

**OPEN FILE**

EL 29/91 - MARIONOAK RIVER, NORTHWEST TASMANIA

**MICROFILMED**  
FICHE No.012881-82REPORT FOR FIRST YEAR OF TENURE  
TO 29 MAY 1993

MINES		
FILE NO. EL 29/91		
- 4 AUG 1993		
DCC. REF.		
OFFICER	FOR ACTION	FOR INFO.
See	Police	28
SECURITY TO	DATE	

A J Hosking  
Darwin NT

July 1993

93-3480.

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## APPENDICES

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993004

3b

E29/91  
(Marion oak)

Pieman Road

MURCHISON  
HIGHWAY

Hellyer  
Que River



TULLAH

Rosebery

ROSEBERY

HIGHWAY

Renison Sn

MURCHISON

Henty Au

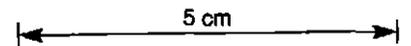
5 360 000 mN

5 360 000 mN

ZEEHAN  
HIGHWAY

Mt. Lyell

QUEENSTOWN



LOCALITY DIAGRAM



0 5 10 20km

SCALE 1 : 250 000

93-3480

Sipa Exploration N.L.

LOCATION OF E29/91  
AND  
MAIN TASMANIAN MINES

Geologist: MGD	Date: JUNE 1993	DRAWING. No.
PDEA	Revised:	1319

## INTRODUCTION

Exploration Licence 29/91 was granted to Mr A J Hosking for one year from 29 May 1992 and is renewable for a further four years before reduction. The licence covers about 23 s.km of mafic and felsic volcanics, volcanoclastics and epiclastic sediments which are prospective for volcanogenic massive sulphide (VMS) mineralisation. The strike length of the prospective zone is approximately ten km. The felsic volcanic component of the sequence is largely unknown. However, a number of encouraging aspects of the known mineralisation and of the previous exploration activities within the area influenced the decision to seek tenure.

A prominent north-south fault zone approximately bisects the area and is considered to warrant exploration for gold, principally in sulphidic, low-grade metasediments in close proximity to the fault zone.

## LOCATION AND ACCESS

The general location of EL 29/91 is shown in Figure 1. The area lies to the near NNW of Rosebery in Northwest Tasmania. Physiographic and cultural features are shown in Figure 2.

Access to the southern part of the licence area is gained conveniently via the east-west Pieman Road. Access to the central part is gained via a track leading in a westerly direction from the general vicinity of the Pinnacles Mines - Burns Peak area. A track to the Silver Falls mine gives access to the northeast corner of the licence area. These tracks, and others either in the vicinity of or within EL 29/91, are shown in Figure 2.

## CURRENT MINERAL TENURE

Exploration Licence 29/91 and licences held by other parties are shown in Figure 3. The EL abuts with titles held by Pasminco, Shell Co, Noranda-Pasminco and AustMin Resources.

Current tenements within EL 29/91 held by other parties are shown in Figures 4a and 4b. In the southern part of the EL, tenements held by EZ Co mark the northern limit of this company's holdings in the Rosebery district. In the northern part of the EL, tenements cover part of the trend which hosts the Silver King deposit. No searches of these titles held by other parties have been carried out by the writer.

A small area in the southeast portion of EL 29/91 has been excluded for cultural reasons.

## KNOWN MINERALISATION

The following mineral deposits occur in close proximity to EL 29/91

Just in Time	Pb, Ag, Ba	to near north
Silver Falls	Pb, Ag, (Ba,Zn,Cu)	to near north
Pinnacles	Zn, Pb, Cu, Ba, Ag, Au	to near east
Brown's Workings (also Thomas' Workings)	Au, Zn, Pb, Ag, Cu	to near east
Chester	pyrite	to near east
Salmon's Lodes	Pb, Zn, Cu	to near south
Rosebery	Zn, Pb, Cu, Ag, Au	to near south

The locations of these deposits are shown in Figure 5 which is derived from the Mineral Deposits and Metallogenic Map of Tasmania, 1988.

No deposits are known to the near west of the EL. However, alluvial gold and platinoids have been recorded in creeks draining a fault-controlled slice of ultramafic intrusive rocks, the trend of which lies just outside the southwest corner of the EL.

The only deposit known within the licence area is the Lynch Creek prospect. Details of the Lynch Creek, Silver Falls and Salmon's Lodes prospects are provided in Appendix I. The principal target mineralisation is envisaged to be of a similar type to that which is present in the Salmon's Lodes prospects.

## PREVIOUS EXPLORATION

Final, annual and interim reports of previous exploration by Aberfoyle and The Shell Company of Australia (a joint venturer with Aberfoyle) reveal an intermittent approach to the area over a long period after a thorough, first-phase exploration program. The JV programs resulted in many geochemical anomalies remaining untested, seemingly because too great a reliance was placed on the ability of electrical geophysical methods to either support or rule out prospective drilling targets. Moreover, conflicting orientations and positions of IP vs UTEM conductors in the South Bastyan Dam prospect remained unresolved (McNeill, 1988.)

Other strong geochemical anomalies found by Aberfoyle during exploration within the former EL 22/74 (see Figure 6) lie along a north-south trend through the middle of EL 29/91 on the western boundary of the volcanoclastic Rosebery Group and adjacent to a major, north-south fault (here termed the Bobadil Fault). These anomalies have not been tested by drilling, despite a fairly constant spatial association with the fault.

Furthermore, a leakage anomaly in the form of a small spring precipitating iron oxides is situated apparently on or near the Bobadil Fault where it intersects the Pieman Road near the eastern edge of the EL and the staining can be seen in the drain on the northern side of the road. The spring, which is depositing a heavy rusty-coloured iron-oxide layer in the drain (presumably from oxidising sulphides), is adjacent to a 4m wide zone of sheared and disseminated lead-zinc mineralisation containing several thin (<0.1m) massive sulphide bands and within about 100m of the site of drillhole SBD-1 (Smyth, 1983). This zone corresponds with the position of the extensive, strong but deep, UTEM conductor found by Aberfoyle and apparently tested in part by subsequent deep drilling (MO-1, MO-2), with negative results (Teakle, 1984; McNeill, 1988).

Aberfoyle/Shell concluded that the UTEM anomaly was caused by fault-bounded, black shales of the Oonah Formation (?) at a downhole depth of 432m (MO2) adjacent to the major fault (Bobadil) at the western boundary of the Rosebery Group. Two zones of anomalous base-metal geochemistry were discovered, the first being the Oonah Formation intercept of approximately 20m, with the second occurring in the Rosebery Group further up the hole to the east over 11m at a downhole depth of 43m. The latter zone should correspond at the surface with an anomalous zone or stratigraphic interval of carbonated and ankeritic, altered carbonaceous siltstones and mafic tuffs located 200 to 300m east of the Bobadil Fault and within Rosebery Group rocks. No anomalous gold geochemistry was reported.

This stratigraphic level is considered by the writer to be the favourable horizon which appears to occur consistently near the western boundary of the Rosebery Group and extends north from Salmon's Lodes (a 4m wide, sheared, volcanogenic lead-zinc-copper deposit northwest of Rosebery) in the south through the anomalous zones outlined by Aberfoyle in the Pieman Road, South-Central, Higgins Creek, South Lynch Creek and North Lynch Creek areas, and through the Just-In-Time basemetal-barite occurrence a few kilometres to the north of Lynch Creek near the Que River/Huskisson River confluence (north of the EL boundary).

The work completed in 1987 and reported on in the final report by Aberfoyle/Shell (McNeill, 1988) at the Bastyan Damsite proper in the vicinity of the HEC earthworks (where mineralised black shales associated with altered Mt Read pyroclastics occur east of and abutting the 65 degree easterly dipping Roseberry Fault) will not be considered here because this area is outside and directly to the east of EL 29/91.

It is emphasised that the area of greatest potential within EL 29/91 lies within a stratigraphic interval of consistently geochemically anomalous volcanoclastics and black shales within the westernmost 300-400m of the Rosebery Group adjacent to the Bobadil Fault. Sub-cropping lead-zinc-barite-pyrite-chalcopyrite mineralisation is known along this zone but has not been followed up adequately in the writer's opinion.

In addition, the possibility of finding Henty-style gold mineralisation at and along the geochemically anomalous Bobadil Fault should not be overlooked. No gold geochemistry has been carried out along the Bobadil Fault zone despite structural, geological and geochemical analogies with the Henty gold deposit (Green, 1990) about 15km to the south.

#### WORK TO DATE

Work to date has involved the following activities:

- . research of Tasmanian Geological Survey investigations which are pertinent to the area covered by EL 29/91
- . research of the main company exploration activities which have occurred in the past, notably by Aberfoyle Exploration Pty Ltd and the Shell Company of Australia (the latter's extensive geophysical activities within the area have not been assessed)
- . acquisition of relevant geological and topographic plans and reports
- . geological reconnaissance and rock-chip sampling in exposures on the Pieman Road by Sipa Resources International NL

#### GEOLOGY

A general discussion of the geology and mineralisation of Northwest Tasmania is not attempted in this report. A useful, recent summary is provided in Green, 1990. A substantial literature exists and particular reference must be made to publications arising from the Mount Read Volcanics Project of the Tasmanian Department of Mines. Numerous contributions to this project also have been made by the Centre for Ore Deposit and Exploration Studies (CODES) at the University of Tasmania.

Two main Cambrian rock units occur in the EL, namely:

- . older Crimson Creek Formation in the west consisting of tholeiitic basalt, greywacke and shale
- . younger Rosebery Group in the east consisting of felsic and mafic pyroclastics, volcanoclastics and epiclastics

As mentioned above, the felsic volcanic component of the Rosebery Group within the EL remains unknown but may be more substantial than has been recognised to date.

Recent work by the Tasmanian Geological Survey considers the Rosebery Group to have formed in a proximal position to and to be contemporaneous with the Mount Read Volcanics, as well as being a correlate in part of the Dundas Group which interfingers with and overlies

the Roschery Group (Brown, 1986).

The EL is bisected by a major north-south fault (Bobadil Fault).

The Rosebery Group is a poorly outcropping and faulted unit of diverse lithologies which has been subdivided into six formations, namely:

- Primrose Pyroclastics and Slate
- Stitt Quartzite
- Matone Volcanics
- Westcott Dolomite Beds
- Munro Creek Slates and Quartzite  
plus Chamberlain Shale

Mapping by the Tasmanian Geological Survey interprets the Rosebery Group to consist of a series of fault slices whose interrelationships are uncertain.

