

000

859001

**AMG REFERENCED**



Cyprus Minerals Australia Company

PART PROJECT A-84-111

**OPEN FILE**

MINES	
File Ref.	EL35/83
	- 2 NOV 1987
Doc. Ref.	
Action Officer	Initials
LETTER	
30. 10. '87	
REFERS	
Resubmit to	Date

PROGRESS REPORT

SIX MONTHS TO SEPTEMBER 1987

SORELL PENINSULA

EXPLORATION LICENCES 35/83, 36/83, 37/83

TASMANIA

C TORREY AND R POLTOCK

AUGUST 1987

REPORT 533

AMG REFERENCE POINTS ADDED

**CYPRUS**

**DISTRIBUTION**

---

- o Denver
- Mines Department
- o Sydney
- o Field
- o Spare
- o Poseidon
- o Placer
- o Arimco

002

**CONTENTS**

---

	<b>Page</b>
SUMMARY AND CONCLUSIONS	1
RECOMMENDATIONS	2
INTRODUCTION	3
EXPLORATION TARGETS	4
DESCRIPTION OF THE PROPERTY AND OWNERSHIP	6
LOCATION AND ACCESS	7
HISTORY AND PREVIOUS EXPLORATION	9
REGIONAL GEOLOGY AND MINERALIZATION	13
GEOLOGY AND MINERALIZATION OF THE PROPERTY	17
WORK CONDUCTED BY CYPRUS	20
EXPLORATION POTENTIAL	28
PROPOSED PROGRAM	29
EXPENDITURE	31

003

**TABLE**

	Page
1 BASE METAL AND GOLD PRODUCTION - TASMANIAN WEST COAST	15

**FIGURES**

	After Page
1 LOCATION	7
2 WANDERER NORTH GEOLOGY	23
3 EL 37/83 GEOCHEMICAL SAMPLE LOCATION	22
4 EL 37/83 STREAM SEDIMENT/ROCKCHIP GEOCHEMISTRY	22
5 EL 37/83 PANNED CONCENTRATE GEOCHEMISTRY	22

**APPENDICES**

1 INTERPRETATION OF ELECTRICAL AND ELECTROMAGNETIC SURVEYS AT ELLIOTT BAY (AND SORELL PENINSULA)	by Mitre Geophysics
2 ANALYTICAL RESULT SHEETS AND SAMPLE DESCRIPTIONS	

004  
ENCLOSURES

---

			Scale
1	ELS 35, 36, 37/83	● REGIONAL GEOLOGY	1:50000
2	Wanderer North - Profiles	● LINE 1	1:5000
3		● LINE 2	1:5000
4		● LINE 2	1:5000



005

146° E

859006

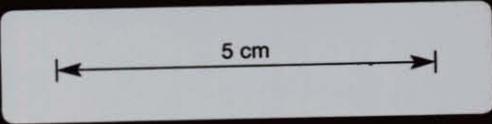
# TASMANIA



BASS STRAIT



# Project Location



006

#### SUMMARY AND CONCLUSIONS

---

Follow-up of Dighem anomalies in the Wanderer North area indicates the prospect displays geochemical anomalism (both base metals and gold) lies on a major prospective structure, lies in a favorable stratigraphic horizon and is geophysically anomalous. Coincident MaxMin-EM and magnetic anomalies are covered by late Tertiary gravels and remain untested.

Initial sampling of ultramafic sequences in the Spero River area for platinum group elements proved inconclusive. More sampling is required in order to build up a database for platinoid evaluation.

007

**RECOMMENDATIONS**

---

- . Follow-up 'Wacka' bedrock sampling, further gridding, soil sampling and geological mapping at Wanderer North
- . Regional stream sampling for platinum group elements in ultramafic belts
- . Follow-up of Dighem anomalies in Muddy Cove as recommended in Cyprus Reports 454 and 500

008

## INTRODUCTION

---

Work on Exploration Licences 35/83, 38<sup>6</sup>/83 and 37/83 during 1986 and 1987 included final assessment of Dighem data in the Wanderer River Area by Mitre Geophysics, follow-up of Dighem anomalies in Wanderer River area (the Wanderer North area) and sediment sampling for gold and platinum group elements in the Spero River area. Field work was conducted from the Tasmanian Mines Department field camp at Wart Hill, and was concentrated in the southern most licence 37/83. A small on-site helicopter was used to transport crews to and from prospects.

Cyprus and Poseidon are currently seeking another joint venture partner for licences 35/83 and 36/83.

#### EXPLORATION TARGETS

---

The three exploration licences protect a prospective section of Cambrian volcanics and volcano sedimentary units and carbonates equivalent to the Dundas Group.

The main target for exploration is a polymetallic volcanogenic massive sulfide orebody with reserves of 15 million tonnes of 20% lead-zinc with gold plus silver credits similar to the Rosebery and Que River/Hellyer deposits 70 kilometers to the north.

Important secondary targets include intrusive related stockwork, breccia, vein and replacement/skarn gold mineralization and/or gold and platinoids associated with ultramafic rocks. The carbonate rich formations of the Cambrian Dundas Group are prospective for replacement type tin deposits similar to Renison (24 million tonnes of 1.1% tin). While this type of deposit is not a

high priority target for the current exploration there are a number of localities within the tenements which could host such a deposit.

DESCRIPTION OF THE PROPERTY AND OWNERSHIP

The tenements comprise three exploration licences held by Placer Development Ltd:-

EL 35/83 - 240 square kilometers  
EL 36/83 - 240 square kilometers  
EL 37/83 - 230 square kilometers

All three tenements were granted on September 20, 1983 and have been renewed to September 20, 1988.

Cyprus has negotiated agreements with Placer Development and Poseidon Ltd whereby Cyprus will operate exploration within the tenements and the equity structure will be:

Cyprus Minerals	50%
Poseidon Ltd	50%
Placer Development	5% net profit

#### LOCATION AND ACCESS

---

The tenements are located over the Sorell Peninsula on the southwest coast of Tasmania and south of Macquarie Harbor (Figure 1). The area has a high annual rainfall (approximately 1750 millimeters) and the geologically prospective units are covered by dense myrtle rainforest and swampy bauera scrubland. Exploration is generally confined to the summer season from November to March.

Access is by helicopter from Queenstown with boat and barge support from Strahan. A limited network of tracks from previous exploration exist but are substantially overgrown. Extreme difficulty of access is experienced by ground crews particularly in bauera and ti-tree scrubland. Ground movement beneath the tall myrtle canopy is easier. Movement of ground crews is improved dramatically by the cutting of rough foot tracks and opening out of the smaller streams and gullies filled with horizontal scrub.

013

350 000E

5320 000N

30

SOUTHERN

42°30'S

859014

AMG REFERENCE POINTS ADDED

5 cm

Figure 1  
**Location**  
10 km



Most areas are only accessible by foot from short term camps located close to the target.

This season work was conducted from the Tasmanian Mines Department base camp at Wart Hill in conjunction with the Cyprus program at Elliott Bay. Crews were transported to and from work by helicopter.

The tenements are located within the Southwest Conservation Area and all mineral exploration and associated activity is regulated and monitored by a working committee chaired by the Department of Mines with representation from the Forestry Commission, Department of Environment and National Parks and Wildlife Service. Exploration programs and alterations must be approved by the committee prior to the granting or renewal of licences.

015

#### HISTORY AND PREVIOUS EXPLORATION

In 1959 a joint venture between Mt Lyell and Electrolytic Zinc Company (Lyell EZ Explorations or LEE) was granted Exploration Licences 1/59 and 3/59. A subsequent airborne magnetic and electromagnetic survey of the tenements included the Cape Sorell area. Average line spacing was 500 to 700 meters and ground clearance averaged 160 meters. Recovery on photomosaics was poor.

Ground follow up of airborne anomalies entailed of geologic mapping, geochemistry and geophysical surveys (magnetometer, gravity, AFMAG and IP). Six diamond drillholes at Pelias Cove were designed to test a gossanous hematite outcrop with anomalous copper values. Maximum depth achieved was 37 meters while recovery was poor averaging about 7%. The best intercept was 1.42 meters of 2.59% copper at the surface in hole L4.

BHP conducted exploration in the mid to late 1960's under Exploration Licences 1/64 and 13/65 initially covering 10,000

square kilometers. Work was conducted over five field seasons between 1965 and 1969. Initially most activity was in the east outside the current licences with reconnaissance mapping and geochemical sampling along the west coast. By the end of the third field season (October 1966 to May 1967) this work had located an area of anomalous copper and zinc in streams between the Mainwaring and Urquhart Rivers (Cypress Creek) and had located the main ultrabasic belt in the Noddy Creek area which was interpreted as sills intruded into the enclosing sediments prior to deformation.

The bulk of BHP exploration took place within the next two field seasons, 1967/68 and 1968/69 over three areas, the Double Cove, Hibbs and Mainwaring Belts. The main regional technique was stream sediment sampling at approximately 400 meter intervals. No assaying for gold or tin was undertaken.

#### Double Cove Belt

- 1 An area southeast of Double Cove drained by Lucas Creek exhibited anomalous copper, nickel and zinc in streams coincident with aeromagnetic Anomaly 123. Follow-up detailed stream, bank and ridge solid sampling in the vicinity of sample GR620104 returned values of 50-270 ppm copper in streams and maximum 348 ppm copper in banks which were considered explained by background copper in rocks of 120 ppm. Unexplained lead assays of 105, 109 and 178 ppm were detected in a stream bank at sample GR620105.
- 2 At aeromagnetic anomalies 128 and 129 detailed ground work was conducted. High copper, nickel, cobalt, zinc values in soils at Anomaly 128 were concluded to reflect rock geochemistry and the aeromagnetic anomaly was considered caused by a gabbro dike. Ground work at Anomaly 129 (Deep Creek Hematite) culminated in one diamond drillhole to 100 meters which intersected one meter of 70% pyrite, 30% hematite after passing through pyritic quartzites, schists and argillites. Base and precious metal assays for the hole were all very low. A follow-up hole was recommended but not drilled.

- 017
- 3 Some soil sampling was conducted at Pelias Cove based on the inconclusive drilling results of LEE. Results confirmed the LEE anomaly but of lower tenor. More sampling was recommended inland.

#### Hibbs Belt

Exploration activity in this area investigated the asbestos mineralization and pentlandite occurrences in banded pyroxenite, gabbro and serpentinites of the ultrabasic belt. Considerable effort was expended on ground evaluation by geophysical surveys, costeaning, bulldozing tracks and diamond drilling culminating in the outlining of 8.5 million tonnes of 2.3% asbestos. Most drillholes were targeted on asbestos mineralization though one was designed to test an EM anomaly at Noddy Creek. The anomaly was explained by an intersection of 3.4 meters of pyritic graphite.

#### Mainwaring Belt

Initial regional sampling along streams at 400 meter intervals returned higher values for copper, nickel and zinc than other areas. Most BHP activity was generated by high copper values particularly in the vicinity of Cypress Creek where detailed soil sampling, stream geochemistry, mapping and ground geophysical surveys conducted along bulldozed tracks in the area. Little work was achieved away from these tracks due to the dense undergrowth. A and B horizon soils were analyzed for copper, nickel and silver and initially for lead and zinc. A costean was bulldozed at GR727579 in an interbedded siltstone, conglomerate, tuff and andesite sequence. A massive pyrite horizon up to 10 centimeters thick and assaying 150 ppm copper, 300 ppm lead, 500 ppm zinc and 400 ppm nickel was located along the contact between this unit and greywacke/argillite to the west. This contact is approximately north-south of the present Cypress Creek helipad. The maximum copper assay in the costean was 1300 ppm and a recommendation was made to test this further at depth by drilling. The most significant nickel anomaly corresponds to the strike extent of a sheared gabbro unit passing through GR748575. A 'first class' airborne EM anomaly was reported along a zone north of the Mainwaring River although this was not tested.

018

A limited airborne survey was conducted over Cypress Creek to infill a gap in the LEE survey of 1959. This small block formed a part of a much larger survey covering areas to the east. Ground clearance was 150 meters on lines spaced at 500 meter intervals.

In February 1968 an airborne scintillometer survey was conducted over selected areas mainly with the aim of testing Precambrian and Ordovician conglomerates for uranium. Only one first order anomaly was located (outside the current tenements) along with 14 second order anomalies. One of these occurred over the Deep Creek ironstone (Anomaly 129) and five others over the coast at Cypress Creek were attributed to ground water effects.

After the fifth field season ended in April 1969 exploration activity declined. A short ground survey was conducted in February/March 1971 over ultrabasic rocks at Spero River and Hibbs Lagoon mainly oriented towards asbestos mineralization but potential for basemetal mineralization associated with the ultrabasics was considered.

Details of previous work by Cyprus (as Amoco Minerals) is included in Amoco Reports 401, 454 and 500 (Progress Reports for 12 months to September 1984, 1985 and 1986). No significant zones of mineralization were identified, however regional mapping enhanced geological knowledge of the area considerably.

It was recommended follow-up of Dighem anomalies in the Muddy Cove area be undertaken. To date no follow-up work has taken place.

## REGIONAL GEOLOGY AND MINERALIZATION

The regional geological setting is related to Paleozoic volcanic and sedimentary processes in a linear trough (the Dundas Trough) along the western margin of the Precambrian Tyennan nucleus composed of metamorphosed siltstones and quartzites. Early Cambrian sedimentation includes sandstone, shale and carbonates (Success Creek Group) followed by mudstones, greywacke and basic volcanics (Crimson Creek Formation) and in the middle to late Cambrian mudstones conglomerate and minor volcanics of the Dundas Group. The associated calc-alkaline Mt Read Volcanics developed on the shallow water eastern margin of the trough sediments adjacent to the Precambrian nucleus. The volcanics interfinger with or are faulted against the Cambrian sediments (Upper Dundas Group) to the west and are composed of rhyolite, dacite, intermediate rocks and basalt in the form of lava flows, breccias, tuffs and plugs. Crustal processes during this latter period resulted in serpentized ophiolitic material being thrust into the sediments of the trough. Tectonic interpretations of

020

these ophiolitic mafic complexes are conjectural and include subduction and rifting.

Sedimentation continued in the late Cambrian to Ordovician with deposition of siliceous sands and gravels (Owen Conglomerate) then shallow water limestones and shales (Gordon limestone). In the Silurian and Devonian sandstones and siltstones of the Eldon Group were deposited.

Folding and faulting of the above sequences and post tectonic granitoid intrusives occurred during the mid Devonian Tabberabberan Orogeny and the resulting sedimentary - intrusive complex is overlain by subhorizontal Carboniferous - Triassic successions intruded by Jurassic dolerite sills and dikes.

All known metal mines and prospects in the region occur in late Precambrian to late Devonian rocks. Base metal and gold production is dominated by the Mt Lyell, Rosebery and Que River mines (Table 1). These are volcanogenic massive sulfide deposits hosted by the central parts of the Cambrian Mt Read Volcanics, a sequence of felsic breccias, tuffs and lavas with minor siltstone. The deposits are characterized by large tonnage and area and are finely layered with generally high zinc-copper ratios. Typical mineral assemblage is pyrite, sphalerite, galena and chalcopyrite with silica and barite gangue minerals. They have extremely variable conductivity and chargeability properties. Airborne EM systems have been successfully used to detect massive sulfides, for example the Que River S lens, however the much larger Que River P lens is nonconductive and lacked an EM response but was strongly responsive to the induced polarization technique. Other favored ground techniques include stream sediment and soil geochemical sampling especially in areas where outcrop and access is poor. However stream sediment dispersion trains may be short (less than a few hundred meters) due to rapid dilution caused by high rainfall and the acid reducing environment caused by thick vegetation. In rapid flowing streams where there is an absence of - 80 mesh silt, consideration should be given to cold extraction geochemistry to detect trace metals fixed by manganese and iron coatings on

021  
gravels. This technique can enhance an anomaly to background contrasts and give longer dispersion trains around mineralization.

TABLE 1 BASEMETAL AND GOLD PRODUCTION - TASMANIAN WEST COAST

Mine	Gross Reserves (million tonnes)	Grade
Rosebery	18.4	5.6% Pb, 18.2% An, 0.7% Cu, 187g/t Ag, 3.4g/t Au
Mount Lyell	147	1.5% Cu, 8g/t Ag, 0.4g/t Au
Que River	3	7% Pb, 12.5% Zn, 171g/t Ag, 3.5g/t Au
Hellyer	15+	Similar grades to Que River
Renison	24	1.1% Sn
Mt Bishoff	18	0.8% Sn
Cleveland	6	0.8% Sn, 0.3% Cu
Queen Hill (Group)	7	0.7% Sn

Another important deposit type is sediment hosted replacement tin associated with granitoids. A major example is the world's largest underground tin orebody at Renison with smaller deposits at Mt Bishoff, Cleveland and Queen Hill. Host rocks are Cambrian dolomitic sediments intruded by Devonian to Carboniferous tin bearing granites which do not necessarily outcrop. The mineral assemblage is cassiterite-pyrrhotite and the most useful initial exploration technique is magnetic surveying.

Also associated with Devonian granitoid intrusives are the scheelite skarn deposits examples of which are mined at King Island and Kara.

Exploration and small scale mining indicate possibilities for discovery of economic deposits in a number of other environments notably stratabound lead-zinc mineralization in Gordon Limestone and nickel/platinum/asbestos mineralization in serpentinized

022

ophiolitic masses. Gold bearing quartz vein deposits are of minor importance in Western Tasmania to date.

023

## GEOLOGY AND MINERALIZATION OF THE PROPERTY \_\_\_\_\_

Geological control within the joint venture area is poor due to its remoteness and mapping is based on the work conducted by BHP in the mid to late 1960's (Enclosure 1).

Large blocks of Precambrian clastic sediments form the basement complex in the northwest portion of the joint venture area.

During the Cambrian period the basement was cut by a series of broad north to northeasterly trending graben structures into which volcanic derived sediments (greywackes, argillites and siltstones) intermediate volcanics and carbonates (dolomites - Mines Department XRF studies) were deposited. The carbonate - dolomite suites may be equivalents of the Success Creek and Crimson Creek Formations which are host to the major tin deposits in Western Tasmania. Upper Devonian granites are known to occur in the area principally on the northwestern tip of Cape Sorell and also to the south of Port Davey at South West Cape and Cox's

024

Bight. Outcrops of microgranite to diorite have been located within the tenements in the Timbertops area just west of Birch's Inlet. The syenitic granite reported on the coast near Birthday Bay is now thought to be more lamprophyric in composition. Mines Department work suggests a Devonian granite occurs just off the coast near Sloop Point in the northwest corner of Exploration Licence 35/83. As mapping to date has been sketchy further possible tin bearing plutons may exist within the tenements. Others may also lie at depth and may be tapped by major linears similar to the Federal Bassett Fault at Renison.

The southern and southeastern portions of the joint venture area are underlain by the uppermost predominantly intermediate to basic Mainwaring Volcanics suite of the Mount Read Volcanic (MRV) Arc. The Mainwaring Volcanics are thought to occur within a discreet vent area due to the abnormal amount of explosive volcanic rocks (agglomerate and breccias) interbedded with tuffaceous sediments compared to other suites of the same stratigraphic position further north. The basic to intermediate (with minor acid) sequence within the Mainwaring Formation has numerous recorded occurrences of native copper, chalcopyrite, bornite and malachite staining occasionally with massive 'stratiform' pyrite lenses up to ten centimeters in width.

A narrow band of Cambrian ultrabasic rocks up to 600 meters wide extends along a zone of thrusting from south of Hibbs Lagoon to Asbestos Point on the shore of Macquarie Harbor. It consists largely of highly sheared serpentinite with minor proxenite, gabbro and hartzburgite. Asbestos, chrome, nickel and copper occurrences have been recorded, associated with the ultrabasic rocks.

Orovidican to Devonian sediments occur in the Timbertops Syncline and are possibly obducted slices within the ultrabasic thrust zone. They consist of quartz sandstones, grits, minor conglomerates and siltstones and limestone.

Reworked Permian tillite and siltstone occur at Point Hibbs and are faulted against Jurassic dolerite to the west.

025

Cambrian granitic to basic igneous bodies intrude the sequences. A number of the more basic intrusives are controlled by the major thrust zones.

No previous production from the area is recorded. A number of alluvial gold occurrences are noted in the southern tenement where rivers drain the predominantly basaltic to andesitic volcanics of the Mainwaring Group and acid rocks of the Lewis River Volcanics.

