



The University of Adelaide  
Department of Geology and Geophysics

INTERPRETATION OF AEROMAGNETIC DATA  
OF THE  
OLARY PROVINCE, SOUTH AUSTRALIA AND THE  
DEVELOPMENT OF INTERPRETATION METHODS

by

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Doctor of Philosophy

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REFERENCE

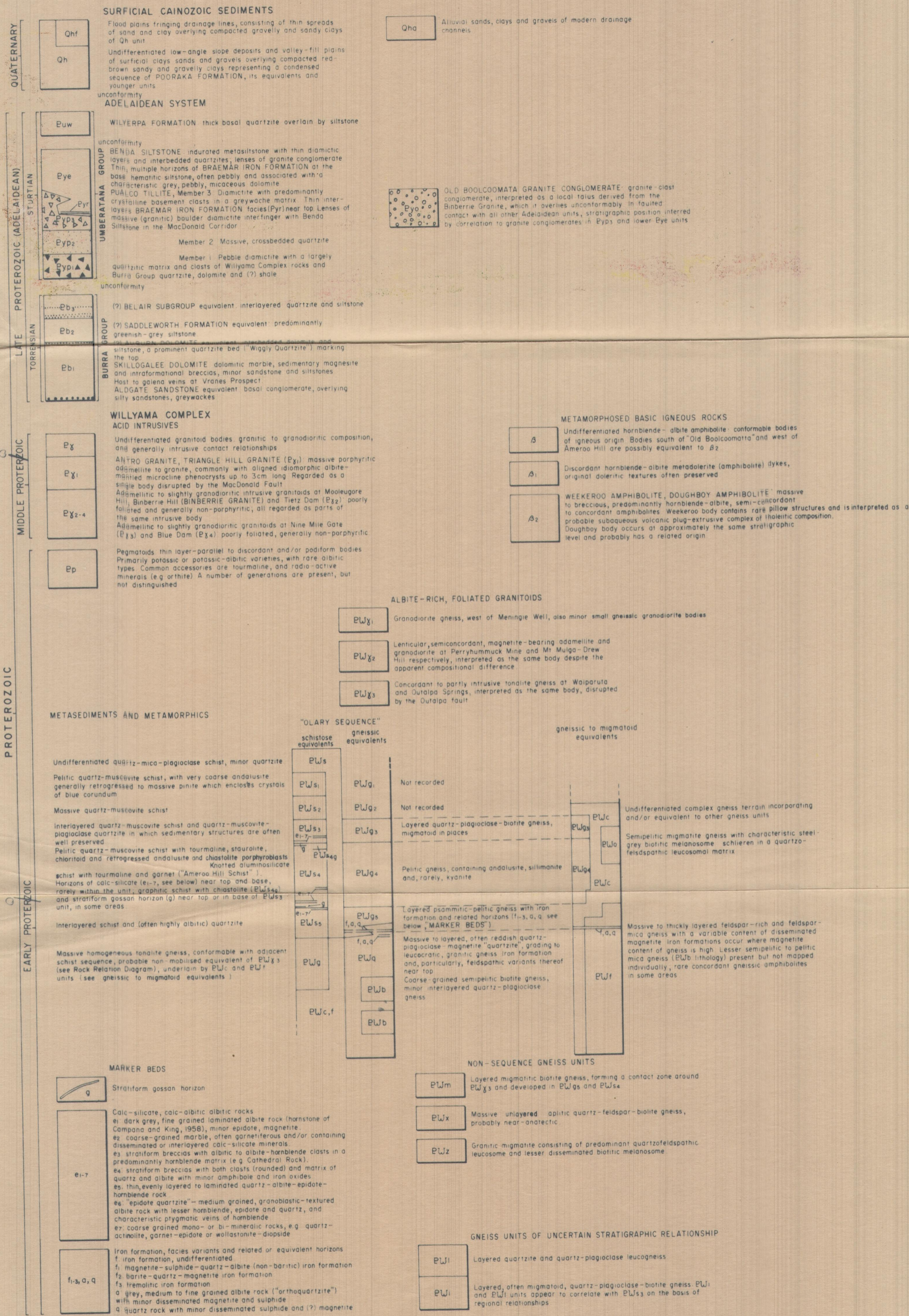


Figure 2.2 The general stratigraphy of the Olary Province (after Forbes and Pitt 1980; Rutland et al., 1981).

