DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
REGIONAL GEOLOGY DIVISION

# GEOLOGY OF THE MOUNT WOODS INLIER

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Rept.Bk.No. 77/134
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D.M. No. 422/62

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CONTENTS PAGE

## FIGURES

# ENCLOSURES

DEPARTMENT OF MINES
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# GEOLOGY OF THE MOUNT WOODS INLIER

## ABSTRACT

The Mount Woods Inlier is a partly fault-bounded Precambrian inlier on the northeastern margin of the Gawler Craton. It coincides with a conspicuous belt of high Bouguer gravity and aeromagnetic intensity anomalies which reflect an Archaean to Early Proterozoic fold belt.

Six major rock units have been recognized which have been grouped into the Mount Woods Metamorphics, Engenina Adamellite and Balta Granite Suite. The Mount Woods Metamorphics is a metasedimentary sequence which has been subdivided into 1. metaconglomerate 2. leucocratic gneisses 3. porphyroblastic garnet gneisses and 4. banded iron formations and cordierite rich granofels and gneisses. The metasediments have been intruded by the Engenina Adamellite (1641 ± 38 Ma) and the Balta Granite Suite (1450 - 1550 Ma).

Deformational history is poorly known. A foliation parallel to layering is the dominant structural fabric of the Mount Woods Metamorphics and a weak to strong foliation has developed in the Engenina Adamellite. A northeasterly trending lineation is common within the metasediments.

Banded iron formation and iron-rich metasediments are primarily responsible for the high Bouguer gravity and aeromagnetic anomalies and are likely the cause of similar, linear anomalies of the Coober Pedy Ridge. By contrast the area of low Bouguer gravity and aeromagnetic intensity on eastern TALLARINGA and bordering COOBER PEDY occur where lower density and less magnetic leucocratic acid gneisses outcrop.

## INTRODUCTION

The Mount Woods Inlier is located on western BILLAKALINA and lies in a high Bouguer gravity - aeromagnetic anomalous belt that extends westerly on to COOBER PEDY (Fig. 1). The Mount Woods Inlier represents the only Precambrian outcrop within this belt. The inlier consists of nearly 70 separate outcrops emergent through Cretaceous and Quaternary sediments over an area of 800 $km^2$ (Encl. 1).

Access to the Mount Woods region (which is within the Woomera Prohibited Area and is 170 km southeast of Coober Pedy) is obtained from a track off the Coober Pedy-William Creek road.

The highest point within the study area is Mount Woods (170 metres). Climate of the area is typical of Central Australia with low annual rainfall (150 mm) and high evaporation rates (3250 mm). Engenina and Baltabaltana Creeks are wide drainage channels which after heavy rains flow northerly into Lake Cadibarrawirracanna.

A total of six days was spent in the field briefly investigating most of the outcrops. Photo locations and data were plotted on enlarged (1:40 000) black and white aerial photographs (Balta survey 573 and Engenina survey 592). Specimens were collected for petrology, chemical analysis, geochronology, specific gravity and magnetic susceptibility determinations.

Geochemical analyses of surface rocks represent the most comprehensive study yet undertaken, while magnetic susceptibility specific gravity and geochronological age determinations are the first ever obtained for this area. All pre-existing data (geological and geophysical) are reassessed in this report.

## PREVIOUS INVESTIGATIONS

The first of the few geologists to visit the Mount Woods area was Lockhart Jack who reported in 1931: "Mount Woods ..... consists of siliceous feldspathised schists, and quartz is very scarce ..... nothing of promise is to be seen on it". Whitten

## AEROMAGNETIC INTENSITY and BOUGUER GRAVITY CONTOURS
Northern Gawler Craton

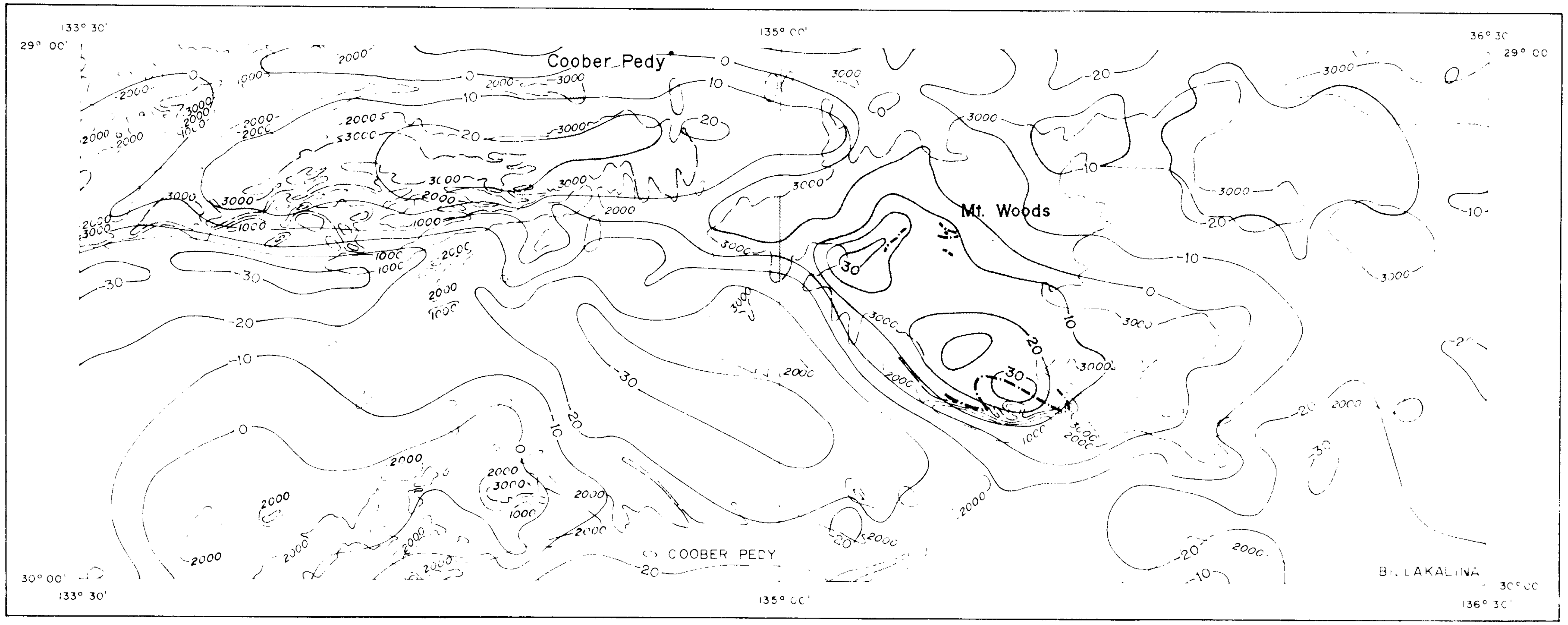


Fig. 1a.

### REFERENCE

Bouguer Gravity contours, 10 m gall interval

Aeromagnetic high intensity linear anomalies (Delhi Australia Petroleum Ltd)

Aeromagnetic intensity, 1000 gamma interval

Aeromagnetic intensity greater than 3000 gamma

Aeromagnetic surveys:

| | Line Spacing (Km) | Station Spacing (Km) | Elevation (m) | Flown by | For | On |
|---|---|---|---|---|---|---|
| 1 | 1.6 N S | ~0.6 | 152 A G L | B M R | S A D M | 1958 |
| 2 | 8 E W | ~8 | 456 BAR | AEROSERV | DELHI | 1961/62 |
| 3 | 3.2 E W | ~0.6 | 152 A G L | B M R | S A D M | 1966 |

Location of aeromagnetic surveys

1. 2. 3.

COOBER PEDY BILLAKALINA

## REGIONAL SETTING
Northern Gawler Craton

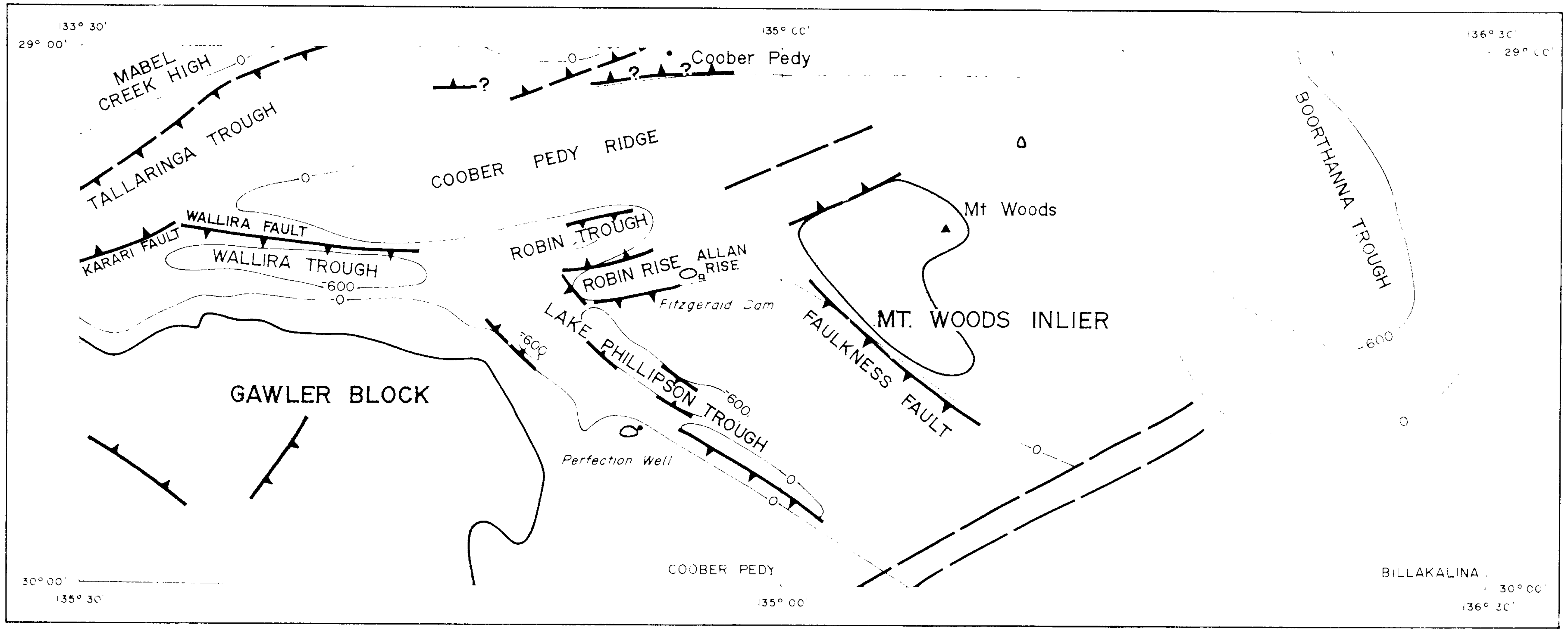


Fig. 1b.

SCALE 1:1 000 000

KILOMETRES 20 10 0 20 40 60 80 100 KILOMETRES

Basement outcrop

Depth to basement (metres) Datum: mean sea level

Faults — interpreted

— observed

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(1965) found and investigated two aeromagnetic anomalies for possible banded iron formations. His report includes a local geological sketch plan (1:12 000) for the region immediately surrounding Mt. Woods.

In the mid-1960's, Delhi Australia Petroleum Ltd. and Santos Ltd. jointly investigated the region in search of banded iron formations (Terry, 1962; Brown and Geyer, 1964; Fitzpatrick, 1965; Ayers, 1965; Hallof and Bell, 1966). Geological and geophysical investigations including gravity, ground magnetics, low level aeromagnetics and induced polarisation surveys were conducted in two areas:

1. Over outcropping Precambrian basement near the Mount Woods trig;
2. Over a regional high Bouguer gravity-aeromagnetic anomaly at White Hill where there is no outcrop. Seven diamond drill-holes were drilled at White Hill. The deepest hole penetrated 66.32 metres of basement diorites and banded iron formation (Mount Woods No. 1). Mount Woods No. 4 penetrated only 0.76 metres of basement gabbro.

In 1972, Asarco (Aust.) Pty. Ltd. as part of a state-wide programme of analysing drill core samples, analysed the seven drill cores from White Hill (Warne, 1972). The analytical data which are tabulated in Enclosure 2 reveal no significant mineralization. Petrological descriptions for both surface and drill hole samples are summarized in Enclosure 3 and their locations are plotted in Enclosure 4.

## REGIONAL GEOLOGY

The Mount Woods Inlier is located on the northeastern margin of the Gawler Craton (Fig. 1). The Precambrian crystalline basement has not been previously subdivided (Forbes, 1961), although the rocks have been interpreted as equivalent to the Hutchison Group of the Cleve Metamorphics due to the presence of banded iron formations (Thomson, 1975).

The present mapping programme has established that metamorphic rocks comprising the inlier are of ?Archaean age and include banded iron formations, garnetiferous and leucocratic gneisses and cordierite-almandine-sillimanite granofels. The stratigraphic relationships of the units are not known. Metamorphism reached granulite facies grade. Diagnostic mineral associations are co-existing potash feldspar-sillimanite-cordierite, cordierite-almandine, while primary muscovite is absent.

The metamorphics are intruded by the Engenina Adamellite which has been radiometrically dated at 1641 $\pm$ 38 Ma (Webb, 1977). The adamellite is generally only weakly foliated; however, large tabular to ovoid feldspar phenocrysts define a preferred orientation.

A later suite of Carpentarian intrusives (Balta Granite Suite) consists of non foliated and often porphyritic granites and adamellites with rare granodiorites and gabbros. Six samples have been radiometrically dated at approximately 1450-1550 Ma (Webb, 1977).

Sedimentation in the Lake Phillipson and Boorthana Troughs occurred throughout most of the Palaeozoic.

Sedimentary types include carbonates of the Devonian Cootanoorina Formation and diamictites, conglomerates and pebbly sandstones of the early Permian Boorthanna Formation. The Boorthanna Formation is unconformably overlain by marine shales of the Permian Stuart Range Formation which is in turn conformably overlain by coals, carbonaceous shales and siltstones, sandstones, siltstones and shale interbeds of the Permian Mount Toondina Formation (Townsend, 1976).

During the Jurassic to Cretaceous periods deposition of the Algebuckina Sandstone, Cadna-owie Formation and Bulldog Shale resulted in a blanket sediment cover over the Palaeozoic troughs and crystalline basement. The basal Algebuckina Sandstone was deposited on a stable, senile land surface under low-gradient fluviatile conditions while Cadna-owie Formation sediments were deposited in a shallow water, marginal marine environment (Wopfner et. al., 1970).

Holocene sediments comprising sand dunes, gibber plains and flood plain alluvial silts and clays form a veneer over older formations. White-grey quartzitic boulders (with clay galls) and red porphyritic rhyolite pebbles (from the Cadna-owie Formation) are the dominant clasts on the gibber plains.

## STRATIGRAPHY AND PETROLOGY

Before the current mapping programme banded iron formation and gneiss were known to outcrop at Mount Woods (Whitten, 1965) and banded iron formation gabbro, hornfels and granitic veins were recorded in the drill holes (Ayers, 1965). Nothing was known of the remainder of the inlier.

### MOUNT WOODS METAMORPHICS

Present mapping indicates that outcropping metasediments in the Mount Woods Inlier (here collectively defined as the Mount Woods Metamorphics) can be subdivided into four categories (Encl. 1).

1. Unnamed metamorphics ($pEm_1$). This unit consists of a wide variety of rock types including quartz-feldspathic-cordierite-sillimanite-garnet-biotite gneiss and granofels, quartz-feldspar-biotite schist, banded iron formation and magnetite-rich schist and gneiss.
2. Metaconglomerate ($pEm_2$). A metaconglomerate overlies the cordierite-rich metamorphics and has a quartz-sillimanite-rich matrix. Clasts range in size from 1

cm up to 10 cm, and their composition is dominantly white quartz and pale grey fine quartzites. Heavy mineral banding is conspicuous in some beds.

3. Leucocratic, pink-pale brown quartz-feldspar gneisses ($pEm_3$). These gneisses are characterised by elongated quartz and feldspar aggregates and scattered large feldspar porphyroblasts.
4. Porphyroblastic quartz-feldspar-garnet gneisses ($pEm_4$). Gneisses of this unit are characterised by conspicuous large white lenticular feldspar aggregates, grey quartz stringers and large pink-red garnet crystals.

The thin conglomerate unit overlies cordierite rich metamorphics but the stratigraphic relationship of both of these units with the quartz-feldspar gneisses and garnetiferous gneisses is not known due to the lack of continuity of outcrop. Similarly the relationship between the quartz-feldspar gneisses and porphyroblastic garnetiferous gneisses is not known.

Two granitic bodies intrude the metamorphic rocks. The Engenina Adamellite is biotite-rich, weakly foliated and strongly porphyritic. The later Balta Granite Suite is relatively biotite poor, non-foliated and only weakly porphyritic.

(a) Unnamed metamorphics $pEm_1$

The unit unnamed metamorphics incorporates a wide variety of rock types including:

1. quartz-feldspar-cordierite-sillimanite-garnet granofels and gneiss;
2. magnetite-rich metasediment;
3. quartz-feldspar-biotite schist and gneiss;
4. quartzite;
5. banded iron formation.

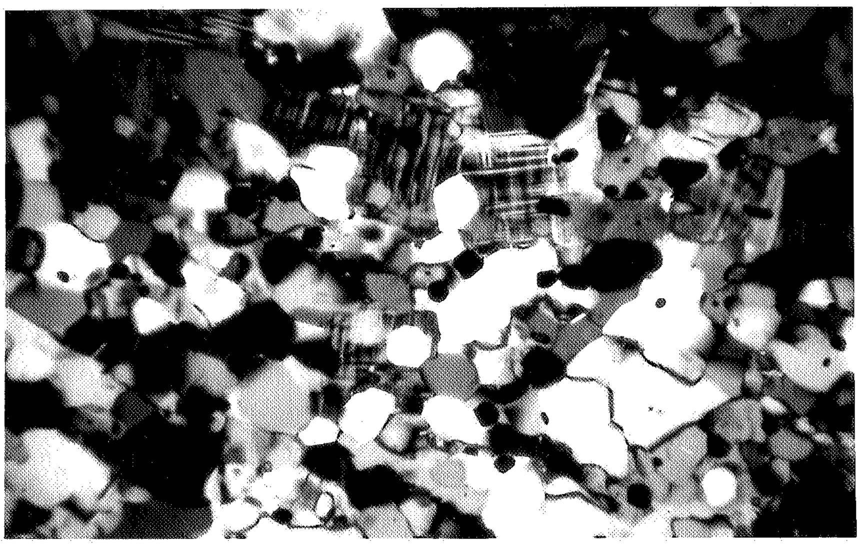
The unit is found over much of the inlier and includes the banded iron formations and metasediments observed at Mount Woods by Whitten (1965). The banded iron formations and metasediments intersected in the drill holes at White Hill have been tentatively incorporated within this unit.

