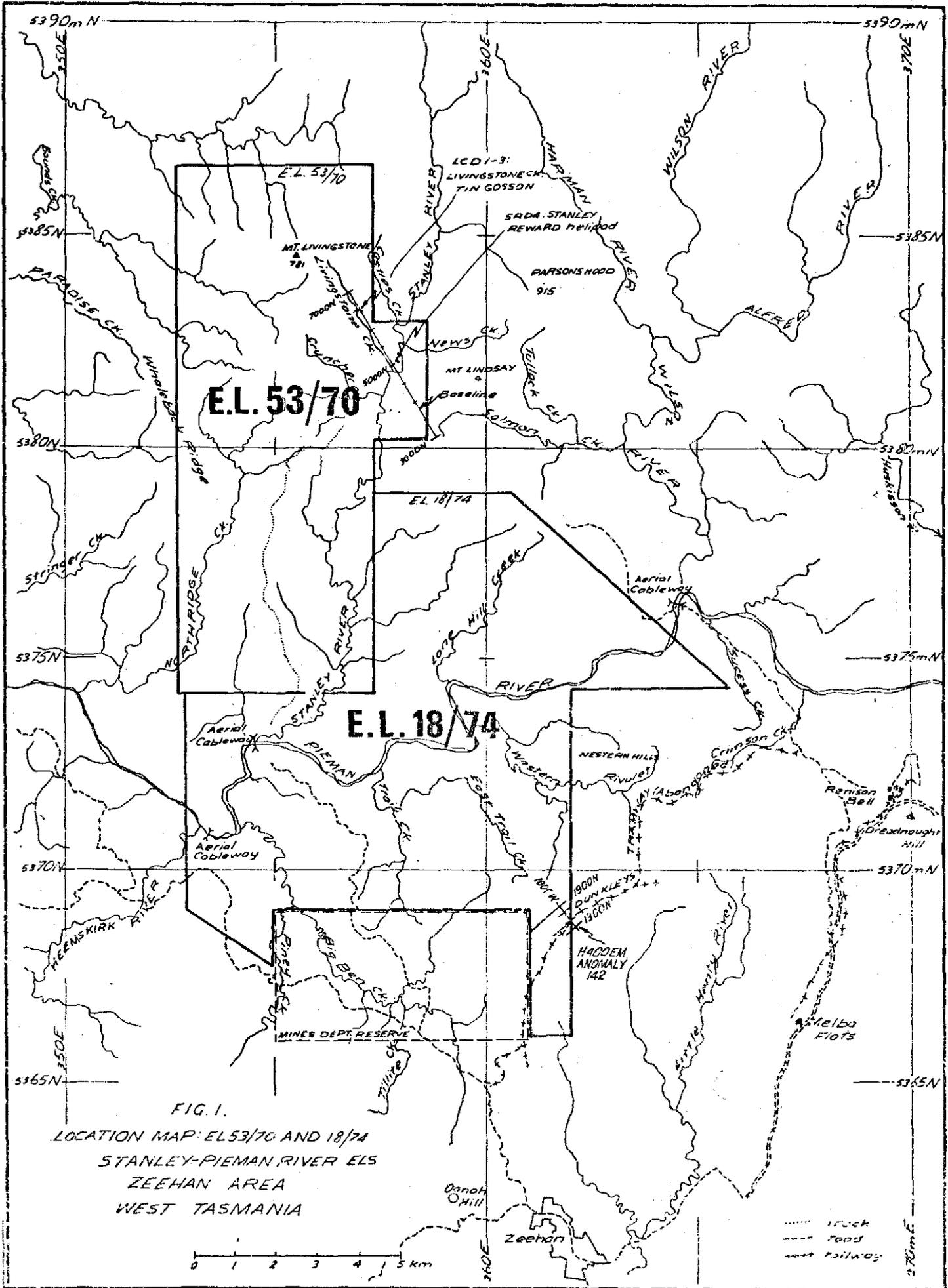


FIG. 1.

LOCATION MAP: EL53/70 AND 18/74
 STANLEY-PIEMAN RIVER ELS
 ZEEHAN AREA
 WEST TASMANIA

0 1 2 3 4 5 km

5 cm

..... track
 - - - - road
 -+ -+ railway

1. INTRODUCTION

1.1 E.L. 18/74 (88 km²), Pieman River is centred 12 km north-east of Zeehan in the west coast region of Tasmania (see Figure 1). The area was taken up originally as being prospective for silver-lead-zinc-copper and possible tin-copper mineralisation.

