

**GEOPEKO**

A DIVISION OF PEKO WALLSEND OPERATIONS LIMITED
A.C.N.000 081 434

**EL 1/90 MEUNNA
RELINQUISHMENT REPORT**

INCLUDING REPORT ON EXPLORATION ACTIVITY

MARCH 1991 TO FEBRUARY 1992

TCR 92-3372

MINES	
FILE NO. EL1/90	
- 8 JUL 1992	
Doc. No.	
Author/Office	Initials
LETTER	
3. 7 '92	
REFERS	
Folio 51	
Resubmit to	Unit

Ian Mathison
June, 1992

T273



Distribution: Geopeko, Parkes
Geopeko, Devonport
DMMR, Hobart

TABLE OF CONTENTS

	<u>Page No.</u>	
1.0 Introduction	1	
1.1 Location & Access	1	
1.2 Tenure & Land Usage	1	
1.3 Regional Geology	1	
1.4 Known Mineral Deposits/Occurrences	2	
1.5 Previous Exploration	2	
1.6 Geopeko's 1990-91 Exploration	2	
2.0 Exploration Activity	2	
2.1 Scope of This Report	2	
2.2 Work Completed	3	
2.3 Results Received	4	
2.4 Geology	5	
3.0 Conclusions	6	
4.0 Recommendations	6	
References	7	
Figure 1 Location and Access		
Figure 2 Regional Geology		
Figure 3 Cann Creek Geological Fact Mapping		
Figure 4 Cann Creek - Rock Sample Locations (50 m)		
Figure 5 Cann Creek - Rock Chip Sampling (25 m)		
Table 1 Stratigraphic Correlation		
Table 2 EL 1/90 Water Geochemistry		
Appendix 1 EL Schedule		
Appendix 2 Water Geochemistry - Sample Descriptions		
Appendix 3 Rock Geochemistry - Sample Descriptions & Results		
Appendix 4 Petrography		
PLATES (In pockets)		
Drawing No.	Title	Scale
2310	Folly - Sample Locations & Number	25,000

1.0 INTRODUCTION

1.1 Location and Access (Fig. 1)

EL 1/90 Meunna is located in NW Tasmania approximately 20 km south-west of the coastal town of Wynyard.

Access within the EL is very good and is provided by a network of unsealed logging roads.

1.2 Tenure and Land Usage

EL 1/90 of 11 km² was granted to Peko Exploration Ltd in March 1990. The EL schedule is detailed in Appendix 1.

The EL consists of State Forest, much of which has been logged. The logged areas now either lie bare awaiting regeneration or support thick regrowth. Vegetation over the rest of the EL is generally moderately open wet eucalypt forest.

1.3 Regional Geology (Table 1)

EL 1/90 lies within the Rocky Cape Region of NW Tasmania. The most interesting rocks in the area are those of the Arthur Lineament. The Arthur Lineament is a north-east trending metamorphic belt consisting of highly deformed sediments, basic volcanics and dolomite. To the west of this belt lies the Rocky Cape Group, a thick shallow marine shelf sequence. The Rocky Cape Group contains Precambrian dolerite/gabbro dykes which have been emplaced into north-north west trending faults. Rocks assigned to the Precambrian Burnie Formation outcrop east of the Arthur Lineament. Within EL 40/89, interbedded siltstone and quartz wacke predominate with at least one dolomitic siltstone unit mapped. Close to the Arthur Lineament, these rocks have been metamorphosed to schistose metasandstones and phyllitic metasiltstone:

Previous explorers have assigned a sequence of interbedded sandstone and siltstone with associated basic volcanics and carbonates lying just west of the intensely deformed rocks of the Arthur Lineament to the Neasy Formation. Some workers question the validity of this formation. However, aeromagnetic maps show that the rocks of the Neasy Formation have a distinctive magnetic character. This unit has been retained for the purposes of this report:

The Precambrian-Cambrian rocks along the eastern edge of the area are in places overlain by Permian fluvio-glacial sediments and/or Tertiary basalt.

1.4 Known Mineral Deposits/Occurrences

There are a number of metallic mineral occurrences adjacent to the western, eastern and southern EL boundaries of Geopeko's Arthur River Project. These are listed in T255 (Virgoe & Mathison 1991)

The deposits range from small, relatively insignificant workings, e.g. Victory Mine, Atlas Leases to large world class ore bodies e.g. Mt Bischoff, Savage River. In most cases, extensions of the prospective host formations can be continued into Geopeko's Arthur River EL's.

1.5 Previous Exploration

The northwest of Tasmania has seen regional company exploration activity since the mid 1960's. Techniques applied include stream sampling, gridding, soil and rock chip sampling, geological mapping, photogeology, diamond drilling and geophysical surveys. Generally this work has been concentrated in areas within a few kilometres walking distance of vehicular access.

Previous exploration activity and results are summarized in T255. (Virgoe & Mathison, 1991)

1.6 Geopeko's 1990-91 Exploration

Exploration conducted by Geopeko in EL 1/90 during 1990 and 1991 is detailed in T255. (Virgoe & Mathison 1991) This included water sampling, rock chip sampling, aeromagnetic interpretation and geological mapping.

2.0 EXPLORATION ACTIVITY

2.1 Scope of This Report

Water geochemistry in EL 1/90 (and the rest of the Arthur River Project) produced gold anomalies which resampling and check analyses proved to be spurious. The 1990-91 field program was cut short because of these analytical problems. It was considered necessary to suspend exploration activity until the analytical problems were resolved or an alternative analytical technique evaluated. Consequently a waiver of expenditure commitment for 1991 was requested and granted:

Water sampling of the Arthur River Project area recommenced in December 1991 and was completed by February 1992. Five samples were collected within EL 1/90 or drain parts of the EL.

Rock chip samples (50 m composites) from Cann Creek also reported highly anomalous gold values. Check sampling at 25 m intervals was completed in early 1991 to better define these anomalies. Results of this sampling were not available when Geopeko report T255 was prepared.

A temporary extension of the EL was negotiated to allow the results of this additional work to be plotted and evaluated. This report discusses these results.

2.2 Work Completed

Water Geochemistry

Five additional water samples which relate to EL 1/90 were collected in 1992 as part of a sampling program along the Arthur River. These were analysed by the CSIRO in Sydney. The following sampling and analytical techniques were used:

Au

One litre of stream water was mixed with lime and sodium cyanide in the field. A sachet of activated charcoal was added immediately after the lime-cyanide mixture. After 24 hours, the activated charcoal was removed. Gold was determined by Neutron Activation Analysis. Waste cyanide was destroyed by oxidization:

Cu, Pb, Cd

One litre of stream water was mixed with $MgSO_4$ and $NaOH$ in a polyethylene sample bottle. The entire sample was then sent to the CSIRO for determination of Cu, Pb and Cd in the precipitate by PDV(voltametry):

Zn, As

A 250 mL polyethylene sample bottle was rinsed several times on site with the stream water to be sampled before filling. Zn, Cu, Pb and Cd were determined on the raw water by ICP-MS and As by graphite furnace AAS. These repeats of Cu, Pb and Cd are secondary checks only. The PDV values are more precise, show more variability and are considered to be more reliable.

pH

pH was determined in the field using pocket pH meters (pHept by HANNA Instruments):

At each sample site, water colour, water level, stream size, vegetation type, contamination and geological information were recorded. All sample bottles were rinsed several times in the stream water to be sampled or treated;

Rock Geochemistry

Composite rock chip samples at 25 m intervals were collected during February 1991 along the anomalous section of Cann Creek and along two small tributaries of Cann Creek. All samples were analysed for Cu, Pb, Zn, Ni and Au. Base metals were determined by AAS after perchloric acid digestion. (ANALABS method 101). Gold was determined by fire assay/AAS finish on a 50g split of the original sample (ANALABS method PM313).

In addition, samples from the 50 m sampling reporting anomalous gold were reassayed by fire assay. (PM313)

Results were not available when the previous report (T255) was compiled.

Geology

Detailed geological mapping was conducted in association with rock chip sampling along Cann Creek.

Petrography

Ten rock samples from the Arthur River area were submitted to Dr. A.J.Stolz for thin section examination. Three of these were collected from within EL 1/90.

2.3 Results ReceivedWater Geochemistry (Drawing 2310 & Table 2)

The assay results of all water samples collected relating to EL 1/90 have been tabulated. (Table 2) This table illustrates the analytical problems encountered during the early part of the project. Recent results are listed in part d - CSIRO. None of these are considered anomalous with respect to the threshold levels used further south. Statistical evaluation of the 195 samples collected from the project area indicates the following anomalous levels:

Element (DL)	1. Possibly Anomalous	% <1	2. Probably Anomalous	% <2
Cu (0.1)	1.5 ppb	85	3.0 ppb	95
Pb (0.05)	0.75 ppb	90	1.4 ppb	97
As (0.01)	0.16 ppb	80	0.30 ppb	97.5
Zn (0.1)	1.7 ppb	85	3.0 ppb	95
Au (0.1)	0.1 ppt	?		