The fine-grained granofels have a distinctive appearance and mineralogy. When evident on weathered surfaces, layering is defined by slight colour variations and is straight and parallel. On fresh surfaces, the rocks are dark pinkish-grey and resemble fine grained quartzites.

Mineralogically, they consist dominantly of microline-quartz-cordierite-plagioclase-sillimanite and garnet. Quartz, feldspar and cordierite often form a granoblastic mosaic with a common grain size of 0.2 - 0.4 mm (Fig. 2). Potash feldspar is dominantly grid-iron twinned microcline, while subordinate plagioclase feldspar is commonly untwinned. Quartz, microcline and plagioclase crystals often exhibit a very cracked appearance.

Cordierite has undergone varying degrees of alteration to very fine grained yellow phyllosilicates. Some cordierite crystals have been completely altered while others show only inicipient replacement along grain margins and fractures. Very rarely, cordierite-spinel pairs occur where porphyroblastic cordierite crystals totally enclose xenoblastic green spinel (Fig. 3). Cordierite can comprise up to 20% of the rock.

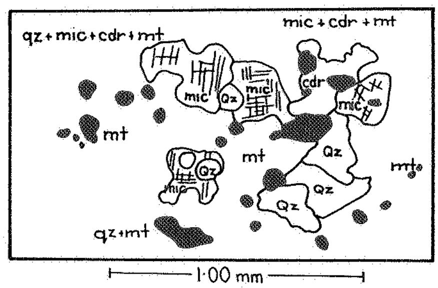
Garnet is disseminated through the rock as xenoblastic crystals up to 1.5 mm in size and poikiloblastically contain rounded quartz grains, biotite flakes and sillimanite fibres. Sillimanite predominantly occurs as fibrous aggregates of acicular needles 0.2 - 0.4 mm in length (Fig. 4). Magnetite forms small crystals 0.05 to 0.1 mm across and is scattered uniformly throughout the rock (Fig. 2).

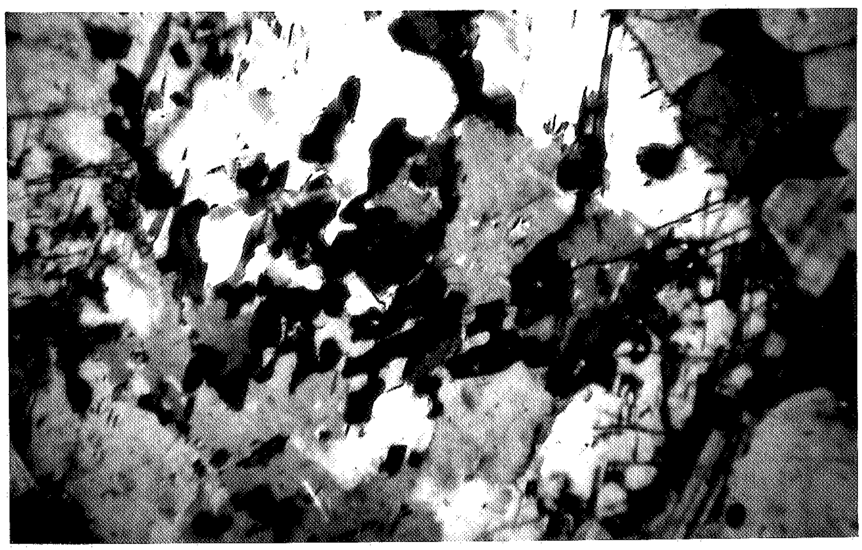


# FIG.2

Equigranular mosaic of quartz microcline - cordierite - magnetite ; P 313/62

PHOTO NO. 28982



# FIG. 3

Cordierite - spinel assemblage; C16771

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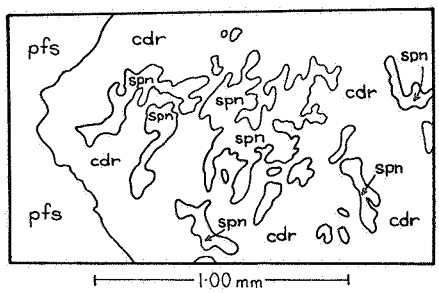
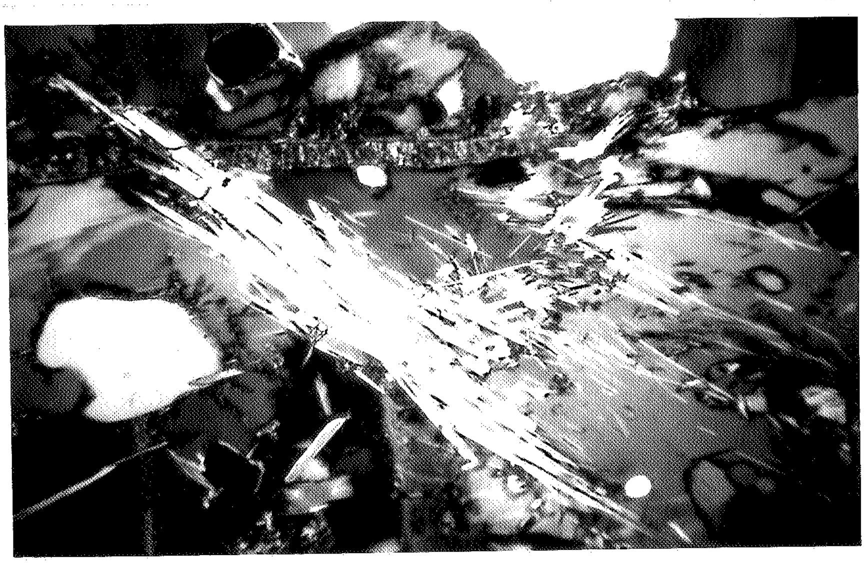
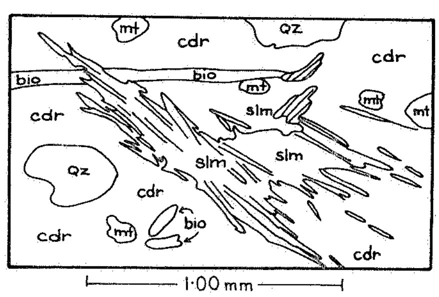


# FIG. 4

Acicular sillimanite fibres and cordierite; P 309/62

PHOTO NO. 28984



Similar pinkish-grey poorly layered to massive quartz-plagioclase-microcline-cordierite-garnet-biotite gneiss have been recorded at Mt. Christie on western TARCOOLA where they have recently been dated as Archaean or Late Proterozoic (Daly et. al., 1977).

Gneisses are more variable in both appearance and mineralogy than the granofels. They are commonly well layered and foliated with grey quartz-feldspar-biotite and dark greyish-black biotite rich zones and lenticular aggregates and layers of pink feldspar. Pink feldspar veins and layers were found microscopically to contain dominantly coarse-grained microcline with minor quartz and subordinate iron oxides (Whitehead, 1977).

Biotite-rich zones have a concentration of biotite, sillimanite, garnet and skeletal opaque grains. Biotite flakes often define a foliation and, if in association with garnet, exhibit strong pleochroism in shades of reddish-brown. Sillimanite occurs as both acicular fibrous aggregates and large prismatic crystals. Large porphyroblastic garnet crystals (up to 1.5 mm) poikiloblastically enclose quartz, biotite and sillimanite. Opaque grains are also concentrated in the biotite-rich layers and skeletal opaque crystals may be graphite.

Banded iron formations and magnetite-rich gneisses occur notably at Mount Woods and in the sub-surface at White Hill. The iron formations observed in outcrop are lenticular and well banded and consist of dominantly medium-grained hematite-magnetite-quartz and potash feldspar with minor actinolite and clinopyroxene.

At White Hill, banded iron formations (formerly described as banded hornfels) were intersected in drill holes 1, 3 and 7. The core from these holes has been relogged and the revised lithological logs are presented in Fig. 5. The iron formations are

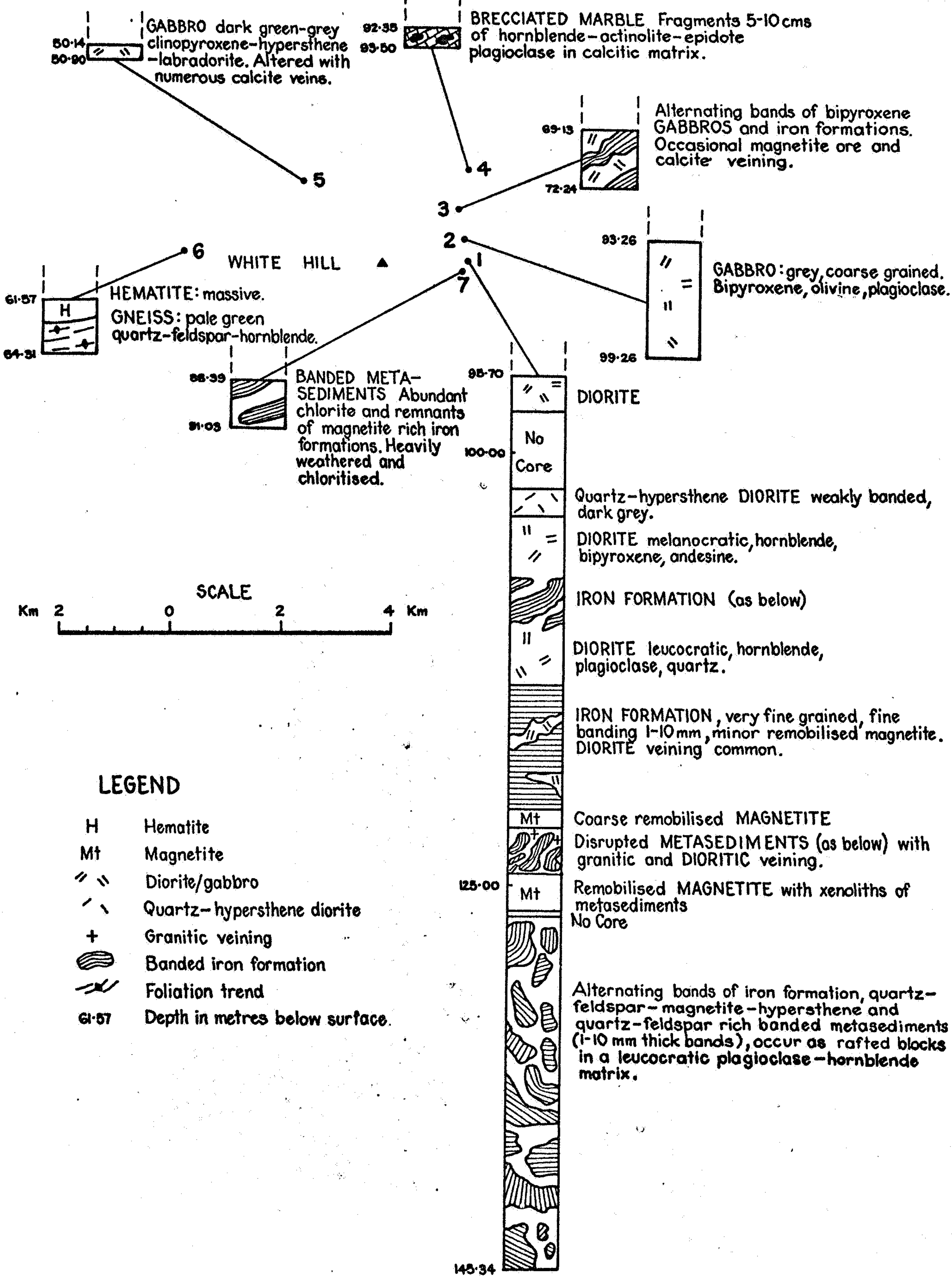



FIG. 5

| | | |
|---|---|---|
| | DEPARTMENT OF MINES—SOUTH AUSTRALIA | Scale: 1:300 approx. vertical 1:100000 horizontal |
| Compiled: R.B.F. | MOUNT WOODS INLIER | Date: 17-10-77 |
| Drn. I.M. Ckd. | PRECAMBRIAN LITHOLOGICAL LOGS | Drg. No. |
| | MOUNT WOODS Nos 1–7 | S 13072 |

500—9.75 F9882 O

finely laminated with alternating bands 1-10 mm thick. Composition of the bands varies from quartz-feldspar to quartz-feldspar-magnetite-hypersthene with numerous layers composed almost entirely of magnetite. Magnetite (with minor pyrite, chalcopyrite and trace pyrrhotite) also occurs as massive aggregates in veins incorporating xenoliths of iron formation. The brecciated marble intersected in Mount Woods No. 4 consists of greyish-green fragments (5-10 cm) of hornblende-actinolite-epidote-plagioclase and more rarely magnetite in a white calcitic matrix.

The mineralogy within the metamorphics, notably cordierite and sillimanite, indicates former pelitic sediments for many units of the unnamed metamorphics. Former calcareous sediments are indicated by rare clinopyroxene-plagioclase-hornblende metasediments and the brecciated limestone (Mount Woods No. 4). No sedimentary structures were observed.

(b) Metaconglomerate $p\mathrm{E}m_2$

A metamorphosed conglomerate outcrops at only one locality. Basal conglomeratic units intertongue with granofelses and gneisses of the unnamed metamorphics. The conglomerate has a very fine-grained reddish-grey quartzitic matrix, enclosing clasts of dominantly white quartz and pale grey fine quartzites. The clasts range up to 10 cm. On freshly fractured surfaces the boundary between clasts and matrix is not easily distinguishable.

Bedding is readily apparent on weathered surfaces due to enhancement of variations in matrix composition. Parallel banding and rare cross-beds are defined by heavy mineral-rich laminae.

The matrix of the conglomerate consists of greater than 70% quartz grains commonly 0.4 to 0.8 mm in size. Aggregates of fine-grained prismatic sillimanite (av. 0.3 mm) and opaque minerals occur in the interstices and along many grain margins.

Sillimanite is also common in the clasts (Whitehead, 1977).

(c) Pink-pale brown feldspar-quartz gneiss $pEm_3$

Leucocratic gneisses outcropping on the northern margin of the inlier form a distinctive rock group in both mineralogy and geophysical characteristics. The fine to medium-grained gneisses are pale pink to pinkish-brown and have a distinctive appearance due to the definition of foliation and ribbon-like banding by elongated quartz and feldspar aggregates which often wrap around scattered pink feldspar porphyroblasts (3.0 - 5.0 mm across).

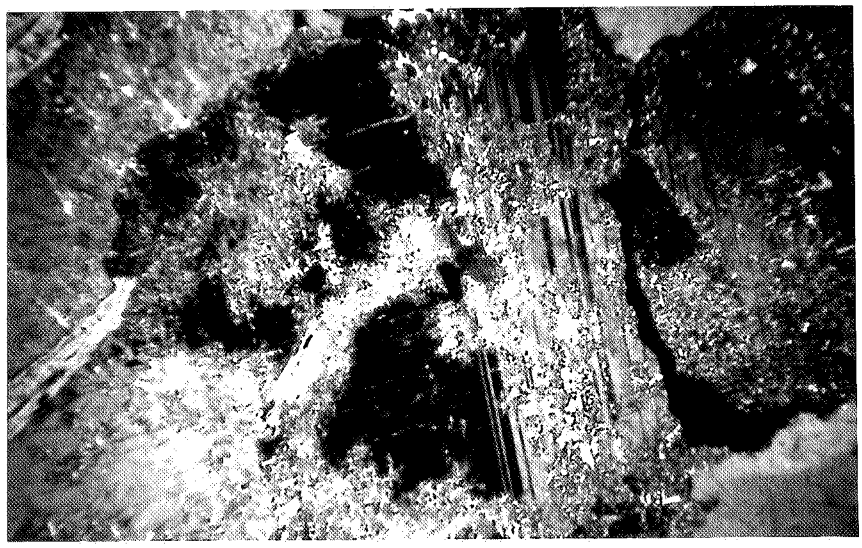
Similar rocks occur in other basement areas of the northern Gawler Block, notably on southern COOBER PEDY (Barnes & Benbow, 1977) and near Kenella Rock Hole on TARCOOLA (Daly et. al., 1977).

The composition of the gneiss ranges from granitic to granodioritic with quartz and feldspar comprising greater than 98% of the rock.

Quartz and feldspar are intergrown forming a mosaic of grains with an average grain size of 0.5 - 2.0 mm. Quartz also occurs as elongate crystals and aggregates (approx. 5.0 mm long) which show extensive undulose extinction (Whitehead, 1977).

Potash feldspar also forms elongate aggregates showing evidence of considerable strain. Microcline is only slightly turbid and less altered than plagioclase. Plagioclase is very turbid and heavily altered to sericite. The high degree of alteration has often obscured the polysynthetic twinning (Fig. 6) or conversely enhanced zonation of plagioclase crystals (Fig. 7). Occasional feldspar porphyroblasts consist of both plagioclase and microcline.

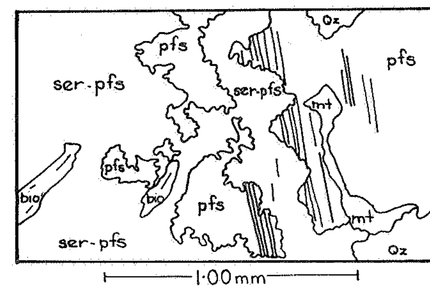
Biotite is only a minor constituent (less than 2%) and hence the foliation observed is defined mainly by parallel elongate aggregates of quartz and to a lesser extent feldspar.

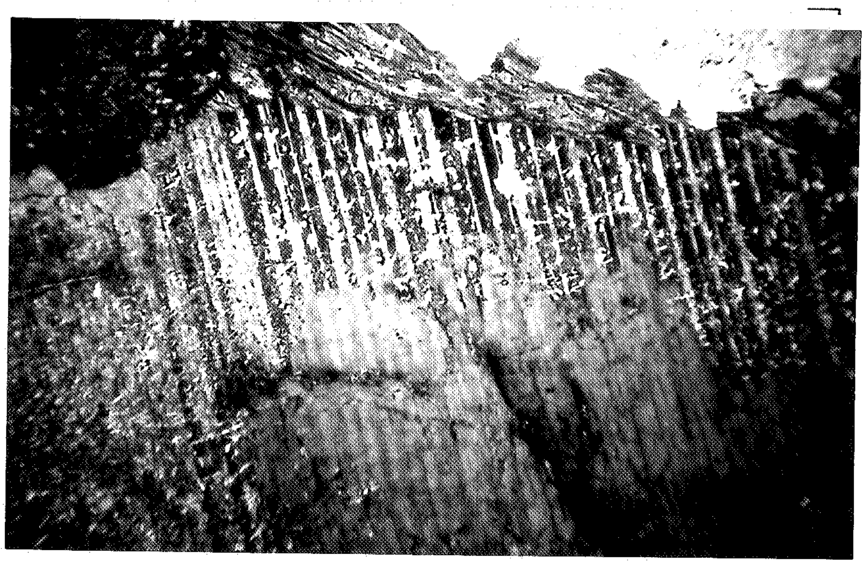


## FIG. 6

Sericitic plagioclase ; quartz-feldspar gneisses.
P1375/76

PHOTO NO. 28985

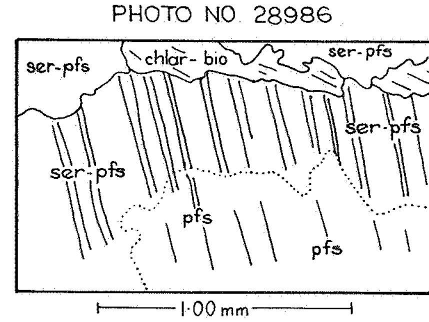


## FIG. 7

Sericitic plagioclase rim; quartz-feldspar gneisses
P1376/76

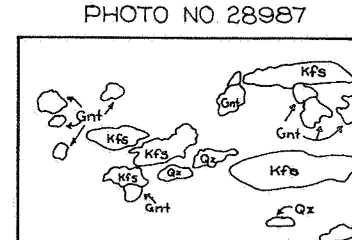
PHOTO NO. 28986




## FIG. 8

Garnet porphyroblasts and white lenticular potash feldspar aggregates.

