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PEMBERTON - IRWIN INLET

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

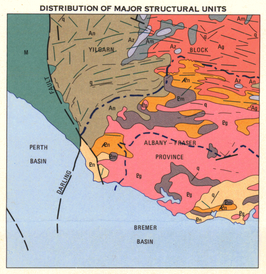
AUSTRALIA 1:250 000 GEOLOGICAL SERIES

SHEET SI 50 - 10 AND PART OF SHEET SI 50 - 14

SYMBOLS

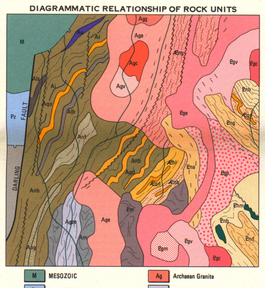
- Geological boundary
  - Accurate
  - Approximate
- Fault
  - Approximate
  - Normal and concealed
- Plunge of minor fold
- Gneissic foliation
  - Inclined
  - Vertical
  - Dip indeterminate
- Mineral foliation in plutonic rocks
  - Inclined
  - Vertical
  - Dip indeterminate
- Schistosity
  - Inclined
  - Vertical
- Direction and plunge of linseation
- Shear foliation in plutonic rocks
  - Inclined
  - Dip indeterminate
- Mylonitized shear zone
- Sheared plutonic rocks
- Attitude of laterite surface
- Air photo lineament
- Macrofossil locality
- Plant fossil locality
- Palynomorph locality
- Geochronological site
- Highway with national route marker
- Formed road
- Track
- Railway 3'6" with siding
- Power line
- Bridge
- Townsite, gazetted
  - Population 1 000 – 10 000 — MANJIMUP
  - Under 1 000 — Jardee
- Building
- Locality — Quinpup
- Airfield
- Landing ground
- Horizontal control : major, minor
- Bench mark, height accurate — cd 92 30m
- Transmitting station
- Sand dune
- Subtidal sand
- Reef exposed (intertidal), submerged
- Watercourse
  - Perennial
  - Intermittent
- Pool
- Bathymetric contour line, depth in metres
- Permanent water
- Well
- Spring
- Petroleum exploration well, dry hole, abandoned
- Mine, abandoned
- Quarry
- Quarry, abandoned
- Alluvial workings, abandoned
- Prospect
- Mineral occurrence
  - Clay — Cl
  - Coal — C
  - Crushed rock aggregate — Rc
  - Graphite — Gr
  - Heavy mineral sands — Hm
  - Kyanite — Ky
  - Limestone — Ls
  - Nickel — Ni
  - Peat — P
  - Pisolitic laterite gravel — Gr
  - Road material (gravel) — Rm
  - Sand, various purposes — Sd
  - Talc — T
  - Tin — Sn

DISTRIBUTION OF MAJOR STRUCTURAL UNITS



- Northern boundary of Albany–Fraser Province
- Onshore limit of Bremer Basin
- Major lineaments

DIAGRAMMATIC RELATIONSHIP OF ROCK UNITS

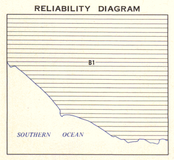


- MESOZOIC
- PALAEOZOIC
- PRECAMBRIAN, undifferentiated
- Proterozoic Granite
- Proterozoic Gneiss
- Archaean Granite
- Archaean Monzonite
- Archaean Gneiss
- Archaean/Proterozoic Gneiss

Compiled and published by the Geological Survey of Western Australia. Cartography by the Geological Mapping Section, Department of Mines. Topographic base from compilations by the Department of Lands and Surveys.

Copies of this map may be obtained from the Geological Survey of Western Australia, 66 Adelaide Tce., Perth.

