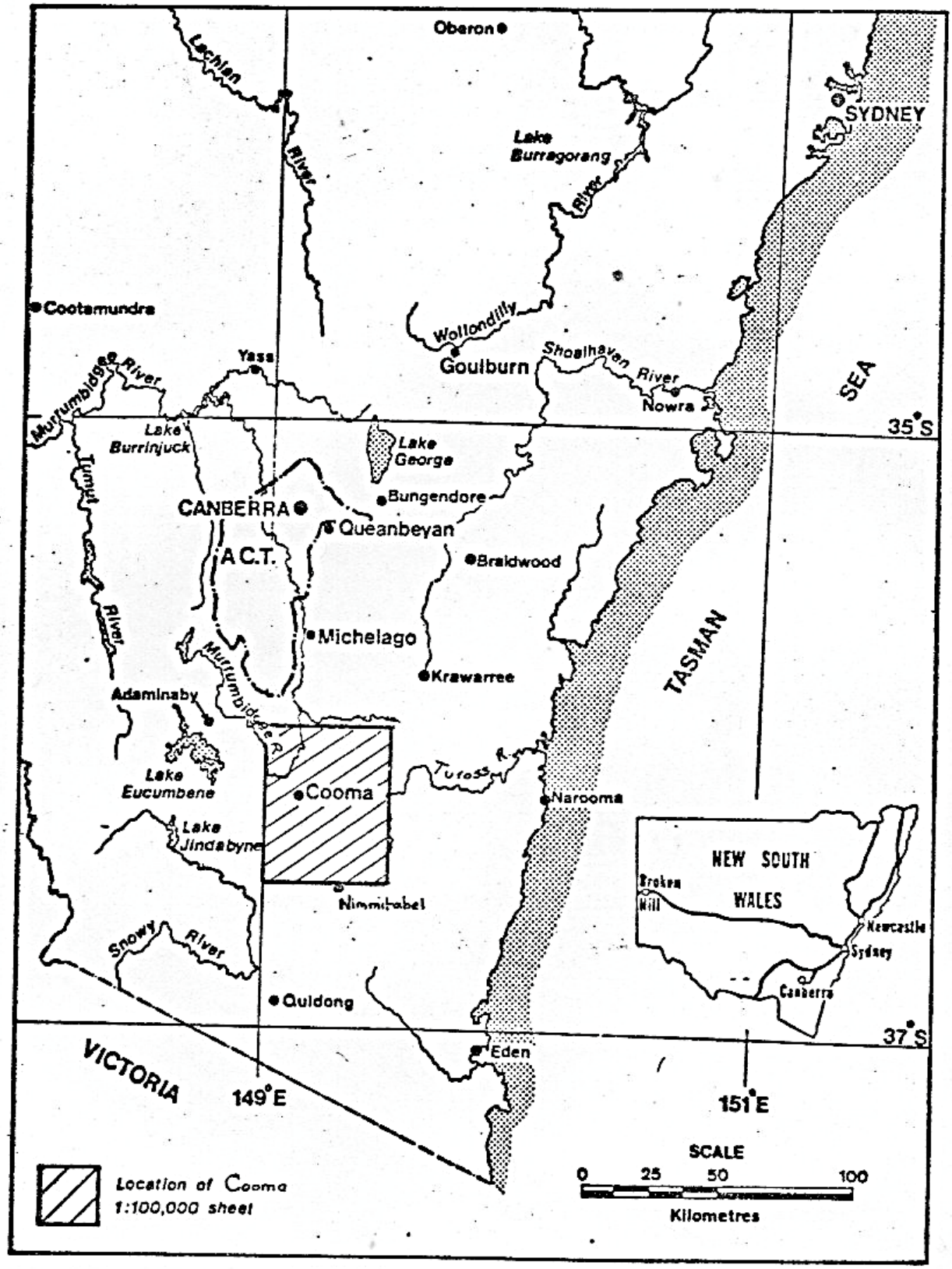


Figure 1. Southeastern New South Wales, showing the location of the Cooma 1:100,000 sheet

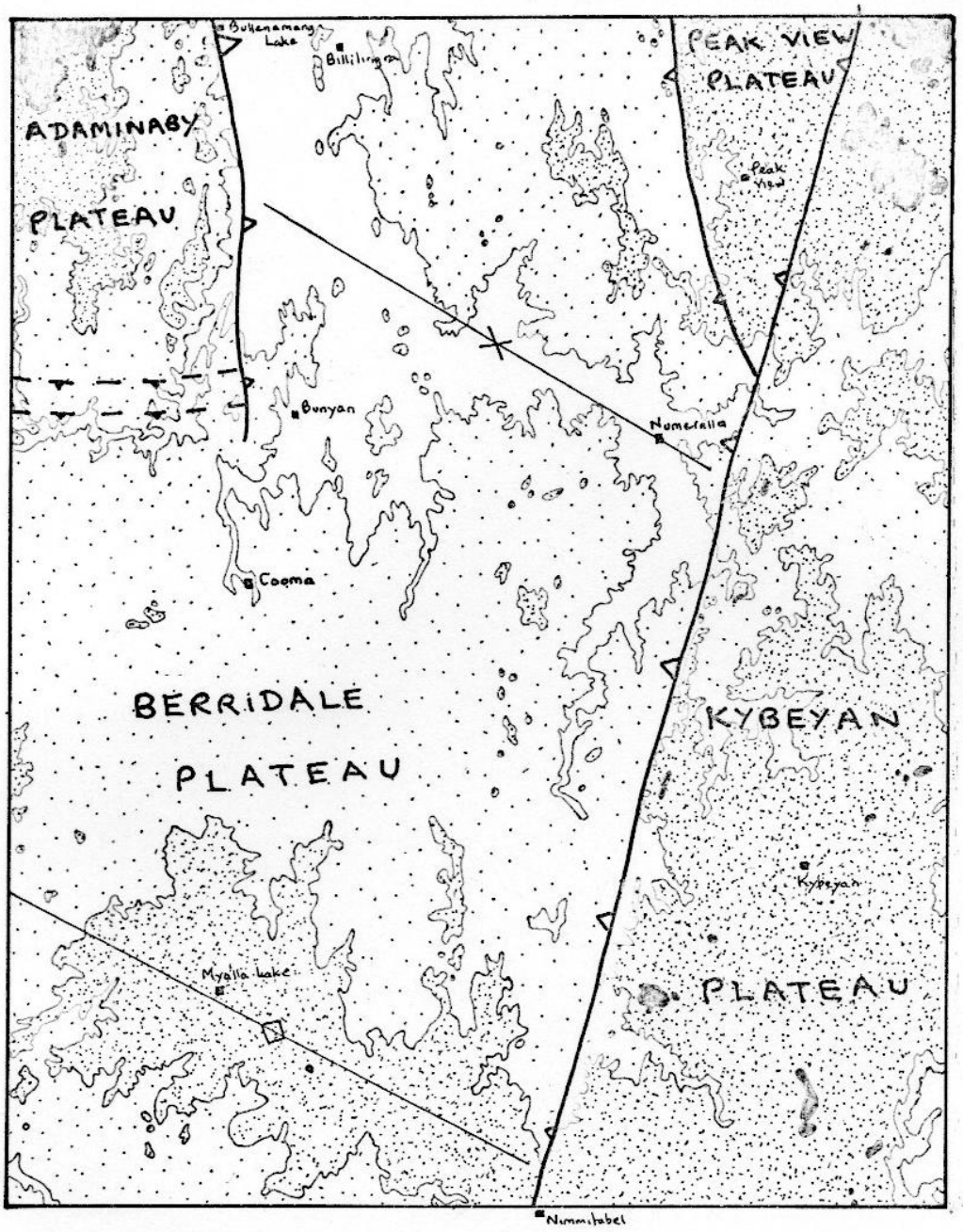


Figure 2. Topography of the Cooma 1:100,000 sheet area and the relationship between the four plateaux present.

Contour
above 1200m
1000 - 1200m
800 - 1000m
below 800m

Abrupt boundary between two plateaux. The tick faces the lower plateau and its size is proportional to the drop in altitude at that point.

Gradual boundary, as above.

Crest of warp in plateau.
Trough of warp in plateau.

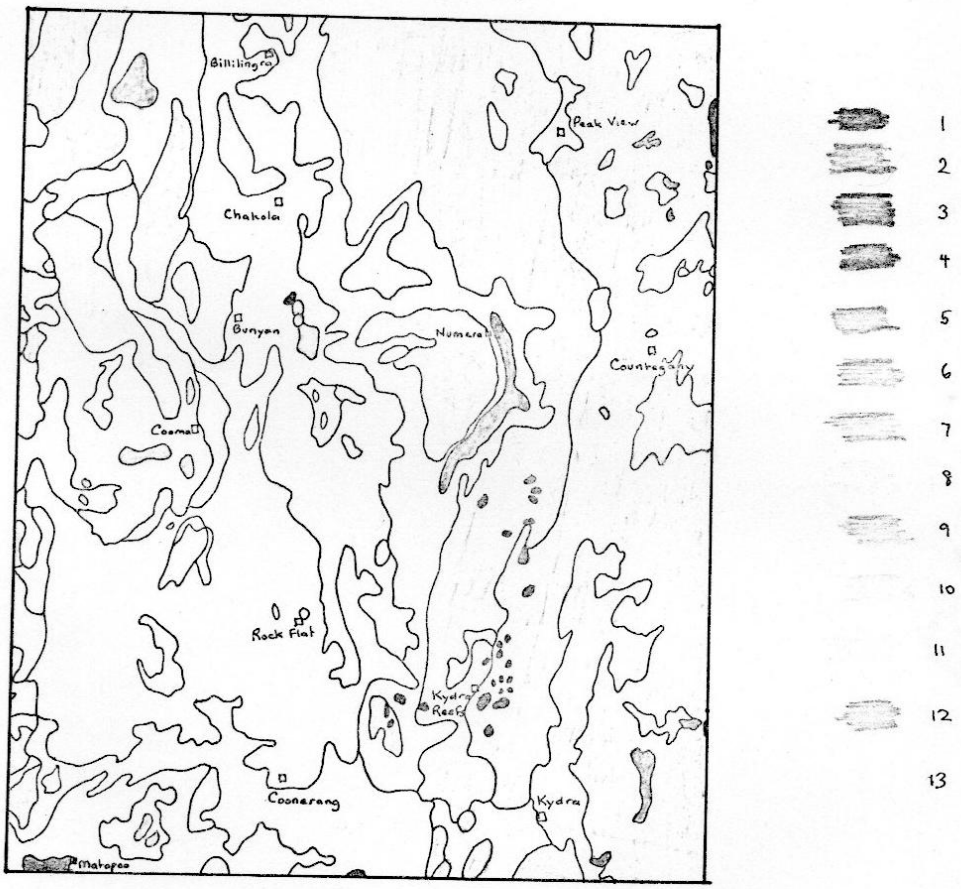


Figure 3. Soils of the Cooma 1:100,000 sheet area.

1	Dry Peat — Brown Podsolic — Lithosol Association	Principal types *Dry Peats, Brown Podsolics, Lithosols.* Minor types *Iron Podsols, Humus Podsols.*
2	Rich Fen Peat Association	Principal type *Rich Fen Peat.* Minor types *Normal Marsh Soils, Silty Bog Soils, Raised Bog Peats.*
3	Normal Meadow Soil — Gley Podsol Association	Principal types *Normal Meadow Soils, Gley Podsols.* Minor types *Brown Meadow Soils, Silty Bog Soils, Alluvial Soils.*
4	Prairie Soil — Normal Meadow Soil Association	Principal types *Prairie Soils, Normal Meadow Soils.* Minor type *Calcareous Meadow Soils.*
5	Alluvial Soils Association	
6	Brown Podsolic — Brown Meadow Soil Association	Principal types *Brown Podsolics, Brown Meadow Soils.* Minor types *Normal Meadow Soils, Iron Podsols, Gley Podsols, Grey-Brown Podsolics.*
7	Grey-Brown Podsolic — Brown Podsolic Association	Principal types *Grey-Brown Podsolics, Brown Podsolics.* Minor types *Lithosols, Colluvial Brown Earths, Iron Podsols.*
8	Grey-Brown Podsolic Association	Principal type *Grey-Brown Podsolics.* Minor types *Brown Podsolics, Brown Soils of Light Texture, Non-calcareous Red-Brown Earths, Degraded Chernozems.*
9	Transitional Alpine Humus Soil — Brown Podsolic Association	Principal types *Transitional Alpine Humus Soils, Brown Podsolics.* Minor types *Iron Podsols, Lithosols, Raised Bog Peats.*
10	Normal Chocolate Soil — Grey Chocolate Soil — Prairie Soil Association	Principal types *Normal Chocolate Soils, Grey Chocolate Soils, Prairie Soils.* Minor types *Normal Meadow Soils, Black Chernozems.*
11	Reddish Chocolate Soil — Normal Chocolate Soil — Black Chernozem Association	Principal types *Reddish Chocolate Soils, Normal Chocolate Soils, Black Chernozems.* Minor types *Prairie Soils, Brown Chernozems, Brown Sierozems, Grey Sierozems.*
12	Terra Rossa — Brown Limestone Soil — Rendzina Association	Principal types *Terra Rossas, Brown Limestone Soils, Rendzinas.*
13	Brown Soils of Light Texture — Grey-Brown Podsolic Association	Principal types *Brown Soils of Light Texture, Grey-Brown Podsolics.* Minor types *Non-calcareous Red-brown Earths, Red-brown Earths, Prairie Soils, Black Chernozems, Degraded Chernozems.*