The Early Cambrian (Eocambrian) Crimson Creek Formation in the western half of the EL consists of mafic volcanoclastics, tholeiitic basalt, siltstone, mudstone, shale and minor carbonate rocks. A fault-bounded wedge of Late Precambrian(?) Oonah Formation is present in the northwest part of the EL in contact with the Crimson Creek Formation to the west and with the Rosebery Group to the east.

The geology of the area is shown in Figure 7.

#### GEOCHEMISTRY

Exploration Licence 22/74 was granted to Cominco in February 1975 with the area having been held previously by Asarco as part of EL 5/73 and Comstaff as part of EL 5/63. Earlier regional surveys also were undertaken by CRA Exploration. Each company's exploration program included stream sediment sampling. However, only the first-mentioned company's work has been evaluated in some detail.

The locations of Cominco (Aberfoyle) stream-sediment anomalies are shown in Figure 6.

While substantial work was undertaken by the two companies, it is significant that the North Lynch Creek prospect was not located and assessed and only limited follow-up sampling by Shell was completed over anomalies defined by the stream-sediment sampling. The inconclusive nature of this work influenced the acquisition of EL 29/91. Shell concentrated most of its work during its joint venture with Aberfoyle on the Bastyan Dam prospect.

Rock-chip sampling of shales and siltstones exposed in a cutting on the Pieman Road carried out by Sipa Resources International NL returned copper, lead and zinc values to 513, 870 and 3400 ppm respectively. Silver and gold values were insignificant (see Appendix 2).

#### FUTURE PROGRAM

The following activities are warranted:

1. location and detailed mapping of the North Lynch Creek prospect
2. detailed mapping of the felsic volcanic unit which trends in a southerly direction into the EL from the vicinity of the Silver Falls prospect (Figure 8)
3. detailed mapping of the North Lynch Creek, Higgins Creek, Unnamed and South-Central anomalous area, as defined by Aberfoyle/Shell, as well as of the northward extension of the Rosebery Group beyond the Pieman River
4. delineation of the Bobadil Fault within the EL
5. BLEG sampling at sites downstream from the Bobadil Fault to assess the gold potential of this structure

#### CONCLUSIONS AND RECOMMENDATIONS

Previous company mineral exploration and government geological investigations within the EL, while providing a substantial amount of relevant data, have not been sufficiently conclusive to downgrade the potential of the area for VMS deposits. Scope is seen for further work specifically directed at determining the presence, nature and extent of felsic volcanics and their relationships, if any, with known base-metal mineralisation and geochemical anomalies delineated by previous workers.

It is considered that the activities proposed for a future work program would complement in a logical way the earlier work of Aberfoyle and Shell and constitute valid tests of the potential of the EL for VMS mineralisation.

As very little is known of the gold potential of sulphidic and carbonaceous rocks adjacent to the Bobadil Fault, an assessment of this target (Henty-style mineralisation) is also warranted.

A J Hosking  
July 1993

EXPENDITURE STATEMENT  
EL 29/91 YEAR 1

<u>Cost Centre</u>	<u>Sipa</u>	<u>Hosking</u>
	\$A	\$A
communications	4.80	50.00
geologists	1 620.00	2 000.00
meals & accomodation	642.40	
maps - tenements	120.00	
geological	215.00	220.00 (incl. topo)
motor vehicle expenses	227.80	
travel expenses	455.00	
assaying (gen.prosp.)	314.90	
	<hr/>	<hr/>
	3 599.90	2 270.00
say	3 600.00	2 270.00
overheads 10%	360.00	227.00
	<hr/>	<hr/>
Totals	\$3 960.00	\$2 497.00
GRAND TOTAL	\$6 437.00	
	=====	

## REFERENCES

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## A P P E N D I X 1

Details of Lynch Creek, Silver Falls  
and Salmon's Lodes prospects

Report on Salmon's Claim  
by I.B. Freytag, after Mackintosh-Reid (1918)

(" " , Aberfoyle)

Salmon's Claim was discovered in 1917, and contained two separate parallel ore bodies approximately 85 metres apart, striking at 340° and dipping east at 65°, 60m in length approx.

Western Lode (structurally lower in the sequence)

Pyrite plus chalcopyrite in "altered porphyroid" - a schistose rock with elongated dark green spherules, traversed by carbonate veins and bunches, and quartz veins.

Lode width: 3.7 metres

Strike length: "several chains". plus other outcrop to the south.

Mineralized rock is enclosed with dark blue slates.

Eastern Lode

"Essentially zinc-blende and galena contained in calcitic schist"

Lode width: 1.5 metres (plus)

Covered by alluvium of the Bobadil plain to the north.

Sphalerite varies from light yellow through resinous brown and reddish brown to black and is the dominant sulphide, occurring as "crystallizing bands" parallel to the foliation of the schist.

Galena is subordinate, usually as blebs and disseminations through calcitic schist. Pyrite and chalcopyrite occur in minor quantities.

A sample assayed (1918) Zn 22.7%, Pb 2.2%, Ag 30 g/t.

The greater part of the lode is hosted in greyish-yellow schist which is overlain conformably by black argillaceous schistose rock.

From:

Sheet 44 Mackintosh  
Geol. Surv. Explor Report  
P.H. Collins et al 1981

chalcopyrite. Twelvetrees (1901) reports stannite detected in galena from this mine. The ore at this deposit also contains a high, but variable silver content with assays of up to 407 g/t Ag in ore containing 64.5mass% Pb (Twelvetrees, 1901).

*North Murchison (Murchison Extended) mine [660592]*

The workings, apparently abandoned at the time of Ward's (1908) inspection, consist of one adit 43 m in length, which intersected a zone of brecciated shale containing siderite veins with minor galena, pyrite and fahlore. Surface trenching indicated the lode is about two metres thick (Twelvetrees, 1901). Further prospecting south and east of the mine located several quartz and siderite veins with minor pyrite and galena.

#### OTHER SILVER-LEAD DEPOSITS

*Silver Falls prospect [564728]*

This prospect is situated at the base of a 30 m waterfall in Ross Creek, approximately 5 km north of Burns Peak. Silver-lead mineralisation was discovered in 1891, but only limited exploration by small open cuts and trenching has been undertaken (Reid, 1918). In the first report on the prospect, Montgomery (1892) concluded that the scattered galena in the lode was not in payable proportions.

The mineralisation occurs along the faulted(?) contact (striking  $010^\circ$  and dipping  $65^\circ$ - $75^\circ$ E) between quartz-feldspar porphyry to the east and mudstone to the west. Fine-grained galena, sphalerite and minor chalcopyrite and pyrite occur as disseminations and as veinlets sporadically distributed throughout silicified dolomite (or limestone) over a thickness of some 15 m (Reid, 1918). Gangue minerals include calcite, barite, talc and pyrophyllite. A sample of galena-bearing dolomitic rock collected by Reid contained 9.4mass% Pb, 1.7mass% Zn and 22 g/t Ag.

Reid (1918) concluded that brecciation and silicification of the host rocks occurred prior to precipitation of calcite, barite and sulphide from hydrothermal solutions.

*White Hawk mine [724664]*

The White Hawk mine is situated on the steep slopes on the west bank of White Hawk Creek, near its confluence with the Brougham River, where the occurrence of galena in limestone was discovered by T.H. Farrell in 1891 (Montgomery, 1892). The mine was first inspected by Montgomery (1895), but the only detailed description of the deposit is that given by Ward (1908), who reported a gossanous lode dipping  $35^\circ$  -  $40^\circ$  SE and striking  $340^\circ$  within limestone dipping  $40^\circ$  due west. Two tunnels driven into the west bank of the creek intersected limited oxidised and semi-oxidised mineralisation at a depth of approximately 25 m below the surface gossan.

Ward (1908) described veins of galena and sphalerite with minor cerussite and calcite filling joints in the limestone and occasionally veinlets of calcite with galena, sphalerite and chalcopyrite, parallel to bedding. Analyses of samples collected by Ward (1908) indicate a high silver content associated with the galena (e.g. 1.625 kg/t Ag in a sample containing 77.2mass% Pb).

*Fury mine [892778]*

Located in Fleece Creek, at the boundary between the Cambrian and Precambrian sequences, are the workings (pits, trenches and adit) of the Fury mine. Krummel (1970) described small, irregular patches of galena with minor pyrite, sphalerite and chalcopryrite and secondary cerussite and malachite in north-west trending faults in Cambrian quartz-feldspar porphyry and volcanic breccia, and in Precambrian(?) quartz-chlorite schist occurring in the north bank of Fleece Creek. This is possibly the same mineralisation as that prospected by R.W. Carter in the north-west corner of E.L. 14/74, and known as the Fleece Creek prospect. A 2 kg sample collected by Carter indicated 35.0mass% Pb, 1.3mass% Zn, <0.01mass% Cu, <0.01mass% As, 60 g/t Ag and trace Au. In polished section the only sulphide mineral visible is galena, occurring as regularly shaped grains <1 mm across and averaging 0.2 - 0.4 mm in a siliceous gangue. There is no evidence of deformation of the galena.

*Boco Creek prospects*

Reid (1918) described a discontinuous linear lode (also known as Samuel Smith's lode), 0.5 - 1.5 m thick, extending from near Farrell Siding along the western bank of Boco Creek to the Boco Plain. Quartz, limonite and siderite with minor chlorite, pyrite and calcite occurring within a steep west dipping fracture in quartz-feldspar porphyry is exposed in cuttings along the Emu Bay Railway line. Reid reported the presence of very small quantities of silver in a number of samples, but disputed a reported occurrence of tin in the lode. The quartz-pyrite-carbonate mineralisation is probably associated with development of a major fracture in the porphyry.

*Lynch Creek prospect [552707]*

Reid (1918) reported the discovery of a siliceous cellular limonite gossan carrying abundant barite, pyrite and occasional blebs of galena in the bed of John Lynch Creek. A sample of the gossan assayed at 1.7mass% Pb and 5 g/t Ag. Reid suggests this deposit formed by metasomatic replacement of a thin bed of limestone within breccia-conglomerate, but the presence of limestone is only inferred from the structure of the siliceous gossan.

## COPPER

Small copper deposits occur within Precambrian rocks (Welcome Home prospect) and within Cambrian volcanogenic sequences (Tullibardine mine, Cutty Sark and Hawkesbury prospects). The Tullibardine deposit exhibits a genetic affinity to the Mt Farrell mineralisation, but is included in this section as copper was the dominant metal apparently prospected and exposed in the workings.