RELIABILITY DIAGRAM



B1 Numerous traverses with air photo interpretation

HON. DAVID PARKER, M.L.A.
MINISTER FOR MINERALS AND ENERGY
A. F. TRENDALL, DIRECTOR, GEOLOGICAL SURVEY DIVISION

SCALE 1:250 000

1 0 5 10 15 20 25 30 Kilometres

TRANSVERSE MERCATOR PROJECTION
ZONE 50 AUSTRALIAN MAP GRID

INDEX TO ADJOINING SHEETS

INDIAN OCEAN	COLLIE SI 50 - 6	DUMBLEYUNG SI 50 - 7
BUSSELTON – AUGUSTA SI 50 - 2, 3	PEMBERTON – IRWIN INLET SI 50 - 10, 14	MT BARKER – ALBANY SI 50 - 11, 15
SOUTHERN OCEAN		

Geology by S.A. Wilde and I.W. Walker 1977-78

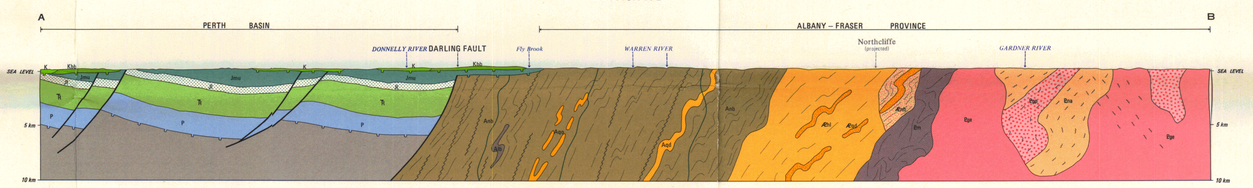
DECLINATION DIAGRAM

The line indicates magnetic declination, 1984 it shows declination to map and correction must be added to compass bearing to give true bearing – maps declination is used and correction must be subtracted from compass bearing to give true bearing.
Annual change is ~1' easterly

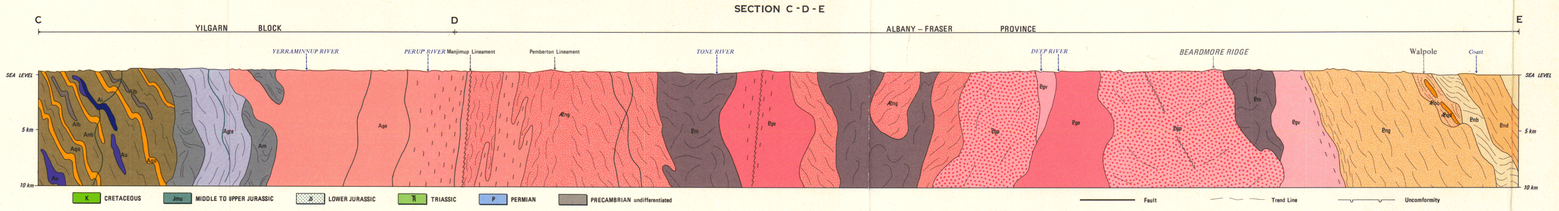
DIAGRAMMATIC SECTIONS

NATURAL SCALE

SECTION A-B



SECTION C-D-E



- CRETACEOUS
- MIDDLE TO UPPER JURASSIC
- LOWER JURASSIC
- TRIASSIC
- PERMIAN
- PRECAMBRIAN undifferentiated

Fault — Trend Line — Uncomformity

REFERENCE

GEOLOGICAL SURVEY & GENERAL LIBRARY
18 JUN 1991
DEPARTMENT OF MINES WESTERN AUSTRALIA

PHANEROZOIC — CAINOZOIC — QUATERNARY — RECENT

- Qrw Swamp and lacustrine deposits — peat, peaty sand and clay
- Qra Alluvium — clay, sand and loam
- Qre Estuarine, lagoonal and lacustrine deposits — clay, silt, marl with shell beds
- Qrs Eolian and beach line sand — slightly lithified and vegetated
- Qrsm calcareous quartz sand (mobile dunes)