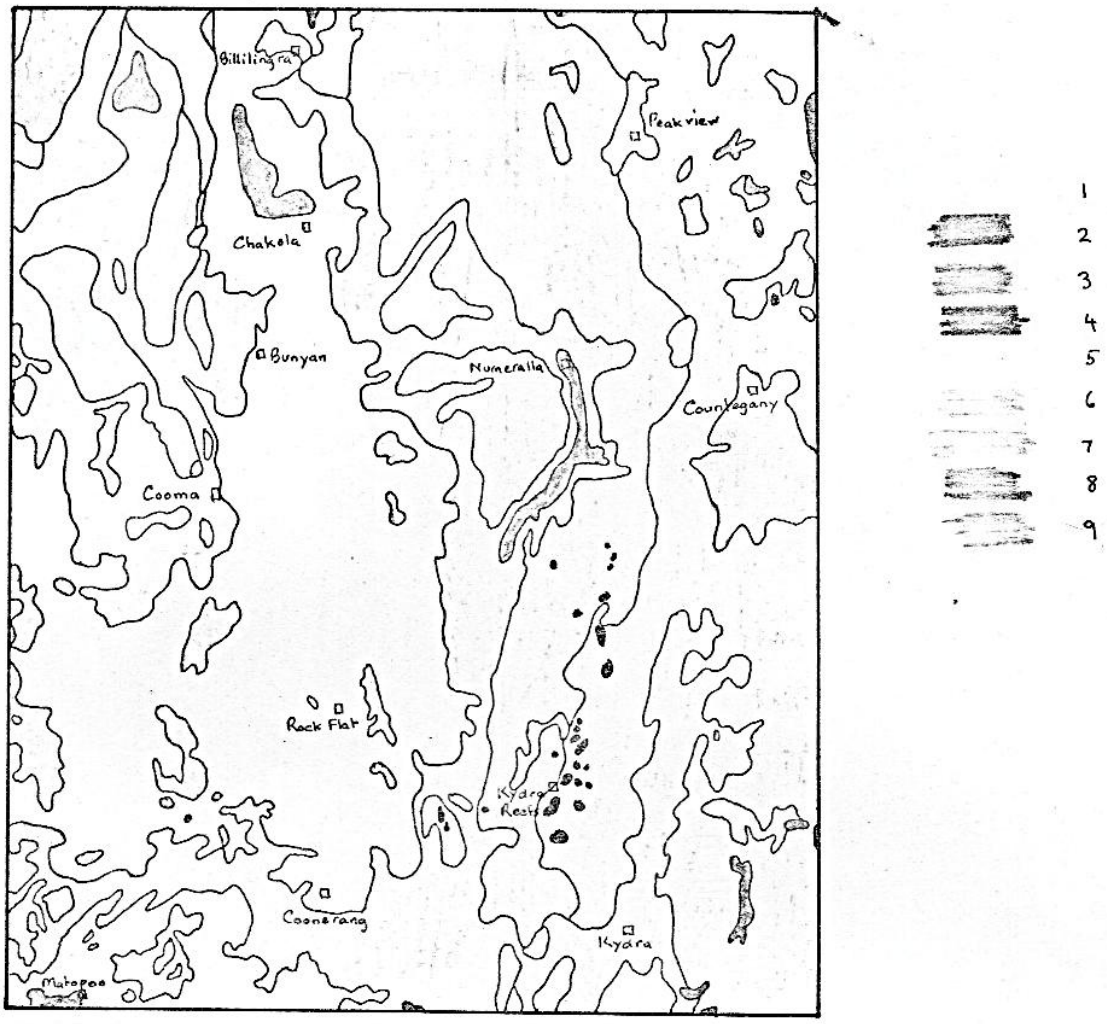


Figure 4. Natural vegetation of the Cooma 1:100,000 sheet area

1 *Stipa scabra — S. bigeniculata* Alliance (Dry Tussock Grassland)

2 *Poa caespitosa* Alliance (Wet Tussock Grassland)

3 *Carex Gaudichaudiana* Alliance (Fen)

4 *Casuarina nana — Leptospermum lanigerum* Alliance (Heath)

5 *Eucalyptus melliodora — E.Blakelyi* Alliance (Savannah Woodland)

6 *Eucalyptus pauciflora — E.stellulata* Alliance (Savannah Woodland)

7 *Eucalyptus macrorhyncha — E.Rossii* Alliance (Dry Sclerophyll Forest)

8 *Eucalyptus delegatensis — E.Dalrympleana* Alliance (Wet Sclerophyll Forest)

9 *Eucalyptus fastigata — E.viminalis* Alliance (Wet Sclerophyll Forest)

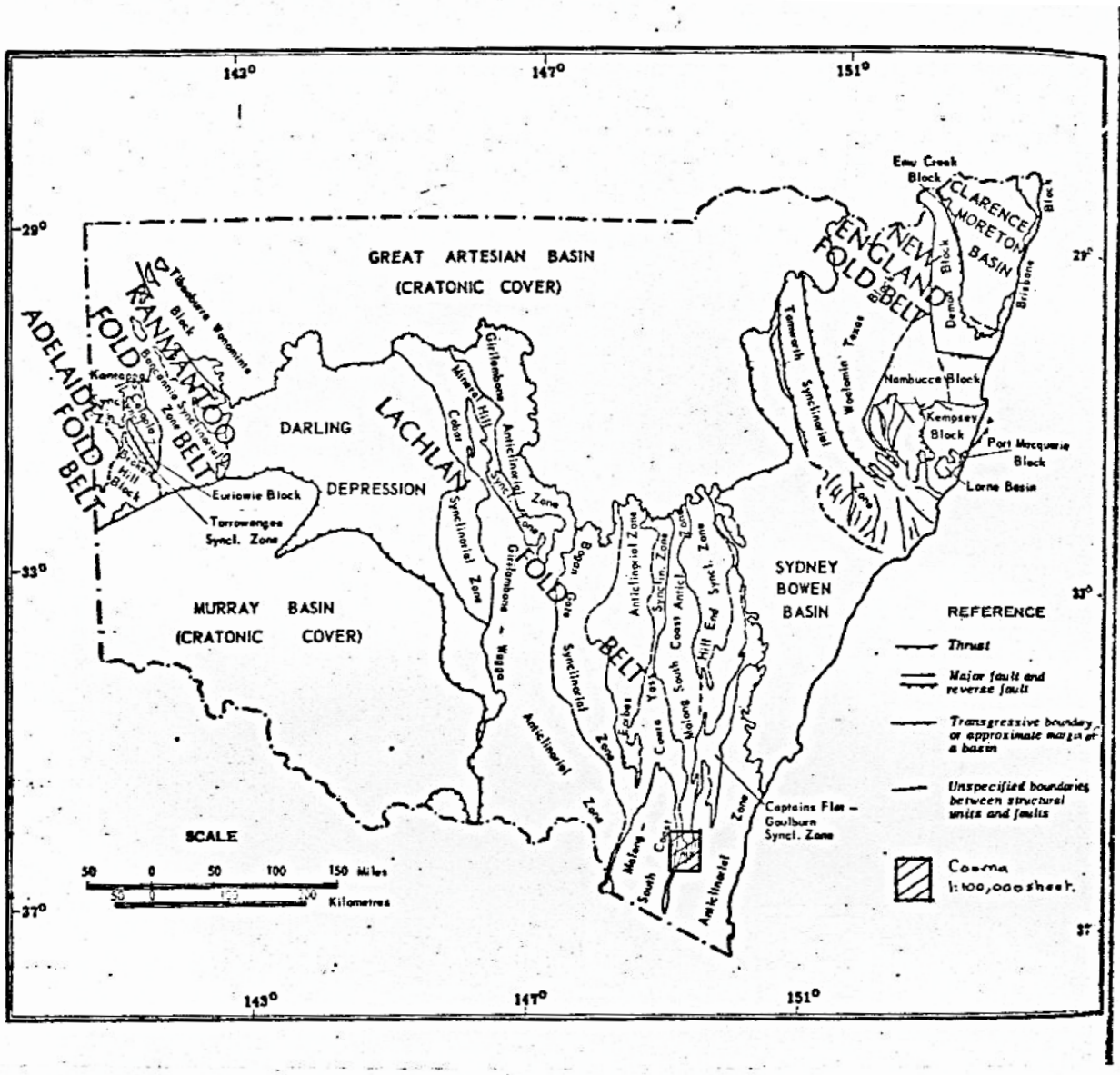
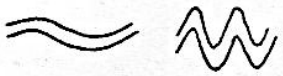


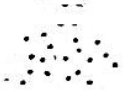
Figure 5. Structural map of New South Wales after Scheibner (1973) showing the position of the Cooma 1:100,000 sheet.

Figure 6. (opposite): Depositional and tectonic history of the Cooma region and nearby areas.



deformational event: mild, intense

felsic plutonic activity



metamorphism

felsic volcanism

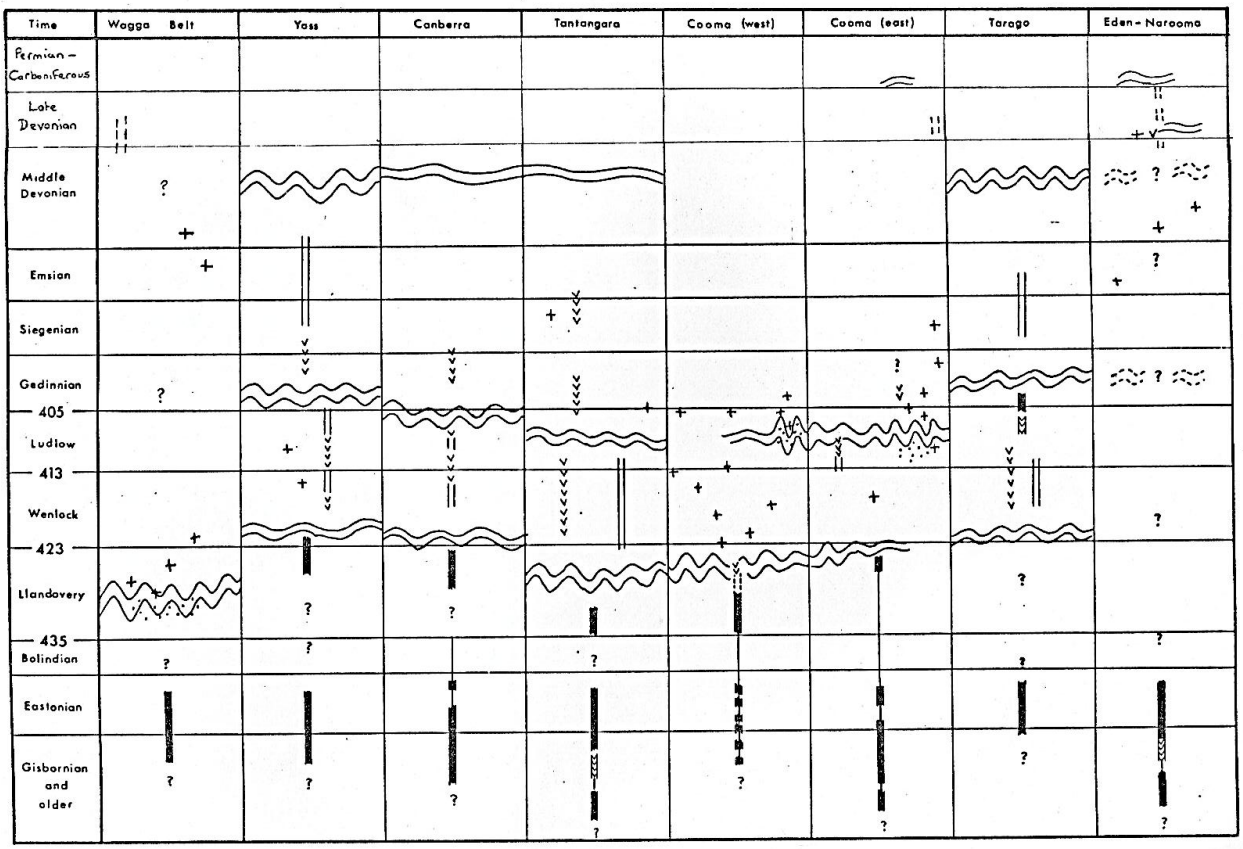
mafic volcanism

terrestrial sediment deposition

shallow-water sediment deposiion

flysch deposition

deep-water mudstone/chert deposition



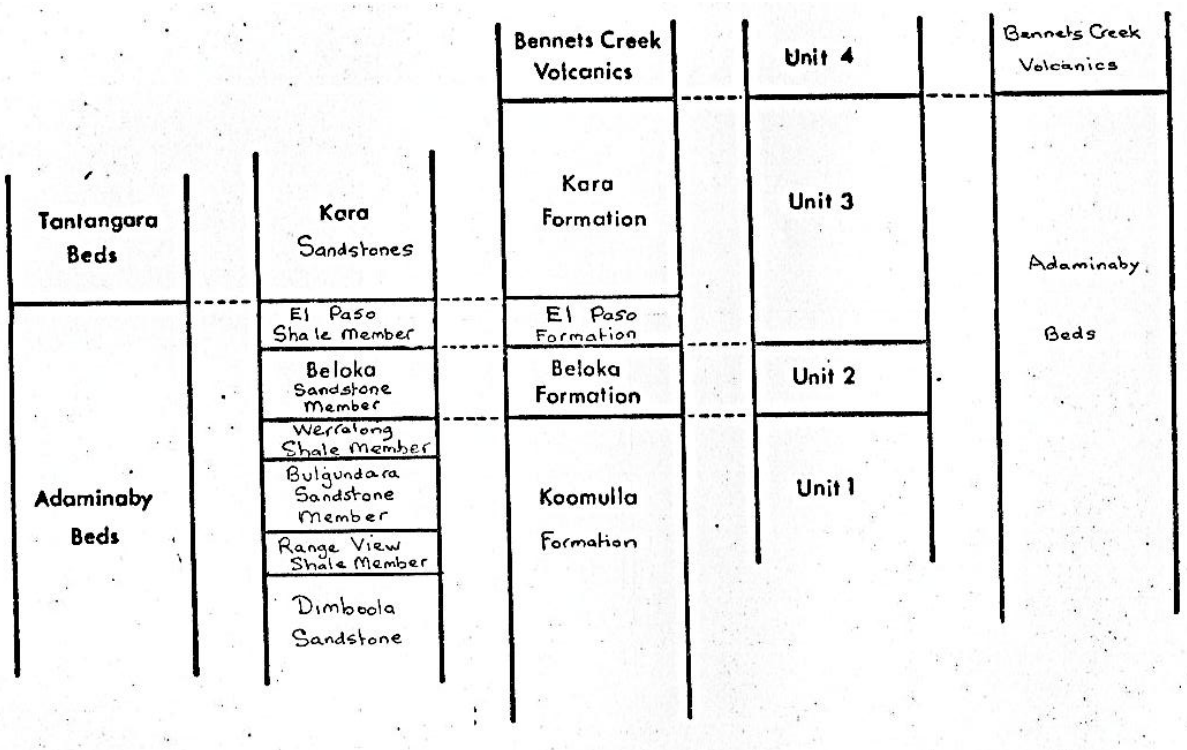


Figure 7. Relation between the Murroo Group stratigraphic sequences of (from left to right) Owen et al. (1974), Browne (1979 unpubl.), this work, Hopwood (1966 unpubl., 1976) and White et al. (1977).

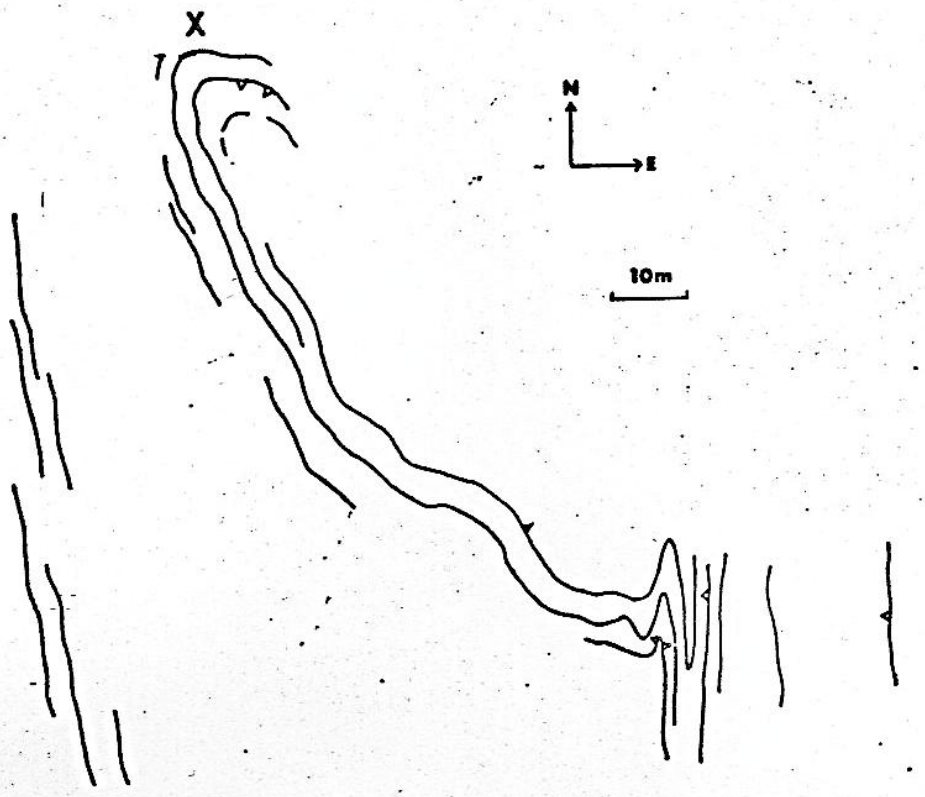


Figure 8. F1 folding, arenite and mudstone, Foxlow Formation, GR 079743. Ticks indicate younging direction; the fold at X plunges 45 degrees north and faces downwards.