*Welcome Home prospect [964792]*

This prospect (also known as the Cataract Creek prospect) is situated on the north bank of the Dove River, approximately one kilometre north-east of its confluence with Pencil Pine Creek and is within the Cradle Mountain - Lake St Clair National Park. Exploration of the prospect is limited to one small open cut in the north bank of the Dove River and several small trenches.

Henderson (1941) described discontinuous, dispersed, lenticular veins, up to 250 mm thick, of pyrite and quartz with minor pyrrhotite, hematite,

From The North Picman and Huskisson  
and Spring Valley Mining Fields  
Geol. Survey Bulletin 28  
Wenatchee, Wash. 1918

... probably quite 5 or 6 feet wide. Its course  
altogether clear, but appears to be nearly north and  
south. No first-class ore is yet exposed, though a  
good deal of the material would probably be worth  
concentrating. The country-rock is limestone and  
sandstone. This is a discovery of some importance,  
and is well worth following up to see if richer ore may  
be obtained.

The many points of similarity of the Lynch Creek pro-  
spect to that just described, in that it is contained in  
limestone and consists essentially of barytes and galena,  
and the situation relative thereto, are strongly suggestive  
of their belonging to the one belt of mineralization.

The lode material at Lynch Creek is a siliceous gossan  
carrying abundant barytes and occasional blebs of galena.  
The tonnage of the gossan is derived from the oxidation of  
pyrites, but a considerable portion of the original pyrite-  
constituent has been leached out, leaving the siliceous  
residue. Evidently it was originally a very porous  
mass. Pseudomorphs of limonite, in the form of pentagonal  
dodecahedra, after pyrite, are commonly observed in the  
ore. Barytes is found in the form of plates several  
inches long, and occurs usually in narrow veins of  
siliceous silica; galena is always found in the form of  
barytes.

massive  
rather than  
epigenetic  
vein-type  
minerals?

A sample of siliceous gossan from the outcrop of the  
Lynch Creek was submitted to Mr. W. H. Wood,  
Government Assayer, who reported the metallic contents  
to be—lead, 1.7 per cent., silver, 3 dwts. per ton. The  
greater portion of the metallic content has been removed  
by the solvent action of the running water, and the assay  
is, therefore, no criterion of the value of the ore, but the  
presence of silver still remaining in the ore is suggestive  
of greater values in the unattacked lode material.

Very large loose blocks of ore were first discovered in  
the bed of Lynch Creek just above the point of crossing by  
Atkinson's track. These boulders of ore were observed in  
the creek for 10 chains northward, but were not noticed,  
apparently *in situ*, in the bed of the creek. An attempt  
to follow the course of the lode on to the steep hill on  
either side of the creek failed because of the heavy mantle  
of talus and surface soil concealing the outcrop. The  
short stay in this locality did not allow of a thorough  
examination being made, but enough observation was  
gained to indicate the probable nature of the ore deposit.

(1) (a) LYNCH CREEK PROSPECT.

The Lynch Creek prospect, occupying in the valley of Lynch  
Creek, tributary to the Huskisson River, at a point near  
the crossing by Atkinson's track. Its position relative to  
the Huskisson River is 1/4 mile due west, and it may be  
reached from that locality by foot-track.

The discovery of this lode was made by the writer during  
his present geological examination of the district.  
The mineralization is quite distinct from that of  
the district to the eastward, and is probably the con-  
tinuation of that reported on by Mr. J. Montgomery in  
1887. This was a barytes-galena mineralization, discovered  
at the point of crossing of the Quebec and Huskisson  
Rivers. It is referred to in the following terms:—

"On the eastern side of the Huskisson, and close  
to the river, a discovery of galena has been made  
which goes by the name of the Just-in-Time claim.  
About a mile south of the crossing of the Que-  
bec River by the pack-track from Wenatchee to the Picman  
River, the outcrop shows a mixture of quartz,  
barytes, and a little calcite. The lode is ex-  
posed over a distance of over 1/2 mile, and is at least, and

(b) Report on the Lynch Creek Prospect, by J. Montgomery, 1887.  
Route of the Huskisson River, p. 10.

The ore-body is doubtless a metasomatic replacement of  
limestone by ore-bearing solutions derived from a gran-  
itic magma during the later stages of rock solidification.  
These solutions contained a very large amount of silica  
and were strongly acidic. It is probable that the original  
limestone bed was very narrow, as no limestone was  
noticed, and its presence is inferred only from the struc-  
ture of the silicified rock. In the non-mineralized portion  
the rock appears in the form of very delicate cells,  
the sides of which are made up of very thin partitions of  
silica. Some of these cellular shapes appear like casts of  
fossils, but if so, they are too obscure to be recognised.  
Silicification has not been confined to this horizon. The  
conformable beds of breccia-conglomerate, largely made up  
of pyroclastic material, in places have also undergone  
replacement by silica.

volcanic  
agglomeration  
breccia?

The facilities for economic mining are decidedly good.  
On either side of the creek hills rise very steeply over 1000  
feet above the bottom of the valley. Timber for all pur-  
poses is here in abundance, and a plentiful supply of  
water is available even in the dry season.

The indications of the potentialities of this ore-bearing  
horizon as a source of galena are decidedly encouraging,  
and certainly justify far greater attention being paid to  
this district than obtained heretofore. Want of accessi-  
bility has been the great obstacle to the advancement of  
this portion of the district, but as developments warrant  
it communication with the main thoroughfares will be pro-  
vided.

(2) (9) SALFORD'S CLAIM.

Section 1646-M, 78 acres.—This property is situated at  
the southern end of Bobadil Plain, on the western side  
of the Rain Bay Railway-line, between the 67 1/2 and 68  
mileage pegs.

The lodes exposed on this section were discovered last  
year by Alfred Lapham in the banks of a small stream  
flowing westward into the Picman River.

There are two quite distinct parallel ore bodies, the more  
important being that on the eastern side, which for the pur-  
pose of reference will be called the "eastern lode."

Developments consist of a small outcrop on the east-  
ern ore body; another small outcrop on the western forma-  
tion; and light surface prospecting here and there over  
the intervening area. So little developmental work has

remobilised calcite  
assoc. with remobilised  
massive sulphide  
no real l.s.  
present?

weathered siliceous  
(siliceous) massive  
sulphide?

been done that it is quite impossible to form an idea of  
the extent or value of either ore-body; but the examina-  
tion of the structural and mineralogical features of the  
ore-body has furnished much data from which certain  
generalisations may be made.

The eastern ore-body, exposed on the northern bank of a  
small creek, consists essentially of zinc-blende and galena,  
and is contained in calcitic schist. There is no definite  
limit to this lode, nor has its lateral extent been determined,  
but it is certainly 5 or 6 feet wide, and probably the ore-bearing  
formation will prove to be much greater than this. An  
attempt has been made by trenching to ascertain the  
extent of the ore-body, the outcrop of which on the north-  
end is covered by fluvial deposits and on the southern  
end is covered by the Picman River.

Sphalerite or zinc-blende is the predominant mineral  
constituent, and occurs as crystalline bands parallel to the  
foliation of the schist, and also as thin irregular fragments  
traversing the rock. Sphalerite occurs also with galena,  
filling joints and cracks, under which conditions of forma-  
tion it has developed a highly crystalline structure. The  
crystals have usually the tetrahedral habit, and are  
usually twinned. The colour varies from light yellow  
through various shades of brown and reddish-brown to black.

Galena is quite subordinate to sphalerite in the  
constitution of the ore, and although always in close association  
with sphalerite usually occurs as blebs and disseminations  
through the calcitic schist. Galena commonly occurs  
crystallised in cubes; also in massive and coarsely granular  
form.

Limonite, derived from the oxidation of pyrites,  
chalcopyrite always accompanies the more valuable  
minerals. It is found pseudomorphous after calcite and  
rhomboid.

Calcite is very abundantly developed in the schist con-  
taining the ores, and is probably a recrystallisation product  
of the original limestone. These are the calcitic schist here  
described by Mr. Loftus Hills in his report on the Road  
Rosebery Zinc Lead Sulphide Deposits as being the re-  
positories of the ore-bodies.

Some calcite, crystallised in the form of acute rhom-  
bohedral, is younger than the zinc-blende. On the  
weathered surface the calcite appears brown. Mn-bearing?

(\*) Vide Loftus Hills: Geol. Surv. Trans. 1887, p. 19, 1918.

993017

## A P P E N D I X 2

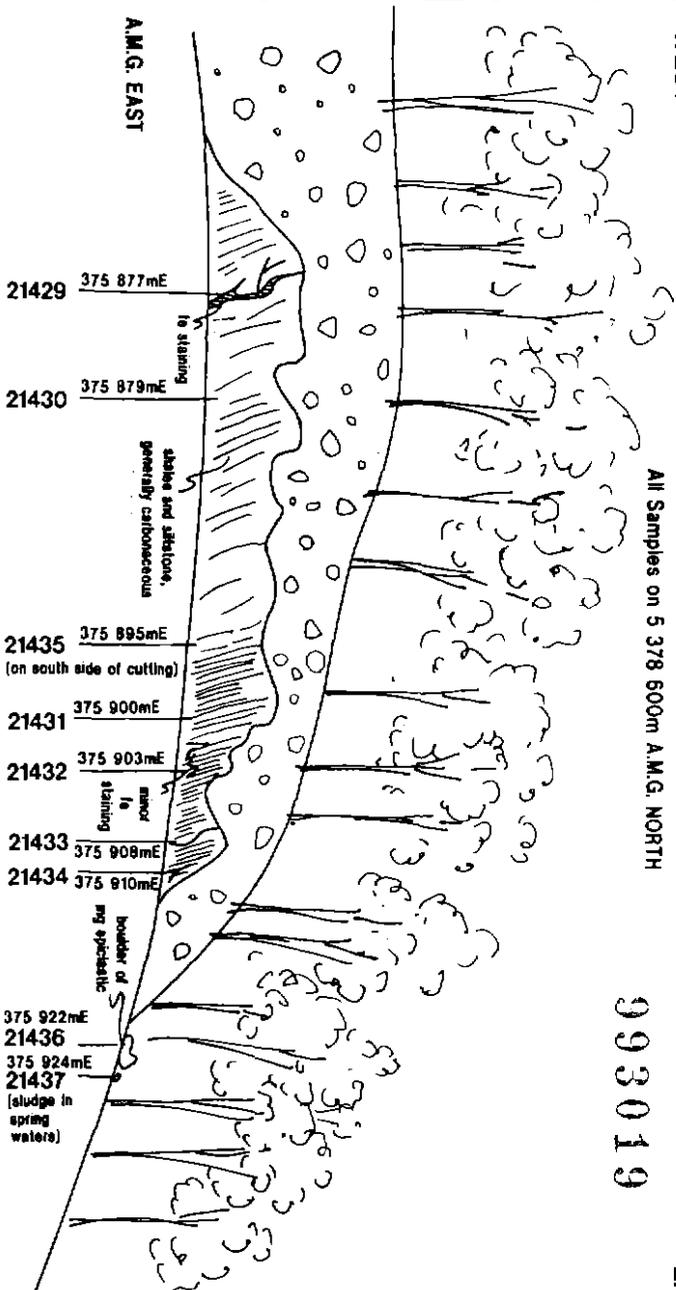
Results of rock-chip sampling by  
Sipa Resources International NL

