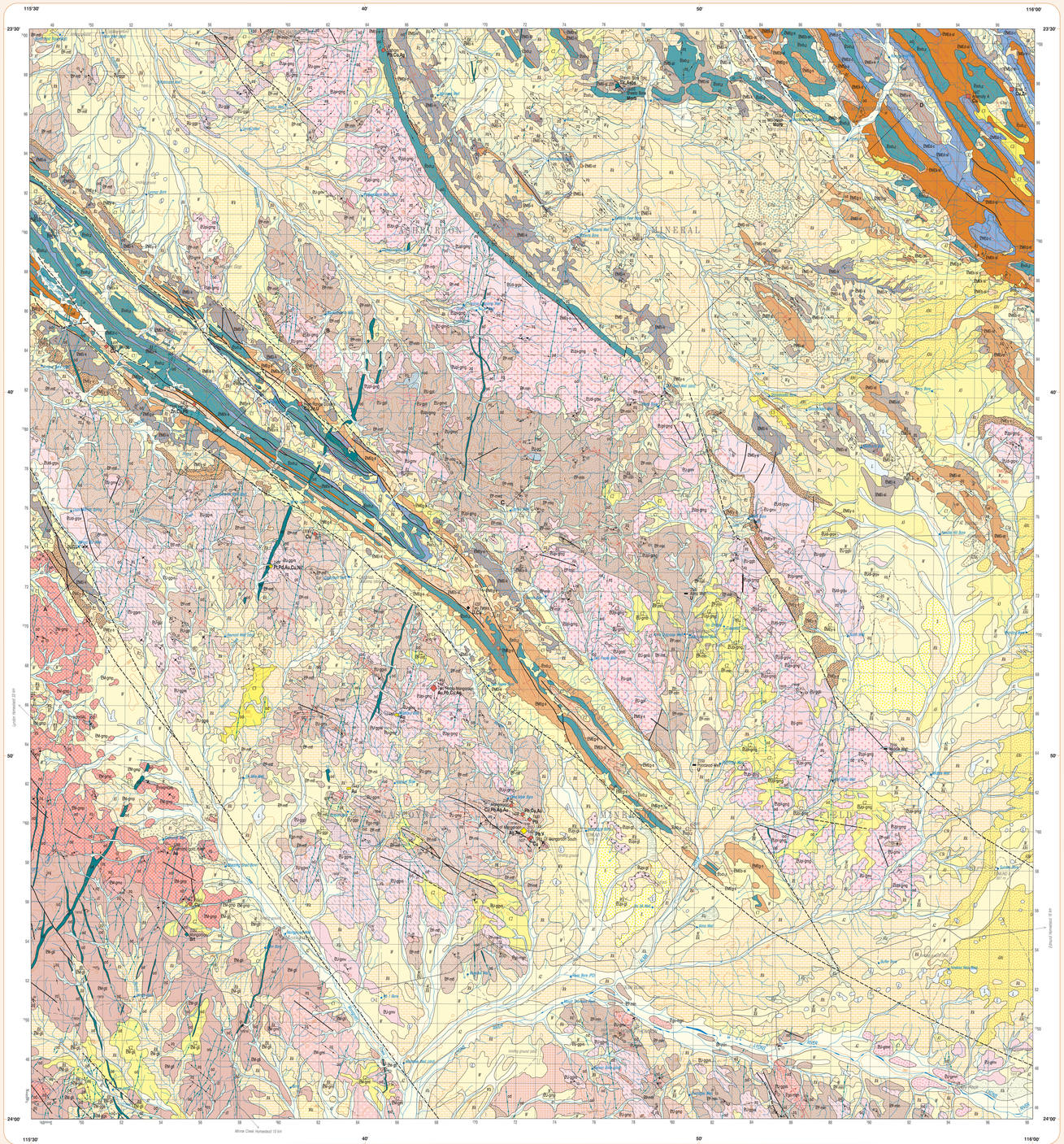
MANGAROON

AUSTRALIA 1 : 100 000 GEOLOGICAL SERIES — **GEOLOGICAL SURVEY OF WESTERN AUSTRALIA** — **SHEET 2050**



DIAGRAMMATIC SECTIONS

A — Mingo Bor Fault — Dooreenarrah Creek — LYNDON RIVER — HIGH RANGE — B

C — MARDONAH SOUTH ROAD — HENRY RIVER — D

PHANEROZOIC

CAINOZOIC — QUATERNARY — Unconsolidated

Sheetwash units
- *Sf* Sandy and clayey distal sheetwash and slope deposits, no clearly defined drainage
- *Rz* Clay, silt, and sand derived from saprolite and saprock
- *Rk* Distal sheetwash with colcrete cutans and carbonate cement
- *Rq* Predominantly quartz-rich silt, sand, and gravel derived from quartz veins and quartz-rich rock

Lacustrine unit
- *L* Unconsolidated, fine-grained deposits in claypans, perennial lakes, and swamps; low-lying areas with internal drainage; typically thickly vegetated

Sandplain unit
- *S* Quartz sand of mixed origin; includes residual and eolian sands

CAINOZOIC — QUATERNARY

Colluvial units, third generation
- *C7* Quartz and rock fragments in an unconsolidated silt and sand matrix; includes ferruginous deposits
- *C3s* Swelling clay (gilgai) and rock fragments, mostly developed over dolerite
- *C3k* Quartz and rock fragments in an unconsolidated silt and sand matrix; contains colcrete cutans and carbonate cement
- *C3q* Quartz fragments in an unconsolidated silt and sand matrix, derived from quartz veins and quartzose rocks
- *C3ds* Sandstone fragments in a silt and sand matrix, derived from sandstone