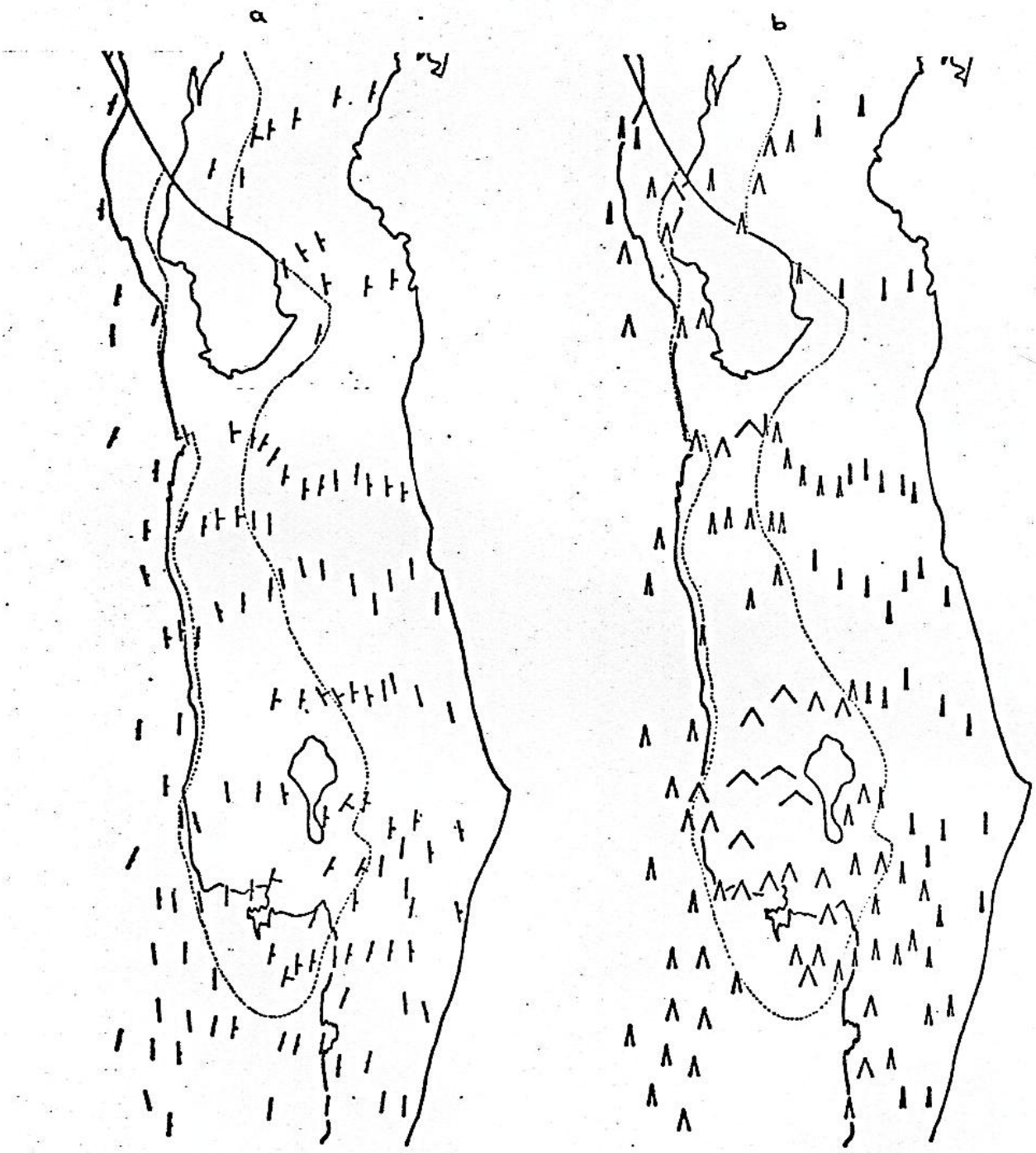


Figure 9. F2 orientation and openness in the Rock Flat - Strike-a-Light Creek area.

a: the symbols represent the orientation of S2; the length of the tick = the length of the strike bar x (90 - the dip of S2) / 100.

b: the interlimb angle of the inverted V = 2 x the local So-S2 angle.

All values are means of several field readings. The dotted line represents the inferred subsurface extent of the granitoid.

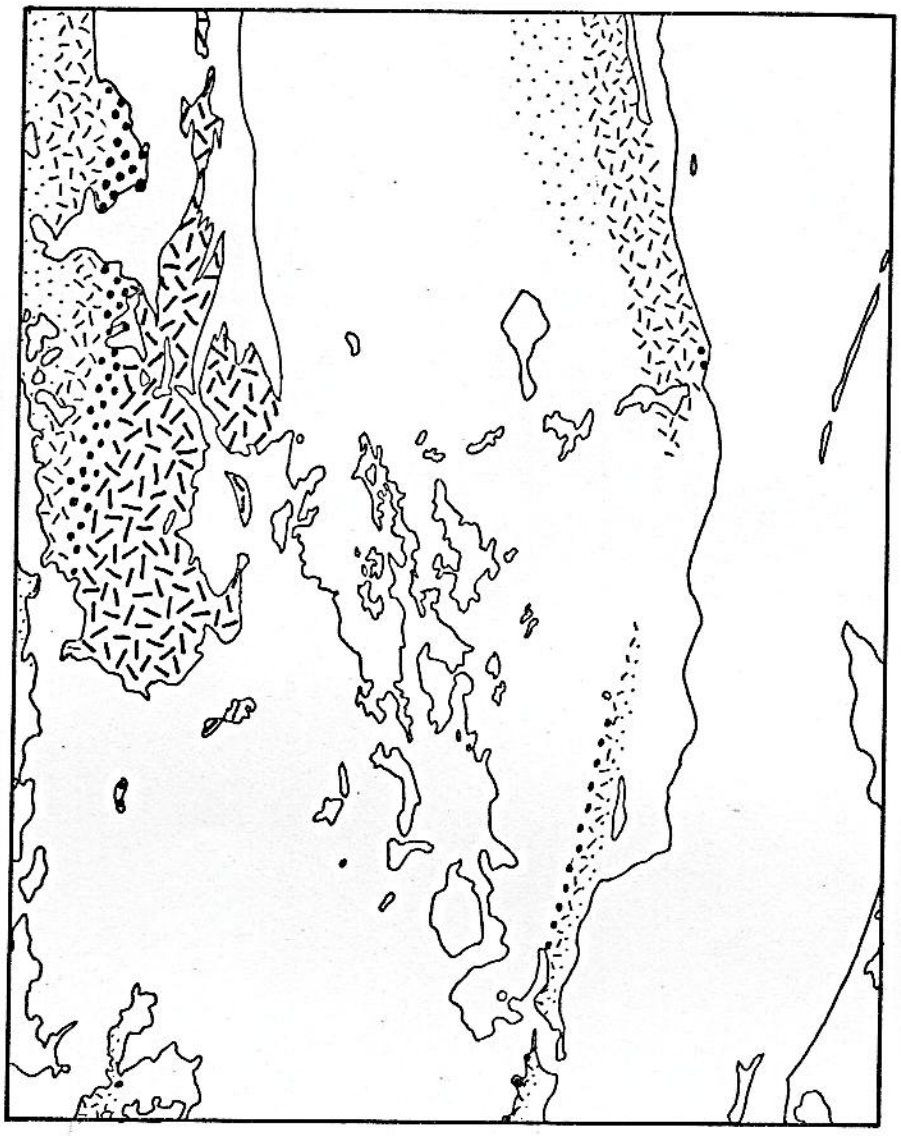


Figure 10. Distribution of metamorphic zones: light dots - areas of notable muscovite recrystallisation and chlorite zone; light ticks - biotite zone; heavy dots - andalusite zone; heavy ticks - sillimanite (including fibrolite) zone.

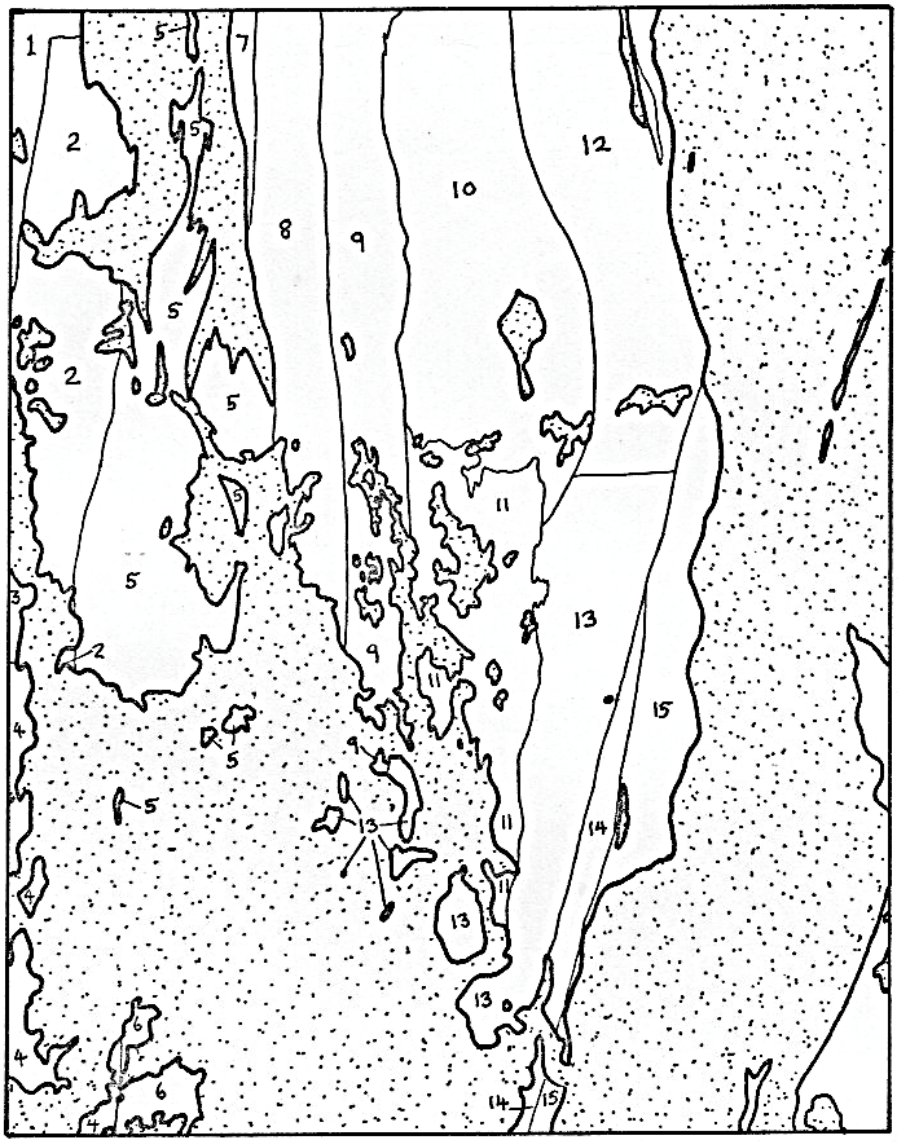


Figure 11. Stratal thickening (expressed as the ratio of post-deformational thickness to pre-deformational thickness) suffered by the sediments and volcanics of the Cooma 1:100,000 sheet area. Domain numbers are shown on the figure and the strain values for each are listed below.

1: 3.3	6: 1.7	11: 3.6
2: 3.6	7: 2.2	12: 6.1
3: 2.2	8: 2.8	13: 2.7
4: 2.0	9: 1.9	14: 3.6
5: 8.2	10: 2.3	15: 4.8

Note: some of the domains extend onto adjacent 1:100,000 sheets and domains 1, 3 and 7 lie mostly off the Cooma sheet.

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APPENDIX 1

FOSSILS RECORDED FROM THE COOMA 1:100,000 SHEET AREA

Foxlow Formation

Locality 1: Por. 124, Par. Callaghan, GR 005051 approx.
Stratigraphic level: probably Gurubang Member.
Lithology: ?
Leptograptus flaccidus Hall
Dicellograptus morrisi Hopkinson
Orthograptus truncatus pauperatus Elles and Wood
Age: lower Bolindian (zone of *Orthograptus quadrimucronatus* and *Pleurograptus linearis*).
Reference: Sherrard (1962).

Locality 2: Por. 6, Par. Clifford, GR 013994 approx.
Stratigraphic level: probably Strike-a-Light Member, near top.
Lithology: ?
Dicellograptus angulatus
Climacograptus bicornis
Climacograptus ?scharenbergi
Orthograptus apiculatus
Cryptograptus tricornis
Age: upper Gisbornian (zone of *Climacograptus peltifer*).
Reference: Sherrard (1962).

Locality 3: Por. 1, Par. Umaralla, GR 003960 approx.
Stratigraphic level: probably Gurubang Member.
Lithology: ?
Dicellograptus elegans Carruthers
Dicellograptus complanatus ornatus Elles and Wood
Dicranograptus nians T.S. Hall
Dicranograptus ramosus (Hall)
Climacograptus tubuliferus Lapworth
Climacograptus caudatus Lapworth
Orthograptus quadrimucronatus Hall
Orthograptus calcaratus Lapworth
Orthograptus truncatus pauperatus Elles and Wood
Age: lower Bolindian (zone of *Orthograptus quadrimucronatus* and *Pleurograptus linearis*).
Reference: Sherrard (1962).

Locality 4: 4km east of Rose Brook homestead, GR 026967.
Stratigraphic level: Birchams Creek Member (near base).
Lithology: black shale.
Orthograptus quadrimucronatus (Hall)
Dicranograptus ?ramosus (Hall)
Climacograptus bicornis (Hall)
Climacograptus tubuliferus Lapworth

Cryptograptus sp.
Age: Eastonian.
Reference: nov.

Locality 5: 2Km north of Coornartna Trig. Station, GR 021950.
Stratigraphic level: Birchams Creek Member (near top).
Lithology: black shale.
Cryptograptus sp.
*Dicranograptus brevicaulis Elles and Wood
Dicranograptus nians (T.S. Hall)
Dicellograptus forchammeri Geinitz
Orthograptus calcaratus ?basilicus Lapworth
Climacograptus tubuliferus Lapworth
*Climacograptus bicornis peltifer Lapworth
Age: upper Gisbornian (?to Lower Eastonian): the more distinctive elements (*) suggest Gisbornian, but others show a wide scatter of ranges.
Reference: nov.

