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EL 40/89 "KEITH RIVER"

Relinquishment and Annual Report
December 1992 - December 1993

by
D GARDNER

Peko-Wallsend Operations Ltd
GEOPEKO DIVISION
ACN 000 081 434

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Base: Mount Isa
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RELINQUISHMENT AND ANNUAL REPORT
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D. GARDNER

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PROJECT ARTHUR RIVER
PROSPECT KEITH RIVER
STATE TASMANIA
COUNTRY AUSTRALIA
TENEMENT EL 40/89
COMPANY GEOPEKO

REPORT TITLE EL 40/89 KEITH RIVER RELINQUISHMENT REPORT AND
 DECEMBER 1992 - DECEMBER 1993

AUTHOR 1 GARDNER **INITIALS** D
AUTHOR 2 **INITIALS**
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IMPRINT MOUNT ISA
VOLUMES 1 **TABLES**
PAGES 9 **APPENDICES** 3
FIGURES 7

COMMODITIES Au, Cu, Pb, Zn.
KEYWORDS WATER SAMPLING, ARTHUR LINEAMENT.

LOCALITY (Nearest Town) BURNIE

REPORT DATE DECEMBER 1993

1: 250 000 SHEET NO. SK 55-3 **NAME** BURNIE
 1: 100 000 SHEET NO. 7915 **NAME** ARTHUR RIVER

LATITUDE 41 ° 13 ' S **LONGITUDE** 145 ° 25 '

HARDCOPY STORED AT MELBOURNE/MOUNT ISA
MICROFICHE STORED AT (orig) (Dup)
MICROFICHE NO.

ABSTRACT Water sampling and reconnaissance mapping highlighted an Au
 anomalous area with highly altered rocks nearby.

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SUMMARY

A regional water sampling program in EL 40/89 (commenced in 1991 - 92) was completed in the 1992-93 summer season as part of a larger program in Geopeko's Arthur Project ELs. Sampling and analytical techniques developed by the CSIRO were used to systematically sample drainages in the EL. Reconnaissance geological mapping and rockchip sampling were undertaken in conjunction with the water sampling.

Three water samples with anomalous Au, drain a common ridge system in the far south of the EL. This area is close to highly altered rocks that may have been subjected to granite sourced fluids at temperatures >500°C. No granites have been mapped, or inferred in previous work. The altered rocks are not anomalous in gold or base metals, however the highest Zn, Pb assay for a rockchip sample comes from near here.

Other anomalous water samples with high base metals are generally associated with a high solid component in the water and/or are streams draining known mineralised areas.

CONCLUSIONS

The regional water sampling and reconnaissance rockchip sampling and mapping has highlighted an area around 366000E 5429000N with anomalous gold in 3 water samples.

Although not a bullseye target, the combination of geology and geochemistry in the area, makes it extremely interesting. No systematic exploration is known to have been undertaken here previously.

It is worth noting that this area is pristine forest at the heart of the 'Tarkine Wilderness'. Possibly only one other party has been here. Thus the conservation value is extremely high, and the chance of developing a deposit or even carrying out a large drilling program for exploration is potentially very low.

Samples 23425 and 23426 have interesting, possibly anomalous Cu, Pb and Zn values which may or may not be due solely to the high proportion of solids in these water samples.

Most of EL has been covered by the water sampling technique and give no indication of anomalous metal values. A few areas on the Keith River have not been tested.

RECOMMENDATIONS

- 1) Follow up the anomalous samples in the south of the EL with more detailed water sampling, stream sediment sampling and geological mapping.
- 2) Reapply for the ground immediately south of the current EL boundary (the gold anomalies extend south of the current boundary), and carry out systematic water sampling in this poorly explored area.
- 3) Review data on the Keith River Prospect, Phil Jones (Gardner 1992, Appendix 2) says it would be worthwhile re-assaying some of the old holes for gold.
- 4) This project is still at a grass roots stage, and though results so far are interesting, drill targets are a long way from being defined. If it is unlikely to be funded consistently for several years, early relinquishment would be recommended. The EL's position in a wilderness area nominated for protection should also be reviewed before further work is undertaken.

1.0 INTRODUCTION

1.1 Location and Access

EL 40/89, Keith River (Fig. 1,2), is located in NW Tasmania approximately 10 km south west of the township of West Takone.

Access within the EL is poor and is restricted to unsealed logging roads in the north and east of the EL, and the Savage River Mines Pipeline Road on the western boundary.

The southern portion of the EL is largely inaccessible and access requires the use of cut walking tracks and helicopter support.

1.2 Tenure and Land Usage

EL 40/89 of 250 km² was granted to Peko Exploration Ltd in January 1990. Partial relinquishment occurred in June 1992 (fig 2).

The EL consists predominantly of Deferred Forest in the west and Multiple Use Forest in the east. The southern edge of the EL includes part of the Savage River, Australian Heritage Commission Act, Registered Entry.

Vegetation is generally comprised of wet eucalypt forest with a thick undergrowth. Buttongrass-tea tree plains occur along north-east trending ridge tops in the parts of the EL.

1.3 Regional Geology

EL 40/89 lies within the Rocky Cape Region of NW Tasmania, (Fig 3). The most interesting rocks in the area are those of the Cambrian - Precambrian 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 Precambrian 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 metasilstone.

The south eastern corner of the Arthur River Project Area is underlain by rocks of the Cleveland-Waratah Association that lie within the Dundas Trough. These rocks have been correlated with the Crimson Creek Formation and consist of basaltic, andesitic and tholeiitic lavas and volcanoclastic sediments of Eo-cambrian to Cambrian age.

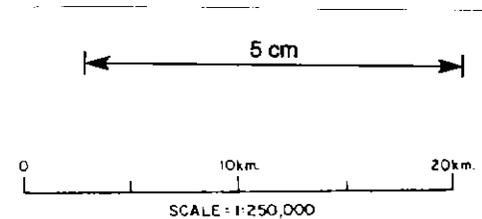
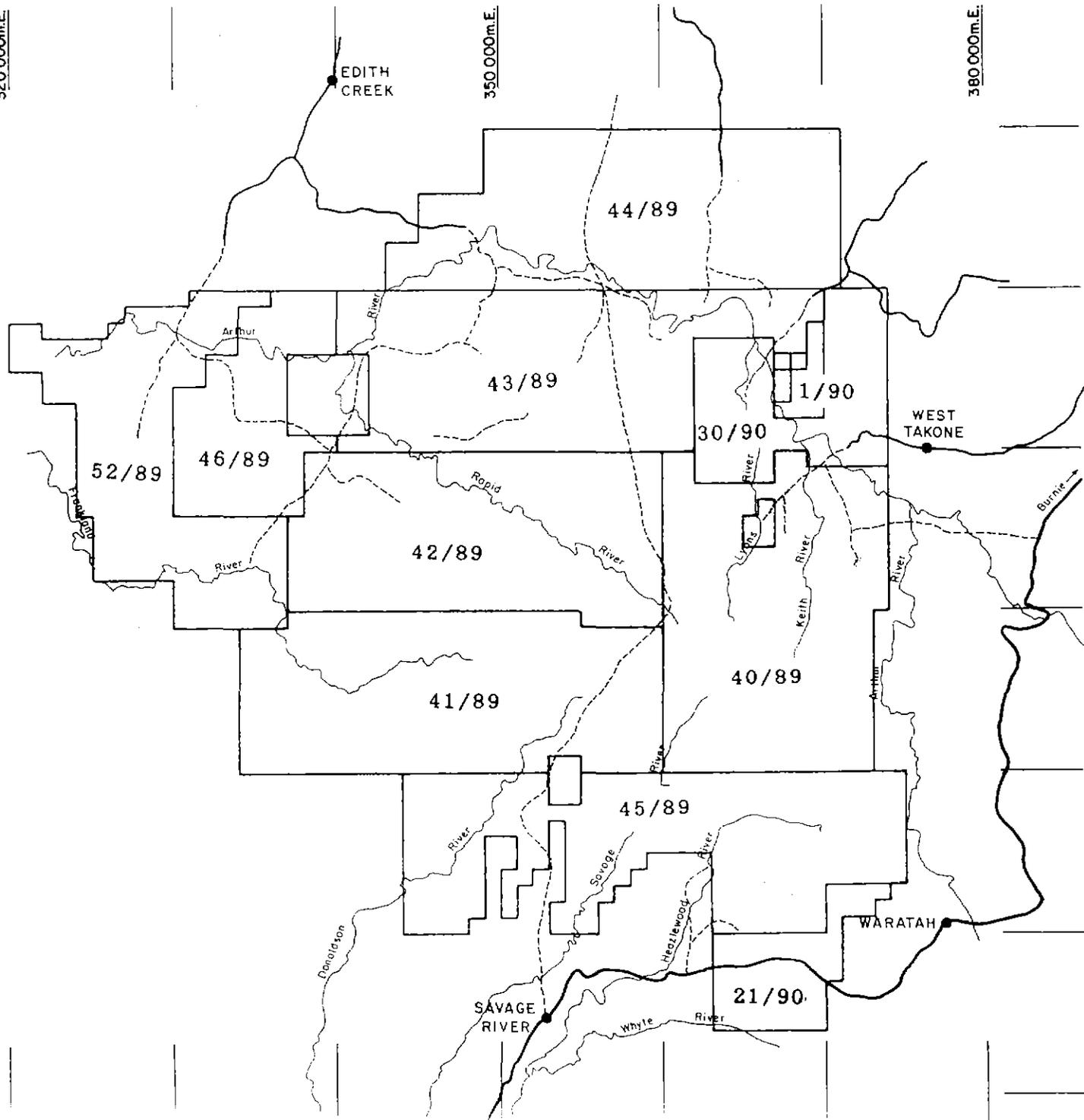
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5 430 000 m.N.

5 400 000 m.N.

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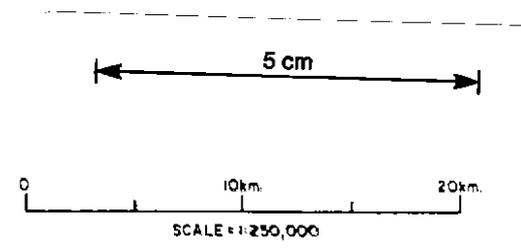
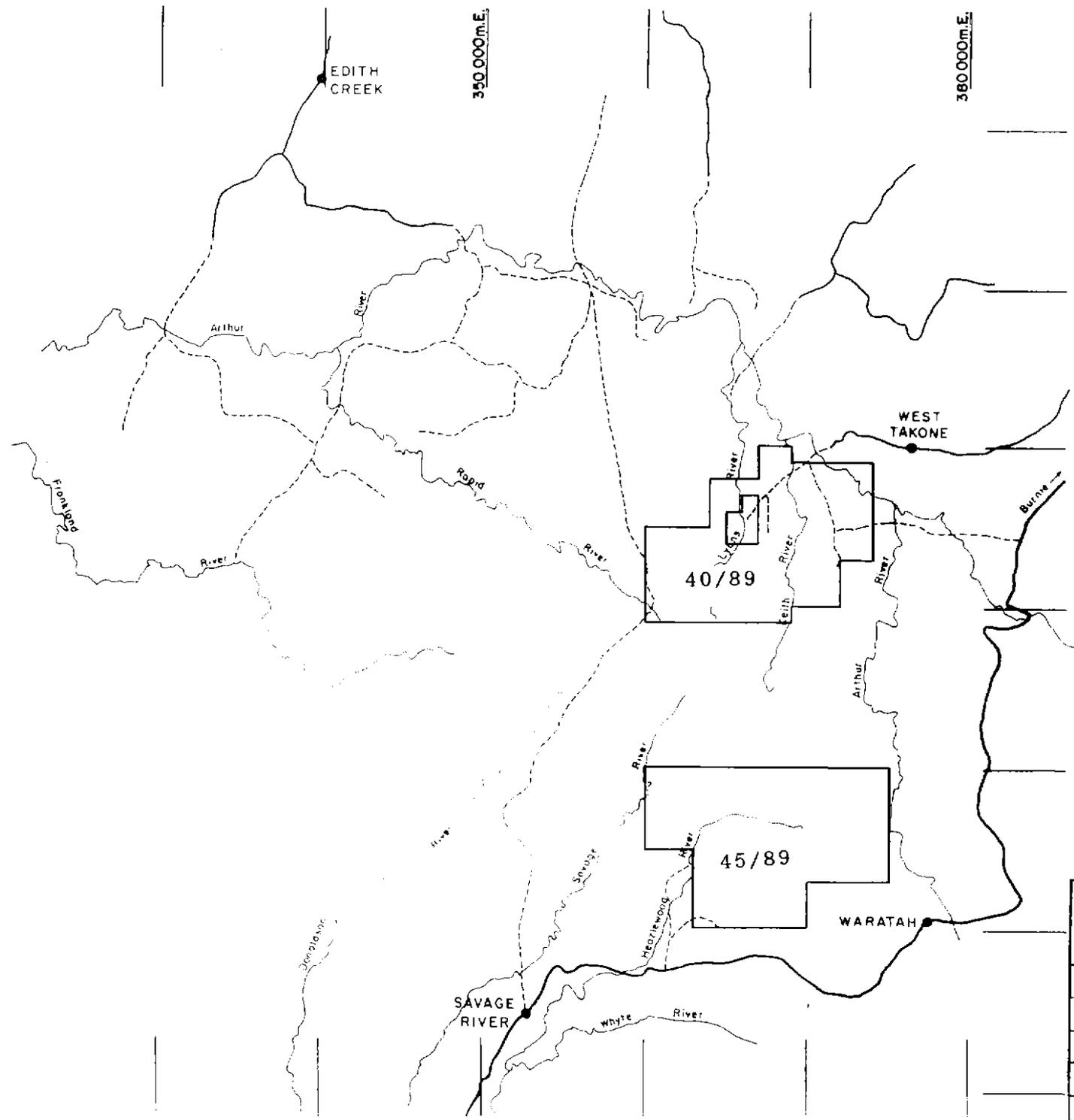
380 000m.E.