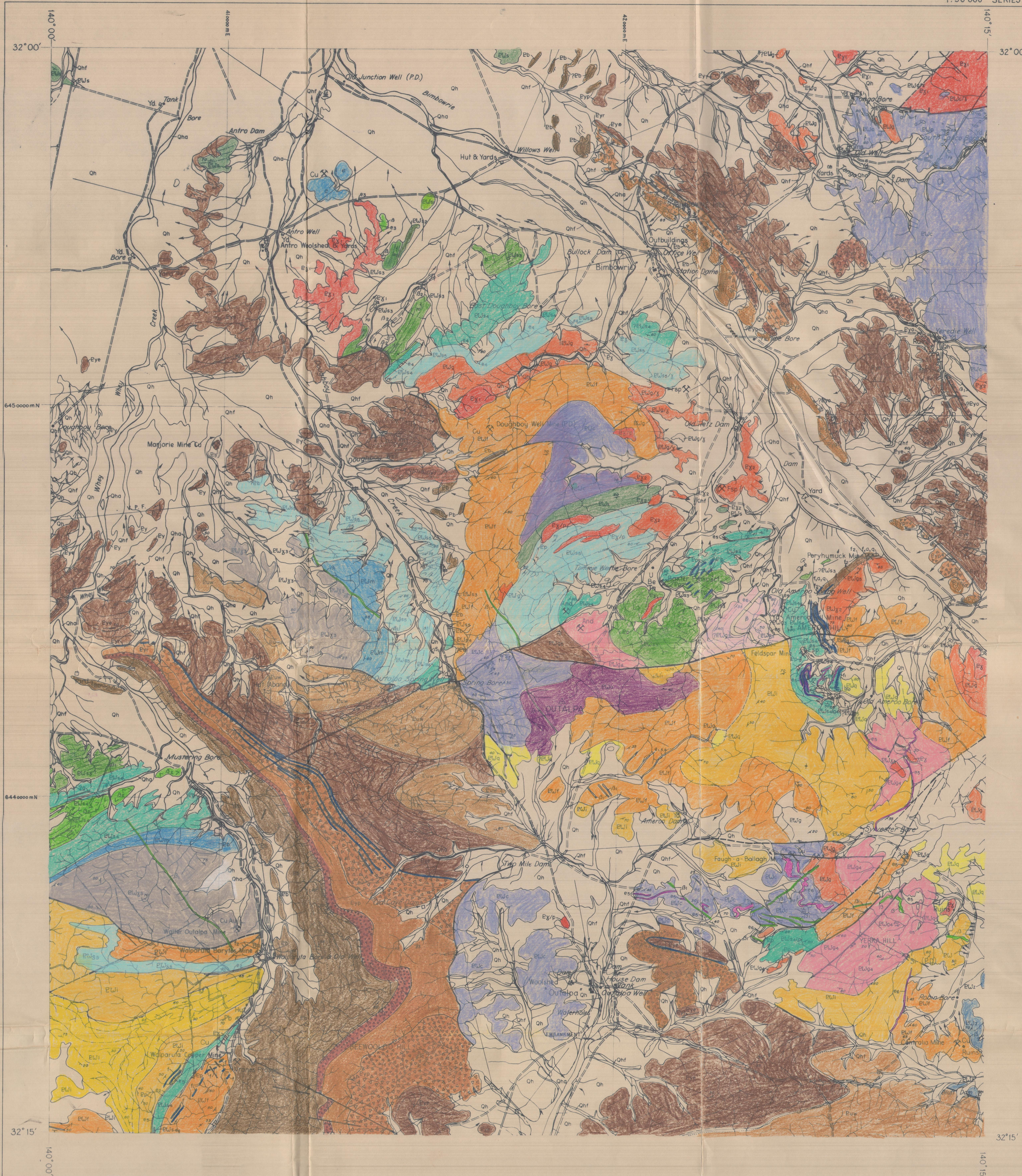
OUTALPA 6933 - IV

FIG 2.3

S.A. DEPT. OF MINES

1:50 000 SERIES

fig 2.2



OUTALPA, BULLOO 1:50000

REFERENCE

**QUATERNARY**

Qhf Flood plains fringing drainage lines, consisting of thin spreads of sand and clay overlying compacted gravelly and sandy clays of Qh unit.

Qh Undifferentiated low-angle slope deposits and valley-fill plains of surficial clays and gravels overlying compacted red-brown sandy and gravelly clays representing a condensed sequence of POORAKA FORMATION, its equivalents and younger units.