Locality 6: Glenfergus State Forest, Par. Umaralla, GR 039927 approx.
Stratigraphic level: probably Gurubang Member.
Lithology: siltstones
Leptograptus flaccidus Hall
Pleurograptus linearis Carruthers
Dicellograptus morrisi Hopkinson
Dicellograptus elegans Carruthers
Dicellograptus pumilus Lapworth
Dicranograptus nians T.S. Hall
Orthograptus quadrimucronatus Hall
Orthograptus calcaratus Lapworth
Retiograptus yassensis Sherrard and Keeble
Pleqmatograptus nebula caudatus (T.S. Hall)
Age: lower Bolindian (zone of Orthograptus quadrimucronatus and Pleurograptus linearis).
Reference: Sherrard (1962).

Locality 7: 2Km northeast of Glenfergus homestead, GR 042925.
Stratigraphic level: Gurubang Member.
Lithology: grey siliceous shale.
Dicellograptus forchammeri Geinitz
Orthograptus calcaratus (Lapworth)
Climacograptus bicornis (Hall)
Age: probably Eastonian.
Reference: nov.

Locality 8: Por. 1A, Par. Montagu, GR 076852 approx.
Stratigraphic level: probably Gurubang Member.
Lithology: ?
Dicellograptus elegans Carruthers
Dicellograptus pumilus Lapworth
Climacograptus tubuliferus Lapworth
Retiograptus yassensis Sherrard and Keble
?Glyptograptus sinuatus Nicholson
Age: lower Bolindian (zone of Orthograptus quadrimucronatus and Pleurograptus linearis).
Reference: Sherrard (1962).

Locality 9: 2Km northeast of Dangelong homestead, GR 069765.
Stratigraphic level: Gurubang Member.
Lithology: black shale.
Dicellograptus cf. ornatus Elles and Wood
?Dicellograptus anceps (Nicholson)
Orthograptus truncatus (Lapworth)
Age: Bolindian.
Reference: nov.

Locality 10: 8Km SSE of Mole homestead, GR 213611.
Stratigraphic level: Gurubang Member.
Lithology: black shale
Dicellograptus ornatus minor Tognill
Climacograptus hvalross Ross and Berry
Climacograptus ?hastatus (Hall)
?Climacograptus tubuliferus Lapworth
Orthograptus calcaratus ?basilicus Lapworth
Age: Bolindian or ?upper Eastonian.
Reference: nov.

Cappanana Formation

Locality 11: near Glenfergus homestead, GR 017920 approx.
Lithology: ?
Howellella sp.
Atrypa sp.
?Leptocoelia sp.
Encrinurus cf. mitchelli Foenste
?Michelinoceras sp.
indet. gastropods
Age: Upper Silurian.
Reference: Sherwin (1972 unpubl.).

Locality 12: near Woodend homestead, GR 046892 approx.
Lithology: ?
Praectenodonta sp.
Howellella sp.
?Leptocoelia sp.
Age: Siluro-Devonian.
Reference: Sherwin (1972 unpubl.).

Locality 13: 1Km northwest of Carlaminda homestead, GR 066851.
Lithology: siltstone
Encrinurus sp.
Prantlia cf. canberrensis Chatterton and Campbell 1980
Eardenia shearsbyi (Dun) 1907
Dolerorthis sp.
Howellella pyramidalis McKellar 1969
Molongia elegans Mitcell 1921
Mesopholidostrophia bendenensis (Mitcell) 1923
Pycnostylus congregationis (Etheridge) 1907
bivalve indet.
Age: brachiopods suggest correlation to Black Bog Shale of Yass area; Prantlia is a Wenlock to Ludlow genus elsewhere; other elements suggest a broadly Upper Silurian age.

Reference: nov.

Locality 14: Por. 1A, Par. Montagu, GR 067849 approx.
Lithology: shale, limestone
Encrinurus cf. *mitchelli*
halysitid corals
brachiopods
Age: probably Upper Silurian.
Reference: Packham (1969).

Locality 15: Stony Creek, Por. 135, Par. Montagu, GR 064838 approx.
Lithology: shale
Leptaena sp.
rhynconellids
spiriferids
chonetids
Encrinurus sp.
ophiuroid remains
Age: probably Upper Silurian.
Reference: Packham (1969).

Locality 16: 1km west of Gurubang homestead, GR 067817.
Lithology: limestone.
cf. *Alleynchidium wassi* St. Joseph
stromatoporoid indet.
fecal traces
Age: probably Ludlow
Reference: nov.

Locality 17: 2km north of Dangelong homestead, GR 055762.
Lithology: limestone.
Dycnostylus congregationis (Etheridge) 1907
?*Tryplasma*
Favosites sp.
Parastriatopora sp.
stromatoporoid
crinoid ossicles
Age: probably Upper Silurian.
Reference: nov.

Locality 18: near Dangelong homestead, GR 049748 approx.
Lithology: sheared limestone.
Solenopora sp.
Syringopora sp.
Age: Silurian.
Reference: Pickett (1971a unpubl.).

Locality 19: Dangelong homestead, GR 056745.
Lithology: limestone
Alleynchidium wassi St. Joseph
Parastriatopora sp.
crinoid ossicles
Age: probably Ludlow.
Reference: nov.

Locality 20: near Eaglefield homestead, GR 047693 approx.
Lithology: sheared limestone.
crinoid stems
stromatoporoid unident.
solitary rugose corals (?*Entelophyllum* sp.)
Solenopora sp.
Age: Silurian.
Reference: Pickett (1971a unpubl.).

?Cappanana Formation

Locality 21: one or more localities near Dangelong, GR ?
Lithology: shales and sandstone
'*Strophomenes*' *pecten* Linnaeus
Muconophyllum crateroides R. Etheridge 1894
'*Spirifer*' *crispus* Hisinger
'*Pterinea*' *ampliata* J. Phillips
Age: Silurian
Rererence: de Koninck (1876-77, 1898)

Colinton Volcanics

Locality 22: 600m northwest of Billilingra Siding, GR 957129.
Lithology: sandy mudstone.
Dolerorthis sp.
Eardenia shearsbyi (Dun).
Praectenodonta sp.
Encrinurus cf. *mitchelli*
indet. gastropod
crinoid fragments
Age: Ludlow.
Reference: Pillans (1974 unpubl.), modified by C. Jenkins.

Locality 23: 400m north of Billilingra Siding, GR 960129.
Lithology: sandstone.
Pholidostrophia (*Mezopholidostrophia*) sp.
Howellella nucula
Molongia elegans capricornae
Dolerorthis sp.
Encrinurus cf. *mitchelli*
Age: Ludlow.
Reference: Pillans (1974 unpubl.).

Locality 24: Billilingra Siding, GR 961125 approx.
Lithology: shales.
Encrinurus mitchelli Eth. fil.
brachiopoda indet.
Alveolites sp.
Favosites sp.
Heliolites sp.
?*Hercophyllum* sp.
Age: Browne (1943) correlates this and further assemblages from nearby on the Michelago 1:100,000 sheet with the lower part of the Upper Silurian Hume Series (Brown, 1941) of the Yass district.

Reference: Browne (1943).

Locality 25: 1.5km southwest of Rose Brook homestead, GR 974965.
Lithology: limestone.
Eavosites gothlandicus (Lamarck)
Age: probably Silurian.
Reference: nov.

Locality 26: Bunyan North. Rock Flat Creek, near "Tallor" homestead, north of Numeralla Road.
Lithology: ?
Entelophyllum cf. *latum* Hill
Eavosites ?*gothlandicus* Lamarck
Coenites sp.
Age: Upper Silurian.
Reference: Pickett (1969 unpubl.).

Locality 27: 3 miles east of Cooma, GR 993932 approx.
Lithology: limestone.
Eavosites ?*gothlandicus* Lamarck
Age: probably Upper Silurian.
Reference: Pickett (1971b unpubl.).

Locality 28: Dartmoor, 6 miles east of Cooma, just north of Carlaminda Road, west bank of Rock Flat Creek, GR 986863 approx.
Lithology: sheared limestone.
Eavosites sp.
Age: Ordovician to Devonian
Reference: Pickett (1969 unpubl.).

?Colinton Volcanics

Locality 29: Rosebrook, GR 994970 approx.
Lithology: limestone.
crinoid stem fragments
tabulate corals (?*Cracilopora*)
rugosan fragment (?*Tryplasma*)
Age: most likely Upper Silurian.
Reference: Pickett (1971b unpubl.).

Locality 30: near Halls Creek, GR 050786 approx.
Lithology: sheared limestone.
stromatoporoid unident.
?orthid brachiopod
pentamerid brachiopods (?*Barrandina* sp.)
Age: Silurian.
Reference: Pickett (1971a unpubl.).

Locality 31: one or more localities, Rock Flat Creek, GR ?
Lithology: brownish shales
'*Monticulipora*' ?*powerbanki* Milne Edwards and J. Haime
'*Strophomenes*' *rhomboidalis* Wilckens
'*Spirifer*' *crispus* Hisinger
'*Euomphalus*' *solarioides* L.G. de Koninck
'*Belleropbon*' *jukesi* L.G. de Koninck 1876
'*Conularia*' *sowerbyi* Defrance

Staurocephalus clarkei L.G. de Koninck 1876
'*Bronteus*' *nodiopeltis* L.G. de Koninck 1876
Age: probably Silurian
Reference: de Koninck (1876-77, 1898).

Undoo Creek Formation

Locality 32: Specimens collected from five limestone pods near Rams Head, GR 119729, 118733, 122743, 126752, 126758.
Lithology: limestone
Panderosus cf. *simplex*
Ozarkodinaa sp.
pentamerid indet.
Age: Middle to Upper Silurian
Reference: Ilsley (1980 unpubl.).

APPENDIX 2

MODAL AND CHEMICAL ANALYSES OF ROCKS FROM THE COOMA 1:100,000 SHEET AREA

All modes, major element analyses and norms are given in percent. Trace element values are given in parts per million.

Abbreviations used in the mode and norm tales are as follows (those used in the mode tables are in the left column; those used in the norm tables are in the right column).

Q	quartz	Q	quartz
Kfs	K-feldspar	C	corundum
mic	microcline	or	orthoclase
pg	plagioclase	ab	albite
amph	amphibole	an	anorthite
hb	hornblende	ac	acmite
bi	biotite	ne	nepheline
chl	chlorite	wo	wollastonite
mu	muscovite	di	diopside
ser	sericite	hy	hypersthene
cord	cordierite	ol	olivene
andl	andalusite	hm	hematite
ep	epidote	mt	magnetite
all	allanite	il	ilmenite
sph	sphene	ap	apatite
ap	apatite		
zr	zircon		
pu	pumpellyite		
fl	flourite		
op	opaques		
acc	accessories		

Other abbreviations used are:

SG	specific gravity
tr	trace
abs	absent
nd	not determined
-	used as in original reference

Ordovician to Lower Silurian Sediments

	1	2	3	4	5
	CHEMICAL ANALYSES				
SiO2	79.25	54.18	57.07	58.87	56.
TiO2	0.42	0.73	0.82	0.84	0.
Al2O3	11.86	25.48	20.95	21.25	23.
Fe2O3	0.86	2.99	4.27	2.47	1.
FeO	0.81	3.08	2.42	4.05	5.
MnO	0.01	0.03	0.05	0.02	0.
MgO	1.28	3.13	3.08	2.98	3.
CaO	0.17	0.41	0.14	0.12	0.
Na2O	1.08	0.73	0.42	0.60	0.
K2O	2.33	5.70	4.50	5.73	5.
P2O5	abs	0.07	0.06	0.05	0.
H2O+	1.30	2.88	3.71	2.59	2.
H2O-	0.19	0.48	1.03	0.22	0.
C	-	0.34	1.33	0.16	0.
CO2		-	0.74	-	-
Total	99.56	100.23	100.59	99.95	100.
SG	2.67	2.80	2.76	2.78	2.

1 Quartz-chlorite-mica schist, El Paso Formation (?). East of McCarth Par. of Coolringdon, GR 817943 approx. Analyst G.A. Joplin (Joplin
2 Chlorite-sericite phyllite, El Paso Formation (?). About 1/2 mile ea Por. 144, Par. of Coolringdon, GR 817943 apprrox. Analyst G.A. Jo
3 Chlorite-sericite phyllite, Koomulla Formation (?). west of Slacks Coolringdon, GR 836942 approx. Analyst G.A.Joplin (Joplin, 1942).
4 Plicated mica schist, Beloka Formation. GR 827914. Analyst G.A. Jo
5 Knotted andalusite schist, Koomulla Formation (?). Slacks Creek, Por 832931 approx. Analyst G.A. Joplin (Joplin, 1942).
6 Tuffaceous psammite, Koomulla Formation. Berridale Road, 1/4 mile 803849 approx. Analyst G.A. Joplin (Joplin, 1942).
7 Amphibole-bearing 'granulite', El Paso Formation (?). Slacks Cr Coolringdon, GR 823907 approx. Analyst G.A. Joplin (Joplin, 1942).

	1	2	3	4	5
			CHEMICAL ANALYSES		
SiO2	66.26	68.06	73.64	54.63	56.
TiO2	0.42	0.63	0.63	0.86	0.
Al2O3	17.38	16.32	13.89	25.35	24.
Fe2O3	0.24	0.99	0.70	2.40	1.
FeO	3.01	4.15	4.04	4.64	4.
MnO	0.04	0.04	0.06	0.05	0.
MgO	2.63	2.21	1.98	2.75	2.
CaO	1.02	1.09	0.28	0.65	0.
Na2O	2.63	1.29	1.12	0.62	1.
K2O	4.26	3.59	2.88	6.28	6.
P2O5	0.23	0.19	nd	0.20	0.
H2O+	1.65	0.93	0.42	1.25	1.
H2O-	0.15	0.11	0.07	0.26	0.
ZrO2				0.15	0.
Total	99.92	99.60	99.71	100.09	99.
SG	2.75	2.76	2.78	2.83	2.

1 Banded schist with alternating andalusite-bearing and amphibole-beari 847932. Analyst G.A. Joplin (Joplin, 1942).
2 'Corduroy granulite', Willarney Formation. Spring Creek, Por. 212, Pa approx. Analyst G.A. Joplin (Joplin, 1942).
3 'Corduroy granulite, Willarney Formation. Spring Creek, Por. 212, Par approx. Analyst G.A. Joplin (Joplin, 1942).
4 'Spotted granulite, Willarney Formation. Por. 212, Par. of Binjura, G G.A. Joplin (Joplin, 1942).
5 Mottled gneiss, Willarney Formation. Spring Creek, Por. 212, Par. of Analyst G.A. Joplin (Joplin, 1942).
6 Mottled gneiss, Willarney Formation. Spring Creek, Por. 212, Par. of Analyst G.A. Joplin (Joplin, 1942).
7 Mottled gneiss, Willarney Formation. Mt. Gladstone, Por. 145, Par. of approx. Analyst G.A. Joplin (Joplin, 1942).