	GEOPEKO
	ARTHUR RIVER PROJECT
	ARTHUR RIVER PROJECT
	ACCESS / EL's
	Figure 1

917008

5 460 000 m.N.
320 000 m.E.
350 000 m.E.
380 000 m.E.
430 000 m.N.
400 000 m.N.



	GEOPEKO
	ARTHUR RIVER PROJECT
	ARTHUR RIVER PROJECT
	EL's at JUNE 1992
	Figure 2

947009

LEGEND

- Holocene
- Carboniferous
 - Cover Rocks, Alluvium.
 - Tertiary Basalts, Permian
 - Glacio Marine Sediments.

- Carboniferous
- Devonian
 - Granites.

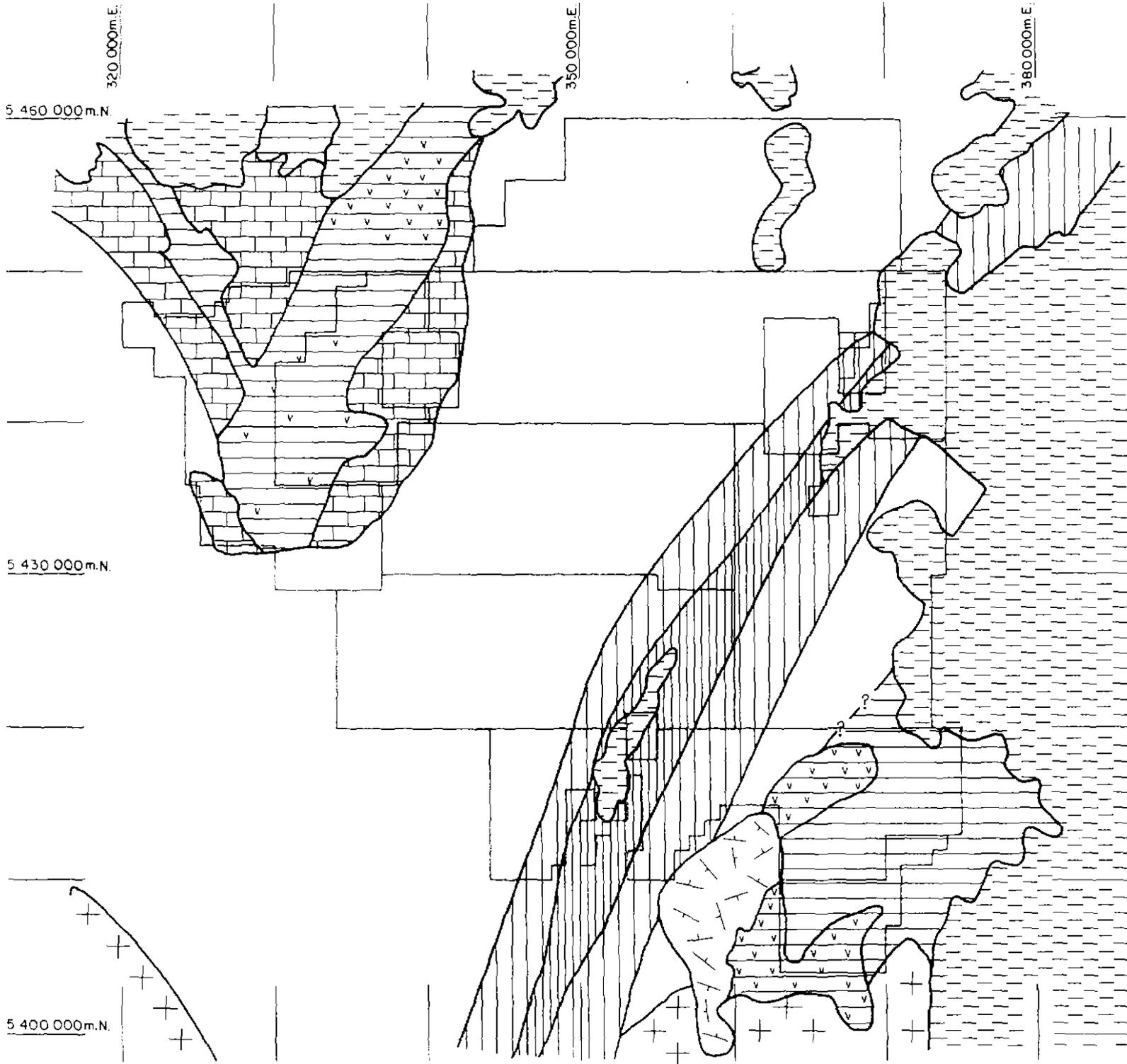
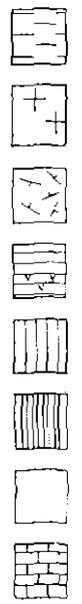
- Cambrian
 - Ultramafic bodies

- Cambrian
- Pre Cambrian
 - Sediments, usually Greywacke
 - turbidites, (with intermediate
 - volcanics, V V dominant).

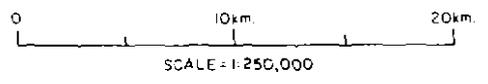
- Pre Cambrian
 - Metamorphic rocks, generally
 - quartz, mica, schist/phyllites
 - and quartzites.
 - With more mafic greenschist,
 - greenstone and amphibolite
 - rocks.

- Pre Cambrian
 - Mudstone - Sandstone Sequences
 - relatively unmetamorphosed.

- Dolomite sequences.



5 cm



GEOPEKO
ARTHUR RIVER PROJECT
ARTHUR RIVER PROJECT
REGIONAL GEOLOGY
Figure 3

947010

In places, the Precambrian-Cambrian rocks are 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. (Green et al 1988).

The deposits range from small, relatively insignificant workings, e.g. Victory Mine, Atlas Leases to large world class ore bodies e.g. Mount 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

Geopeko report T250 (Virgoe and Mathison, 1990), summarises previous exploration and details the results of Geopeko's 1990 exploration. Report T260 (Mathison, 1991) reports 1991 exploration. Report T267 (Mathison, 1992) details exploration in the relinquished part of EL40/89, T277 (Gardner, 1992) the retained portion. T276 (Gardner et al 1992) describes the overall water sampling program.

1.6 Scope of this report

The aim of Geopeko's exploration of EL 40/89, is to use water sampling, rock chip sampling, geological mapping and the results of previous exploration to delineate prospective and geochemically anomalous areas within the EL. Areas worthy of further investigation are to be followed up with more detailed exploration.

Due to major problems with the DMMR's analytical techniques for stream water geochemistry, little work was carried out in EL 40/89 in 1991. It was felt necessary to suspend exploration until these problems were corrected and consequently a waiver of expenditure commitment was sought and granted. Reconnaissance water sampling recommenced in December 1991. A temporary extension of the licence was negotiated to allow the results of 1991/1992 sampling to be evaluated. A part of EL 40/89 was relinquished in June 1992. This report summarises Geopeko's exploration activity in the retained portion of EL 40/89 from December 1992 to December 1993.

2.0 WORK COMPLETED

2.1 Water Geochemistry - Sample Collection and Analysis

Water sampling and analytical techniques developed by Angela Giblin (C.S.I.R.O. Div. Exploration Geoscience) were used for this seasons fieldwork (Gardner et al 1992)

Water samples were collected from streams with a drainage area between 1 and 5 km². Occasional check samples were collected from streams with drainage areas up to 10 km² including two or more other samples. At each sample site pH of the water, water colour, float geology, outcrop geology, and vegetation type were recorded. Possible contamination from roads, forestry operations, mines, or farms was noted. Sample sites were marked with numbered tags and flagging tape. Three water samples were collected from each site:

1. A 100 ml sample of raw stream water was collected in a new 125 ml polyethylene sample bottle. Cu, Pb, Cd and Zn were determined by ICP-MS and As by graphite furnace AAS.
2. Au was extracted from one litre of water in the field onto a sachet of activated charcoal. Au was determined by neutron activation at Becquerel Laboratories.
3. Cu, Pb and Cd were pre-concentrated on site by coprecipitation from one litre of water. Metal values were determined by CSIRO using voltammetry.(PDV)

All sample bottles were washed many times in the stream water before treating or collecting samples.

Fifty-five (55) water samples were collected from streams draining EL 40/89 covering most of the licence area. They were analysed as part of a set of 64 samples collected in the 1992-93 season and compared with the results of 195 samples collected in 1991-92. Samples were plotted on to the updated 1991/92 plans.

2.2 Rockchip Sampling

Eighty-seven (87) rockchip samples were collected during the water sampling program. These were analysed at Amdel Laboratories in Adelaide for Ag, Bi, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, P, Sb, V and Zn by ICP-OES. Au was determined by fire assay.

2.3 Track Clearing

The walking track east from the Rapid River Bridge on the Pipeline Road was extended by approximately 5 km to allow access to the southern part of EL 40/89. A helipad was cut on a scrubby knoll (plan 2058A, 365100E, 5429200N). The track and helipad conformed with exploration code of conduct guidelines and no large trees were felled during the operation.

3.0 RESULTS

3.1 Stream Water Geochemistry

Cumulative frequency plots of the 1991-92 data set (195 samples) identified the following levels as being possibly and probably anomalous.

Method	Element	(DL)	Possibly Anomalous	% of samples	Probably Anomalous	% of samples
PDV	Cu	0.1	>1.5 ppb	15	>3.0 ppb	5
PDV	Pb	0.05	>0.75 ppb	10	>1.4 ppb	3
GFAAS	As	0.01	>0.16 ppb	20	>0.3 ppb	2.5
ICPMS	Zn	0.1	>1.7 ppb	15	>3.0 ppb	5
NAA	Au	0.1	>0.1 ppt			

The preconcentrated analyses are considered to be more reliable than the raw analyses, as they are read higher on the instrument's scale and have fewer problems with near detection limit values.

No statistical analysis has been made of the 1992-93 data set (water sample data and analytical results are given in Appendix 1). Sample sites are plotted on plans 2309A and 2058A. The general tenor and range of results is similar to the 91-92 sets. Statistical treatment is complicated because 8% of the samples are repeats from a known anomalous area (these samples account for 50% of the above detection Au samples). From 'visual integration', the contrast between a background population and a number of elevated analyses is quite marked eg. for Cu (preconcentrated), (5% of samples > 3µg/L), Pb preconcentrated (6% samples > 2µg/L) and Zn (8% samples > 3µg/L).