Using these thresholds, the As values appear anomalous. However, most of the other water samples collected from the areas around EL 1/90 also reported elevated As values. A higher background for As in this area seems likely.

Rock Geochemistry (See Figs 4,5 and Appendix 3)

Results from the 24 check samples and the four repeat analyses showed that the previously reported gold anomalism was spurious. None reported gold above the detection limit of 0.005 g/t. Results reported for base metals were also not anomalous.

2.4 Geology

Reconnaissance

EL 1/90 is underlain predominantly by the metamorphosed rocks of the Arthur Lineament.

Regional field mapping of roads and creeks within the EL has not yet been undertaken. However, rock float observed in creeks during water sampling consisted of vein quartz, phyllite and meta arenites.

Tertiary basalt and cleaved Rocky Cape Group siltstones underlie the northern parts of the EL:

Cann Creek (Figure 6 and Appendix 4)

Intensely deformed, low grade metamorphic rocks are exposed along Cann Creek. These include magnesite, slate, phyllite, quartzite, talc schist and green schist/amphibolite. Quartz veining and segregations are common and detached fold hinges occur in several places. These isoclinal fold hinges pitch steeply in the local cleavage:

The green schist and amphibolite are interpreted as metamorphosed basic volcanic rocks. They are easily distinguished from intrusive dolerite dykes. Although serpentinized dolerite has been mapped on the margins of one dolerite dyke, the body of this dyke is massive and has not reached the metamorphic grade of the green schists and amphibolites exposed nearby.

Three rocks collected in 1990 from Cann Creek were submitted to Dr.A.J.Stolz for thin section petrography. His descriptions are appended as Appendix 4. Descriptions from other samples from Cann Creek (EL 43/89 & EL 30/90) are included for reference. See Geopeko Report T255 (Virgoe & Mathison, 1991) for the locations of these samples:

3.0 CONCLUSIONS

- * Rocks exposed along Cann Creek in EL 1/90 are similar to Arthur Lineament rocks exposed further south.
- * Anomalous gold values reported from rock chip samples from Cann Creek are spurious. ANALABS admitted a laboratory error, probably contaminated glassware, for these results.
- * Water samples draining EL 1/90 are not anomalous in Au, Cu, Pb, Cd, Zn, or As.

4.0 RECOMMENDATIONS

No further work should be conducted in EL 1/90 at this stage. The EL should be relinquished.

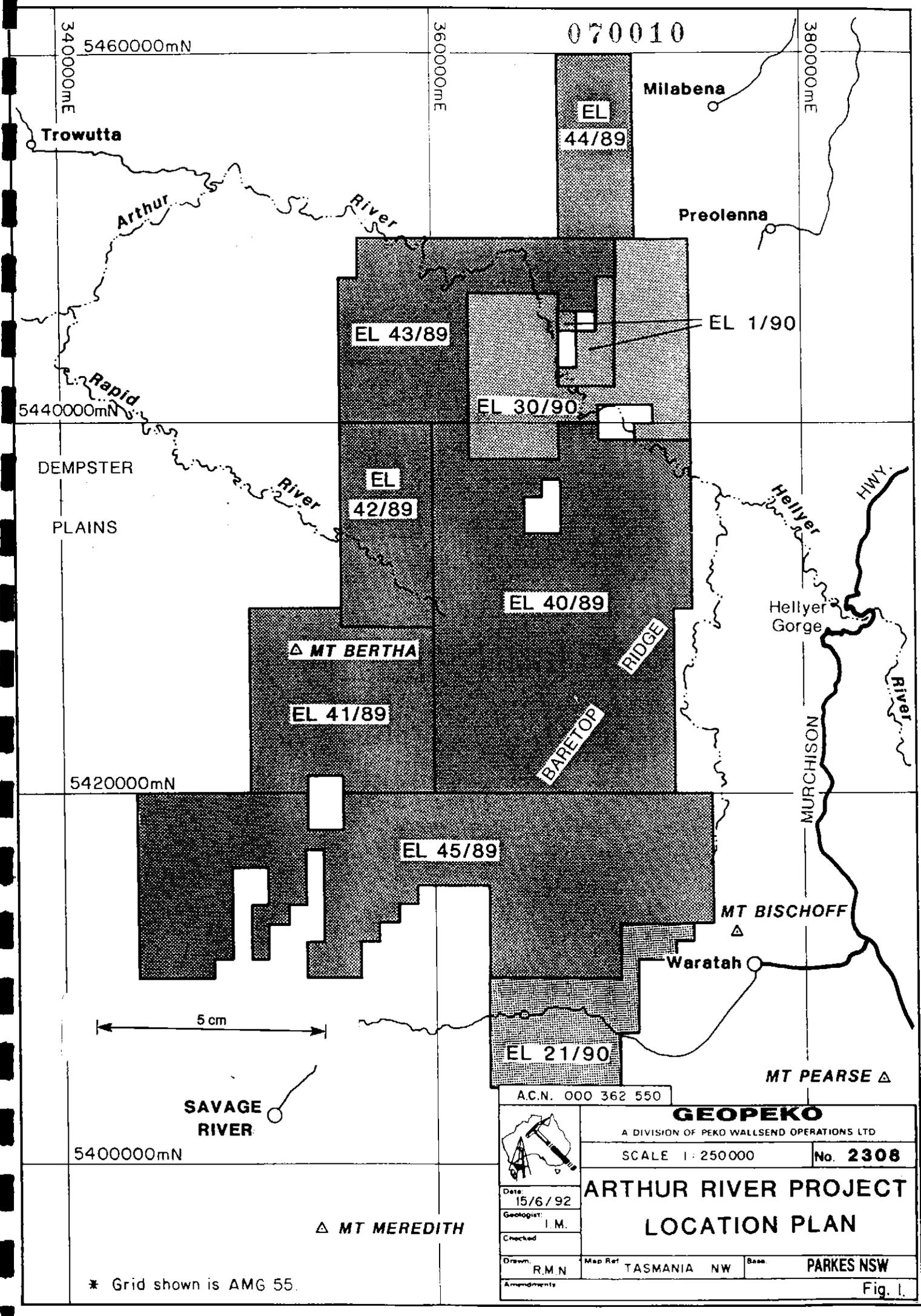
5.0 ENVIRONMENTAL DISTURBANCE AND REHABILITATION

Exploration conducted by Geopeko between 1990 and 1992 has caused no environmental disturbance. Semi permanent samples markers left at sample sites are considered to be valuable reference points for future exploration. No rehabilitation has been necessary.

Jan Matheson

REFERENCES

- BROWN, A.V. (1989), "Geological Survey Explanatory Report, 1:50 000 series Sheet 21 - Smithton". Tas. DMMR.
- BURRETT, C.F., Martin E.L. (1989) "Geology & Mineral Resources of Tasmania" Geological Society of Australia 15 (Burrett et al 1989)
- GREEN, G.R., BOTTRILL, R.S., BACON, C.A., TURNER, N.J. (1988) - Mineral Deposits and Metallogenic Map of Tasmania 1:50 000, Tas. DMMR.
- LEAMAN, D.E., (1990) - Geophysical - Structural Review - Rocky Cape Block NW Tasmania. Unpublished report for Geopeko.
- VIRGOE, K. & MATHISON, I. (1991) - EL 1/90 MEUNNA - Report on Exploration Activity March 1990 to February 1991. Unpublished Geopeko report T255.



070010

5460000mN

3600000mE

3800000mE

Trowutta

Milabena

EL 44/89

Preolenna

Arthur River

EL 1/90

EL 43/89

EL 30/90

5440000mN

DEMPSTER PLAINS

EL 42/89

EL 40/89

Hellyer HWY

Hellyer Gorge

△ MT BERTHA

RIDGE

EL 41/89

BARETOP

MURCHISON

5420000mN

EL 45/89

MT BISCHOFF △

Waratah

5 cm

SAVAGE RIVER

EL 21/90

MT PEARSE △

A.C.N. 000 362 550

GEOPEKO

A DIVISION OF PEKO WALLSEND OPERATIONS LTD

SCALE 1:250000

No. 2308



**ARTHUR RIVER PROJECT
LOCATION PLAN**

Date 15/6/92

Geologist I.M.

Checked

Drawn R.M.N.