WEST

EAST

993019

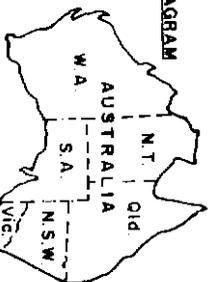
All Samples on 5 378 600m A.M.G. NORTH



Cd ppm	Se ppm	Te ppm	Ag ppm	As ppm	Pb ppm	Zn ppm	Cu ppm	Mn ppm	Fe ppm	Co ppm	Ni ppm	Cr ppm	Ba ppm	Sb ppm	Sn ppm	Bi ppm	Mo ppm	W ppm	Au ppm
16	<10	<0.2	2.0	99	825	3100	117	4690	19.0%	40	96	170	62	52	2	0.4	2.5	1.0	<0.01
1.0	<10	0.4	<0.1	8	65	314	109	7600	8.96%	43	70	110	224	3.8	3	0.4	1.0	1.0	0.01
<0.5	<10	<0.2	<0.1	8	10	221	12	2970	10.6%	88	104	160	238	1.2	3	<0.2	0.5	<0.5	<0.01
0.5	<10	<0.2	<0.1	19	755	111	23	1370	2.81%	6	12	180	265	30	3	0.2	11	4.0	0.02
<0.5	<10	<0.2	<0.1	9	80	121	156	169	9.20%	50	78	200	220	5.0	3	0.2	9.5	1.5	<0.01
<0.5	<10	<0.2	<0.1	5	55	135	100	1940	8.94%	23	60	150	128	2.4	2	<0.2	1.5	<0.5	<0.01
<0.5	<10	<0.2	<0.1	2	20	74	11	797	8.77%	11	167	50	32	0.6	<1	<0.2	3.0	<0.5	<0.01
<0.5	<10	<0.2	<0.1	5	20	164	12	841	3.37%	8	10	90	804	1.4	2	<0.2	2.0	15	0.01
2.0	<10	<0.2	<0.1	37	295	1310	513	376	24.6%	266	182	250	614	4.4	<1	0.4	5.5	<0.5	<0.01

5 cm

LOCALITY DIAGRAM



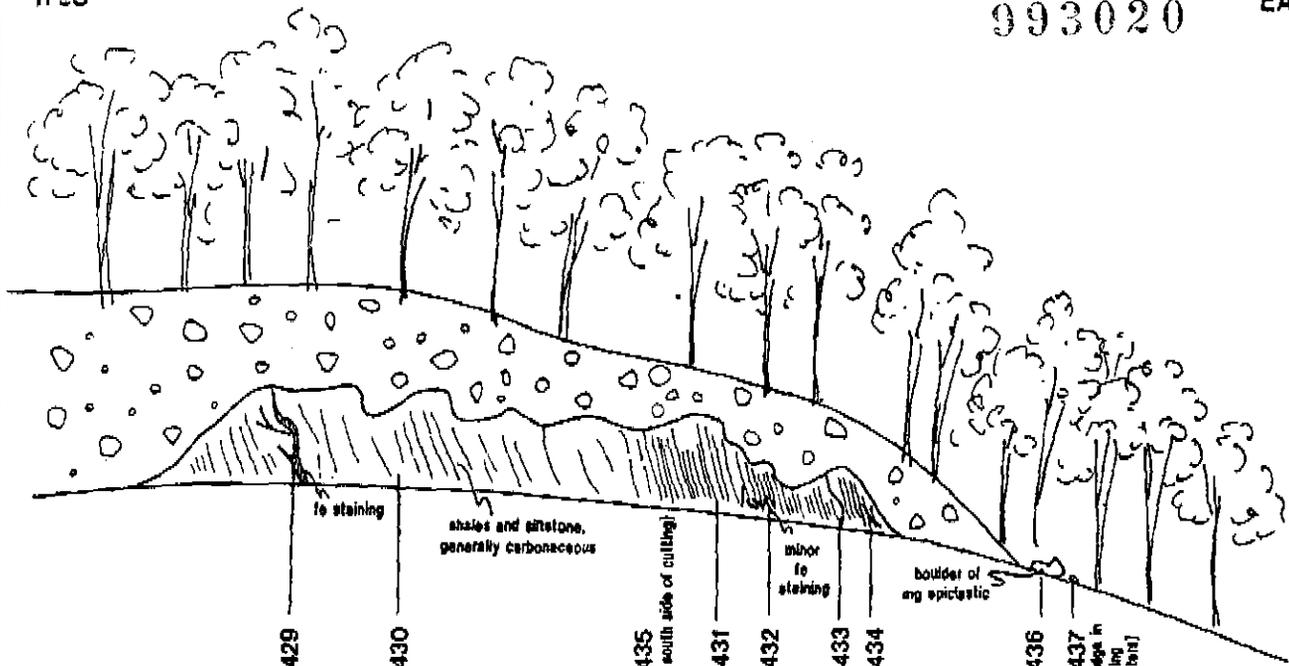
HORIZONTAL SCALE 1:500 V/H = 5

0 5 10 20 30metres


**Sipa Exploration N.L.**  
 Sample Dispatch Advice: SRL 00306 **93-3480**

**MARIANOAK EL29/91 (A J Hosking)**  
**NORTH WEST TASMANIA**  
**SAMPLE LOCATION DIAGRAM**

Geologist: MGD. Date: MAY 1993 DRAWING No. 1314  
 Prepared: PDEA Revised:



Element	21429	21430	21435 (on south side of cutting)	21431	21432	21433	21434	21436	21437 (boulder in spring waters)
Au ppm	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01
W ppm	1.0	1.0	<0.5	4.0	1.5	<0.5	<0.5	1.5	<0.5
Mo ppm	2.5	1.0	0.5	1.1	0.5	1.5	2.0	2.0	5.5
Bi ppm	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.4
Sn ppm	2	3	3	3	3	2	1	2	1
Sb ppm	52	3.8	1.2	3.0	5.0	2.4	0.8	1.4	4.4
Br ppm	52	224	238	265	220	178	32	804	514
Cr ppm	170	110	150	180	200	150	50	90	250
Ni ppm	96	70	104	12	75	50	167	30	182
Co ppm	40	43	68	6	50	23	11	8	266
Fe ppm	19.0%	8.96%	10.6%	2.81%	9.20%	8.94%	8.77%	3.37%	24.6%
Mn ppm	4890	7600	2970	1370	169	1840	197	841	376
Cu ppm	117	109	12	23	256	100	11	12	513
Zn ppm	3800	314	221	111	121	135	74	164	1370
Pb ppm	825	65	10	755	80	55	20	20	285
As ppm	99	6	6	19	9	5	2	5	37
Ag ppm	2.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Te ppm	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Se ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cd ppm	1.0	<10	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	2.0



LOCALITY DIAGRAM



HORIZONTAL SCALE 1:500 V/H : 5  
 10 5 0 10 20 30metres

Sample Dispatch Advice: SRL 00306

<p><b>Sipa Exploration N.L.</b></p>		
<p><b>MARIANOAK EL29/91 (A J Hosking)</b></p>		
<p><b>NORTH WEST TASMANIA</b></p>		
<p><b>SAMPLE LOCATION DIAGRAM</b></p>		
Geologist: M.G.D.	Date: MAY 1993	DRAWING. No. 1374
Drafted: PDEA	Revised:	



Reference Number : 55941  
 Samples Received : 05/05/93  
 Results Reported : 19/05/93  
 Order Number : 00306

Report Analyte Codes:  
 L.N.R. Listed but not received  
 I.S. Insufficient sample  
 for analysis  
 \*SS Duplicate sample analysed  
 (from second split)

Mr M G Doepel  
 Sipa Resources Limited  
 PO Box 1183  
 WEST PERTH

WA 6005

**ANALYSIS REPORT FOR MINERAL SAMPLES**

Approved Signature: 

for

Samantha Claudius  
 Senior Chemist - Quality Control

These results are issued in accordance with terms and conditions  
 as defined in our Schedule of Services, dated August, 1992

**MULTILAB Pty Ltd**

A MEMBER OF THE SCIENTIFIC SERVICES GROUP A.C.N. 008 746 610

**HEAD OFFICE:**

41-45 LUNNACRE ROAD  
 WEDDINGTON, W.A. 6105  
 PO BOX 808, CANNING TOWN,  
 WESTERN AUSTRALIA, 6107  
 TELEPHONE: (09) 451 9383  
 FACSIMILE: (09) 451 3151

**MINE RESOURCE LABORATORY:**

59 CROCKER DRIVE,  
 MARGA, W.A. 6042  
 TELEPHONE: (09) 249 3399  
 FACSIMILE: (09) 249 3381

**KALGOORLIE:**

296 HAY STREET,  
 KALGOORLIE, W.A. 3410  
 TELEPHONE: (09) 912 456  
 FACSIMILE: (09) 216 808

**LEINSTER:**

CAMP TWO,  
 LEINSTER, W.A. 6437  
 TELEPHONE: (099) 329 064  
 FACSIMILE: (099) 329 197

**MT MAGNET:**

101 530, CRIDDLE STREET,  
 MT MAGNET, W.A. 6038  
 TELEPHONE: (099) 634 559  
 FACSIMILE: (099) 634 559

993022

Order Number : 00306  
 Project Code :