Qho Alluvial sands, clays and gravels of modern drainage channels.

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**ADELAIDEAN SYSTEM**

**WILVERIPA FORMATION:** thick basal quartzite overlain by siltstone

**UNBERERINA GROUP**

**BENDI SILTSTONE:** indurated metasilstone with thin diamicitic layers and interbedded quartzites, lenses of granite conglomerate

**PULLCO TILLITE, Member 3:** Diamicite with predominantly crystalline basement clasts in a greywacke matrix. The inter-layers BRAEMAR IRON FORMATION facies (Pyr) near top. Lenses of massive (granitic) boulder diamicite inter-finger with Bendi Siltstone in the MacDonald Corridor.

**Member 2:** Massive, crossbedded quartzite

**Member 1:** Pebble diamicite with a largely quartzitic matrix and clasts of Willyama Complex rocks and Burra Group quartzite, dolomite and (?) shale

**(?) BELAIR SUBGROUP equivalent:** interlayered quartzite and siltstone.

**(?) SADDLEWORTH FORMATION equivalent:** predominantly greenish-grey siltstone

**(?) AUBURN DOLOMITE equivalent:** interbedded dolomite and siltstone, a prominent quartzite bed ("Wiggly Quartzite") marking the top.

**(?) SKILLOGALLEE DOLOMITE:** dolomitic marble, sedimentary magnesite and interformational breccias, minor sandstone and siltstones. Host to galena veins at Vrones Prospect.

**ALDGAITE SANDSTONE equivalent:** basal conglomerate, overlying silty sandstones, greywackes.

**WILLYAMA COMPLEX**

**ACID INTRUSIVES**

**EX** Undifferentiated granitoid bodies, granitic to granodioritic composition, and generally intrusive contact relationships

**EY** ANTRO GRANITE, TRIANGLE HILL GRANITE (EY1) massive porphyritic dolerite to granite, commonly with slight idiomorphic albite-mantled microcline phenocrysts up to 3cm long. Regarded as a single body disrupted by the MacDonald Fault.

**EY2** Admetalic to slightly granodioritic massive granitoids of Moolgaree Hill, Binberrie Hill (BINBERRIE GRANITE) and Tietz Dam (EY2), poorly foliated and generally non-porphyrific, all regarded as parts of the same intrusive body.

**EY3** Admetalic to slightly granodioritic granitoids at Nine Mile Gate (EY3) and Blue Dam (EY4), poorly foliated, generally non-porphyrific.

**EP** Pegmatoids: thin layer-parallel to discordant and/or postiform bodies primarily potassic or potassic-albitic varieties, with rare albitic types. Common accessories are tourmaline, and radio-active minerals (e.g. uranite). A number of generations are present, but not distinguished.

**ALBITE-RICH, FOLIATED GRANITOIDS**

**EUx1** Granodiorite gneiss, west of Meningie Well, also minor small gneissic granodiorite bodies

**EUx2** Lenticular, semi-concordant, magnetite-bearing adamellite and granodiorite at Burra, Buck Mine and Mt Wager-ore Hill respectively, interpreted as the same body despite the apparent compositional difference.

**EUx3** Concordant to partly intrusive tonalite gneiss at Waiparuta and Outalpa Springs, interpreted as the same body, disrupted by the Outalpa fault.

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**PROTEROZOIC**

**METASEDIMENTS AND METAMORPHICS**

Undifferentiated quartz-mica-plagioclase schist, minor quartzite

Pelitic quartz-muscovite schist, with very coarse andolusite generally retrogressed to massive pinitic which encloses crystals of blue corundum

Massive quartz-muscovite schist

Interlayered quartz-muscovite schist and quartz-muscovite-plagioclase quartzite in which sedimentary structures are often well preserved

Pelitic quartz-muscovite schist with tourmaline, stauropine, chloritoid and retrogressed andolusite and clastitic porphyroblasts

Knotted chloritoid schist with tourmaline and garnet ("Ameroo Hill Schist")

Horizons of calc-silicate (see below) near top and base, rarely within the unit, graphic schist with chloritoid (EU34) and stratiform gossan horizon (g) near top or in base of EU33 unit, in some areas.