Map Ref TASMANIA NW

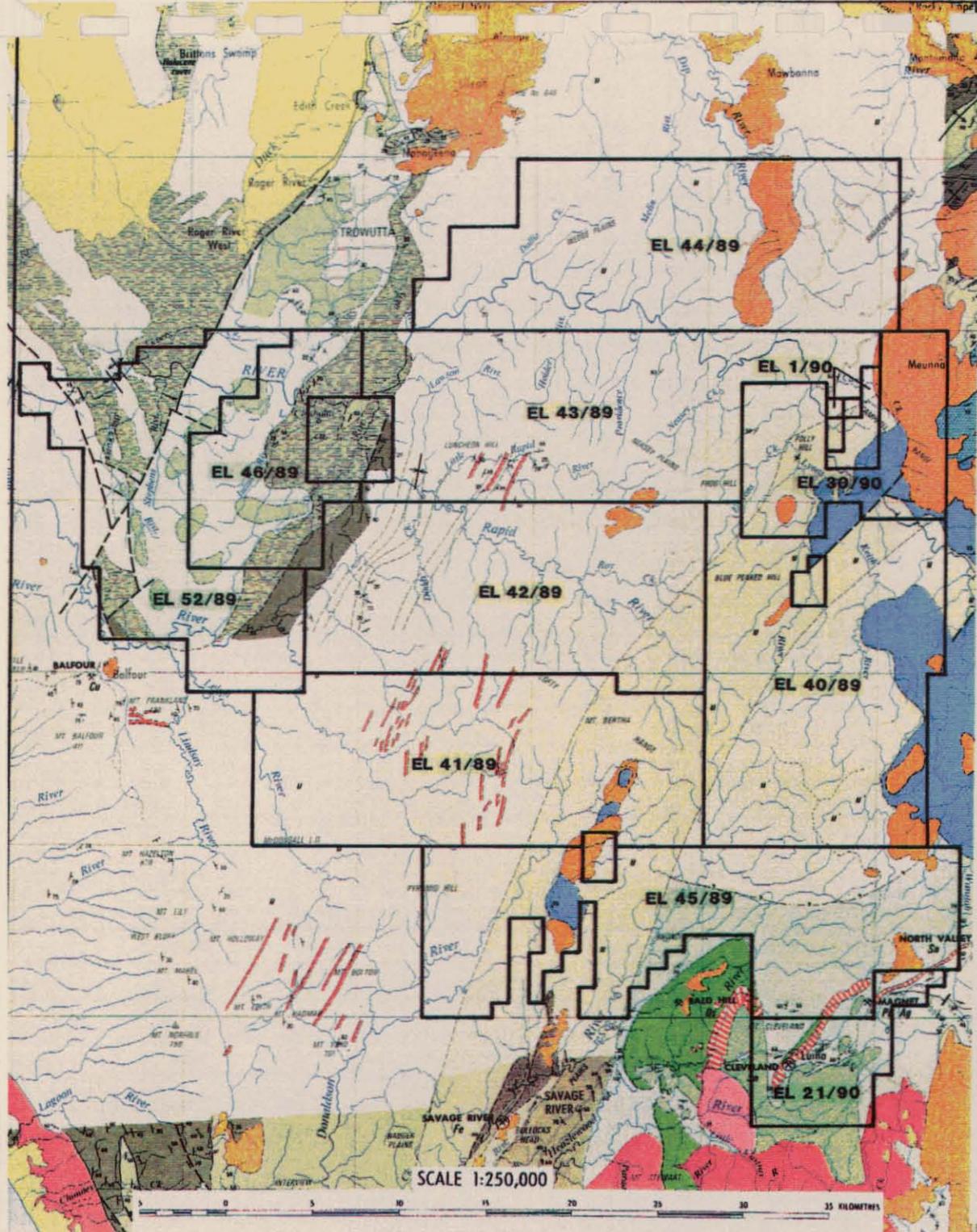
Base PARKES NSW

Amendments

Fig. 1.

△ MT MEREDITH

* Grid shown is AMG 55.



HOLOCENE		Alluvium, sand, gravel and talus.
PLEISTOCENE		Till, fluvio-glacial periglacial and associated deposits.
		Erosional surface.
TERTIARY		Non-marine sequences (light); marine limestone (dark) basalt and related igneous rock types (orange).
		Low angle unconformity.
TRIASSIC		Fluvio-lacustrine sequences of sandstone, siltstone, mudstone (light) with carbonaceous sequences indicated (dark). Fresh water sequence with some coal measures.
PERMIAN		Upper glacio-marine sequence of pebbly mudstone, pebbly sandstone and limestone. Fresh water sequence with some coal measures.
UPPER CARBONIFEROUS		Lower glacio-marine sequence of pebbly mudstone, pebbly sandstone, minor limestone, Tasmanite oil shale and basal tillite.
CAMBRIAN		Middle-Upper Cambrian fossiliferous usually greywacke turbidite sequences (horizontally lined over-print); acid with intermediate volcanic and associated rocks dominant (dark), and horizon with fossiliferous Upper Cambrian shallow water deposits (vertically lined over-print); basic-intermediate volcanic and associated rocks dominant (diagonally lined over-print); probably Cambrian unfossiliferous usually greywacke turbidite sequences (light); probably Cambrian unfossiliferous orthoquartzite sequence (dotted).
		Usually unconformity attributed to Penguin Orogeny but apparent conformity at Smithton and Pieman River.
PRECAMBRIAN		Comparatively unmetamorphosed sequences. Mudstone-sandstone sequences (u) - dominantly mudstone (light), dominantly orthoquartzite (dark), quartzwacke turbidite successions (small dot over-print), conglomerate (large dot over-print); dolomite (horizontally lined over-print); basalt lava (vertically lined over-print).
		Metamorphic rocks. Pelitic sequences (dark); metaquartzite sequences (light) with some platy quartzite units indicated (vertically lined over-print); amphibolite (diagonally lined over-print). Garnet bearing rocks are indicated (g).
IGNEOUS ROCKS		
CAMBRIAN		Dominantly adamellite-granite.
LOWER CARBONIFEROUS - UPPER DEVONIAN		Coarser grained basic rocks.
		Serpentinite, peridotite and associated rocks.
PRECAMBRIAN		Dolerite.

GEOPEKO

A DIVISION OF PEKO WALLSEND OPERATIONS LTD

SCALE 1 : 250 000

No Fig 2

ARTHUR RIVER PROJECT

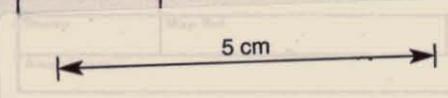
REGIONAL GEOLOGY

Date: _____

Geologist: _____

Checked: _____

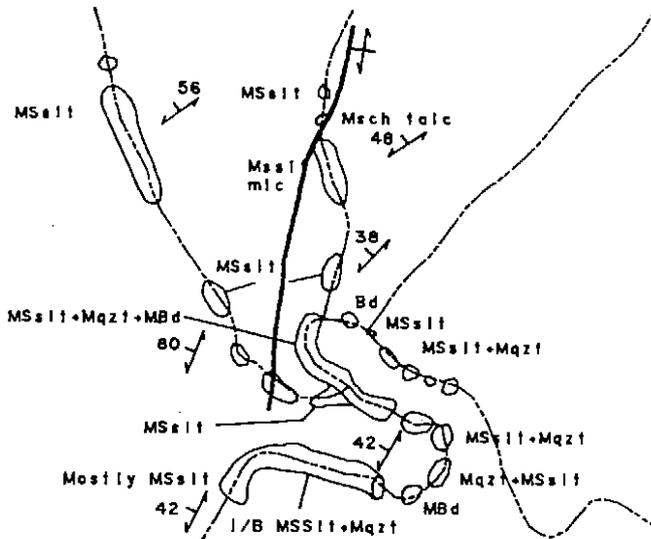
TASMANIA



07001

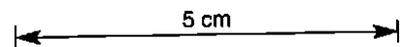
5447500N

5447500N



5447000N

5447000N



5446500N

5446500N

Operator/Manager on behalf of Licence Holder PEKO EXPLORATION LIMITED (ACN 000 382 580)

	GEOPEKO		A DIVISION OF PEKO-WALLSEND OPERATIONS LTD. ACN 000 081 434	
	Scale 1:5000			
PARKES		Project/ Tenure		
EL 1/90 - MEUNNA		CANN CREEK		
GEOLOGICAL FACT MAPPING		Fig 3.		
Doc	I. M.	Date	23-JUN-92	
Carto	W. S.	Job No	201_92	100K Sheet No.
Checked			7915	Dwg No.
				2306