PHOTO NO. 28987



(d) Porphyroblastic quartz-feldspar-garnet gneiss $pEm_4$

Outcropping in the northeastern map area are several exposures of medium to coarse-grained white to greyish white gneisses, characterized by large white lenticular feldspar aggregates, grey quartz stringers, black biotite and large pinkish-red garnet crystals (Fig. 8). The gneissosity is due to parallel elongation of quartz and feldspar aggregates and alignment of biotite flakes.

Composition of the gneiss varies from adamellitic to granodioritic. Quartz and feldspar have a common grain size averaging 1.0 mm. However there are larger patches of optically continuous quartz and granulated quartz aggregates (up to 5.0 mm), drawn out parallel to the foliation (Whitehead, 1977).

The potash feldspars orthoclase and microcline often show evidence of strong fracturing and subsequent recrystallization, and now form lenticular aggregates of granulated, recrystallized feldspar (Whitehead, 1977). Abundant myrmekitic intergrowths indicate replacement of potash feldspar by worm-like quartz and plagioclase (Fig. 9), which results in a change to granodioritic compositions.

Biotite occurs as both individual flakes and elongate aggregates which are oriented parallel to the layering. Large garnet crystals (up to 10 mm across) poikiloblastically enclose biotite, quartz, apatite and zircon.

## ENGENINA ADAMELLITE

Outcropping centrally in the inlier is a foliated, porphyritic grey adamellite here named the Engenina Adamellite which is characterised by abundant, very large, simply twinned, tabular to ovoid feldspar phenocrysts (up to 20 mm long), generally aligned subparallel to the foliation. The high biotite content of 10-15% clearly defines a vertical foliation which strikes northeasterly to easterly (Encl. 1). Xenoliths are very common and consist of blocks up to 1 m across of dark grey gneisses and granofels similar to nearby outcropping metasediments.

The phenocrysts consist of orthoclase, microcline and plagioclase. Carlsbad, grid-iron and polysynthetic twinning are all common (Whitehead, 1977). Small patches of fine myrmekite often extend into larger microcline phenocrysts (Fig. 10). Former feldspar phenocrysts are indicated by aggregates (2.0 - 4.0 mm) of small feldspar grains. The groundmass shows extensive granulation and recrystallization. Quartz shows extreme undulose extinction and quartz aggregates are often aligned parallel to the foliation.

Biotite content is high, 10-15%, and common accessory minerals are hornblende, sphene, epidote, zircon and opaques (Whitehead, 1977).

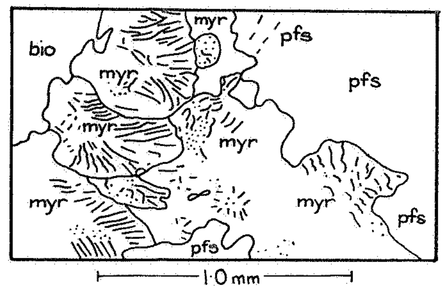
Six adamellite samples were radiometrically dated and yielded a Model 1 isochron of 1641 ± 38 Ma and an initial $Sr^{87}/Sr^{86}$ ratio of 0.7081 ± 0.0014 (Webb, 1977). Decay constants used were $Rb^{85}/Rb^{87} = 2.60$ and $Rb^{87} = 1.42 \times 10^{-11} yr^{-1}$.

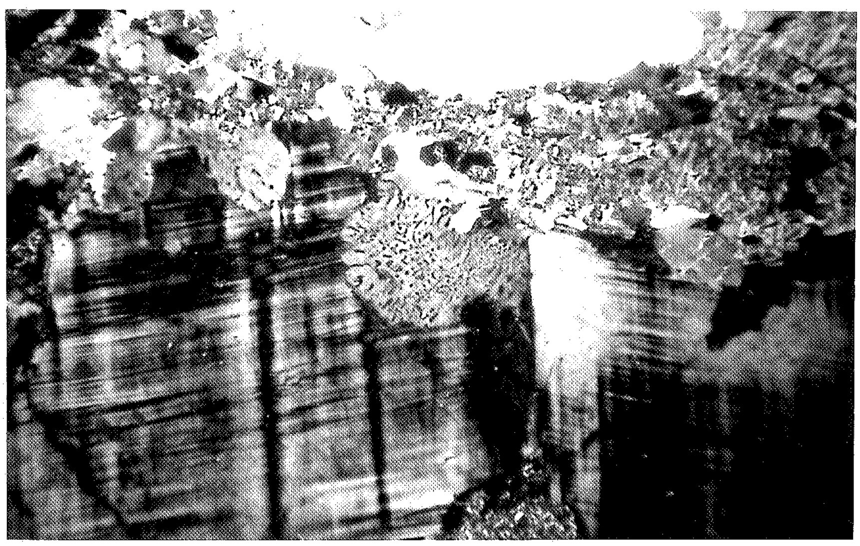
The Engenina Adamellite intrudes the Mount Woods Metamorphics. As the adamellite is relatively unmetamorphosed its intrusion postdates the high grade metamorphism observed in the metasediments. On the other hand, the foliation in the metamorphics and the adamellite have a similar strike but the foliation in the metamorphics dips more shallowly, which indicates the the date obtained for the adamellite provides a minimum age for deposition and metamorphism of the Mount Woods Metamorphics.

## FIG. 9

Quartz - plagioclase myrmekites; porphyroblastic garnet gneisses. P1371/76

PHOTO NO. 28988

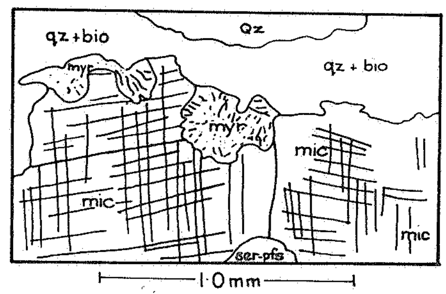


## FIG. 10

Microcline phenocryst with myrmekitic reaction rims; Engenina Adamellite. P1351/76

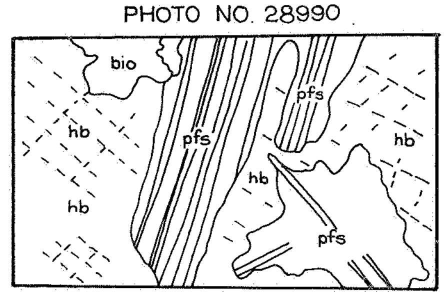
PHOTO NO. 28989




## FIG. 11

Ophitic texture of plagioclase and hornblende; gabbro; Balta Granite Suite P 1365/76

PHOTO NO. 28990



BALTA GRANITE SUITE

The Balta Granite Suite consists of a variety of porphyritic and non-porphyritic granitic types and gabbros which exhibit a wide range in colour, texture, and mineralogy. They have been grouped because of their intimate and complex associations in the field. They are generally non-foliated and non-metamorphosed, implying a relatively young intrusive age. This is supported by Rb/Sr radiometric dating which, although there is a large scatter of the data, indicates a Carpentarian intrusive age in the range 1450-1550 Ma (Webb, 1977). The rocks comprising the Balta Granite Suite may be allocated to one of five general types.

(a) Brick red granite

The brick red granites outcrop in the southeastern map area are only rarely observed elsewhere. The distinctive colour is due to the high potash feldspar content (approx. 60% microcline). The feldspars range in grain size from 0.5 mm to 1.5 mm, with a few larger crystals up to 4 mm. Quartz is finer grained and exhibits undulose extinction and recrystallization. The percentage of plagioclase is minor (5%); biotite, muscovite and opaque minerals are present in only trace amounts (Whitehead, 1976).

(b) Gabbro

Gabbroic and dioritic dykes and other small intrusive bodies are exposed in the northern outcrops of the Balta Granite Suite, and were encountered in Mount Woods Nos. 1, 2, 3 and 5 where they have invaded and disrupted finely layered iron formations. The age of emplacement of the gabbroic bodies is not known, but is assumed to be synchronous with the Balta Granite Suite.

The basic intrusives range from weakly-banded quartz-hypersthene diorite, melanocratic augite-hypersthene diorite, leucocratic plagioclase-hornblende diorite, to augite-hypersthene-olivine gabbro. Pyrite and magnetite are common accessory minerals.

The gabbro and diorite are medium to coarse-grained and contain calcic plagioclase, clinopyroxene, orthopyroxene and olivine. Plagioclase crystals are 1.0 to 3.0 mm long and are randomly oriented. Large clinopyroxene crystals (up to 6 mm across) commonly enclose idiomorphic plagioclase laths (Fig. 11) and olivine. Olivine has often been replaced by serpentine and fine-grained iron oxides (Whitehead, 1976).

(c) Porphyritic granite (fine-grained groundmass)

Porphyritic granites in the suite may be subdivied on the basis of colour and groundmass and phenocryst size. Grey to red porphyritic granite with a fine-grained groundmass occur in the southern part of the area and are characterised by subiomorphic phenocrysts up to 5 mm long of microcline, plagioclase and to a lesser extent quartz in an interstitial groundmass with a grain size of 0.2 - 0.8 mm, composed of quartz, microcline, hornblende and plagioclase. Many euhedral plagioclase and microcline phenocrysts are surrounded by generally optically continuous rims of feldspar which contain numerous, small, globular quartz inclusions. These rims have been interpreted as feldspar-quartz overgrowths on original feldspar phenocrysts (Whitehead, 1976). Biotite and muscovite are generally absent and hornblende is present only in small quantities (2-3%).

(d) Porphyritic granite (coarse-grained groundmass)

Porphyritic granites with a coarse-grained groundmass and large feldspar phenocrysts are exposed in the central and northern part of the area. They have distinctive extremely large (10-15 mm) phenocrysts of red to brick-red potash feldspar and smaller white to pale green plagioclase. Potash feldspar phenocrysts are microcline and orthoclase, both with ropy to ribbon-like perthitic intergrowths. Plagioclase phenocrysts exhibit well-developed polysynthetic twinning and have been partly sericitized. The interstitial groundmass comprises intergrown quartz, microcline, plagioclase, biotite (5-10%) and opaque minerals, with a grain size of 0.5 - 1.0 mm (Radke, 1976; Whitehead, 1976; 1977).

(e) Hybrid gneiss

Exposed in the northern outcrops of the Balta Granite Suite are banded hornblende-biotite and granitic gneisses in which layering is defined by the parallelism of numerous red ovoid potash feldspar xenocrysts (up to 50 mm long) and abundant quartz-feldspar xenoliths and segregations (Figs. 12 and 13).

All the gneisses contain up to 15% hornblende and scapolite. Plagioclase crystals are extensively fractured and veined by hornblende and scapolite (Whitehead, 1976). One possible explanation for the mineralogy and field appearance of the hybrid gneisses is comagmatic contamination resulting in large ovoid xenocrysts and xenoliths, and hornblende-scapolite metasomatism.

## METAMORPHISM

Various grades of metamorphism have been postulated for the Mount Woods Metamorphics from hornblende hornfels and pyroxene hornfels facies (Sweeney, 1965) to granulite facies (Thomson, 1970; Webb and Thomson, 1977). However Ayres in 1965 reclassified many of the granulites as gabbros.

Present mapping indicates that the granofelsic and gneissic rocks provide useful metamorphic grade indicators. Cordierite, a ferromagnesian alumina silicate mineral, is widespread over the entire inlier, but its presence in these rocks has only recently been recorded (Radke, 1976; Whitehead, 1976; 1977).

**FIG. 12**

Balta Granite Suite
Hybrid gneiss
Photo No. 28991

**FIG. 13**

Balta Granite Suite
Xenocrysts and xenoliths;
hybrid gneiss.
Photo No. 28992

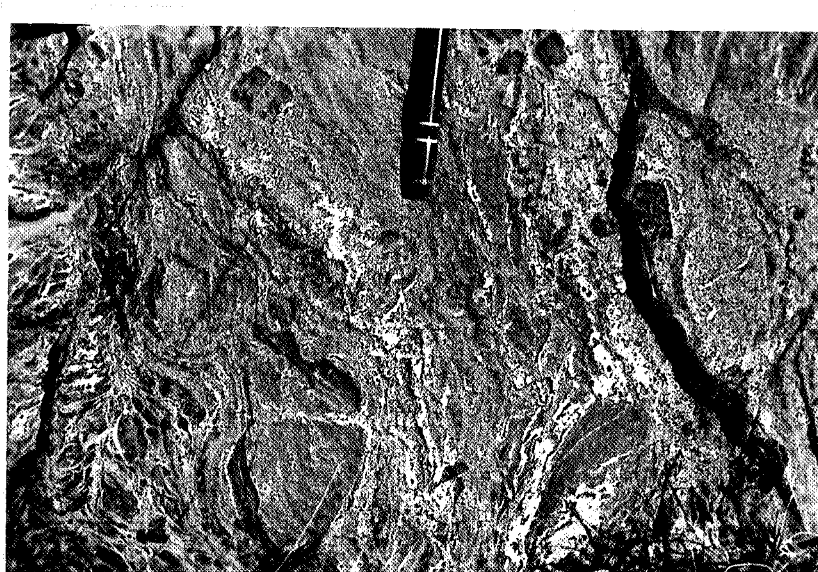


**FIG. 14**

Migmatite;
Photo No. 28993

Mineral assemblages commonly observed are:

Quartz + microcline + plagioclase + biotite + garnet + cordierite;

Quartz + microcline + plagioclase + cordierite + biotite + magnetite;

Quartz + microcline + plagioclase + cordierite + sillimanite + magnetite.

These mineral assemblages indicate a cordierite-almandine facies of granulite facies grade of metamorphism (Winkler, 1974).

The transition from medium (amphibolite facies) to high (granulite facies) grade regional metamorphism of pelitic rocks is characterized by the disappearance of primary muscovite in the presence of quartz and plagioclase, and the coexistence of potash feldspar, $Al_2$ Si 0 polymorphs (sillimanite, kyanite, andalusite), almandine and/or cordierite (Winkler, 1974. New mineral associations formed above this isograd transition are:

Potash feldspar + sillimanite/kyanite + almandine + biotite $\pm$ plagioclase $\pm$ quartz;

Potash feldspar + sillimanite + cordierite + biotite $\pm$ plagioclase $\pm$ quartz;

Potash feldspar + sillimanite + cordierite + almandine $\pm$ plagioclase $\pm$ quartz;

Potash feldspar + biotite + cordierite + almandine $\pm$ plagioclase $\pm$ quartz;

Potash feldspar + biotite + sillimanite + cordierite + almandine $\pm$ plagioclase $\pm$ quartz;

Potash feldspar + cordierite + almandine + quartz (Turner, 1968; Miyashiro, 1973; Winkler, 1974). These mineral associations are very similar to the observed mineral assemblages in the Mount Woods Inlier. As muscovite is totally absent (as a primary mineral) it is assumed that pressure - temperature conditions exceeded the stability field for coexisting quartz-muscovite : 580$^{o}$C at 1 kb; 660$^{o}$C at 3 kb (Winkler, 1974).

Individual mineral associations involving cordierite characterise different facies conditions. An association of cordierite, garnet and potassium feldspar (without hypersthene) is characteristic of the entire bi-pyroxene gneiss (granulite) facies, and also the amphibolite facies but at lower pressures (Sobolev, 1972). Support for the high grade metamorphism in the Mount Woods Metamorphics is given by rare metamorphosed calcareous sediments. These contain common clinopyroxenes, notably augite and diopside, while the orthopyroxene, hypersthene, is rare. No coexisting clinopyroxene-orthopyroxene pairs have been observed in the metasediments. Typical mineral assemblages observed are:

Quartz + augite + labradorite + magnetite;

Andesine + quartz + diopside + amphibole;

Plagioclase + clinopyroxene + hornblende + magnetite.

These all support the concept of granulite facies grade of metamorphism (Winkler, 1974).

Migmatites are common in the Mount Woods Metamorphics (Fig. 14) and indicate the onset of anatexis. According to Winkler (1974) anatexis can be used to define the beginning of high grade metamorphism if water pressures are greater than 3.5 kb. During anatexis, muscovite accompanied by plagioclase and quartz ($\pm$ biotite and potassium feldspar) are completely dissolved within the melt. Minimal temperatures are:

660$^{o}$ at 3.5 kb; or 615$^{o}$ at 10 kb (Winkler, 1974).

Therefore, summarizing the metamorphic grade indicators, (presence or absence of minerals and mineral assemblages, anatexis), the grade of metamorphism appears to be the cordierite-almandine subfacies of the granulite facies. Pressure-temperature estimates are $650^{o}$-$700^{o}$ C at 3-4 kb pressure.

GEOCHEMISTRY

No mines, shafts or prospects exist in the Mount Woods Inlier. The first geochemical data were obtained when the Mount Woods holes were drilled by Delhi Australian Petroleum Ltd. and Santos Ltd. They analysed only core from Mount Woods No. 1 for Co, Cr, Mn, Ni, V, Ag, Cu, Sn, Zn, Au and Pt. All elements were determined by emission spectrosocopy except Cu which was determined by X-ray fluorescence. No significant mineralisation was detected. In 1972, Asarco (Aust.) Pty. Ltd. analysed core material from numerous drillholes throughout the state, including White Hill (Warne, 1972). Powdered samples were taken over a broad depth interval and analysed by atomic absorption spectroscopy for Co, Cr, Mn, Ni, Ag, Cu, Pb and Zn. No anomalous readings were recorded.

As part of the present mapping programme, most of the outcrops were sampled and analysed by emission spectroscopy to semiquantitatively detect elements present in concentrations of economic interest. Sixty samples were analysed on an 18 element scan for Ba, Co, Cr, Mn, Mo, Ni, V, W, Ag, As, Bi, Cu, Pb, Sb, Sn, Zn, Au and P.