Interlayered schist and (often highly albitic) quartzite

Massive homogeneous tonalite gneiss, conformable with adjacent schist sequence, probable non-metabased equivalent of EU33 (see Rock Relation Diagram), underlain by EU2 and EU1 units (see gneissic to migmatoid equivalents)

**"OLARY SEQUENCE"**

schistose gneissic equivalents

gneissic to migmatoid equivalents

EU35	EU35	Not recorded
EU34	EU34	Not recorded
EU33	EU33	Layered quartz-plagioclase-biotite gneiss, migmatoid in places
EU32	EU32	Pelitic gneiss, containing andolusite, sillimanite and, rarely, kyanite
EU31	EU31	Layered psammitic-pelitic gneiss with iron formation and related horizons (f, s, a, q; see below "MARKER BEDS")
EU30	EU30	Massive to layered, often reddish quartz-plagioclase-magnetite quartzite, grading to leucocratic, gneissic gneiss, iron formation and, particularly, feldspathic variants thereof near top
EU29	EU29	Coarse-grained semipelite biotite gneiss, minor interlayered quartz-plagioclase gneiss
EU28	EU28	Massive to thickly layered feldspar-rich and feldspar-mica gneiss with a variable content of disseminated magnetite iron formations occur where magnetite content of gneiss is high. Lesser semipelite to pelitic mica gneiss (EU28 lithology) present but not mapped individually, rare concordant gneissic amphibolites in some areas

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**MARKER BEDS**

g Stratiform gossan horizon

eu-7 Calc-silicate, calc-albitic albitic rocks

eu-8 eu-9 eu-10 eu-11 eu-12 eu-13 eu-14 eu-15 eu-16 eu-17 eu-18 eu-19 eu-20 eu-21 eu-22 eu-23 eu-24 eu-25 eu-26 eu-27 eu-28 eu-29 eu-30 eu-31 eu-32 eu-33 eu-34 eu-35

eu-1 eu-2 eu-3 eu-4 eu-5 eu-6 eu-7 eu-8 eu-9 eu-10 eu-11 eu-12 eu-13 eu-14 eu-15 eu-16 eu-17 eu-18 eu-19 eu-20 eu-21 eu-22 eu-23 eu-24 eu-25 eu-26 eu-27 eu-28 eu-29 eu-30 eu-31 eu-32 eu-33 eu-34 eu-35

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**NON-SEQUENCE GNEISS UNITS**

EU1m Layered migmatitic biotite gneiss, forming a contact zone around EU33 and EU34

EU1x Mostly layered quartz-plagioclase-biotite gneiss, probably near-orthostatic

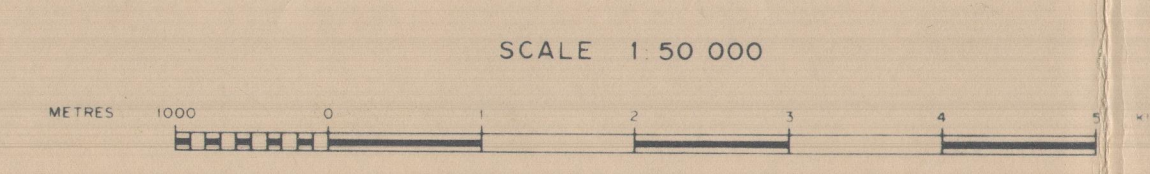
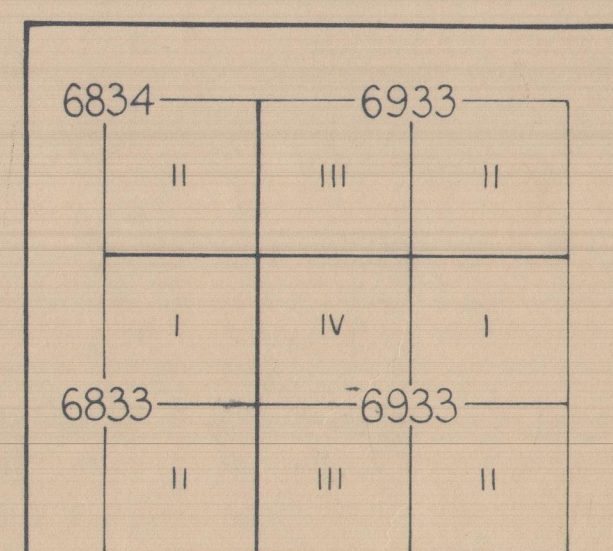
EU1z Granitic migmatite consisting of predominant quartzofeldspathic leucosome and lesser disseminated biotitic melanosome