369500E

070013

5447500N

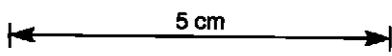
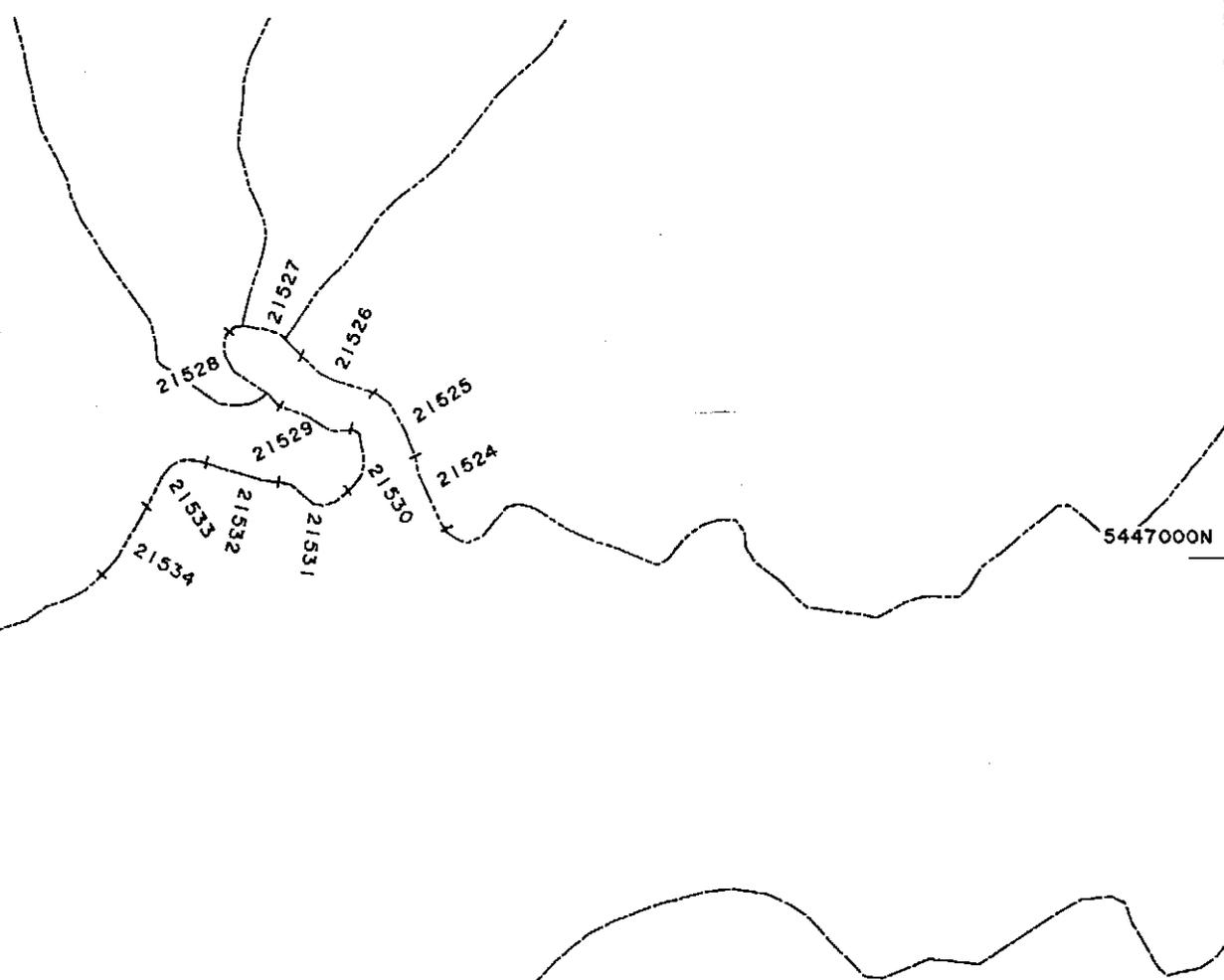
5447500N

5447000N

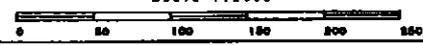
5447000N

5446500N

5446500N



Operator/Manager on behalf of Licence Holder PEKO EXPLORATION LIMITED
[ACN 000 362 550]

 PARKES	GEOPEKO		A DIVISION OF PEKO-WALLSEND OPERATIONS LTD. ACN 000 081 434	
	Scale 1:5000 			
Project/ Title		EL 1/90 - MEUNNA		
Date 23-JUN-92		CANN CREEK ROCK SAMPLE LOCATIONS 50m Samples Replotted		
Job No. 201_92		100K Sheet No. 7915	Dwg No. 2306	Fig 4.

070014

369500E

5447500N

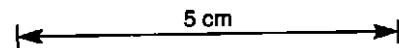
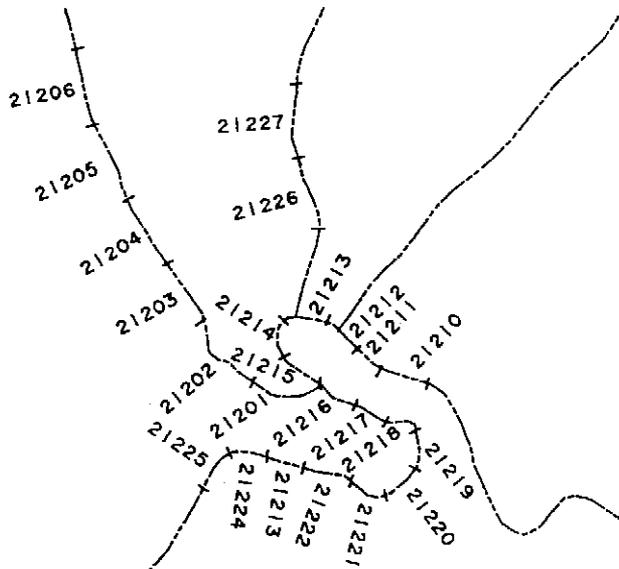
5447500N

5447000N

5447000N

5446500N

5446500N



Operator/Manager on behalf of Licence Holder PEKO EXPLORATION LIMITED
(ACN 000 382 550)

GEOPEKO

A DIVISION OF
PEKO-WALLSEND OPERATIONS LTD.
ACN 000 081 434

Scale 1:5000



Project/
Tasero **EL 1/80 - MEUNNA**



PARKES

Des	I.M.
Carto	W.S.
Checked	
Date	23-JUN-92
Job No.	201_92

**CANN CREEK
ROCK CHIP SAMPLING
SAMPLE LOCATIONS**

Fig 5.

Block Sheet No. 7915 Page No. 2307

STRATIGRAPHIC CORRELATION ADOPTED FOR THIS REPORT

070015 Table 1.

	ROCKY CAPE BLOCK	CORINNA	LYONS RIVER (Arthur Lineament)	CLEVELAND - WARTAR	DEZAS (Ord - Dev seds omitted)	DUNDAS TROOPS (Ord - Dev seds omitted)
TERTIARY	Tb - Tertiary Basalt Tc - Tertiary gravel	Tb - Tertiary Basalt Tc - Tertiary gravels	Tb - Tertiary Basalt Tc - Tertiary gravel	Tb - Tertiary Basalt Tc - Tertiary gravel	Tb - Tertiary Basalt Tc - Tertiary gravels	Tb - Tertiary Basalt Tc - Tertiary gravels
PERMO-CARB			P - Parmelee Supergroup Fluvatile sandstone, coal measures, glaciomarine & glacial deposits			
DEVONIAN	Intrusion of Sandy Cape Granite	Intrusion of Plassen Granite		Intrusion of Cleveland Granite	Intrusion of Redish Bell & Heerskick Granite	Intrusion of Granite Top, Housestop, & other granites
CAMBRIAN	Christmas Hills Sequence Cs - Unnamed Quartzwacke, siltstone, mudstone, conglomerate				Dundas Group - siltstone, mudstone, sandstone, polymict conglomerate, minor acid tuff	Dundas Group - siltstone, mudstone, sandstone, polymict conglomerate, minor acid tuff
PRO-CAMBRIAN	Ed - Smithton Dolomite Eh - Smithton Basalt Mafic volcanoclastics and tholeiitic basalts Eb - Black River Dolomite Dolomite, silicified dolomite, chert Ef - Forest Conglomerate and Quartzite	Ed - Corinna Dolomite Ebv - Bernabei Volcanics Esd - Savage Dolomite	Timbs Group Amphibolite, ironstone, magnetite, serpentinite Amphibolite & green schist + meta basalt & dolerite Ox mica schist, phyllite, + meta siltstone & sst	EWA & LOTI andesite & tholeiitic basaltic and Intrusion/emplacement of Ultramafic bodies Ew - Unnamed mafic volcs volcanoclastics and turbidites with some carbonates	LOTI basalt Intrusion/emplacement of Ultramafic bodies Crimson Creek Formation Volcanoclastic lithic-wacke siltstone, & mudstone with minor carbonate and tholeiitic basalt Red chert, mudst & dolomite Lam siltst, sst & dolomite Mudstone & carbonates Ox sst, siltst & dolomite Polymict cgl & sandstone	LOTI basalt Intrusion/emplacement of Ultramafic bodies Crimson Creek Formation Crimson Creek Formation Success Creek Group
PRE-CAMBRIAN	Pri - Irby Siltstone Black mudstone, minor siltstone, sandstone, & dolomite Prd - Detention Quartzite Quartzite & siltstone Prc - Cowrie Siltstone Laminated siltstone pyritic mudstone	Pd - Donaldson Formation Quartzose turbidites Pi - Interview Slate and Quartzite	Burnie Fm equivalents Pelitic & quartzose schist	Pb - Burnie Formation Interbedded quartzose quartzwacke & siltstone with minor mafic volcs	Conah Formation Interbedded quartzwacke and siltstone with some carbonates & mafic volcs	Conah Formation Interbedded quartzwacke and siltstone with some carbonates & mafic volcs