All geochemical assay values are tabulated in Enclosure 2, while Table 1 lists the mean element abundances for the different rock groups. The pink-pale brown quartz-feldspar gneiss unit has

ELEMENTS P.P.M.

| Rock Types | Ba | Co | Cr | Mn | Mo | Ni | V | W | Ag | As | Bi | Cu | Pb | Sb | Sn | Zn | Au | P | Nos. Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UN-NAMED METAMORPHICS | 880 | 57 | 145 | 1000 | 0.5 | 100 | 110 | x | x | x | x | 22 | 14 | x | 0.8 | 28 | x | 660 | 24 |
| LEUCOCRATIC GNEISSES | 500 | 10 | 37 | 470 | 0.7 | 30 | 67 | x | x | x | x | 20 | 13 | x | 0.6 | 4 | x | 760 | 7 |
| QTZ-FELD-GNT GNEISSES | 1200 | 35 | 83 | 575 | 10 | 58 | 120 | x | x | x | x | 50 | 9 | x | x | 33 | x | 750 | 4 |
| ENGENINA ADAMELLITE | 820 | 24 | 100 | 580 | 0.6 | 51 | 88 | x | x | x | x | 26 | 18 | x | 0.9 | 26 | x | 890 | 9 |
| BALTA GRANITE SUITE | 1170 | 47 | 59 | 650 | 2 | 52 | 93 | x | x | x | x | 31 | 11 | x | 0.2 | 25 | x | 745 | 18 |
| | X ASSAYED, BUT NOT DETECTED : OR VALUE BELOW 0.1 p.p.m.<br>1 < MEAN ABUNDANCES < 10 APPROXIMATED TO NEAREST INTEGRAL VALUE<br>MEAN ABUNDANCES > 100 APPROXIMATED TO NEAREST 5 p.p.m. | | | | | | | | | | | | | | | | | | |
| SHALES | 580 | 19 | 90 | 850 | 2.6 | 68 | 130 | 1.8 | .07 | 13 | | 45 | 20 | 1.5 | 6 | 9.5 | .004 | 700 | |
| AVERAGE IGNEOUS ROCKS | 640 | 18 | 117 | 1000 | 1.7 | 100 | 90 | 2 | 0.2 | 2 | 0.1 | 70 | 16 | 0..3 | 32 | 80 | | 900 | |

TABLE 1 MEAN ELEMENT ABUNDANCES FOR 5 ROCK TYPES - MOUNT WOODS INLIER.

COMPARISON WITH AVERAGE ELEMENT ABUNDANCES FOR SHALES (FROM TUREKIAN & WEDEPOHL, 1961) & IGNEOUS ROCKS (FROM HAWKES & WEBB, 1962).

DEPARTMENT OF MINES—SOUTH AUSTRALIA

MOUNT WOODS INLIER

GEOCHEMISTRY

TABLE I

Compiled: R.B.F.

Drn. I.M. Ckd.

Scale:

Date: 17-10-77

Drg. No. S13073

500-9.75 F9882 O

the lowest values for all the elements in comparison with the other metasediments. Mean values for cordierite-rich metasediments and porphyroblastic quartz-feldspar-garnet gneisses are broadly similar, and resemble shale element abundances quoted in Turekian and Wedepohl (1961). Mean element compositions for the Engenina Adamellite and Balta Granite Suite are broadly analogous and similar to values stated in Hawkes and Webb (1962) for average igneous rocks (Table 1).

Chemical analyses of diorites, gabbros, magnetite-rich rocks and iron formations from the drill holes reveal no significant anomalies. Magnetite-pyrite-ilmenite and minor chalcopyrite are ubiquitous accessory minerals in the basic intrusives. Ayres (1965) provides a more detailed report on the mineralisation.

## STRUCTURE

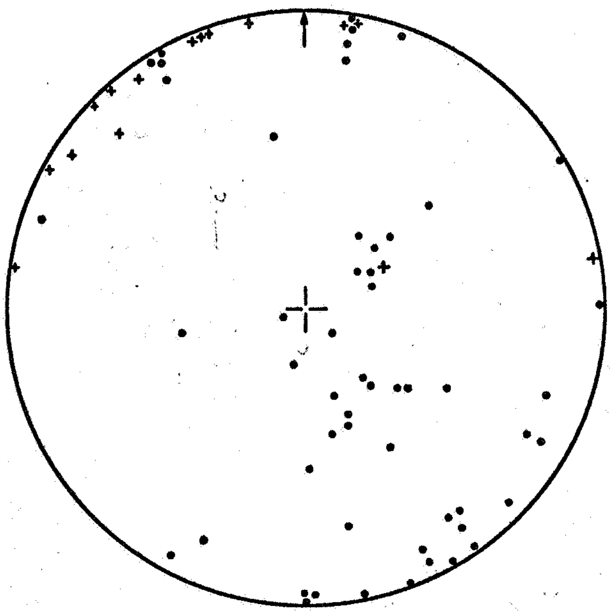
Three deformational phases have been recognised in the Mount Woods Inlier. An early layer-parallel foliation has been overprinted by at least two deformation events.

Within units of the Mount Woods Metamorphics the schistosity and gneissosity are defined by a weak to strong preferred orientation of biotite and the elongation of quartz and feldspar aggregates. The stereoplot of normals to foliation (Fig. 15) yields a very broad scatter of points about a possible fold axis plunging at 25$^{o}$ towards 250$^{o}$. Stereoplots of the rare lineations and fold axes observed give a scatter of readings in a steeply-dipping plane striking 070$^{o}$. At Mount Woods, numerous axial plane crenulations postdate the foliation within the metasediments. Two deformational phases are evident but their relative ages and orientations are not known.

Within the Engenina Adamellite, (which is intrusive and postdates the schistosity and gneissosity of the metamorphics), a poor to strongly developed foliation is defined by the preferred

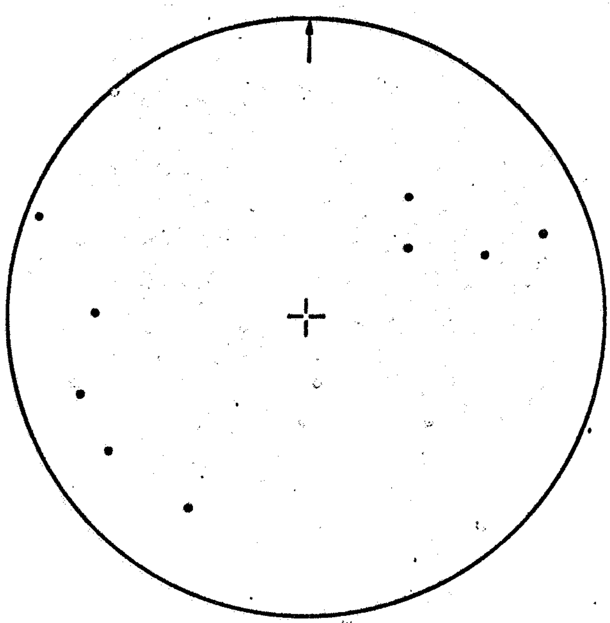
FOLIATION—GNEISSOSITY—SCHISTOSITY

71 Pts



FOLD AXES AND LINEATIONS

10 Pts



Lower hemisphere equal area projections

+ Engenina Adamellite

• Mount Woods Metamorphics

FIG. 15

| | DEPARTMENT OF MINES—SOUTH AUSTRALIA | Scale: |
|---|---|---|
| Compiled: R.B.F. | MOUNT WOODS INLIER | Date: 17-10-77 |
| Drn. I.M. Ckd. | STRUCTURAL DATA | Drg. No. S13074 |

500—9.75 F9882 O

orientation of biotite. The general orientation of the foliation strikes northeasterly and dips vertically. Because the foliation within the Engenina Adamellite is of similar orientation to the plane containing the observed fold axes and lineations, the two events are assumed to be the same. The relationship of this deformational phase to the later two deformational events observed at Mount Woods is not known.

GEOPHYSICS

Geophysical surveys have been invaluable in outlining the regional structure. The regional gravity survey of Hall et. al., (1971) shows that the Mount Woods Inlier lies in a northwesterly trending belt 80 km long and 35 km wide of high Bouguer gravity anomalies (Fig. 1). Gravity values exceed 35 milligals, making this a prominent feature on the 1:1 000 000 Gravity Anomaly Map of South Australia (Coppin et. al., 1973). Coincident with the gravity belt over the inlier is a zone of regionally high magnetic intensity with a number of linear high intensity anomalies having a predominantly northwesterly strike (Fig. 1; Terry, 1962; Brown et. al., 1964; Whitten, 1971).

Specific gravity and magnetic susceptibility measurements were determined on over 90 surface and subsurface specimens (Table 2 and Encl. 6). Within units of the Mount Woods Metamorphics, the leucocratic quartz-feldspar gneisses outcropping on the northern margin of the inlier have the lowest density and magnetic susceptibility values. This is reflected in the lowest Bouguer gravity values (0 milligals) for the inlier which coincide with outcrops of the leucocratic gneisses.

Measurements on core material of banded iron formation and gabbro gave high average specific gravity and magnetic susceptibility values of 3.27 $g/cm^3$, 36150 x $10^{-5}$ cgs units and

3.77 g/cm$^3$, 4150 x 10$^{-5}$ cgs units respectively. Higher values for both parameters were obtained for magnetite-rich bands (Table 2). Intrusive rock types of the Balta Granite Suite and Engenina Adamellite show a large range in specific gravity and magnetic susceptibility values, while the unnamed metamorphics ($pEm_1$) is one of the densest and most magnetic outcropping rock groups.

Detailed ground gravity and magnetic surveys were conducted in two areas, near Mount Woods and White Hill (Encl. 5). Brown et. al., (1964) revealed a number of "superimposed gravity anomalies (on the regional trend) of small amplitude (1-4.6 milligals) and areal extent". Most gravity anomalies coincide with magnetic anomalies of 12 000 - 20 000 gammas.

At Mount Woods, gravity and magnetic anomalies coincide with the line of outcrops and delineate a fold closure. Southwesterly dips in the metasediments on the northern limb suggest a synform plunging northwesterly. Whitten in 1965 recorded iron-rich lenses at Mount Woods, however calculations for the depth of the source of the anomalies give values of 180 m (Brown et. al., 1964).

At White Hill where no outcrop occurs, Brown et. al., (1964) delineated a number of magnetic anomalies which were interpreted to result from a folded body having a northwesterly plunging fold axis. The corresponding Bouguer gravity anomalies are broader and are slightly offset to the south. Calculated depths to the source of the anomalies range from 150 to 365 m (Brown et. al., 1964).

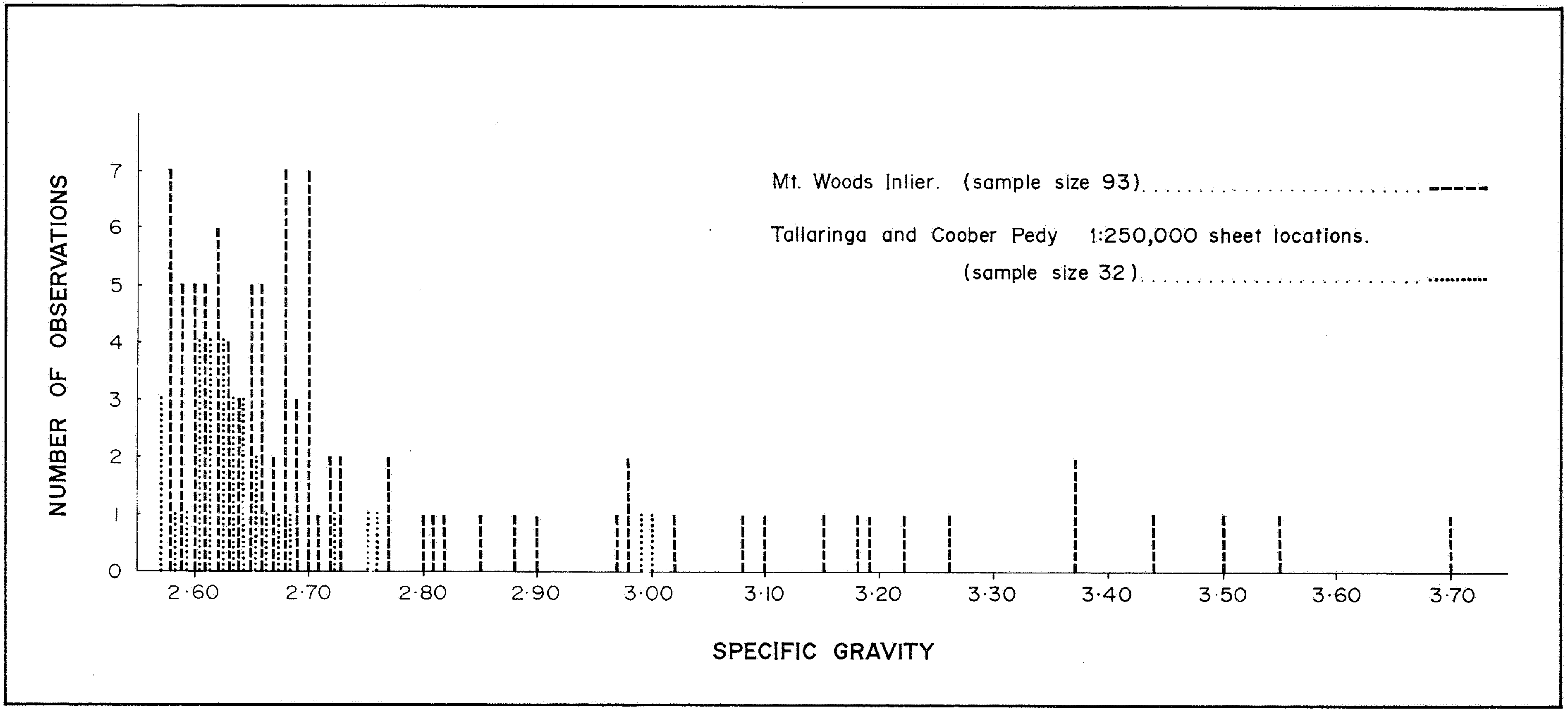
A drilling programme at White Hill to test several of the anomalies (Fitzpatrick, 1965) intersected banded iron formation (petrologically described as banded hornfels), diorite, gabbro and granite (Ayres, 1965). Basement banded iron formation was intersected in Mount Woods No. 1 borehole from 79 to 145 m which was shallower than the predicted 235 m for the source of the magnetic anomaly. The banded iron formation and gabbro provide sufficient density contrast with the country rock and are sufficiently magnetic to account for the observed coincident gravity and magnetic anomalies.

A short comparison has been made between the geophysical parameters of basement rocks of the Mount Woods Inlier, COOBER PEDY and TALLARINGA (Figs. 16 and 17). The graph of logarithm of magnetic susceptibility versus specific gravity for samples from the areas reveals:

1. separation of the geographical areas on geophysical parameters;
2. increasing magnetic susceptibility with increasing density;
3. increasing spread of magnetic susceptibility values with increasing specific gravity.

The low specific gravity values determined for rocks of the TALLARINGA-COOBER PEDY area is reflected in the low Bouguer gravity (-15 to -25 milligals) and low magnetic intensity (approximately 1600 gammas). This is to be expected as rock types are dominantly leucocratic quartz-feldspar gneisses which are very poor in mafics and iron oxides. In comparison, the Mount Woods Inlier has Bouguer gravity values ranging from 0 to 30 milligals and the background magnetic intensity is at least twice that of the TALLARINGA area. Abundant rock types are magnetite-rich granofels, gneisses, granites, banded iron formation and gabbros with relatively high specific gravity and magnetic susceptibility values. It is evident that the differing

# HISTOGRAM OF SPECIFIC GRAVITY




COMPILED: M. C. BENBOW

S 12652

Fig. 16

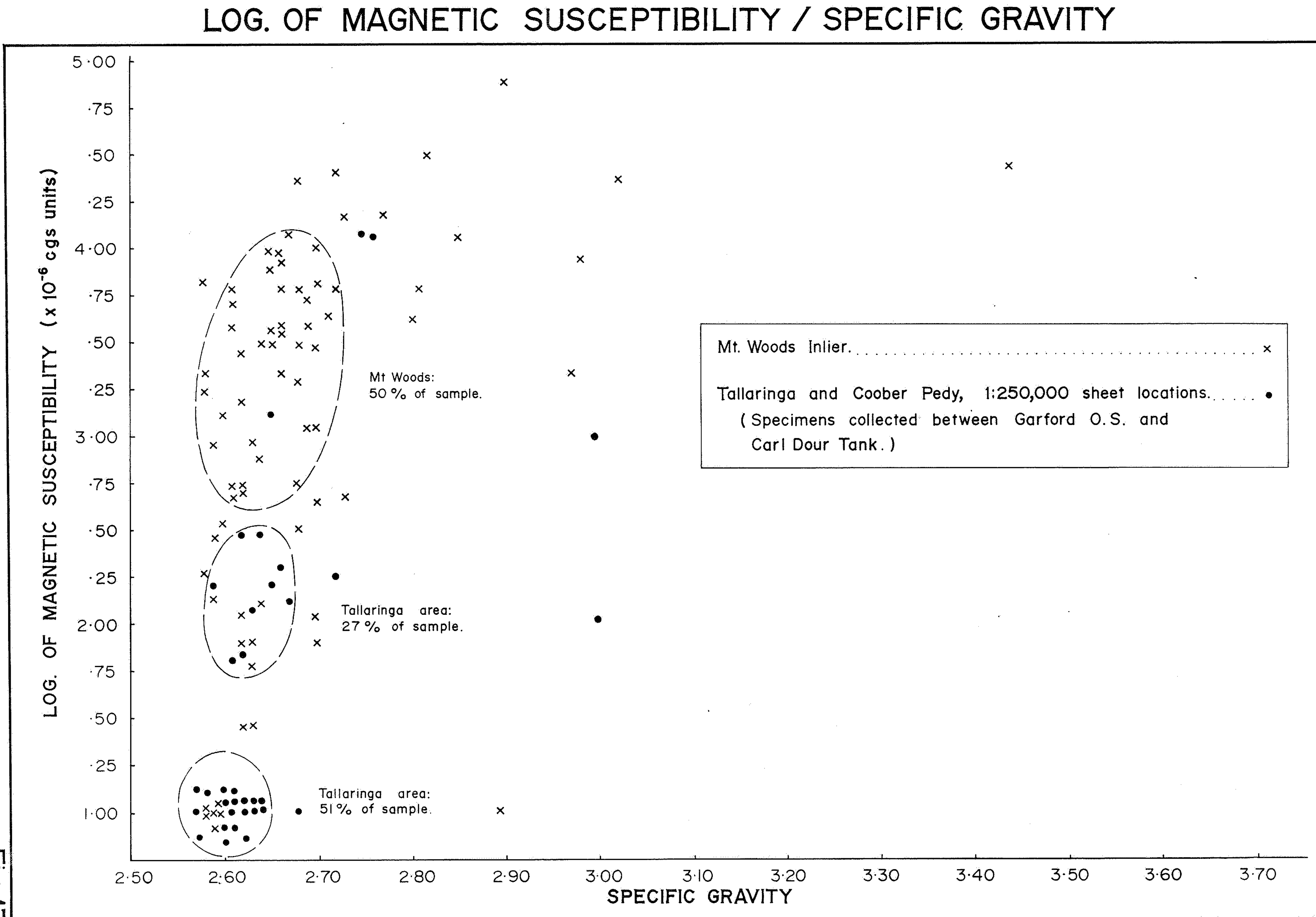


Fig. 17

COMPILED: M. C. BENBOW

S 12653

magnetic and gravity patterns for the two areas are due to the contrasting rock types.