PLEISTOCENE–RECENT

- Qpc Colluvium, including valley-fill deposits, variably lateritized and podsolized
- Qpcs Colluvium — sand, often associated with older drainage courses
- Qsp Thin veneer of sand with bands of ferruginous pisolithe, overlying Precambrian rocks
- Qas Sand — variously reworked, associated with older stream channels
- Qcp Hummocky calcareous sand with peaty horizons and small freshwater swamps, forming narrow coastal plain

PLEISTOCENE

- Qpl Dune limestone — eolian calcarenite, variably lithified, calcretized and leached to quartz sand
- Qpe Fixed dune sand over limestone, variously lithified and vegetated. Calcium carbonate content extremely variable
- Qpf Quartz sand in fixed dunes developed on subhorizontal plain. Basement ranges from Precambrian to Pleistocene in age and may include some limestone
- Qpa Alluvium — clay, sand, loam and gravel, variably lateritized and podsolized

TERTIARY — ?TERTIARY

- Czl Laterite — chiefly massive, but includes overlying pisolitic gravel and minor lateritized sand
- Czs Sand overlying laterite — yellow, white, grey or orange
- Cz Ferruginous soil with pisolithes and local areas of massive laterite (includes "Karri loam"). May contain small outcrops of rock
- Czc Complex association of laterite, pisolitic gravel, sand, colluvium, alluvium and small swamps, marking southern boundary of Blackwood Plateau
- Czc Conglomerate — cobble/pebble boulders (mainly quartzose) in sand or clay matrix, variably lateritized
- Czs Broad tracts of sandy alluvium often traversed by dunes, variously reworked by present drainage
- Czt terraces above alluvium, often lateritized
- Czw White colluvial sand, in various landscape positions, derived from earlier Tertiary deposits (especially PLANTAGENET GROUP)

TERTIARY — ?PLIOCENE

- Tpe Estuarine, lagoonal and lacustrine deposits — numerous small lakes and swamps. Linear dunes common

TERTIARY — EOCENE

Warnbro Group

- Tg Alluvial, lacustrine and (?) shallow marine deposits, strongly lateritized in part — conglomerate, grit, sand and clay (includes and overlies some WERILLUP FORMATION of the PLANTAGENET GROUP). Preserved mainly along drainage divides
- Tpz Sand rich in quartz fragments, pebbles and grit, derived locally from underlying quartz rocks
- Twp **PALLINUP SILTSTONE** : grey-brown siltstone and rare spongolite overlain by white residual sand. Local marine fossils

MESOZOIC — CRETACEOUS

- Kll **LEEDERVILLE FORMATION** : sandstone, siltstone and shale, with minor conglomerate and thin coal seams
- Klb **BUNBURY BASALT** : tholeiitic basalt, commonly porphyritic and vesicular. Local columnar jointing

JURASSIC

- Jky **YARRAGADEE FORMATION** : sandstone, siltstone and shale, with coal seams. Crops out in Fly Brook

PRECAMBRIAN UNDETERMINED

- Mafic dykes — fine to coarse-grained doleritic and gabbroic dykes, variously altered and metamorphosed
- g Granite dykes and veins
- p Pegmatite and aplite veins — late intrusions in granitic complexes
- pf Pegmatite dykes and veins — foliated and deformed intrusions in the gneisses north of Pemberton
- q Quartz dykes and veins

PROTEROZOIC

- Epe Even-grained granitic rocks — fine to medium-grained granodiorite, adamellite and granite, often partially recrystallized
- Epp Porphyritic granite — medium to coarse-grained granite with microcline megacrysts
- Epv Fine to medium-grained adamellite and granite with scattered microcline megacrysts
- Epc Coarse, even-grained granodiorite, adamellite and granite
- Epm Mixed granitic rocks, chiefly interdeveloped even-grained and porphyritic granite
- Emi Migmatite — nebulitic or with strongly contorted banding. Palaeosome often a streaked-out augen gneiss
- Ena Augen gneiss, coarse-grained with microcline augen, strong cataclastic foliation. Derived from porphyritic granite
- Eng Granitic gneiss, coarse-grained orthogneiss
- End Granitic gneiss, intensely deformed orthogneiss with conjugate folds common
- Enb Quartz-feldspar-biotite (-garnet) gneiss
- Enh Quartz-feldspar-hornblende (-biotite) gneiss
- Emu Granulite facies assemblages — interlayered ultramafic, mafic and felsic units containing ortho-and clinopyroxene