TABLE 2 EL 1/90 WATER GEOCHEMISTRY

(a) Dept. of Mines – Hobart 1990 Water Samples

Sample Number	Original	TOC ppm	Repeat	AAS-GF	NAA	Repeat
	Au ppt		Au ppt	Pb ppb	Au ppt	Sample
20069	20.2	9.5	5.7			
20071	3468.0	3.4	1.8	1.2		21044
20144	3.3	9.1			4.8	
20145	2.5	2.4			<4.0	
20146	2.3	3.4				
20147	2.6	1.9				

(b) ANALABS – Melbourne 1990 Water Samples

Sample Number	Graphite Furnace – A.A.S.				A.A.S.
	Cu ppb	Pb ppb	Zn ppb	As ppb	Au ppt
20069	2.2	<0.5	8.0	<0.5	
20071	1.1	6.0	<10	<0.5	5.0
20144	3.4	5.5	11.0	<0.5	
20145	1.5	22.0	9.0	<0.5	
20146	0.7	2.0	2.0	<0.5	
20147	1.1	2	6	<0.5	

(c) ANALABS – Melbourne – 1990 Repeat Samples

Sample Number	Graphite Furnace – A.A.S.				T.O.C. ppm	NAA
	Cu ppb	Pb ppb	Zn ppb	As ppb		Au ppt
21044	1.0	0.2	2.5	1.0	2.6	<2.0

(d) CSIRO – Sydney 1992 Water Samples

Sample Number	NAA	ICP – MS straight water			ICPAES/AASGF			PDV – precon		
	Au ppt	Cu ppb	Pb ppb	Cd ppb	Zn ppb	Zn ppb	As ppb	Cu ppb	Pb ppb	Cd ppb
22420	<1	0.22	0.07	<0.5	0.80	<10	0.11	0.41	<0.05	<0.05
22421	<1	<0.5	<0.5	<0.5	0.82	<10	0.17	0.19	0.22	<0.05
22422	<1	<0.5	<0.5	<0.5	0.78	<10	0.14	0.85	0.13	<0.05
22423	<1	0.67	<0.5	<0.5	1.20	<10	0.22	1.20	0.27	<0.05
22807	<1	<0.5	<0.5	<0.5	<0.5	<10	0.16	0.47	0.14	<0.05

070017

APPENDIX 1
E.L. SCHEDULE

No. E.L. 1/90

(Regulation 6A)

The Mining Act 1929**EXPLORATION LICENCE**

Issued to PEKO EXPLORATION LTD of PO BOX 180, ROSEBERY, TASMANIA, 7470
in respect of 11 square kilometres of land in the Land Districts
of WELLINGTON AND RUSSELL vicinity of MEUNNA as described in the
schedule hereto.

This licence shall remain in force until the THIRTIETH day of MARCH
1991.

This licence is subject to the following conditions:-

1. That the licensee shall immediately on the issue of this licence take steps to commence preliminary works necessary for the investigation of the area.
2. That the licensee shall carry out investigations as may be necessary to determine the mineral potential of the area, and in particular will fulfil the proposals set out in the exploration programme and approved by the Director of Mines.
3. That the licensee shall employ such technical and other staff and equipment as may be necessary effectively to carry out such investigations.
4. This licence shall apply to all minerals.
5. The licensee shall notify the owner and occupier of private land, in writing, at least three days before entering such land.
6. That the security (Private Land Deposit) provided by Section 15E (1) (a) & (b) of the Mining Act, 1929, (see below) shall be lodged with the Director of Mines before entering private land.
7. The licensee shall observe, perform and fulfil the conditions as set forth in Schedule 'A' (Revised) attached hereto.
8. The licensee shall be liable to pay the cost of any work carried out to remedy any damage arising from any breach of the conditions of this licence.

070019

9. The licensee shall deposit an amount of \$5,000 (Performance Deposit) as security that the conditions contained herein shall be observed. Upon expiry or sooner determination of the licence, if the licensee satisfies the Director of Mines that such conditions have been complied with, the Director of Mines shall refund such deposit or such portion thereof, as he may determine.
10. If it is found, that the operations hereby authorised, are causing any undue damage to, or erosion of, the subject land or other land in the vicinity thereof or are unnecessarily disturbing the environment, the Minister may cancel the licence without compensation to the licensee by giving seven days' notice in writing of his intention so to do.
11. The licensee shall obtain the written permission of the Director of Mines before carrying out any work in a Forest Reserve.
12. The licensee shall arrange and keep in good standing public liability insurance to the minimum of \$1,000,000. Evidence of currency shall be produced on demand.

SCHEDULE

Part 1 (10 skm)

Commencing at the southeast corner at grid co-ordinates 370 000 metres E. 5 442 000 metres N. thence grid west to 367 000 metres E. grid north to 5 443 000 metres N. grid east to 368 000 metres E. again grid north to 5 445 000 metres N. again grid east to 369 000 metres E. again grid north to 5 448 000 metres N. again grid east to 370 000 metres E. aforesaid thence grid south to the point of commencement.

The area excludes a 29 ha Mineral Lease.

Part 2 (1 skm)

Commencing at the northwest corner at grid co-ordinates 367 000 metres E. 5 446 000 metres N. thence grid east to 368 000 metres E. grid south to 5 445 000 metres N. grid west to 367 000 metres E. aforesaid thence grid north to the point of commencement.

Land Tenure:

The area comprises: State Forest

Note: The land tenure table is a guide only.

EXCLUSIONS

The area embraced by this licence includes State Forests but does not include:

- (a) All other public reserves or municipal reserves or roadways.
- (b) All forms of mining tenements and water licences including leases, water licences, easement licences, special and exploration licences, prospectors licences, miners rights, permits to enter, owners consents and owners rights which were in lawful possession or marked out prior to the date of marking out of this licence.
- (c) Land exempt from the provisions of the Mining Act, 1929.
- (d) Land under the National Parks and Wildlife Act, 1970, not subject to the Mining Act, 1929.
- (e) All Crown reservations or other land set apart or dedicated for any public purposes.

MINISTER FOR RESOURCES AND ENERGY

Date

APPENDIX 2
WATER GEOCHEMISTRY
Sample Descriptions

070025

03/07/1992

ARTHUR RIVER PROJECT
 WATER GEOCHEMISTRY - 1991-92 SAMPLES - CSIRO ANALYSES
 EL 1/90, 30/90 & 43/89 - FOLLY SHEET

SAMPLE NUMBER	-----ICPMS - RAW WATER -----			-PDV - Preconcentrated-			GF AAS	NAA	ICPABS	LOCATION		
	Cu ug/l	Pb ug/l	Cd ug/l	Zn ug/l	Cu ug/l	Pb ug/l	Cd ug/l	As ug/l	Au ng/l	Zn ug/l	EL	MAP
22410	-0.50	-0.50	-0.50	0.73	0.63	0.15	0.20	0.15	-1.00	-10	43/89	FOLLY
22411	-0.50	-0.50	-0.50	1.20	0.63	0.15	0.30	0.19	-1.00	-10	43/89	FOLLY
22412	-0.50	-0.50	-0.50	1.30	0.92	0.23	0.40	0.21	-1.00	-10	43/89	FOLLY
22413	-0.50	-0.50	-0.50	1.00	0.63	0.32	0.20	0.24	-1.00	-10	43/89	FOLLY
22414	-0.50	-0.50	-0.50	1.00	0.74	0.45	-0.05	0.20	-1.00	-10	43/89	FOLLY
22415	-0.50	-0.50	-0.50	1.70	0.60	0.48	-0.05	0.20	-1.00	-10	43/89	FOLLY
22416	-0.50	-0.50	-0.50	1.00	0.50	0.15	-0.05	0.21	-1.00	-10	43/89	FOLLY
22417	0.50	-0.50	-0.50	1.50	0.96	0.45	0.35	0.36	-1.00	-10	43/89	FOLLY
22418	-0.50	-0.50	-0.50	1.60	0.85	0.18	-0.05	0.21	-1.00	-10	43/89	FOLLY
22419	-0.50	-0.50	-0.50	1.70	0.37	0.29	-0.05	0.13	-1.00	-10	43/89	FOLLY
22420	-0.50	-0.50	-0.50	0.80	0.41	-0.05	-0.05	0.11	-1.00	-10	1/90	FOLLY
22421	-0.50	-0.50	-0.50	0.82	0.19	0.22	-0.05	0.17	-1.00	-10	30/90	FOLLY
22422	-0.50	-0.50	-0.50	0.78	0.85	0.13	-0.05	0.14	-1.00	-10	30/90	FOLLY
22423	0.67	-0.50	-0.50	1.20	1.20	0.27	-0.05	0.22	-1.00	-10	1/90	FOLLY
22801	-0.50	0.65	-0.50	0.85	0.33	0.40	-0.05	0.10	74.00	-10	43/89	FOLLY
22802	0.50	-0.50	-0.50	0.78	0.90	0.70	-0.05	0.19	-1.00	-10	43/89	FOLLY
22803	-0.50	-0.50	-0.50	0.04	0.90	0.33	-0.05	0.19	-1.00	-10	43/89	FOLLY
22804	-0.50	-0.50	-0.50	0.52	0.90	0.27	-0.05	0.24	-1.00	-10	43/89	FOLLY
22805	-0.50	-0.50	-0.50	1.76	1.00	0.60	-0.05	0.14	-1.00	-10	43/89	FOLLY
22806	0.55	-0.50	-0.50	1.32	0.51	0.53	-0.05	0.16	-1.00	-10	43/89	FOLLY
22807	-0.50	-0.50	-0.50	0.85	0.47	0.14	-0.05	0.16	-1.00	-10	1/90	FOLLY
22808	-0.50	-0.50	-0.50	-0.50	0.69	0.35	-0.05	0.16	-1.00	-10	30/90	FOLLY
22809	0.50	-0.50	-0.50	-0.50	0.45	0.15	-0.05	0.17	-1.00	-10	30/90	FOLLY