1.2 The main rock unit in the area is the Oonah Quartzite and Slate (hereafter referred to as the "Oonah Formation"). A small doubtful occurrence of the overlying unit (Crimson Creek Formation) occurs in the south-east of the E.L. Particular attention was paid during prospecting to checking for the presence of the main prospective horizon in the Zeehan-Renison Bell region. This occurs at the top of the Oonah Quartzite and Slate below the overlying Crimson Creek Formation. As magnetic signature of these two main units is quite distinctive, 450 line km of combined airborne electromagnetics (E.M.) and magnetics were flown over the E.L. in 1975 at 0.2 km spacing using (for the E.M.) a McPhar H400 E.M. system. Forty-four airborne detected anomalies were subsequently checked by ground geochemical traverses in the 1975-1976 summer field season (Macnamara, 1976). This work indicated that most of the E.M. anomalies checked appeared to be related to black pyritic shaley siltstones which had, at most, only minor associated geochemical anomalies.

1.3 This present report deals with check work done on three areas considered to have residual potential after the 1975-1976 field season's results had been assessed. For convenience these areas are designated by the number of the associated or nearest E.M. anomaly shown on DWG K555-5. The anomalies are:-

- (a) E.M. 98 - west sector of DWG K555-5
- (b) E.M. 125 - south sector of DWG K555-5
- (c) E.M. 142 - south sector of DWG K555-5

2. SUMMARY

2.1 Various geological and magnetic data discussed in the main body of the report indicated that E.M. anomalies 98, 125 and 142 could be associated with (or possibly along strike from) the prospective Upper Oonah Formation horizon known as the "Success Creek Phase". This prospective horizon is distinguished from the normal Oonah Formation quartzitic siltstones and shales by the appearance of such lithologies as dolomites, chert, spilites, conglomerates etc. in the sequence.

2.2 The three anomalies and surrounding areas were checked for lithological changes, signs of hornfelsing (which might indicate a nearby granite source for potential tin mineralisation) and for geochemical anomalies indicating mineralisation.

2.3 Except for detrital tin and gold associated with Tertiary gravels of limited extent near E.M. Anomaly 98, geochemical evidence of mineralisation was disappointing. Only weak anomalies of little potential were indicated.

No hornfelsing or signs of granitic intrusions (possible tin sources) were seen. No dolomites (potential host rocks for tin mineralisation) were seen.

Only normal Oonah Formation rocks were encountered in the vicinity of E.M. Anomalies 98 and 125.

2.4 E.M. Anomaly 142 is probably associated with the upper part of the Oonah Formation but gridding to date has not indicated any geochemical anomaly or any features such as dolomite, hornfelsing etc. which would justify further exploration. In addition, potential strike length appears limited, alluvial cover prevalent and secondary scrub so thick as to require gridding even for reconnaissance purposes.

2.5 For the above reasons, further prospection of
E.L. 18/74 does not appear warranted.

3. E.M. ANOMALY 98

3.1 The interest in this area was due to the following aspects:-

3.1.1 Geological and magnetic trends indicated the anomaly was approximately along strike to the north-west of lead-copper occurrences reported in the Mines Department Reserve. These occurrences are in Big Ben Creek and a tributary 0.7 and 1.5 km respectively north of the Zeehan-Granville Harbour road along the track to the Pieman River cage.

3.1.2 The anomaly appeared also to be along strike from the Big Ben Mine and nearby spilites, indicating that the top of the Oonah Quartzite and Slate might be present (see 1:63,360 Zeehan Geological Sheet).

3.1.3 A strong magnetic anomaly occurs nearby (DWG K555-5).

3.1.4 Sample 601 98 024R collected in late 1975 in dark-brown pyritic shale yielded 980 ppm Zn, 190 ppm Pb but had not been checked for other elements such as tin and gold.

3.2 Further geological traverses across the strong magnetic anomaly near E.M. Anomaly 98 failed to locate any evidence of the prospective upper Oonah Quartzite and Slate ("Success Creek phase") horizon. No spilites, carbonate rocks or other changes in sedimentation were seen. The rocks appeared to be the normal Oonah quartzitic siltstones and shales.

3.3 A number of drainage, soil and rock chip samples were initially collected to recheck the area. These initial samples are labelled 601 0001-0015 (see Appendix I). Samples 601 0033-0039 were collected later as a further check.