	1	2	3	4
			CHEMICAL ANALYSES	
SiO2	71.05	55.50	50.24	57.43
TiO2	0.39	0.75	0.93	0.82
Al2O3	13.23	22.29	26.21	21.57
Fe2O3	0.78	1.09	1.35	1.02
FeO	2.67	6.22	7.55	6.53
MnO	0.04	0.06	0.20	0.05
MgO	1.97	4.20	5.23	3.93
CaO	1.44	0.26	1.85	0.16
Na2O	2.39	1.15	1.33	0.85
K2O	4.71	6.02	2.05	5.46
P2O5	0.02	0.11	0.04	0.12
S	<0.02	<0.02	0.03	0.16
H2O+	0.81	1.60	2.50	1.63
H2O-	0.16	0.29	0.13	0.06
CO2	0.07	0.13	0.19	0.48
rest	0.35	0.25	0.20	0.26
			100.03	100.53
O=S			0.01	0.08
	100.08	100.12	100.02	100.45
Ba	1935	745	540	830
Rb	142	263	107	258
Sr	386	114	103	78
Pb	42.0	64	13.5	40.0
Th	12.8	18.6	23.6	20.2
U	1.8	4.4	2.4	3.6
Zr	185	112	112	114
Nb	11.0	14.0	14.5	15.0
Y	8	32	27	33
La	25	33	37	34
Ce	57	76	83	76
Nd	16	27	28	28
Sc	9	20	20	20
V	57	121	129	124
Cr	48	112	159	131
Mn	300	490	1585	420
Co	11	15	25	24
Ni	23.0	54	39.5	52
Cu	4.0	54	1.5	50
Zn	57	141	100	149
Ga	15.0	29.6	32.0	29.4

1 Gneiss, Willarney Formation. Within the Cooma Granodiorite, GR 90886
2 Gneiss, Willarney Formation. GR 840863. Analyst B.W. Chappell.
3 Gneiss, Willarney Formation. GR 902113. Analyst E.J. Reid (Reid, i
4 Schist, Beloka Formation. GR 864059. Analyst E.J. Reid (Reid, in p
5 Schist, Beloka Formation. GR 855093. Analyst E.J. Reid (Reid, in p
6 Gneiss, Willarney Formation. GR 902107. Analyst E.J. Reid (Reid, i

	1	2	3	4	5	6	7	8	9
	MODAL ANALYSES								
Grainsize (mm)	0.3	0.2	1.0	0.5	0.9	0.8	1.0	0.6	0.9
Quartz	251	110	145			215	172	114	198
Feldspar	2	1	3	0	1	42	29	6	19
Rock Fragments	10	27	22			2	22	11	33
Muscovite	0	1	0			0	0	0	6
Accessories	4	0	1	2	4	1	1	0	2
Matrix + cement	233	361	329			240	276	369	242
Feldspars:									
Untwinned albite	0	0	0	0	0	3	5	0	2
Albitic plagioclase	0	0	1	0	0	5	3	2	4
Oligoclase / andesine	0	0	0	0	0	0	0	0	0
Plagioclase (composition ?)	0	0	0	0	0	3	0	1	0
Chess-board-twinned albite	0	1	0	1	1	7	2	3	2
Orthoclase	0	0	0	0	0	0	1	0	2
Orthoclase microperthite	0	0	0	0	0	17	11	0	3
Microcline	0	0	0	0	0	0	0	0	1
Unknown	2	0	2	0	0	7	7	0	5
Rock Fragments:									
Mudstone / chert ± felsic volcanic	8	24	18			1	5	4	9
Arenite	2	2	2			0	6	1	3
Polycrystalline quartz	0	1	2			0	11	6	21
Felsic volcanic	0	0	0			0	0	0	0
Felsic intrusive	0	0	0			1	1	0	0
Accessories:									
Opaques	423	30	43	19	57	33	28	43	34
Tourmaline	3	2	4	4	7	4	9	1	3
Apatite	1	0	2	5	6	34	6	0	1
Zircon + monazite	15	11	19	5	10	5	5	11	3
Sphene	2	0	0	0	1	0	0	0	0
Epidote	0	0	0	0	1	1	0	0	0
Biotite	0	0	3				4	0	1
Amphibole	0	0	0	0	0	0	0	0	0
Pyroxene	0	0	0	0	0	0	0	0	0
Others	4	0	1	0	1	3	1	0	0
Unknown	13	10	13	7	3	5	5	5	5

1 Arenite, Beloka Formation. GR 803622. Analyst D.M. Ilsley (Ilsley,
2 Arenite, Beloka Formation. GR 807614. Analyst D.M. Ilsley (Ilsley,
3 Arenite, Beloka Formation. GR 804613. Analyst D.M. Ilsley (Ilsley,
4 Arenite, Mowles Gully Formation. GR 090708. Analyst D.M. Ilsley (I
5 Arenite, Mowles Gully Formation. GR 102742. Analyst D.M. Ilsley (I
6 Arenite, Foxlow Formation. GR 094117. Analyst D.M. Ilsley (Ilsley,
7 Arenite, Foxlow Formation. GR 109113. Analyst D.M. Ilsley (Ilsley,
8 Arenite, Foxlow Formation. GR 077122. Analyst D.M. Ilsley (Ilsley,
9 Arenite, Foxlow Formation. GR 157115. Analyst D.M. Ilsley (Ilsley,

10 Arenite, Foxlow Formation. GR 055123. Analyst D.M. Ilsley (Ilsley,
11 Arenite, Foxlow Formation. GR 084734. Analyst D.M. Ilsley (Ilsley,
12 Arenite, Foxlow Formation. GR 107811. Analyst D.M. Ilsley (Ilsley,
13 Arenite, Willarney Formation. GR 852752. Analyst D.M. Ilsley (Ilsl
14 Arenite, Ryrie Formation. GR 882599. Analyst D.M. Ilsley (Ilsley,
15 Arenite, Ryrie Formation. GR 057759. Analyst D.M. Ilsley (Ilsley,
16 Arenite, Ryrie Formation. GR 216610. Analyst D.M. Ilsley (Ilsley,

	1	2	3	4	5
			MODAL ANALYSES		
Q	33.4	48.5	39.7	21.3	30.4
pg	36.6	39.1	37.3	26.6	23.7
mic	-	-	-	-	-
bi	29.8	11.5	21.5	10.6	6.8
hb	-	1.0	0.8	40.6	38.3
ep	0.2	1.1	0.5	0.5	-
ser	-	-	0.2		
Fe ores				0.4	-
			CHEMICAL ANALYSES		
SiO2	63.35	63.67			
TiO2	0.84	0.69			
Al2O3	16.92	14.81			
Fe2O3	1.23	1.04			
FeO	4.58	4.73			
MnO	nd	0.07			
MgO	3.03	3.70			
CaO	4.45	5.13			
Na2O	1.90	1.94			
K2O	2.28	2.69			
P2O5	tr	0.15			
H2O+	0.86	1.38			
H2O-	0.09	0.08			
CO2	nd	0.03			
Total	99.53	99.67			
SG					3.044
			C.I.P.W. NORMS		
Q	26.78	23.05			
C	3.24				
or	13.47	15.90			
ab	16.08	16.42			
an	22.08	23.76			
di		0.58			
hy	13.55	15.75			
mt	1.78	1.51			
il	1.60	1.31			
ap		0.35			

1 Clear Range Granodiorite. Bark Gunyan Creek, 2.5 miles SSE of Mur approx. Analyst N.J. Snelling (Snelling, 1957 unpubl.).
2 Murrumbucka Tonalite. Murrumbucka Gap, about 3 miles ENE of Murrumbu Analyst N.J. Snelling (Snelling, 1957 unpubl.).
3 Murrumbucka Tonalite. About 6.5 miles SSE of Murrumbucka Trig (Snelling, 1957 unpubl.).
4 Xenolith, Murrumbucka Tonalite. Murrumbucka Creek at Gap Road crossi Snelling (Snelling, 1957).

5 Xenolith, Murrumbucka Tonalite. Murrumbucka Creek at Gap Road crossi Snelling (Snelling, 1957).
6 Xenolith, Murrumbucka Tonalite. Murrumbucka Creek at Gap Road crossi Snelling (Snelling, 1957).
7 Xenolith, Murrumbucka Tonalite. Murrumbucka Creek at Gap Road crossi Snelling (Snelling, 1957).
8 Xenolith, Murrumbucka Tonalite. 4 miles SE of Murrumbucka Trig., GR Snelling (Snelling, 1957).

	1	2	3	4	5	
			MODAL ANALYSES			
Q	36.6	36.9	38.3	37.1	41.8	2
Kfs	0.1	tr	1.1	3.3	0.7	
pg	34.5	37.4	33.8	35.4	35.9	3
amph						
bi	27.6		26.4	23.7	18.8	
chl					0.1	
mu				0.6		
cord						
andl						
ep+all	0.4		0.1		0.2	
sph						
ap	0.2					
op	0.1					
others	0.5	26.7	0.2		0.3	3
			CHEMICAL ANALYSES			
SiO2	65.04	64.84	66.04	66.94	67.63	6
TiO2	0.73	0.65	0.67	0.66	0.60	
Al2O3	14.82	15.61	14.65	14.64	14.68	1
Fe2O3	0.91	0.88	0.98	0.98	0.88	
FeO	4.65	4.37	4.27	4.03	3.82	
MnO	0.06	0.07	0.07	0.09	0.08	
MgO	3.27	2.88	3.12	2.54	2.57	
CaO	3.98	4.24	3.80	3.49	3.42	
Na2O	1.73	1.97	1.84	1.99	1.93	
K2O	2.91	2.58	2.93	3.04	2.87	
P2O5	0.12	0.13	0.12	0.16	0.13	
S	<0.02	0.03	<0.02	<0.02	<0.02	<
H2O+	1.18	1.22	1.14	1.25	1.18	
H2O-	0.11	0.07	0.13	0.15	0.12	
CO2	0.11	0.13	0.10	0.03	0.15	
rest	0.20	0.18	0.19	0.20	0.18	
		99.85				
O=S		0.01				
	99.82	99.84	100.05	100.19	100.24	9
Ba	475	420	415	500	450	
Rb	142	126	141	153	140	
Sr	160	177	176	146	155	
Pb	19.5	24.5	23.0	20.5	26.0	
Th	19.4	16.0	21.0	18.0	16.4	
U	1.2	2.4	2.6	2.4	2.2	
Zr	168	169	168	212	144	
Nb	11.0	9.0	11.5	12.0	10.5	
Y	15	24	30	15	25	
La	43	28	58	38	36	
Ce	88	64	111	91	77	
Nd	32	22	47	34	30	
Sc	20	20	20	21	19	
V	123	111	101	102	95	
Cr	118	97	92	64	76	
Mn	470	550	570	675	610	
Co	21	23	19	19	18	
Ni	31.5	24.5	29.5	24.5	25.5	
Cu	22.5	18.5	10.0	20.0	18.0	
Zn	83	79	75	77	73	
Ga	18.2	18.4	17.8	16.6	16.6	
			C.I.P.W. NORMS			
Q	27.67	27.54	28.85	30.27	32.09	3
C	1.82	2.13	1.78	2.06	2.44	
or	17.20	15.25	17.31	17.96	16.96	1
ab	14.64	16.67	15.57	16.84	16.33	1
an	19.11	20.33	18.21	16.42	16.26	1
di						
hy	14.84	13.53	13.83	11.99	11.85	1
mt	1.32	1.28	1.42	1.42	1.28	
il	1.39	1.23	1.27	1.25	1.14	
ap	0.28	0.31	0.28	0.38	0.31	

1 Clear Range Granodiorite. GR 893101. Analyst E.J. Reid (Reid, in p
2 Clear Range Granodiorite. GR 864116. Analyst E.J. Reid (Reid, in p
3 Clear Range Granodiorite. GR 872064. Analyst A.S. Joyce (Joyce, 19
4 Clear Range Granodiorite. GR 868060. Analyst A.S. Joyce (Joyce, 19
5 Clear Range Granodiorite. GR 865096. Analyst A.S. Joyce (Joyce, 19
6 Clear Range Granodiorite. GR 862099. Analyst E.J. Reid (Reid, in p
7 Altered Clear Range Granodiorite, GR 912059. Analyst E.J. Reid (Rei
8 Xenolith, Clear Range Granodiorite, GR 901108. Analyst E.J. Reid (R

	1	2	3	4	5	
MODAL ANALYSES						
Q		23.3	27.2	34.6	33.6	2
Kfs					0.9	
pg		37.3	39.2	33.2	34.6	3
amph		14.0	10.3	10.2	4.6	
bi		23.4	22.5	21.5	24.3	2
chl				0.3		
mu						
cord						
and						
ep+all		0.1		0.3	0.9	
sph			tr		0.1	
ap		0.3	0.1		0.3	
op		1.0	0.3		0.1	
others		0.6	0.4	0.1	0.6	
CHEMICAL ANALYSES						
SiO2	81.46	61.08	61.90	64.01	65.44	6
TiO2	0.57	0.69	0.69	0.57	0.57	
Al2O3	8.14	15.11	14.95	14.80	14.67	1
Fe2O3	0.49	1.64	1.25	1.65	1.08	
FeO	2.15	5.29	5.08	3.93	4.28	
MnO	0.03	0.10	0.09	0.10	0.07	
MgO	1.12	4.90	4.56	3.90	3.68	
CaO	1.21	5.97	5.14	5.33	4.59	
Na2O	1.09	1.51	1.65	1.81	1.81	
K2O	2.30	2.01	2.19	2.19	2.63	
P2O5	0.14	0.14	0.15	0.12	0.11	
S	0.02	0.02	0.05	<0.02	<0.02	
H2O+	0.75	1.56	1.60	1.06	1.24	
H2O-	0.10	0.12	0.09	0.21	0.18	
CO2	0.08	0.17	0.18	0.11	0.17	
rest	0.24	0.21	0.19	0.19	0.20	
	99.89	100.52	99.76			9
O=S	0.01	0.01	0.02			
	99.88	100.51	99.74	99.98	100.72	9
Ba	565	370	360	390	440	
Rb	95	94	102	106	127	
Sr	84	195	184	194	177	
Pb	21.0	15.5	16.5	19.0	18.0	
Th	29.6	8.8	6.2	14.6	13.2	
U	4.6	1.6	1.8	1.2	1.4	
Zr	667	143	153	133	150	
Nb	6.0	8.0	4.0	9.0	9.0	
Y	42	28	19	22	25	
La	46	24	16	24	28	
Ce	110	58	33	61	63	
Nd	39	25	12	21	24	
Sc	9	26	26	26	21	
V	39	155	141	127	114	
Cr	77	216	212	147	169	
Mn	245	780	715	775	570	
Co	10	30	27	23	23	
Ni	11.0	52	51	39.0	42.5	
Cu	9.5	28.0	26.0	18.5	21.0	
Zn	42	92	86	76	79	
Ga	8.4	17.8	16.8	16.4	17.0	
C.I.P.W. NORMS						
Q	61.18	21.54	23.14	25.82	26.97	2
C	1.94		0.83		0.71	
or	13.59	11.88	12.94	12.94	15.54	1
ab	9.22	12.78	13.96	15.32	15.32	1
an	5.23	28.51	24.65	25.79	22.20	2
di		0.26		0.01		
hy	5.45	19.48	18.68	14.81	15.32	1
mt	0.71	2.38	1.81	2.39	1.57	
il	1.08	1.31	1.31	1.08	1.08	
ap	0.33	0.33	0.36	0.28	0.26	