APPENDIX 3
ROCK CHIP GEOCHEMISTRY
Sample Descriptions and Results

ARTHUR RIVER PROJECT - ROCK CHIP SAMPLING

EL 1/90 - MEUNNA

NUMBER 21201 SAMPLER MAT TYPE RC EL 1/90 DATE 31/01/1991
 LOCATION CANN CREEK TRIB. FROM 0 TO 50
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY MSslt, PHYLLITIC. DARK GREY - WEATHERED. V. DARK GREY - FRESHER
 COMMENTS DEFINITE LINEATION. MINOR QUARTZ VEINS
 PURPOSE

NUMBER 21202 SAMPLER MAT TYPE RC EL 1/90 DATE 31/01/1991
 LOCATION CANN CREEK TRIB. FROM 50 TO 100
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY 1/2 SAMPLE - RUST. 1/2 SAMPLE - SPORADIC OUTCROP & SILICIFIED ROCK
 COMMENTS QUARTZ VEINS IN OUTCROP
 PURPOSE

NUMBER 21203 SAMPLER MAT TYPE RC EL 1/90 DATE 31/01/1991
 LOCATION CANN CREEK TRIB. FROM 100 TO 150
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PATCHY OUTCROP.
 COMMENTS PART WTHD MSslt WITH SLATY CLEAVAGE, & PART SERICITE ON CLEAVAGE
 PURPOSE

NUMBER 21204 SAMPLER MAT TYPE RC EL 1/90 DATE 31/01/1991
 LOCATION CANN CREEK TRIB. FROM 200 TO 250
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PART WEATHERED PAPER SLATES MSslt SILICIFIED CLEAVAGE
 COMMENTS MINOR QUARTZ VEINING AT 250M. NO OUTCROP 150-200M
 PURPOSE

NUMBER 21205 SAMPLER MAT TYPE RC EL 1/90 DATE 31/01/1991
 LOCATION CANN CREEK TRIB. FROM 250 TO 300
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PART WEATHERED DK GREY MSslt SLATS SOME SERICITION OF CLEAVAGE
 COMMENTS
 PURPOSE

NUMBER 21209 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 0 TO 25
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITIC MSslt WITH THIN-5CM-BEDS FGMNTD DK GREY Mqzt IN CLEAVAGE
 COMMENTS QUARTZ VEIN, APPROX. 30CM AT 15M. QUARTZ VEINS/PATCHES COMMON.
 PURPOSE

02/07/1992

ARTHUR RIVER PROJECT - ROCK CHIP SAMPLING

EL 1/90 - MEUNNA

NUMBER 21210 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 25 TO 50
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PART DECOMPOSED MSslt SLATE TO PHYLLITE DISTINCT SER. SHEEN
 COMMENTS STRAIGHT CLEAVAGE. MUCH OUTCROP UNDER WATER- SAMPLED WHERE COULD
 PURPOSE

NUMBER 21211 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 50 TO 75
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY SPARSE OUTCROP, MSslt, MASS DOLERITE - DYKE AT ONE END.
 COMMENTS QUARTZ VEIN
 PURPOSE

NUMBER 21212 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 95 TO 100
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY MASSIVE BED AT START, THEN MSslt PHYLLITE
 COMMENTS PHYLLITE WITH RUSTY QUARTZ PATCHES. MOST BEDS & QUARTZ VNS AT END
 PURPOSE

NUMBER 21213 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 100 TO 125
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE AND MINOR QUARTZ SOME SILVERY MINERALS ON SOME QUARTZ BEDS
 COMMENTS SERICITE INCREASES NEAR QUARTZ VEINS AND PATCHES
 PURPOSE

NUMBER 21214 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 125 TO 150
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE, Mgzt, MBd
 COMMENTS QUARTZ VEINING
 PURPOSE

NUMBER 21215 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 150 TO 175
 AMG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE MINOR MBd
 COMMENTS SOME QUARTZ VEINING
 PURPOSE

ARTHUR RIVER PROJECT - ROCK CHIP SAMPLING

EL 1/90 - MEUNNA

NUMBER 21216 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 175 TO 200
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE MINOR Mqzt
 COMMENTS FEW QUARTZ VEINS
 PURPOSE

NUMBER 21217 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 200 TO 225
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY GREY/DARK GREY Mqzt & PHYLLITE
 COMMENTS SOME MINOR QUARTZ VEINING
 PURPOSE

NUMBER 21218 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 225 TO 250
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY Mqzt WITH INTERBEDDED MSslt. THIN PYRITIC TALC/SER. SCHIST AT 250
 COMMENTS QUARTZ VEINING AT LAST 5 M
 PURPOSE

NUMBER 21219 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 250 TO 275
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY Mbd, GREEN SCHIST qz AND Mqzt - FRAGMENTED AND CLAYEY
 COMMENTS LARGE BLOCK QUARTZ IN MIDDLE OF CREEK
 PURPOSE

NUMBER 21220 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 275 TO 300
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY Mqzt, QUARTZ, MINOR PHYLLITE
 COMMENTS
 PURPOSE

NUMBER 21221 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 300 TO 325
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY INTERBEDDED GREY Mqzt AND MSslt MOSTLY OUTCROP
 COMMENTS SOME QUARTZ VEINING
 PURPOSE

02/07/1992

ARTHUR RIVER PROJECT - ROCK CHIP SAMPLING

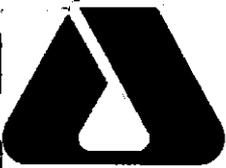
EL 1/90 - MEUNNA

NUMBER 21222 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 325 TO 350
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY DARK GREY MSslt - SLATE AND MINOR INTERBEDDED Mgzt fg. GY & DK GY
 COMMENTS
 PURPOSE

NUMBER 21223 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 350 TO 375
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE
 COMMENTS MINOR QUARTZ, ONE THIN vfg Mgzt
 PURPOSE

NUMBER 21224 SAMPLER MAT TYPE RC EL 1/90 DATE 01/02/1991
 LOCATION CANN CREEK (DOWNSTREAM END) FROM 375 TO 400
 ANG COORDINATES EAST 0 NORTH 0
 LITHOLOGY PHYLLITE
 COMMENTS MINOR QUARTZ AND ONE THIN fg Mgzt AT START
 PURPOSE

02/07/1992



ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

070031

Analabs - A Division of Inchcape Inspection & Testing Services

Phone (004) 31 8837

14 Thirkell St. Coee Tas 7320

Fax No. (004) 31 8890

ANALYTICAL REPORT No. 106480.60.07729

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

INVOICE TO:

Geopeko
P.O. Box 180
Rosebery
Tasmania 7470

ORDER No.

PROJECT

50072

Pouna

DATE RECEIVED

RESULTS REQUIRED

05/02/91

ASAP

No. OF PAGES OF RESULTS

DATE REPORTED

No. OF COPIES

TOTAL No. OF SAMPLES

2

25/02/91

1

29

SAMPLE NUMBERS

SAMPLE DESCRIPTION

ELEMENT/METHOD

21201/05,21208/27

RD Prep: 6P006,6P009,6P018

Cu,Pb,Zn,Ni/6A101

21201/05,21208/27,21527/30

RD

Au,Au(R),Au(S)/66313,Au/RAW,Au/Wt

21201/05,21208/27,21527/30

RD

+75u/66315

REMARKS

RESULTS

TO

Mr Ian Mathison
Geopeko
P.O. Box 180
Rosebery
Tasmania 7470

RESULTS

TO

RESULTS

TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE	CLIENT ORDER No.		PAGE	
		106480.60.07729				25/02/91	50072		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ni	Au	+75u			
1	21201	30	35	45	50	<0.005	-		1/90	Conn. to Tube
2	21202	20	30	40	<5	<0.005	-			
3	21203	35	40	70	35	<0.005	-			
4	21204	30	40	55	20	<0.005	-			
5	21205	20	40	30	10	<0.005	-			
6	21208	SNR	-	Panned Con.		-	-			
7	21209	30	30	55	25	<0.005	-		1/90	Conn. to Tube
8	21210	30	35	45	10	<0.005	-			
9	21211	40	40	85	495	<0.005	-			
10	21212	35	50	75	295	<0.005	-			
11	21213	35	60	85	20	<0.005	-			
12	21214	70	45	85	80	<0.005	-			
13	21215	50	45	85	75	<0.005	-			
14	21216	30	55	65	15	<0.005	-			
15	21217	35	35	55	5	<0.005	-			
16	21218	30	35	75	15	<0.005	-			
	21219	25	40	105	160	<0.005	-			
18	21220	25	30	60	10	<0.005	-			
19	21221	30	30	70	5	<0.005	-			
20	21222	30	35	85	5	<0.005	-			
21	21223	30	35	55	15	<0.005	-			
22	21224	30	30	50	5	<0.005	-			
23	21225	30	35	45	5	<0.005	-		1/90	Conn. to Tube
24	21226	30	35	60	5	<0.005	-			
25	21227	25	40	45	<5	<0.005	-			

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



ANALABS

A Division of Incharge Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

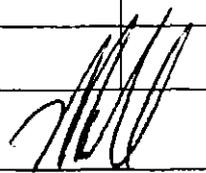
CLIENT ORDER No.