3.4 Sample 601 0015R and subsequent check sample 601 0036R are outcrop chip samples taken to test further the anomalous 601 98024R sample (980 ppm Zn, 190 ppm Pb) which had been taken the previous season from dark brown pyritic siltstone. Chemical analyses indicated no anomalous tin, gold etc. values although Cu, Zn and Pb were weakly anomalous. Such results of course are not unusual for dark pyritic siltstones.

3.5 Soil samples 601 0001 and 601 0009-0010 yielded up to 200 ppm Sn and 2.3 ppm Au. Panned sample 601 0002P also indicated visible traces of gold and cassiterite in tailings in the gold pan.

Later sampling (601 0033-0039) yielded negative results although check panning again confirmed traces of gold and cassiterite in the creek at 601 0002P. Geological traverses indicated the presence of rounded granite cobbles shedding from gravel cappings on nearby ridges. These remnants of (?) Tertiary gravels include rounded transported (exotic) cobbles of granite, quartz-tourmaline, siltstone etc. Several old small (2 m deep) pits from past testing of the gravels were located during traversing.

3.6 By analogy with other gravel ridge cappings elsewhere within the E.L. it can be reasonably assumed that the gold-cassiterite in creeks and soil samples originates from the gravel cappings. Lack of associated Cu, Zn etc. anomalies with the tin tends to indicate an alluvial gravel (rather than a residual) origin to the anomalous tin also. Lack of hornfelsing of the country rock or evidence of "Success Creek phase" changes in sedimentation are negative features also.

3.7 In summary, there appears to be insufficient reason to prospect the anomaly further.

4. E.M. ANOMALY 125

4.1 The 1975-1976 field season sampling in this area indicated a slightly anomalous sample (60 ppm Sn) associated with material described as "silcrete" (sample number 601 SPOT 233R). A number of aeromagnetic anomalies and trends occur in the general vicinity (Macnamara, 1976) of the weak tin anomaly. The area was checked further in order to ascertain whether these factors were associated with mineralisation or with changes of rock type associated with transition of the Oonah Quartzite and Slate to the prospective "Success Creek phase".

4.2 From near E.M. Anomaly 130, (see DWG K555-5), a north-eastwards traverse was made across strike to the ridge scarp immediately west of and overlooking Dunkleys Tramway. From here the traverse was continued westwards to E.M. Anomaly 125 and then back to E.M. Anomaly 130. Rock units encountered appeared to be the normal Oonah Formation types. No variations suggesting the presence of the "Success Creek Phase" of the top part of this formation were seen. Visual inspection indicated that the rock originally described as a "silcrete" at site 601 SPOT-233R is a strongly silicified and quartz-veined Oonah Formation limonitic quartzitic siltstone.

4.3 Samples 601 0016-0032 and 601 0040-0041 were collected but chemical analyses indicate only a few are very weakly anomalous at best.

5. E.M. ANOMALY 142 : DUNKLEYS TRAMWAY

5.1 E.M. Anomaly 142 occurs associated with a small occurrence of poorly outcropping shales along the valley floor of Parting Creek adjacent to Dunkleys Tramway. The shales have been mapped tentatively as possible Crimson Creek Formation on the One Mile Zeehan Geological Sheet.

5.2 On available data, within E.L. 18/74, the shales are of limited width and strike length and appear to be either fault bounded (graben structure) or a synclinal keel remnant. E.M. Anomaly 142 and a magnetic anomaly to the west are also of limited strike length.

5.3 The area was checked in early 1976 by cutting grid lines across the anomaly and the shales to the Oonah Formation to the east and west of the shales. These lines were then soil sampled, geologically mapped and surveyed by ground E.M. and magnetometer (Macnamara, 1976). The work indicated no strong geochemical anomalies but much of the area is obscured by alluvial cover which was not always penetrated by the soil sampling.

5.4 Elsewhere in the Zeehan region (outside E.L. 18/74 near Mount Livingstone) Crimson Creek Formation rocks are apparently typified by weathering to a khaki clayey soil and by yielding a magnetic response which varies rapidly in amplitude across strike. In contrast, the shales around E.M. Anomaly 142 yield pale clayey soils while the magnetic signature variations across strike are weak to moderate only. This suggests that these shales are below the Crimson Creek Formation proper but could still be among the variable lithologies of the upper part of the Oonah Formation (i.e. the "Success Creek Phase").