026

**WORK CONDUCTED BY CYPRUS**

---

Work conducted by Cyprus during the 12 months to September 1987 included:-

- . Assessment of Dighem data in the Wanderer North area (Mitre Geophysics - Appendix 1)
- . Follow up of Dighem anomalies in the Wanderer North area
- . Stream sediment and rockchip sampling of ultramafic rocks in the Spero River area for platinoids and gold

Work programs entailed:-

- . Cutting 3.2 line kilometers of access in dense rainforest
- . Collection of 20 pan concentrate and 20 minus 80 mesh sediment samples

027

- . Collection of 92 soil samples
- . Collection of 20 rockchip samples of which 12 were assayed
- . Geological mapping
- . Surveying of 3.2 line kilometers of MaxMin EM at three frequencies 3555 Hz, 888Hz and 222Hz (100m transmitter receiver separation)
- . Surveying of 3.2 line kilometers of ground magnetics
- . Assaying for copper, lead zinc, zinc, silver, arsenic and gold, and platinum, palladium, ruthenium, rhodium, iridium, osmium, nickel, cobalt and chromium in samples from Spero River.

The following details exploration conducted at the Spero River and Wanderer North prospects.

#### Spero River

Assessment was made of the Spero River Ultrafamic Complex for its platinum group and gold potential by stream and rockchip geochemistry.

All samples were assayed for gold, platinum, palladium, ruthenium, rhodium, iridium, osmium, copper, lead zinc, zinc, nickel, cobalt and chromium.

The ultrafamic complex is located at Sperio Bay in the northeast sector of EL 37/83 (Enclosure 1). The area was accessed by helicopter from the Wart Hill camp. Beaches and a gravel bar in the Spero River 1.5 kilometers upstream from its mouth are suitable landing sites.

### Geology

Ultrafamic to basic intrusives, extrusives and fine grained sediments are exposed in the coastal section from Whitehorse Beach south to the Spero River. Inland outcrop is obscured by beach sands and possible Tertiary sediments. Lithologies in the coastal section include:

- . medium-coarse grained gabbros with pods of peridotite and pyroxenite
- . biotite pyroxenite dikes
- . basic to intermediate lavas
- . fine-medium grained volcanoclastics

Faulting and associated brecciation in the gabbros is common. Quartz, calcite, magnetite, pyrite veining and stockworking frequently occur in the brecciated zones.

### Stream Geochemistry

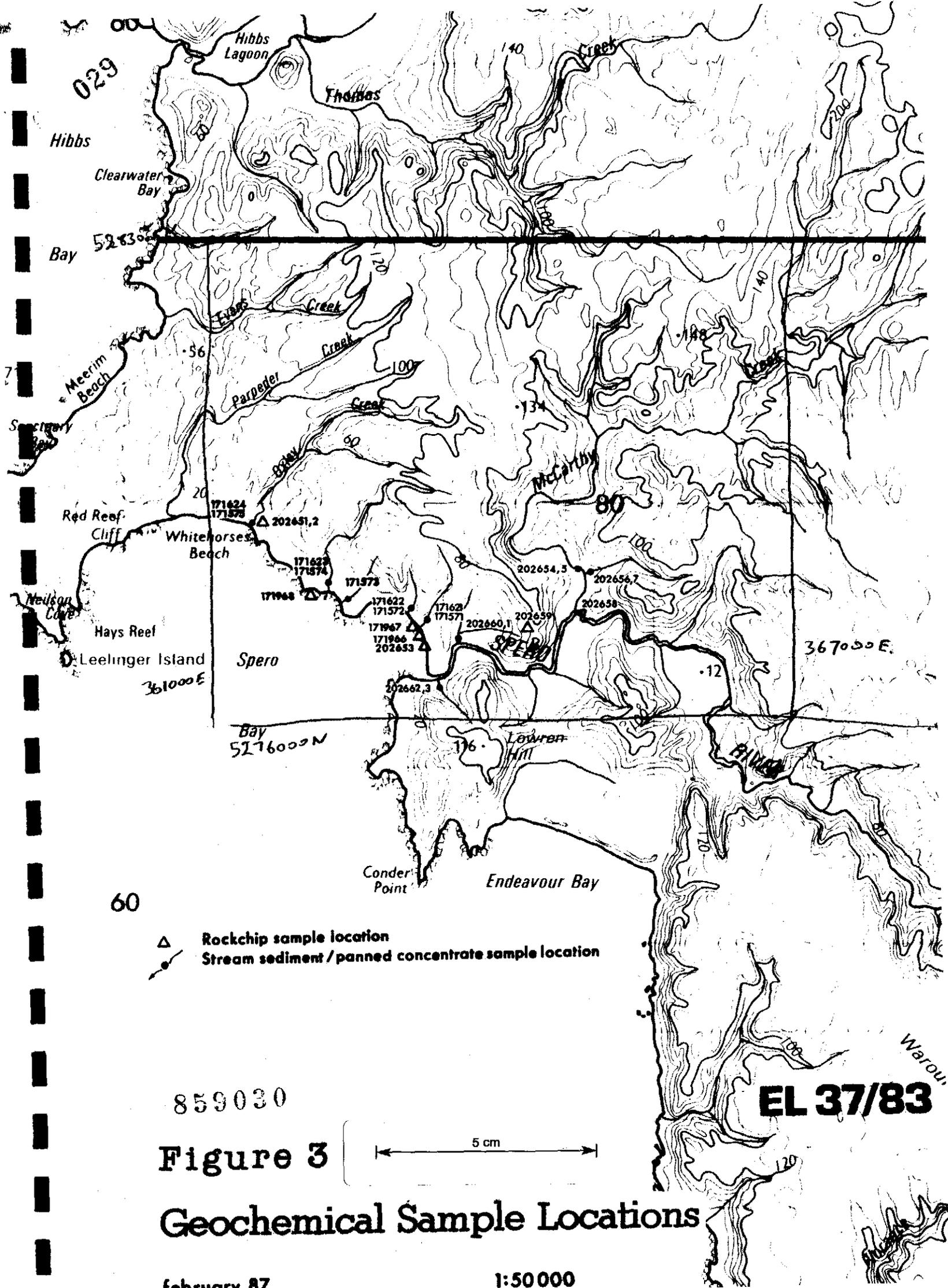
The ultramafic complex is difficult to assess by stream geochemistry due to the small size of the body, lacking extensive drainage systems and Tertiary to Recent sediments mask the ultrafamic geochemistry.

A total of nine sites were sampled, both pan concentrates and minus 80 mesh sediments (Figures 3 and 4 and Appendix 2).

Platinum group elements assayed at higher levels than gold. Platinum has the greatest range of values from 0.5 - 420 ppb, the maximum in a panned concentrate draining gabbros, with associated ruthenium, rhodium, iridium and osmium ranging from 18-52 ppb.

High levels of osmium (250 ppb) occur in a panned concentrate draining serpentinite with associated platinum value of 150 ppb.

Maximum chromium value of 6600 ppm occurs in concentrates and 1000 ppm in minus 80 mesh.



▲ Rockchip sample location  
 ● Stream sediment / panned concentrate sample location

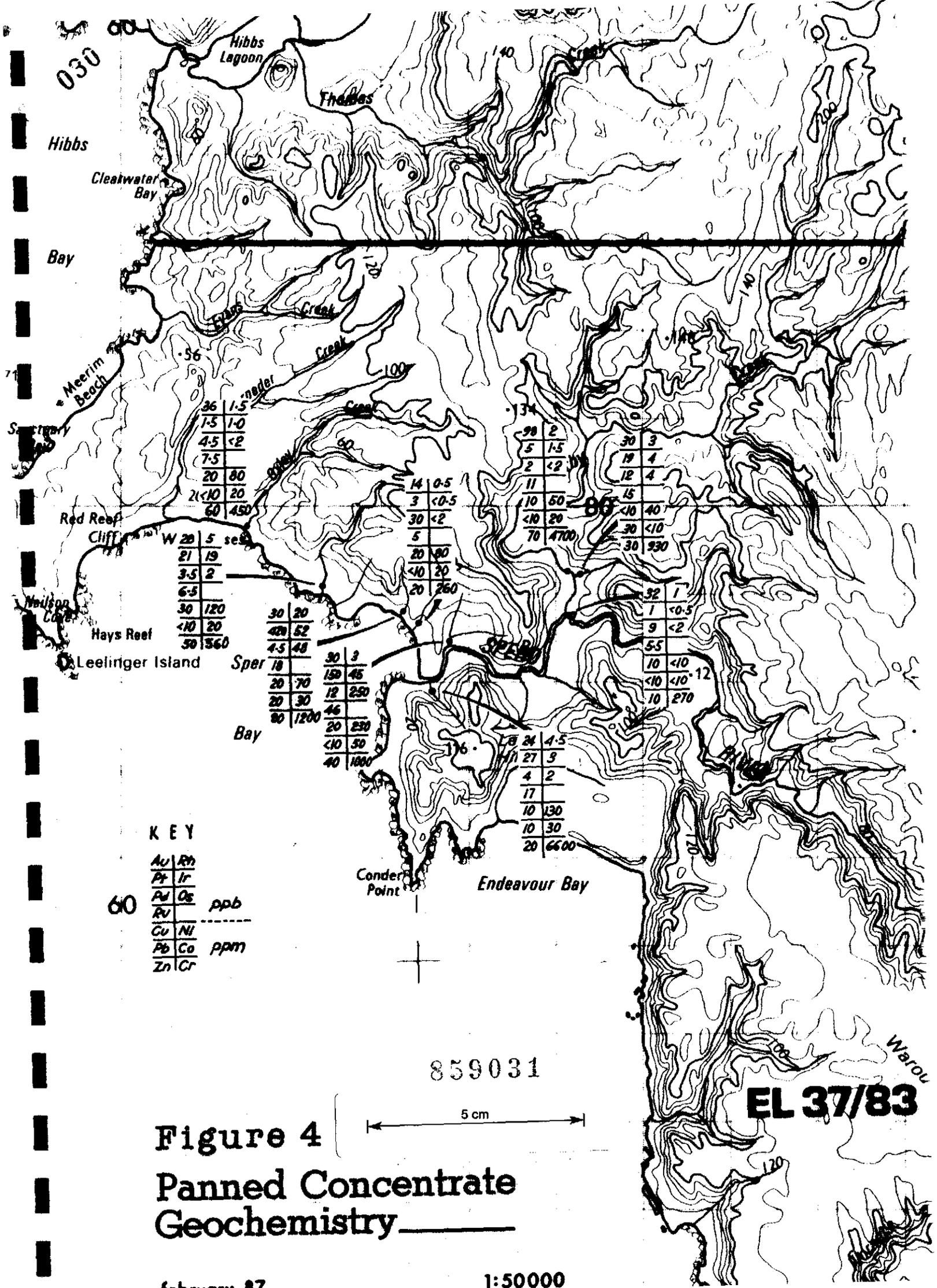
859030

Figure 3

5 cm

Geochemical Sample Locations

EL 37/83

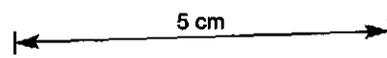


**KEY**

Au	Rh	ppb
Pt	Ir	
Pd	Os	ppm
Cu	Ni	
Pb	Co	ppm
Zn	Cr	

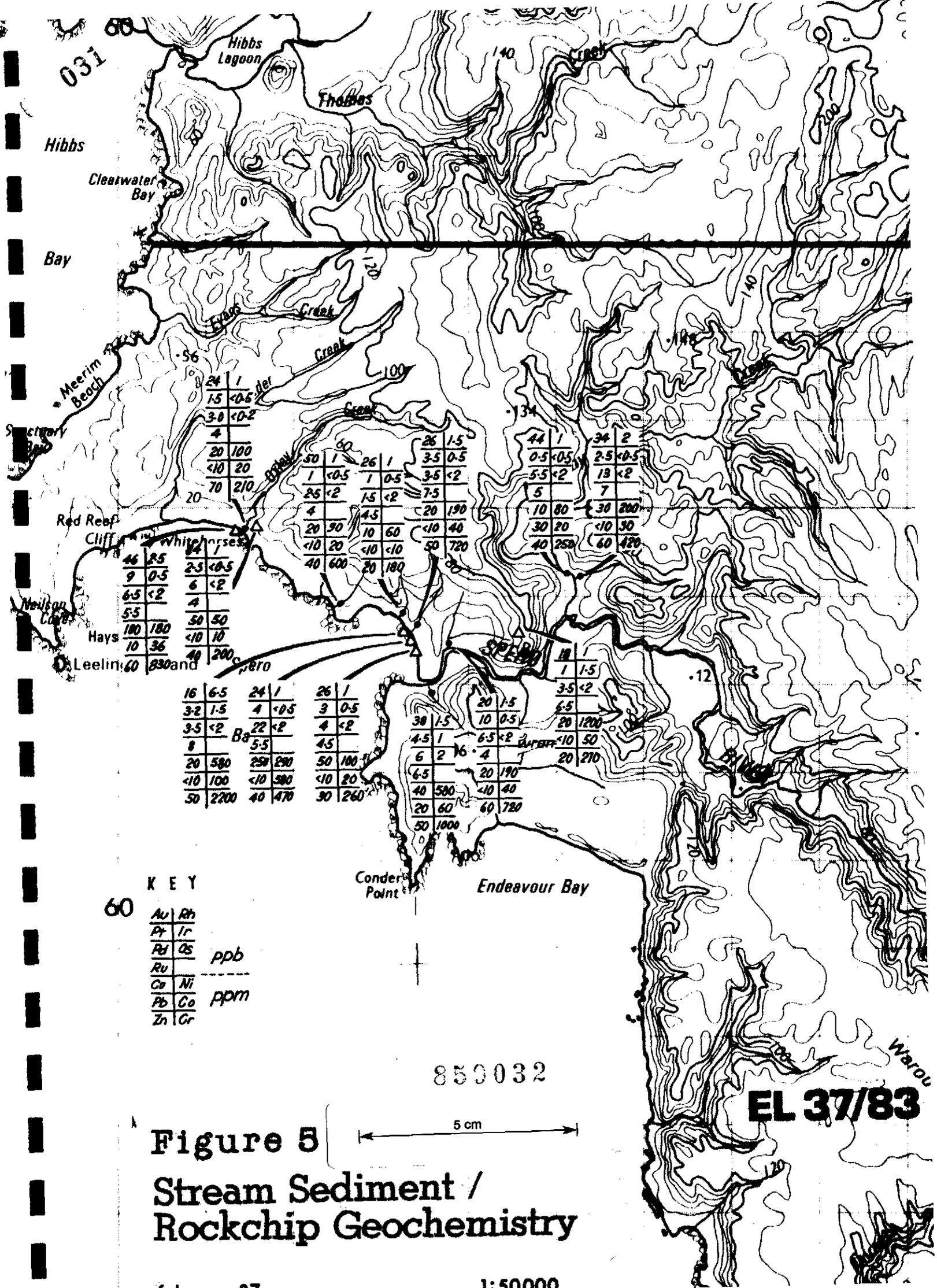
60

859031



**Figure 4**  
**Panned Concentrate**  
**Geochemistry**

**EL 37/83**



**KEY**

60	Au	Rh	
	Pt	Ir	
	Pd	Os	ppb
	Ru		
	Cu	Ni	
	Pb	Co	ppm
	Zn	Cr	

850032

**EL 37/83**

**Figure 5** 5 cm  
**Stream Sediment /  
 Rockchip Geochemistry**

february 87

1:50000

The maximum gold value of 98 ppb occurs in a concentrate, all other values were less than 50 ppb with concentrates and minus 80 mesh samples assaying at similar levels.

#### Rock Geochemistry

A total of seven rocks were assayed, most associated with breccias and shearing. (Figure 4 and Appendix 1). Sample 171966 is a 4 centimeters wide magnetite sulfide vein in gabbro assayed palladium 22 ppb, copper 250 ppm, nickel 290 ppm and cobalt 580 ppm.

Sample 171967 is a sheared ferruginous serpentized gabbro and assayed 32 ppb platinum, 580 ppm nickel, 2200 ppm chromium.

All golds assayed less than 84 ppb at similar levels to the stream samples.

#### Conclusions

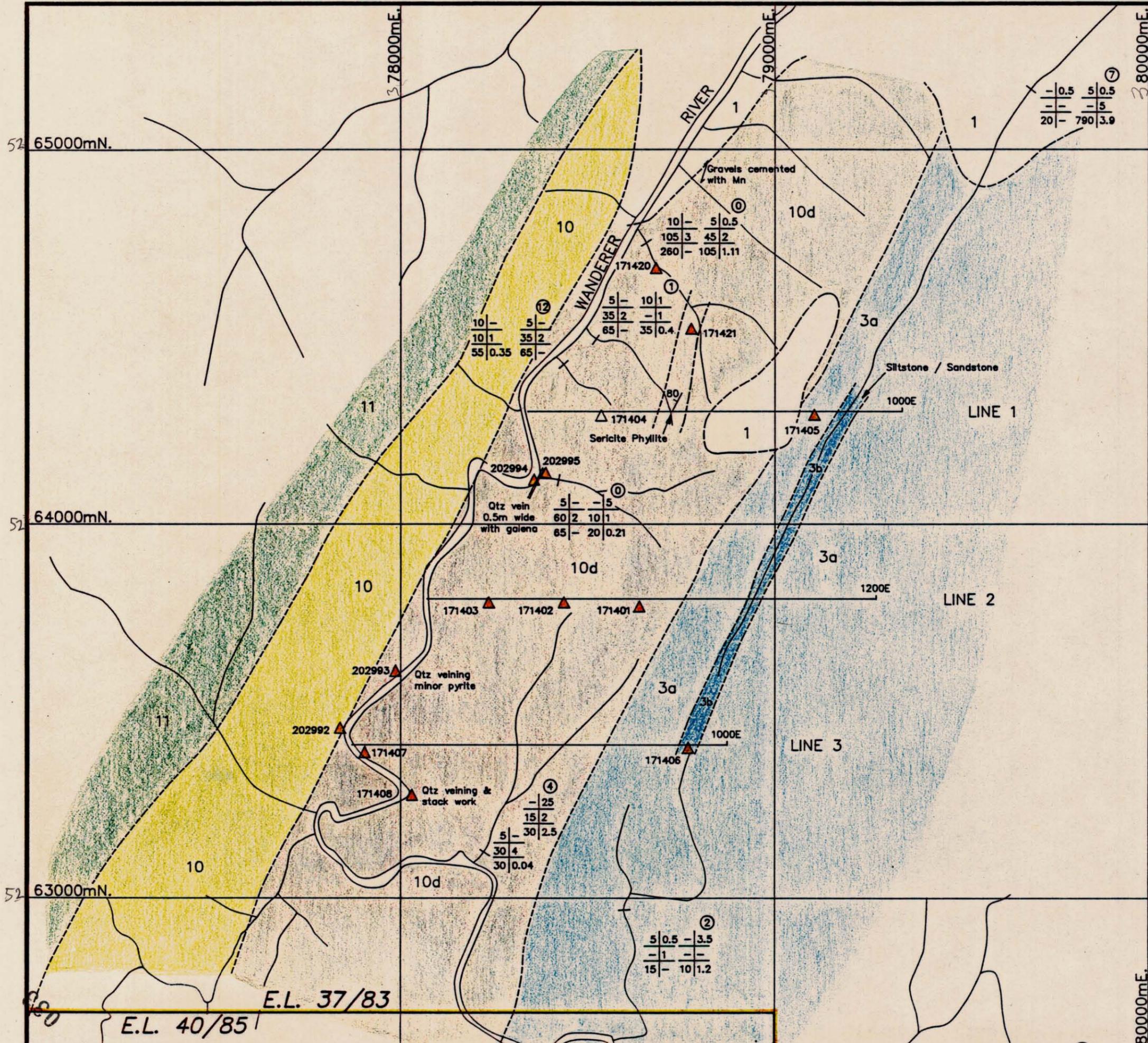
Due to the small data base for platinum group exploration in this area, it is difficult to ascertain if stream sediment values are significant. However platinum group and gold rock-chip values are not anomalous.

Until more is known about the ultrafamics and their platinum group mineralization in the Cape Sorell licences, it is difficult to draw any conclusions or make recommendations.

#### Wanderer North

Previous reconnaissance mapping by BHP located silver/lead veins in the Wanderer River at 378000E/63600N. This season's work has been primarily aimed at assessing Dighem anomalies.

The area is located on the steep eastern flanks of the Wanderer River (Enclosure 1). Access is by helicopter, the eastern ends of all lines are on open plains which have been recently burnt.



ROCK CHIP SAMPLES

No.	Cu	Pb	Zn	Ag	As	Au
171421	105	500	905	0.5	2	<0.005
202992	10	5	10	<0.5	3	0.370
202993	15	<5	25	<0.5	10	4.03
202994	1400	6.06%	3.65%	25	2	0.05
202995	15	610	770	<0.5	8	0.04

5 cm

CYPRUS MINERALS AUST. CO. & POSEIDON LTD.

CAPE SORELL - E.L. 37/83

WANDERER NORTH GEOLOGY

SCALE 1:10,000

FIG. 2

DRAWN BY: R.P.  
 DRAFTSMAN: T.G.D.S.  
 DATE: June '87  
 REVISIONS:  
 FILE No.