The Geophysics Division is presently preparing a broad appraisal of the geophysical data extending southwards from the Mount Woods Inlier and incorporating the Stuart Shelf.

TABLE 2

| Rock Type | Specific Gravity | | | Magnetic Susceptibility ($x10^{-5}$ cgs units) | | |
|---|---|---|---|---|---|---|
| | No. Samples | Average | Range | Samples | Average | Range |
| SURFACE | | | | | | |
| 1. Aplites | 4 | 2.58 | 2.58-2.59 | 4 | 0 | 0 |
| 2. Brick red granites of Balta Granite Suite | 6 | 2.59 | 2.58-2.61 | 6 | 36 | (0-144) |
| 3. Pink-pale brown quartz-feldspar gneisses | 12 | 2.60 | 2.58-2.66 | 12 | 260 | (14-646) |
| 4. Engenina Adamellite | 7 | 2.65 | 2.62-2.70 | 7 | 221 | (8-654) |
| 5. Hybrid gneisses of Balta Granite Suite | 12 | 2.66 | 2.61-2.70 | 12 | 457 | (8-1 200) |
| 6. Gneisses and granofels of unnamed metamorphics | 11 | 2.69 | 2.64-2.73 | 11 | 786 | (32-3 135) |
| 7. Gabbros of Balta Granite Suite | 6 | 2.83 | 2.65-2.98 | 6 | 856 | (421-1 50[illegible] |
| 8. Banded iron formation | 1 | 3.70 | | 1 | 29 141 | |
| SUBSURFACE | | | | | | |
| 1. Gabbros | 5 | 3.08 | 2.90-3.44 | 3 | 4 150 | (2 306-7 650) |
| 2. Banded iron formation | 6 | 3.27 | 3.19-3.50 | 2 | 36 150 | (17 100-55 200) |
| 3. Magnetite rich rock | 3 | 3.77 | 3.22-4.72 | 1 | 50 400 | - |

A Bison model 3101A instrument was used for the measurement of magnetic susceptibility. The apparent value was corrected according to the relative volume of the specimen to that of the standard. Apparent values between 0-5 x $10^{-5}$ cgs units were approximated to zero. Apparent values are accurate to 5 x $10^{-5}$ cgs units. A Metler balance was used for the measurement of specimen weights in air and water. This enabled a calculation of specific gravity values with an accuracy of ± 0.01.

SUMMARY

The Mount Woods Inlier is a partly fault-bounded inlier on the northeastern margin of the Gawler Craton and coincides with a conspicuous regional belt of high Bouguer gravity and aeromagnetic anomalies. The geological history can be summarised as follows.

Pelitic, psammitic and iron-rich sediments were folded and metamorphosed to the almandine-cordierite subfacies of the granulite facies during the ?Archaean. Metasedimentary rock types recognised within the Mount Woods Metamorphics are:

1. Unnamed metamorphics, composed of quartz-feldspar-cordierite-sillimanite-garnet hornfelses and gneisses, banded iron formations, quartz-feldspar-biotite schists and minor quartzites;
2. Metaconglomerate, consisting of white quartz and grey quartzite clasts in a quartz-sillimanite matrix;
3. Leucocratic gneisses, pink to pale brown in colour and composed of ribbon-like quartz and feldspar layers;
4. Porphyrblastic quartz-feldspar-garnet gneisses, containing large red garnet crystals.

The intrusive Engenina Adamellite, consisting of tabular to avoid feldspar phenocrysts in a foliated biotite-rich matrix, has been radiometrically dated at 1641 $\pm$ 38 Ma with an initial $Sr^{87}/Sr^{86}$ ratio of 0.7081 $\pm$ 0.0014. A folding episode with a northeasterly striking axial plane may be associated with the intrusion of the Engenina Adamellite.

Rock types of the later intrusives of the Balta Granite Suite range from brick-red feldspar granites, porphyritic granites, leucogranites and gabbros. These have been radiometrically dated at 1450-1550 Ma.

Banded iron formations, gabbros and iron-rich metasediments are primarily responsible for the high Bouguer gravity and aeromagnetic anomalies and are the likely cause of similar, linear anomalies of the Coober Pedy Ridge. In contrast the area of low Bouguer gravity and aeromagnetic intensity on eastern TALLARINGA and southern COOBER PEDY occur where lower density and less magnetic leucocratic gneisses outcrop.

R.B. Flint

RBF/MCB:DJJ
14th November, 1977.

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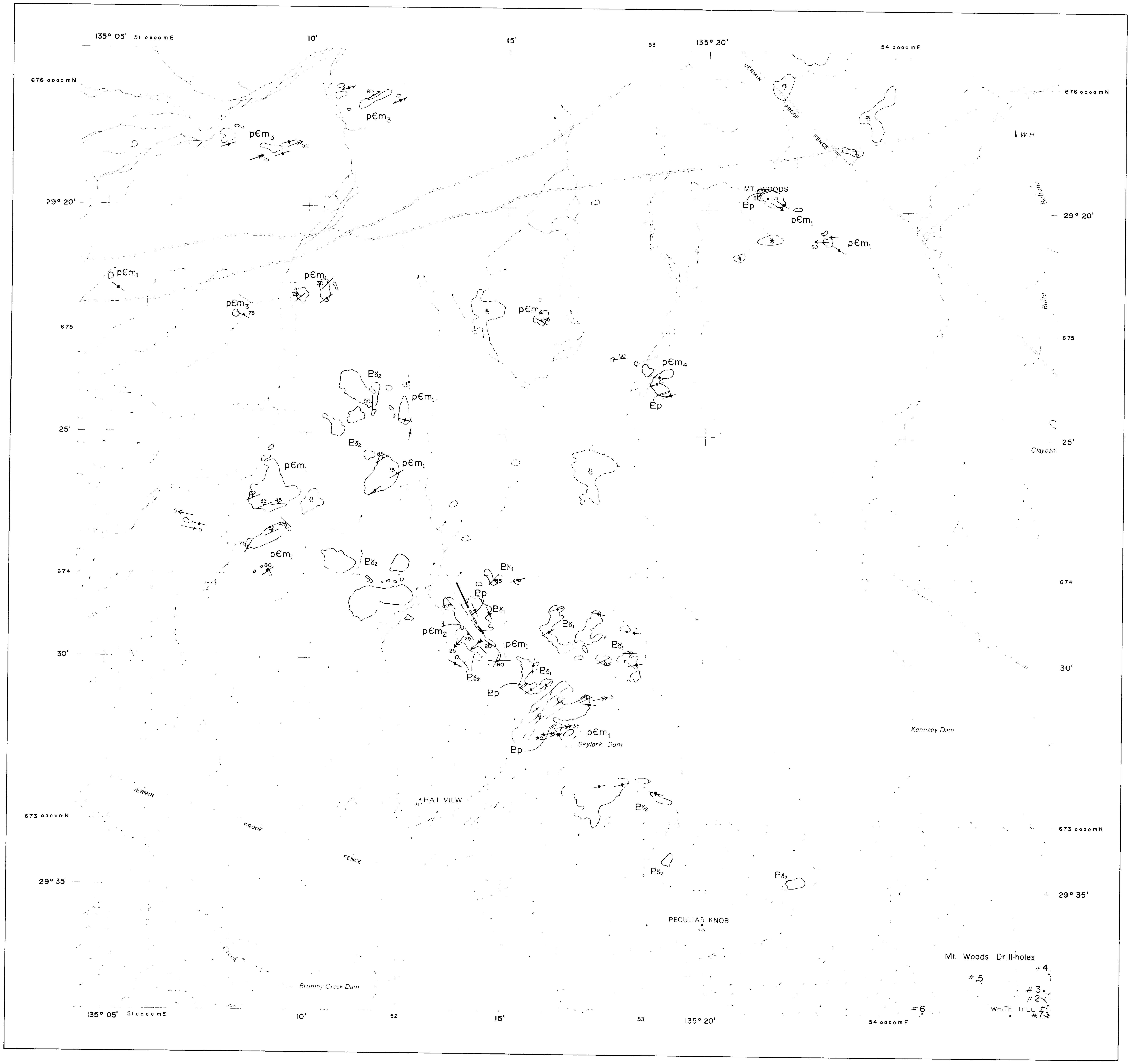
S.A. DEPT OF MINES

# MT. WOODS INLIER

## GEOLOGICAL MAP




SCALE

KILOMETRES 2 1 0 2 4 6 8 10 12 14 KILOMETRES

## REFERENCE

**PROTEROZOIC — CARPENTARIAN INTRUSIVE SUITE**

| | |
| --- | --- |
| Єp | Pegmatite and aplite dykes. |
| Єδ2 | Balta Granite Suite Adamellites, granites, granodiorite, diorite, aplites, occasional xenoliths. Radiometric age 1450 – 1550 Ma.* |
| Єγ1 | Engenina Adamellite: porphyritic foliated adamellite; feldspar laths and xenoliths subparallel to foliation. Radiometric age 1641 ± 38 Ma.* |

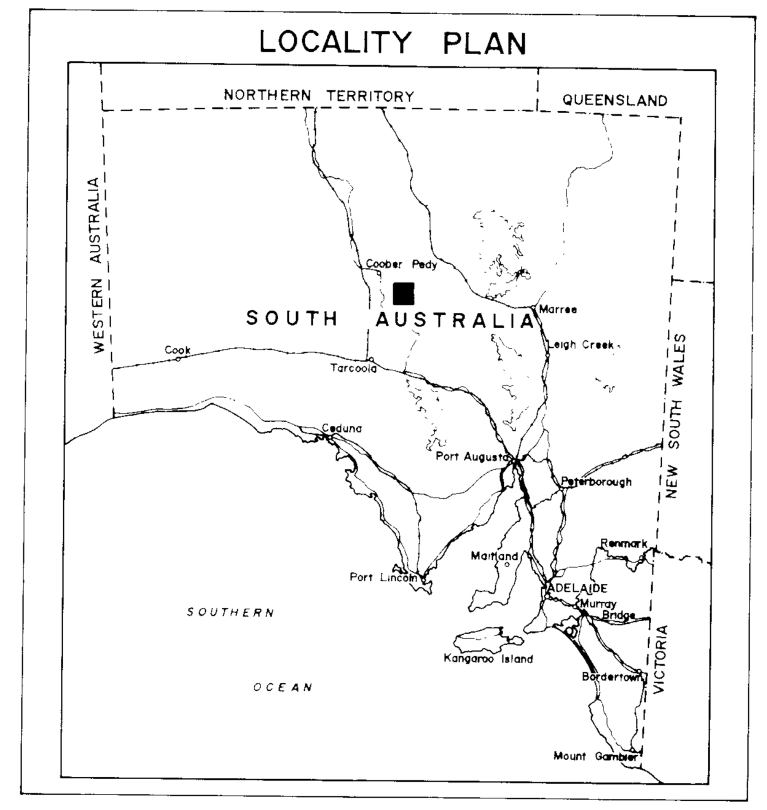
**ARCHAEAN – LOWER PROTEROZOIC — MT. WOODS METAMORPHICS**

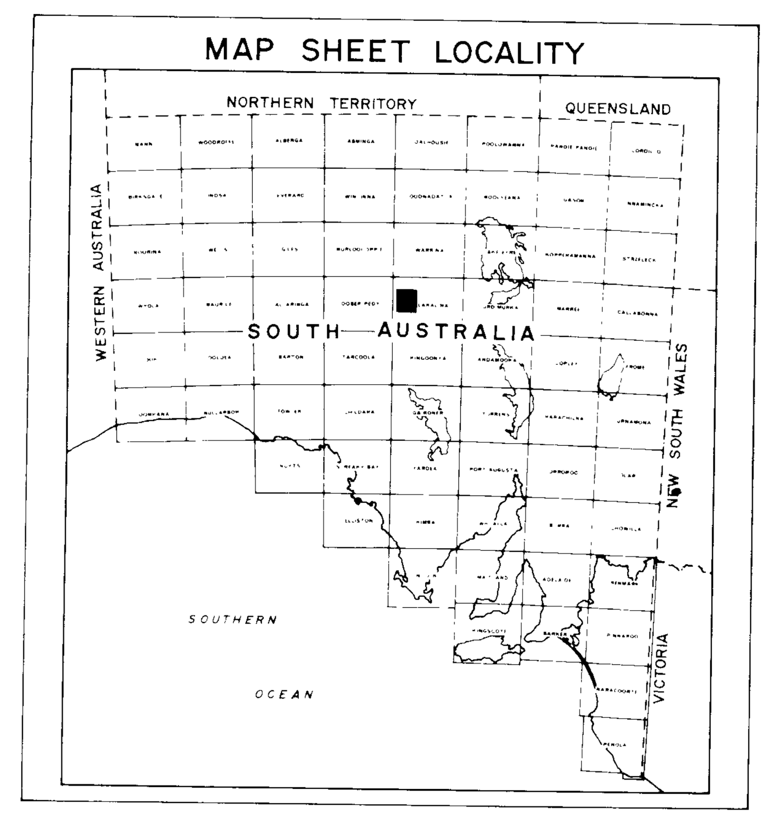
| | |
| --- | --- |
| pЄm2 | Meta-conglomerate and heavy mineral cross bedded quartzite |
| pЄm1 | Un-named metamorphics, massive, dark, fine grained feldspar-cordierite-sillimanite granofels; feldspar-cordierite-sillimanite-biotite gneisses; banded iron formations; magnetite rich gneisses; rare white quartzites. |
| pЄm4 | White-grey porphyroblastic feldspar-quartz-biotite-garnet gneiss. |
| pЄm3 | Pale pink to light brown feldspar-quartz gneiss. |

*Ma = 1 mega year = $10^6$ years

Radiometric ages determined by A.W. WEBB A.M.D.E.L.