Job Number: 55941

ANALYTICAL REPORT

Page 1 of 5

Element	Au	Ag
Units	ppm	ppm
Det.Lim	0.01	0.1
21429	<0.01	2.0
21430	0.01	<0.1
21431	0.02	<0.1
21432	<0.01	<0.1
21433	0.01	<0.1
21434	<0.01	<0.1
21435	<0.01	<0.1
21436	0.01	<0.1
21437	<0.01	<0.1
*SS 21429	<0.01	2.1

Scheme

A25AAS A25AAS



Order Number : 00306  
Project Code :

Job Number: 55941

## ANALYTICAL REPORT

Page 2 of 5

Element	Zn	Cu	Ni
Units	ppm	ppm	ppm
Det.Lim	1	1	2
21429	3100	117	96
21430	314	109	70
21431	111	23	12
21432	121	156	76
21433	135	100	60
21434	74	11	16
21435	221	12	104
21436	164	12	10
21437	1310	513	182
*SS 21429	3400	116	90

Scheme

M50AAS M50AAS M50AAS



993024

Order Number : 00306  
Project Code :

Job Number: 55941

## ANALYTICAL REPORT

Page 3 of 5

Element	Mn	Fe	Cr	Ba
Units	ppm	ppm	ppm	ppm
Det.Lim	1	10	10	2
21429	7600	19.0%	170	62
21430	1370	8.96%	110	224
21431	169	2.81%	180	266
21432	1940	9.20%	200	220
21433	797	8.94%	150	128
21434	2970	8.77%	50	32
21435	841	10.6%	160	238
21436	376	3.37%	90	804
21437	4690	24.6%	250	614
*SS 21429	7540	18.4%	160	58

Scheme

M500ES M500ES M500ES M500ES



Order Number : 00306  
 Project Code :

Job Number: 55941

ANALYTICAL REPORT

Page 4 of 5

Element	As	Pb	Sb	Sn	Bi	Mo	W
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Det.Lim	1	5	0.2	1	0.2	0.5	0.5
21429	99	825	52	2	0.4	2.5	1.0
21430	6	65	3.8	3	0.4	1.0	1.0
21431	19	755	30	3	0.2	11	4.0
21432	9	80	5.0	3	0.2	9.5	1.5
21433	5	55	2.4	2	<0.2	1.5	<0.5
21434	2	20	0.6	<1	<0.2	3.0	<0.5
21435	6	10	1.2	3	<0.2	0.5	<0.5
21436	5	20	1.4	2	<0.2	2.0	1.5
21437	37	295	4.4	<1	0.4	5.5	<0.5
*SS 21429	97	870	49	2	0.4	2.0	1.0

Scheme

M50MS6 M50MS6 M50MS6 M50MS6 M50MS6 M50MS6 M50MS6



993026

Order Number : 00306  
Project Code :

Job Number: 55941

## ANALYTICAL REPORT

Page 5 of 5

---

Element	Co	Cd	Se	Te
Units	ppm	ppm	ppm	ppm
Det.Lim	1	0.5	10	0.2
21429	40	16	<10	<0.2
21430	43	1.0	<10	0.4
21431	6	0.5	<10	<0.2
21432	50	<0.5	<10	<0.2
21433	23	<0.5	<10	<0.2
21434	11	<0.5	<10	<0.2
21435	68	<0.5	<10	<0.2
21436	8	<0.5	<10	<0.2
21437	266	2.0	<10	<0.2
*SS 21429	39	16	<10	<0.2

---

Scheme

M50MS6 M50MS6 M50MS6 M50MS6



993027

ob number : 55941 Order number : 00306

-----  
Scheme code : PD2 - Sample drying  
-----

Sample drying (1-2kg)

-----  
Scheme code : PJ2 - Jaw crush (2kg)  
-----

Jaw crush (2kg)

-----  
Scheme code : PH2 - Hammer mill (2kg)  
-----

Hammer mill (2kg)

-----  
Scheme code : PR3 - Pulverise 300g R/Lab  
-----

Rotary split 300g, pulverise in Rocklab bowl.

-----  
Scheme code : A25AAS - Analysis by AAS  
-----

A 25g sample is digested in aqua regia, extracted into DIBK; the DIBK layer is then analysed by atomic absorption spectrophotometry (AAS).

-----  
Scheme code : MAD50 - Mixed Acid Digest  
-----

Approx. 0.50 of sample has been made up into 50mLs solution with a mixed acid digest.

-----  
Scheme code : M50AAS - Analysis by AAS  
-----

Approx 0.50g sample made up to 50mL solution with mixed acid digest, has been analysed by atomic absorption spectrophotometry (AAS).

-----  
Scheme code : M50OES - Analysis by ICPOES  
-----

Approx 0.50g sample made up to 50mL solution with a mixed acid digest, analysed by inductively coupled optical emission spectrometer (ICP-OES)





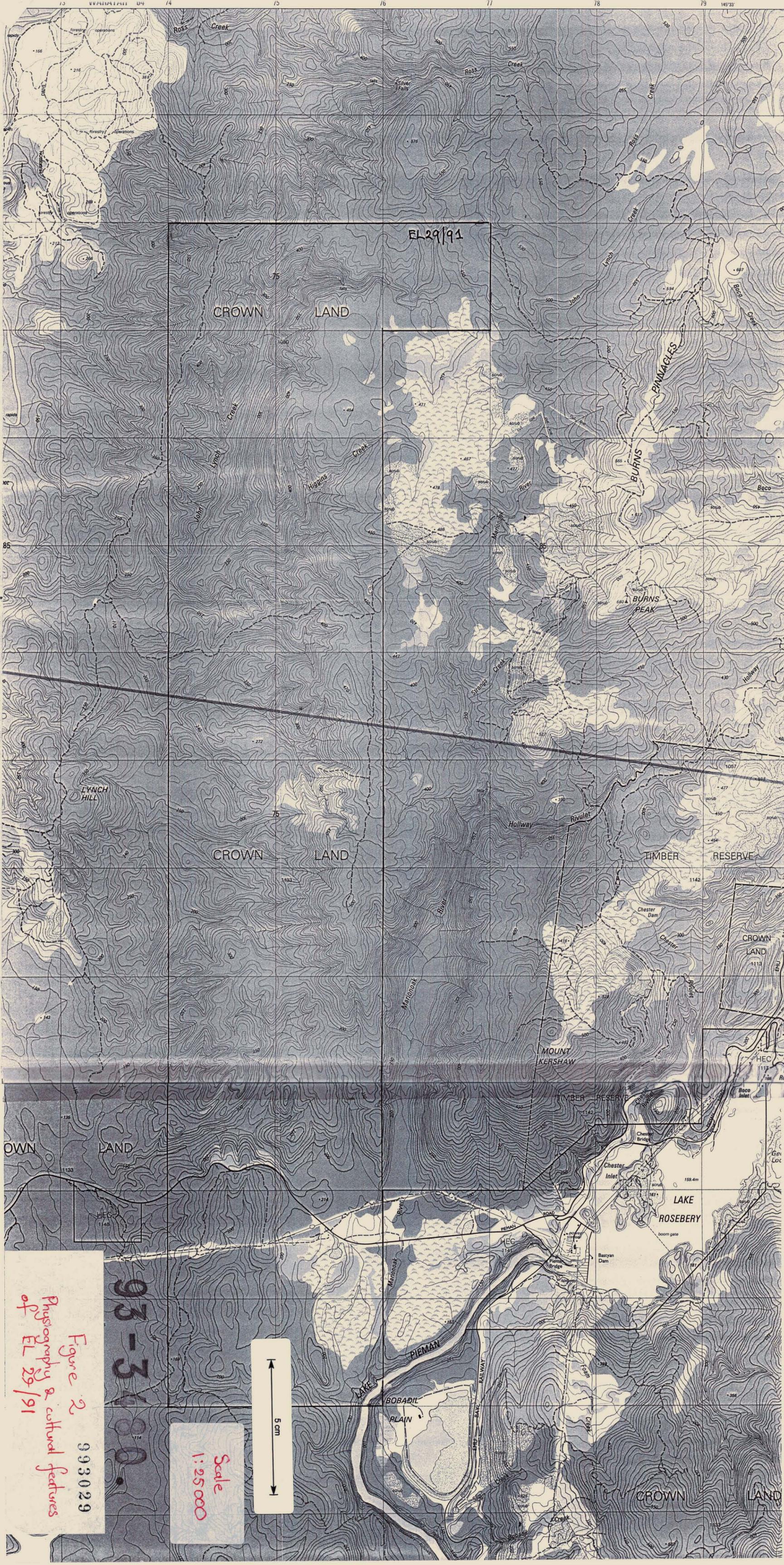
993028

Figure 1

Location of EL 29/91

97-3480.