TERTIARY \_\_\_\_\_

1 Quartzose Gravel

JURASSIC \_\_\_\_\_

2 Dolerite

LATE CAMBRIAN - EARLY ORDOVICIAN \_\_\_\_\_

3 Owen Conglomerate - undifferentiated  
 3a - coarse quartzose sandstone  
 3b - siltstone

4 Waterloo Creek Group - undifferentiated  
 4a - hematitic volcanoclastic conglomerate  
 4b - tuffaceous coarse sandstone and grit  
 4c - black shale ± pyrite  
 4d - fine-med. grained rhyolitic volcanoclastic

CAMBRIAN - MT. READ VOLCANICS \_\_\_\_\_

5 Wart Hill and Hudson River Volcanics - undifferentiated  
 5a - fine to med. grained rhyolitic volcanoclastic  
 5b - rhyolitic quartz-feldspar porphyry (lavas and intrusives)  
 5c - dacitic porphyry  
 5d - coarse rhyolitic volcanoclastic  
 5e - siltstone  
 5f - siliceous conglomerate  
 5g - greywacke and siltstone

CAMBRIAN INTRUSIVES \_\_\_\_\_

6 Elliott Point Porphyry  
 7 Granite  
 8 Microgranite  
 9 Porphyritic Microgranite

CAMBRIAN - WESTERN EPICLASTICS \_\_\_\_\_

10 Western Epiclastics - undifferentiated  
 10a - andesitic - basaltic volcanics  
 10b - brown-grey tuffaceous siltstone and quartzose conglomerate  
 10c - black shale ± pyrite  
 10d - fine to medium grained rhyolitic volcanics  
 10e - gabbro  
 10f - coarse rhyolitic volcanoclastic sandstone

CAMBRIAN - MAINWARING GROUP \_\_\_\_\_

11 Mainwaring Group - undifferentiated  
 11a - gabbro  
 11b - andesite-basaltic volcanics  
 11c - dolomite  
 11d - black shale ± pyrite  
 11e - siltstone and sandstone

PRECAMBRIAN \_\_\_\_\_

12 Metamorphics - quartzite, schist and phyllite

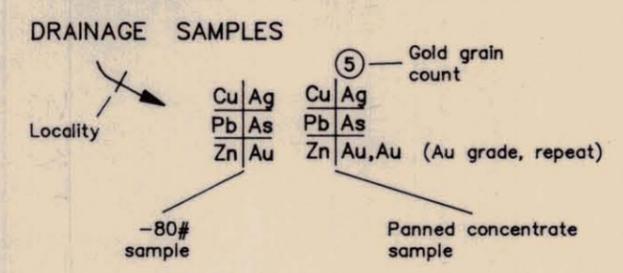
- Geological contact
- ~ Unconformity
- Fault
- 60° Strike and dip of schistosity
- 60° Strike and dip of bedding - facing indicated
- ↘ Plunging syncline
- ⚒ Old workings

ALTERATION - Pervasive and vein controlled \_\_\_\_\_

- Chlorite - magnetite
- Sericite
- Sericite - quartz
- Chlorite - pyrite
- Quartz - chlorite - pyrite - tourmaline
- Quartz - sericite - talc ± chlorite
- Quartz - chlorite

- Quartz vein
- Alteration boundary

GEOCHEMISTRY \_\_\_\_\_



ROCK CHIP SAMPLES

- △ 202567 - Sample location and number
- △ 202569 - Sample location number and assays
- △ 202569 TS - Thin section sample
- ⊙ v33/1 - Diamond drill hole location

DETECTION LIMITS (ppm)

	Cu	Pb	Zn	Ag	As	Au
Rocks	5	5	5	0.5	1	0.005
-80# plus panned concentrates	5	5	5	0.5	1	0.008
Soils	5	5	5	0.5	1	0.01 (AAS) 0.008 (Fire assay)

- = Below limit of detection

859035

CYPRUS MINERALS AUST CO & POSEIDON LTD

CAPE SORELL EL 37/83

**LEGEND**

DRAWN BY :  
 DRAFTSMAN : T.G.D.S.  
 DATE : April '87  
 REVISIONS :  
 FILE No.

730

### Gridding

A total of 3.2 kilometers of lines have been cut, bearing 090° true from the Wanderer River. The three lines are at 400-500 meter spacings (Figure 2).

### Geology

Both Cambrian and Ordovician clastics occur in the grid area, trends are north-northeast, bedding and foliation is near vertical. A remnant patch of Tertiary gravels overlies the volcanics on Line 1. Cambrian and Ordovician lithologies can be subdivided into:

- . Western Epiclastics. Fine-medium grained quartz phyric rhyolite volcanoclastics outcrop between the Wanderer River and the Ordovician rocks. The only variation is a sericitized phyllite lens at 375-425 on Line 1.
- . West of the Wanderer River the Western Epiclastics consist of siltstones with basic volcanics.
- . Ordovician Owen Conglomerate. These quartz sandstones, grits, pebble conglomerates and siltstones appear to conformably overlie the Cambrian sequence. The contact between the two units may be the focus for major faulting parallel to strike.

The only significant mineralization located is a system of quartz sulfide veins in the Wanderer River and on western end of Line 2. The veins are parallel to the regional lithological trends and occur in the rhyolitic volcanoclastics in proximity to their western contact with the siltstone basic volcanic association.

Veining is 0.5 - 1.5 meters wide occurring over a strike length of at least 1 kilometer as discrete bodies and irregular masses. Veins are composed of quartz with minor galena and pyrite. Base metal and weak gold anomalies in soils on the western ends of lines are probably attributable to these veins.

036

### Stream Geochemistry

Eleven minus 80 mesh and pan concentrate sample sites were collected from streams draining the area of Dighem anomalies (Figure 2). Best gold value was 0.39 ppm in minus 80 mesh associated with 12 fine gold grains in the pan concentrate. This small stream drains a single point soil gold anomaly of 0.09 ppm on Line 1.

Arsenic in pan concentrate and minus 80 mesh samples are all less than 12 ppm. Maximum copper, lead and zinc values are 75, 110 and 260 ppm respectively.

Anomalous streams are generally located to the north of Line 1, a thick manganiferous wad is common in these drainages.

### Soil Geochemistry

All lines were sampled at 25 meter intervals from the Wanderer River east to the Owen Conglomerate. With the exception of Tertiary gravel cover on Line 1, all soils were residual taken in the B/C horizon (Enclosures 2, 3 and 4).

The maximum gold value in soils was 0.09 ppm and located on Line 1 at 200E, eight other samples assayed above detection at 0.01 to 0.04 ppm. A value of 0.14 ppm by AAS, Line 2, 25E was not repeated by fire assay.

On Line 3 there is a rough correlation between topographic highs and weakly anomalous gold soil values. These ridges are interpreted to be silicified or veined zones which are more resistant to erosion.

Highest base metal values located on Line 2 at 100-200E are as follows: copper 170 ppm, lead 980 ppm and zinc 350 ppm. Silver and arsenic values up to 4.5 and 5 ppm respectively occur in this zone. All gold values are less than 0.008 ppm. These anomalies are most likely associated with the sulfidic quartz veins exposed in the river 300 meters north of Line 2.

### 037 Rock Geochemistry

Rocks anomalous in base and precious metals are all associated with sulfidic and manganiferous quartz veining. Samples 202992/3 are of quartz veining with minor pyrite, assaying 0.37 and 4.03 ppm gold with arsenic less than 10 ppm and base metals less than 25 ppm (Figure 2). Assays and rock descriptions are included in Appendix 2.

A high graded sample of a quartz-galena vein (2029940 assayed 1400 ppm copper, 6.06% lead, 3.65% zinc, 25 ppm silver, 2 ppm arsenic and 0.05 ppm gold. A sample of manganiferous quartz vein (171421) assayed 105 ppm copper, 500 ppm lead, 905 ppm zinc with arsenic, silver and gold close to a detection limit.

### Geophysics

Magnetic and EM data are of poor quality (J Bishop, perscomm) possibly due to irregular peg spacings on steep topography for electromagnetics and magnetic storms for magnetics.

A strong maximum EM response and coincident magnetic response occurs on Line 1 at 500-700E. A weaker response in a similar position on the grid is located on Line 2. The anomaly is coincident with Tertiary gravel cover less than 20 meters thick. The EM response may be caused by waterfilled clays and gravels, but may have another explanation considering there is a coincident magnetic anomaly.

### Conclusions

The EM anomaly has been located but is still unexplained due to Tertiary gravel cover. Streams draining the area are anomalous in base metals. This geochemical anomaly and coincident magnetics with the EM warrants further testing by 'Wacka' bedrock sampling system, on 250 meters lines at 25 meter spacings. The quartz sulfide veins with anomalous gold in the Wanderer River warrant further work. Lines 1, 2 and 3 should be extended to the west and 400 meters spaced infill lines should be cut to cover this zone.

038

These lines should be sampled at 12.5 meter intervals to adequately test the potential of this vein system which has a strike length of 1000 meters and is 200 meters wide.

039

#### EXPLORATION POTENTIAL

It is considered potential for platinum group elements and/or gold exists within the largely unexplored parts of the Cambrian Ultrafamic Belt which traverses Cape Sorell from the Spero River in the west to Abestos Point in the east.

Polymetallic massive sulfides are also considered a high priority target. Further work on the Dighem anomalies at Wanderer North and Muddy Cove is required.

Finally, gold mineralization associated with Cambrian Intrusives may occur in Cape Sorell. Gold mineralization, analogous to Voyager 24 or North Lewis (Voyager 12) in the Elliott Bay region south of Cape Sorell, is considered highly prospective.

040

#### EXPLORATION PROPOSAL

---

The exploration program envisaged for next season will comprise these parts:-

- . Follow-up of anomalies at Wanderer North with deep 'Wacka' sampling, extended line cutting, soil sampling, geological mapping and diamond drilling of targets
- . Follow-up of geophysical anomalies at Muddy Cove with line cutting, soil and bedrock sampling, geological mapping and ground geophysics
- . Regional drainage sampling of ultramafic belts for gold and platinum group elements

It is envisaged the program will be conducted in conjunction with ongoing exploration at Elliott Bay. The base for the season will be the Wart Hill camp. Fly camps will be established where necessary. An on-site helicopter will supply field crews.

041

Cyprus and Poseidon wish to joint venture the northern-most licences (35/83 and 38/83) on the Sorell Peninsula. It is hoped an operating partner might wish to share logistics and support facilities.

Signed

  
C TORREY*for both*

R POLTOCK

042

## CYPRUS MINERALS AUSTRALIA COMPANY

EXPENDITURE FOR THE PERIOD 12 MONTHS ENDED 31ST AUGUST 1987

EXPLORATION LICENCE SORELL PENINSULA ELs 35, 36, 37/83

Salaries and Wages	994.59
Benefits	93.90
Drafting	354.25
Cookery	874.48
Field Supplies - General	23.71
Freight	761.51
Travel	75.00
Aircraft Charter	10,385.00
Communications	866.08
Consulting Fee	1,166.15
Assays	6,027.07
Contract - Geological	5,314.94
Geophysics	9,050.00
Other Contractors	68.84
Equipment Rental	728.12
Equipment Operation and Maintenance	178.17
Property Payments	7,680.00

Overhead @ 10%

44,641.81

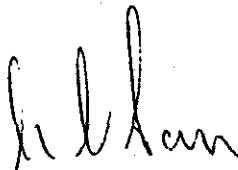
4,464.18

---



---

49,105.99



M BASS  
ACCOUNTANT



APPENDIX 1 \_\_\_\_\_

INTERPRETATION OF ELECTRICAL AND ELECTROMAGNETIC SURVEYS AT  
ELLIOTT BAY (AND SORELL PENINSULA) by Mitre Geophysics

NOTE: Complete text is included however only maps pertaining to  
Sorell Peninsula are included

045



# MITRE GEOPHYSICS PTY LTD

MINERAL EXPLORATION AND ENGINEERING CONSULTANTS

DUGGS LANE ELLIOTT TASMANIA 7325 PHONE 004-363143

## INTERPRETATION OF ELECTRICAL AND ELECTROMAGNETIC SURVEYS

AT ELLIOTT BAY (E.L. 40/85).

for

Cyprus Minerals Australia Company

by

Dr J.R. Bishop

CM/MG86/07  
Oct., 1986



## CONTENTS

List of Tables and Figures	2
Summary	3
Introduction	4
Exploration Targets and Geological Setting	4
Exploration History	5
Survey Details	6
Dighem	6
Maxmin	6
Induced Polarisation	6
UTEM	7
Interpretation	7
Dighem	7
Maxmin	9
Induced Polarisation	9
UTEM	10
Conclusions and Recommendations	11
References	12



047

## LIST OF TABLES AND FIGURES

Table 1.	Petrophysical Measurements of V19 samples.	p. 13
Table 2.	Summary of Recommendations.	p. 14
Figure 1.	Geology and prospect location plan (1:25,000 scale).	
Figure 2.	Dighem EM anomalies and location of Maxmin traverses (1:25,000 scale).	
Figure 3.	Contours of averaged chargeabilities (1:10,000 scale).	
Figure 4.	Contours of averaged resistivities (1:10,000 scale).	
Figure 5.	UTEM interpretation (1:10,000 scale).	
Figure 6.	A comparison of overlapping sections of the Sorell and Elliott Bay Dighem surveys.	
Figure 7.	Areas recommended for further work.	

Figures referred to, but not included in this report.

Dighem EM, resistivity, magnetic and enhanced magnetic maps for Elliott Bay (1:10,000 scale).

IP and resistivity pseudosections (1:5,000 scale).

Maxmin profiles (1:5,000 scale).

UTEM profiles (1:5,000 scale).

Geology of Wart Hill area, E.L. 27/76 (1:10,000 scale).

048



#### SUMMARY

A Dighem survey over the northern section of E.L. 40/85 has not produced any responses of prime interest, however a number of anomalous zones have been chosen for follow up. Similarly, examination of IP and UTEM surveys carried out for Geopeko in the Wart Hill area has not lead to any VMS targets, but the results may assist a gold exploration program.

Despite these negative findings, Elliott Bay is still a highly prospective area. Large regions with favourable lithologies remain ungridded and little explored. It is recommended that these areas be covered by gradient array IP surveys to look for zones of alteration.



## INTRODUCTION

E.L. 40/85 (Elliott Bay) covers the southern section of the highly mineralised Mt Read Volcanics which form a long, arcuate belt across western Tasmania. The licence is held by Cyprus Minerals who are managing the exploration program with Poseidon as a joint venture partner.

Elliott Bay is a remote area within the Southwest Conservation Area. Access is by aeroplane to a landing strip in the north of the licence or, since much of the lease is open button-grass, by helicopter. A disused track to the lighthouse at Low Rocky Point runs through the area and Cyprus used a four wheel motorcycle along this track during the 1985/86 field season, to ferry gear to the campsites. Poor weather for seven or eight months of the year usually restricts field work to the summer season.

A Dighem survey was carried out over the northern section of the licence for the joint venture partners in January, 1986. This report evaluates the results of that survey and the follow-up field work using the Maxmin electromagnetic (EM) system. It also comments on the induced polarisation (IP) and UTEM surveys undertaken for the previous licence-holders, Geopeko.

## EXPLORATION TARGETS AND GEOLOGICAL SETTING

The prime target is for a polymetallic volcanogenic massive sulphide (VMS) body, similar to those found at the Rosebery and Hellyer mines. The prospectivity of the Elliott Bay licence has been considerably enhanced by the discovery, by Geopeko, of two small pods of such sulphides.

A secondary target is for a volcanic-hosted gold deposit. Although there are no type deposits within the Mt Read Volcanics, an area anomalously high in gold has been defined within E.L. 40/85 and other exploration companies are having some encouragement elsewhere in the belt.

Geophysical surveys over Rosebery, Que River and Hellyer and petrophysical measurements of samples, have shown these ores to have similar properties. They are not magnetic, but they are chargeable, dense and good, though not excellent, conductors. Testing of two samples from the Elliott Bay sulphides indicates that deposits with rather less desirable geophysical properties may occur here. The results, given in Table 1, are much less chargeable and only weakly conductive. Although only two specimens have been measured, the results are in agreement with detailed IP surveys which were carried out by Geopeko over both pods.

The sulphide pods occur within a belt of north-south striking pyroclastics which have been classified as direct correlates of the 'Central Belt' of the Cambrian Mt Read Volcanics in the Queenstown area. These rocks, the Lewis River Volcanics, occupy



the central and eastern parts of the licence. In the north-central section, they are overlain by a syncline of Late-Cambrian (Tyndall Group) and Ordovician sediments. On the western flank of the licence there are basic Cambrian volcanics of the Mainwaring Group and sediments correlated with the 'Western Sequence' of the Mt Read Volcanics (see Figure 1). Thus the regional strike is approximately north-south, with the rocks interpreted to face, and dip steeply, to the west. Black shales occur in both the Tyndall Group and Western Sequence and these may give rise to IP &/or EM responses.

#### EXPLORATION HISTORY

The Elliott Bay area was first held by Mt Lyell and EZ (the LEE syndicate) in the 1950's and early 1960's, as part of their large southwest exploration licence. They flew an aeromagnetic survey over the area and may have done some ground work at Elliott Bay, but no search has been made for any record of this.

The area was next held by BHP as part of E.L. 13/65. In 1975, Georex carried out a helicopter-borne EM and magnetic survey using the McPhar H-400 system for BHP, who dropped the ground before following up the 100 or so anomalies defined by the survey.

The ground was picked up by Geopeko (as E.L. 27/76). Initially, they followed up the airborne EM and magnetic anomalies defined by the H-400 survey, as well as investigating several old workings. During the 1981/82 field seasons, two small, high-grade Pb-Zn-Ag lenses were discovered during a soil geochemistry survey. A large area of anomalous gold in stream sediments was also defined.

In 1982/83, a dipole-dipole IP survey and c-horizon soil geochemistry program covered the altered rocks around the VMS deposits. No good targets were defined by this survey and in the 1983/84 season, the exploration program concentrated on the potential of the gold zone, with disappointing results. The results of the IP survey are further discussed later in this report. During the next field season, a UTEM survey was carried out over several of the better prospects covered by the IP survey, to explore to greater depths (ie, say 150m to 250m compared to 50m to 100m for the IP). No obvious VMS targets were defined by this survey, but a detailed interpretation is given below.

Apart from the areas covered in detail by the IP, UTEM and geochemistry, Geopeko have looked at a number of other prospects, apparently in isolation (a total of 35 'Voyager' prospects; V1 to V36, with no V13). That is, there are no maps showing a synthesis of their work. It is recommended later in this report that such a compilation be carried out by Cyprus. Several of the prospects showed interesting results and some of these were recommended for further investigation by Geopeko's geologists.



Cyprus' first field season started in March, 1986 following the Dighem survey in January. Work consisted of Maxmin surveys along reconnaissance lines to locate anomalies picked from a preliminary interpretation of the Dighem results (Bishop, 1986). These lines were also soil sampled and geologically mapped. The traverses covered are shown in Figure 2 and a report on the work is given by Jones (1986). The Maxmin results are also discussed below.

## SURVEY DETAILS

### DIGHEM

The Dighem survey was carried out in January, 1986. It covered about 700 line-kms, using a nominal line spacing of 150m and a nominal terrain clearance of 30m. The system used coaxial and coplanar coils at ~900Hz and coplanar coils at 7200Hz. A Geometrics G813 magnetometer monitored the total magnetic field. Flight line positioning was done from strip film only (no navigation systems) and recovery was apparently difficult over the largely featureless (and forested) western side of the licence (see later comments).

The usual Dighem maps of EM anomalies; apparent resistivity (assuming a uniform earth); magnetics and high-pass filtered magnetics were produced on photo-mosaic bases at 1:10,000 scale (see Kilty, 1986). The location of the EM anomalies is shown in Figure 2 of this report. Only responses interpreted as bedrock conductors have been differentiated here. For the more detailed classifications, the reader is referred to the original Dighem maps.

### MAXMIN

Location of the preliminary Dighem anomalies was carried out using the Maxmin EM system. The planned traverses were surveyed with compass, tape and clinometer and flagged at horizontally corrected 25m intervals. The % inclination for each 25m interval was recorded and this data was then used to slope-correct the Maxmin readings.

The survey was carried out with the coils horizontal (ie, vertical axes) at a 100m spacing. Three frequencies, 3555; 888 & 222Hz, were read at 25m station spacings. The results have been presented as profiles at 1:5,000 in Jones (1986).

### INDUCED POLARISATION

The survey was carried out by Geopeko during the 1982/83 field season. Two different IP receivers were used: an IPR-11 and an IPR-8. The latter instrument was used in the more inaccessible areas. For plotting, the decay between 510 and 1050msecs was used

052



for the IPR-11 results (channel 6+7) and for the IPR-8, the decay between 650 and 1170msecs (channel 232): both measuring a 2 second on, 2 second off square wave pulse. For both receivers a dipole-dipole array was used with a 50m dipole spacing, read to  $n=6$  and a line separation of 200m (with some infill lines). Sumpton (in Herrmann, 1983) found that channel 232 on the IPR-8 gave a chargeability reading about 3 times the plotted IPR-11 value and the contours in Figure 3 tend to confirm this conversion factor. The resistivities (Figure 4) are instrument independent.