- Foliation
- Fold axis
- Lineation
- Fold axis & lineation
- Fault




Enclosure I

GEOLOGY: M.C. BENBOW, R.B. FLINT

77-364

## SURFACE SAMPLES

| ANALYSIS No. | SAMPLE No. | Ba | Co | Cr | Mn | Mo | Ni | V | W | Ag | As | Bi | Cu | Pb | Sb | Sn | Zn | Au | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G4755/76 | P1344/76 | 700 | 30 | 80 | 700 | x | 70 | 80 | x | x | x | x | 10 | 10 | x | 1 | 50 | x | 300 |
| G4756/76 | P1345/76 | 700 | 30 | 80 | 700 | x | 30 | 80 | x | x | x | x | 20 | 10 | x | 1 | 30 | x | 1000 |
| G4757/76 | P1346/76 | 700 | 30 | 80 | 700 | x | 100 | 80 | x | x | x | x | 20 | 10 | x | 1 | 30 | x | 1000 |
| G4758/76 | P1347/76 | 2000 | 30 | 100 | 200 | x | 80 | 100 | x | 0.3 | x | x | 50 | 10 | x | x | x | x | 500 |
| G4759/76 | P1348/76 | 1000 | 20 | 70 | 500 | x | 50 | 80 | x | x | x | x | 10 | 20 | x | 1 | 30 | x | 500 |
| G4760/76 | P1349/76 | 500 | 20 | 70 | 500 | x | 30 | 50 | x | x | x | x | 5 | 20 | x | 1 | 50 | x | 1000 |
| G4761/76 | P1350/76 | 300 | 10 | 30 | 300 | x | 30 | 70 | x | 0.1 | x | x | 10 | 20 | x | 1 | 30 | x | 500 |
| G4762/76 | P1351/76 | 700 | 20 | 50 | 500 | x | 50 | 100 | x | 0.5 | x | x | 20 | 20 | x | x | 30 | x | 500 |
| G4763/76 | P1352/76 | 1000 | 5 | 20 | 500 | x | 20 | 70 | x | x | x | x | 10 | 1 | x | x | x | x | 2000 |
| G4764/76 | P1353/76 | 1000 | 30 | 200 | 500 | x | 70 | 100 | x | x | x | x | 50 | 10 | x | 1 | x | x | 1000 |
| G4765/76 | P1354/76 | 1500 | 30 | 200 | 500 | x | 50 | 100 | x | x | x | x | 20 | 20 | x | 1 | x | x | 2000 |
| G4766/76 | P1355/76 | 300 | x | x | 100 | x | 10 | x | x | x | x | x | 20 | 1 | x | x | x | x | 300 |
| G4767/76 | P1356/76 | 3000 | 10 | 30 | 500 | x | 30 | 50 | x | x | x | x | 30 | 3 | x | x | 80 | x | 500 |
| G4768/76 | P1357/76 | 1500 | 10 | 30 | 500 | x | 5 | 50 | x | x | x | x | 50 | 3 | x | x | 50 | x | 300 |
| G4769/76 | P1358/76 | 300 | 20 | 30 | 500 | x | 50 | 70 | x | x | x | x | 50 | 10 | x | x | x | x | 300 |
| G4770/76 | P1359/76 | 1000 | x | 30 | 100 | x | 30 | 50 | x | x | x | x | 10 | 10 | x | x | x | x | 300 |
| G4771/76 | P1360/76 | 1500 | 20 | 50 | 1000 | x | 20 | 50 | x | x | x | x | 30 | 10 | x | x | 30 | x | 3000 |
| G4772/76 | P1361/76 | 800 | 30 | 100 | 500 | x | 50 | 100 | x | x | x | x | 10 | 5 | x | 1 | 30 | x | 2000 |
| G4773/76 | P1362/76 | 800 | 100 | 200 | 700 | 10 | 150 | 200 | x | x | x | x | 30 | 5 | x | 2 | 30 | x | 2000 |
| G4774/76 | P1363/76 | 1000 | 5 | 30 | 500 | 10 | 20 | 80 | x | x | x | x | 10 | 3 | x | x | x | x | 300 |
| G4775/76 | P1364/76 | 800 | 50 | 100 | 800 | 10 | 70 | 150 | x | x | x | x | 30 | 10 | x | x | 50 | x | 300 |
| G4776/76 | P1365/76 | 500 | 300 | 100 | 1000 | x | 300 | 200 | x | x | x | x | 100 | 10 | x | x | 50 | x | 500 |
| G4777/76 | P1366/76 | 300 | 30 | 150 | 500 | x | 70 | 100 | x | x | x | x | 5 | 10 | x | 1 | 30 | x | 500 |
| G4778/76 | P1367/76 | 300 | 10 | 50 | 300 | x | 50 | 70 | x | x | x | x | 10 | 10 | x | x | 30 | x | 1000 |
| G4779/76 | P1368/76 | 1500 | 50 | 150 | 700 | 20 | 100 | 150 | x | x | x | x | 100 | 10 | x | x | 100 | x | 1000 |
| G4780/76 | P1369/76 | 1500 | 10 | 50 | 300 | 5 | 30 | 100 | x | x | x | x | 10 | 10 | x | x | x | x | 500 |
| G4781/76 | P1370/76 | 300 | x | 30 | 300 | 5 | 30 | 30 | x | x | x | x | 10 | 5 | x | x | x | x | 500 |
| G4782/76 | P1371/76 | 1500 | 50 | 100 | 1000 | 10 | 70 | 200 | x | x | x | x | 80 | 10 | x | x | 30 | x | 1000 |
| G4783/76 | P1372/76 | 700 | 50 | 100 | 1500 | 5 | 100 | 100 | x | x | x | x | 30 | 30 | x | 2 | x | x | x |
| G4784/76 | P1373/76 | 700 | x | 20 | 300 | x | 30 | x | x | x | x | x | 30 | 3 | x | x | x | x | 1000 |
| G4785/76 | P1374/76 | x | x | 20 | 300 | x | 5 | 10 | x | x | x | x | 10 | 10 | x | 1 | x | x | 1000 |
| G4786/76 | P1375/76 | 500 | x | 30 | 300 | x | 5 | 70 | x | x | x | x | 20 | 10 | x | x | x | x | 1000 |
| G4787/76 | P1376/76 | 800 | x | 20 | 300 | x | x | 50 | x | x | x | x | 20 | 20 | x | x | x | x | 1000 |
| G4788/76 | P1377/76 | 500 | 10 | 20 | 300 | x | 20 | 100 | x | x | x | x | 20 | 10 | x | 1 | x | x | 300 |
| G4789/76 | P1378/76 | 1000 | 100 | 100 | 1500 | x | 50 | 150 | x | x | x | x | 50 | 10 | x | 1 | x | x | 300 |
| G4790/76 | P1390/76 | 800 | 20 | 50 | 500 | 10 | 70 | 20 | x | x | x | x | 30 | 5 | x | x | 80 | x | 300 |
| G4791/76 | P1492/76 | 1000 | 30 | 100 | 1000 | 5 | 50 | 100 | x | x | x | x | 30 | 30 | x | 1 | 30 | x | 500 |
| G4792/76 | P200/76 | 1500 | 20 | 50 | 500 | 5 | 5 | 200 | x | x | x | x | 10 | 5 | x | x | x | x | 500 |
| G4793/76 | P202/76 | 200 | x | 70 | 300 | x | 5 | x | x | x | x | x | 10 | 20 | x | x | x | x | 500 |
| G4794/76 | P203/76 | 500 | 30 | 100 | 500 | x | 70 | 100 | x | x | x | x | 10 | 10 | x | x | 50 | x | 500 |
| G4795/76 | P206/76 | 700 | 70 | 150 | 100 | x | 100 | 100 | x | x | x | x | 10 | 10 | x | 1 | x | x | x |
| G4796/76 | P207/76 | 700 | 100 | 150 | 1000 | x | 150 | 100 | x | x | x | x | 10 | 30 | x | 1 | 50 | x | 300 |
| G4797/76 | P208/76 | 500 | 100 | 100 | 1000 | x | 70 | 100 | x | x | x | x | 30 | 30 | x | 1 | 50 | x | 2000 |
| G4798/76 | P210/76 | 5000 | 50 | 50 | 300 | x | 70 | 100 | x | x | x | x | 50 | 10 | x | 1 | 30 | x | 1000 |
| G4799/76 | P214/76 | 500 | 50 | 50 | 500 | x | 30 | 100 | x | x | x | x | 20 | 30 | x | 1 | 30 | x | 500 |
| G4800/76 | P215/76 | 700 | 50 | 50 | 500 | x | 50 | 100 | x | x | x | x | 10 | 30 | x | x | x | x | 500 |
| G4801/76 | | 3000 | 50 | 100 | 1000 | x | 50 | 100 | x | x | x | x | 20 | 30 | x | 1 | 30 | x | x |
| G4802/76 | | [illegible] | 50 | 100 | 1000 | x | 50 | 100 | x | x | x | x | 10 | 10 | x | 1 | x | x | 500 |
| G4803/76 | | 1500 | 30 | 150 | 1000 | x | 50 | 100 | x | x | x | x | 20 | 30 | x | 1 | 30 | x | 500 |
| G4804/76 | [illegible] | 1000 | 100 | 250 | 1000 | x | 100 | 100 | x | x | x | x | 20 | 5 | x | 1 | x | x | 300 |
| G4805/76 | [illegible] | 1000 | 30 | 150 | 500 | x | 50 | 100 | x | x | x | x | 20 | 10 | x | 2 | x | x | 300 |
| G4806/76 | [illegible] | 500 | 70 | 150 | 3000 | x | 70 | 100 | x | x | x | x | 10 | 10 | x | 1 | x | x | 500 |
| [illegible] | [illegible] | 300 | 30 | 150 | 500 | x | 100 | 100 | x | x | x | x | 5 | 10 | x | x | x | x | 1000 |
| [illegible] | [illegible] | 1000 | 30 | 100 | 500 | x | 150 | 100 | x | x | x | x | 20 | 20 | x | 1 | x | x | 2000 |
| [illegible] | [illegible] | 1000 | 100 | 200 | 700 | x | 150 | 150 | x | x | x | x | 10 | 20 | x | x | 50 | x | 300 |
| [illegible] | [illegible] | [illegible] | 50 | 150 | 70 | x | 70 | 100 | x | x | x | x | 10 | 20 | x | x | 50 | x | 1000 |
| [illegible] | [illegible] | [illegible] | 50 | 100 | 1000 | x | 100 | 100 | x | x | x | x | 10 | 5 | x | 1 | x | x | 300 |
| [illegible] | [illegible] | 1000 | 10 | 150 | 500 | x | 100 | 100 | x | x | x | x | 10 | 30 | x | x | 70 | x | 500 |
| [illegible] | [illegible] | [illegible] | 50 | 100 | 1000 | x | 100 | 100 | x | x | x | x | 100 | 10 | x | x | 50 | x | 300 |
| [illegible] | [illegible] | [illegible] | [illegible] | 150 | 300 | x | 100 | 100 | x | x | x | x | 10 | 10 | x | x | 30 | x | 300 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | x | 30 | 100 | x | x | x | x | 50 | 10 | x | [illegible] | 30 | x | 500 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | x | [illegible] | [illegible] | x | x | x | x | [illegible] | 1 | x | 1 | 10 | x | 300 |

## DRILL HOLE SAMPLES

| ANALYSIS NO. | SAMPLE INTERVAL from | to | Ba | Co | Cr | Mn | Mo | Ni | V | W | Ag | As | Bi | Cu | Pb | Sb | Sn | Zn | Au | Pt | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MOUNT WOODS NO. 1 | | | | | | | | | | | | | | | | | | | | | |
| 22684 | 79.25 | 85.34 | - | - | - | - | - | - | - | - | - | - | - | 100 | 10 | - | - | 55 | x | - | 2 |
| 22685 | 85.34 | 91.44 | - | - | - | - | - | - | - | - | - | - | - | 55 | 10 | - | - | 45 | x | - | 2 |
| 22686 | 91.44 | 95.71 | - | - | - | - | - | - | - | - | - | - | - | 70 | 10 | - | - | 50 | x | - | 2 |
| | 95.73 | | - | 30 | 8 | 300 | - | 6 | 80 | - | x | - | - | 79 | - | - | 5 | 50 | x | x | - |
| | 96.90 | | - | 20 | 15 | 400 | - | 7 | 150 | - | x | - | - | 90 | - | - | 6 | 50 | x | x | - |
| | 97.51 | | - | 6 | 200 | 150 | - | 25 | 200 | - | x | - | - | 55 | - | - | 2 | 25 | x | x | - |
| 22687 | 97.54 | 97.84 | - | 35 | 25 | 770 | - | 15 | - | - | - | - | - | 85 | 10 | - | - | 45 | x | - | 2 |
| 22688 | 97.84 | 101.80 | - | 20 | 20 | 400 | - | 20 | - | - | - | - | - | 150 | 15 | - | - | 80 | x | - | - |
| | 101.85 | | - | 80 | 150 | 300 | - | 70 | 150 | - | 0.4 | - | - | 90 | - | - | 3 | 20 | x | - | - |
| | 102.26 | | - | 15 | 150 | 250 | - | 20 | 150 | - | 0.4 | - | - | 24 | - | - | 3 | 20 | x | - | - |
| | 102.67 | | - | 50 | 250 | 400 | - | 60 | 120 | - | 0.4 | - | - | 160 | - | - | 4 | 40 | x | - | - |
| | 102.95 | | - | 70 | 200 | 250 | - | 100 | 250 | - | x | - | - | 125 | - | - | 6 | 80 | x | - | - |
| | 103.68 | | - | 30 | 8 | 500 | - | 15 | 30 | - | 0.3 | - | - | 145 | - | - | 6 | 50 | x | - | - |
| | 104.34 | | - | 40 | 40 | 250 | - | 20 | 150 | - | x | - | - | 170 | - | - | 4 | 40 | x | - | - |
| | 104.70 | | - | 70 | 15 | 150 | - | 8 | 150 | - | 0.2 | - | - | 330 | - | - | 6 | 50 | x | - | - |
| 22689 | 101.80 | 104.85 | - | 25 | 55 | 210 | - | 30 | - | - | - | - | - | 190 | 10 | - | - | 95 | x | - | - |
| 22690 | 101.80 | 104.85 | - | 35 | 55 | 670 | - | 10 | - | - | - | - | - | 100 | 10 | - | - | 85 | x | - | - |
| 22691 | 104.85 | 107.29 | - | 25 | 5 | 190 | - | 10 | - | - | - | - | - | 300 | 5 | - | - | 75 | x | - | - |
| 22692 | 107.29 | 110.03 | - | 10 | 270 | 140 | - | 50 | - | - | - | - | - | 440 | 5 | - | - | 90 | x | - | - |
| 22693 | 110.03 | 112.78 | - | 35 | 60 | 260 | - | 20 | - | - | x | - | - | 200 | 10 | - | - | 50 | x | - | - |
| - | 110.34 | | - | 40 | <1 | 150 | - | 15 | 120 | - | x | - | - | 800 | - | - | 6 | <20 | x | x | - |
| 22694 | 112.78 | 115.21 | - | 20 | 95 | 210 | - | 25 | - | - | x | - | - | 150 | 5 | - | - | 45 | x | - | - |
| 22695 | 115.21 | 118.26 | - | 20 | 120 | 150 | - | 35 | - | - | x | - | - | 230 | 5 | - | - | 60 | x | - | - |
| | 120.78 | | - | 70 | 8 | 100 | - | 12 | 3 | - | 0.1 | - | - | - | - | - | 10 | 400 | x | x | - |
| 22696 | 118.26 | 121.31 | - | 170 | 40 | 180 | - | 25 | - | - | - | - | - | 400 | 5 | - | - | 100 | x | - | - |
| 22697 | 120.40 | 121.31 | - | 210 | 5 | 150 | - | 10 | - | - | - | - | - | 400 | 5 | - | - | 110 | x | - | - |
| 22698 | 121.31 | 123.75 | - | 100 | 130 | 140 | - | 25 | - | - | - | - | - | 490 | 10 | - | - | 130 | x | - | - |
| - | 123.14 | | - | 15 | 10 | 80 | - | 2 | 25 | - | x | - | - | 30 | - | - | 1 | 20 | x | x | - |
| 22699 | 123.75 | 126.19 | - | 150 | 5 | 190 | - | 15 | - | - | - | - | - | 540 | 5 | - | - | 45 | x | - | - |
| | 126.19 | | - | 80 | 2 | 100 | - | 3 | 2 | - | 0.1 | - | - | - | - | - | 15 | 50 | x | x | - |
| 22700 | 126.45 | 129.24 | - | 20 | 140 | 160 | - | 30 | - | - | x | - | - | 85 | 5 | - | - | 75 | x | - | - |
| 22701 | 129.24 | 131.98 | - | 15 | 35 | 150 | - | 25 | - | - | x | - | - | 65 | 10 | - | - | 85 | - | - | - |
| 22702 | 131.98 | 134.11 | - | 15 | 130 | 160 | - | 35 | - | - | x | - | - | 110 | 10 | - | - | 65 | - | - | - |
| 22703 | 134.11 | 136.83 | - | 15 | 120 | 130 | - | 35 | - | - | x | - | - | 50 | 5 | - | - | 85 | - | - | - |
| 22704 | 136.83 | 138.99 | - | 30 | 100 | 210 | - | 35 | - | - | x | - | - | 95 | 5 | - | - | 30 | - | - | - |
| 22705 | 138.99 | 140.97 | - | 30 | 75 | 320 | - | 25 | - | - | x | - | - | 65 | 5 | - | - | 45 | - | - | - |
| 22706 | 140.97 | 145.57 | - | 25 | 45 | 190 | - | 25 | - | - | x | - | - | 65 | 5 | - | - | 50 | - | - | - |
| MOUNT WOODS NO. 2 | | | | | | | | | | | | | | | | | | | | | |
| - | 93.27 | | - | 80 | 100 | 300 | - | 150 | 100 | - | x | - | - | 150 | - | - | <1 | 50 | x | x | - |
| 22708 | 93.27 | 95.71 | - | 35 | 95 | 320 | - | 55 | - | - | x | - | - | 35 | <5 | - | - | 70 | - | - | - |
| 22709 | 95.71 | 98.45 | - | 35 | 85 | 290 | - | 50 | - | - | x | - | - | 45 | <5 | - | - | 55 | - | - | - |
| 22711 | 98.45 | 99.62 | - | 50 | 120 | 720 | - | 80 | - | - | x | - | - | 100 | 5 | - | - | 65 | - | - | - |
| MOUNT WOODS NO. 3 | | | | | | | | | | | | | | | | | | | | | |
| 22707 | 69.14 | 72.21 | - | 35 | 190 | 840 | - | 55 | - | - | x | - | - | 25 | 5 | - | - | 70 | - | - | - |
| - | 70.26 | | - | 30 | 6 | 1200 | - | 30 | 150 | - | x | - | - | 70 | - | - | 2 | 60 | x | x | - |
| MOUNT WOODS NO. 4 | | | | | | | | | | | | | | | | | | | | | |
| 22712 | 92.35 | 93.27 | - | 15 | 10 | 1450 | - | 20 | - | - | x | - | - | 40 | 15 | - | - | 35 | - | - | - |
| MOUNT WOODS NO. 5 | | | | | | | | | | | | | | | | | | | | | |
| | 50.14 | | - | 20 | 3 | 1000 | - | 1 | 80 | - | x | - | - | 50 | - | - | 1 | 80 | x | x | - |
| 22713 | 50.14 | 50.90 | - | 55 | 5 | 850 | - | 15 | - | - | - | - | - | 35 | 5 | - | - | 90 | - | - | - |
| MOUNT WOODS NO. 6 | | | | | | | | | | | | | | | | | | | | | |
| 22714 | 61.60 | 64.31 | - | 15 | 10 | 90 | - | 10 | - | - | - | - | - | 10 | 5 | - | - | 50 | - | - | - |
| MOUNT WOODS NO. 7 | | | | | | | | | | | | | | | | | | | | | |
| 22715 | 88.39 | 90.58 | - | 50 | 120 | 720 | - | 80 | - | - | - | - | - | 30 | 10 | - | - | 45 | - | - | - |
| Detection Limits | | | 200 | 5 | 2 | 10 | 3 | 5 | 20 | 50 | 0.1 | 50 | 1 | 1 | 1 | 30 | 1 | 20 | 3 | | |

Drill hole depth in metres

Encl. 2

## LEGEND

x Not detected, not assayed

770 Values in ppm

## DATA SOURCE

Amdel report MP 790/65 for Delhi Australia Petroleum Ltd. and Santos Ltd in S.A. Dept of Mines Open File ENV 422

Amdel Job No 2373/72 for Asarco (Aust.) Pty Ltd in S.A. Dept of Mines Open File ENV 1880

Amdel report AN1671/77 for S.A. Dept of Mines

**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

MOUNT WOODS INLIER

# GEOCHEMISTRY

| | | |
|---|---|---|
| Compiled R.B.F. | Scale : | |
| | Date : 17-10-77 | |
| Drn. I.M. | Drg. No. 77-904 | |
| Director of Mines | Ckd. | |