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**GNEISS UNITS OF UNCERTAIN STRATIGRAPHIC RELATIONSHIP**

EU1j Layered quartzite and quartz-plagioclase leucogneiss

EU1k Layered, often migmatoid, quartz-plagioclase-biotite gneiss (EU1) and EU1k units appear to correlate with EU33 on the basis of regional relationships



DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

OUTALPA 6933-IV PRELIMINARY GEOLOGY

COMPILED GMP DRAWN P.J.W. DATE 10.5.80 CHECKED DATE 10.5.80 SCALE 1:50 000 PLAN NUMBER 81-345

90-293

# BULLOO 6933-1

SA DEPT OF MINES

1:50000 SERIES



- HEAD STATION, OUTSTATION, HUT
- RAILWAY AND SIDING
- HIGHWAY AND NATIONAL ROUTE NUMBER
- SECONDARY ROAD
- TRACK
- FENCE
- VERMIN PROOF FENCE
- BRIDGE
- LANDING GROUND
- YARD
- MINE OR MINERAL PROSPECT
- QUARRY
- MOUNTAIN OR HILL
- EMBANKMENT
- BORE, WELL, TANK
- SPRING
- WATERHOLE
- DAM
- EFFLUENTIAL STREAM
- OUTWASH OR FLOOD PLAIN
- CLAYPAN
- SWAMP
- DRAIN

\* - centre of modelled anomaly.

SCALE 1:50 000

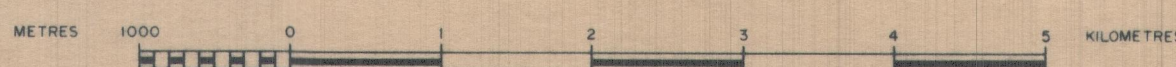
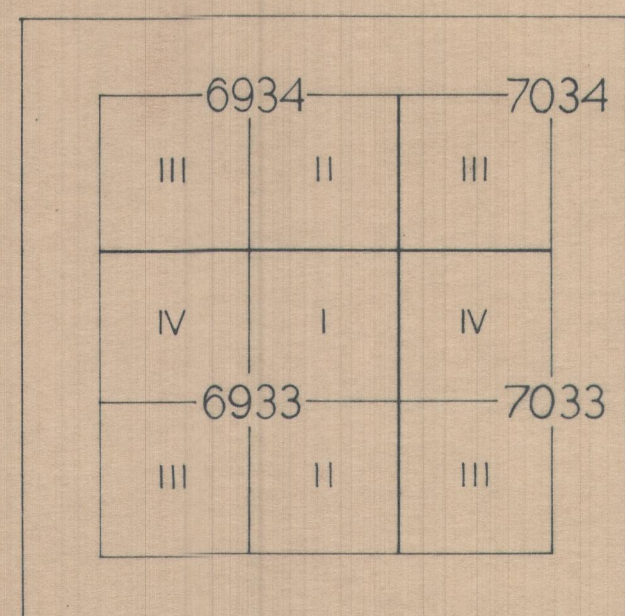