There are a number of areas where the IP data is of doubtful quality (eg, isolated 'diagonals' of high numbers; negative values) and Sumpton (in Herrmann, 1983) noted that the IPR-11 did "suffer moisture related problems". A repeat survey was carried out over one apparently interesting response (line 11400N; Herrmann and Sumpton, 1984) and different, non-anomalous, results were obtained.

The data have been presented by Geopeko as pseudosections in book form; one book of chargeabilities and a second one of resistivities, both at 1:5,000 scale. Those sections considered anomalous, are shown in Herrmann (1983). Geopeko also produced 1:10,000 scale plans with most of the pseudosections shown (data from the few 100m infill lines are missing).

#### UTEM

The survey was carried out by Lamontagne Geophysics in March, 1984 for Geopeko. A total of four loops, each 800m x 1600m were used for the survey. One loop covered V19; two loops covered the area immediately to the south (V29 & V29W) and the fourth loop covered V9, further to the south again (see Figure 5). A station spacing of 25m was used with line spacings of 100m or 200m. Only the vertical component was measured, using a frequency of 26Hz.

Data quality was reasonably good with some noise towards the ends of the 1000m+ lines. Some lines on loop 1 apparently suffered from a (?) 'sync' problem with the early-time channels having large offsets. The data appears as 1:5,000 scale profiles in Herrmann and Sumpton (1984).

#### INTERPRETATION

##### DIGHEM

The Dighem survey was designed to cover the northern section of the licence which was largely unexplored. The survey was split into two halves, east and west of the Mt Osmund syncline.

A preliminary interpretation, from the analog records, was carried out at the completion of the survey. All possible anomalies were noted under three classifications. Those responses which

053



had in-phase excursions on the 900Hz channels were given the highest grade (#A); those with in-phase excursions on the 7200Hz were classed as intermediate (#B); while those with out-of-phase on 7200Hz only, were given the lowest grading (#C). These results are given in Jones (1986). Only two #A responses were located over the Lewis River Volcanics and these were in close proximity to the conductive Tertiary gravels in the north-east corner of the survey. A large number of #B and #C grade responses were picked over the Volcanics on the eastern side of the syncline with a considerably fewer number on the western side. This preliminary interpretation formed the basis of the first season's field work which located several weak conductors (see later, under Maxmin). The follow up of the 'preliminary anomalies' was not completed, but the areas have been superseded by the prospects recommended below.

The final Dighem results were delivered in July; difficulty in flight line location being blamed for the long delay. Some idea of the accuracy of the survey can be obtained by comparing the results with those from the adjacent Sorell survey. Figure 6 compares the EM responses in one area of overlap. Some of the differences in the results can perhaps be ascribed to improvements in instrumentation, but the poor correspondence between the two EM maps is certainly cause for concern. These differences were being discussed with Dighem Ltd at the time of writing this report.

The survey recorded a large number of weak, low amplitude responses which were mostly interpreted as being due to surficial sources (Kilty, 1986). Very few responses were interpreted as being due to bedrock conductors and those that were, are mostly of small amplitude thus making the interpretation less certain. (Thus it is also possible that some of the low amplitude responses interpreted as being due to surficial sources, may in fact be caused by bedrock conductors.) Several of the interpreted bedrock responses are outside of the E.L. boundary, but these lie either within E.L. 37/83 or in the narrow strip of vacant ground between the two licences, thus all anomalies are dealt with in this report.

A total of 17 anomalies or zones of anomalies have been picked for follow up. The strongest response lies on the 'Spero River' sheet. Although geophysically the best response and given priority '1', the northern section of the zone may coincide with the edge of the conductive Tertiary gravels and the whole zone may be within the Tyndall Group, which is usually regarded as a less prospective unit of the Mt Read Volcanics.

The remaining anomalies are geophysically much poorer, but most are in more favourable locations. Kilty (1986) suggests (weakly conducting and magnetic) sulphides as a cause for only one

---

\* Cyprus Minerals is a joint venture partner in E.L. 37/83 and manages the exploration program there.

054



response and this is a possible ('X') anomaly. For the other bedrock conductors, geologic contacts are mostly suggested. Nevertheless, some of these should be followed up. The anomalies to be further investigated are listed in Table 2 and shown in Figure 7 with numbering in order of priority.

The Dighem survey has also produced some detailed aeromagnetic maps with 5nt contouring. There is little response on the eastern side of the syncline, but on the western side, the relatively non-magnetic and little explored acid volcanics can be distinguished from the more basic rocks .

#### MAXMIN

Following the preliminary interpretation of the Dighem results, a number of zones were chosen for follow up. The Maxmin system was used to try and locate the Dighem responses on the ground and it was largely successful. Ten areas were picked and labelled in order of priority (see Figure 2), however a geographical approach was taken for the field program, starting from the northeast corner.

A total of 15 lines were surveyed with Maxmin, which covered prospects 1, 2 & 7. On most lines there was a good correspondence with the interpreted Dighem responses. However all of the Maxmin responses were small amplitude, out-of-phase, local anomalies indicating surficial zones of low resistivity. Most of these lines were also surveyed with a magnetometer and soil sampled. Some high base-metal values were obtained, but since no geophysical target has been defined, these will not be immediately followed up. Some further work; eg. a fixed loop EM survey, giving a deeper penetration, could be carried out if the geology was considered favourable.

#### INDUCED POLARISATION

Geopeko carried out this survey, which covered about 25 sq km of "favourable lithologies" to try and locate a VMS deposit buried to 100m or less from the surface. The results were rather disappointing; no good, well defined responses were obtained away from the graphitic shales. The data was integrated with geochem and geology and by 'over-interpreting', a total of 60 anomalies were defined by Geopeko. Three of these were recommended for drilling of which only one was largely based on the IP: this was at 9400E/11400N. Since this anomaly included some suspect data, the line was resurveyed and no results of interest were recorded by the repeat survey.

---

\* One of the reasons for the overlap between the Sorell and Elliott Bay Dighem surveys, was to allow merging of the magnetic data from these two surveys but so far, this has not been done.



To give an over-view of the results, Geopeko presented the results as 'stacked pseudosections' at 1:10,000 scale. Coloured in, this gives some appreciation of the response levels. However for this report, the data has been averaged as described by Fraser (1981), which makes the data readily amenable to contouring (assuming a factor of 3 for the difference between the two types of IP receivers).

Figure 3 shows a fairly uniform chargeability contour plan. The high values at the northwestern corner are due to black shales at both ends of the lines. The V19 massive sulphides occur in this region, but cause only a gentle widening of the lowest (5msec) contour. The anomalous zone in the centre of the survey (lines 10,000N to 11,000N) is also ascribed to black shales within the Tyndall Group at the southern end of the Mt Osmund syncline. The 5+msec values in the southwest quarter of the survey overlie a granitic intrusion and dacitic lavas and tuffs. This last unit is host to the V24 gold mineralisation, however the chargeabilities may be largely due to black shales in this area (Large, 1985). Certainly the results do not appear to correlate with the V24 mineralisation. However in the southeast quadrant, they do appear to define an interesting elongate feature partially enclosing the V9 prospect.

#### UTEM

No formal interpretation of the UTEM survey was produced by Geopeko. Herrmann and Sumpton (1984) stated that "the results of the survey were on the whole disappointing, with no conductors being detected which are likely to relate to massive sulphide mineralisation".

A detailed interpretation of the UTEM survey has been carried out here. This was deemed necessary since a buried, possibly poor conductor would give only a subtle response. The results are given in Figure 5. The responses were picked independent of the geology and location and apart from the black shales, the most pronounced anomalies do occur in the vicinity of the V19 sulphides. However, since only shallow depths are indicated (30-40m & ~50m, assuming line sources, for responses at 10025E/13200N and 10100E/13400N respectively) and since there were no corresponding anomalies from either of Geopeko's gravity or IP surveys, the sources are unlikely to be massive sulphides.

Pronounced anomalies were also interpreted on the two southernmost lines of the V9 grid, as was pointed out by Herrmann and Sumpton (1984). Again shallow causes were indicated (<30m) and since there were no corresponding IP anomalies, a VMS deposit is an unlikely source. However these two anomalies, at 10975E/7600N and 11600E/7800N, are within a zone of elevated chargeabilities and being coincident with a mapped fault, the area may have potential for a structurally controlled gold deposit. Being on the southernmost lines, the zone is open to the south.



Pronounced anomalies are of course not necessarily those associated with ore deposits. A subtle response, preferably extending out to late times is a more likely target. No responses were picked extending out to late times, but given enough geological encouragement, some of the responses shown in Figure 5 could be recommended for drilling, on the assumption that the source had properties similar to those listed in Table 1.

#### CONCLUSIONS AND RECOMMENDATIONS

The Dighem survey has defined one good anomalous zone, located in an area of possible interest and a number of poor anomalies in areas of definite interest. A list of those anomalies chosen for ground follow up is given in Table 2 in order of priority.

Geopeko's semi-regional IP survey covered an area of alteration around known mineralisation. No VMS targets have been defined from this evaluation of the data, but a resistive zone may extend the V24 gold belt and the V9 chargeability zone may also be of interest for gold. Similarly, no drill targets have been recommended following the integration of the UTEM survey, but several responses lie within the V9 grid and may have structural relevance for gold.

A strong recommendation is made for a compilation of all of Geopeko's geophysical and geochemical data onto a series of 1:25,000 maps. This would permit a proper evaluation of the considerable amount of data gathered by the company and, most importantly, highlight those areas with prospective lithology which have received little attention or which showed early promise, but which were by-passed for apparently more promising areas.

Given the low percentage of outcrop within the licence, it is suggested that a gradient array IP survey may be the best way of rapidly evaluating the large areas of acid volcanics not examined by Geopeko. Whilst little depth penetration would be achieved, the survey should respond to pyritised 'host horizons' and thus considerably reduce the area of prospective ground to be explored. It is also possible that such a survey, in conjunction with a soil geochemistry program, would discover a relatively shallow deposit, such as occurs at V19.

The limited petrophysical measurements of the V19 samples have suggested that resistive bodies with low chargeability may constitute an economic target. Such bodies would be more difficult to find than the expected 'typical' west coast VMS deposit and a quite different exploration approach would be required. It is recommended that further measurements be made of the V19 mineralisation and if the results are confirmed and V19 type bodies are considered to be an attractive target, then some effort should be expended to determine why V19 is different and whether much larger bodies with similar properties are likely to occur.

*JL Bushy*  
Oct., 1986.



## REFERENCES

- Bishop, J.R., 1986. Preliminary interpretation of the Elliott Bay and Muddy Cove Dighem surveys. Appendix 1 in: Jones, P.A., 1986.
- Fraser, D.C., 1981. Contour map presentation of dipole-dipole IP data. Geoph. Pros., 29, 639-651.
- Jones, P.A., 1986. Progress report six months to June 1986; Elliott Bay, E.L. 40/85. Cyprus Minerals report.
- Kilty, S.J., 1986. Dighem survey of the Muddy Cove, Spero River and Elliott Bay areas, Tasmania. Dighem Ltd report for Cyprus Minerals.
- Large, R.R., 1985. Notes on the Voyager 24 gold mineralisation, Elliott Bay.
- Herrmann, W., 1983. E.L. 27/76, Elliott Bay, annual report 1982-83 field season. Geopeko report.
- Herrmann, W. and Sumpton, J., 1984. Elliott Bay, annual report 1983-84 field season. Geopeko report.



Table 1

Petrophysical Measurements

The measurements were made on two hand-sized massive sulphide samples taken from a costean at Voyager 19.

SAMPLE No.	DENSITY t/m <sup>3</sup>	MAGNETIC SUSCEPTIBILITY x 10 <sup>-6</sup> cgs units	CONDUCTIVITY @ 2.5MHz S/m	RESISTIVITY @ 0.1Hz ohm-m	IP EFFECT	
					P.F.E. 0.1-1.0Hz	Phase 0.1Hz
26/1a	4.39	20	negligible	1.9	0	0
26/1b	4.51	20	"	0.8	2	16
26/2a	3.74	20	"	(face 1) 632 (face 2) 805	16 14	104 71
26/2b	3.30	20	"	72	10	37

Measurements were made at the University of Sydney's petrophysical laboratory in July, 1986.

Electrical measurements were made using 4 electrodes on the sample surface.



Table 2

## Summary of Recommendations

(A)

Follow up of Dighem anomalies.  
(listed below in order of priority)

- (1) 20031F-20040F-20050D-20060F-20070D-20080D-20090C.  
20040H & 20050XB.
- (2) 20120B-20130A-20140A-20150B-20160C-20170B-20180C-20192B-  
20200A-20210B-20221C.
- (3) 20140B-20150C-20160D.
- (4) 20180D-20192C.
- (5) 20210D-20221D.
- (6) 20440B-20451XB.
- (7) 20230XD-20240D-20251XD.
- (8) 20390A-20400B-20410A-20421A.
- (9a) 20700A-20710B-20720B-20731B-20740A-20750D.
- (9b) 20800B-20810A-20820B-20830C-20840XD.
- (10) 20810XA-20820XB.
- (11) 20760A-20770B-20780C-20790C.
- (12) 30740C-30750C-30760C-30770C-30770XA-30780E-30790B-30800A-  
30810A-30820D-30830B.
- (13) 30820E-30830C.
- (14) 30900D-30910C-30920C.
- (15) 30910A-30920B-30930A.
- (16) 30540B-30550A-30560B-30570A.
- (17) 30540A.

(B)

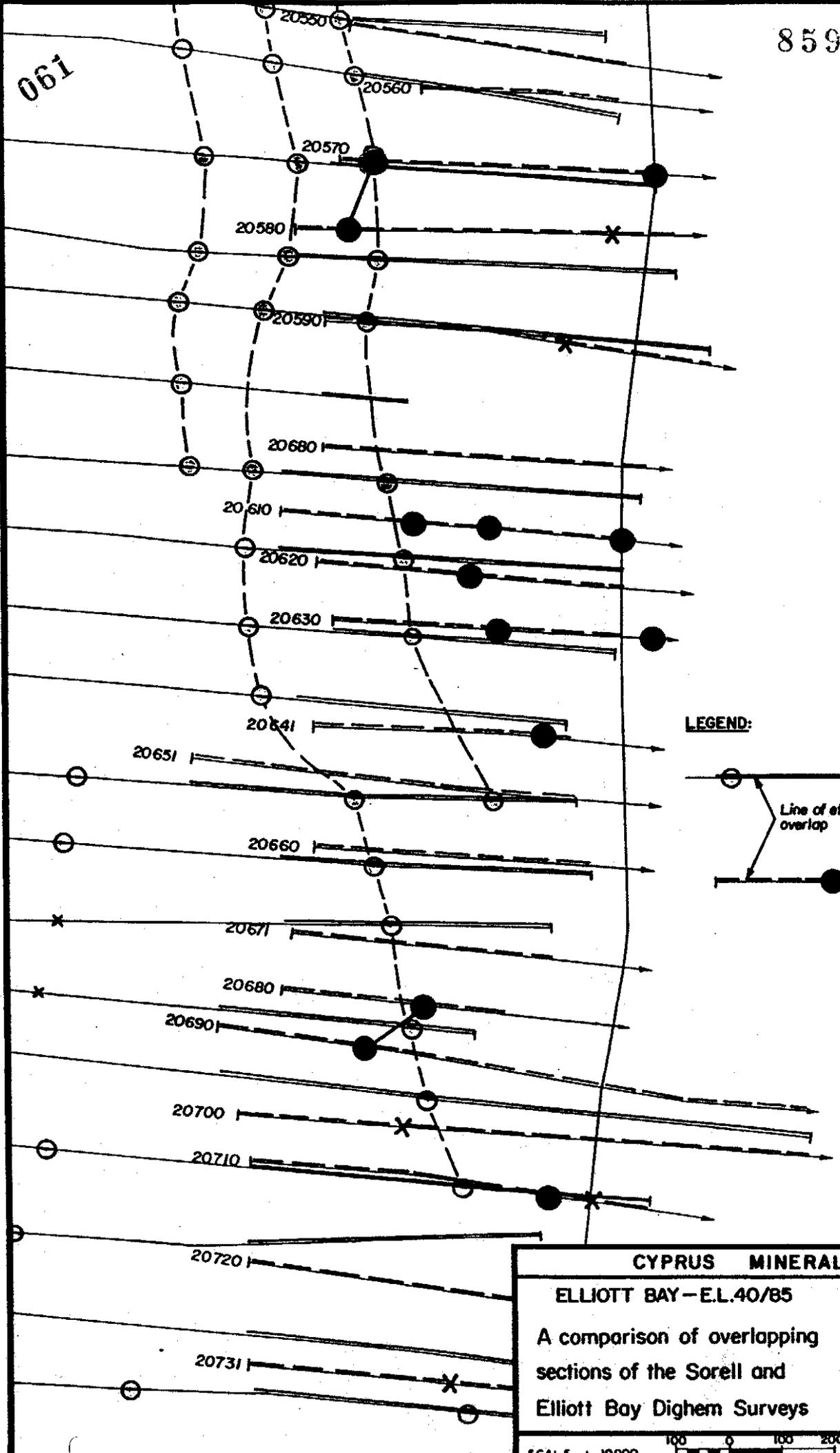
Down-hole EM surveys down any open holes at V19 and possibly at other prospects. The economics of reaming out blocked holes should also be examined.



Summary of Recommendations (continued).

- (C) A compilation of all of Geopeko's geophysical and geochemical data onto 1:25,000 scale maps.
  
- (D) Regional gradient array IP surveys over prospective lithologies not gridded by Geopeko. The exact areas to be determined from (C) above.

061



**LEGEND:**

-  Sorell survey, 1984.
-  Line of effective overlap
-  Elliott Bay survey, 1986.