200-4.70 A2412

## DRILL HOLE SAMPLES

| DEPTH (metres) | SAMPLE NUMBER | PETROLOGICAL SUMMARY: ROCK NAME | PETROLOGICAL SUMMARY: MINERALS PRESENT |
|---|---|---|---|
| MOUNT WOODS=1 | | | |
| 95.83 | TS14963 PS8393 | Diorite | Di, hy, andes, bio,qz,mt,il. |
| 96.04 | TS14964 PS8394 | Diorite | Di, hy, andes, bio,mt,hm,il. |
| 96.11 | TS14965 PS8395 | Diorite | Di,hy,andes,qz,bio,chl,mt,il. |
| 96.90 | TS14966 PS8396 | Diorite | Di,hy,andes,qz,bio,chl,mt,il. |
| 97.21 | TS14967 PS8397 | Diorite | Di,hy,andes,qz,bio,chl,mt. |
| 97.51 | TS14968 PS8398 | Altered diorite | Andes,kfs,qz,mt,femg. |
| 101.85 | TS14969 PS8399 | Contaminated diorite | Qz,hy,lab,bio,mt,il. |
| 102.26 | TS14970 PS8400 | Contaminated diorite | Qz ,lab,hy,kfs,mt,il. |
| 102.38 | TS14971 PS8401 | Contaminated diorite | Qz, lab, hy, mt, py. |
| 102.67 | TS14972 PS8402 | Contaminated diorite | Qz, andes, hy, mt, il. |
| 102.95 | TS14973 PS8403 | Contaminated diorite | Andes,hy, qz,mt,py,chc,il. |
| 103.68 | TS14974 PS8404 | Diorite | Qz,andes,hb,di,py,ap. |
| 104.32 | TS14975 PS8405 | Diorite | Andes,hy,bio,qz,mt,py. |
| 104.34 | TS14976 PS8506 | Diorite | Andes,px,qz,bio,hb,mt. |
| 104.70 | TS14977 PS8407 | Diorite | Andes,di,qz,bio,hb,mt,il,py. |
| 106.75 | TS14925 | Diorite | Andes,di,qz,amf,bio. |
| 107.54 | TS14926 | Diorite | Andes,di,hy,qz,kfs,bio. |
| 108.71 | TS14928 | Hornfels | Andes,di,qz,bio,amf. |
| 108.81 | TS14927 | Hornfels | Andes,di,qz,bio,amf,cnl. |
| 109.22 | TS14929 | Gneiss | Qz,andes,di,hb,bio,cnl. |
| 110.11 | TS14930 PS8476 | Gneiss | Qz,andes,bio,amf,cnl. |
| 110.36 | TS14931 | Gneiss | Andes,bio,qz,amf. |
| 113.46 | TS14932 | Aplite | Qz,pfs,mic,bio. |
| 114.60 | TS14933 | Diorite | Andes,qz,bio. |
| 120.78 | PS8478 | Magnetite | Mt,py. |
| 120.93 | PS8479 | Hornfels | Mt,py. |
| 123.14 | TS14934 PS8480 | Aplite | Qz,pfs,kfs,bio,cnl,hb. |
| 126.19 | PS8481 | Magnetite | Mt,py,chc. |
| 132.90 | TS14935 PS8482 | Hornfels | Andes,qz,bio,py,cnl,amf. |
| 135.66 | PS8483 | Magnetite | Mt,chc. |
| 145.08 | TS14936 | Hornfels | Andes,qz,di,tr-act,amf. |
| 145.57 | total depth. | | |

| DEPTH (metres) | SAMPLE NUMBER | PETROLOGICAL SUMMARY: ROCK NAME | PETROLOGICAL SUMMARY: MINERALS PRESENT |
|---|---|---|---|
| MOUNT WOODS=2 | | | |
| 93.27 | TS14949 PS8528 | Gabbro | Opx,cpx,lab,ol,amf. |
| 95.86 | TS14950 | Gabbro | Opx,cpx,lab,ol. |
| 99.39 | TS14951 | Gabbro | Opx,cpx,lab,ol. |
| 99.62 total depth | | | |
| MOUNT WOODS=3 | | | |
| 69.13 | TS14953 | Gabbro | Opx,cpx,lab. |
| 70.26 | TS14952 | Gabbro | Opx,cpx,lab. |
| 72.21 total depth | | | |
| MOUNT WOODS=4 | | | |
| 92.66 | TS14954 | Metamorphosed lime-stone | |
| 92.66 | TS14955 | Metamorphosed lime-stone | Cc,scp,hb,pfs,ep,qz. |
| 93.50 total depth | | | |
| MOUNT WOODS=5 | | | |
| 50.14 | TS14956 | Gabbro | Opx,cpx,lab. |
| 50.90 total depth | | | |
| MOUNT WOODS=6 | | | |
| 61.57 | PS? | Hematite | Hm. |
| 64.01 | TS14957 | Gneiss | Qz,mic,hb,pfs,chl. |
| 64.31 total depth | | | |
| MOUNT WOODS=7 | | | |
| 89.00 | TS14958 | Hornfels | Mt,chl,cc. |
| 90.07 | TS14959 | Aplite | Mic,qz,ab,bio,cc. |
| 90.53 | TS14960 | Hornfels | Tr-act,bio,qz,cc,cnl. |
| 91.03 total depth | | | |

## SURFACE SAMPLES

| SAMPLE NUMBER | PETROLOGICAL SUMMARY: ROCK NAME | PETROLOGICAL SUMMARY: MINERALS PRESENT |
|---|---|---|
| P308/62 | Quartz-feldspar-garnet gneiss | Qz,pfs,bio,gar,cdr. |
| P309/62 | Microcline-cordierite gneiss | Mic,cdr,qz,bio,opq,slm,pfs. |
| P310/62 | Quartz-orthoclase-garnet gneiss | Qz,or,bio,gar,opq. |
| P311/62 | Ironstone | Hm,qz,cc. |
| P312/62 | Quartz-feldspar-sillimanite gneiss | Mic,qz,bio,slm,opq,mus. |
| P313/62 | Quartz-feldspar-andalusite gneiss | Mic,qz,mus,pfs,bio,cdr,opy,and. |
| P314/62 | Feldspathic sandstone | CC, qz, kfs,pfs. |
| P315/62 | Fibrous mineral | Cc, clay |
| P316/62 | Plagioclase-hornblende hornfels | Pfs, hb, opq. |
| P317/62 | Plagioclase-diopside hornfels | Pfs,di, hb, qz, opq. |
| P318/62 | Quartz-feldspar-garnet gneiss | Qz, pfs, mic, bio, gar, or. |
| P319/62 | Metasediment | Qz, mic, bio, pfs, opq. |
| P320/62 | Metasediment | Goeth, qz, cc, bio. |
| P329/62 | Goethite | Goeth. |
| P259/70 | Quartz-microcline-cordierite hornfels | Qz,mic, cdr,opq,mus. |
| P260/70 | Quartz-microcline-cordierite hornfels | Qz,mic,opq,mus,cdr. |
| P171/75 | Porphyritic granite | Kfs,qz,opq. |
| P172/75 | Porphyritic granite | Kfs,qz,pfs,hb. |
| P173/75 | Porphyritic granite | Kfs,qz,opq. |
| P174/75 | Cordierite gneiss | Pfs,kfs,bio,cdr,qz,gar. |
| P199/76 | Granite | Qz,mic,pfs,bio. |
| P200/76 | Porphyritic adamellite | Qz,mic,pfs,bio. |
| P201/76 | Microgranite | Qz,mic,pfs,bio. |
| P202/76 | Microgranite | Qz,mic,pfs,bio. |
| P203/76 | Quartz-biotite-garnet schist | Qz,bio,mic,gar. |
| P204/76 | Adamellite gneiss | Qz,pfs,mic,bio. |
| P205/76 | Quartz-feldspar-cordierite hornfels | Qz,mic,pfs,cdr,mt. |
| P206/76 | Metasediment | Mic,cdr.qz,mt. |
| P207/76 | Quartz-microcline-cordierite gneiss | Mic,qz,cdr,mt,slm,bio. |
| P208/76 | Metamorphic rock | Pfs,qz,kfs,hb,opx,copx,mt. |

| SAMPLE NUMBER | PETROLOGICAL SUMMARY: ROCK NAME | PETROLOGICAL SUMMARY: MINERALS PRESENT |
|---|---|---|
| P209/76 | Granite | Mic,qz,pfs,mt. |
| P210/76 | Porphyritic adamellite | Pfs,mic,qz,bio,mt. |
| P211/76 | Granophyre | Kfs,qz,opq,pfs. |
| P212/76 | Gneiss | Scp,qz,mic,bio,hb,pfs. |
| P213/76 | Banded gneiss | Mic,qz,pfs,bio,hb,scp,cpx. |
| P214/76 | Granitic gneiss | Mic,qz,pfs,hb,bio. |
| P215/76 | Granite | Mic,qz,pfs,hb,bio. |
| P243/76 | Granite | Mic,qz,pfs,bio. |
| P1344/76 | Quartz-feldspar-biotite gneiss | Mic,qz,bio,gar. |
| P1345/76 | Porphyritic granodiorite | Pfs,qz,kfs,bio. |
| P1346/76 | Porphyritic granodiorite | Pfs,qz,bio,kfs. |
| P1347/76 | Quartz-magnetite gneiss | Qz,mt,kfs,act. |
| P1348/76 | Gneissic leucogranite | Mic,qz,pfs,bio. |
| P1349/76 | Gneissic adamellite | Pfs,qz,mic,bio. |
| P1350/76 | Gneissic granodiorite | Pfs,qz,mic,bio. |
| P1351/76 | Porphyritic granodiorite | Pfs,qz,mic,bio. |
| P1352/76 | Porphyritic adamellite | Kfs,pfs,qz,bio. |
| P1353/76 | Porphyritic adamellite | Pfs,mic,qz,bio. |
| P1354/76 | Gneissic adamellite | Kfs,pfs,qz,hb,bio. |
| P1355/76 | Porphyritic leucogranite | Mic,qz,pfs. |
| P1356/76 | Porphyritic microgranite | Kfs,qz,pfs,hb. |
| P1357/76 | Porphyritic microgranite | Kfs,qz,pfs,hb. |
| P1358/76 | Microgranite | Kfs,qz,bio. |
| P1359/76 | Porphyritic microgranite | Kfs,qz,pfs. |
| P1360/76 | Adamellite | Kfs,pfs,qz,bio,hb. |
| P1361/76 | Quartz-feldspar-cordierite gneiss | Qz,kfs,cdr,pfs,mt,bio. |
| P1362/76 | Sillimanite gneiss | Bio,slm,pfs,mic,qz,mus,mt,cdr. |
| P1363/76 | Granite | Kfs,qz,pfs,bio,opq. |
| P1364/76 | Hornblende gneiss, veins | Qz,pfs,mic,scp,hb,bio. |

| SAMPLE NUMBER | PETROLOGICAL SUMMARY: ROCK NAME | PETROLOGICAL SUMMARY: MINERALS PRESENT |
|---|---|---|
| P1365/76 | Olivine gabbro | Pfs,cpx,bio,opx,ol,opq. |
| P1366/76 | Cordierite hornfels | Qz,mic,cdr,pfs,mt. |
| P1367/76 | Adamellite gneiss | Mic,pfs,qz,bio. |
| P1368/76 | Garnetiferous gneiss | Pfs,qz,bio,gar,kfs. |
| P1369/76 | Garnetiferous gneiss | Pfs,qz,kfs,bio,gar. |
| P1370/76 | Adamellite gneiss | Pfs,qz,mic,bio. |
| P1371/76 | Granodiorite gneiss | Pfs,qz,bio,cnl. |
| P1372/76 | Gneiss | Kfs,qz,pfs,bio,gar. |
| P1373/76 | Quartz-feldspar gneiss | Kfs,qz,pfs. |
| P1374/76 | Quartz-feldspar gneiss | Mic,pfs,qz. |
| P1375/76 | Granodiorite gneiss | Pfs,qz,kfs,bio. |
| P1376/76 | Adamellite gneiss | Kfs,qz,pfs,mus,bio. |
| P1377/76 | Adamellite gneiss | Kfs,qz,pfs. |
| P1378/76 | Diorite | Pfs,hb,kfs,qz. |
| P1390/77 | Granite | Kfs,qz,pfs,bio. |
| P1492/77 | Acid gneiss | Qz,kfs,pfs,bio. |
| P 5/77 | Metaconglomerate | Qz,slm,opq. |
| P 6/77 | Metaconglomerate | Qz,slm,opq. |
| C16765 | Gneiss | Qz,pfs,kfs,slm,opq. |
| C16766 | Quartz-feldspar-cordierite gneiss | Qz,mic,pfs,cdr.bio. |
| C16767 | Quartz-feldspar-cordierite hornfels | Qz,mic,cdr,pfs,bio. |
| C16768 | Quartz-feldspar-cordierite hornfels | Qz,pfs,mic,cdr,bio. |
| C16769 | Quartz-microcline-cordierite gneiss | Qz,mic,cdr,slm,pfs,opq. |
| C16770 | Cordierite-garnet gneiss | Qz,pfs,cdr,bio,mic,gar. |
| C16771 | Quartz-feldspar-cordierite hornfels | Qz,pfs,mic,cdr,gar,spn. |
| C16772 | Quartz-microcline hornfels | Qz,mic,pfs,cdr. |
| C16773 | Cordierite-garnet gneiss | Mic,qz,pfs,cdr,gar,bio. |
| C16774 | Quartz-feldspar-garnet gneiss | Qz,mic,pfs,bio,gar. |
| C16775 | Gneiss | Qz,mic,bio,pfs,mus. |
| C16776 | Sillimanite gneiss | Qz, slm, cdr,bio,opq. |
| C16777 | Plagioclase-clinopyroxene hornfels | Pfs,cpx,hb,bio,opq. |

## LEGEND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ab | albite | cpx | clinopyroxene | lab | labradorite | py | pyrite |
| act | actinolite | di | diopside | kfs | potassium feldspar | px | pyroxene |
| amf | amphibole | dol | dolomite | mt | magnetite | qz | quartz |
| and | andalusite | ep | epidote | mic | microcline | scp | scapolite |
| andes | andesine | ferg | ferromagnesian minerals | mus | muscovite | sf | sphene |
| ap | apatite | | | ol | olivine | slm | sillimanite |
| aug | augite | gar | garnet | opq | opaques | spn | spinel |
| bio | biotite | goeth | goethite | opx | orthopyroxene | tr | tremolite |
| cc | calcite | hb | hornblende | or | orthoclase | | |
| cdr | cordierite | hm | hematite | pfs | plagioclase feldspar | P100/72 | Petrological sample |
| chc | chalcopyrite | hy | hypersthene | | | PS8400 | Polished Section |
| chl | chlorite | il | ilmenite | | | TS & C16777 | Thin Section |

Encl. 3

**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

MOUNT WOODS INLIER

PETROLOGY

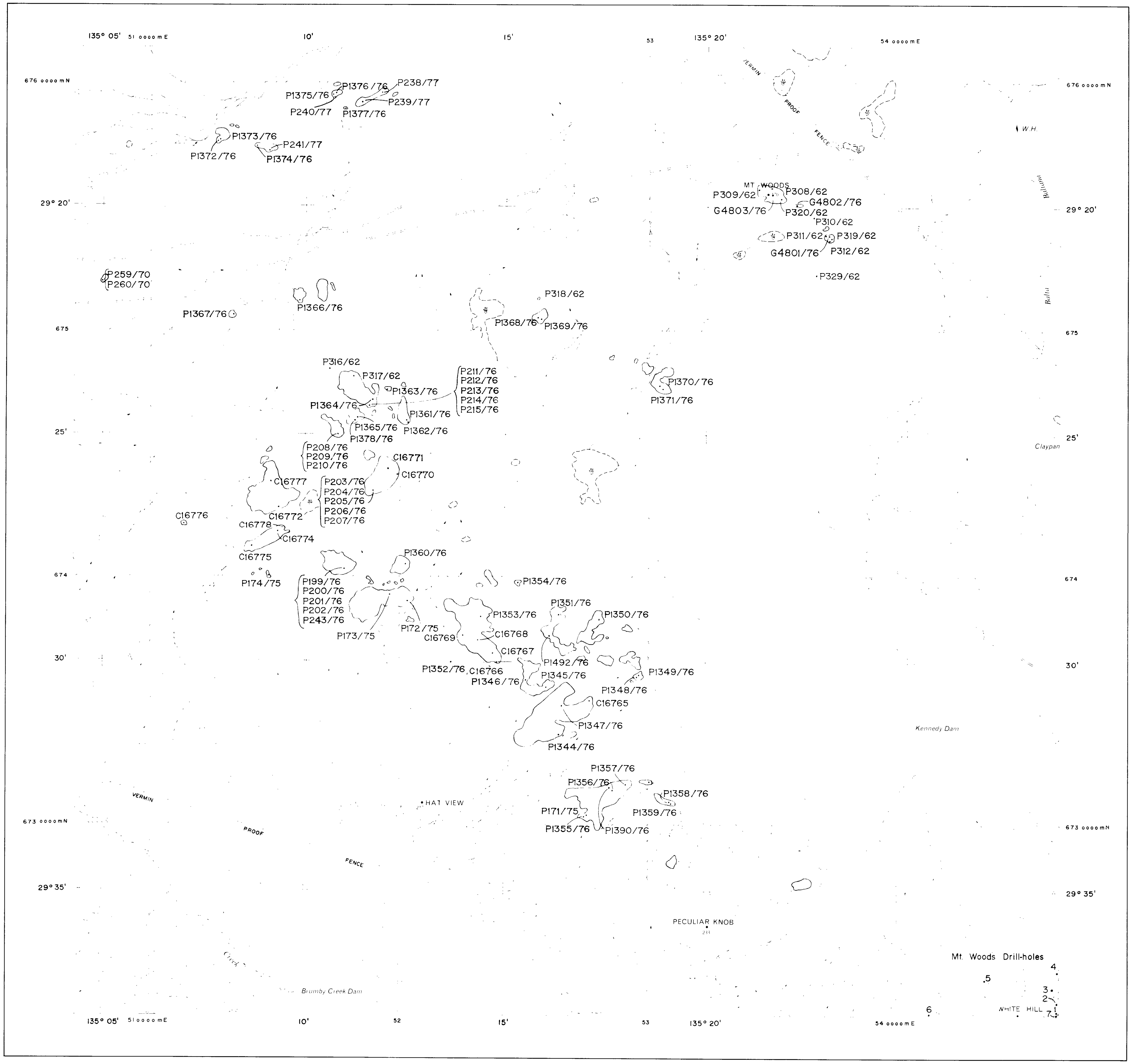
| | | |
|---|---|---|
| Director of Mines | Compiled R.B.F. | Scale: |
| | Drn. I.M. | Date: 17-10-77 |
| | Ckd. | Drg. No. 77-905 |

S.A. DEPT OF MINES

# MT. WOODS INLIER

## PETROLOGY

### THIN SECTIONED SPECIMEN LOCATION MAP




SCALE

KILOMETRES 2 1 0 2 4 6 8 10 12 14 KILOMETRES

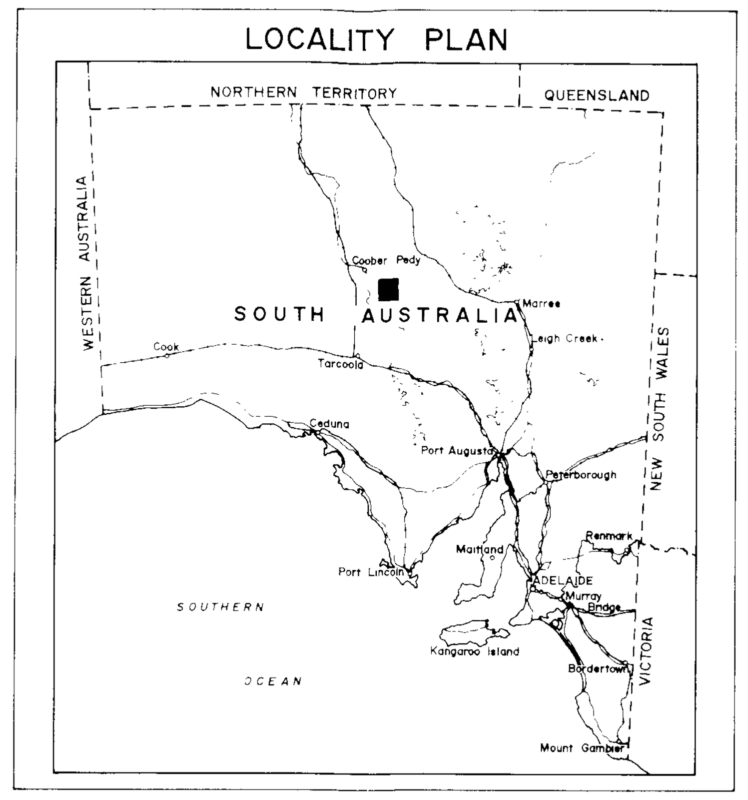
## REFERENCE

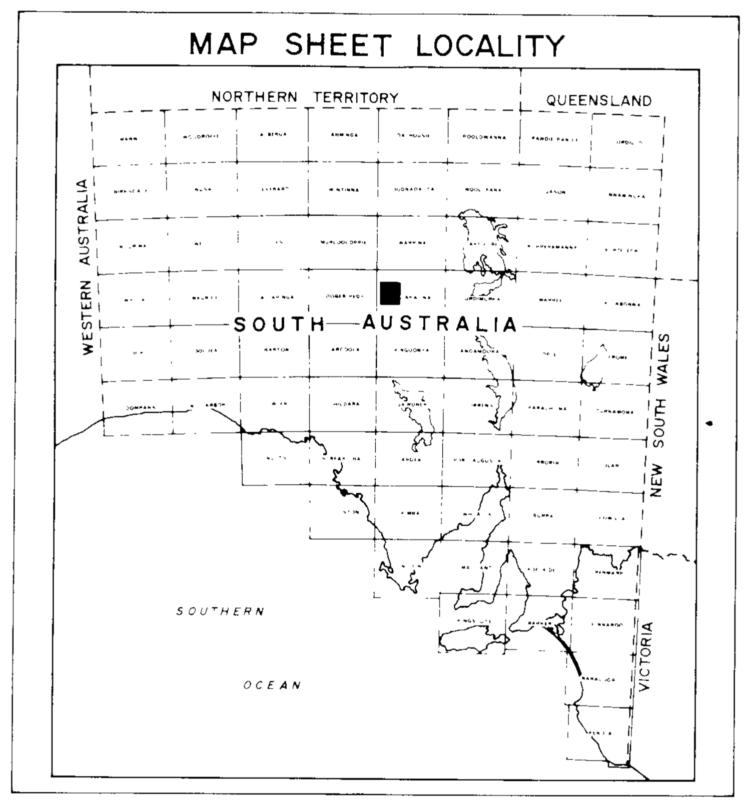
S.A.D.M. thin sectioned specimen number ........ •P260/76

A.M.D.E.L. thin section number .................. •C16770

S.A.D.M. geochemical specimen number ............ •G4801/76

Refer to Enclosure 3 for description.