1 Xenolith, Clear Range Granodiorite, GR 862099. Analyst E.J. Reid (R
2 Murrumbucka Tonalite. GR 906113. Analyst E.J. Reid (Reid, in prep.
3 Murrumbucka Tonalite. GR 902102. Analyst E.J. Reid (Reid, in prep.
4 Murrumbucka Tonalite. GR 883091. Analyst A.S. Joyce (Joyce, 1970 u
5 Murrumbucka Tonalite. GR 874084. Analyst E.J. Reid (Reid, in prep.
6 Murrumbucka Tonalite. GR 888076. Analyst E.J. Reid (Reid, in prep.
7 Altered Murrumbucka Tonalite. GR 897108. Analyst A.S. Joyce (Joyce
8 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid

	1	2	3	4	5	
			CHEMICAL ANALYSES			
SiO2	58.69	59.03	61.08	59.84	57.69	6
TiO2	0.50	0.47	0.45	0.50	0.69	
Al2O3	14.14	14.17	13.33	14.25	16.20	1
Fe2O3	1.72	1.50	1.42	1.58	1.18	
FeO	6.13	6.32	6.22	6.01	6.23	
MnO	0.22	0.19	0.20	0.19	0.16	
MgO	6.24	6.59	6.34	5.82	5.58	
CaO	7.94	6.10	5.91	6.69	7.92	
Na2O	1.02	0.95	0.96	1.02	1.31	
K2O	0.95	2.11	1.78	1.71	0.90	
P2O5	0.07	0.08	0.07	0.08	0.10	
S	0.03	0.02	0.03	0.03	0.03	
H2O+	1.79	1.87	1.72	1.65	1.61	
H2O-	0.09	0.16	0.12	0.15	0.08	
CO2	0.13	0.10	0.14	0.15	0.16	
rest	0.17	0.20	0.20	0.18	0.16	
	99.83	99.86	99.97	99.85	100.00	9
O=S	0.01	0.01	0.01	0.01	0.01	
	99.82	99.85	99.96	99.84	99.99	9
Ba	165	330	335	265	145	
Rb	41.0	100	84	79	37.0	
Sr	137	125	127	136	197	
Pb	14.0	14.0	12.5	14.5	16.5	
Th	8.2	7.2	9.6	11.2	8.8	
U	1.2	1.2	1.4	2.0	2.0	
Zr	86	73	83	86	101	
Nb	4.0	4.0	4.5	5.0	5.0	
Y	19	21	22	28	25	
La	19	21	22	20	22	
Ce	45	49	47	46	48	
Nd	18	20	20	22	21	
Sc	40	34	36	37	35	
V	193	164	165	175	180	
Cr	254	311	315	244	153	
Mn	1675	1500	1575	1450	1215	
Co	37	32	36	31	35	
Ni	33.5	57	47.5	41.5	37.0	
Cu	13.0	7.5	8.5	15.0	28.5	
Zn	107	113	112	105	93	
Ga	15.2	16.4	14.6	15.8	17.4	
			C.I.P.W. NORMS			
Q	20.37	18.55	22.69	21.08	17.86	2
or	5.61	12.47	10.52	10.10	5.32	1
ab	8.63	8.04	8.12	8.63	11.08	
an	31.20	28.17	26.81	29.25	35.66	2
di	6.36	1.37	1.76	2.86	2.51	
hy	21.86	25.69	24.81	22.36	22.29	2
mt	2.49	2.17	2.06	2.29	1.71	
il	0.95	0.89	0.85	0.95	1.31	
ap	0.17	0.19	0.17	0.19	0.24	

1 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
2 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
3 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
4 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
5 I-type xenolith, Murrumbucka Tonalite, GR 904101. Analyst E.J. Reid
6 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
7 I-type xenolith, Murrumbucka Tonalite, GR 904101. Analyst E.J. Reid
8 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid

	1	2	3	4	5	
MODAL ANALYSES						
Q						3
Kfs						2
pg						3
amph						
bi						
mu						
cord						
andl						
ep+all						
sph						
ap						
op						
others						
CHEMICAL ANALYSES						
SiO2	59.72	42.93	72.35	78.80	78.04	7
TiO2	0.43	1.14	0.54	0.55	0.49	
Al2O3	14.97	27.16	10.96	7.34	9.91	1
Fe2O3	1.40	2.61	1.63	1.75	0.60	
FeO	5.58	4.41	2.94	1.54	2.02	
MnO	0.21	0.06	0.11	0.09	0.10	
MgO	5.26	3.86	1.44	1.27	0.99	
CaO	8.36	10.75	7.52	5.93	6.37	
Na2O	0.73	1.64	0.55	0.47	0.27	
K2O	1.18	2.44	0.19	0.16	0.06	
P2O5	0.06	0.07	0.15	0.16	0.15	
S	0.02	0.57	0.07	0.26	0.04	
H2O+	1.47	2.05	0.86	0.76	0.45	
H2O-	0.13	0.25	0.10	0.05	0.06	
CO2	0.11	0.04	0.21	0.59	0.13	
rest	0.15	0.30	0.13	0.13	0.13	
	99.78	100.28	99.75	99.85	99.81	9
O=S	0.01	0.28	0.03	0.13	0.02	
	99.77	100.00	99.72	99.72	99.79	9
Ba	225	480	<5	<5	35	
Rb	55	120	2.8	3.4	0.6	
Sr	128	365	167	88	272	
Pb	15.0	25.0	11.5	12.0	6.0	
Th	5.0	24.8	23.6	20.6	20.2	
U	1.6	4.0	5.0	7.8	3.6	
Zr	76	176	274	380	317	
Nb	4.5	12.5	11.0	10.5	10.0	
Y	25	6	64	43	37	
La	19	54	41	50	39	
Ce	44	127	97	107	93	
Nd	19	42	40	38	34	
Sc	40	17	11	8	10	
V	198	164	63	56	28	
Cr	100	189	49	56	47	
Mn	1645	440	850	660	760	
Co	30	69	13	7	7	
Ni	14.0	138	15.5	7.5	9.0	
Cu	7.0	270	38.0	96	8.5	
Zn	98	95	42	28	33	
Ga	15.2	30.0	14.0	10.2	12.0	
C.I.P.W. NORMS						
Q	22.87		51.08	63.37	61.41	3
C		2.37				
or	6.97	14.42	1.12	0.95	0.35	2
ab	6.18	7.98	4.65	3.98	2.28	2
an	34.09	53.09	26.88	17.45	25.65	1
ne		3.20				
di	5.78		7.85	8.69	4.20	
hy	19.04		3.07	-0.32	2.97	
ol		9.96				
mt	2.03	3.78	2.36	2.54	0.87	
il	0.82	2.17	1.03	1.04	0.93	
hm						
ap	0.14	0.17	0.36	0.38	0.36	

1 I-type xenolith, Murrumbucka Tonalite, GR 904103. Analyst E.J. Reid
2 S-type xenolith, Murrumbucka Tonalite, GR 902102. Analyst E.J. Reid
3 S-type xenolith, Murrumbucka Tonalite, GR 892115. Analyst E.J. Reid
4 S-type xenolith, Murrumbucka Tonalite, GR 876082. Analyst E.J. Reid
5 S-type xenolith, Murrumbucka Tonalite, GR 896128. Analyst E.J. Reid
6 Five Hundred Acre Granodiorite. GR 913124. Analyst E.J. Reid (Reid
7 Aplite, Five Hundred Acre Granodiorite. GR 867117. Analyst E.J. Re
8 Aplite, Five Hundred Acre Granodiorite. GR 913124. Analyst E.J. Re

	1	2	3	4	5	
			MODAL ANALYSES			
Q	36.8	36.7	48.3	44.7	51.1	4
Kfs	1.9		8.8	5.9		
pg	42.0	34.9	18.9	20.0	18.1	2
amph						
bi	12.6		17.4	19.5	16.9	2
mu	3.8		4.0	3.1	13.3	
cord				3.2		
andl			2.4	3.4		
ep+all	1.5					
spn						
ap	tr		0.1	0.1	0.2	
op	0.6		0.1	0.1	0.3	
others	0.8	28.4			0.1	
			CHEMICAL ANALYSES			
SiO2	69.24	68.14	72.00	70.43	69.03	7
TiO2	0.73	0.70	0.54	0.67	0.66	
Al2O3	14.68	15.41	13.72	14.15	14.39	1
Fe2O3	1.09	0.72	0.59	0.57	1.02	
FeO	3.18	3.47	3.48	4.10	3.53	
MnO	0.03	0.05	0.06	0.06	0.06	
MgO	1.16	1.84	1.76	2.16	2.30	
CaO	3.99	2.97	0.95	1.33	0.88	
Na2O	2.34	2.47	1.49	1.52	1.26	
K2O	2.16	2.31	3.73	3.25	4.10	
P2O5	0.05	0.05	0.13	0.08	0.14	
S	0.03	0.03	<0.02	0.03	0.02	
H2O+	0.90	1.38	1.28	1.21	1.93	
H2O-	0.09	0.11	0.14	0.07	0.08	
CO2	0.17	0.11	0.13	<0.01	0.12	
rest	0.25	0.15	0.21	0.20	0.19	
	100.09	99.91		99.83	99.71	9
O=S	0.01	0.01		0.01	0.01	
	100.08	99.90	100.21	99.82	99.70	9
Ba	450	265	765	585	550	
Rb	98	126	153	141	157	
Sr	269	264	127	152	105	
Pb	22.5	26.0	34.5	24.5	27.0	
Th	94	9.4	21.4	26.0	20.4	
U	2.0	2.2	3.8	2.8	3.4	
Zr	164	127	201	201	194	
Nb	10.0	13.0	9.0	12.0	13.0	
Y	26	23	39	42	28	
La	162	18	31	35	33	
Ce	369	38	68	80	74	
Nd	144	12	24	26	24	
Sc	12	14	12	14	12	
V	88	93	64	81	73	
Cr	26	48	56	76	82	
Mn	205	365	485	495	430	
Co	8	16	15	16	13	
Ni	6.0	19.5	24.0	25.0	26.0	
Cu	6.5	8.5	11.0	13.0	8.5	
Zn	61	78	71	77	79	
Ga	17.4	17.6	15.0	16.4	18.2	
			C.I.P.W. NORMS			
Q	35.42	33.76	42.35	40.47	38.91	4
C	1.29	3.52	5.74	5.84	6.56	
or	12.76	13.65	22.04	19.21	24.23	1
ab	19.80	20.90	12.61	12.86	10.66	1
an	19.64	14.55	4.06	6.24	3.60	
hy	6.68	9.30	9.51	11.44	10.39	
mt	1.58	1.04	0.86	0.83	1.48	
il	1.39	1.33	1.03	1.27	1.25	
ap	0.12	0.12	0.31	0.19	0.33	

1 Altered Five Hundred Acre Granodiorite. GR 911115. Analyst E.J. Re
2 Altered Five Hundred Acre Granodiorite. GR 909061. Analyst E.J. Re
3 Cooma Granodiorite. GR 902876. Analyst B.W. Chappell (Chappell and
4 Gap Granodiorite. GR 910060. Analyst E.J. Reid (Reid, in prep.).
5 Gap Granodiorite. GR 888076. Analyst E.J. Reid (Reid, in prep.).
6 Gap Granodiorite. GR 909061. Analyst E.J. Reid (Reid, in prep.).
7 Gap Granodiorite. GR 902107. Analyst E.J. Reid (Reid, in prep.).
8 Altered Gap Granodiorite. GR 909060. Analyst E.J. Reid (Reid, in p

	1	2	3	4
		CHEMICAL ANALYSES		
SiO2	70.65	75.27	74.71	73.66
TiO2	0.65	0.60	nd	nd
Al2O3	15.25	11.77	15.51	17.89
Fe2O3	0.83	1.95	tr	tr
FeO	3.45	2.91	tr	tr
MnO	0.05	0.05	abs	tr
MgO	1.63	0.70	abs	0.09
CaO	0.94	0.80	0.34	0.27
Na2O	1.77	1.56	1.59	2.36
K2O	4.63	3.08	8.11	5.12
P2O5	0.12	0.19	0.10	0.02
H2O+	0.60	0.70	0.10	0.58
H2O-	0.09	0.15	0.03	0.07
ZrO2		tr		
SO3		abs		
Cl		tr		
Fl		abs		
FeS2		abs		
Cr2O3		tr		
NiO+CoO		0.02		
BaO		0.05		
SrO		present		
Li2O		present		
V2O3		abs		
Total	100.66	99.83	100.49	100.06
SG	2.79	2.74	2.60	2.67
		C.I.P.W. NORMS		
Q	36.40	50.90	33.98	39.68
C	5.90	4.87	3.74	8.02
or	27.36	18.20	47.93	30.26
ab	14.98	13.20	13.45	19.97
an	3.88	2.73	1.03	1.21
ac				
wo				
di				
hy	8.73	4.58		0.22
mt	1.20	2.83		
il	1.23	1.14		
nm				
ap	0.28	0.44	0.23	0.05

1 Cooma Granodiorite (with plagioclase phenocrysts). Massie Street, Co (Joplin, 1942).
2 Cooma Granodiorite. Cooma. Analyst H.B. Gurney (Cambage, 1909).
3 Graphic Pegmatite, Cooma Granodiorite. Soho Street, Cooma, GR 909 Joplin (Joplin, 1942).
4 Albite-muscovite 'gneiss', Cooma Granodiorite. Dry Plains Road, Por. 878880. Analyst G.A. Joplin (Joplin, 1942).
5 Clear Range Granodiorite. Murrumbucka Gap, Por. 46, Par. of York, G.A. Joplin (Joplin, 1943).
6 Five Hundred Acre Granodiorite. Cutting on Sydney Road, Bunyan, GR 9 Joplin (Joplin, 1943).