5 cm

<b>CYPRUS MINERALS</b>	
<b>ELLIOTT BAY - E.L.40/85</b>	
A comparison of overlapping sections of the Sorell and Elliott Bay Dighem Surveys	
DRAWN BY J.B.	DATE Sept 85
DRAFTSMAN T.G.D.S.	REVISIONS
FILE NO	FIG. 6
SCALE 1:10000	
	

062

859063

**APPENDIX 2**

---

**ANALYTICAL RESULT SHEETS**

063

SPERO RIVER

SAMPLE DESCRIPTION

Sample	ROCK DESCRIPTION
202651	Gabbro with carbonate veining
202652	Beach cobble. Rhyolite? fine grained, silicified; minor pyrite
202653	Ultrabasic with quartz calcite stock-working
202659	Ultrabasic pink to grey, carbonate and silica alteration
171966	Magnetite, sulfide vein 4 cm wide in gabbro
171967	Highly sheared, ferruginous, serpentized gabbro in breccia zone
171968	Ferruginous, fractured, fine grained mafic - intermediate volcanoclastic sandstone

064

## SPERO ULTRAMAFICS

## ROCK GEOCHEMISTRY

SAMPLE	Au ppb	Pt ppb	Pd ppb	Ru ppb	Rh ppb	Ir ppb	Os ppb	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm	Cr ppm
202651	46	9.0	6.5	5.5	2.5	0.5	<2	180	10	60	180	30	830
202652	84	2.5	6.0	4.0	1.0	<0.5	<2	50	<10	40	50	10	200
202653	26	3.0	4.0	4.5	1.0	0.5	<2	50	<10	30	100	20	260
202659	18	1.0	3.5	6.5	1.0	1.5	<2	20	<10	20	1200	50	270
171966	24	4.0	22.0	5.5	1.0	<0.5	<2	250	<10	40	290	580	470
171967	16	32.0	3.5	8.0	6.5	1.5	<2	20	<10	50	580	100	2200
171968	18	3.5	2.0	4.0	1.0	<0.5	<2	140	<10	140	160	50	390

065

## SPERO ULTRAMAFICS

## STREAM GEOCHEMISTRY

SAMPLE	TYPE	Au ppb	Pt ppb	Pd ppb	Ru ppb	Rh ppb	Ir ppb	Os ppb	Cu ppm	Pb ppm	Zn ppm	Ni ppm	Co ppm	Cr ppm
202654	-80#	44	0.5	5.5	5.0	1.0	<0.5	<2	10	30	40	80	20	250
202655	pancon	98	5.0	2.0	11	2.0	1.5	<2	10	<10	70	50	20	4700
202656	-80#	34	2.5	13	7.0	2.0	<0.5	<2	30	<10	60	200	30	420
202657	pancon	30	19	12	15	3.0	4.0	4	<10	30	30	40	<10	930
202658	pancon	32	1.0	9.0	5.5	1.0	<0.5	<2	10	<10	10	<10	<10	270
202660	pancon	30	150	12	46	3.0	45	250	20	<10	40	230	50	1000
202661	-80#	20	10	6.5	4.0	1.5	0.5	<2	20	<10	60	190	40	720
202662	-80#	38	4.5	6.0	6.5	1.5	1.0	2	40	20	50	580	60	1000
202663	pancon	24	27	4.0	17	4.5	3.0	2	10	10	120	130	30	6600
171621	pancon	14	3.0	30	5.0	0.5	<0.5	<2	20	<10	20	80	20	260
171622	pancon	30	420	4.5	18	20	52	48	20	20	80	70	30	1200
171623	pancon	28	21	3.5	6.5	5.0	19	2	30	<10	50	120	20	560
171624	pancon	36	1.5	4.5	7.5	1.5	1.0	<2	20	<10	60	80	20	450
171571	-80#	26	3.5	3.5	7.5	1.5	0.5	<2	20	<10	50	100	20	540
171572	-80#	26	1.0	1.5	4.5	1.0	0.5	<2	10	<10	20	60	<10	180
171573	-80#	50	1.0	2.5	4.0	1.0	<0.5	<2	20	<10	40	90	20	600
171575	-80#	24	1.5	3.0	4.0	1.0	<0.5	<2	20	<10	>0	100	20	210

SAMPLE	DESCRIPTION	ASSAY PPM					
		Cu	Pb	Zn	Ag	As	Au
171401	Rhyolitic volcanoclastic, medium grained quartz pyritic	NOT ANALYZED					
171402	Ditto 171401 + sericitic						
171402	Ditto 171401 + chloritized fragments						
171404	Ditto 171401						
171405	Owen Conglomerate white quartzite						
171406	Owen Conglomerate siltstone cream-green						
171407	Rhyolitic volcanoclastic, medium grained, quartz pyritic						
17408	Ditto 171407						
171420	Phyllite pale grey and medium grained, quartz pyritic volcanoclastic, weathered with Mn	NOT ANALYZED					
171421	Phyllite grey with quartz and manganese	105	500	905	0.52	2	<0.005
202992	Rhyolitic volcanic with quartz veining and stockworking	10	5	10	<0.5	3	0.370
202993	Rhyolitic volcanic with quartz veining, minor pyrite	15	45	25	<0.5	10	4.03
202994	Quartz vein 0.5 m wide with dots of galena and pyrite	1400	6.06%	3.65%	25	2	0.05
202995	Quartz limonite vein 20 m from and on strike with 202994 vein	15	610	770	<0.5	8	0.04



068

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

See page 15  
for Sample Descriptions

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		1713061-171319				05. 0787		E 00251		1 OF 26	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuPt	AuPt	
1											
2											
3											
4											
5											
		100	45	75	4.0	150	0.020				
7	171301	5	<5	40	<0.5	3	<0.008	<0.01			
8	171302	<5	<5	<5	<0.5	3	<0.008	<0.01			
9	171303	<5	<5	5	<0.5	2	<0.008	<0.01			
10	171304	<5	<5	25	<0.5	2	<0.008	<0.01			
11	171305	<5	<5	15	<0.5	5	<0.008	<0.01			
12	171306	<5	<5	5	0.5	2	<0.008	<0.01			
13	171307	<5	5	5	<0.5	2	<0.008	<0.01			
14	171308	<5	<5	5	<0.5	2	<0.008	<0.01			
15	171309	5	<5	70	<0.5	2	<0.008	<0.01			
16	171310	5	<5	70	<0.5	4	<0.008	<0.01		<0.01	
17	171311	<5	<5	50	0.5	2	<0.008	<0.01			
18	171312	<5	<5	150	<0.5	3	<0.008	<0.01			
19	171313	<5	<5	125	<0.5	3	<0.008	<0.01			
20	171314	<5	<5	15	0.5	2	<0.008	<0.01			
21	171315	<5	<5	65	<0.5	2	<0.008	<0.01			
22	171316	<5	<5	50	0.5	2	<0.008	<0.01			
23	171317	<5	20	145	<0.5	2	<0.008	<0.01			
24	171318	<5	45	50	<0.5	2	<0.008	<0.01			
25	171319	<5	70	20	<0.5	2	<0.008	<0.01			

069

**ANALABS**

A Division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		7.5.08.04168				03/03/87		E 00251		2 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt	
1	171320	5	260	40	<0.5	2	<0.008	<0.01	-	<0.01	
2	171321	15	140	200	0.5	3	<0.008	<0.01	-	-	
3	171322	30	480	250	0.5	4	<0.008	<0.01	-	-	
4	171323	10	320	95	0.5	3	<0.008	<0.01	-	-	
5	171324	175	980	355	4.5	3	<0.008	0.04	-	-	
	171325	10	90	250	0.5	2	<0.008	<0.01	-	-	
7	171326	105	630	350	1.5	5	<0.008	<0.01	-	-	
8	171327	<5	<5	40	<0.5	2	<0.008	<0.01	-	-	
9	171328	<5	<5	25	<0.5	3	<0.008	<0.01	-	-	
10	171329	<5	20	20	<0.5	2	<0.008	0.14	-	-	
11	171330	5	15	20	<0.5	3	<0.008	<0.01	-	<0.01	
12	171331	15	<5	55	<0.5	2	<0.008	<0.01	-	-	
13	171332	<5	<5	20	<0.5	2	<0.008	<0.01	-	-	
14	171333	5	<5	55	<0.5	2	0.010	<0.01	-	-	
15	171334	<5	<5	35	<0.5	2	<0.008	<0.01	-	-	
16	171335	5	<5	75	<0.5	2	<0.008	<0.01	-	-	
17	171336	15	<5	110	<0.5	4	0.020	<0.01	-	-	
18	171337	<5	<5	30	<0.5	2	<0.008	<0.01	-	-	
19	171338	15	<5	120	<0.5	3	<0.008	<0.01	-	-	
20	171339	<5	<5	25	<0.5	2	0.010	<0.01	<0.008	-	
21	171340	<5	<5	15	<0.5	2	<0.008	<0.01	-	<0.01	
22	171341	<5	<5	60	<0.5	1	0.090	<0.01	-	-	
23	171342	<5	<5	40	0.5	1	<0.008	<0.01	-	-	
24	171343	<5	25	110	0.5	1	<0.008	<0.01	-	-	
25	171344	<5	20	120	0.5	2	<0.008	<0.01	-	-	

Results in ppm unless otherwise specified

T = element present but concentration too low to measure

X = element concentration is below detection limit

- = element not determined

AUTHORISED  
OFFICER*af. L*

070

**ANALABS**

A division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

3 OF 28

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Al	AuRpt	AuRpt
1	171345	<5	25	120	<0.5	1	<0.008	<0.01	-	-
2	171346	<5	20	145	<0.5	2	<0.008	<0.01	-	-
3	171347	<5	<5	30	0.5	1	<0.008	<0.01	-	-
4	171348	<5	<5	45	<0.5	4	<0.008	<0.01	-	-
5	171349	<5	<5	25	<0.5	1	<0.008	<0.01	-	-
	171350	<5	230	45	<0.5	1	0.020	0.03	-	<0.01
7	171351	<5	<5	5	<0.5	1	<0.008	0.02	-	-
8	171352	<5	<5	5	<0.5	1	<0.008	<0.01	-	-
9	171353	5	<5	15	<0.5	1	<0.008	<0.01	-	-
10	171354	<5	<5	<5	<0.5	1	<0.008	<0.01	-	-
11	171355	<5	<5	5	<0.5	1	<0.008	<0.01	-	-
12	171356	5	<5	25	<0.5	1	<0.008	<0.01	-	-
13	171357	30	<5	10	<0.5	1	<0.008	<0.01	-	-
14	171358	<5	<5	10	<0.5	2	<0.008	<0.01	-	-
15	171359	15	<5	25	<0.5	4	<0.008	<0.01	-	-
16	171360	<5	<5	5	<0.5	1	<0.008	<0.01	-	<0.01
17	171361	<5	<5	10	<0.5	1	<0.008	<0.01	-	-
18	171362	<5	<5	5	<0.5	1	<0.008	<0.01	-	-
19	171363	<5	<5	5	<0.5	1	<0.008	<0.01	-	-
20	171364	<5	<5	5	<0.5	2	0.010	<0.01	-	-
21	171365	<5	<5	5	<0.5	1	<0.008	<0.01	-	-
22	171366	<5	<5	10	<0.5	2	<0.008	<0.01	-	-
23	171367	<5	<5	15	<0.5	1	0.030	<0.01	-	-
24	171368	<5	<5	25	<0.5	1	<0.008	<0.01	-	-
25	171369	<5	<5	25	<0.5	1	<0.008	<0.01	-	-

Results in ppm unless otherwise specified

Y = element present; but concentration too low to measure

X = element concentration is below detection limit

- = element not determined

AUTHORISED  
OFFICER*ajf*

071

859072

**ANALABS**

A Division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		7.5.08.04168				03/03/87		E 00251		4 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt	
1	171370	<5	<5	10	0.5	1	<0.008	<0.01	-	<0.01	
2	171371	<5	<5	10	<0.5	1	<0.008	<0.01	-	-	
3	171372	<5	<5	15	0.5	1	0.030	<0.01	-	-	
4	171373	<5	10	45	<0.5	1	<0.008	<0.01	-	-	
5	171374	<5	10	55	<0.5	1	<0.008	<0.01	-	-	
	171375	<5	10	65	<0.5	1	0.020	<0.01	-	-	
7	171376	<5	290	40	<0.5	1	0.010	<0.01	-	-	
8	171377	<5	100	70	<0.5	1	0.040	<0.01	-	-	
9	171378	<5	130	65	<0.5	1	<0.008	<0.01	-	-	
10	171379	<5	<5	20	<0.5	1	<0.008	<0.01	-	-	
11	171380	<5	<5	15	<0.5	1	<0.008	<0.01	-	<0.01	
12	171381	10	50	40	1.0	<1	<0.008	<0.01	-	-	
13	171382	5	25	30	1.0	<1	0.030	<0.01	-	-	
14	171383	5	210	20	0.5	<1	0.030	<0.01	0.030	-	
15	171384	5	10	30	1.0	<1	<0.008	<0.01	-	-	
16	171385	5	<5	15	1.0	<1	<0.008	<0.01	-	-	
17	171386	5	20	80	<0.5	3	<0.008	<0.01	-	-	
18	171387	<5	<5	10	1.0	<1	<0.008	<0.01	-	-	
19	171388	<5	<5	10	<0.5	<1	<0.008	<0.01	-	-	
20	171389	5	<5	10	1.0	<1	<0.008	<0.01	-	-	
21	171390	<5	<5	10	1.0	<1	<0.008	<0.01	-	<0.01	
22	171391	<5	<5	10	0.5	<1	<0.008	<0.01	-	-	
23	171392	5	<5	10	0.5	<1	<0.008	<0.01	-	-	
24											
25											

Results in ppm unless otherwise specified

072

**ANALABS**

A division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.00.04108

03/03/87

E 00251

1 OF 25

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt
1	171487	10	<5	35	1.0	1	0.400	-	-	-
2	171488	<5	20	25	2.0	1	5.490	-	4.950	-
3	171489	<5	10	20	0.5	-	0.210	-	-	-
10	171451	5	30	30	<0.5	4	0.040	-	-	-
11	171452	5	<5	15	0.5	1	<0.008	-	-	-
21	171462	5	60	65	<0.5	2	<0.008	-	-	-
22	171463	10	10	55	<0.5	1	0.380	-	-	-
23	171464	5	35	65	<0.5	2	<0.008	-	-	-
24	171465	10	105	260	<0.5	3	<0.008	-	-	-
25	171486	5	45	105	0.5	2	1.110	-	-	-

13	171499	<5	<5	10	3.5	<1	1.240	-	-	-
14	171500	<5	15	30	2.5	2	2.520	-	3.050	-

073

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

15 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght						
1	[REDACTED]	-	[REDACTED]	[REDACTED]					
2	[REDACTED]	-	-	[REDACTED]					
3	[REDACTED]	-	-	[REDACTED]					
4	171279	-	-	[REDACTED]					
5	171280	-	-	[REDACTED]					
6	[REDACTED]	-	-	[REDACTED]					
7	171301	-	-	[REDACTED]					
8	171302	-	-	[REDACTED]					
9	171303	-	-	[REDACTED]					
10	171304	-	-	Soil Samples					
11	171305	-	-	[REDACTED]					
12	171306	-	-	Line 2					
13	171307	-	-	[REDACTED]					
14	171308	-	-	Wanderer North.					
15	171309	-	-	[REDACTED]					
16	171310	-	-	[REDACTED]					
17	171311	-	-	[REDACTED]					
18	171312	-	-	[REDACTED]					
19	171313	-	-	[REDACTED]					
20	171314	-	-	[REDACTED]					
21	171315	-	-	[REDACTED]					
22	171316	-	-	[REDACTED]					
23	171317	-	-	[REDACTED]					
24	171318	-	-	[REDACTED]					
25	171319	-	-	[REDACTED]					

074

859075

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

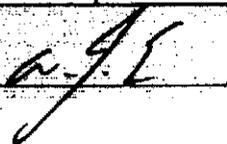
E 00251

16 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght						
1	171320	-	-						
2	171321	-	-						
3	171322	-	-		Soil	Samples			
4	171323	-	-						
5	171324	-	-		Line 2				
	171325	-	-						
7	171326	-	-		Wanderer	North			
8	171327	-	-						
9	171328	-	-						
10	171329	-	-						
11	171330	-	-						
12	171331	-	-						
13	171332	-	-						
14	171333	-	-		Soil	Samples			
15	171334	-	-						
16	171335	-	-		Line 1				
17	171336	-	-						
18	171337	-	-		Wanderer	North			
19	171338	-	-						
20	171339	-	-						
21	171340	-	-						
22	171341	-	-						
23	171342	-	-						
24	171343	-	-						
25	171344	-	-						

Results in ppm unless otherwise specified  
 T = element present but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER



075

859076

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

17 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght						
1	171345	-	-						
2	171346	-	-						
3	171347	-	-						
4	171348	-	-						
5	171349	-	-						
	171350	-	-						
7	171351	-	-						
8	171352	-	-						
9	171353	-	-						
10	171354	-	-						
11	171355	-	-						
12	171356	-	-						
13	171357	-	-						
14	171358	-	-						
15	171359	-	-						
16	171360	-	-						
17	171361	-	-						
18	171362	-	-						
19	171363	-	-						
20	171364	-	-						
21	171365	-	-						
22	171366	-	-						
23	171367	-	-						
24	171368	-	-						
25	171369	-	-						

Soil Samples

Line 1

Wanderer North

Soil Samples

Line 3

Wanderer North

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER *a.j.e.*

076

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

18 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght							
1	171370	-	-							
2	171371	-	-							
3	171372	-	-							
4	171373	-	-							
5	171374	-	-							
6	171375	-	-			Soil	Samples			
7	171376	-	-			Line	3			
8	171377	-	-							
9	171378	-	-			Wanderer	North.			
10	171379	-	-							
11	171380	-	-							
12	171381	-	-							
13	171382	-	-							
14	171383	-	-							
15	171384	-	-							
16	171385	-	-							
17	171386	-	-							
18	171387	-	-							
19	171388	-	-							
20	171389	-	-							
21	171390	-	-							
22	171391	-	-							
23	171392	-	-							
24	<del>171393</del>	-	-							
25	<del>171394</del>	-	-							

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

859078

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

077

7.5.08.04168

03/03/87

E 00251

70 of 100

TUBE No.	SAMPLE No.	AuChk	Wght						
1	171487		45.1						
2	171488		56.2						
3	171489		63.6						
10			298.1						
11			504.8						
21	171462	-	307.2						
22	171463	-	180.9						
23	171464	-	232.8						
24	171465	-	288.6						
25	171486	-	54.0						
15	171499		4.5						
14	171500		41.6						

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER

*a.g.l.*

078

# CAPE SORELL

ANALYSIS

**RECEIVED**

ANALYTICAL REPORT No. 7.5.08.04189

7.5.08.04189

ORDER No. PROJECT

B. Roxburgh  
Cyprus Minerals  
P.O. Box 493  
North Sydney  
N.S.W. 2060

E 00252 D/N 4820,1,2

DATE RECEIVED 30/01/87 RESULTS REQUIRED ASAP

30/01/87 ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
16	05/03/87	1	181

STATE OF SAMPLES	SAMPLE NUMBER	PRE-TREATMENT							ANALYSIS			
		DRY	CRUSH	SPLIT	PULVERISE	SEIVE	OTHER SEE REMARKS	TYPE TO ANALYSIS SECTION	PREPARATION	METHOD		
Various	17128	RC	Prep: 004,017							Cu,Pb,Zn,Ag/101,As/114		
Various		RC								Au/313		
Various		SO	Prep: 005,018							Cu,Pb,Zn,Ag/101,As/114		
Various		SO								Au,AuRpt/329		
Various		PC	Prep: 006,018							Cu,Pb,Zn,Ag/101,As/114		

171432  
RESULTS TO

B. Roxburgh  
Cyprus Minerals  
P.O. Box 493  
North Sydney  
N.S.W. 2060

RESULTS TO

C. Torrey  
Cyprus Minerals  
P.O. Box 230  
Zeehan  
Tasmania 7469

REMARKS

079

7.5.09.04189

05/03/87

E 00252

1 of 16

16										
17										
18										
19										
20										
21										
22										
23										

1	171470	<5	<5	-	20	0.5	-	<1	<0.008	-
2	171471	<5	<5	-	25	0.5	-	<1	<0.008	-
11	171421	105	500	-	905	0.5	-	2	-	<0.005
21	171480	5	<5	-	790	0.5	-	5	3.920	-
22	171481	10	<5	-	1650	0.5	-	8	0.390	-
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	25	5	0.5	2	1	0.008	0.005
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
25	METHOD	101	101	104	101	101	104	114	309	313

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER

*[Signature]*

859080

# ANALYTICAL DATA

REPORT DATE: 05/03/87 CLIENT ORDER: E 00252

080

7.5.08.04189

05/03/87

E 00252

16 of 16

1	171470	-	-90 #	Stream Sediment	Samples				
2	171471	-		Wanderer North					
11	171421	-	Rock chip	Wanderer North					
21	171480	-	Fanned	Concentrate	Wanderer North				
22	171481	-							

10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	0.00B							
24	UNITS	PPM							
25	METHOD	309							

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER *[Signature]*

AUTHORISED OFFICER *[Signature]*

859081

081

859082

# CAPE SORELL ANALABS

See

Phone (09) 458 7999

A division of MacDonalld Hamilton & Co. Pty. Ltd.  
52 Murray Road, Welshpool, W.A. 6106  
TEL: HH 57224

Telex AA92560

ANALYTICAL REPORT No. 15,08,04168

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

**RECEIVED**

- 9 MAR 1987

Roxburgh  
Cyprus Minerals  
P.O. Box 495  
North Sydney  
N.S.W. 2060

ORDER No. PROJECT

E 00251 DN 4817, S. 9

DATE RECEIVED RESULTS REQUIRED

24/01/87

No. OF PAGES OF RESULTS

DATE REPORTED

No. OF COPIES

TOTAL No. OF SAMPLES

26

17/02/87

1

528

STATE OF SAMPLES BELOW	SAMPLE NUMBERS	PRE-TREATMENT							ANALYSIS			
		DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD	
	Various	RC	Prep: 005	017						Cu, Pb, Zn, Ag/101, As/14		
	Various	RC								As/14		
	Various	RC								Mo/101		
	171451/65, 171351/65	RC	Prep: 006	9507, 413, 007						Cu, Cu+, Pb, Pot+, Zn, Zn+, Ag, Ag+/101, As, As+/14, Wght		
	171451/65, 171351/65	RC								Hu, Au, AuR, AuA+/129		

RESULTS

TO

B. Roxburgh  
Cyprus Minerals  
P.O. Box 495  
North Sydney  
N.S.W. 2060

RESULTS

TO

C. Torrey  
Cyprus Minerals  
P.O. Box 230  
Zeelan  
Tasmania 7469

REMARKS

STATE OF SAMPLES	ANALYSIS - PREPARATION	ANALYSIS - METHOD
WA	pressed powder (XRF)	AAS
TI	fusion	XRF
SS		ICP
HM		ICP

082

859083

**ANALABS**

A division of MacDonal Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**See page 15  
for sample Descriptions

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE	CLIENT ORDER No.		PAGE	
		171067-04126				05/12/87	E 00251		1 OF 25	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt
1										
2										
3										
4										
5										
		1100	45	45	4.0	150	0.020			
7	171301	5	<5	40	<0.5	3	<0.008	<0.01		
8	171302	<5	<5	<5	<0.5	3	<0.008	<0.01		
9	171303	<5	<5	5	<0.5	2	<0.008	<0.01		
10	171304	<5	<5	25	<0.5	2	<0.008	<0.01		
11	171305	<5	<5	10	<0.5	5	<0.008	<0.01		
12	171306	<5	<5	5	<0.5	2	<0.008	<0.01		
13	171307	<5	<5	5	<0.5	2	<0.008	<0.01		
14	171308	<5	<5	5	<0.5	2	<0.008	<0.01		
15	171309	<5	<5	70	<0.5	2	<0.008	<0.01		
16	171310	5	<5	70	<0.5	4	<0.008	<0.01		<0.01
17	171311	<5	<5	30	0.5	2	<0.008	<0.01		
18	171312	<5	<5	150	<0.5	3	<0.008	<0.01		
19	171313	<5	<5	125	<0.5	3	<0.008	<0.01		
20	171314	<5	<5	15	0.5	2	<0.008	<0.01		
21	171315	<5	<5	65	<0.5	2	<0.008	<0.01		
22	171316	<5	<5	50	0.5	2	<0.008	<0.01		
23	171317	<5	20	145	<0.5	2	<0.008	<0.01		
24	171318	<5	45	50	<0.5	2	<0.008	<0.01		
25	171319	<5	70	20	<0.5	2	<0.008	<0.01		

Results in ppm unless otherwise specified.