A number of these high values are possibly spurious as there is a strong correlation between high Cu, Pb, Zn, a high solid component and high Mn, Co, Cr, Ni. It is likely that colloidal material with adsorbed metals is being analysed here as well as the stream water. Samples 23610, 11 & 12 (plan 2309A) cover areas near the mineralised Keith River Gossan.

Samples 23425 and 26 are near no known mineralisation but have very similar assay results to 23610, 11, 12 also with a high (45 ppt) solid component.

Without doubt, the most interesting result is in the gold geochemistry. Of the 55 samples, 4 are above detection and the three highest of these (samples 23622, 23628, 23438) drain the same ridge system (Plan 2058A). As with the Karilyn Creek/Monday Creek Anomaly in EL 45/89 the spatial consistency of the elevated values is impressive.

3.2 Rockchip Geochemistry

Eighty-five (85) samples were sent for analysis (see appendix 2). Two samples returned possibly anomalous base metal results, 23324 assayed 470ppm Pb, 550ppm Zn and 23705 assayed 810ppm Pb, 1660ppm Zn. 23324 had 26.7% Fe and 5900ppm Mn and 195ppm Co suggesting scavenging may account for the elevated Pb and Zn. It is from a weathered schistose unit near the Keith River mineralisation. Sample 23705 is not high in Fe, Mn or Co and occurs near no known mineralisation. It comes from an iron stained outcrop of mica quartz schist just north of the three anomalous gold samples on a tributary of Rohani Creek.

Gold results were poor, the only sample greater than 0.02ppm being 23307 (0.08ppm Au). 5 samples have 0.02ppm Au. Two of these are round the Au anomalous water samples.

3.3 Geology

Float and outcrop geology were recorded at all water sample sites and as often between sites as time allowed. Fact mapping and a broad interpretation is given in plans 2309B and 2058B.

Tertiary basalt cover is widespread and judging by the float there are certainly Tertiary gravels under the basalts in many places. These are possible sources of spurious gold results. The other post Cambrian rock are Permian glacio-marine sediments extending south into the central northern part of the EL.

Precambrian (-Cambrian?) rocks are generally mica, quartz, schists; with a well developed NE-ESE foliation. Some black shales and quartzites occur with the schists.

Within this sequence sits a similar but generally more mafic collection of lithologies described as green schists and greenstones. Some definitely have mafic precursors such as samples 23093 and 23707 (see Appendix 3). Other samples such as 23089 (Appendix 3) were probably sediments that now have a significant chlorite component making them look "greener". There is probably a slightly higher grade of regional metamorphism in this zone compared to the rocks to the east and west. The dolomite magnesite horizon containing the Lyons River and Arthur River magnesite deposits (\pm Au mineralisation) was not seen to the south-west but it quite possibly exists under the extensive basalt cover.

It is interesting that Dr Crawford, in his petrographic descriptions (Appendix 3) correlates sample 23707 with Crimson Creek Formation basalts and dolerites. This would support the idea that the Arthur Lineament is younger than the flanking Pre Cambrian sediments and contains PreCambrian to early Cambrian aged rocks

The most unusual lithologies found in the area occur in Rohani Creek. Outcropping over at least 100m are strongly silicified rocks with up to 5% pyrite locally. Samples 23709-12, 23715, 23717-28 were taken in this area. Samples 23720 and 23721 sent for petrography (Appendix 3) are described as coarse sandstones - conglomerates which have suffered intense hydrothermal alteration, probably by granite derived solutions (both samples have silica tourmaline magnetite alteration assemblages).

These rocks outcrop in a creek that was too large to water sample. The nearest tributary of Rohani Creek (sample 23438) however, is one of the three gold anomalous samples draining a common ridge. The outcrop samples themselves do not have elevated assay values for either gold or base metals.

Phil Jones (Gardner 1992, Appendix 2), describes the Rapid River Structural Discontinuity Zone, a NW-SE feature across which the "gross character of the Arthur Lineament changes from uranium rich and magnetically intense to the south and thorium rich and magnetically subdued to the north". He indicates that this "fundamental structure" passes very close to the granite altered rocks in Rohani Creek and the Au anomalous drainages.

4.0 CONCLUSIONS

The regional water sampling and reconnaissance rockchip sampling and mapping has highlighted an area around 366000E 5429000N with anomalous gold in three water samples.

Although not a bullseye target, the combination of geology and geochemistry in the area, makes it extremely interesting. No systematic exploration is known to have been undertaken here previously.

It is worth noting that this area is pristine forest at the heart of the 'Tarkine Wilderness'. Possibly only one other party has been here. Thus the conservation value is extremely high, and the chance of developing a deposit or even carrying out a large drilling program for exploration is potentially very low.

Samples 23425 and 23426 have interesting, possibly anomalous Cu, Pb and Zn values which may or may not be due solely to the high proportion of solids in these water samples.

Most of the EL has been covered by the water sampling technique and give no indication of anomalous metal values. A few areas on the Keith River have not been tested.

5.0 RECOMMENDATIONS

- 1) Follow up the anomalous samples in the south of the EL with more detailed water sampling, stream sediment sampling and geological mapping.
- 2) Reapply for the ground immediately south of the current EL boundary (the gold anomalies extend south of the current boundary), and carry out systematic water sampling in this poorly explored area.
- 3) Review data on the Keith River Prospect, Phil Jones (Gardner 1992, Appendix 2) says it would be worthwhile re-assaying some of the old holes for gold.
- 4) This project is still at a grass roots stage, and though results so far are interesting, drill targets are a long way from being defined. If it is unlikely to be funded consistently for several years, early relinquishment would be recommended. The EL's position in a wilderness area nominated for protection should also be reviewed before further work is undertaken.

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APPENDICES

Abbreviations usedTertiary Basalt

Tb

Carboniferous - Permian Wynyard Tillite

C-Pwt

Precambrian - Cambriansediments

Ssst sandstone
 Sgwk greywacke
 Sslt siltstone
 Sdol dolomite
 Ssha shale
 Smst mudstone

volcanics

Volc volcanic
 tuff tuff

Mineralogy

qtz quartz
 fs feldspar
 Fe iron
 py pyrite
 ser sericite
 chl chlorite
 si siliceous

metamorphics

Hsch schist
 Mphy phyllite
 Mgnst greenstone
 Mgnsch greenschist
 Msla slate

others

U/m ultramafic
 int intrusive

Textures

vn vein
 lam laminated
 stn stain
 wth weathered
 clvd cleaved
 foln foliation
 mas massive
 bx brecciated
 strg strongly
 m medium

Colour

bk black
 wh white
 gn green
 gy grey
 yl yellow
 bn brown
 dk dark
 pl pale

APPENDIX 1
WATER SAMPLE DATA AND ANALYSES

ARTHUR RIVER PROJECT - 1992-93 WATER SAMPLES

SAMPLE NUMBER	23627	DATE	06.02.1993	EL40/89	MAP	BARETOP
VEGETATION	RAIN FOREST	AMG COORDS.	364539	mE	5429373	mN
STREAM FLOW	MODERATE	CONTAMINATION FROM	NONE			
LEVEL	AVERAGE	WATER COLOUR	WEAK BROWN			
WIDTH	1.0m	PH	7.50			
DIRECTION	0°	DRAINAGE AREA	1.3 km ²			
GEOLOGY						
OUTCROP	Blue gy mica schist	FLOAT	80 % Msch			
			20 % Qtz			
	cf 23163		0 %			

12.12.1993

947041

TABLE 1

Page 1
Tasmanian River Water- Data

Sample No.	Precipitate Condition	% stream solids in ppt.	Au ng/l	As ug/l	Cd ug/l precon	Cd ug/l orig	Cu ug/l precon	Cu ug/l orig
23411	Lht Brown	25	<1.0	0.15	<0.005	<0.2	0.32	<0.2
23412	Brown	20	<1.0	0.17	<0.005	<0.2	0.49	<0.2
23413	Brown	30	<1.0	0.14	0.006	<0.2	0.55	0.2
23414	Lht Brown	20	<1.0	0.13	<0.005	<0.2	0.40	<0.2
23415	Drk Tan	10	<1.0	0.14	0.007	<0.2	0.40	<0.2
23416	Drk Tan	10	<1.0	0.17	<0.005	<0.2	0.36	<0.2
23417	Drk Brown	10	<1.0	0.19	<0.005	<0.2	0.49	<0.2
23418	Brown	10	<1.0	0.12	0.005	<0.2	0.52	<0.2
23419	Brown	10	<1.0	0.08	<0.005	<0.2	0.34	<0.2
23420	Brown	30	<1.0	0.08	<0.005	<0.2	0.57	<0.2
23421	Drk Tan	40	<1.0	0.12	<0.005	<0.2	0.36	<0.2
23422	Lht Brown	30	<1.0	0.14	<0.005	<0.2	0.26	<0.2
23423	Brown	20	<1.0	0.20	<0.005	<0.2	0.36	<0.2
23424	Cream	20	<1.0	0.39	0.009	<0.2	0.32	<0.2
23425	Cream	45	<1.0	0.13	<0.005	<0.2	0.80	<0.2
23426	Brown-green	45	<1.0	0.07	0.023	<0.2	4.50	0.5
23427	Tan	10	<1.0	0.19	0.010	<0.2	0.56	0.4
23428	Brown	10	<1.0	0.13	0.010	<0.2	0.58	0.6
23429	Brown	20	<1.0	0.13	0.019	<0.2	0.60	0.9
23430	Tan	10	<1.0	0.25	<0.005	<0.2	0.50	0.8
23431	Cream	10	<1.0	0.20	<0.005	<0.2	0.40	0.6
23432	Cream	20	<1.0	0.09	<0.005	<0.2	0.40	0.7
23433	Cream	20	<1.0	0.13	0.007	<0.2	0.30	0.5
23434	Cream	20	<1.0	0.14	<0.005	<0.2	0.36	0.6
23435	Cream	10	<1.0	0.20	0.005	<0.2	0.35	0.7
23436	Cream	20	<1.0	0.15	<0.005	<0.2	0.20	0.4
23437	Brown	5	<1.0	0.22	<0.005	<0.2	0.42	0.7
23438	Brown	20	2.6	0.13	<0.005	<0.2	0.42	0.5
23601	Cream	20	<1.0	0.13	<0.005	<0.2	0.74	0.3
23602	Tan	30	<1.0	0.11	<0.005	<0.2	0.69	0.9
23603	Lht Brown	20	<1.0	0.09	<0.005	<0.2	0.68	0.6
23604	Cream	20	<1.0	0.09	0.008	<0.2	0.60	0.6
23605	Cream	20	<1.0	<0.05	<0.005	<0.2	0.56	0.6
23606	Tan	20	<1.0	0.06	<0.005	<0.2	0.48	0.6
23607	Brown	10	<1.0	0.24	0.007	<0.2	0.66	1.0

Note when stream solids are high all trace elements measured by preconcentration method are also high due to contributions from stream solids

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TABLE 1

Page 2
Tasmanian River Water-Data

Sample No.	Pb ug/l preconc	Pb ug/l orig	Zn ug/l preconc	Zn ug/l orig	U ug/l preconc	U ug/l orig
23411	0.16	<0.2	1.10	<1.0	0.014	<0.2
23412	0.42	<0.2	1.00	<1.0	0.009	<0.2
23413	0.46	<0.2	1.20	2.3	0.022	<0.2
23414	0.20	<0.2	0.90	<1.0	<0.005	<0.2
23415	0.15	<0.2	0.81	<1.0	0.005	<0.2
23416	0.48	0.3	1.70	<1.0	0.010	<0.2
23417	0.49	0.3	1.60	<1.0	0.020	<0.2
23418	0.41	0.2	1.30	<1.0	0.020	<0.2
23419	0.09	<0.2	0.81	<1.0	0.009	<0.2
23420	0.19	<0.2	1.20	<1.0	<0.005	<0.2
23421	0.21	<0.2	0.62	<1.0	<0.005	<0.2
23422	0.10	<0.2	0.49	<1.0	<0.005	<0.2
23423	0.31	<0.2	1.00	<1.0	0.022	<0.2
23424	0.20	<0.2	0.90	<1.0	<0.005	<0.2
23425	0.29	0.3	2.30	1.9	0.010	<0.2
23426	1.30	<0.2	10.0	1.1	0.090	<0.2
23427	3.70	<0.2	1.50	1.5	0.026	<0.2
23428	0.65	0.2	1.10	1.4	0.008	<0.2
23429	0.35	<0.2	2.80	3.0	0.007	<0.2
23430	0.35	<0.2	1.00	1.5	0.040	<0.2
23431	0.15	<0.2	0.74	1.6	0.018	<0.2
23432	0.05	<0.2	0.76	<1.0	<0.005	<0.2
23433	0.11	<0.2	1.00	1.3	<0.005	<0.2
23434	0.42	<0.2	0.60	1.1	0.020	<0.2
23435	0.18	<0.2	0.76	2.1	<0.005	<0.2
23436	0.03	0.4	1.00	1.8	0.060	0.1
23437	0.14	<0.2	0.80	1.5	0.020	<0.2
23438	0.11	<0.2	1.10	1.8	0.009	<0.2
23601	0.06	<0.2	1.40	0.7	0.010	<0.2
23602	0.23	<0.2	2.50	1.8	0.008	<0.2
23603	0.20	<0.2	1.60	1.6	0.008	<0.2
23604	0.27	<0.2	1.60	3.8	0.008	<0.2
23605	0.09	<0.2	1.30	2.9	0.013	<0.2
23606	0.22	<0.2	1.00	1.4	0.012	<0.2
23607	0.23	0.3	2.00	2.4	0.013	<0.2