5 cm



EL29/91

CROWN LAND

BURNS PINNACLES

BURNS PEAK

CROWN LAND

TIMBER RESERVE

CROWN LAND

CROWN LAND

TIMBER RESERVE

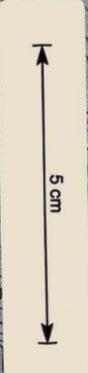
LAKE ROSEBERY

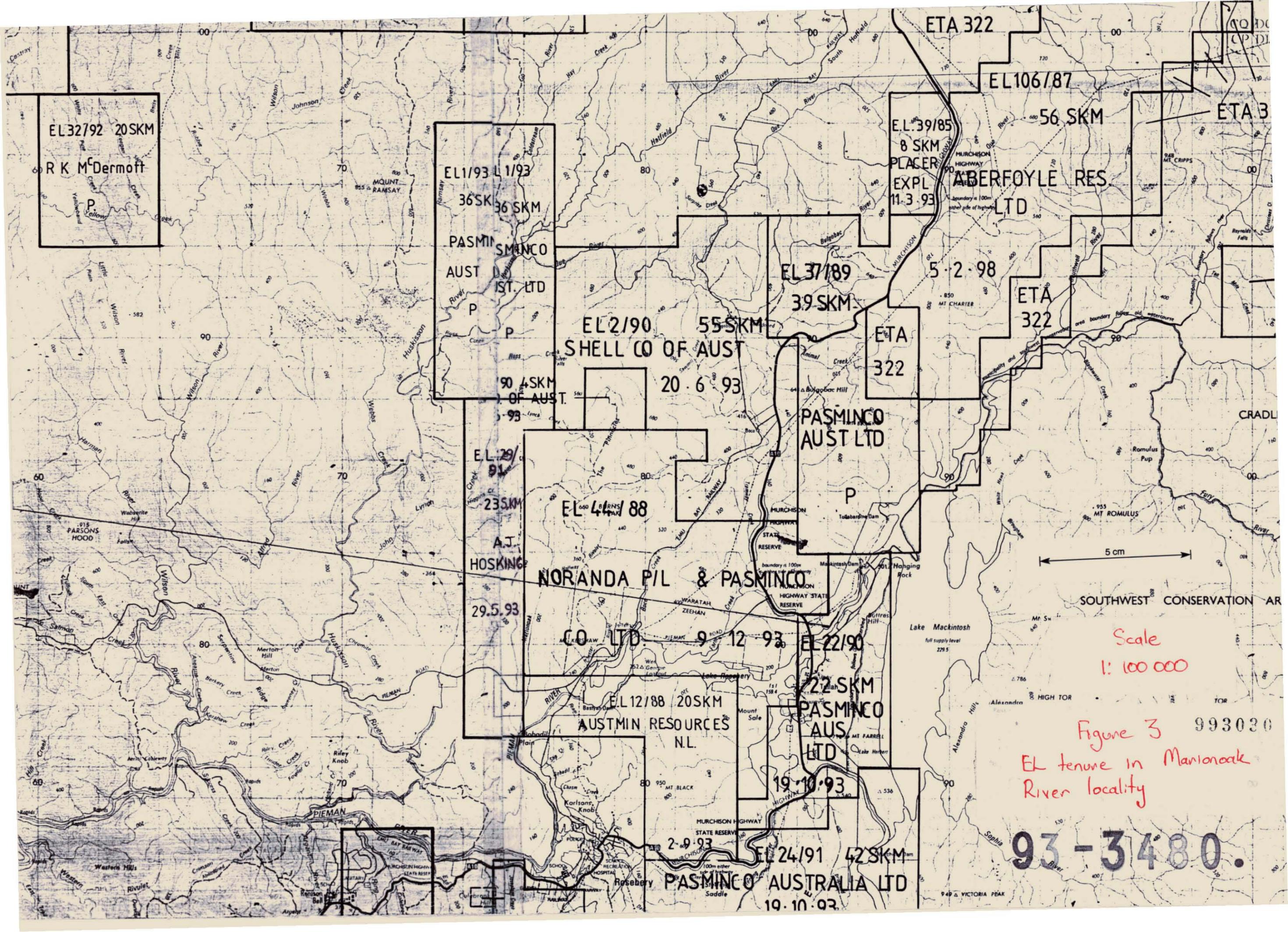
93-3480

Figure 2  
Physiography & cultural features  
of EL 29/91

993029

Scale  
1:25000





EL32792 20SKM

R K M'Dermott

EL1193 11/93

36SK 36SKM

PASMINCO

AUST LTD

EL2190 55SKM  
SHELL CO OF AUST

90.4SKM  
OF AUST.

20.6.93

EL37189

39SKM

E.L.39/85

8 SKM

PLACER

EXPL

11.3.93

ABERFOYLE RES.

56 SKM

LTD

5.2.98

ETA

322

ETA

322

E.L.29/91

23SKM

A.J.

HOSKING

EL 44188

NORANDA P/L & PASMINGO

29.5.93

CO LTD

9.12.93

EL22190

EL12/88 20SKM

AUSTMIN RESOURCES

N.L.

22 SKM

PASMINCO

AUS

LTD

19.10.93

2.9.93

EL24191 42SKM

PASMINCO AUSTRALIA LTD

19.10.93

5 cm

SOUTHWEST CONSERVATION AR

Scale  
1: 100 000

Figure 3  
EL tenure in Marionoak  
River locality

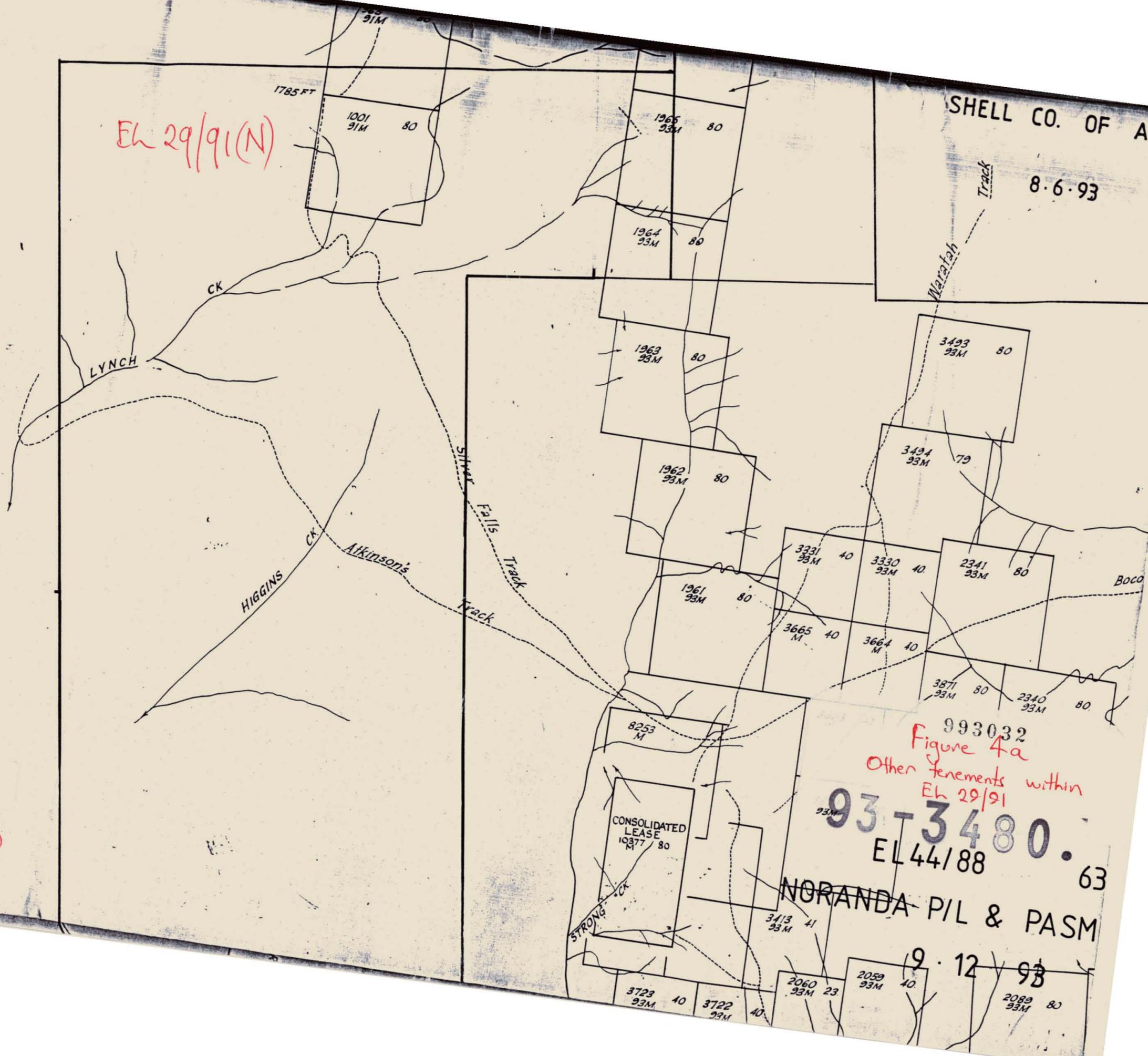
93-3480.



EH 29/91(N)

SHELL CO. OF AUST.

8.6.93



5 cm

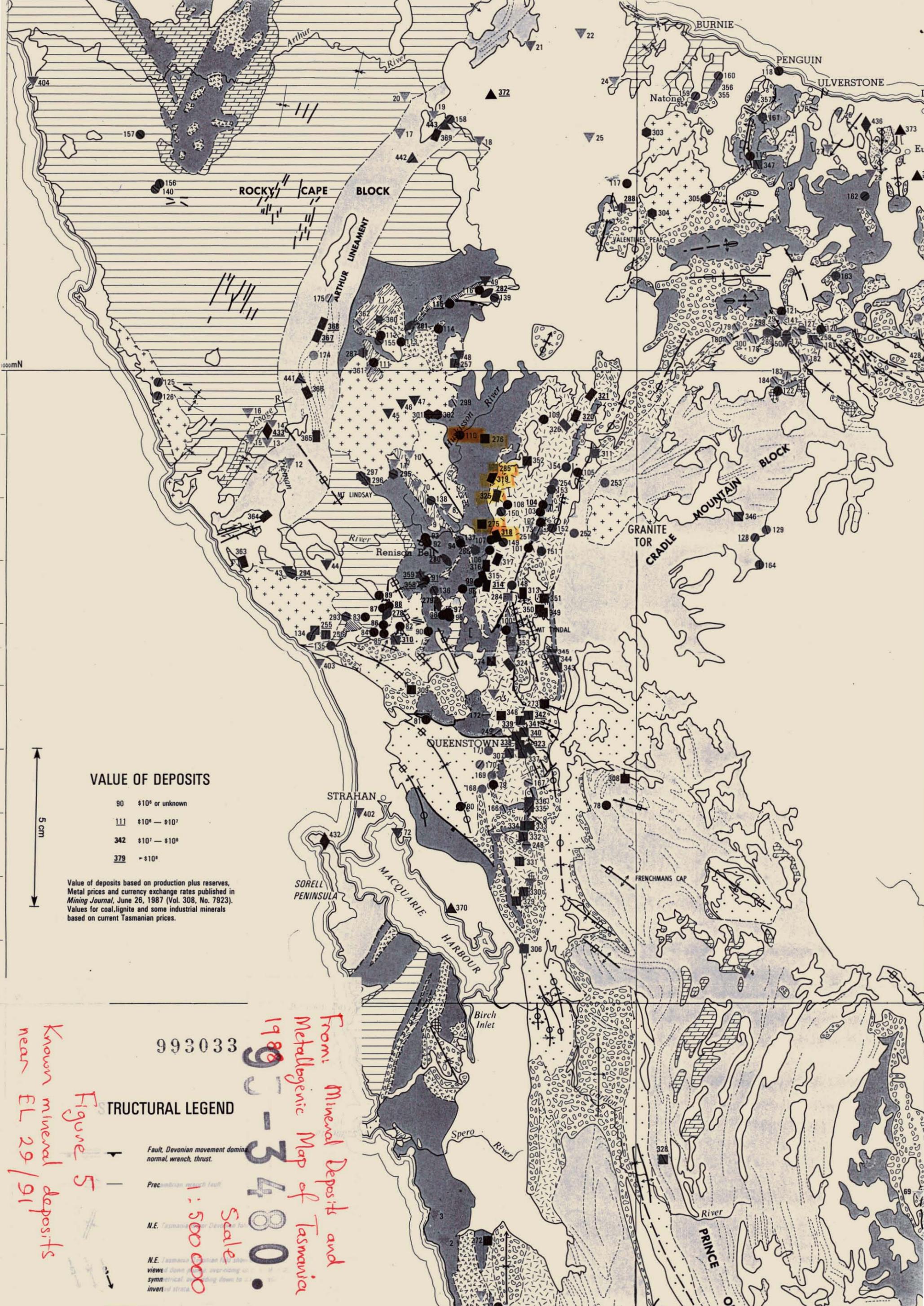
Scale 1: 15840

993032  
Figure 4a  
Other tenements within  
EH 29/91

93-3480.  
EL 44/88 63

NORANDA P/L & PASM

9.12.93



**VALUE OF DEPOSITS**

- 90 \$10<sup>6</sup> or unknown
- 111 \$10<sup>6</sup> - \$10<sup>7</sup>
- 342 \$10<sup>7</sup> - \$10<sup>8</sup>
- 379 > \$10<sup>8</sup>

Value of deposits based on production plus reserves, Metal prices and currency exchange rates published in Mining Journal, June 26, 1987 (Vol. 308, No. 7923). Values for coal, lignite and some industrial minerals based on current Tasmanian prices.