PAGE

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE	CLIENT ORDER No.		PAGE	
		106480.60.07729				25/02/91	50072		2 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ni	Alu	+75u	<i>Repeats</i>		
1	21527	--	--	--	--	<0.005	<0.008	<i>Can't fit</i>		
2	21528	--	--	--	--	<0.005	<0.008			
3	21529	--	--	--	--	<0.005	<0.008			
4	21530	--	--	--	--	<0.005	<0.008			
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
18										
19										
20										
21										
22	SNR = Sample Not Received									
23	DETECTION	5	5	5	5	0.005	0.008			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA101	GA101	GA101	GA101	GG313	GG313			

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



APPENDIX 4
PETROGRAPHY

THIN SECTION DESCRIPTIONS FOR ROCKS FROM
THE ARTHUR METAMORPHIC COMPLEX

REPORT TO GEOPEKO

by

A.J. STOLZ

February 1991

c/- CODES
GPO Box 252C,
Hobart Tas 7001.

Thin Section Descriptions.

Sample 20262 Quartz-sericite-chlorite schist (*Part S.N 21550*) 30/90

<u>Mineralogy:</u>	mineral	percentage abundance
	quartz	18
	albite	20
	sericite	20
	chlorite	35
	epidote	3
	magnetite/hematite	2
	sphene	2

Thin Section:

This sample is composed of xenoblastic porphyroblasts (0.5 - 1 mm diameter) of plagioclase (albite/oligoclase) which commonly display albite twinning, and are characterised by rotational trails of epidote, chlorite and elongate quartz grains. The porphyroblasts occur in a strongly deformed matrix of chlorite, sericite, quartz, epidote, sphene and minor hematite/magnetite.

The matrix retains evidence of a strong S_1 ? cleavage which wraps around plagioclase porphyroblasts, together with a later S_2 crenulation cleavage depicted by cross-cutting plates of chlorite and sericite. Pods of quartz originally aligned parallel to S_1 have been partially recrystallised and enclose recrystallised sericite aggregates aligned parallel to S_2 .

The relatively high abundances of quartz and sericite in this rock are inconsistent with a basic volcanic or intrusive precursor unless it had experienced significant silicification and potassic hydrothermal alteration. It could also be a recrystallised metasediment (perhaps siltstone) although I tend to favour it being an altered basic volcanic. An analysis of the Ti/Zr value for rocks such as this would be useful for distinguishing between altered metabasic rocks and metasediments. In general the metabasic rock will retain its relatively high Ti/Zr value (ie. > 60). The relatively small amount of epidote has probably resulted from the breakdown of detrital

calcic plagioclase during metamorphism under greenschist facies conditions.

This sample has close textural similarities to 20271 although the latter contains less chlorite, and more sericite and quartz.

Sample 20263 calc-silicate metasediment Part S.N 21562. 30/90

<u>Mineralogy:</u>	mineral	percentage abundance
	quartz	60
	epidote	25
	amphibole	5
	sphene	8
	chlorite	1
	Fe-oxides	1

Thin Section:

The equigranular texture of this rock gives it a slightly igneous appearance in hand specimen, but in thin section it comprises a recrystallised aggregate of quartz, epidote, amphibole, chlorite, albite, leucoxene after sphene and minor hematite.

The quartz aggregates have broadly polygonal boundaries with very minor development of sutured margins. Scattered throughout the quartz-rich and feldspar-poor matrix are abundant aggregates of prismatic idioblastic epidote grains with subordinate prismatic crystals of amphibole and minor chlorite. The prismatic amphibole crystals are weakly aligned within the section and may describe a weak lineation. However, the epidote crystals appear to occur in random orientations often cross-cutting this direction.

The amphibole consists of purple-blue pleochroic cores typically rimmed with pale-green actinolite. The low birefringence, strong pleochroism and other optical features of these relict amphiboles are consistent with them being transitional compositions between actinolite and the sodic amphibole glaucophane.

Amphiboles of this composition are relatively common from the Arthur Metamorphic Complex. The partial retrogression to actinolite has occurred in response to a change from peak (amphibolite facies) to greenschist facies metamorphic conditions.

The epidote in this rock has a distinctive yellow-pink pleochroism which is consistent with a relatively Mn-rich composition.

The recrystallised mineralogy of this rock seems most consistent with an impure calcareous metasediment which originally contained appreciable quantities of quartz. This latter feature and the paucity of feldspar is inconsistent with a basic volcanic composition. The absence of sericite suggests a minimal pelitic component.

Sample 20264 Quartz-chlorite-sericite schist = SN 21570 30/90

<u>Mineralogy:</u>	mineral	percentage abundance
	quartz	70
	sericite	15
	chlorite	13
	magnetite/hematite	2

Thin Section:

This rock is composed of elongate aggregates of recrystallised quartz typified by strain extinction and sutured margins. The quartz pods are wrapped by strongly aligned sericite and chlorite which define the main S_1 cleavage. The S_1 cleavage has been partially translated by an oblique S_2 cleavage which has resulted in significant reorientation and recrystallisation of sericite and chlorite.

Both the sericite and chlorite exhibit significant Fe-staining by limonite probably precipitated by low temperature fluids migrating along the cleavage. The reddish material filling cavities is hematite and limonite possibly derived from remobilisation of Fe-oxides disseminated throughout the rock.

This rock most likely represents a metamorphosed psammo-pelitic sediment which last recrystallised under greenschist facies conditions. The origin of the cavities is uncertain, and their xenoblastic form gives no obvious clues of a specific porphyroblastic phase which has been selectively removed by weathering.

Sample 20265	Metadolerite	part SN 21537	1/90
<u>Mineralogy:</u>	mineral	percentage abundance	
	plagioclase	64	
	actinolite	15	
	chlorite	10	
	epidote	8	
	magnetite	3	
	sphene	<1	

Thin Section:

This sample consists of abundant xenoblastic to subidioblastic crystals of plagioclase (albite) typically 0.5 - 1.0 mm diameter, and subordinate idioblastic porphyroblasts of magnetite (up to 0.5 mm) and epidote in a matrix dominated by chlorite, actinolite and epidote with accessory granular sphene.

The plagioclase grains contain abundant tiny inclusions of granular epidote, with some chlorite and actinolite. The coarse idioblastic magnetite grains appear to be quite late and cross-cut plagioclase-matrix boundaries. The matrix chlorite and actinolite are weakly aligned to define a weak foliation, but there are numerous cross-cutting elongate grains which suggests some subsequent recrystallisation under low strain, possibly contact metamorphic conditions. There are also some relatively coarse-grained and randomly oriented chlorite and epidote grains in veins which trend subparallel to the original foliation direction.

Elongate pods of quartz are also aligned in this orientation. The pods also occasionally contain minor chlorite and hematite rimming magnetite. The quartz has been recrystallised to aggregates of strained grains which are elongate oblique to the trend of the elongation of the pod itself reflecting a later recrystallisation event.

The pods are likely to have been original vesicles in a shallow intrusive mafic rock, which were subsequently filled with silica.

43/89

Sample 20268

Metadolerite

part 21501

Cannock

<u>Mineralogy:</u>	mineral	percentage abundance
	plagioclase	50
	actinolite	22
	chlorite	13
	epidote	10
	sphene	3
	biotite	2

Thin Section:

Abundant xenoblastic to subidioblastic grains of plagioclase (albite), usually with simple twinning, are scattered through a matrix dominated by actinolite, chlorite and finer-grained epidote. The larger amphibole crystals have pale-green cores and dark green to blue-green pleochroic rims.

The prismatic actinolite and platy chlorite aggregates display a weak preferred orientation defining a weak cleavage. Randomly oriented platy crystals of biotite and fine granular aggregates of sphene are disseminated throughout the rock.