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TABLE 1

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Tasmanian River Water-Data

Sample No.	Mn ug/l preconc	Mn ug/l orig preconc	Co ug/l	Co ug/l orig preconc	Cr ug/l	Cr ug/l orig preconc	Ni ug/l preconc	Ni ug/l orig
23411	8.7	2.3	0.15	<0.2	0.41	1.1	0.36	0.2
23412	5.1	4.0	0.11	<0.2	1.10	1.8	0.51	0.8
23413	14.0	15	0.26	0.4	1.10	1.7	0.49	0.6
23414	7.3	1.8	0.18	<0.2	0.68	1.2	0.55	0.6
23415	8.0	2.1	0.24	<0.2	0.94	1.3	0.73	0.8
23416	6.3	5.8	0.15	0.3	0.92	1.4	0.55	0.5
23417	15.0	15	0.22	0.4	1.30	2.0	0.53	0.6
23418	9.3	9.3	0.15	0.2	1.40	1.8	0.59	0.6
23419	12.0	2.4	0.23	<0.2	1.10	1.4	0.70	1.2
23420	23.0	2.9	0.47	<0.2	1.20	1.2	1.10	0.8
23421	14.0	1.1	0.20	<0.2	0.40	0.8	0.25	0.3
23422	4.8	0.9	0.17	<0.2	0.92	1.0	0.56	0.4
23423	26.0	27	0.31	0.4	0.60	1.1	0.48	0.5
23424	7.1	0.7	0.11	<0.2	0.90	1.4	0.52	0.5
23425	39.0	2.9	1.10	<0.2	2.70	1.0	2.30	0.8
23426	194	2.1	6.50	<0.2	12.0	0.6	7.00	0.8
23427	8.7	1.4	0.12	<0.2	0.42	0.4	0.63	0.6
23428	9.0	1.3	0.16	<0.2	1.00	0.9	0.64	0.7
23429	8.8	1.3	0.14	<0.2	1.80	1.4	1.10	1.1
23430	21.0	3.1	0.26	<0.2	0.51	0.6	0.70	1.1
23431	15.0	19	0.23	<0.2	0.70	1.0	0.75	0.7
23432	13.0	2.5	0.30	<0.2	1.10	0.9	1.10	0.7
23433	9.5	3.5	0.24	<0.2	0.80	0.9	1.90	2.0
23434	6.7	4.4	0.15	<0.2	1.00	0.9	0.60	0.5
23435	4.7	1.2	0.07	<0.2	0.56	0.9	0.66	0.7
23436	5.0	1.0	0.07	<0.2	0.10	0.6	0.80	0.9
23437	20.0	3.7	0.19	<0.2	0.40	0.7	0.53	0.5
23438	14.0	13	0.34	0.3	1.80	1.7	1.10	1.0
23601	20.0	0.8	0.62	<0.2	2.00	0.6	1.80	0.4
23602	24.0	2.5	0.69	<0.2	2.00	1.0	1.90	0.8
23603	31.0	2.6	0.77	<0.2	2.00	0.9	2.00	0.8
23604	12.0	0.8	0.24	<0.2	0.53	0.5	0.71	0.5
23605	9.3	4.9	0.26	<0.2	0.81	0.6	0.77	0.5
23606	12.0	2.6	0.21	<0.2	0.60	0.8	0.43	0.4
23607	6.9	5.8	0.14	<0.2	1.60	1.5	0.78	0.7

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TABLE 1

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Tasmanian River Water-Data

Sample No.	V ug/l preconc	V ug/l orig	Al ug/l preconc	Fe ug/l preconc
23411	0.27	0.3		
23412	0.28	0.3		
23413	0.41	0.7		
23414	0.55	0.5		
23415	0.93	0.5		
23416	0.47	0.9		
23417	0.38	0.6		
23418	0.44	0.4		
23419	0.94	0.9		
23420	1.50	1.0		
23421	0.75	0.4		
23422	0.90	0.4		
23423	0.25	0.5		
23424	0.44	0.4		
23425	3.20	1.7	910	1200
23426	15.0	1.0	3800	6200
23427	0.37	0.3		
23428	0.31	0.2		
23429	0.47	0.4		
23430	0.32	0.4		
23431	0.56	0.8		
23432	1.20	0.8		
23433	0.55	0.6		
23434	0.45	0.4		
23435	0.24	0.4		
23436	0.16	0.3		
23437	0.21	<0.2		
23438	0.87	0.8		
23601	2.70	0.8		
23602	2.60	1.0		
23603	2.60	1.0		
23604	0.62	0.3		
23605	0.69	0.4		
23606	0.25	0.4		
23607	0.40	0.6		

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TABLE 1

Page 1 CONTINUED
Tasmanian River Water-D: Data

Sample No.	Precipitate Condition	% stream solids in ppt.	Au ng/l	As ug/l	Cd ug/l precon	Cd ug/l orig	Cu ug/l preconc	Cu ug/l orig
23608	Cream	5	<1.0	0.12	<0.005	<0.2	0.42	0.3
23609	Tan	10	<1.0	0.23	0.009	<0.2	0.80	1.1
23610	Brown	40	<1.0	0.39	0.009	<0.2	1.10	1.2
23611	Drk Brown	45	<1.0	0.13	0.080	<0.2	6.70	1.6
23612	Drk Brown	45	<1.0	0.11	0.053	<0.2	6.00	0.9
23613	Tan	40	<1.0	0.09	0.010	<0.2	0.82	1.2
23614	Brown	40	<1.0	0.11	0.010	<0.2	0.71	0.7
23615	Brown	5	<1.0	0.17	<0.005	<0.2	0.77	0.9
23616	Lgh Brown	30	<1.0	0.11	<0.005	<0.2	0.71	0.7
23617	Drk Tan	20	<1.0	0.12	0.006	<0.2	0.72	0.7
23618	Drk Tan		<1.0	0.43	0.006	<0.2	0.60	0.9
23619	Drk tan	10	<1.0	0.16	<0.005	<0.2	0.60	0.6
23620	Drk Tan	20	<1.0	0.12	0.005	<0.2	0.44	0.6
23621			<1.0	0.16	<0.005	<0.2	0.44	0.6
23622	Drk Brown-green	10	3.3	0.23	<0.005	<0.2	0.47	0.7
23623	Tan	20	<1.0	0.16	0.005	<0.2	0.48	0.7
23624	Brown	30	<1.0	0.14	0.013	<0.2	0.91	1.1
23625	Drk Brown	30	1.6	0.20	0.020	<0.2	0.85	1.0
23626	Drk Brown	5	<1.0	0.42	<0.005	<0.2	0.60	1.4
23627	Tan	10	2.6	0.18	<0.005	<0.2	0.51	0.7

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TABLE 1

Page 2 CONTINUED
Tasmanian River Water-Data

Sample No.	Pb ug/l precon	Pb ug/l orig	Zn ug/l precon	Zn ug/l orig	U ug/l precon	U ug/l orig
23608	3.90	<0.2	1.50	1.0	<0.005	<0.2
23609	0.24	<0.2	2.10	2.4	0.007	<0.2
23610	1.50	0.2	5.20	4.3	0.040	<0.2
23611	5.50	0.4	30.0	3.6	0.230	<0.2
23612	2.90	<0.2	19.0	2.4	0.165	<0.2
23613	0.55	0.6	1.40	1.3	<0.005	<0.2
23614	0.37	<0.2	1.50	1.9	0.007	<0.2
23615	0.23	<0.2	0.92	2.0	0.025	<0.2
23616	0.18	<0.2	0.88	1.2	0.012	<0.2
23617	0.13	<0.2	0.94	0.8	<0.005	<0.2
23618	0.27	0.2	1.10	1.3	0.026	<0.2
23619	0.15	<0.2	1.00	1.0	0.007	<0.2
23620	0.13	<0.2	0.75	1.0	0.007	<0.2
23621	0.10	<0.2	1.10	2.7	0.009	<0.2
23622	0.40	0.4	1.60	3.5	0.026	<0.2
23623	0.06	<0.2	0.99	1.7	0.005	<0.2
23624	0.66	0.5	3.70	5.2	0.024	<0.2
23625	0.66	0.4	2.10	2.2	0.026	<0.2
23626	0.61	0.6	1.30	2.1	0.029	<0.2
23627	0.19	<0.2	0.61	1.2	<0.005	<0.2

TABLE 1

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Page 3 CONTINUED
Tasmanian River Water-Data

Sample No.	Mn	Mn	Co	Co	Cr	Cr	Ni	Ni
	ug/l preconc	ug/l orig	ug/l preconc	ug/l orig	ug/l preconc	ug/l orig	ug/l preconc	ug/l orig
23608	4.2	0.4	0.04	<0.2	0.13	0.4	0.24	0.2
23609	63	6.8	0.27	<0.2	0.34	0.5	1.30	0.6
23610	160	11	1.00	<0.2	1.40	1.0	2.00	1.3
23611	442	2.0	12.00	<0.2	11.0	0.8	16.0	1.7
23612	287	1.2	8.50	<0.2	20.0	1.0	18.0	1.5
23613	18.0	0.9	0.29	<0.2	2.40	1.1	1.60	0.7
23614	16.0	1.2	0.23	<0.2	1.70	1.2	0.98	0.9
23615	11.0	10	0.32	0.2	1.20	1.2	0.93	0.7
23616	14.0	2.4	0.49	<0.2	2.60	1.7	1.60	1.0
23617	19.0	4.0	0.68	<0.2	2.20	1.5	1.60	1.1
23618	13.0	6.0	0.32	<0.2	1.50	1.3	1.00	0.7
23619	11.0	4.0	0.36	<0.2	3.10	2.3	1.50	1.1
23620	7.7	3.9	0.22	<0.2	1.60	1.3	0.93	0.6
23621	10.0	2.4	0.42	<0.2	1.10	0.8	1.20	0.8
23622	30.0	27	0.47	0.4	1.40	1.4	0.66	0.7
23623	12.0	3.9	0.33	<0.2	1.00	1.0	1.20	0.9
23624	24.0	20	0.39	0.3	1.20	1.1	0.66	0.6
23625	27.0	17	0.41	0.2	1.80	1.4	0.84	0.5
23626	18.0	16	0.40	0.3	1.70	1.6	0.74	0.6
23627	15.0	3.0	0.30	<0.2	1.50	1.4	0.89	0.5

TABLE 1

Page 4 CONTINUED
Tasmanian River Water Data

Sample No.	V ug/l preconc	V ug/l orig	Al ug/l preconc	Fe ug/l preconc
23608	0.34	0.5		
23609	0.57	0.4	112	520
23610	2.10	0.9	853	2460
23611	12.0	0.5	4650	12300
23612	19.0	0.9	5360	9610
23613	0.95	0.4		
23614	0.67	0.4		
23615	0.49	0.5		
23616	2.60	1.3		
23617	2.40	1.4		
23618	0.66	0.6		
23619	1.40	1.1		
23620	0.77	0.6		
23621	0.73	0.5		
23622	0.56	0.8		
23623	0.00	0.5		
23624	0.55	0.5		
23625	0.74	0.6		
23626	0.76	0.9		
23627	0.52	0.4		