5.5 A number of traverses were made in early 1977 to check the area around E.M. 142 for signs of the "Success Creek Phase" rocks. Particular attention was paid to checking for carbonate rocks and signs of hornfelsing with

which tin mineralisation might occur. Results were largely negative but access is limited by dense scrub to a few creeks, Dunkleys Tramway and cut grid lines.

5.6 In view of results to date it is considered that insufficient potential has been indicated in the vicinity of E.M. Anomaly 142 to warrant further exploration.

6. REFERENCES

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APPENDIX I

GEOCHEMICAL ANALYSES

APPENDIX I

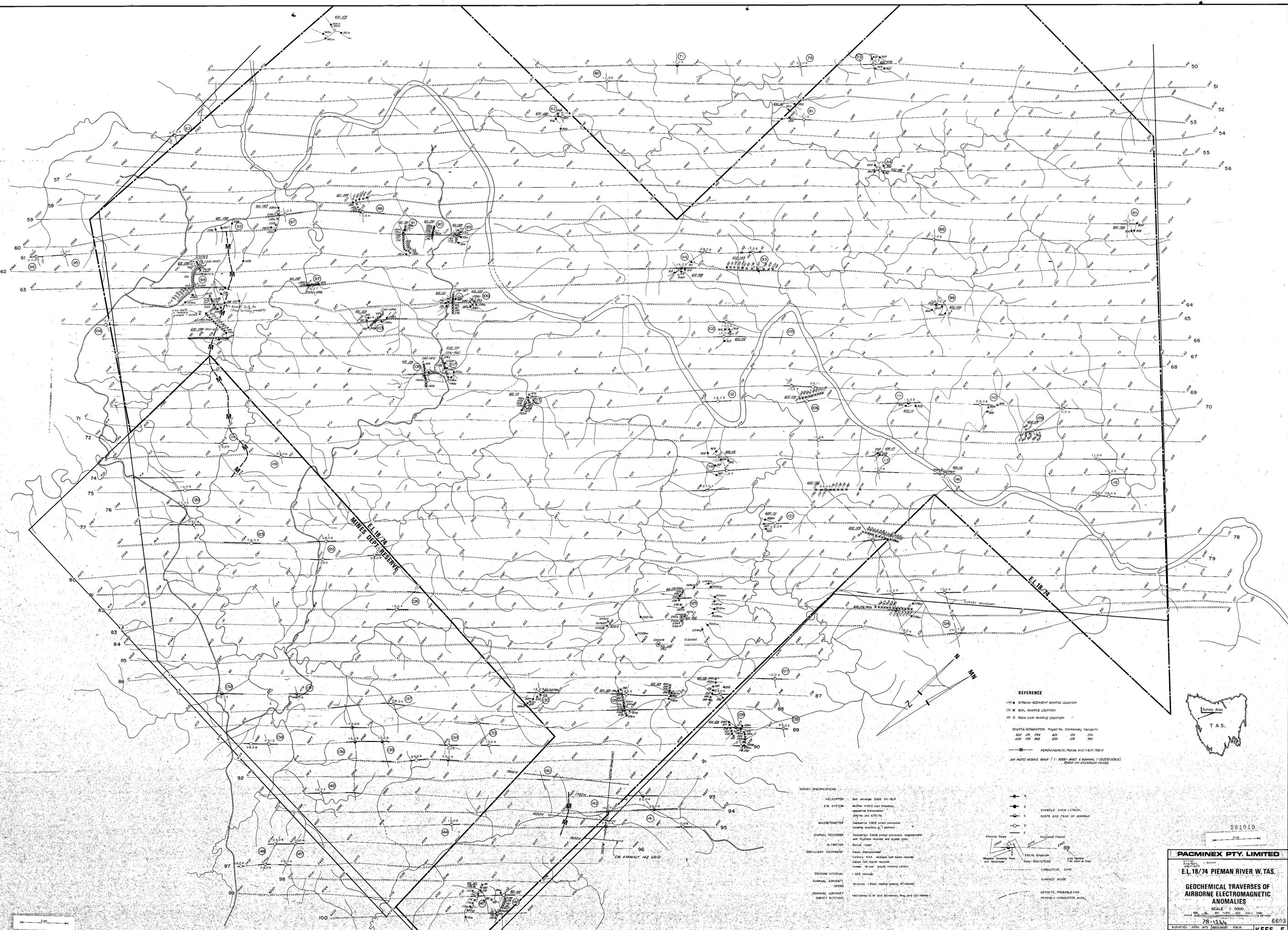
E.M. ANOMALIES 98, 125 AND 142

SAMPLE NO./ LOCATION	Sn	Cu	Zn	Pb	Bi	Ag	Au	SAMPLE DESCRIPTION
601 0001S*	50	2	10	10	10	<1	<0.1	Black ooze mid way up slope
601 0002P								(Panned concentrates with trace of gold and black heavy minerals)
601 0003R	<20	5	50	190	5	<1		Iron stained quartz with pyrite or marcasite
601 0004R	<20	5	10	80	10	<1		Iron stained crenulated politic rock (black)
601 0005S	<50	2	10	10	10	<1	<0.1	Soil dark grey overlying gravelly quartz/quartzite
601 0006S	<50	2	10	15	5	<1	<0.1	Soil dark grey overlying gravelly quartz/quartzite
601 0007S	50	2	15	10	5	<1	<0.1	Soil dark grey overlying gravelly quartz/quartzite
601 0008S	200	2	10	5	5	<1	<0.1	Dark soil-gravel is iron stained with iron sulphide black shale bedrock