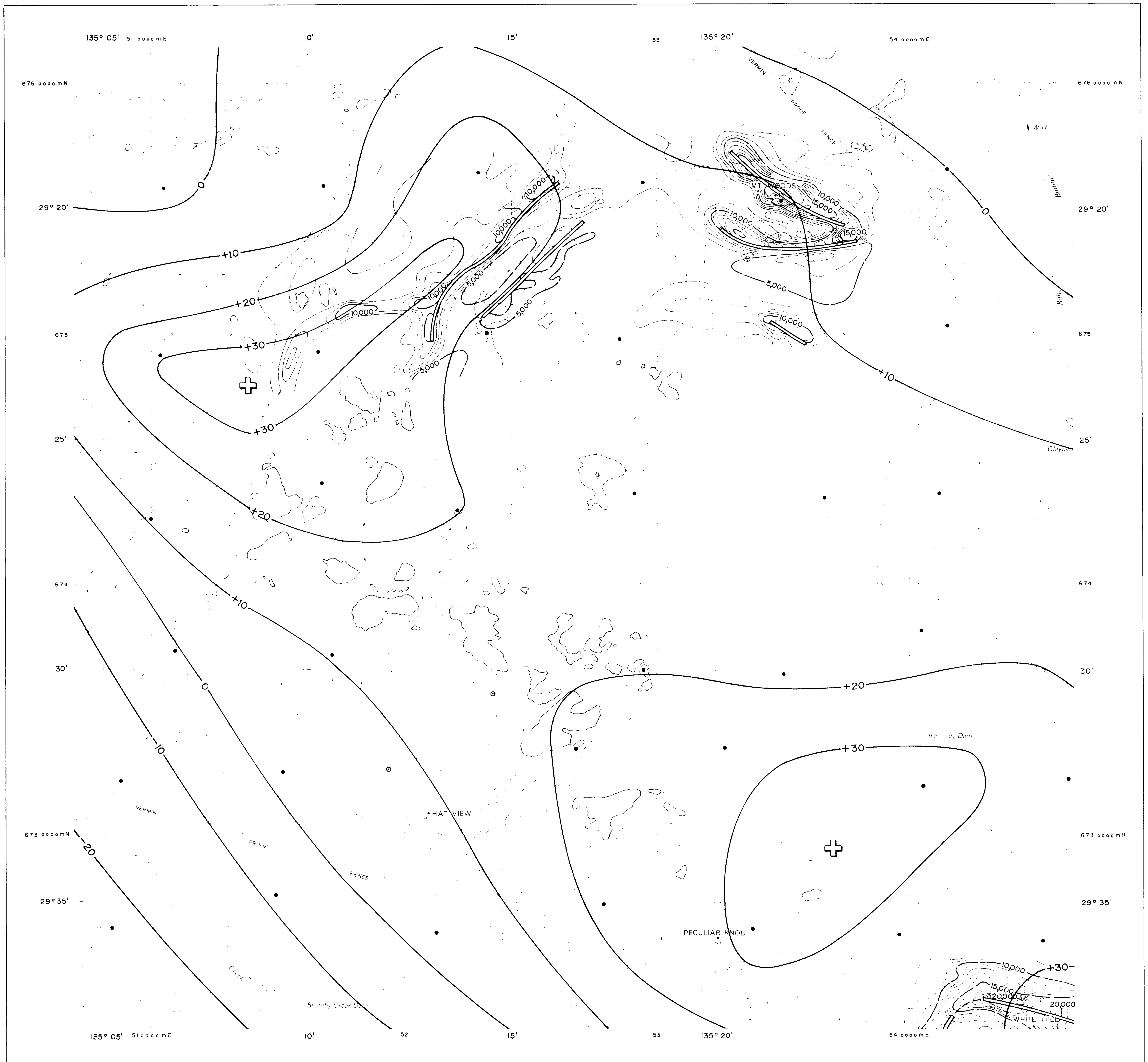

Enclosure 4

GEOLOGY: M.C. BENBOW, R.B. FLINT 77-365

S.A. DEPT OF MINES

# MT. WOODS INLIER

## BOUGUER GRAVITY AND AEROMAGNETIC CONTOURS




## REFERENCE

Bouguer Gravity contours, interval 10·0 m. gall.

Bouguer Gravity stations

(from BILLAKALINA 1:250 000 Bouguer Gravity Sheet, 1971.)

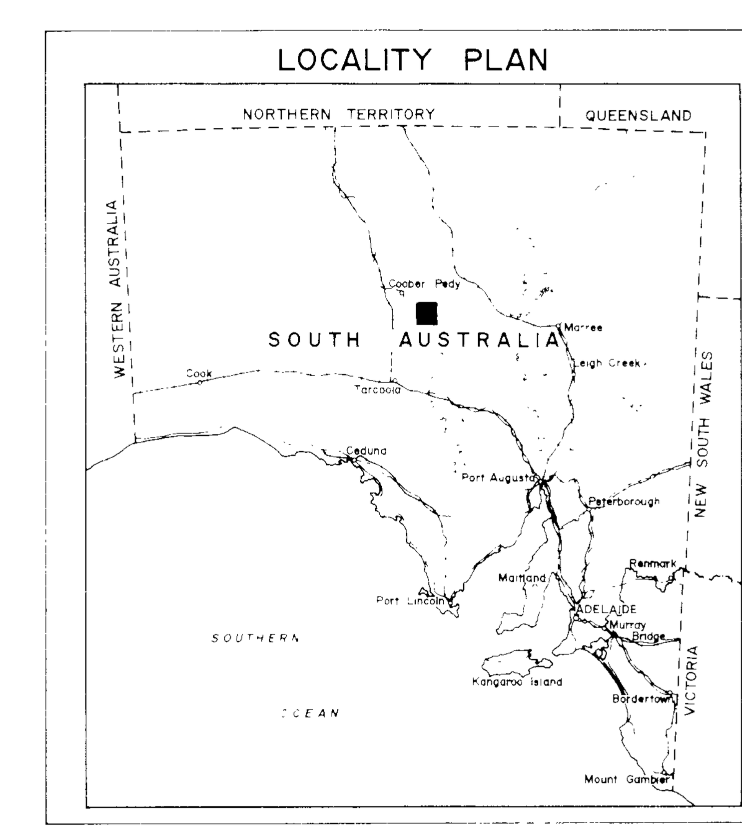
Total Magnetic Intensity, contour interval 1000 gamma

Flight interval approx. 400 metres, flight altitude 150 metres, base intensity arbitrary, coverage only where contoured

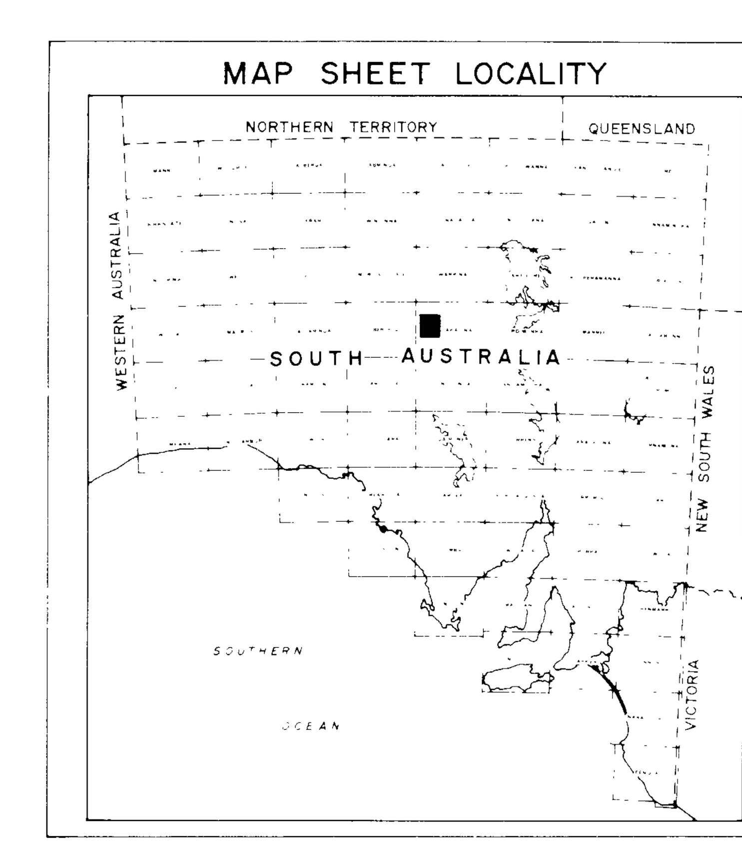
(Delhi Australia Petroleum Ltd. Envelope 213.)

Magnetic trend lines

LOCALITY PLAN




MAP SHEET LOCALITY




SCALE

KILOMETRES 2 1 0 2 4 6 8 10 12 14 KILOMETRES

Enclosure 5

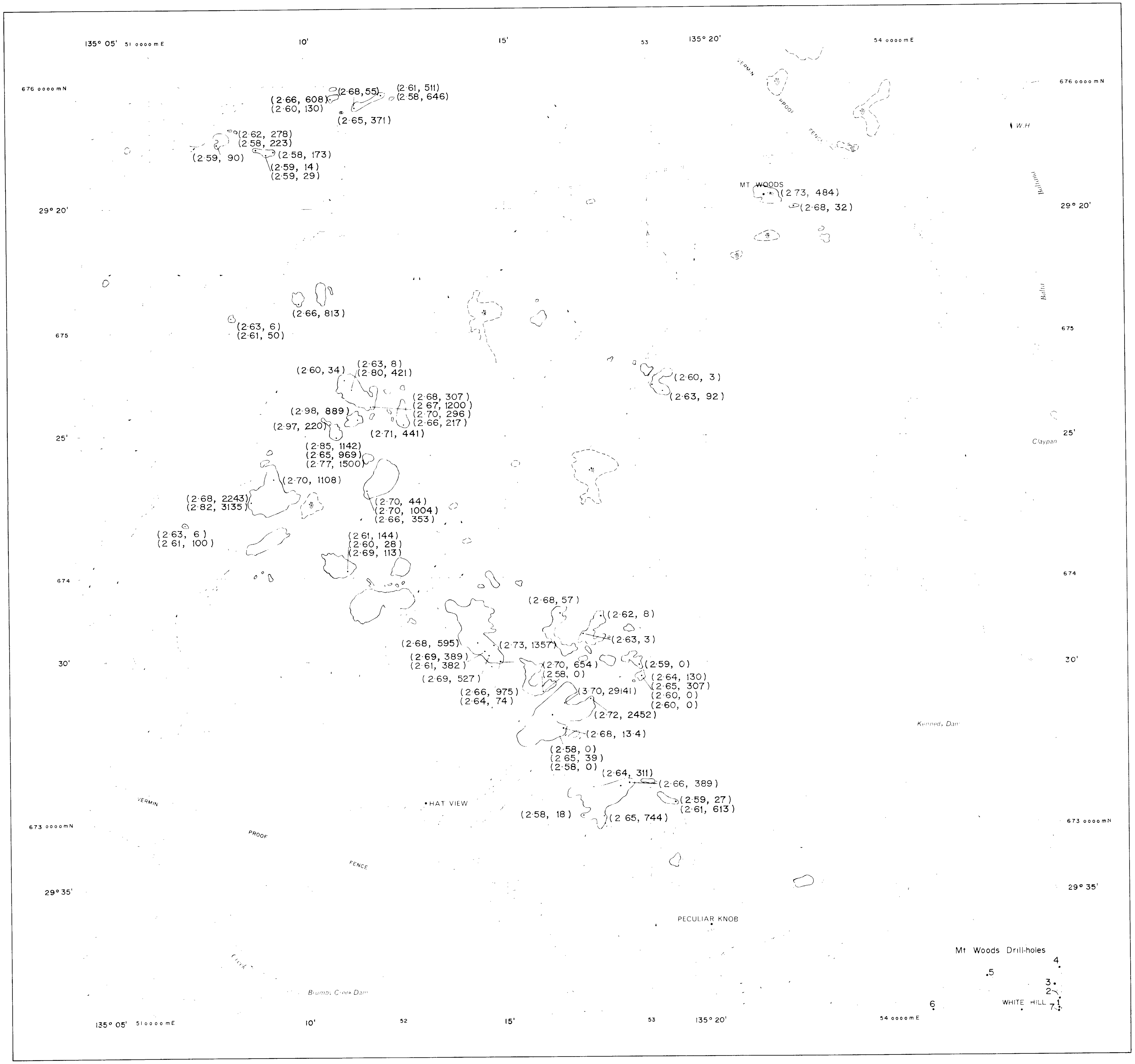
GEOLOGY M.C. BENBOW, R.B. FLINT

77-366

S.A. DEPT OF MINES

# MT. WOODS INLIER

## SPECIFIC GRAVITY AND MAGNETIC SUSCEPTIBILITY

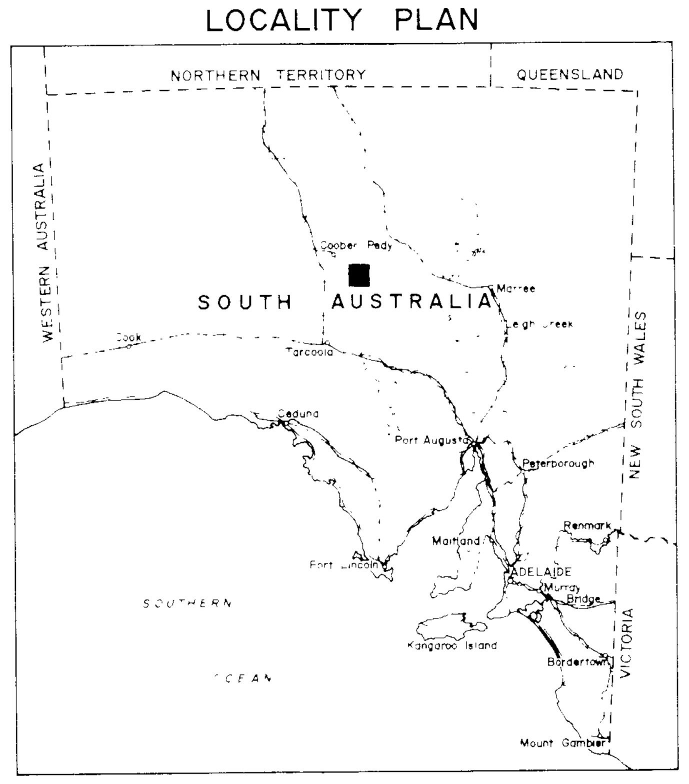



## REFERENCE

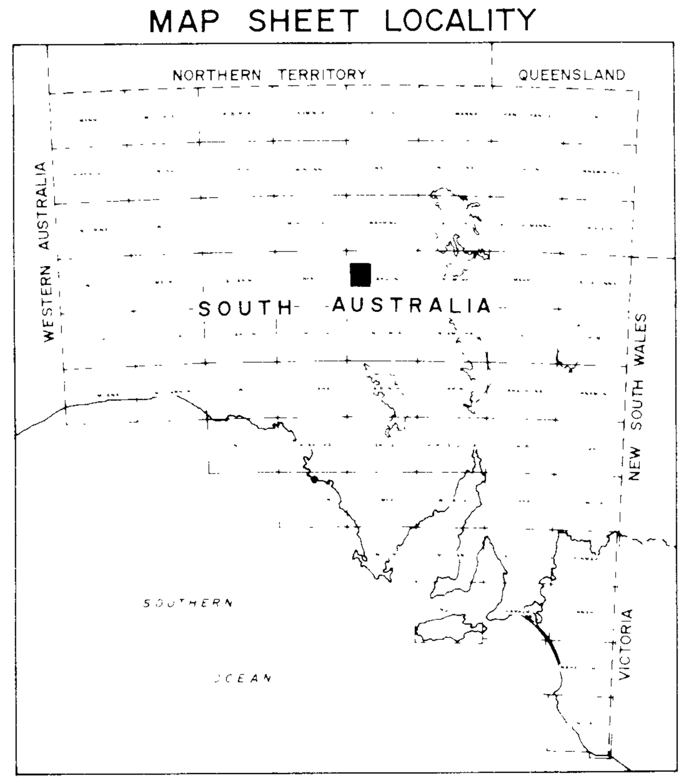
Specimen location: ........................................ ·(2·68, 325)

(specific gravity, magnetic susceptibility [x $10^{-5}$ cgs units] )

### LOCALITY PLAN




### MAP SHEET LOCALITY




Enclosure 6

SCALE

KILOMETRES 2 1 0 2 4 6 8 10 12 14 KILOMETRES

GEOLOGY M C BENBOW, R B FLINT 77-367