APPENDIX 2
ROCKCHIP SAMPLE DATA AND ANALYSES

11.69

ARTHUR RIVER PROJECT - ROCK SAMPLE DESCRIPTIONS
REGIONAL ROCK CHIP SAMPLING - KEITH SHEET

NUMBER	TYPE	AMG COORDS	
		EAST	NORTH
23074	O/C	366324	5434725
23075	FLOAT	366367	5434598
23076	FLOAT	366367	5434596
23077	FLOAT	366606	5434569
23078	FLOAT	366606	543469
23079	O/C	366530	5434406
23080	FLOAT	366631	5434048
23081	O/C	366562	5434114
23082	FLOAT	366202	5435339
23083	O/C	363441	5432156
23084	O/C	364187	5432021
23085	O/C	364300	5431684
23086	O/C	363970	5432008
23087	O/C	364155	5432354
23088	O/C	364708	5436894
23089	FLOAT	364386	5436868
23090	O/C	364017	5436305
23091	O/C	364457	5436795
23092	O/C	364854	5437051
23093	O/C	365543	5437584
23094	O/C	368876	5435903
23095	O/C	369414	5435812
23096	O/C	369870	5435974
23097	O/C	370042	5435852
23098	O/C	363605	5436133
23099	O/C	362916	5436319

ARTHUR RIVER PROJECT - ROCK SAMPLE DESCRIPTIONS
REGIONAL ROCK CHIP SAMPLING - KEITH SHEET

NUMBER	TYPE	AMG COORDS	
		EAST	NORTH
23152	FLOAT	371067	5434465
23153	O/C	371084	5434583
23154	FLOAT	370346	5435207
23307	O/C	365064	5435766
23308	O/C	368675	5437555
23309	FLOAT	368935	5437115
23310	FLOAT	368987	5437081
23311	FLOAT	369413	5436821
23312	O/C	369181	5436790
23313	FLOAT	370300	5438015
23314	O/C	365541	5437824
23315	O/C	367467	5439842
23316	FLOAT	366774	5437127
23317	FLOAT	366800	5436947
23318	O/C	370327	5439906
23319	O/C	370327	5439906
23320	O/C	370327	5439906
23321	O/C	370327	5439906
23322	O/C	369826	5439293
23323	O/C	369826	5439293
23324	O/C	368867	5438880
23325	O/C	368867	5438880
23326	O/C	372732	5437952
23327	O/C	372166	5438556
23328	O/C	372245	5438626
23705	O/C	366618	5430098

11.69

ARTHUR RIVER PROJECT - ROCK SAMPLE DESCRIPTIONS
REGIONAL ROCK CHIP SAMPLING - BARETOP SHEET

NUMBER	TYPE	AMG COORDS	
		EAST	NORTH
23155	FLOAT	365922	5427726
23156	O/C	364234	5426834
23157	FLOAT	367222	5429341
23158	O/C	367241	5429412
23159	O/C	367084	5428599
23160	O/C	364095	5429806
23161	FLOAT	364045	5429436
23162	O/C	364232	5429304
23163	O/C	364489	5429367
23701	O/C	367596	5426922
23702	FLOAT	367909	5426939
23703	O/C	368312	5426968
23704	O/C	367988	5426914
23707	O/C	365103	5429612
23708	O/C	365018	5429440
23709	O/C	366615	5428432
23710	O/C	366615	5428432
23711	O/C	366615	5428432
23712	O/C	366615	5428432
23713	O/C	367116	5428725
23714	FLOAT	368941	5428394
23715	O/C	366615	5428432
23716	FLOAT	369074	5429152
23717	O/C	366615	5428432
23718	FLOAT	366615	5428432

ARTHUR RIVER PROJECT - ROCK SAMPLE DESCRIPTIONS
REGIONAL ROCK CHIP SAMPLING - BARETOP SHEET

NUMBER	TYPE	AMG COORDS	
		EAST	NORTH
23719	FLOAT	366615	5428432
23720	O/C	366615	5428432
23721	O/C	366615	5428432
23722	FLOAT	366615	5428432
23723	O/C	366615	5428432
23724	FLOAT	366615	5428432
23725	FLOAT	366615	5428432
23726	FLOAT	366615	5428432
23727	O/C	366615	5428432
23728	O/C	366615	5428432

ANALYTICAL REPORT

Job: 3AD0603

O/N: 50086

Sample	Ag	As	Bi	Cd	Co	Cu	Fe
23074	<0.5	7	<5	<1	24	32	3.96
23075	<0.5	4	<5	<1	4	10	1.61
23076	<0.5	22	<5	<1	5	6	1.32
23077	<0.5	7	<5	<1	38	74	7.25
23078	<0.5	6	<5	<1	50	72	6.55
23079	<0.5	5	<5	<1	5	7	2.24
23080	<0.5	5	<5	<1	6	50	4.70
23081	<0.5	1	<5	<1	<2	3	0.56
23082	<0.5	4	<5	<1	7	48	3.74
23083	<0.5	2	<5	<1	9	9	5.75
23084	<0.5	1	<5	<1	15	18	2.54
23085	<0.5	3	<5	<1	14	24	3.08
23086	<0.5	2	<5	<1	8	14	2.56
23087	<0.5	<1	<5	<1	3	8	0.70
23088	<0.5	5	<5	<1	20	135	4.60
23089	<0.5	4	<5	<1	38	82	4.30
23090	<0.5	2	<5	<1	42	130	7.05
23091	<0.5	4	<5	<1	26	120	4.56
23092	<0.5	<1	<5	<1	24	24	3.24
23093	<0.5	4	<5	<1	34	140	5.40
23094	<0.5	24	<5	<1	16	30	1.36
23095	<0.5	<1	<5	<1	35	13	5.10
23096	<0.5	14	<5	<1	<2	16	2.52
23097	<0.5	18	<5	<1	14	18	2.64
23098	<0.5	<1	<5	<1	16	15	2.44
23099	<0.5	8	<5	<1	11	19	2.36
23153	<0.5	5	<5	<1	7	20	0.39
23154	<0.5	<1	<5	<1	8	17	1.77
23155	<0.5	1	<5	<1	<2	<2	0.20
23156	<0.5	2	<5	<1	54	6	2.86
23157	<0.5	3	<5	<1	9	12	3.10
23158	<0.5	<1	<5	<1	11	6	1.60
23159	<0.5	10	<5	<1	17	48	2.28
23160	<0.5	2	<5	<1	8	13	2.58
23161	<0.5	<1	<5	<1	6	8	2.10
23162	<0.5	19	5	1	25	62	5.75
23163	<0.5	8	<5	1	92	8	2.10
23307	<0.5	240	5	2	5	6	18.1
23308	<0.5	6	<5	<1	6	24	2.52
23309	<0.5	5	<5	<1	28	100	5.55
23310	<0.5	5	<5	<1	16	9	1.21
23311	<0.5	2	<5	<1	6	18	1.97
23312	<0.5	<1	5	1	115	64	9.40
23313	<0.5	1	<5	<1	3	12	0.47
23314	<0.5	<1	<5	<1	12	74	2.46
Units	ppm	ppm	ppm	ppm	ppm	ppm	%
DL	0.5	1	5	1	2	2	0.01
Scheme	IC2E						

ANALYTICAL REPORT

Sample	Ag	As	Bi	Cd	Co	Cu	Fe
23315	<0.5	3	<5	<1	11	20	2.46
23318	<0.5	4	<5	<1	11	42	2.42
23319	<0.5	10	<5	<1	16	94	2.32
23320	<0.5	5	<5	<1	3	32	2.14
23321	<0.5	4	<5	<1	<2	44	3.30
23322	<0.5	<1	<5	<1	8	220	7.55
23323	<0.5	<1	<5	<1	<2	5	0.28
23324	<0.5	<1	5	2	195	250	26.7
23325	<0.5	<1	<5	1	145	270	10.8
23326	<0.5	<1	<5	<1	24	32	3.84
23327	<0.5	5	<5	<1	11	25	1.78
23328	<0.5	2	<5	<1	7	11	1.96
23701	<0.5	1	<5	<1	12	22	2.64
23702	<0.5	2	<5	<1	<2	3	0.47
23703	<0.5	11	<5	<1	8	22	1.26
23704	<0.5	25	<5	<1	5	28	1.46
23705	0.5	12	<5	11	16	13	2.48
23706	<0.5	<1	<5	<1	32	60	3.36
23707	<0.5	<1	<5	<1	50	35	6.60
23708	<0.5	10	<5	1	185	42	6.10
23709	<0.5	22	<5	<1	64	3	2.36
23710	<0.5	5	<5	<1	46	2	1.55
23711	<0.5	4	<5	<1	16	3	1.92
23712	<0.5	35	<5	<1	100	4	3.62
23713	<0.5	3	<5	<1	12	19	2.50
23714	<0.5	2	<5	<1	3	4	0.78
23715	<0.5	42	<5	<1	120	3	2.14
23716	<0.5	105	<5	<1	190	25	23.3
23717	<0.5	25	<5	<1	32	36	4.94
23718	<0.5	2	<5	<1	12	3	1.36
23719	<0.5	2	<5	<1	4	7	1.12
23720	<0.5	90	<5	<1	230	3	4.50
23721	<0.5	135	<5	<1	350	4	5.35
23722	<0.5	4	<5	<1	15	3	2.12
23723	<0.5	7	<5	<1	22	2	1.11
23724	<0.5	12	<5	<1	48	6	2.24
23725	<0.5	5	<5	<1	22	24	1.86
23726	<0.5	9	<5	<1	28	2	2.34
23727	<0.5	11	<5	<1	26	5	1.77
23728	<0.5	6	<5	<1	28	3	1.50
Units	ppm	ppm	ppm	ppm	ppm	ppm	%
DL	0.5	1	5	1	2	2	0.01
Scheme	IC2E						



Job: 3AD0603
O/N: 50086

ANALYTICAL REPORT

Sample	Mn	Mo	Ni	Pb	P	Sb	V
23074	880	1	30	30	380	<5	22
23075	65	2	11	50	230	<5	4
23076	115	3	9	20	125	<5	11
23077	1160	<1	120	5	370	<5	80
23078	3000	2	50	20	400	<5	17
23079	190	<1	14	<5	220	<5	10
23080	220	1	15	5	440	<5	11
23081	30	1	4	<5	110	<5	5
23082	150	<1	19	230	280	<5	32
23083	85	1	24	<5	270	<5	76
23084	500	1	24	40	110	<5	12
23085	560	<1	24	20	360	<5	16
23086	170	<1	22	5	170	<5	18
23087	65	3	13	<5	80	<5	9
23088	700	<1	19	10	490	<5	140
23089	940	2	44	25	400	<5	84
23090	840	<1	54	5	810	<5	150
23091	850	<1	30	5	580	<5	130
23092	540	<1	32	5	330	<5	48
23093	1100	<1	42	5	600	<5	140
23094	165	4	20	5	350	<5	11
23095	640	<1	250	15	230	10	84
23096	35	2	7	5	115	<5	14
23097	620	2	22	5	140	<5	9
23098	680	2	36	10	240	<5	28
23099	280	2	20	5	220	<5	18
23153	30	2	10	20	300	<5	7
23154	320	2	15	10	170	<5	10
23155	10	1	2	<5	55	<5	6
23156	1150	2	35	<5	160	<5	22
23157	175	2	24	15	260	<5	14
23158	530	3	14	10	130	<5	7
23159	600	2	26	5	280	<5	10
23160	290	1	24	10	310	<5	14
23161	160	3	19	5	105	<5	15
23162	780	2	84	15	400	5	82
23163	5200	2	66	20	105	<5	13
23307	45	9	8	20	30	15	8
23308	115	2	20	10	240	<5	15
23309	770	<1	42	5	390	<5	185
23310	125	1	22	<5	360	<5	5
23311	170	1	18	<5	200	<5	14
23312	2750	<1	970	125	810	25	200
23313	50	1	11	<5	50	<5	6
23314	230	2	48	10	105	<5	35
Units	ppm						
DL	5	1	1	5	5	5	1
Scheme	IC2E						