601 0009S	<50	25	30	30	<5	<1	0.2	Dark grey soil - glacial detritus
601 0010S	<50	5	10	10	5	<1	2.3	Heavy muddy soil
601 0011S	<50	2	10	5	5	<1	<0.1	Dark thick muddy soil
601 0012S	<50	<2	10	10	5	<1	<0.1	Dark muddy soil
601 0013S	<50	<2	10	10	10	<1	<0.1	Dark muddy soil
601 0014S	<50	2	10	5	5	<1	<0.1	Black muddy soil with base Oonah Quartzite
601 0015R	20	180	60	120	5	1		"Pyritic" (?) shale dark brown, sulphurous odour, marcasite(?)
601 0016R	<20	180	120	35	20	1		"Silcrete" sample - quartzite with quartz veins
601 0017S		5	10	20	10	1		Silty reddish-brown soil
601 0018M		5	10	10	10	<1	✓	Black gully mud
601 0019M		2	10	15	5	<1	✓	Black gully mud
601 0020M		<2	15	10	5	<1	✓	Black gully mud
601 0021M		2	15	15	10	<1	✓	Black gully mud
601 0022M		2	10	15	10	<1	✓	Dark gully mud
601 0023M		2	10	5	10	<1	✓	Black mud-bedrock shows slight iron staining
601 0024M		2	10	5	5	<1	✓	Black gully mud
601 0025M		2	10	10	10	<1	✓	Black gully mud
601 0026M		2	10	15	10	<1	✓	Brown-grey silty mud
601 0027M		2	15	15	10	<1	✓	Grey, dark brown mud
601 0028M		2	15	20	10	<1	✓	Grey, dark brown mud
601 0029R	<20	5	10	10	5	<1		Dark silty hornfelsed (almost) rich iron stained, dark hardened siltstone - quartz veins
601 0030S		10	10	20	5	1		Yellow soil
601 0031R	<20	140	110	50	20	2		Iron stained dark siltstone - quartz veining - black sub metallic lustre
601 0032S		10	15	15	5	1		Yellow soil