	1	2	3	4	5	6
			MODAL ANALYSES			
Q	28.6	30.3	29.2	26.8	33.6	31.2
Kfs	16.6	20.0	16.7	0.1	31.5	17.4
pg	40.9	37.7	40.0	56.6	29.6	37.9
mu	0.1	-	0.1	-	0.1	-
bi	0.1	7.1	5.4	12.6	5.1	6.2
chl	12.1	tr	1.2	-	tr	-
ep	0.1	0.1	0.2	0.3	0.1	0.3
hb	0.1	4.8	7.0	3.3	-	6.9
op	1.4	tr	0.2	0.3	tr	0.1
acc	pu zr ap	zr ap	ap zr	zr ap sph	ap zr	ap

1 Hangmans Creek Granodiorite. GR 064966. Analyst D.M. Ilsley (Ilsle
2 Anembo Granodiorite. GR 165128. Analyst D.M. Ilsley (Ilsley, 1980
3 Frogs Hollow Granodiorite. GR 158038. Analyst D.M. Ilsley (Ilsley,
4 Peak View Tonalite. GR 175066. Analyst D.M. Ilsley (Ilsley, 1980 u
5 Celeys Creek Adamellite. GR 229029. Analyst D.M. Ilsley (Ilsley, 1
6 Glenbog Granodiorite. GR 190928. Analyst D.M. Ilsley (Ilsley, 1980
7 Throsby Granite. GR 077636. Analyst D.M. Ilsley (Ilsley, 1980 unpu
8 Throsby Granite. GR 130701. Analyst D.M. Ilsley (Ilsley, 1980 unpu
9 Hurlstone Adamellite. GR 114703. Analyst D.M. Ilsley (Ilsley, 1980

	1	2	3	4	5	
MODAL ANALYSES						
Q		27.7				
Kfs		10.2				
pg		44.2				
bi		8.5				
ep		0.1				
nb		8.4				
op		0.9				
acc		ap				
		zr				
CHEMICAL ANALYSES						
SiO2	68.69	66.71	65.52	67.53	68.64	6
TiO2	0.44	0.55	0.54	0.50	0.44	
Al2O3	14.31	14.63	15.02	14.45	14.24	1
Fe2O3	1.19	1.92	1.74	1.81	1.39	
FeO	2.56	2.92	2.95	2.55	2.38	
MnO	0.06	0.08	0.08	0.08	0.07	
MgO	1.40	1.95	2.03	1.54	1.42	
CaO	3.78	4.65	4.69	4.10	3.72	
Na2O	2.77	2.48	2.49	2.62	2.80	
K2O	3.15	2.67	2.69	2.94	3.15	
P2O5	0.77	0.08	0.08	0.08	0.07	
S	<0.02	0.02	<0.02	<0.02	0.03	
H2O+	1.20	1.02	1.49	1.45	1.23	
H2O-	0.09	0.13	0.14	0.19	0.15	
CO2	0.12	0.14	0.03	0.04	0.04	
rest	0.15	0.15	0.16	0.16	0.15	
		100.10			99.92	10
O=S		0.01			0.01	
	99.98	100.09	99.65	100.04	99.91	10
Ba	445	390	430	425	450	
Rb	146	132	127	147	162	
Sr	129	137	153	134	129	
Pb	17.0	10.5	10.5	21.5	17.5	
Th	18.0	16.0	13.6	18.2	18.6	
U	2.6	3.4	1.8	2.6	3.6	
Zr	133	131	150	145	140	
Nb	7.0	8.0	7.5	7.5	7.5	
Y	28	27	27	30	31	
La	29	22	23	29	30	
Ce	65	51	54	65	66	
Nd	22	20	20	24	22	
Sc	15	20	18	17	15	
V	78	106	104	95	78	
Cr	8	13	14	9	8	
Mn	500	595	585	615	530	
Co	10	16	15	14	12	
Ni	4.0	6.0	6.0	6.0	4.5	
Cu	3.5	2.0	6.0	12.0	7.0	
Zn	48	63	74	70	52	
Ga	14.6	15.8	16.4	15.4	15.0	
C.I.P.W. NORMS						
Q	29.31	28.38	26.58	29.19	29.40	3
C						
or	18.61	15.78	15.90	17.37	18.61	1
ab	23.44	20.99	21.07	22.17	23.69	2
an	17.31	20.90	21.86	18.98	16.98	1
di	0.92	1.44	0.83	0.78	0.94	
hy	6.14	7.17	7.89	5.96	5.70	
mt	1.73	2.78	2.52	2.62	2.02	
il	0.84	1.04	1.03	0.95	0.84	
ap	0.17	0.19	0.19	0.19	0.17	

1 Frogs Hollow Granodiorite. GR 159036. Analyst B.W. Chappell (Beams
2 Yalgatta Granodiorite. GR 188687. Modal analysis D.M. Ilsley (Ilsl
analysis P. Gooday (Beams, in prep.).
3 Yalgatta Granodiorite. GR 177743. Analyst P. Gooday (Beams, in pre
4 Glenbog Granodiorite. GR 147753. Analyst P. Gooday (Beams, in prep
5 Glenbog Granodiorite. GR 174935. Analyst B.W. Chappell (Beams, in
6 Glenbog Granodiorite. GR 202881. Analyst B.W. Chappell (Beams, in
7 Adamellite, Myocum Complex. GR 178694. Analyst P. Gooday (Beams, i
8 Tnrosby Granite. GR 117703. Analyst P. Gooday (Beams, in prep.).

	1	2	3	4	5	6
			CHEMICAL ANALYSES			
SiO2	53.25	56.52	52.50	59.13	52.06	62.12
TiO2	1.01	0.30	0.22	0.32	0.29	0.32
Al2O3	15.26	6.47	11.72	7.92	14.83	10.51
Fe2O3	1.70	1.19	2.30	0.98	1.08	1.62
FeO	6.72	4.16	5.94	4.06	4.51	3.89
MnO	0.16	0.12	0.11	0.10	0.67	0.11
MgO	6.39	14.32	10.44	14.29	11.75	9.16
CaO	9.59	13.74	13.04	12.37	12.31	10.06
Na2O	2.86	0.57	0.97	0.44	1.19	0.87
K2O	0.84	0.22	0.53	0.15	0.98	0.61
P2O5	0.09	0.07	0.07	abs	abs	abs
S		<0.02				
H2O+		1.62	1.66	0.31	0.60	0.29
H2O-		0.11	0.28	0.15	0.36	0.24
CO2		0.23	0.06			
NiO+CoO			0.01			
Cr2O3			0.02	tr	tr	tr
V2O3			0.05			
Total	97.87	99.66	99.92	100.22	100.63	99.80
SG			2.993	3.039	3.100	2.821
Ba		55				
Rb		3.6				
Sr		188				
Pb		2.0				
Th		7.0				
U		2.0				
Zr		61				
Nb		3.0				
Y		15				
La		15				
Ce		40				
Nd		21				
Sc		57				
V		131				
Cr		2040				
Co		51				
Ni		212				
Cu		21.5				
Zn		44				
Ga		6.8				
			C.I.P.W. NORMS			
Q	3.69	10.35	5.74	14.42	0.01	22.73
C						
or	4.96	1.30	3.13	0.89	5.79	3.60
ab	24.20	4.82	8.21	3.72	10.07	7.36
an	26.32	14.45	26.06	19.19	32.23	22.97
ne						
di	16.82	42.24	30.60	33.40	23.02	21.83
hy	17.29	22.08	20.19	26.11	26.44	17.92
ol						
mt	2.46	1.73	3.33	1.42	1.57	2.35
il	1.92	0.57	0.42	0.61	0.55	0.61
ap	0.21	0.17	0.16			

1 Begendal Gabbro. GR 182694. Analyst P. Gooday (Gooday, 1977 unpubl
2 Soho Street Amphibolite. GR 909876. Analyst B.W. Chappell (Chappel
3 Relict gabbro, Soho Street Amphibolite. GR 909869. Analyst H.P. Wh
4 Fine-grained granoblastic amphibolite, Soho Street Amphibolite. GR 9
(Joplin, 1939).
5 Fine phase of heterogeneous amphibolite, Soho Street Amphibolite.
Joplin (Joplin, 1939).
6 Coarse phase of heterogeneous amphibolite, Soho Street Amphibolite.
Joplin (Joplin, 1939).
7 Pyroxene amphibolite, Soho Street Amphibolite. GR 909869. Analyst G
8 Amphibolite. Cooma Creek near entrance to gorge, Por. 135, Par. of
Analyst G.A. Joplin (Joplin, 1942).
9 Chlorite amphibolite. Pine Valley, Por. 70, Par. of Binjura, GR 83
Joplin (Joplin, 1942).

	1	2	3	4	5	6
MODAL ANALYSES						
Q	2.4	3.00	6.3	8.8	14.0	1.8
Kfs	84.9	88.38	83.0	61.7	78.2	64.7
pg	2.6	0.65	3.3	15.7	0.7	18.3
bi	-	-	-	tr	-	2.7
chl	-	-	-	-	-	7.6
hb	7.9	7.78	6.5	11.1	7.1	tr
px	0.8	-	-	1.5	-	3.0
ap	tr	tr	tr	tr	tr	0.56
op	1.3	0.32	0.8	1.0	tr	0.95
CHEMICAL ANALYSES						
SiO2	62.21	63.30	64.97	64.47	69.81	58.62
TiO2	0.46	0.47	0.39	0.62	0.20	1.30
Al2O3	16.92	16.81	16.45	15.42	14.22	15.93
Fe2O3	1.98	1.23	0.81	2.01	1.31	2.82
FeO	2.75	3.09	3.03	3.42	1.73	4.28
MnO	0.14	0.12	0.10	0.13	0.09	0.13
MgO	0.43	0.39	0.37	0.30	0.09	1.69
CaO	2.17	2.10	1.82	2.16	0.68	3.54
Na2O	5.36	5.41	5.20	5.05	5.52	4.65
K2O	5.79	5.58	5.79	5.04	5.20	4.69
P2O5	0.12	0.13	0.09	0.21	0.02	0.53
H2O+	0.81	0.82	0.75	0.73	0.72	1.04
H2O-	0.22	0.35	0.27	0.29	0.19	0.23
CO2	0.37	0.42	0.38	0.39	0.30	0.29
Total	99.73	100.22	100.42	100.24	100.08	99.74
Rb	97	142	151	168	230	151
Sr	169	198	170	225	6	375
Y	31	40	46	49	93	37
Pb	13	19	16	17	26	17
Th	11.6	19.7	25.6	20.4	47.3	16.4
U	1.1	2.6	5.3	3.8	7.4	4.5
C.I.P.W. NORMS						
Q	3.67	4.86	7.21	10.62	16.37	4.52
C						
or	34.22	32.98	34.22	29.78	30.73	27.72
ab	45.35	45.78	44.00	42.73	44.19	39.35
an	5.01	5.10	4.44	4.52		8.74
ac					2.22	
di	4.25	3.86	3.47	4.19	2.85	4.41
hy	1.81	3.08	3.56	2.41	1.29	5.66
mt	2.87	1.78	1.17	2.91	0.79	4.09
il	0.87	0.89	0.74	1.18	0.38	2.47
hm						
ap	0.28	0.30	0.21	0.49	0.05	1.23

1 Hornblende-pyroxene syenite, main syenite intrusion. GR 923806. (Veijayaratnam, 1970 unpubl.).
2 Hornblende-high-K syenite, main syenite intrusion. GR 903808. (Veijayaratnam, 1970 unpubl.).
3 Hornblende-high-K syenite, main syenite intrusion. GR 915803. (Veijayaratnam, 1970 unpubl.).
4 Plagioclase high-K syenite, main syenite intrusion. GR 925806. (Veijayaratnam, 1970 unpubl.).
5 Quartz high-K syenite, main syenite intrusion. GR 902805. A (Veijayaratnam, 1970 unpubl.).
6 Banatite, main syenite intrusion. GR 897794. Analyst M. Veijayar unpubl.).
7 Central quartz monzonite. GR 904793. Analyst M. Veijayaratnam (Vei
8 Latite dyke. GR 908795. Analyst M. Veijayaratnam (Veijayaratnam, 1
9 Quartz microsyenite dyke. GR 902793. Analyst M. Veijayaratnam (Vei

	1	2	3	4	5	6
				CHEMICAL ANALYSES		
SiO2	47.45	47.36	46.74	44.51	45.83	47.98
TiO2	1.52	1.52	1.42	1.99	1.86	1.63
Al2O3	14.81	14.20	14.15	13.86	14.80	15.54
Fe2O3	2.78	2.80	3.25	3.52	2.92	3.44
FeO	8.16	8.11	7.56	6.64	7.90	6.28
MnO	0.15	0.15	0.15	0.14	0.15	0.11
MgO	9.42	9.38	9.50	11.45	9.66	7.57
CaO	8.05	8.03	9.27	9.75	9.62	9.88
Na2O	2.74	2.92	2.42	1.96	2.71	2.89
K2O	0.81	1.11	0.90	1.55	0.82	1.06
P2O5	0.34	0.38	0.34	0.64	0.54	0.48
H2O+	2.42	2.10	1.68	1.74	1.43	1.56
H2O-	0.59	1.06	1.00	1.31	0.86	0.80
CO2	0.30	0.17	0.19	0.09	0.19	0.25
Total	99.70	99.46	98.84	99.48	99.50	99.65
Rb	14	21	19	25	13	17
Sr	375	430	1364	1334	705	558
Y	21	21	19	23	24	21
Th	5	6	6	8	8	7
Zr	143	140	121	207	180	137
Nb	44	49	37	83	66	60
Pb	6	7	4	6	6	10
Ga	16	15	13	15	14	14
V	128	129	116	149	147	138
Cr	235	247	254	306	221	186
Ni	167	184	187	236	174	103
Cu	56	56	48	46	56	48
Zn	95	98	86	77	83	74
Ba	221	237	303	652	292	299
La	25	28	24	47	35	29
Ce	48	53	49	90	63	54
Pr	5	4	4	10	7	5
Nd	15	2	12	33	23	19
				C.I.P.W. NORMS		
or	4.98	6.84	5.56	5.01	9.55	0.48
ab	24.10	25.76	21.42	23.70	15.95	25.28
an	26.74	23.31	26.24	26.66	25.49	27.19
ne					0.73	
di	10.10	12.66	15.82	15.37	16.52	16.41
hy	13.89	7.23	9.67	0.27		5.63
ol	13.07	16.97	14.38	20.81	23.21	11.77
mt	3.28	3.28	3.24	3.22	3.03	2.87
il	3.00	3.01	2.82	3.65	3.94	3.20
ap	0.84	0.94	0.84	1.32	1.58	1.18

1 Alkali basalt. 36 20'S, 149 12'E. Analyst S.E. Kesson (Kesson, 197

2 Alkali basalt. 36 15'S, 149 1.5'E. Analyst S.E. Kesson (Kesson, 19
3 Alkali basalt. 36 15'S, 149 9'E. Analyst S.E. Kesson (Kesson, 1972
4 Alkali basalt. 36 15.5'S, 149 10.5'E. Analyst S.E. Kesson (Kesson,
5 Alkali basalt. 36 16'S, 149 12'E. Analyst S.E. Kesson (Kesson, 197
6 Alkali basalt. 36 22'S, 149 17.5'E. Analyst S.E. Kesson (Kesson, 1
7 Alkali basalt. 36 21.5'S, 149 15.5'E. Analyst S.E. Kesson (Kesson,
8 Alkali basalt. 36 25.5'S, 149 13'E. Analyst S.E. Kesson (Kesson, 1
9 Alkali basalt. 36 27'S, 149 11'E. Analyst S.E. Kesson (Kesson, 197

	1	2	3	4	5
			CHEMICAL ANALYSES		
SiO2	47.33	47.16	48.54	45.92	46.70
TiO2	1.51	1.68	1.99	1.72	1.73
Al2O3	14.18	15.23	15.60	14.13	15.02
Fe2O3	3.06	4.35	3.49	2.46	3.52
FeO	7.18	7.18	6.28	8.39	7.27
MnO	0.14	0.15	0.15	0.18	0.15
MgO	8.34	8.57	6.64	10.25	8.54
CaO	9.24	8.99	8.33	10.15	9.87
Na2O	3.00	2.74	3.12	2.45	2.49
K2O	1.29	0.83	1.74	0.77	1.10
P2O5	0.50	0.30	0.55	0.61	0.44
H2O+	1.16	1.32	1.57	1.25	1.48
H2O-	0.92	0.76	1.09	0.98	1.03
CO2	1.13	0.14	0.00	0.35	0.05
Total	99.20	99.60	99.30	99.89	99.60
Rb	29	18	44	13	18
Sr	682	831	711	1241	722
Y	22	21	25	24	22
Th	8	4	8	7	6
Zr	144	144	200	191	147
Nb	64	34	65	64	54
Pb	7	4	9	8	6
Ga	14	14	17	15	16
V	126	127	153	134	149
Cr	203	178	110	252	232
Ni	169	139	49	201	121
Cu	48	64	22	49	47
Zn	85	80	83	98	86
Ba	405	228	455	377	342
La	40	19	38	40	33
Ce	75	36	78	73	65
Pr	7	4	9	7	6
Nd	23	14	28	27	24
			C.I.P.W. NORMS		
or	7.97	5.06	10.68	4.69	6.72
ab	26.53	23.91	27.41	21.36	21.79
an	22.38	27.64	24.32	26.06	27.46
ne					
di	17.93	13.27	12.08	17.55	16.38
hy	0.47	8.15	7.08	2.57	4.78
ol	17.43	14.58	10.25	19.69	15.21
mt	3.07	3.38	2.89	3.23	3.19
il	3.00	3.29	3.92	3.37	3.40
ap	1.24	0.73	1.35	1.49	1.08

1 Alkali basalt. 36 26'S, 149 12'E. Analyst S.E. Kesson (Kesson, 197

2 Alkali basalt. 36 27'S, 149 11'E. Analyst S.E. Kesson (Kesson, 197
3 Alkali basalt. 36 27'S, 149 10.5'E. Analyst S.E. Kesson (Kesson, 1
4 Alkali basalt. 36 17'S, 149 8'E. Analyst S.E. Kesson (Kesson, 1972
5 Alkali basalt. 36 19.5'S, 149 8.5'E. Analyst S.E. Kesson (Kesson,
6 Basanite. 36 15.5'S, 149 10.5'E. Analyst S.E. Kesson (Kesson, 1972
7 Basanite. 36 27'S, 149 11'E. Analyst S.E. Kesson (Kesson, 1972 unp
8 Basanite. 36 21.5'S, 149 16'E. Analyst S.E. Kesson (Kesson, 1972 u

APPENDIX 3

RADIOMETRIC AGE DETERMINATIONS ON ROCKS FROM THE COOMA 1:100,000 SHEET AREA

All ages have been calculated in accordance with the decay constants of Steiger and Jaeger (1977).