083

**ANALABS**

A division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		7.5.08.04168				03/03/87		E 00251		2 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt	
1	171320	5	260	40	<0.5	2	<0.008	<0.01	-	<0.01	
2	171321	15	140	200	0.5	3	<0.008	<0.01	-	-	
3	171322	30	480	250	0.5	4	<0.008	<0.01	-	-	
4	171323	10	320	95	0.5	3	<0.008	<0.01	-	-	
5	171324	175	980	355	4.5	3	<0.008	0.04	-	-	
	171325	10	90	250	0.5	2	<0.008	<0.01	-	-	
7	171326	105	630	350	1.5	5	<0.008	<0.01	-	-	
8	171327	<5	<5	40	<0.5	2	<0.008	<0.01	-	-	
9	171328	<5	<5	25	<0.5	3	<0.008	<0.01	-	-	
10	171329	<5	20	20	<0.5	2	<0.008	0.14	-	-	
11	171330	5	15	20	<0.5	3	<0.008	<0.01	-	<0.01	
12	171331	15	<5	55	<0.5	2	<0.008	<0.01	-	-	
13	171332	<5	<5	20	<0.5	2	<0.008	<0.01	-	-	
14	171333	5	<5	55	<0.5	2	0.010	<0.01	-	-	
15	171334	<5	<5	35	<0.5	2	<0.008	<0.01	-	-	
16	171335	5	<5	75	<0.5	2	<0.008	<0.01	-	-	
17	171336	15	<5	110	<0.5	4	0.020	<0.01	-	-	
18	171337	<5	<5	30	<0.5	2	<0.008	<0.01	-	-	
19	171338	15	<5	120	<0.5	3	<0.008	<0.01	-	-	
20	171339	<5	<5	25	<0.5	2	0.010	<0.01	<0.008	-	
21	171340	<5	<5	15	<0.5	2	<0.008	<0.01	-	<0.01	
22	171341	<5	<5	60	<0.5	1	0.090	<0.01	-	-	
23	171342	<5	<5	40	0.5	1	<0.008	<0.01	-	-	
24	171343	<5	25	110	0.5	1	<0.008	<0.01	-	-	
25	171344	<5	20	120	0.5	2	<0.008	<0.01	-	-	

Results in ppm unless otherwise specified

T = element present, but concentration too low to measure

X = element concentration is below detection limit

- = element not determined

AUTHORISED  
OFFICER*a.j.l.*

084

**ANALABS**

A division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		7.5.08.04168				03/03/87		E 00251		3 of 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt	
1	171345	<5	25	120	<0.5	1	<0.008	<0.01	-	-	
2	171346	<5	20	145	<0.5	2	<0.008	<0.01	-	-	
3	171347	<5	<5	30	0.5	1	<0.008	<0.01	-	-	
4	171348	<5	<5	45	<0.5	4	<0.008	<0.01	-	-	
5	171349	<5	<5	25	<0.5	1	<0.008	<0.01	-	-	
	171350	<5	230	45	<0.5	1	0.020	0.03	-	<0.01	
7	171351	<5	<5	5	<0.5	1	<0.008	0.02	-	-	
8	171352	<5	<5	5	<0.5	1	<0.008	<0.01	-	-	
9	171353	5	<5	15	<0.5	1	<0.008	<0.01	-	-	
10	171354	<5	<5	<5	<0.5	1	<0.008	<0.01	-	-	
11	171355	<5	<5	5	<0.5	1	<0.008	<0.01	-	-	
12	171356	5	<5	25	<0.5	1	<0.008	<0.01	-	-	
13	171357	30	<5	10	<0.5	1	<0.008	<0.01	-	-	
14	171358	<5	<5	10	<0.5	2	<0.008	<0.01	-	-	
15	171359	15	<5	25	<0.5	4	<0.008	<0.01	-	-	
16	171360	<5	<5	5	<0.5	1	<0.008	<0.01	-	<0.01	
17	171361	<5	<5	10	<0.5	1	<0.008	<0.01	-	-	
18	171362	<5	<5	5	<0.5	1	<0.008	<0.01	-	-	
19	171363	<5	<5	5	<0.5	1	<0.008	<0.01	-	-	
20	171364	<5	<5	5	<0.5	2	0.010	<0.01	-	-	
21	171365	<5	<5	5	<0.5	1	<0.008	<0.01	-	-	
22	171366	<5	<5	10	<0.5	2	<0.008	<0.01	-	-	
23	171367	<5	<5	15	<0.5	1	0.030	<0.01	-	-	
24	171368	<5	<5	25	<0.5	1	<0.008	<0.01	-	-	
25	171369	<5	<5	25	<0.5	1	<0.008	<0.01	-	-	

Results in ppm unless otherwise specified

Y = element present; but concentration too low to measure

X = element concentration is below detection limit

- = element not determined

AUTHORISED  
OFFICER*a.j.v.*

085

**ANALABS**

A Division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

4 OF 28

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt
1	171370	<5	<5	10	0.5	1	<0.008	<0.01	-	<0.01
2	171371	<5	<5	10	<0.5	1	<0.008	<0.01	-	-
3	171372	<5	<5	15	0.5	1	0.030	<0.01	-	-
4	171373	<5	10	45	<0.5	1	<0.008	<0.01	-	-
5	171374	<5	10	55	<0.5	1	<0.008	<0.01	-	-
	171375	<5	10	65	<0.5	1	0.020	<0.01	-	-
7	171376	<5	290	40	<0.5	1	0.010	<0.01	-	-
8	171377	<5	100	70	<0.5	1	0.040	<0.01	-	-
9	171378	<5	130	65	<0.5	1	<0.008	<0.01	-	-
10	171379	<5	<5	20	<0.5	1	<0.008	<0.01	-	-
11	171380	<5	<5	15	<0.5	1	<0.008	<0.01	-	<0.01
12	171381	10	50	40	1.0	<1	<0.008	<0.01	-	-
13	171382	5	25	30	1.0	<1	0.030	<0.01	-	-
14	171383	5	210	20	0.5	<1	0.030	<0.01	0.030	-
15	171384	5	10	30	1.0	<1	<0.008	<0.01	-	-
16	171385	5	<5	15	1.0	<1	<0.008	<0.01	-	-
17	171386	5	20	80	<0.5	3	<0.008	<0.01	-	-
18	171387	<5	<5	10	1.0	<1	<0.008	<0.01	-	-
19	171388	<5	<5	10	<0.5	<1	<0.008	<0.01	-	-
20	171389	5	<5	10	1.0	<1	<0.008	<0.01	-	-
21	171390	<5	<5	10	1.0	<1	<0.008	<0.01	-	<0.01
22	171391	<5	<5	10	0.5	<1	<0.008	<0.01	-	-
23	171392	5	<5	10	0.5	<1	<0.008	<0.01	-	-
24									-	-
25									-	-

Results in ppm unless otherwise specified

086

**ANALABS**

A division of MacDonald Hamilton &amp; Co. Pty. Ltd.

**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04100

03/03/87

E 00251

6 OF 25

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Au	Au	AuRpt	AuRpt
1	171487	10	<5	35	1.0	1	0.400	-	-	-
2	171488	<5	20	25	2.0	1	5.490	-	4.950	-
3	171489	<5	10	20	0.9	-	0.210	-	-	-
10	171451	5	30	30	<0.5	4	0.040	-	-	-
11	171452	5	<5	15	0.5	1	<0.008	-	-	-
21	171462	5	60	65	<0.5	2	<0.008	-	-	-
22	171463	10	10	55	<0.5	1	0.380	-	-	-
23	171464	5	35	65	<0.5	2	<0.008	-	-	-
24	171465	10	105	260	<0.5	3	<0.008	-	-	-
25	171486	5	45	105	0.5	2	1.110	-	-	-

13	171499	<5	<5	10	3.5	<1	1.240	-	-	-
14	171500	<5	15	30	2.5	2	2.520	-	3.050	-



088

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

859089

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

16 of 28

TUBE No.	SAMPLE No.	AuChk	Wght						
1	171320	-	-						
2	171321	-	-						
3	171322	-	-		Soil	Samples			
4	171323	-	-						
5	171324	-	-		Line	2			
	171325	-	-						
7	171326	-	-		Wanderer	North			
8	171327	-	-						
9	171328	-	-						
10	171329	-	-						
11	171330	-	-						
12	171331	-	-						
13	171332	-	-						
14	171333	-	-		Soil	Samples			
15	171334	-	-						
16	171335	-	-		Line	1			
17	171336	-	-						
18	171337	-	-		Wanderer	North			
19	171338	-	-						
20	171339	-	-						
21	171340	-	-						
22	171341	-	-						
23	171342	-	-						
24	171343	-	-						
25	171344	-	-						

Results in ppm unless otherwise specified  
 † = element present, but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER

089

# ANALABS

A division of MacDonold Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

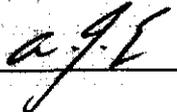
E 00251

17 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght						
1	171345	-	-						
2	171346	-	-						
3	171347	-	-						
4	171348	-	-						
5	171349	-	-						
	171350	-	-						
7	171351	-	-			Soil Samples			
8	171352	-	-			Line 1			
9	171353	-	-						
10	171354	-	-			Wanderer North			
11	171355	-	-						
12	171356	-	-						
13	171357	-	-						
14	171358	-	-						
15	171359	-	-						
16	171360	-	-						
17	171361	-	-						
18	171362	-	-						
19	171363	-	-						
20	171364	-	-						
21	171365	-	-			Soil Samples			
22	171366	-	-						
23	171367	-	-			Line 3			
24	171368	-	-						
25	171369	-	-			Wanderer North			

Results in ppm unless otherwise specified  
 T = element present, but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER



090

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

7.5.08.04168

03/03/87

E 00251

18 OF 28

TUBE No.	SAMPLE No.	AuChk	Wght							
1	171370	-	-							
2	171371	-	-							
3	171372	-	-							
4	171373	-	-							
5	171374	-	-							
6	171375	-	-							
7	171376	-	-							
8	171377	-	-							
9	171378	-	-							
10	171379	-	-							
11	171380	-	-							
12	171381	-	-							
13	171382	-	-							
14	171383	-	-							
15	171384	-	-							
16	171385	-	-							
17	171386	-	-							
18	171387	-	-							
19	171388	-	-							
20	171389	-	-							
21	171390	-	-							
22	171391	-	-							
23	171392	-	-							
24	[REDACTED]	-	-							
25	[REDACTED]	-	-							

Soil Samples

Line 3

Wanderer North.

# ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

859092

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

SAMPLE PREFIX		REPORT NUMBER		REPORT DATE	CLIENT ORDER No.	PAGE	
		7.5.08.04166		03/05/87	E 00251	20 OF 26	
TUBE No.	SAMPLE No.	AuChk	Wght				
1	171487		45.1	Panned Concentrates			
2	171488		56.2	Wanderer North			
3	171489		63.6				
10			298.1	-80# Stream Sediment			
11			504.8	Wanderer North.			
21	171462	-	307.2	-80# Stream Sediment.			
22	171463	-	180.9				
23	171464	-	232.8	Wanderer North.			
24	171465	-	288.6				
25	171486	-	54.0	Panned Concentrate Wanderer North			
13	171499		41.5	Panned Concentrates			
14	171500		41.6	Wanderer North.			

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER

*a.g.l.*

092

# CAPE SORELL

ANALYSIS

ANALYTICAL REPORT No. 7.5.08.04189

**RECEIVED**

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

7.5.08.04189

ORDER No.

PAGE 14

1	17128	B. Roxburgh Cyprus Minerals P.O. Box 493 North Sydney N.S.W. 2060	E 00252	D/N 4820,1,2
2	17128		DATE RECEIVED	RESULTS REQUIRED
3	17128		30/01/87	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES	0.675
16	05/03/87	1	181	0.300

STATE OF SAMPLE	SAMPLE NUMBER	PRE-TREATMENT						ANALYSIS		
		DRY	CRUSH	SPLIT	PULV	SEIVE	OTHER SEE REMARKS	ANALYSIS SECTION	PREPARATION	REMARKS
	17128									
	Various	RC	Prep: 006,017							Cu,Pb,Zn,Ag/101,As/114
	Various	RC								Au/313
	Various	SD	Prep: 005,018							Cu,Pb,Zn,Ag/101,As/114
	Various	SD								Au,AuRpt/329
	Various	PC	Prep: 006,018							Cu,Pb,Zn,Ag/101,As/114

15	171433	B. Roxburgh Cyprus Minerals P.O. Box 493 North Sydney N.S.W. 2060
16	171433	
17	171433	
18	171433	C. Torrey Cyprus Minerals P.O. Box 230 Zeehan Tasmania 7469
19	171433	
20	171433	

REMARKS



093

7.5.08.04189

05/03/87

E 00252

1 of 16

16										
17										
18										
19										
20										
21										
22										
23										

1	171470	<5	<5	-	20	0.5	-	<1	<0.008	-
2	171471	<5	<5	-	25	0.5	-	<1	<0.008	-
11	171421	105	500	-	905	0.5	-	2	-	<0.005
21	171480	5	<5	-	790	0.5	-	5	3.920	-
22	171481	10	<5	-	1650	0.5	-	8	0.390	-
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	25	5	0.5	2	1	0.008	0.005
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
25	METHOD	101	101	104	101	101	104	114	309	313

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER 

859094

# ANALYTICAL DATA

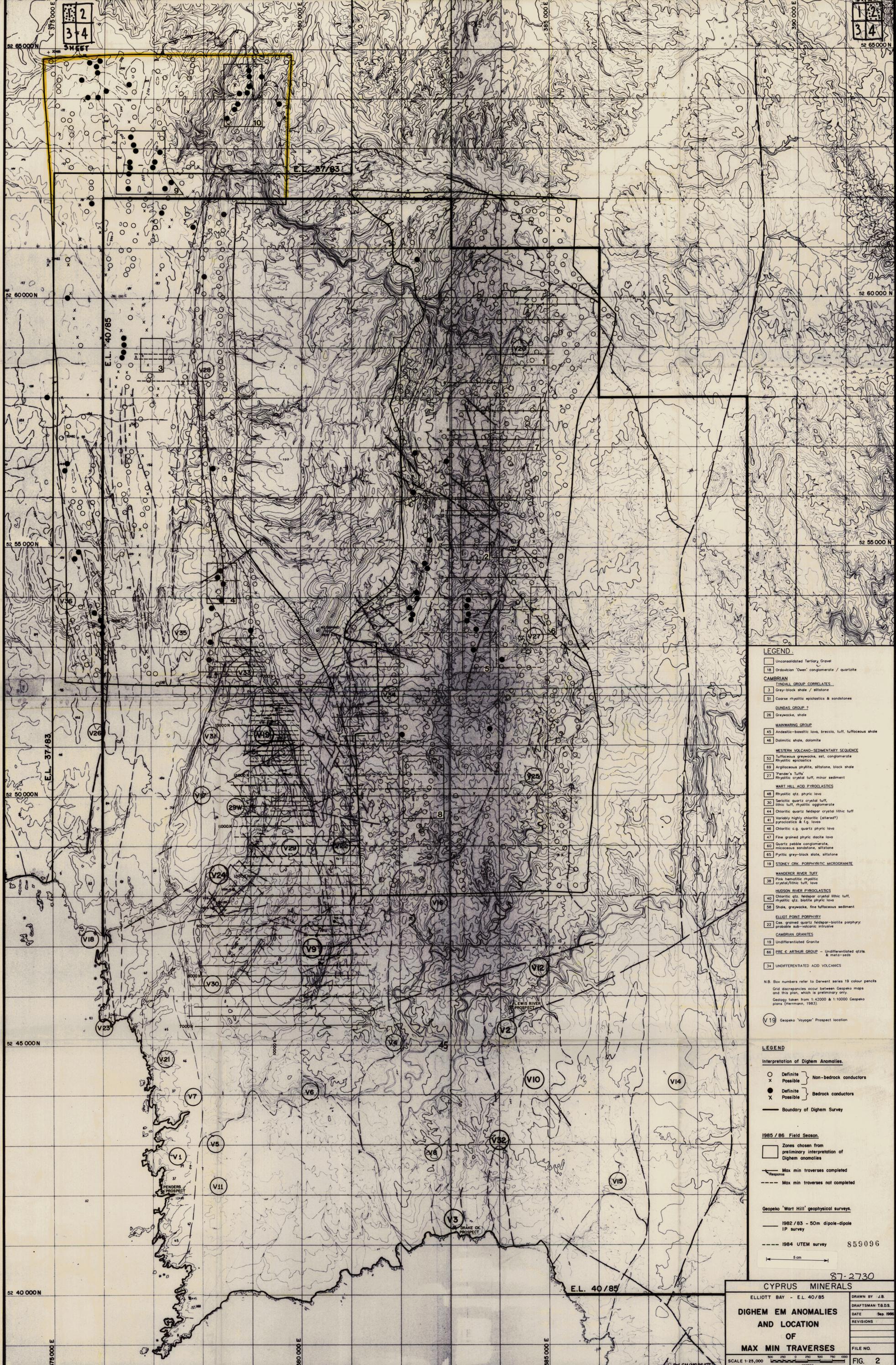
	99A	7.5.08.04189	05/03/87	E. 00252	16 of 16
1	171470	-	-90 #	Stream Sediment	Samples
2	171471	-	Wanderer North		
11	171421	-	Rock Chip	Wanderer North	
21	171480	-	Panned Concentrate	Wanderer North	
22	171481	-			

10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	0.008							
24	UNITS	PPM							
25	METHOD	309							

Results in ppm unless otherwise specified  
 T = element present; but concentration too low to measure  
 X = element concentration is below detection limit  
 - = element not determined

AUTHORISED OFFICER *a.j.l.*

AUTHORISED OFFICER *[Signature]*



- LEGEND**
- Unconsolidated Tertiary Gravel
  - 18 Ordovician "Owen" conglomerate / quartzite
- CAMBRIAN**
- 3 TINDALL GROUP CORRELATES
    - 3 Grey-black shale / siltstone
    - 51 Coarse rhyolitic epiclastics & sandstones
  - QUINDAS GROUP ?
    - 26 Greywacke, shale
  - MAINWARING GROUP
    - 45 Andesitic-basaltic lava, breccia, tuff, tuffaceous shale
    - 46 Dolomitic shale, dolomite
- WESTERN VOLCANO-SEDIMENTARY SEQUENCE**
- 52 Tuffaceous greywacke, sst, conglomerate
  - Rhyolitic epiclastics
  - 69 Argillaceous phyllite, siltstone, black shale
  - 27 Pender's Tuffs
    - Rhyolitic crystal tuff, minor sediment
- WART HILL ACID PYROCLASTICS**
- 48 Rhyolitic qtz. phryic lava
  - 30 Sericitic quartz crystal tuff, lithic tuff, rhyolitic agglomerate
  - 44 Chloritic quartz feldspar crystal lithic tuff
  - 41 Variably highly chloritic (altere?) pyroclastics & t.g. lava
  - 46 Chloritic c.g. quartz phryic lava
  - 47 Fine grained phryic dacite lava
  - 60 Quartz sabbie conglomerate, micaceous sandstone, siltstone
  - 65 Pyritic grey-black slate, siltstone
- 19 STONEY CREEK PORPHYRY MICROGRANITE
- WANDERER RIVER TUFF**
- 38 Pink hematitic rhyolitic crystal/lithic tuff, lava
- HUDSON RIVER PYROCLASTICS**
- 40 Chloritic qtz. feldspar crystal lithic tuff, rhyolitic qtz. biotite phryic lava
  - 58 Shale, greywacke, fine tuffaceous sediment
- ELLIOT POINT PORPHYRY**
- 22 Cas. grained quartz feldspar-biotite porphyry, probable sub-volcanic intrusive
- CAMBRIAN GRANITES**
- 19 Undifferentiated Granite
  - 66 PRE-C ARTHUR GROUP - Undifferentiated qtzite & meta-seals
  - 34 UNDIFFERENTIATED ACID VOLCANICS
- N.B. Box numbers refer to Derwent series 19 colour pencils  
Grid discrepancies occur between Geopako maps and this plan, which is preliminary only.  
Geology taken from 1:42000 & 1:10000 Geopako plans (Hermann, 1983).