ARCHAEAN

Archaean rocks intensely deformed and metamorphosed in the Pemberton–Northcliffe area

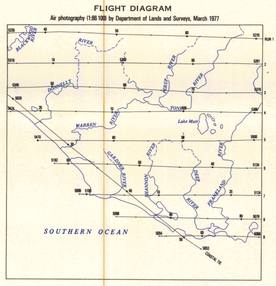
- Aeg Granitic orthogneiss — strongly deformed Archaean granite, locally interdeveloped with less deformed material
- Aeb Quartz-feldspar-biotite-garnet gneiss
- Aqd Deformed orthoquartzite with fine-grained mylonitic zones
- Ahi Fine to medium-grained leucocratic granulite, with perthitic feldspar and hypersthene
- Age Even-grained granite rocks — fine to medium-grained granodiorite, adamellite and granite
- Agc Coarse, even-grained adamellite and granite, grades into Age and Agv
- Agv Fine to medium-grained adamellite and granite with scattered microcline megacrysts
- Agg Leucocratic adamellite, fine to coarse-grained with abundant pegmatite
- Agd Dioritic rocks, range from monzonite to diorite. Small intrusions only
- Agpp Porphyritic hornblende-bearing quartz monzonite. Scattered amphibolite xenoliths
- Agcs Even-grained hornblende-bearing quartz monzonite. Local range to alkali granite and syenite. Often recrystallized and lineated
- Au Ultramafic bodies — peridotite and pyroxenite intrusions, variously deformed and metamorphosed to greenschist facies assemblages
- Aua Anthophyllite — talc schist
- Am Migmatite — banded and nebulitic, often strongly contorted
- Ana Augen gneiss, coarse-grained with microcline augen, strong cataclastic foliation
- Ang Granitic gneiss, coarse-grained orthogneiss, commonly with braided biotite foliation, includes local augen gneiss and migmatite
- Anb Quartz-feldspar-biotite (-garnet) gneiss, generally well-banded. Includes biastonynionite along Darling Scarp
- Aaf Quartz-feldspar-biotite (-hornblende-garnet) granofels, generally bluish with only weak foliation
- Anh Quartz-feldspar-hornblende (-biotite) gneiss
- Alb Quartz-mica schist, biotite generally in excess of muscovite
- Als sillimanite-bearing schist
- Alk kyanite-bearing schist
- Alc graphite-bearing schist
- Alm staurolite-bearing schist
- Alg Quartz-mica-garnet schist
- Alm Quartz-muscovite-chlorite phyllitic schist
- Aa Amphibolite, hornblende-plagioclase (-clinopyroxene) rocks, also includes minor hornblendite
- Aqs Quartzite — metamorphosed orthoquartzite, often with green chrome muscovite (fuchsite)
- Aqf Quartzite — deformed metamorphosed orthoquartzite, with kyanite, sillimanite and muscovite. Flaser to mylonitic texture
- Aqg Garnet quartzite — granoblastic, equigranular rock, with approximately equal amounts of garnet and quartz
- Ai Undifferentiated — chiefly quartz-magnetite-grunerite assemblages
- Aiq Banded magnetite-bearing quartzite

Banded iron-formations

Overprint, indicating bedrock largely obscured by residual and colluvial deposits

FLIGHT DIAGRAM

Air photography (1:80 100) by Department of Lands and Surveys, March 1977



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FIRST EDITION 1984

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