The following notes refer to the letters by the map numbers of some data.

a The minimum and maximum values were obtained by using initial Strontium ratios of .720 and .704 respectively.

b These values define a cooling curve for the Cooma Granodiorite and Soho Street Amphibolite through the blocking temperatures of the various minerals.

c The inclusion of a biotite analysis in this isochron increases the scatter and lowers the age to 399.8 ± 3.1Ma. This suggests that biotite has been open to radiogenic strontium diffusion long after other minerals became closed.

d This age is too high considering the geological controls. Pidgeon and Compston (1965) suggested that all minerals except orthoclase lost radiogenic strontium during alteration.

e Dates subject to future recalculation.

The following abbreviations are used

isoc	isochron	mu	muscovite
tr	total rock	fs	feldspar
min	mineral	kfs	K-feldspar
hb	hornblende	or	orthoclase
bi	biotite	mic	microcline

Unit	Locality	Map No	Age (Ma)	Method
Murroo Group	GR 814872 approx GR 818918 approx GR 817922 approx GR 815925 approx	1	450±11	Rb-Sr TR isoc
Willarney Formation	GR 839876 approx unknown locality	2	391±28	Rb-Sr TR+or isoc
	unknown locality GA55	3a	403-408	Rb-Sr bi
	GA55	4a	396-400	
Leucozome from migmatitic Willarney Formation	GR 871921 approx GR 884864 approx	5	394	Rb-Sr TR isoc
Melanozome from migmatitic Willarney Formation		6	402	
Cooma Granodiorite	GR 915874 approx	7	390±13	K-Ar bi
	GR 893873 approx	8	378	K-Ar bi
	GR 902876	9b	401.3±3.6	K-Ar mu
		10b	398.8±2.5	K-Ar bi
		11b	387.9±3.7	K-Ar kfs
	GR 893873 approx GR 872873 approx GR 904883 approx	12	406±12	Rb-Sr TR+fs isoc
	GR 872873 approx	13a	393-407	Rb-Sr mu
		14a	410-417	Rb-Sr bi
		15a	403-410	
	GR 904883 approx	16a	384-388	
		17a	386-391	
	GR 893873 approx	18a	409-411	
		19a	404-407	
		20a	401-443	Rb-Sr mu
	GR 902876	21c	408.2±5.7	Rb-Sr TR+pgt+fs+mu isoc
Leucogranite in migmatite zone	NW of Cooma	22d	578	Rb-Sr TR+or isoc
Pegmatites near Cooma	GR 854917 approx	23	272	K-Ar bi
		24	369	K-Ar mu
		25	372	
		26	379	
		27	394±7	Rb-Sr mic-mu isoc
		28a	254-260	Rb-Sr bi
		29a	255-262	
		30a	400-406	Rb-Sr mu
		31a	387-391	
		32a	403-412	
		33a	401-410	
Soho Street Amphibolite	GR 909869	34b	409.6±5.8	K-Ar hb
		e		
Murrumbucka Tonalite	GR 875085	35e	404.1±3.5	K-Ar hb
		36e	393.0±2.5	K-Ar bi
	GR 886094 approx	37e	384±4	Rb-Sr mic isoc
Myalla Road Syenite	GR 915805 approx	38	167±5	K-Ar kfs
		39	161±6	K-Ar hb
	GR 900796 approx	40	171±3	K-Ar bi
		41	169±3	K-Ar kfs
Cenozoic volcanics	GR 037862 approx	42	39.8±1.0	K-Ar TR
	GR 942646 approx	43	40.5±1.0	
		44	38.2±1.0	
		45	39.5±1.0	
		46	41.2±1.6	
	GR 941646 approx	47	46.3±0.8	
	GR 984740 approx	48	54.4±1.2	
	GR 984734 approx	49	54.0±0.9	
		50	55.8±1.0	

INTRUSIVE IGNEOUS UNITS

Myalla Road Syenite		Jms	hb syenite, ba
		Jmm	qz monzonite
		Jmb	intrusive brec
Felsic Hypabyssal Rocks	Dangelong Microgranite	S-Dpd	lc microgranit
	Woolumla Porphyry	Spw	bi-qz-fsp porp
	Cranky Dans Porphyry	Spc	bi-qz-fsp porp
	Felsic dykes		bi-qz-fsp porp
Murrumbidgee Batholith	Clear Range Granodiorite	Sgmr	bi gd and ton
	Murrumbucka Tonalite	Sgmm	hb-bi ton
	Five Hundred Acre Granodiorite	Sgmf	lc gd
	Gap Granodiorite	Sgmg	cord-mu-bi-gd
		Swg	gneissic Willa Formation, mig and Gap Granod
	Cooma Granodiorite	Sgc	cord-mu-bi-gd
	Hangmans Creek Granodiorite	Sgn	hb-bi gd
	Bredbo River Adamellite	S-Dgr	bi ad
		S-Dg	lc ad/gr
Bega Batholith	Anembo Granodiorite	S-Dgba	hb-bi gd
	Frogs Hollow Granodiorite	S-Dgbf	bi-hb gd
	Peak View Tonalite	S-Dgbp	hb-bi ton
	Celeys Creek Aadamellite	S-Dgbc	bi ad
	Glenbog Granodiorite	S-Dgbg	hb-bi gd
	Yalgatta Granodiorite	S-Dgby	bi-hb gd
	Nimmitabel Adamellite	S-Dgbn	bi and hb-bi a
	Towneys Creek Adamellite	S-Dgbt	bi ad
	Begonia Adamellite	S-Dgbb	lc ad
	Throsby Granite	S-Dgbo	lc gr/ad
	Hurlstone Adamellite	S-Dgbh	lc ad
	Bold Slate Range Granite	S-Dgbs	lc gr
	Myocum Complex	S-Dgbm	ad, gr, gd
	Tilga Granodiorite	S-Dgbi	hb-bi gd
	Bemboka Granodiorite	S-Dgbk	hb-bi gd
	Jumping Creek Granodiorite	S-Dgbu	bi-hb gd
	Jibolara Complex	S-Dgbj	ad, gr, gd
Gabbros	Begendal Gabbros	S-Dgbx	gabbro

SEDIMENTARY/VOLCANIC UNITS

Cenozoic Deposits	Qa	alluvial fills of present-day river channels
	Tm	high-level sediments of the Billilingra-Bunyan-Numeralla area
	Tb	mafic volcanics
	Ts	pre-volcanic sediments

	Kydra Formation	Dk	cong, ar, mst

	Narribin Volcanics	Dn	dacite lava
	Colinton Volcanics	Scc	felsic volcs a
		Sccv	lavas
		Scct	undifferentiat
		Sccb	Billilingra Tu
		Scca	agglomerate
		Sccw	tuff, lava, ag
Chakola Group		Sccf	mudflow deposi
		Sccs	sandstone
		Sccm	mst with minor lst, chert and
		Sccl	lst
		Sccu	sediment and t
	Cappanana Formation	Scp	ar, mst, lst
		Scpl	lst
		Scps	ar, mst
	Kohinoor Volcanics	Sk	felsic volcs,
	Countegany Formation	Sbc	ar, mst
	Greenland Swamp Formation	Sbg	ar, mst, chert
Beresford Group	Bulgundramine Formation	Sbb	felsic tuff, a
	Rams Head Formation	Sbr	ar, mst, felsi
	Undoo Creek Formation	Sbul	lst
		Sbus	ar, mst, chert
	Warreen Formation	Sbw	ar, mst
	Doolondondoo Formation	Sbd	ar, mst
	Bennets Creek Volcanics	Sb	sh, lst
	Willarney Formation	Owg	migmatite
		Owb	banded gneiss
		Owm	mottled gneiss
		Ow	gw
	Ryrie Formation		
	Carlaminda Member	Snrc	gw
	Gungoandra Member	Snrg	stst
	Foxlow Formation		
Numeralla Group	Gurubang Member	Onfg	mst, chert
	Coornartha Member	Onfc	gw
	Birchams Creek Member	Onfb	mst, chert
	Strike-a-Light Member	Onfs	gw, mst, chert
	Mowles Gully Formation	Ong	gw
	Murrululа Formation	Onm	gw
	Kara Formation	Smk	gw, mst
Murroo Group	El Paso Formation	Ome	mst, chert, ar
	Beloka Formation	Omb	gw
	Koomulla Formation	Omk	gw, mst, chert

Abbreviations:

ar : arenite	mst : mudstone	stst : siltston
sh : shale	lst : limestone	cong : conglome
gw : greywacke	volcs: volcanics	agg : agglomer
ton : tonalite	gd : granodiorite	ad : adamelli
gr : granite	lc : leucocratic	qz : quartz
fsp : feldspar	bi : biotite	hb : hornbler
mu : muscovite	gn : garnet	andl : andalusi
cord : cordierite	(I) : (I-type)	(S) : (S-type)

MAJOR FAULTS AND LINEAMENTS

1 Alum Creek Fault
2 Lawarra Fault
3 Slacks Creek Fault
4 Berridale Fault
5 Torakina Faults
6 Bobundra Fault
7 Bullenamang Fault
8 Murrumbidgee Fault
9 Tollbar Fault
10 Gum Flat Fault
11 Narongo Fault
12 Bold Slate Range Fault
13 Sunny Corner Fault
14 Tom Groggin Fault
15 Big Badja Fault
16 Waterview Fault
17 Punchbowl Fault
18 Myola Fault
19 Swamp Creek Fault
20 Parkside Fault
21 Kydraban Fault
22 Robinsons Creek Fault
23 Rock Flat Lineament
24 Nandawar Lineament

STRUCTURAL SKETCH MAP

Cenozoic volcanics and sediments	largel
Jurassic Syenite	undefc
Devonian volcanics and sediments	largel
Late Silurian to Early Devonian intrusives	undefc strong
Late Silurian sediments, volcanics and sub-volcanic intrusions	open t (mainl
Middle to Late Silurian sediments and volcanics	close foldin
Middle Silurian intrusions	lagely
Ordovician to Early Silurian sediments	open t foldin
Unconformity (note the Devonian deposits overlie all older rocks	
Intrusive boundary	
Fault	
Lineament	

MINERAL DEPOSITS

No.	Name	Grid Ref.	Commoditi
1		072135	Au
2	Cowarra Gold Mine	072125	Au
3	The Queen	072123	Au
4	The Princess	070121	Au
5	The King	070120	Au
6	Vanderbilt Gold Mine	074129	Au
7	Ironclad Gold Mine	077125	Au
8	The Ambassador	076121	Au
9	The Prime Minister	075117	Au
10	The Democrat	075112	Au
11	Pole Star Mine	077107	Au
12	Never Never Line of Workings	079134	Au
13	Macanally Workings	090044	Au (Cu)
14	Fiery Creek Gold and Copper Workings	088019	Au (Cu)
15		084001	Au
16	Bobundara Gold Prospect	845603	Au
17		948105	Ba
18	Birchams	992124	Cu,Pb,Zn
19	Harnett Prospect	944015	Cu,Pb,Zn
20	Rosebank Mine	002925	Cu,Au,Ag,
21	Star of the North	948880	Au (Pb,Cu
22	No. 1 North	948879	Au,Cu (Pb
23	Prospectors Claim	948877	Au,Cu (Pb
24	MacKenzies No. 1 and No. 2 Shafts	949873	Au (Pb,Ag
25	Blake and Party	942876	Au (Cu)
26		942876	Au
27		954873	Ba
28		969874	Ba
29		982885	Au
30	Dartmoor Mine	982867	Zn,Pb,Cu
31	Dartmoor East Mine	985864	Zn,Pb,Cu
32	Skidmore Copper Mine	007885	Cu,Au (Ag
33	Monaro Copper Mine	795706	Cu (Ag,Au
34	Mowitts Swamp Mine	235670	Au,Pb,Cu
35		104702	Au,Ag (Pb
36		104702	Au,Ag
37		106702	Au,Ag (Pb
38	Clinton Reef	106702	Au (Ag,Cu
39	Wisserks Limonite Show	152742	Fe (Cu)
40	Big Badja Silver Mine	155965	Ag (Pb,Au
41		166947	Ag,Pb (Cu
42	Big Badja River Alluvial Workings	146950-130941	Au
43	Gladstone Quartzite Quarry	983746	Quartzite
44	Rock Flat Clay Pit	967712	Clay
45	Middle Flat Diatomite Deposit	954918	Diatomite

Geological Boundary - accurate
- approximate
Unconformity (cross sections only)
Fault - accurate
- approximate
- inferred
Lineament
Bedding - inclined (younging upwards)
(younging downwards)
- vertical (younging in direction of dot)
- inclined (younging not known)
- vertical (younging not known)
Bedding trend (cross sections only)
Cleavage (F2 axial plane) - inclined
- vertical
Foliation (F3 axial plane) - inclined
- vertical
Foliation (F4 axial plane) - inclined
- vertical
Axial Plane - F1 - inclined
- vertical
- F2 - inclined
- vertical
- F3 - inclined
- vertical
- F4 - inclined
- vertical
- later folds - inclined
- vertical
Fold plunge - F1
- F2
- F3
- F4
Trace of major anticlinal axial surface
Foliation in igneous rock - inclined
- vertical
Foliation trend (cross sections only)
Fossil locality - position accurate
- position approximate
Mineral deposit
Radiometric age determination locality
- position accurate
- position approximate