This rock most likely was a fine- to medium-grained andesitic to basaltic shallow level intrusive which has subsequently recrystallised under greenschist facies conditions. It has a very similar mineralogy, composition and textural features to 20265 and they may well be the same unit.

Sample 20269 Amphibolite = SN 21582 Lyons R. Quarry #0/09

<u>Mineralogy:</u>	mineral	percentage abundance
	plagioclase	40
	amphibole	40
	epidote	10
	chlorite	5
	quartz	3
	sphene	2
	pyrite	trace
	magnetite	trace

Thin Section:

Subidioblastic porphyroblasts of plagioclase (0.2 - 0.5 mm) and similar sized but less common porphyroblasts of epidote occur in a strongly foliated and deformed matrix dominated by a blue-green to brown amphibole, prismatic to granular epidote, chlorite, quartz and sphene.

The plagioclase porphyroblasts are strongly poikiloblastic with abundant inclusions of fine prismatic epidote, amphibole and some quartz. These inclusions are frequently arranged in curved trails defining a strong rotational fabric, and indicating syn-deformational growth of the plagioclase porphyroblasts. However, some of the epidote is clearly replacing the plagioclase porphyroblasts due to the breakdown of the relatively calcic plagioclase during the amphibolite to greenschist facies retrogression.

Matrix amphibole and chlorite strongly wrap around the plagioclase and epidote porphyroblasts, whereas the few relatively large magnetite porphyroblasts appear to cut across the cleavage.

Patches rich in quartz with minor amphibole and epidote are flattened parallel to the foliation and individual quartz grains in these patches are elongate in the same orientation.

The blue-green to brown pleochroic amphibole has optical properties similar to the amphibole in 20263 and is probably a relatively sodic high-pressure amphibole.

This rock is an amphibolite which has been partially retrogressed to a greenschist facies assemblage. The original precursor was either a basic volcanic or intrusive rock (dolerite).

Samples 20265 and 20268 have a similar mineralogy and composition to 20269 but are less deformed. 20262 is a much more quartz- and sericite-rich rock and has a closer affinities with 20271 although it contains more chlorite and less sericite.

Neasy Creek Trib.

Sample 20270

Metabasalt/metadolerite

Part 21801

43/89

<u>Mineralogy:</u>	mineral	percentage abundance
	actinolite	35
	plagioclase	35
	epidote	10
	chlorite	10
	sphene	3
	sericite	3
	quartz	3
	pyrite	<1
	magnetite	<1
	Vein:	
	quartz	80
	epidote	20
	Vein:	
	quartz	72
	chlorite	25
	actinolite	3

Thin Section:

Sparse subidioblastic phenocrysts of plagioclase (0.5 - 1.0 mm) have been completely pseudomorphed by sericite and minor chlorite, whereas a few relatively large (0.5 - 1.0 cm) patches of chlorite appear to be pseudomorphs after original ferromagnesian phases (possibly clinopyroxene). These occur in a very weakly foliated matrix of actinolitic amphibole, chlorite, fine granular epidote and interstitial plagioclase with dispersed granules of sphene and minor patches of quartz. A few relatively coarse crystals (0.3 - 0.5 mm) of pyrite are scattered throughout the matrix.

The thin section examined is transected by two quartz-rich veins, one in which elongate quartz grains and prismatic epidote crystals are strongly aligned perpendicular to the vein walls and parallel to the weak cleavage. In the other vein, the quartz and chlorite is xenoblastic and exhibits no preferred orientation.

This rock has a basic composition and was originally probably a sparsely porphyritic fine-grained dyke rock or an extrusive. The presence of sericite and pyrite indicates some weak hydrothermal alteration.

Sample 20271

Quartz-sericite schist

Part SN 21559

30/90

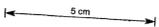
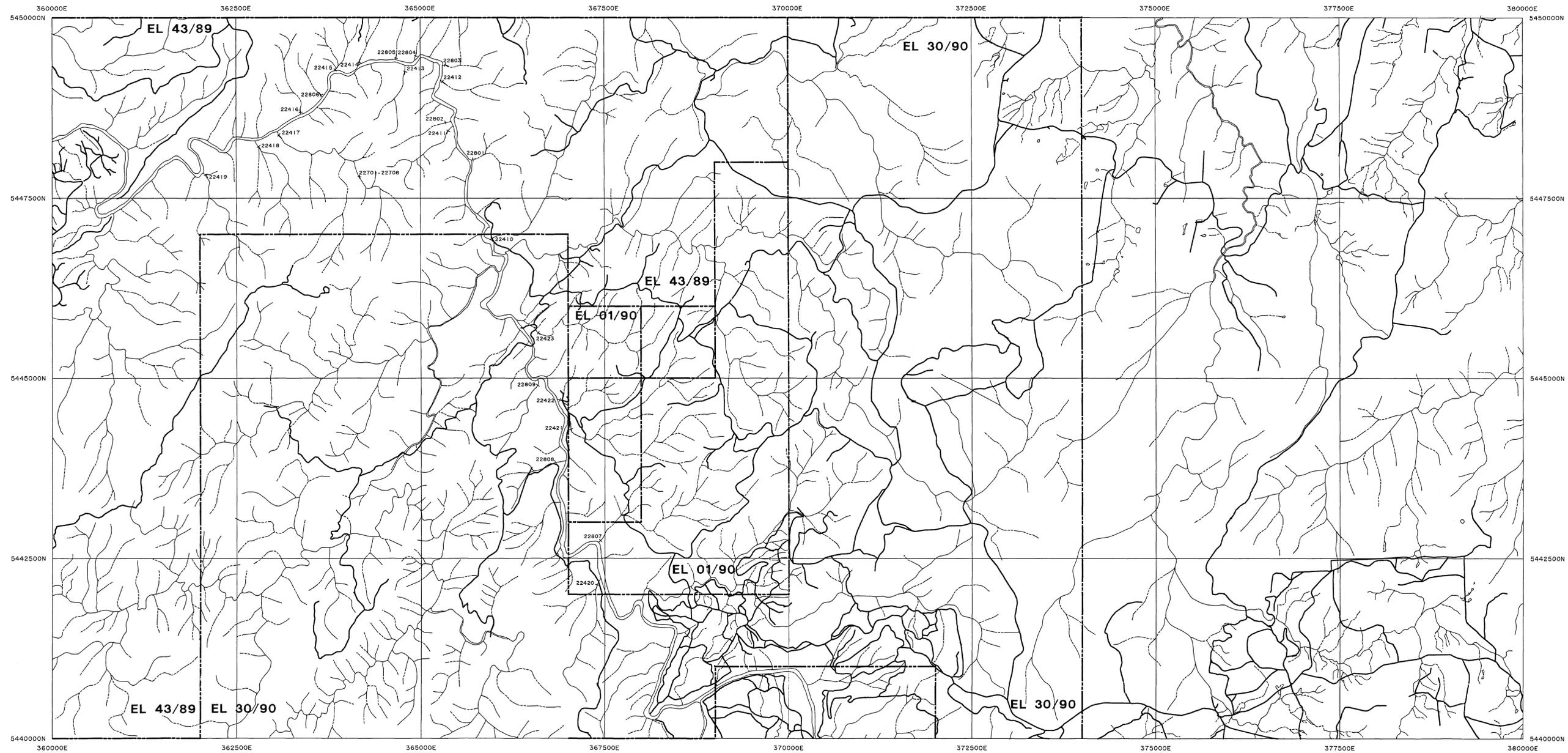
Mineralogy:

mineral	percentage abundance
quartz	50
sericite	40
epidote	7
sphene	2
magnetite	1

Thin Section:

This rock consists of alternating relatively quartz-rich and sericite-rich layers which exhibit a moderate to strong S_1 foliation which has been refolded (S_2) producing a cross-cutting crenulation cleavage. Quartz-rich pods are composed of slightly elongate strained quartz crystals with sutured margins, and small amounts of sericite, sphene and magnetite. The sericite-rich bands also contain the bulk of the epidote, sphene and magnetite with minor dispersed aggregates of quartz grains.

This sample has closest similarities to 20262 with respect to textures and metamorphic history, although it contains much higher modal sericite and less chlorite. The very high sericite content combined with the presence of epidote, and absence of chlorite and albite is unusual, and suggests a peculiar very potassic whole-rock composition. This probably indicates some pre-deformation silicification and potassic hydrothermal alteration, possibly of a silicic volcanic.



LOCATION SYMBOLS
 + Location of Rock Chip sample
 x Location of Water sample

1:25000 SHEET LAYOUT

3445	3645	3945
3444	3644	3844
3443	3643	3843

070049
92-3312

GEOPEKO A DIVISION OF PEKO WALLSEND OPERATIONS LTD
A.C.N. 000 081 434

Scale 1:25000
 500 0 500 1000 1500 2000 2500m

PARKES Project / Tenure

Rec. Client. D. G.
 Carta. R. M. N.
 Checked
 Date 12/3/92
 Appended
 Job No. 82_92 100% Sheet 7915 DWG No. 2310

FOLLY 3644
SAMPLE LOCATIONS & NUMBER