FIG. 4.1b HOLOGEOLOGICAL MAP SUPERIMPOSED ON THE GEOLOGY MAP OF THE OLARY PROVINCE



04PH  
634  
c2



# OUTALPA 6933 - IV

S.A. DEPT. OF MINES

1:50 000 SERIES



\* - centre of modelled anomaly

SCALE 1:50 000

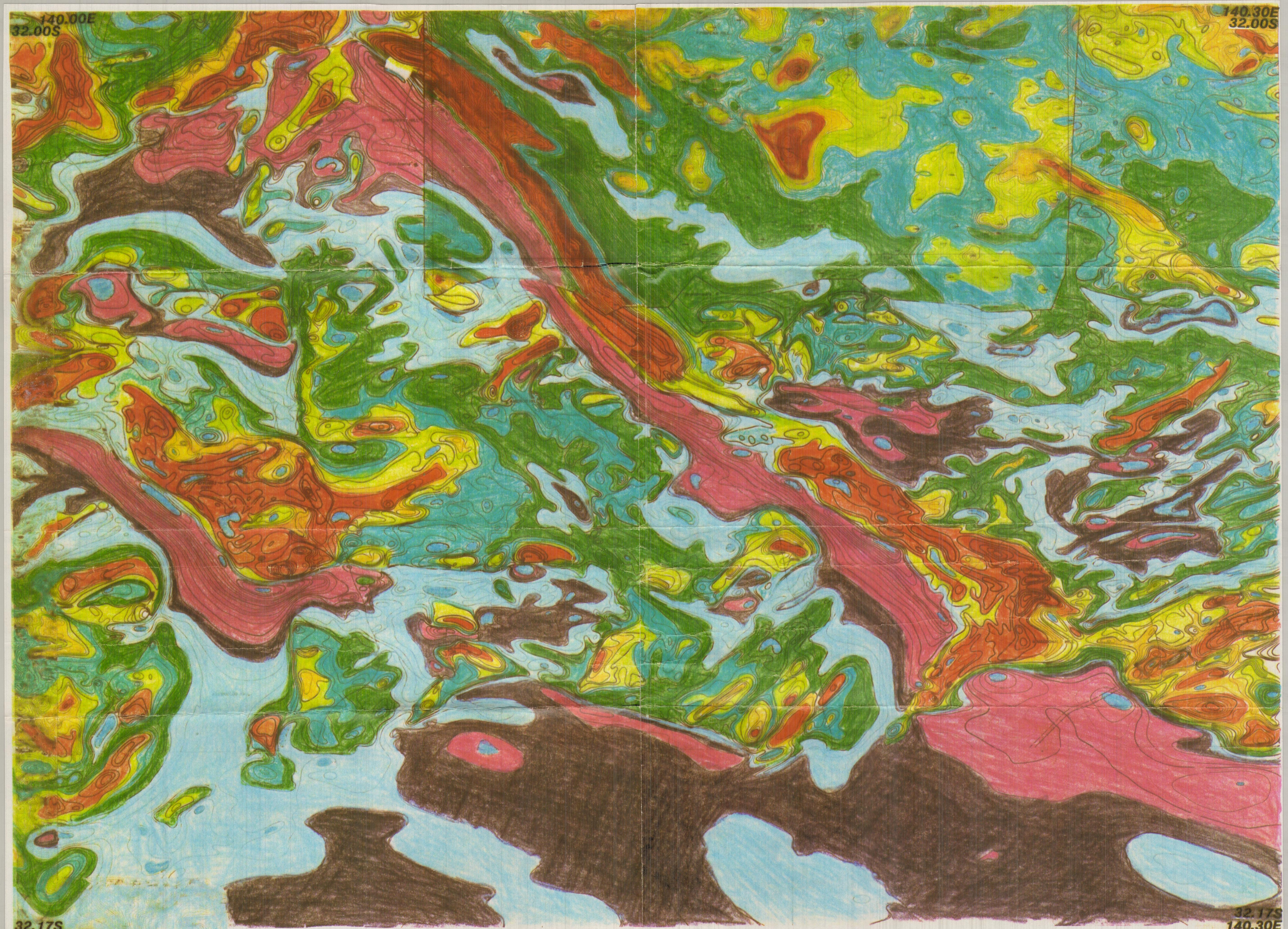
METRES 1000 0 1 2 3 4 5 KILOMETRES

FIG. 4.1b HOLOGEOLOGICAL MAP SUPERIMPOSED ON THE GEOLOGY MAP OF THE OLARY PROVINCE

6834	6933
II	III
I	I
6833	6933
II	III

09PH  
U34  
c-2





140.00E  
32.00S

140.30E  
32.00S

32.17S  
140.00E

32.17S  
140.30E

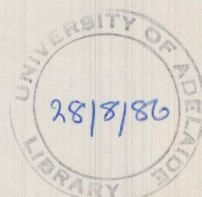
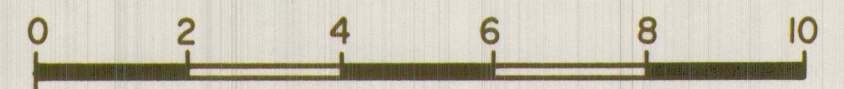
ESSO AUSTRALIA LTD  
(Survey D)

South Australia  
Dept. of Mines  
(Survey E)

> 59000	[Red]	> 700
58800 - 59000	[Orange-Red]	500-700
58600 - 58800	[Orange]	300-500
58400 - 58600	[Yellow-Orange]	100-300
58200 - 58400	[Yellow]	-100-100
58000 - 58200	[Light Green]	-300-100
57800 - 58000	[Green]	-500-300
57600 - 57800	[Light Blue]	-700-500
57400 - 57600	[Dark Blue]	-900-700
< 57400	[Purple]	< -900

OLARY PROVINCE  
Total Magnetic Intensity

SCALE: Km



09PH/034/c.2





Figure 4.2 The aeromagnetic map of the Olary Province

09PH  
U34  
c 2