**STRUCTURAL LEGEND**

- Fault, Devonian movement dominant, normal, wrench, thrust.
- Precambrian thrust fault.
- N.E. Tasmanian or Devonian fault.
- N.E. Tasmanian or Devonian fault, view down dip, over-hanging, symmetrical, arching down to inverted strata.

993033  
 1989  
 95-3480  
 Scale 1:500,000  
 From: Mineral Deposits and Metallogenic Map of Tasmania  
 Figure 5  
 Known mineral deposits near EL 29/91



**LEGEND**

- Area still to be sampled, stream sed survey
- Quaternary plain
- Unprospective Upper Cambrian
- Rhyolitic tuff
- Dacitic/rhyolitic tuff

**STREAM SEDIMENT ANOMALIES**

- 1st order Cu-Pb-Zn anomaly
- 2nd order Pb-Zn(-Cu) anomaly
- Low order Pb anomaly
- Approx. anomaly catchment

**SCALE**

metres 0 1000 2000 3000 4000metres

5 cm

Area of intensive exploration by Aberfoyle-Billiton

Aberfoyle geochemical anomalies within and near EL 29/91

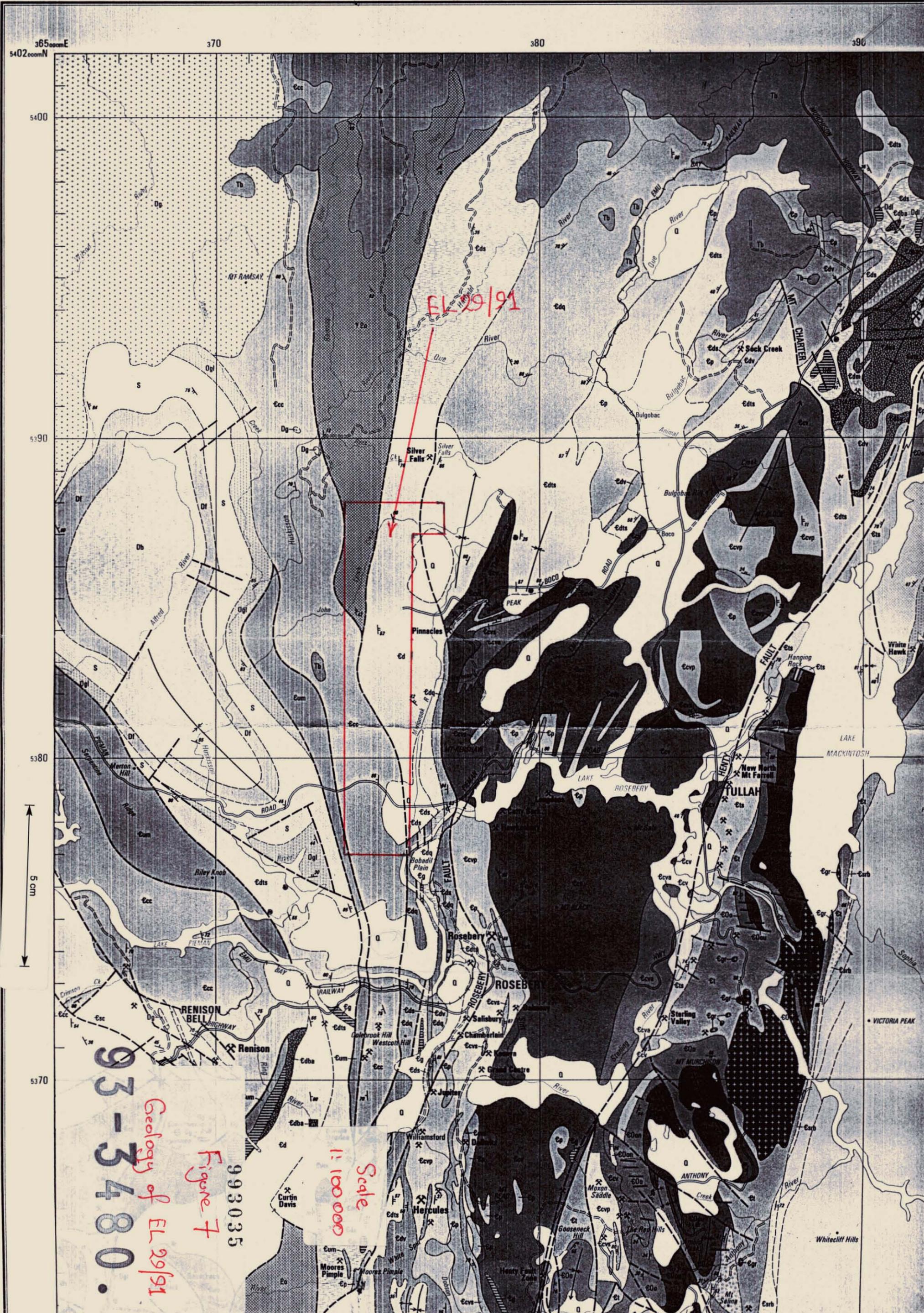
93-3480  
993034

**Cominco Exploration Pty Ltd**

Drawn: I.B.F.  
Traced: R.K.Y.  
Checked:  
Revised: Date:

NORTH WEST TASMANIA  
E.L.22/74 - MARIONOAK RIVER  
EXPLORATION SUMMARY MAP 1976

Location code:  
Scale: 1:50,000  
Date: October 1976  
Plate N°: MOC 6



EL 29/91

93-3480

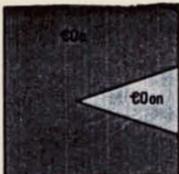
Geology of EL 29/91

Figure 7

993035

Scale 1:100000

EARLY ORDOVICIAN  
— LATE CAMBRIAN

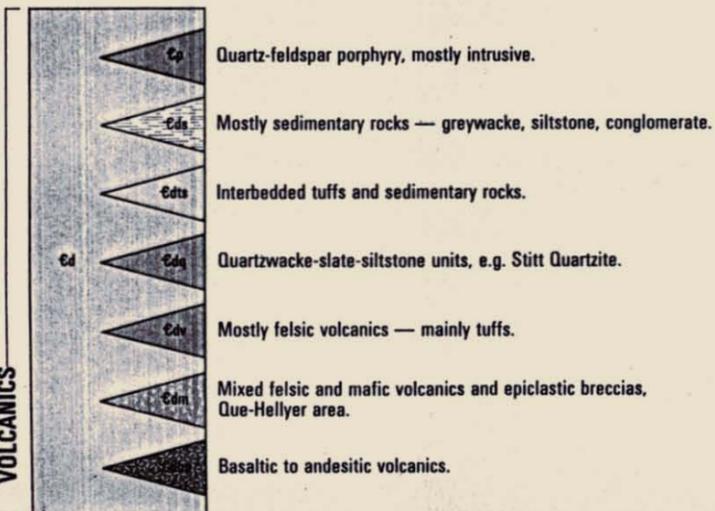


Undifferentiated conglomerate and sandstone (COo).  
Newton Creek Sandstone (COon) — interbedded sandstone siltstone and conglomerate with marine fossils.