ANALYTICAL REPORT

Sample	Mn	Mo	Ni	Pb	P	Sb	V
23315	380	2	28	25	290	<5	55
23318	330	<1	14	55	185	<5	13
23319	230	<1	15	5	140	<5	15
23320	30	<1	5	50	135	<5	9
23321	65	<1	6	20	50	<5	12
23322	60	<1	32	25	1160	<5	230
23323	10	2	4	5	20	<5	2
23324	5900	<1	780	470	1080	15	220
23325	1320	<1	730	45	820	15	260
23326	660	1	110	15	310	<5	62
23327	105	2	30	5	135	<5	11
23328	240	1	17	5	185	<5	11
23701	770	1	30	10	230	<5	16
23702	40	2	5	<5	50	<5	3
23703	310	2	15	40	310	<5	5
23704	75	18	60	30	175	<5	10
23705	1060	2	15	810	170	<5	9
23706	590	<1	145	10	550	<5	76
23707	1440	<1	135	5	890	10	115
23708	8500	<1	210	20	840	<5	80
23709	660	2	46	<5	290	<5	5
23710	1320	2	30	<5	240	<5	9
23711	185	2	18	<5	220	<5	5
23712	370	2	96	<5	330	<5	5
23713	660	1	25	<5	270	<5	5
23714	340	3	11	10	145	<5	8
23715	500	<1	65	<5	270	<5	3
23716	95	18	340	10	50	5	16
23717	1120	2	30	10	230	<5	8
23718	110	1	10	<5	340	<5	5
23719	70	2	7	10	150	<5	22
23720	480	1	125	5	150	<5	6
23721	1050	2	185	35	130	<5	4
23722	65	2	14	10	70	<5	12
23723	240	2	40	<5	240	<5	4
23724	115	1	28	<5	370	<5	3
23725	540	2	12	15	330	<5	22
23726	360	<1	22	<5	420	<5	5
23727	210	1	32	<5	440	<5	4
23728	540	2	20	<5	270	<5	4
Units	ppm						
DL	5	1	1	5	5	5	1
Scheme	IC2E						



ANALYTICAL REPORT

Sample	Zn	Au	Avg	Au	Au	Rp1	Au	SS1
23074	94	0.02	0.02			--		0.01
23075	32	<0.01	<0.01			--		--
23076	6	<0.01	<0.01			--		--
23077	68	<0.01	<0.01			--		--
23078	26	<0.01	<0.01			--		--
23079	40	<0.01	<0.01			--		--
23080	22	0.01	0.01			--		--
23081	2	<0.01	<0.01			--		--
23082	34	<0.01	<0.01			--		--
23083	12	0.01	0.01			--		--
23084	60	<0.01	<0.01			--		--
23085	45	<0.01	<0.01			--		--
23086	40	0.01	0.01			--		--
23087	3	0.01	0.01			--		--
23088	64	0.01	0.01			--		--
23089	62	0.02	0.02			--		--
23090	90	<0.01	<0.01			--		--
23091	60	0.02	0.02			--		--
23092	48	<0.01	<0.01			--		--
23093	94	<0.01	<0.01			--		--
23094	10	<0.01	<0.01			--		<0.01
23095	100	<0.01	<0.01			--		--
23096	9	<0.01	<0.01			--		--
23097	26	<0.01	<0.01			--		--
23098	76	0.01	0.01			--		--
23099	34	<0.01	<0.01			--		--
23153	20	<0.01	<0.01			--		--
23154	44	<0.01	<0.01			--		--
23155	9	<0.01	<0.01			--		--
23156	19	<0.01	<0.01			--		--
23157	48	<0.01	<0.01			--		--
23158	34	<0.01	<0.01			--		--
23159	20	<0.01	<0.01			--		--
23160	30	<0.01	<0.01			--		--
23161	24	<0.01	<0.01			--		--
23162	32	<0.01	<0.01			--		--
23163	78	<0.01	<0.01			--		--
23307	6	0.08	0.07			0.09		--
23308	40	<0.01	<0.01			--		--
23309	110	<0.01	<0.01			--		--
23310	15	<0.01	0.01			--		<0.01
23311	38	0.01	0.01			--		--
23312	320	<0.01	<0.01			--		--
23313	6	<0.01	<0.01			--		--
23314	42	<0.01	<0.01			--		--
Units	ppm	ppm	ppm	ppm	ppm			
DL	1	0.01	0.01	0.01	0.01			0.01
Scheme	IC2E	FA1	FA1	FA1	FA1			FA1



947059

Job: 3AD0603
O/N: 50086

ANALYTICAL REPORT

Sample	Zn	Au Avg	Au	Au Rp1	Au SS1
23315	140	<0.01	<0.01	--	--
23318	38	<0.01	<0.01	--	--
23319	19	<0.01	<0.01	--	--
23320	34	<0.01	<0.01	--	--
23321	58	<0.01	<0.01	--	--
23322	68	<0.01	<0.01	--	--
23323	2	<0.01	<0.01	--	--
23324	550	<0.01	<0.01	--	--
23325	290	<0.01	<0.01	--	--
23326	52	<0.01	<0.01	--	--
23327	14	<0.01	<0.01	--	--
23328	26	<0.01	<0.01	--	--
23701	30	<0.01	<0.01	--	--
23702	2	<0.01	<0.01	--	--
23703	12	<0.01	<0.01	--	--
23704	24	<0.01	<0.01	--	<0.01
23705	1660	<0.01	<0.01	--	--
23706	58	<0.01	<0.01	--	--
23707	85	<0.01	<0.01	--	--
23708	130	0.02	0.02	--	--
23709	14	<0.01	<0.01	--	--
23710	22	<0.01	<0.01	--	--
23711	9	<0.01	<0.01	--	--
23712	12	<0.01	<0.01	--	--
23713	5	<0.01	<0.01	--	--
23714	12	<0.01	<0.01	--	--
23715	14	<0.01	<0.01	--	--
23716	90	<0.01	<0.01	--	--
23717	24	<0.01	<0.01	--	--
23718	10	<0.01	<0.01	--	--
23719	5	<0.01	<0.01	--	--
23720	14	<0.01	<0.01	--	--
23721	50	<0.01	<0.01	--	--
23722	12	<0.01	<0.01	--	--
23723	13	<0.01	<0.01	--	--
23724	10	<0.01	<0.01	--	<0.01
23725	18	0.02	0.02	--	--
23726	7	<0.01	<0.01	--	--
23727	14	<0.01	<0.01	--	--
23728	12	<0.01	<0.01	--	--
Units	ppm	ppm	ppm	ppm	ppm
DL	1	0.01	0.01	0.01	0.01
Scheme	IC2E	FA1	FA1	FA1	FA1

APPENDIX 3

PETROGRAPHIC DESCRIPTIONS

Dr A.J. Crawford
University of Tasmania

CQ 63443216

SAMPLE NUMBER: ARTHUR 23083

SUMMARY: This sample is a hydrothermal quartz reef or fracture filling with occasional tourmaline and magnetite grains; it is presumably of Devonian age.

HAND SPECIMEN:

This is a very small piece that I had trouble finding, let alone describing in hand specimen.

THIN SECTION DESCRIPTION:

This rock is composed entirely of hydrothermal (vein) quartz with very small amounts of limonite and tourmaline. It consists of a very heterogeneous-textured aggregate of anhedral and strained quartz, grading rapidly and haphazardly from crystals up to 2mm across, to very fine-grained, sugary quartz. Grain boundaries between adjacent large quartz veins are very frilly. Brittle fracture zones transect the rock, and are accompanied by intense granulation of the quartz, with mesh-like fractures being defined by sericite. Strongly pleochroic greenish tourmaline occurs as dispersed crystals in the granulation zones. A few small magnetite(?) crystals are present, and veinlets composed of bright red limonite cut the sample in a few places.

This is presumably a Devonian quartz reef or replacement (fracture-filling) in whatever the host rock was to this sample.

C06L793687

SAMPLE NUMBER: 23089

SUMMARY: This sample is a quartzitic-textured pelitic regional metamorphic rock composed of quartz, sericite, Al-rich epidote, chlorite and subordinate magnetite and pyrite.

HAND SPECIMEN:

This is a weathered and pitted quartz-mica schist or micaceous quartzite.

THIN SECTION DESCRIPTION:

This rock is a recrystallized metamorphic rock dominated by anhedral strained quartz with frilly grain boundaries and remarkably variable grain size up to about 1 mm maximum. The quartz contains abundant small sericite crystals, less abundant and usually slightly larger spots, patches and veinlets of chlorite, and most significantly, abundant well-crystallized, almost colourless epidote (Al-rich rather than Fe³⁺-rich). The latter occurs as subhedral rather ragged prisms usually less than 0.5 mm long making up around 5-10 modal% of the rock. Small pyrite, or pyrite plus magnetite crystals occur intergrown in chlorite veinlets.

This sample lacks a foliation, and so should not be referred to as a schist. Nor does it have a hornfelsic texture. It is probably best described as a micaceous quartzite, and was probably derived from a slightly carbonated muddy sandstone or micaceous greywacke during a static regional metamorphic event.

SAMPLE NUMBER: 23093

CG 65 54 3758

SUMMARY: This sample is an epidote amphibolite derived from tholeiitic metadolerite or microgabbro at P ~ 5-8kb.

HAND SPECIMEN:

This is a massive recrystallized dolerite or microgabbro with disseminated pyrite.

THIN SECTION DESCRIPTION:

This rock is a thoroughly recrystallized tholeiitic microgabbro or metadolerite. Former plagioclase crystals in the microgabbro are intact but ragged-edged and albitized. They make up around 50 modal% of the rock and contain abundant inclusions of epidote and chlorite. The remainder of the rock comprises a swirling mass of felted bright green actinolite-hornblende, chlorite and coarser-grained granular epidote, with disseminated idiomorphic pyrite. Minor interstitial phases include anhedral quartz and a few small patches of brown biotite. This green intergrowth of chlorite and amphibole replaces former augite, and indicates extensive and thorough recrystallization of the mafic components of this rock. The amphibole occurs from very fine-grained felted aggregates to rather more blocky prismatic crystals. The latter have an almost bluish-green pleochroism, suggesting a crossitic component, indicating rather high pressures of metamorphism. The amphibole has presumably absorbed the Ti released during breakdown of the FeTi oxides that must have been a minor component of this rock. This sample contains ten or twelve 1mm-sized perfectly euhedral pyrite grains.

There is little doubt that this is an amphibolite derived from a tholeiitic microgabbro or dolerite. The presence of epidote and strongly coloured prismatic hornblende with a bluish tinge may indicate that recrystallization occurred at pressures of 5-8kb.

CQ 6510 2961

SAMPLE NUMBER: ARTHUR 23707

SUMMARY: This sample is a high greenschist facies strongly foliated greenschist derived from a metabasalt or metadolerite, probably correlated with the Crimson Creek Formation-type basalts and dolerites.

HAND SPECIMEN:

This is a quite strongly foliated greenschist.

THIN SECTION DESCRIPTION:

This rock is a strongly foliated greenschist in which no trace of the primary texture is preserved. Laminae of polycrystalline quartz with frilly margins occur interleaved with chlorite-dominated layers. The quartzose layers commonly bulge out to form augen up to 3mm wide containing small rather acicular crystals of chlorite, muscovite, and actinolite. The green, chloritic layers are composed of a dense intergrowth of chlorite, actinolite, muscovite, and much larger and blockier sphene crystals surrounded by dirty yellow-brown epidote. Occasional augen dominated by very fine-grained muscovite or sericite show a cleavage oriented at an angle of about 40° to the dominant foliation defined by the quartz and chlorite layers.

This sample was probably a metabasaltic or metadoleritic rock that has thoroughly recrystallized in a strong stress regime. Conditions of recrystallization were high greenschist facies, as defined by the assemblage quartz-chlorite-actinolite-epidote-sphene. I have seen very similar greenschists from the Corinna-Savage River area, that have compositions clearly indicating derivation from Crimson Creek Formation-correlated tholeiitic basalts and dolerites.

CQ 6407 2915

SAMPLE NUMBER: ARTHUR 23716

SUMMARY: This sample is composed of exceptionally fine-grained crustiform to colloform black, powdery pyrite with strained quartz inclusions, that presumably formed in a surficial reducing weathering environment.

HAND SPECIMEN:

This is a botryoidal to colloform mass dominated by a black, soft mineral in which are embedded tiny sparkling crystals.