- LEGEND**
- Interpretation of Dighem Anomalies.**
- Definite } Non-bedrock conductors
  - x Possible } Non-bedrock conductors
  - Definite } Bedrock conductors
  - x Possible } Bedrock conductors
- Boundary of Dighem Survey
- 1985 / 86 Field Season.**
- Zones chosen from preliminary interpretation of Dighem anomalies
  - Max min traverses completed
  - - - Max min traverses not completed
- Geopako 'Wart Hill' geophysical surveys.**
- 1982 / 83 - 50m dipole-dipole IP survey
  - - - 1984 UTEM survey
- 859096
- 5 cm

87-2730

**CYPRUS MINERALS**

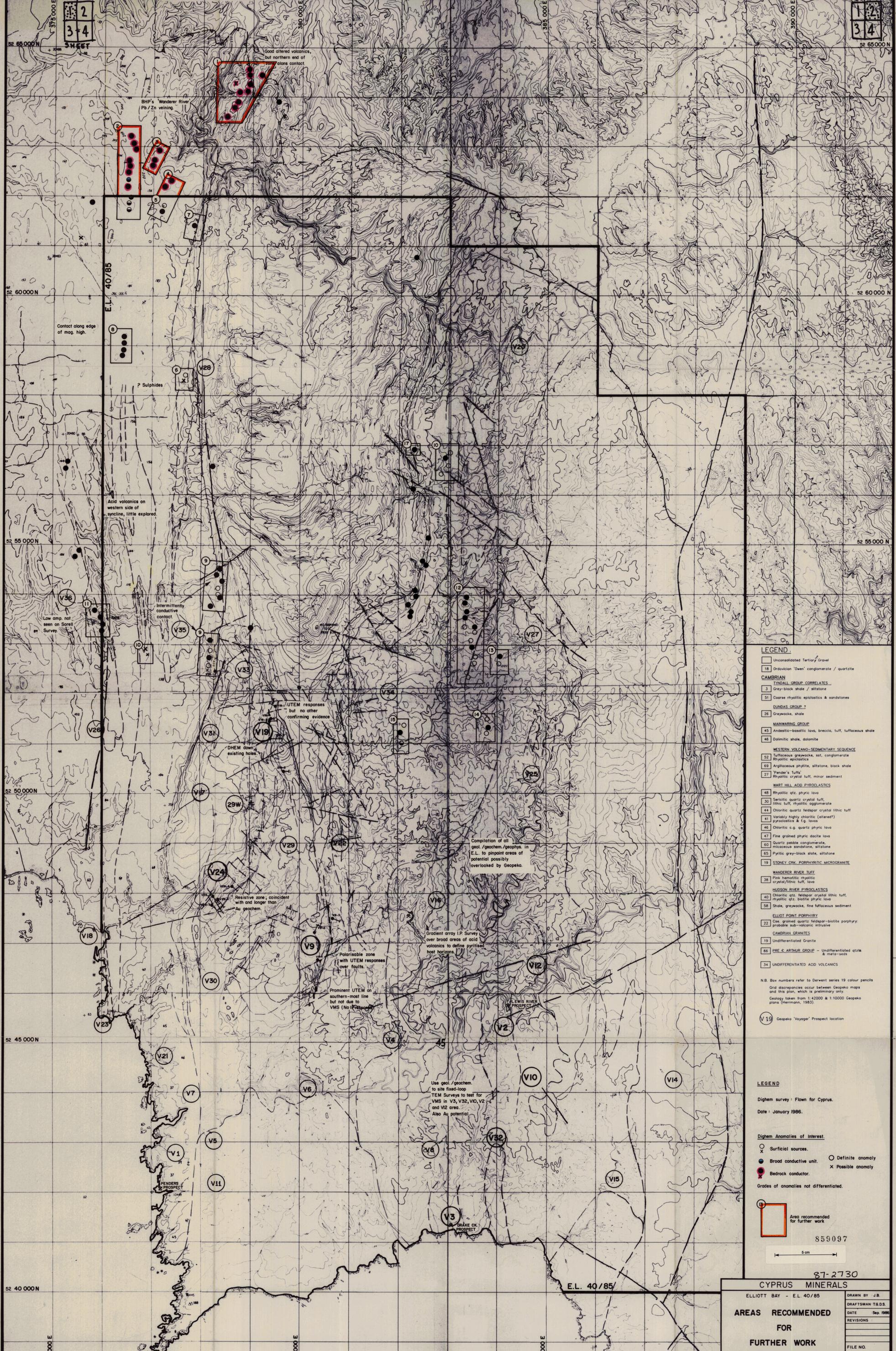
ELLIOTT BAY - E.L. 40/85

**DIGHEM EM ANOMALIES AND LOCATION OF MAX MIN TRAVERSES**

SCALE 1:25,000

METRES

DRAWN BY J.B.  
DRAFTSMAN T.B.S.  
DATE Sep. 1986  
REVISIONS  
FILE NO.  
FIG. 2



- LEGEND**
- Unconsolidated Tertiary Gravel
  - 18 Devonian "Dew" conglomerate / quartzite
  - CAMBRIAN**
  - 3 Grey-black shale / siltstone
  - 51 Coarse rhyolitic epiclastics & sandstones
  - DUNDAS GROUP ?**
  - 26 Greywacke, shale
  - MAINWARRING GROUP**
  - 45 Andesitic-basaltic lava, breccia, tuff, tuffaceous shale
  - 46 Dolomitic shale, dolomite
  - WESTERN VOLCANIC-SEDIMENTARY SEQUENCE**
  - 52 Tuffaceous greywacke, sst, conglomerate
  - Rhyolitic epiclastics
  - 69 Argillaceous phyllite, siltstone, black shale
  - 27 Fender's Tuff, Rhyolitic crystal tuff, minor sediment
  - WART HILL ACID PYROCLASTICS**
  - 48 Rhyolitic Qtz. phytic lava
  - 30 Sericitic quartz crystal tuff, lithic tuff, rhyolitic agglomerate
  - 44 Chloritic quartz feldspar crystal lithic tuff
  - 41 Variably highly chloritic (altered?) pyroclastics & lg. lava
  - 46 Chloritic c.g. quartz phytic lava
  - 47 Fine grained phytic dacite lava
  - 60 Quartz pebble conglomerate, micaceous sandstone, siltstone
  - 65 Pyritic grey-black slate, siltstone
  - 19 **STONEY CREEK PORPHYRY MICROGRANITE**
  - WANDERER RIVER TUFF**
  - 38 Pink hematitic rhyolitic crystal/lithic tuff, lava
  - Hudson River Pyroclastics**
  - 40 Chloritic Qtz. feldspar crystal lithic tuff, rhyolitic Qtz. biotite phytic lava
  - 58 Shale, greywacke, fine tuffaceous sediment
  - ELLIOT POINT PORPHYRY**
  - 22 Coe. grained quartz feldspar-biotite porphyry, probable sub-volcanic intrusion
  - CAMBRIAN GRANITES**
  - 19 Undifferentiated Granite
  - 66 **PBE & ARTHUR GROUP** - Undifferentiated Qtz & meta-sands
  - 34 **UNDIFFERENTIATED ACID VOLCANICS**
- N.B. Box numbers refer to Derwent series 19 colour pencils  
Grid discrepancies occur between Geopeko maps and this plan, which is preliminary only.  
Geology taken from 1:25000 & 1:10000 Geopeko plans (Hermann, 1983).
- 19 Geopeko "Voyager" Prospect location

- LEGEND**
- Diphen survey: Flown for Cyprus.  
Date: January 1986.
- Diphen Anomalies of Interest.**
- Surficial sources.
  - Broad conductive unit.
  - Definite anomaly
  - Bedrock conductor.
  - × Possible anomaly
- Grades of anomalies not differentiated.
- 8 Area recommended for further work
- 859097
- 5 cm

87-2730  
CYPRUS MINERALS  
ELLIOTT BAY - E.L. 40/85

**AREAS RECOMMENDED FOR FURTHER WORK**

SCALE 1:25,000

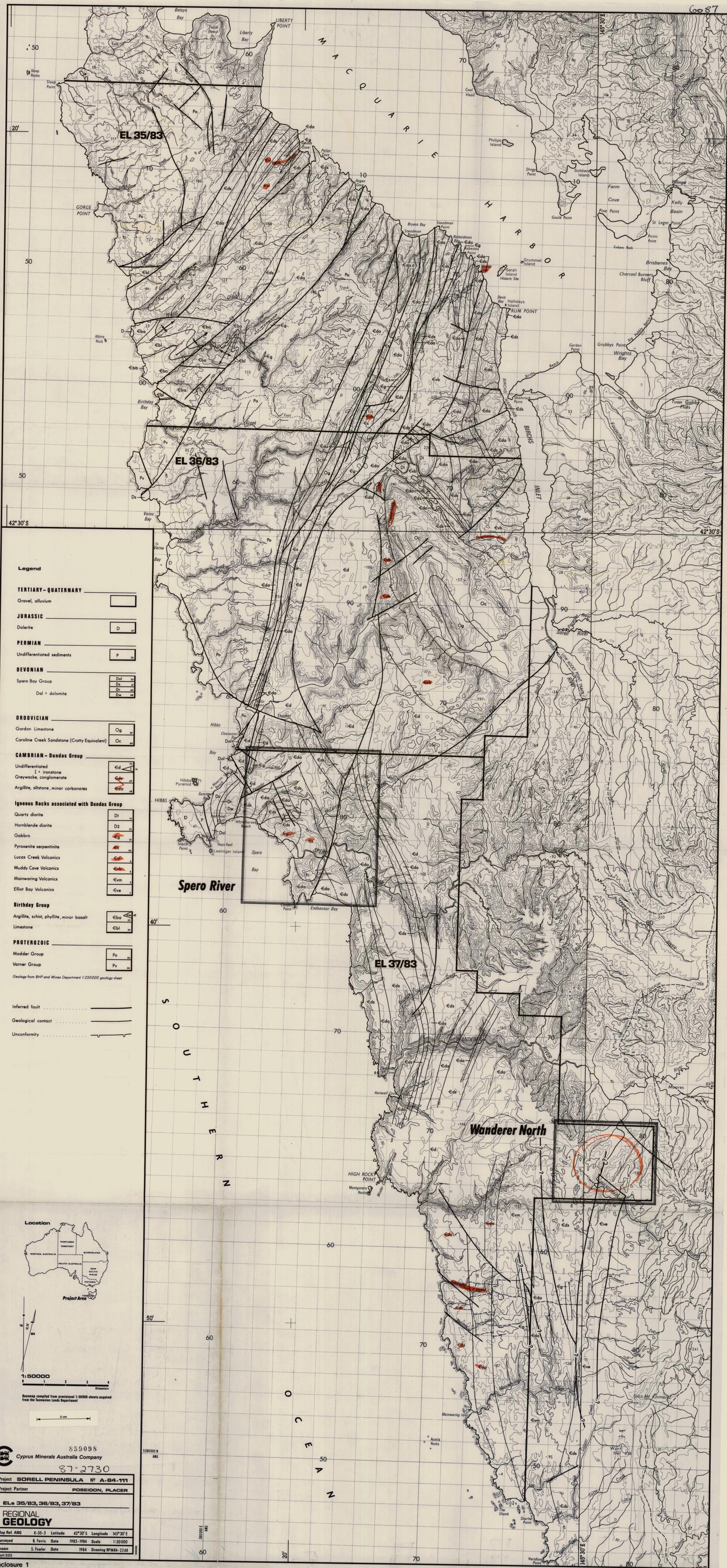
0 250 500 750 1000 METRES

FILE NO. **FIG. 7**

DRAWN BY J.B.  
DRAFTSMAN T.G.D.S.  
DATE Sep 1986  
REVISIONS  
FILE NO.

RM/CM/WG86/07

CYPRUS REPORT 533 APPENDIX 1



**Legend**

**TERTIARY - QUATERNARY**

Gravel, alluvium

**JURASSIC**

Dolerite  D

**PERMIAN**

Undifferentiated sediments  P

**DEVONIAN**

Spero Bay Group

Dol	31
Ds	41
Dv	42
Dw	43

Dol = dolomite

**ORDOVICIAN**

Gordon Limestone  Og

Caroline Creek Sandstone (Crotty Equivalent)  Oc

**CAMBRIAN - Dundas Group**

Undifferentiated  Ed

I = ironstone  Ed

Greywacke, conglomerate  Ed

Argillite, siltstone, minor carbonates  Ed

**Igneous Rocks associated with Dundas Group**

Quartz diorite  D1

Hornblende diorite  D2

Gabbro  G

Pyroxenite serpentinite  G

Lucas Creek Volcanics  G

Muddy Cove Volcanics  G

Mairwaring Volcanics  G

Elliot Bay Volcanics  G

**Birthday Group**

Argillite, schist, phyllite, minor basalt  Eba

Limestone  Ebl

**PROTEROZOIC**

Modder Group  Po

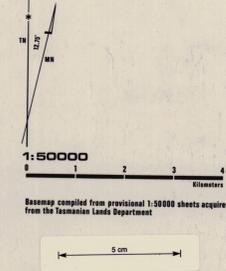
Verner Group  Pv

*Geology from BHP and Mines Department 1:250000 geology sheet*

Inferred fault

Geological contact

Unconformity



859098  
Cyprus Minerals Australia Company  
87-2730

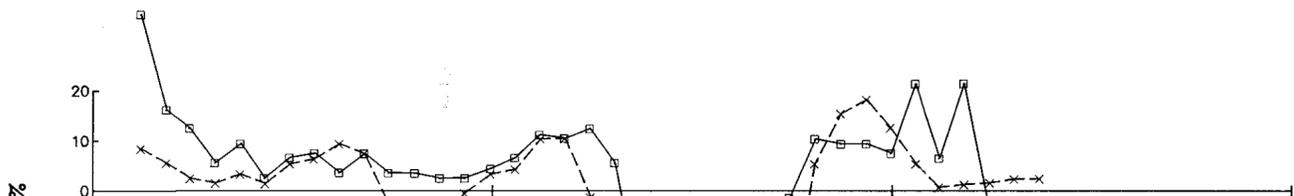
**Project SORELL PENINSULA N° A-84-111**

Project Partner **POSEIDON, PLACER**

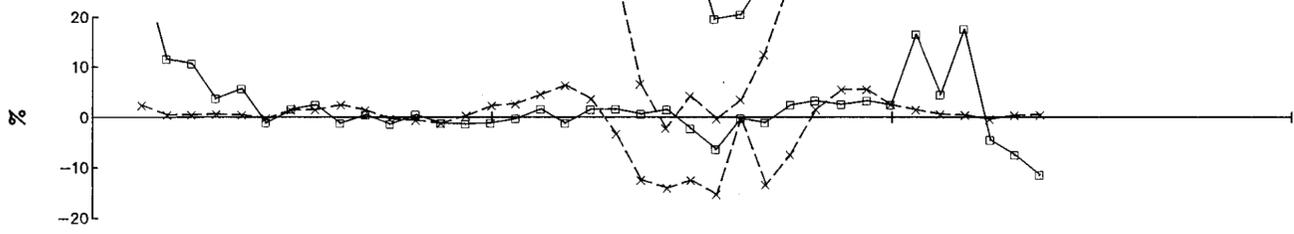
**ELs 35/83, 36/83, 37/83**

**REGIONAL GEOLOGY**

Map Ref. ANG K-55-5 Latitude 42°30'S Longitude 149°30'E  
 Surveyed B. Ferris Date 1983-1984 Scale 1:50000  
 Drawn S. Fowler Date 1984 Drawing N°M84-2248  
 Report 533