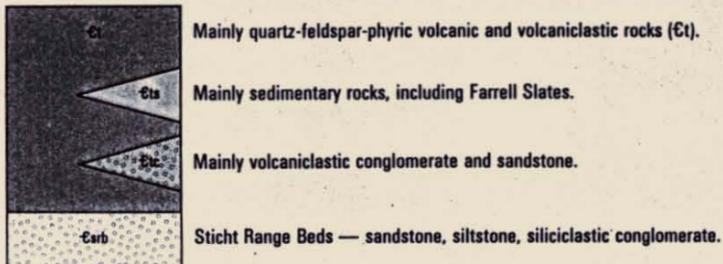
OWEN CONGLOMERATE  
= DENISON GROUP

993036

**NORTH AND WEST OF HENTY FAULT  
DUNDAS GROUP AND CORRELATES**

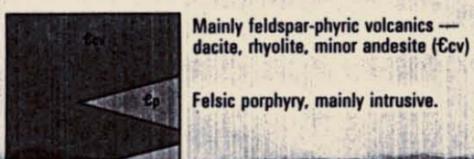


**SOUTH AND EAST OF HENTY FAULT  
TYNDALL GROUP AND CORRELATES**

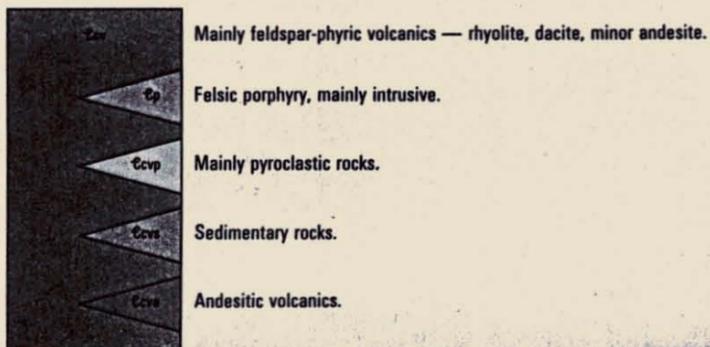


MOUNT READ VOLCANICS

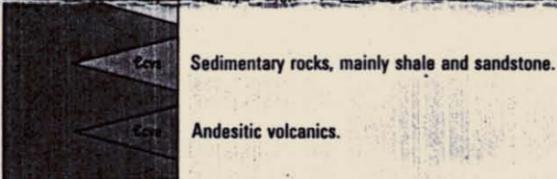
**CENTRAL VOLCANIC COMPLEX**



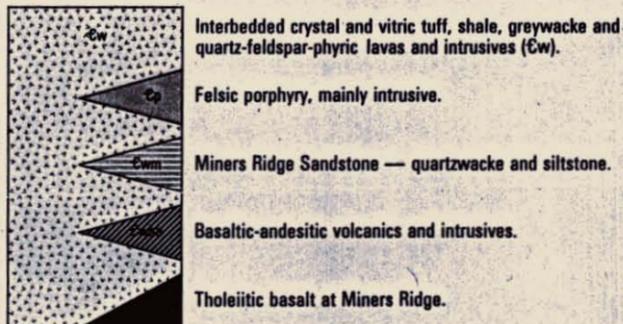
**CENTRAL VOLCANIC COMPLEX**



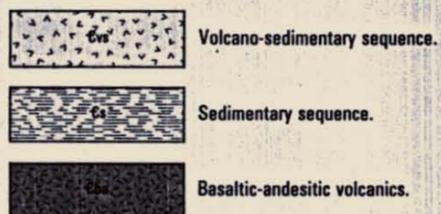
CAMBRIAN



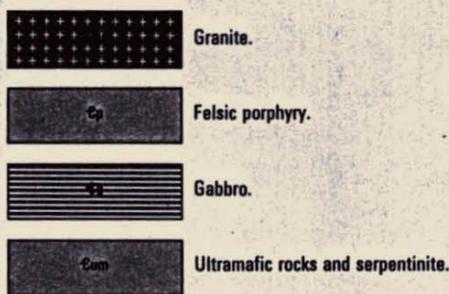
**WESTERN SEQUENCE**



**UNASSIGNED CAMBRIAN UNITS**



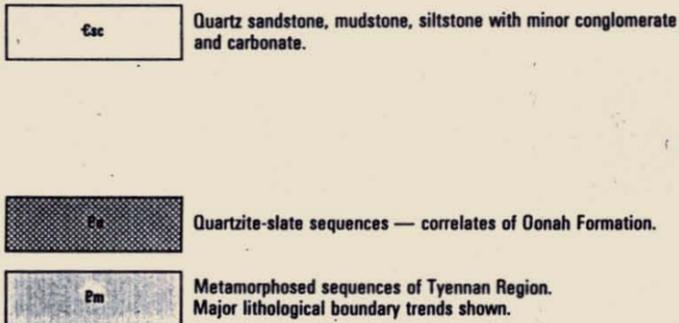
**CAMBRIAN INTRUSIVE ROCKS**



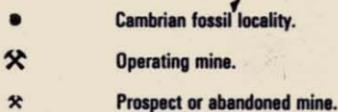
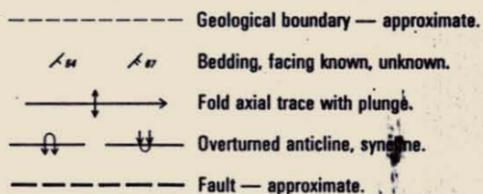
**CRIMSON CREEK FORMATION**



**SUCCESS CREEK GROUP**



PRECAMBRIAN



93-3480

Figure 7a



Location of felsic  
volcanics in northeast  
corner of FL 29/91  
993037

Figure 8

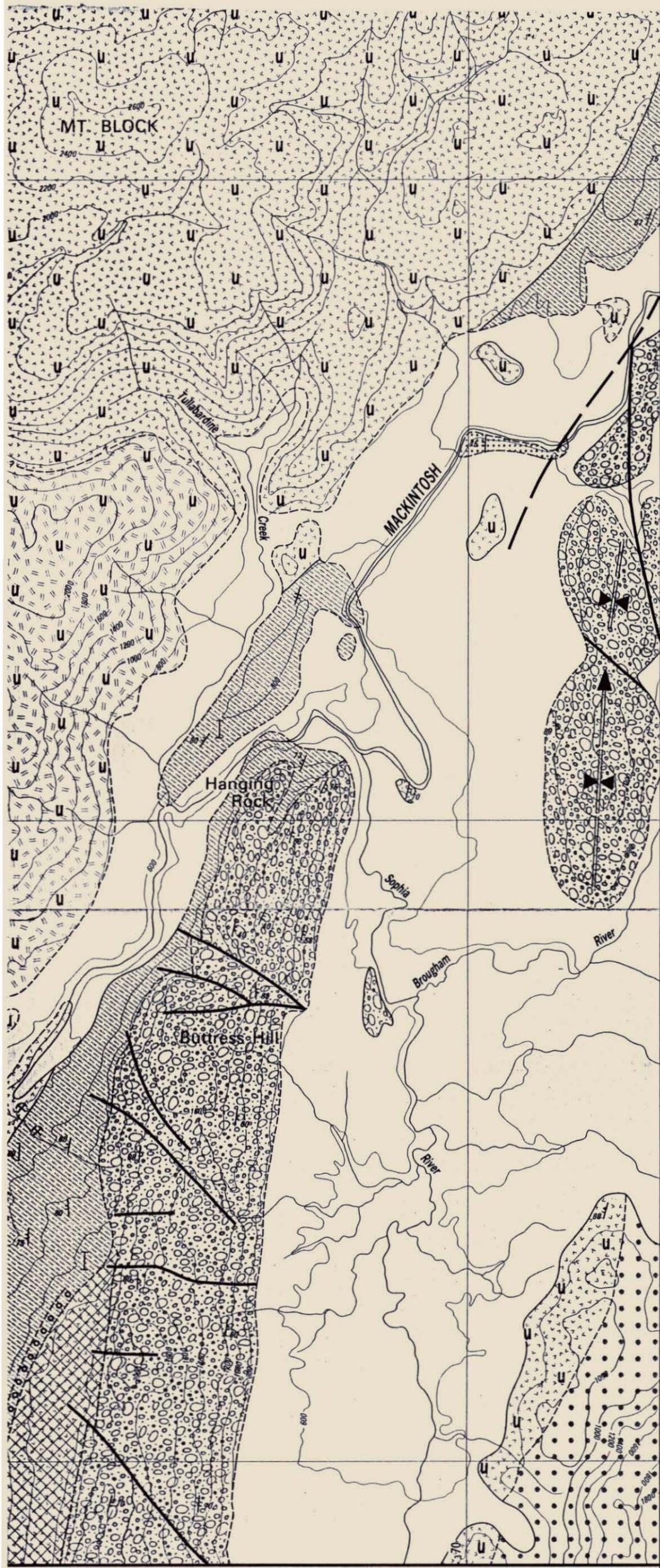
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# GEOLOGY OF THE PINNACLES — QUE RIVER AREA

P. L. F. COLLINS MAY 1980

5 cm

0 1 2  
SCALE 1:36,680



993038  
REFERENCE

- |                         |   |   |
|-------------------------|---|---|
| QUATERNARY              |   | Alluvial, fluvial, fluvio-glacial and glacial sediments.  |
| TERTIARY                |   | Basalt, minor sediments.  |
| JURASSIC                |   | Dolerite  |
| E.DEVONIAN — ORDOVICIAN |   | Siliceous conglomerate and sandstone, limestone, quartzite, siltstone and shale.  |
| CAMBRIAN                |   | Mudstone-greywacke sequence of the Coldstream River, with limestone conglomerate indicated.   |
|                         |   | Greywacke conglomerate-sandstone and mudstone sequence.   |
|                         |   | Greywacke-mudstone, sequence of the Hatfield River.   |
|                         |   | Mudstone-quartzite-greywacke and tuffaceous greywacke-mudstone sequence of the Bulgobac-Pinnacles area; with conglomerate horizons indicated. |
|                         |   | Shale and tuff sequence of the Boco Ck.-Bulgobac valley.  |
|                         |   | Animal Creek Greywacke; with thick tuff units indicated.  |
|                         |   | Tuff and minor agglomerate.   |
|                         |   | Que River Beds, with basal (?) agglomerate indicated. Shale horizons in volcanic sequences.   |
|                         |   | Farrell Slate, with conglomerate unit indicated.  |
|                         |   | Shale, quartzite, tuff, argillite and conglomerate of the Rosebery Group.   |
| PRECAMBRIAN             |   | Undifferentiated sediments, with crystal-vitric tuff units indicated.   |
|                         |   | Feldspar-phyric and minor quartz-phyric felsic lavas and pyroclastic rocks with dominant pyroclastic sequences indicated.                     |
|                         |   | Undifferentiated lavas, pyroclastic rocks, and sediments.   |
|                         |   | Crystal tuff, with agglomerate unit indicated.  |
|                         |   | Pyrite-sericite-chlorite alteration zone. Rhyolite, tuff and agglomerate of the Murchison Volcanics.  |
|                         |   | Undifferentiated volcanic rock.   |
|                         |   | Quartz-feldspar porphyry.   |
|                         |   | Andesite-dacite.  |
|                         |   | Basic dyke (dip indicated).   |
|                         |   | Quartzite and pelite sequences.   |
|                         | Geological boundary (observed, approximate, inferred).        |   |
|                         | Strike and dip of bedding (facing indicated).                 |   |
|                         | Strike and dip of bedding (facing unknown), vertical bedding. |   |
|                         | Strike and dip of flow banding, vertical banding.             |   |
|                         | Strike and dip of cleavage, vertical cleavage.                |   |
|                         | Minor fold direction and plunge.                              |   |
|                         | Hinge line of major fold-anticline, syncline.                 |   |
|                         | Fault (dip indicated), fault inferred.                        |   |
|                         | Mine or prospect.   |   |

Map compiled by P. L. F. Collins from original mapping by P. L. F. Collins and from Barton et al. (1966), and additional unpublished mapping by W. B. Anderson, C. Barton, D. I. Groves, A. B. Gulline, B. Marshall, W. L. Matthews and Rio Tinto Australia Exploration.  
Cartography by:— P. B. NANKIVELL