THIN SECTION DESCRIPTION:

This is an unusual mineral that is very powdery and opaque, and smells strongly of sulphide. In thin section, it is absolutely opaque, isotropic, and microcrystalline, and contains small anhedral quartz crystals, as well as patches of multi-crystalline, very strained quartz aggregates. A few small perfectly euhedral pyrite-shaped crystals are also present, but without a polished thin section, it is very difficult to diagnose these opaque minerals. My guess is that this is 'bog pyrite or marcasite', formed in a surficial highly reducing environment; the geological setting as determined by field observations could no doubt provide more information on the paragenesis of this unusual sample.

CQ 662 2843

SAMPLE NUMBER: ARTHUR 23720

SUMMARY: This sample is a metaconglomerate of uncertain correlation which has suffered an intense Devonian hydrothermal event that produced a pervasive silica-tourmaline-magnetite assemblage.

HAND SPECIMEN:

This is a pitted and weathered conglomerate with clasts up to almost 1 cm of fine-grained originally pyritic quartzose metasediments(?).

THIN SECTION DESCRIPTION:

This rock is a very strongly altered and recrystallized conglomerate that has been intensely silica-tourmaline-altered. No trace of the primary texture of the best preserved clasts are obvious, and the cm-sized clast clear in this section is composed of a background of polycrystalline quartz thoroughly pervaded by stout perfectly euhedral crystals of zoned pale green to clear tourmaline. Only one small clast retains any trace of the original texture and this is a very fine-grained metasediment with occasional tiny angular quartz fragments. Most of the rock lacks any clastic texture, and appears to be dominated by a fairly coarse-grained quartz liberally but very heterogeneously peppered with small tourmaline crystals and less abundant but larger perfectly hexagonal deep red crystals of hematite after magnetite. Other areas of the rock contain patches of finer-grained, more spherulitic textured quartz with fan extinctions.

This rock contains enough of the primary texture to be sure that it was a conglomerate with probable metasedimentary clasts. However, it has suffered intense and pervasive hydrothermal metamorphism leading to production of a fairly coarse-grained silica-tourmaline-magnetite assemblage. This is presumably a Devonian hydrothermal overprint.

EQ 662 2943

SAMPLE NUMBER: ARTHUR 23721

SUMMARY: This sample is a former metasedimentary rock, probably a coarse sandstone or conglomerate, that has been soaked by granite-derived hydrothermal fluids, leading to intense recrystallization to a holocrystalline quartz-albite-tourmaline-magnetite assemblage.

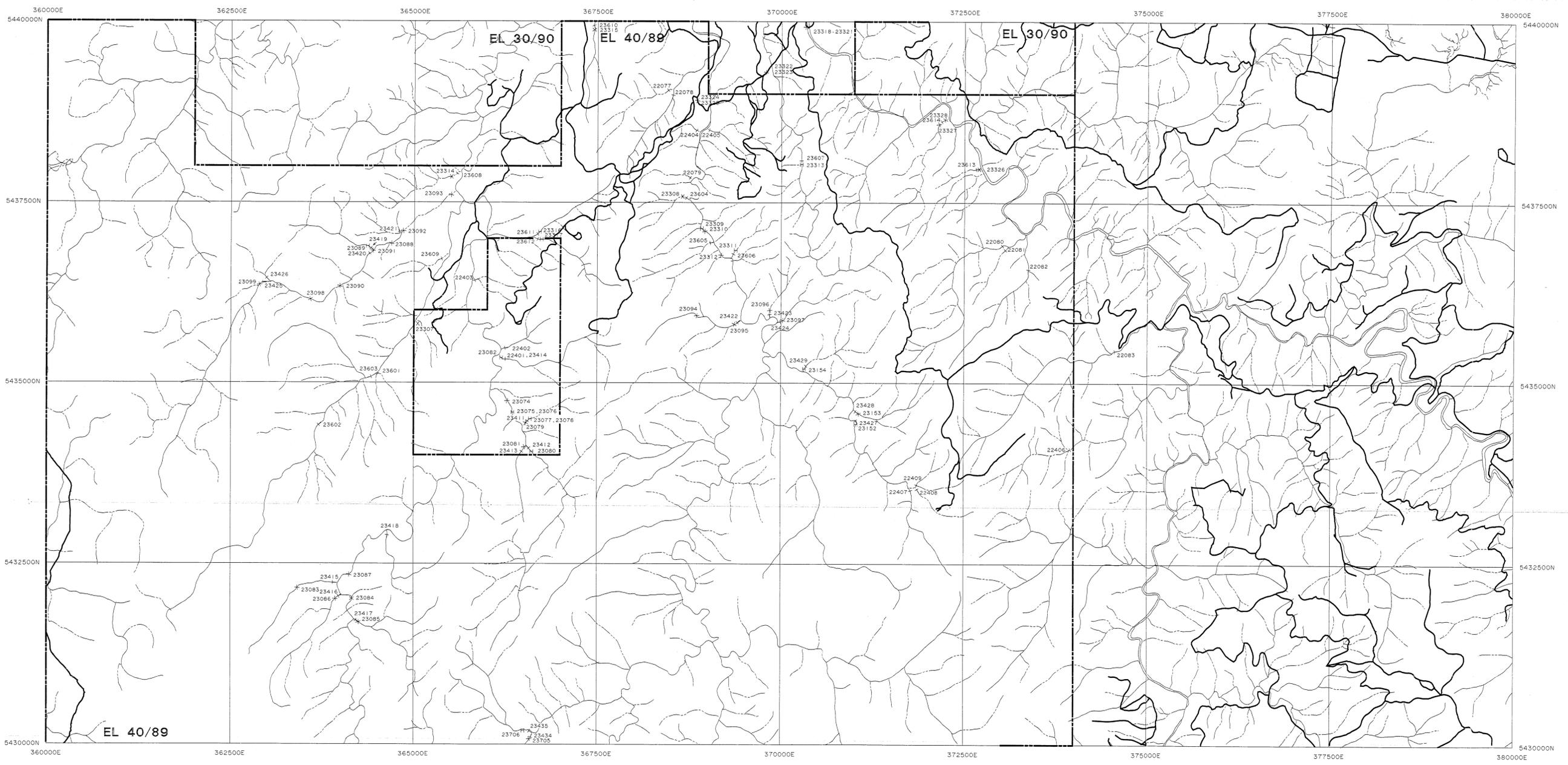
HAND SPECIMEN:

This is a grey, fine-grained metasediment(?) with weathered magnetite crystals abundant recrystallized quartz.

THIN SECTION DESCRIPTION:

This rock is quite remarkable in thin section. At first glance, it appears to be a holocrystalline quartz-albite intrusive tonalite. However, careful examination shows ghost outlines of former rounded clastic grains, and, in fact, several rounded clasts have been totally pseudomorphed by very fine-grained tourmaline. This original clastic sandstone to conglomerate texture is obliterated by recrystallization of quite a coarse-grained quartz-albite intergrowth with approximately equal abundances of quartz and albite. The albite occurs as mainly blocky to prismatic subhedral to euhedral crystals, whereas the quartz is quite anhedral. Small stout pleochroic prisms of tourmaline are scattered throughout the quartz and albite, and rather larger idiomorphic hematite-altered magnetite also occur in the same way, the latter making up around 2-4 modal% of the rock.

This sample is similar in many respects to 23720, being an intensely hydrothermally-altered former coarse sandstone to fine-grained conglomerate, with the alteration assemblage dominated by silica-tourmaline-magnetite, and in this instance, albite as well. The rock has a holocrystalline intrusive texture and resembles a tonalite, and presumably recrystallized under rather high-temperature conditions (>500°C). The alteration is probably due to fluid-soaking associated with probably Devonian granitoid magmatism.



LOCATION SYMBOLS

- X Location of Rock Chip sample (outcrop)
- W Location of Water sample
- H Location of Rock Chip sample (float)

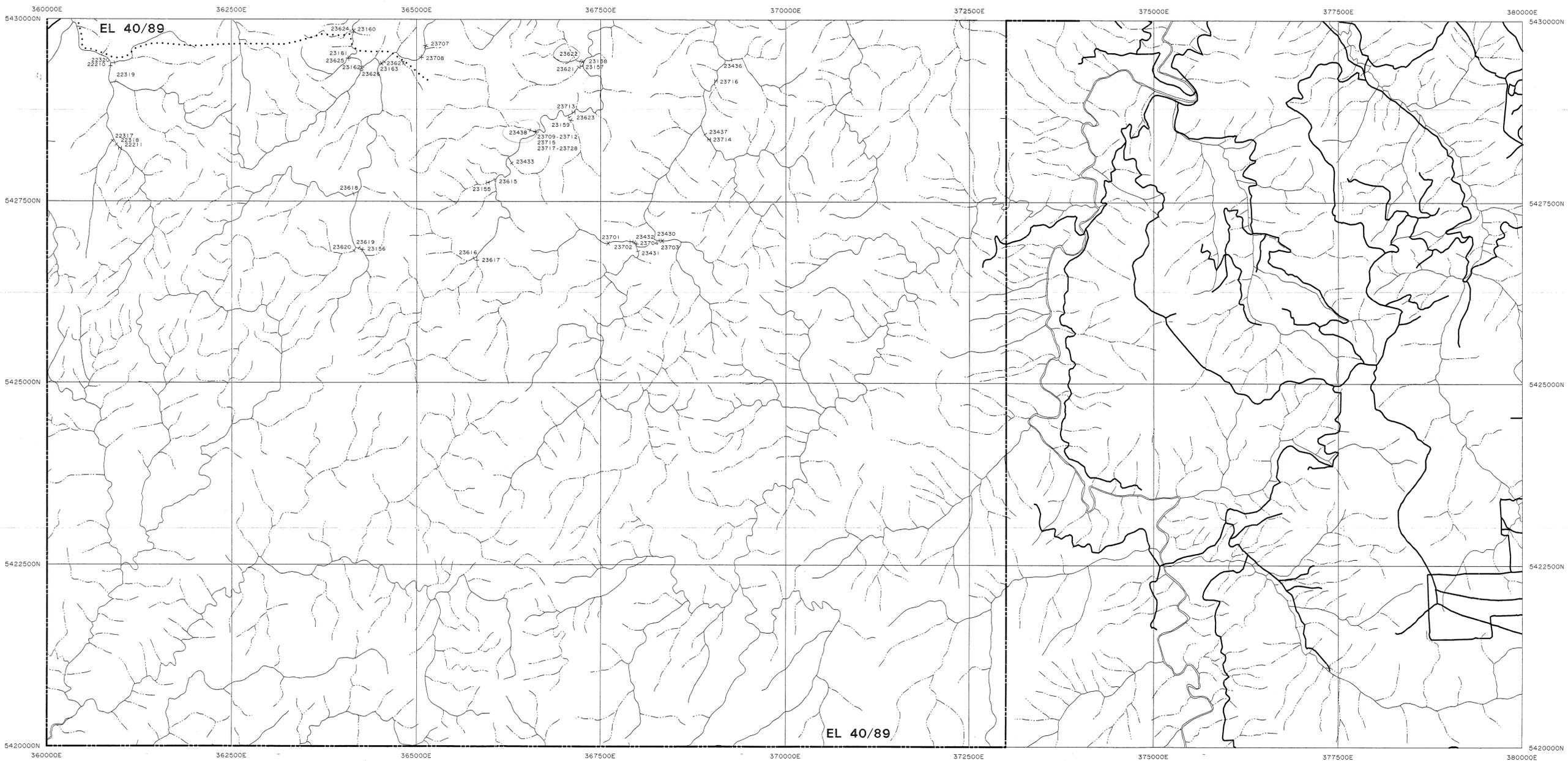
5 cm

93-3529.

1:25000 SHEET LAYOUT

3444	3644	3844
3443	3643	3843
3442	3642	3842

	GEOPEKO		A DIVISION OF PEKO WALLSEND OPERATIONS LTD A.C.N. 000 081 434
	Scale	1:25000	
500 0 500 1000 1500 2000 2500m		Project / Tenure	
PARKES		ARTHUR RIVER PROJECT	
Geo. Client.	D. G.	KEITH 3643	
Carto.	R. M. N.	SAMPLE LOCATIONS & NUMBER	
Checked			
Date	12/3/92		
Appended			
Job No.	82_92	100k. Sheet	7915
		DWG No. 2309A	



LOCATION SYMBOLS

- X Location of Rock Chip sample (outcrop)
- ⌵ Location of Water sample
- H Location of Rock Chip sample (float)

5 cm

93-3529.