017

SAMPLE NO./ LOCATION	Sn	Cu	Zn	Pb	Bi	Ag	Au	Ni	Co	Cr	Mn	Mo	W	SAMPLE DESCRIPTION
601 0033R	<1	5	30	1	10	<0.1	<3	<3	<5	<20	200	<3	<50	Channel sample of shaft wall. Shaft is 2.2 m deep and is composed of gravels. Gravels appear leached Oonah Quartzites and siltstones and fibrous quartzite. No quartzite-tourmaline gravels evident. Location 100 m N.W. of 601 0002P. N.B. In creek 50 m immediately downslope from 601 0033R tourmaline and cassiterite and gold observed in Leduy concentrates; creek may have previously been worked (possibly silicified).
601 0034R	<1	5	<20	3	10	<0.1	<3	<3	<5	<20	100	<3	<50	Interbedded dark grey shales and minor siltstones at location of previous samples 601 0003R and 601 0004R, very close to site of old trenching. Iron sulphides are present in dark grey shales.
601 0035R	<1	3	<20	3	10	<0.1	<3	<3	<5	<20	100	<3	<50	Dark grey scree shale close to previous sample location 601 0008S (which gave 200 ppm Sn). Black (dark grey) shales are probably locally derived (near in-situ) and occur with high level gravels. N.B. At site of 601 0009S, high level gravels are 1 m thick and are non-residual
601 0036R	<1	20	30	100	10	<0.1	<3	<3	<5	<20	300	<3	<50	Dark brown (sulphurous) shaley siltstones with dark greenish laminae with dark (?) manganese staining, contains fine pyrite, c 1-1½ m thick. At site of geochemical anomaly 601 098 024R (at end of logging track).
601 0037S	<1	5	<20	<1	10	<0.1	<3	<3	<5	<20	300	<3	<50	Vertical profile of ½ m deep pit through gravels (possibly scree slope material). Gravels comprise sub-rounded to angular Oonah Quartzites with abundant quartz veinings. Location is at site of sample 601 0010S (= 2.3 ppm Au).
601 0038R	<1	3	20	<1	5	<0.1	<3	<3	<5	<20	200	<3	<50	Rock chip sample of dark shales o/c along logging track above slope of sample location 601 0010S to top of slope.
601 0039R	<1	5	20	3	3	<0.1	<3	<3	<5	<20	300	<3	<50	Rock chip sample of dark shales o/c along logging track. Continuation of samples of 601 0038R downslope from Ridge (= E.M. anomaly 098) to top of Next Ridge (i.e. Ridge to Ridge). N.B. At spur of ridge and along sides, well rounded pebbles of quartz and quartz-tourmaline rock are present.
601 0040R	<1	5	20	<1	5	<0.1	<3	<3	<5	<20	300	<3	<50	Brecciated rock, dark shale fragments, quartz veins/vughs, limonite on hill slope.
601 0041R	20	100	20	<1	50	1	<3	<3	<5	300	200	10	50	Rock sample at 601 SPOT 233R brown limonite stained siltstone-mudstone with quartz fragments. Some specimens have a "silcrete" appearance (not of carbonate origin) due to silicification - quartz veining.

281018



REFERENCE

- (●) STREAM SEDIMENT SAMPLE LOCATION
- (X) SOIL SAMPLE LOCATION
- (□) ROCK CHIP SAMPLE LOCATION

SAMPLE DESIGNATION: Project No. EM Anomaly (sample No.)
 400 100 200 400 200 100
 600 100 200 400 200 100

— M — AEROMAGNETIC PEAKS AND TRENDS

AIR PHOTO MOSAIC BASE (1:5000 BASED A NOMINAL 1:10000 SCALE)
 BASED ON ENLARGED PHOTOS

SURVEY SPECIFICATIONS

- HELICOPTER: Bell 430B 2000 V.H. 4-10
- E.M. SYSTEM: Mather 1400 and frequency apparatus, transmission, 300 Hz and 1070 Hz.
- MAGNETOMETER: Geometrics 10000 proton precession (resolving capability 0.1 gamma)
- JOURNAL RECORDER: Geometrics 10000 proton precession magnetometer with R1000 recorder and crystal clock.
- ALTIMETER: Barvac - radar
- ANCILLARY EQUIPMENT: Geometrics 10000 proton precession magnetometer; Cesium 444 - cesium ion beam receiver; Gevac film digital recorder; Vinten 16 mm ground marking camera.
- READING INTERVAL: 1.023 seconds
- NOMINAL AIRCRAFT SPEED: 90 knots (8000 ft, 10000 ft, 12000 ft)
- NOMINAL AIRCRAFT SURVEY ALTITUDE: 1400 meters (4600 feet), 1600 meters (5250 feet), 1800 meters (5900 feet)

CONDUCTIVE ZONE

— SURFACE ROISE

— DEFINITE, PROBABLE AND POSSIBLE CONDUCTOR AXIS



281019

PACMINEX PTY. LIMITED

PROJECT: E.L. 18/74 PIEMAN RIVER W. T.A.S.

GEOCHEMICAL TRAVERSES OF AIRBORNE ELECTROMAGNETIC ANOMALIES

SCALE: 1:5000

MADE BY: N.S.I.E. DATE: SEPT 1978

SURVEYED: APRIL 1975 GEOLOGIST: P.M.M.

DRAWN BY: N.S.I.E. DATE: SEPT 1978

6603

K555-5