3555 Hz



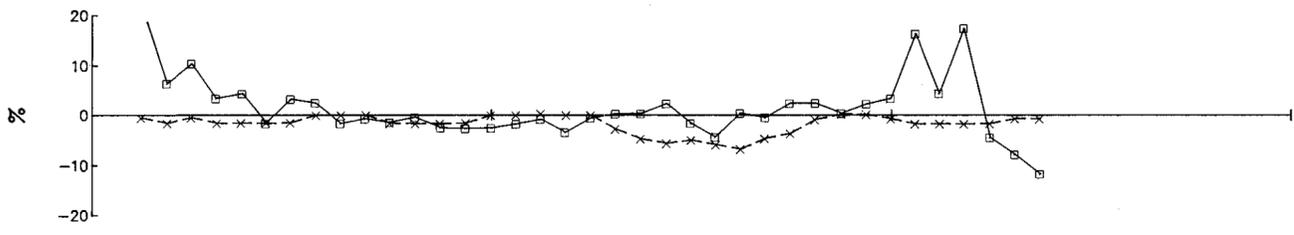
888 Hz

MAX - MIN

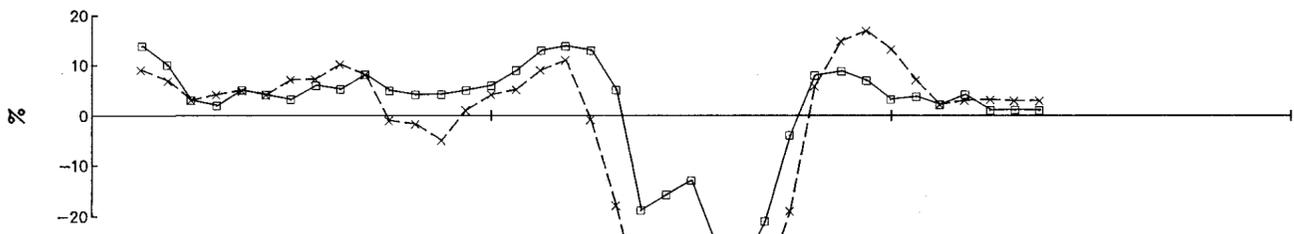
Tx → Rx = 100m

IN PHASE □—□

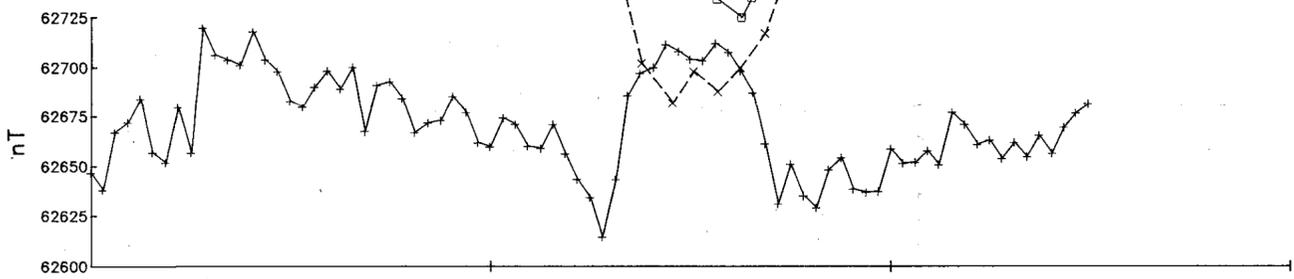
OUT OF PHASE x--x



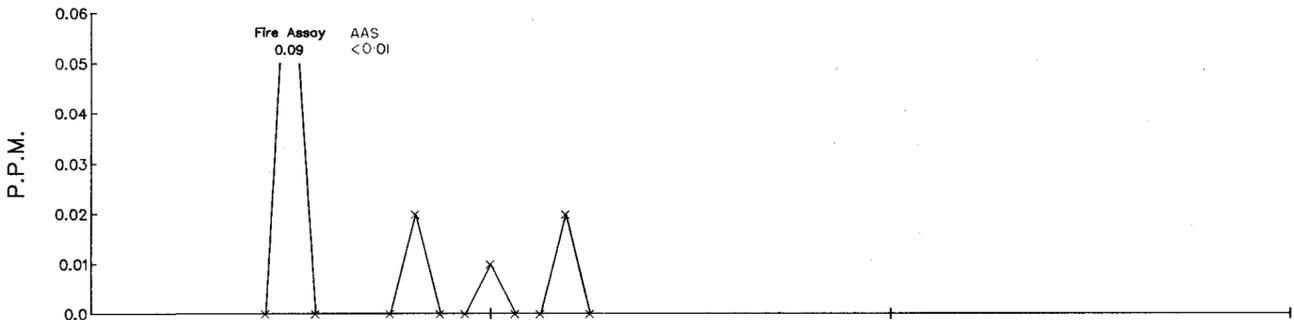
222 Hz



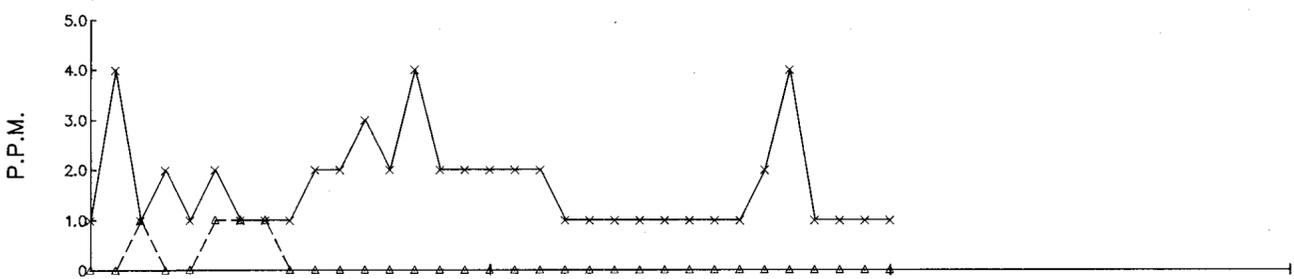
3555 Hz - 222 Hz



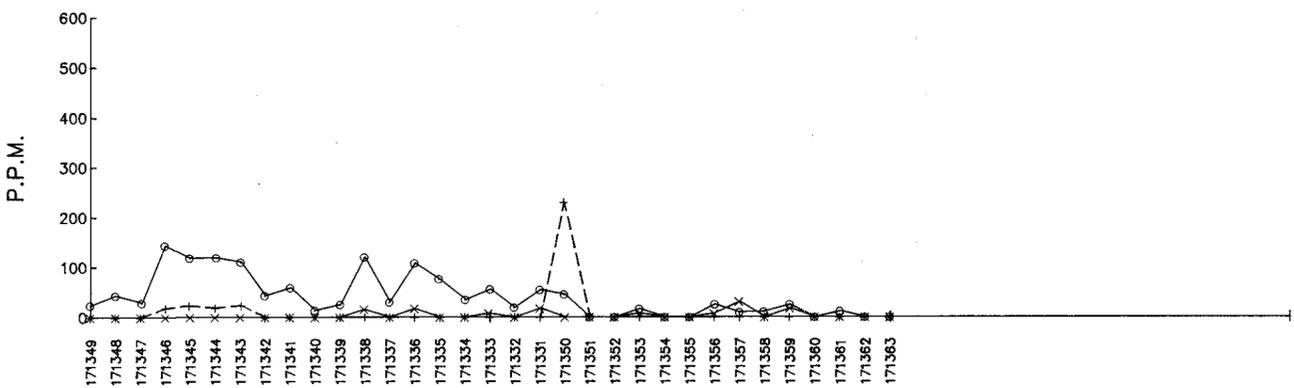
MAGNETICS



Au



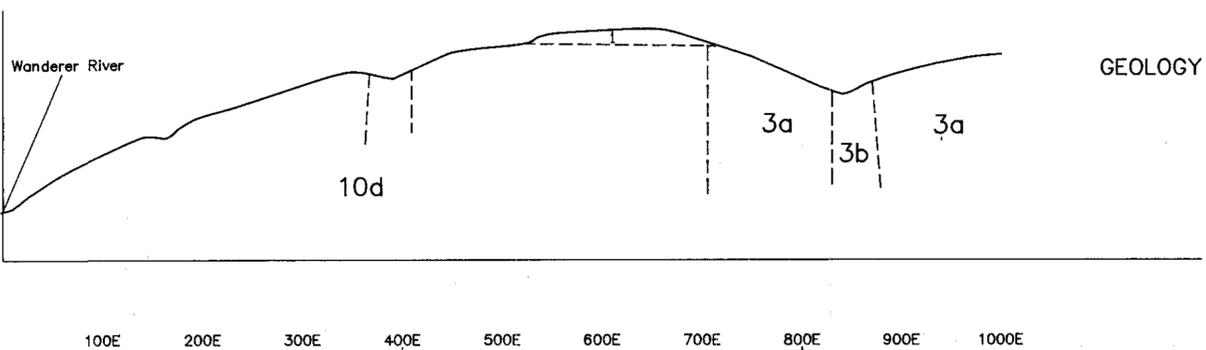
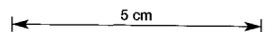
As x  
Ag Δ



Cu x  
Pb +  
Zn o

SOIL SAMPLE  
NUMBERS

859099



GEOLOGY

87-2730

CYPRUS MINERALS AUST. CO. & POSEIDON LTD.

CAPE SORELL - E.L. 37/83

WANDERER NORTH  
LINE 1  
PROFILES

DRAWN BY : R.P.

DRAFTSMAN : T.G.D.S.

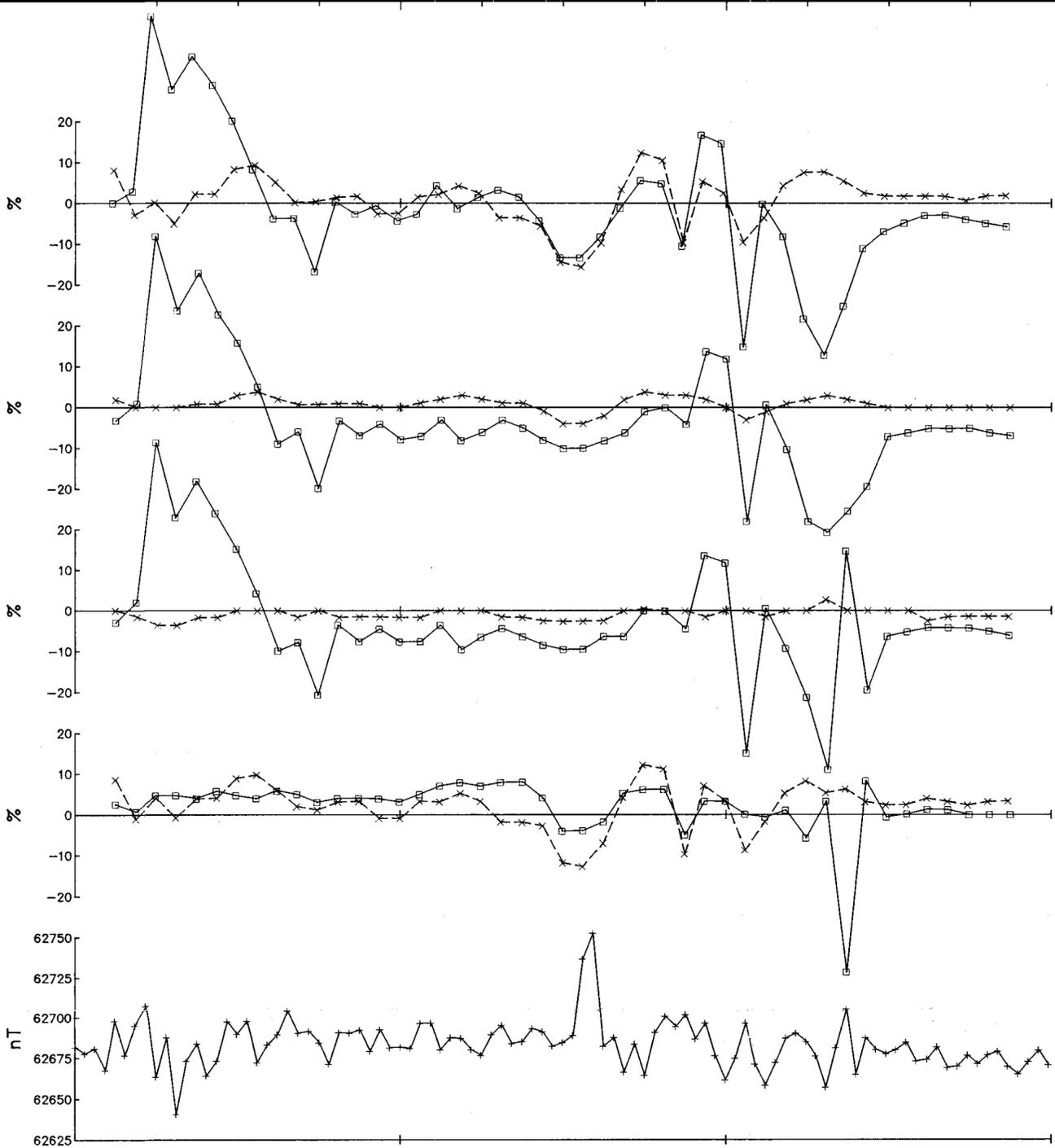
DATE : April '87

REVISIONS :

FILE No.

FIG.



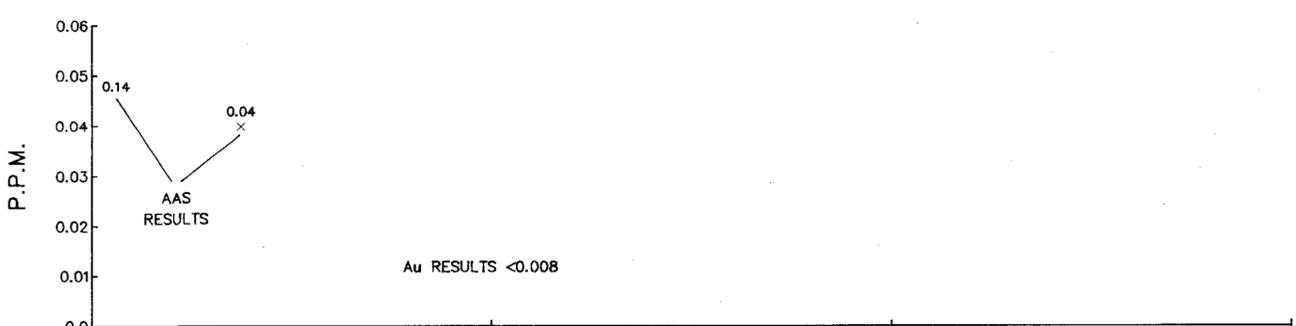


MAX - MIN

Tx → Rx = 100m

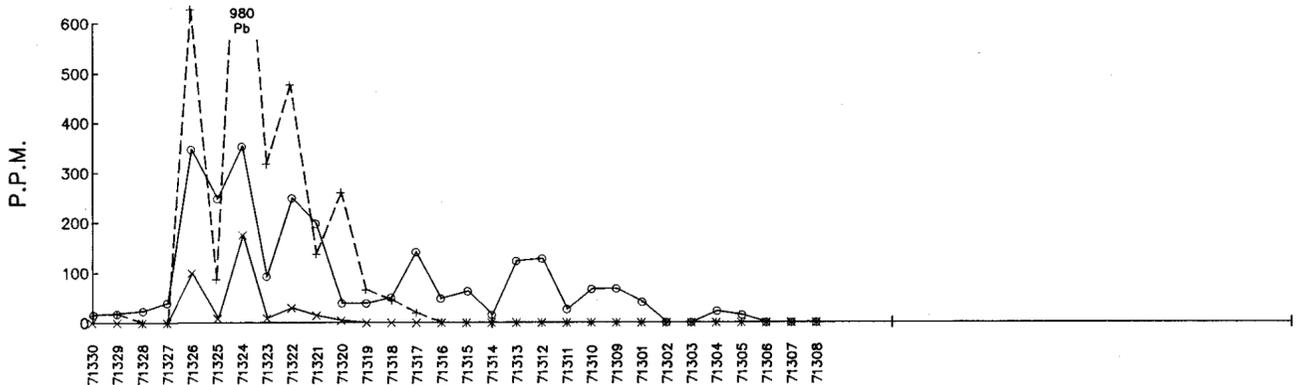
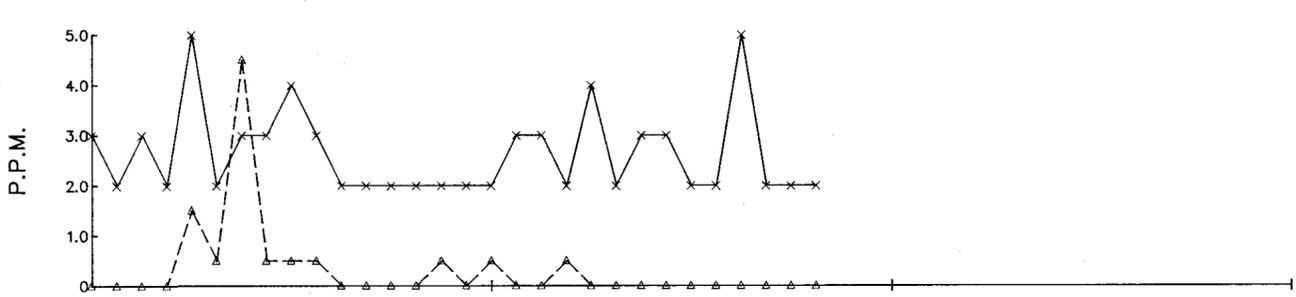
IN PHASE □—□

OUT OF PHASE x--x



MAGNETICS

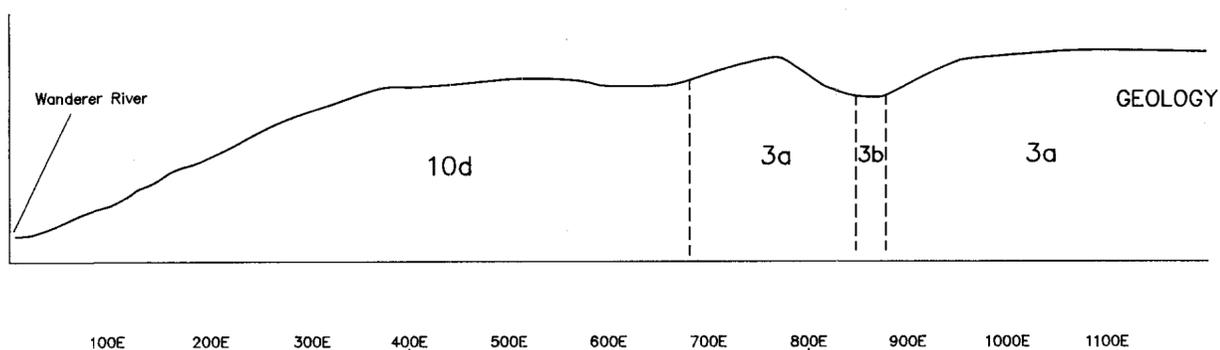
Au



SOIL SAMPLE NUMBERS

859100

5 cm



87-2730

CYPRUS MINERALS AUST. CO. & POSEIDON LTD.

CAPE SORELL - E.L. 37/83

WANDERER NORTH  
LINE 2  
PROFILES

DRAWN BY: R.H.

DRAFTSMAN: T.G.D.S.

DATE: April '87

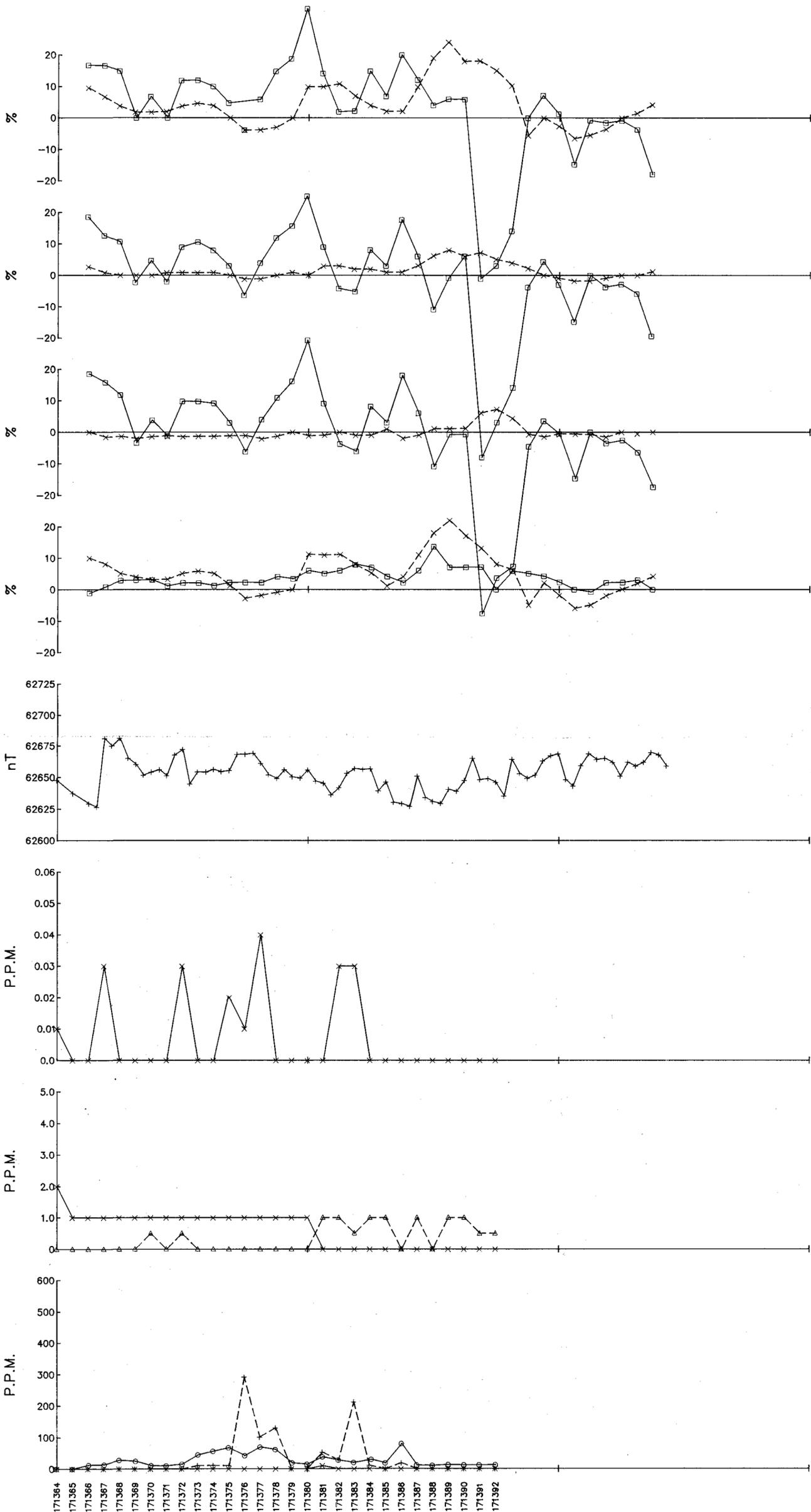
REVISIONS:

FILE No.

FIG.

SCALE 1:5000

50 100 200 METRES



3555 Hz

888 Hz

222 Hz

3555 Hz - 222 Hz

MAX - MIN

Tx → Rx = 100m

IN PHASE □—□

OUT OF PHASE x---x

MAGNETICS

Au

As x  
Ag Δ

Cu x  
Pb +  
Zn ○

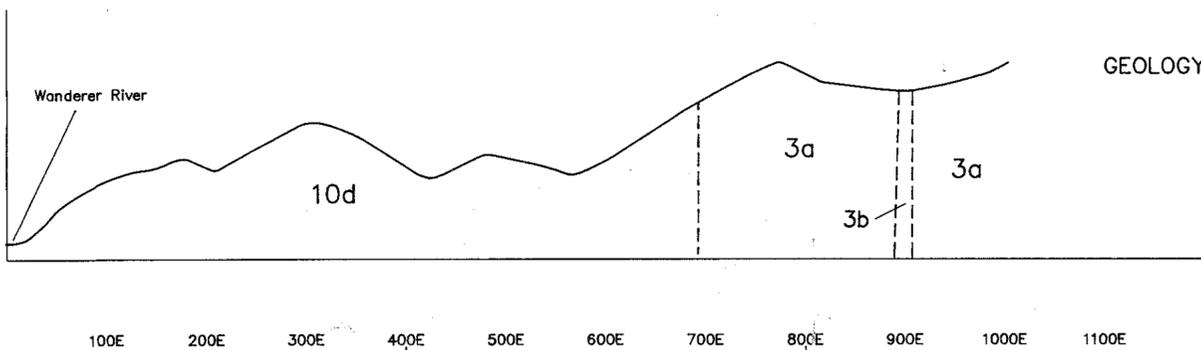
SOIL SAMPLE  
NUMBERS

859101

5 cm

87-2730

GEOLOGY



CYPRUS MINERALS AUST. CO. & POSEIDON LTD.

CAPE SORELL - E.L. 37/83

WANDERER NORTH  
LINE 3  
PROFILES

DRAWN BY: R.P.

DRAFTSMAN: T.G.D.S.

DATE: April '87

REVISIONS:

FILE No.

SCALE 1:5000

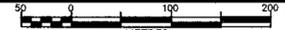


FIG.

6000