947069

1:25000 SHEET LAYOUT

3443	3643	3843
3442	3642	3842
3441	3641	3841



PARKES
 Geo. Client: D. G.
 Carto. R. M. N.
 Checked:
 Date: 12/3/92
 Appended:
 Job No. 82_92

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

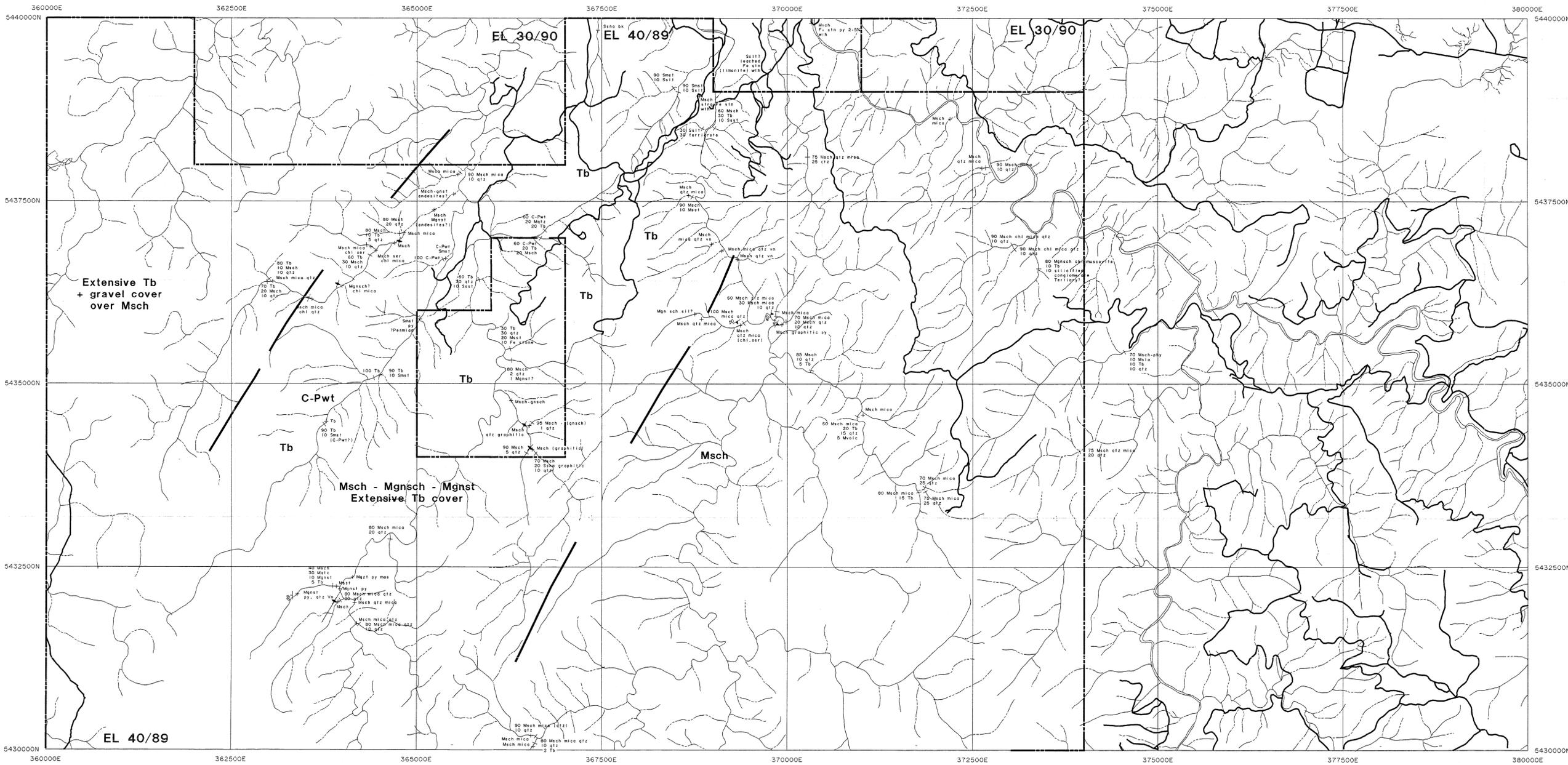
Scale: 1:25000
 500 0 500 1000 1500 2000 2500m

Project / Tenure: **ARTHUR RIVER PROJECT**

BARETOP 3642

SAMPLE LOCATIONS & NUMBER

100% 7915
 DWG No. 2058A



GEOLOGICAL LEGEND

TERTIARY

Tb Basalt

CARBONIFEROUS - PERMIAN

C-Pwt Wynyard Tillite glacio-marine sequences

PRE CAMBRIAN - CAMBRIAN

SEDIMENTS

Ssst sandstone
Sgwk greywacke
Ssll siltstone
Sdol dolomite
Ssha shale

METAMORPHICS

Msch schist
Mphy phyllite
Mgnst greenstone
Mgnsch greenschist
Mqzt quartzite
Msla slate

COLOURS

bk black
wh white
gn green
gy grey
pl pale
dk dark
bn brown

LOCATION SYMBOLS

+ Location of outcrop with description
 Location of stream float with percentages of each float type in stream

VOLCANICS

Volc volcanic
tuff tuff

OTHER

U/m ultramafic

MINERALOGY

qtz quartz
fs feldspar
Fe iron
py pyrite
ser sericite
chl chlorite
sl siliceous

TEXTURES

Vn vein, veining
lam laminated
str strain
wth weathered
cldv cleaved
foln foliation
mas massive

STRUCTURES

bedding
 foliation
 definite contact
 approximate contact
 possible contact

5 cm

93-3529.

947070

1:25000 SHEET LAYOUT

3444	3644	3844
3443	3643	3843
3442	3642	3842



PARKES

Geo. Client: D. G.
Carto: N. A. P.
Checked: 16/11/93
Appended:

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

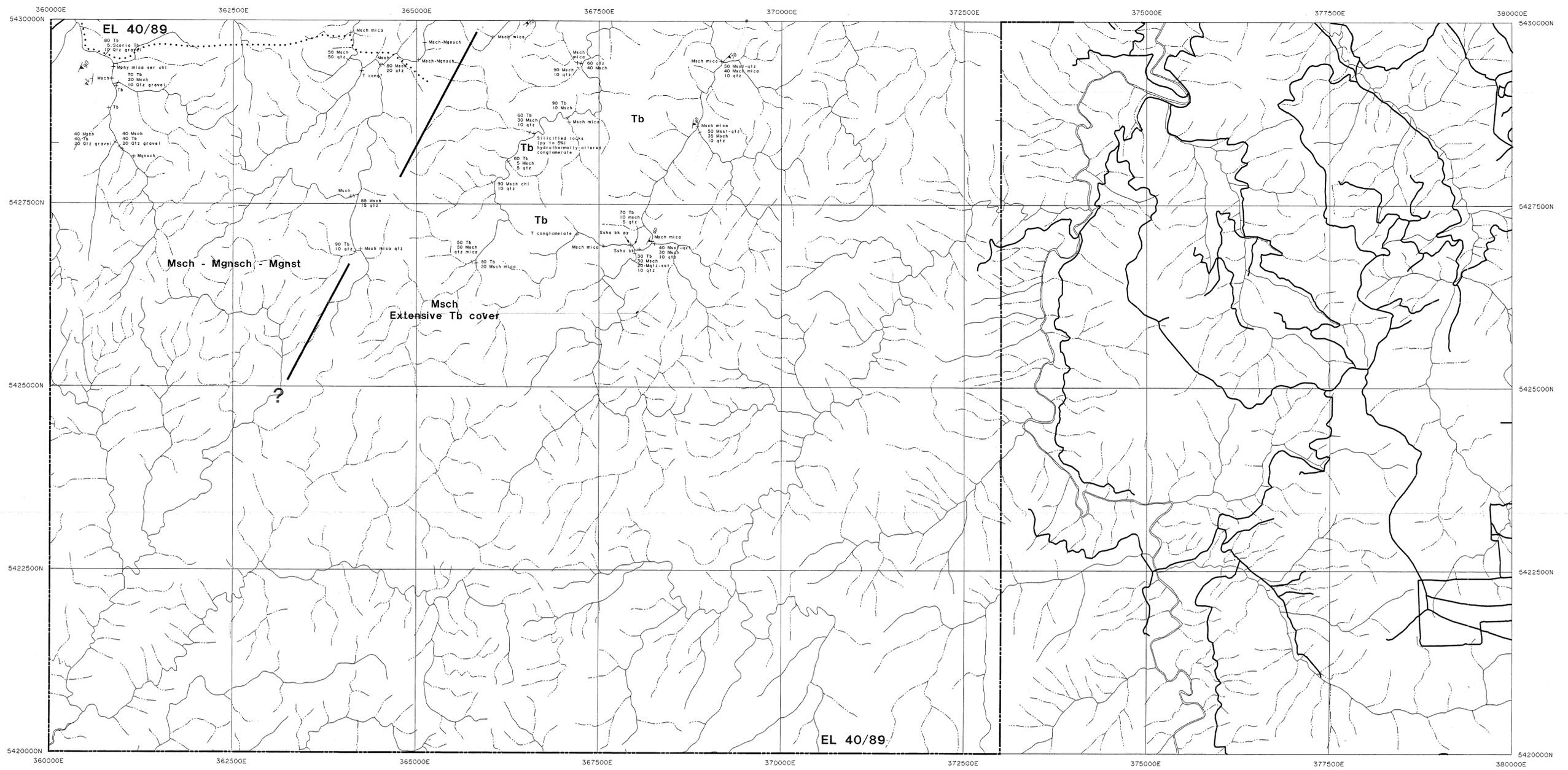
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Project / Tenure **ARTHUR RIVER PROJECT**

KEITH 3643

FACT GEOLOGY & INTERPRETATION

Job No: 347_93 100k Sheet: 7915 DWG No: 2309B



GEOLOGICAL LEGEND

- TERTIARY**
Tb Basalt
- CARBONIFEROUS - PERMIAN**
C-Pwt Wynyard Tillite
- PRE CAMBRIAN -**
- | | | | |
|------------------|---------------------|----------------|--|
| SEDIMENTS | METAMORPHICS | COLOURS | LOCATION SYMBOLS |
| Ssst sandstone | Msch schist | bk black | + Location of outcrop with description |
| Sgwk greywacke | Mphy phyllite | wh white | |
| Ssll siltstone | Mgnst greenstone | gn green | |
| Sdol dolomite | Mgnsch greenschist | gy grey | 40 Msch Location of stream float with percentages of each float type in stream |
| Ssha shale | Mqzt quartzite | pl pale | |
| | Msta slate | dk dark | |
| | | bn brown | |
-
- | | |
|------------------|----------------|
| VOLCANICS | OTHER |
| Volc volcanic | U/m ultramafic |
| tuff tuff | |
-
- | | | |
|-------------------|------------------|---------------------|
| MINERALOGY | TEXTURES | STRUCTURES |
| qtz quartz | Vn vein, veining | bedding |
| fs feldspar | lam laminated | foliation |
| Fe iron | sln slain | definite contact |
| py pyrite | wh weathered | approximate contact |
| ser sericite | clvd cleaved | foliation |
| chl chlorite | foin foliation | possible contact |
| sil siliceous | mas massive | |

5cm
93-3529.

947071

1:25000 SHEET LAYOUT

3443	3643	3843
3442	3642	3842
3441	3641	3841

PARKES		GEOPEKO	
Geo. Client:	D. G.	A DIVISION OF PEKO WALLSEND OPERATIONS LTD A.C.N. 000 081 434	
Carto.:	R. M. N.	Scale 1:25000	
Checked:		500 0 500 1000 1500 2000 2500m	
Date:	12/3/92	Project / Tenure ARTHUR RIVER PROJECT	
Appended:		BARETOP 3642	
Job No.:	82_92	FACT GEOLOGY & INTERPRETATION	
IOGK Sheet:	7915	DWG No. 2058B	