Alluvial units, third generation
- *A1* Unconsolidated silt, sand, and gravel in active drainage channels; includes ferruginous deposits
- *A3* Unconsolidated, mainly fine-grained deposits in drainage depressions
- *A3s* Silt, sand, and gravel as stream-bank deposits marginal to active channels, incised by modern drainage

Colluvial units, second generation
- *C2* Quartz and rock fragments in a partly consolidated silt and sand matrix

Alluvial units, second generation
- *A2* Partly consolidated silt, sand, and gravel; partly dissected by present-day drainage

Colluvial units, first generation
- *C1* Quartz and rock fragments in a weakly cemented and compacted silt and sand matrix; deeply dissected valley-fill deposits

Alluvial units, first generation
- *A1* Weakly cemented and compacted silt, sand, and gravel; deeply dissected by present-day drainage
- *A1fd* Sand and gravel with ferruginous cement; deeply dissected by present-day drainage

Residual or relict units
- *Rf* Ferruginous deposits, including lateritic, ferruginous, and mangan
- *Rk* Colcrete, developed in and adjacent to alluvial channels; locally silicified; dissected by major present-day drainage lines
- *R1* Saprolite and saprock of uncertain protolith
- *Rz* Silcrete and brecciated siliceous outcrop

MESOPROTEROZOIC

- *Qz* Quartz veins, of various ages
- *do* Dolerite dykes, sills, and small intrusions, of various ages; one suite dated at c. 755 Ma[1]; includes minor quartz diorite, tonalite, and biotite monzogranite

Edmundian Orogeny (1070–750 Ma[1])

- *EdDo-g* Dolerite and gabbro sills intruded into **Edmund Group**; oldest suite (Pds) dated at c. 1465 Ma[3,4], and youngest suite (Pds) dated at c. 1070 Ma[3,4]

PALAEOPROTEROZOIC – MESOPROTEROZOIC

Bangemall Supergroup — Edmund Group

- *EMEs-k* **DEVIL CREEK FORMATION:** laminated dolostone and dolomitic siltstone; local thick-bedded dolorudite
- *EMEs-c* **DISCOVERY FORMATION:** massive or laminated chert; silicified mudstone, and siltstone; local silicified sandstone and conglomerate
- *EMEs-st* Siltstone
- *EMEs-k* **KIANGI CREEK FORMATION:** siltstone, mudstone, and thin to very thick bedded quartz sandstone; minor dolostone and conglomerate
- *EMEs-st* Siltstone; minor fine-grained sandstone
- *EMEp-k* **CHEYNE SPRINGS FORMATION:** dolosilite, dolarenite, dolorudite, mudstone, siltstone, and minor sandstone
- *EMEs-st* Medium- to thick-bedded sandstone and siltstone; locally sulfidic
- *EMEs-sl* **BLUE BILLY FORMATION:** siltstone and mudstone; minor thin- to thick-bedded sandstone; locally sulfidic
- *EMEg-s* **GOORAGOORA FORMATION:** fine- to coarse-grained sandstone and siltstone; minor conglomerate, dolostone, and dolomitic siltstone
- *EMEs-k* **IRREGULLY FORMATION:** stromatolitic and non-stromatolitic dolostone, dolomitic siltstone, quartz sandstone, and conglomerate
- *EMEs-ss* Sandstone and siltstone; minor dolostone
- *EMEs-st* Siltstone, sandstone, and dolomite
- *EMEs-st* Sandstone, conglomerate, siltstone, and dolostone
- *EMEp-st* **YILGATHERRA FORMATION:** sandstone, siltstone, conglomerate, and dolostone
- *EMEg-st* Siltstone and sandstone

c. 1605 Ma[1]

Mongarroon Orogeny (1680–1620 Ma)

1685–1620 Ma[1,2]

Dunbarton Supersuite

- *BUgqb* Mesocratic, medium-grained, equigranular biotite granodiorite
- *BUgqp* Grey, massive, medium-grained, porphyritic biotite granodiorite
- *BUgqs* Schlieric, medium-grained biotite-muscovite granodiorite with abundant inclusions of metasedimentary rock and augen gneiss; minor fine-bonded biotite-muscovite monzogranite with inclusions
- *BUgmb* Equigranular, medium-grained biotite monzogranite
- *BUgmp* Cream, massive, medium-grained, porphyritic biotite(-muscovite) monzogranite
- *BUgmv* Cream, medium-grained muscovite-biotite granodiorite and monzogranite; equigranular or weakly porphyritic
- *BUgmel* Cream, medium-grained muscovite-biotite(-tourmaline-)(cordierite) monzogranite; locally garnet bearing
- *BUgpt* Tourmaline-muscovite pegmatite and coarse-grained granite, and fine-grained, leucocratic tourmaline–muscovite monzogranite
- *BUpb-gpv* **DINGO CREEK GRANITE:** porphyritic biotite-muscovite granite; fine to medium grained with thin, tubular K-feldspar phenocrysts defining a trachytic texture
- *BUpg-pmg* **PIMIYARA GRANITE:** massive, medium-grained, megacrystic and porphyritic biotite(-muscovite) monzogranite; tubular megacrysts of K-feldspar up to 7 cm long
- *BUpl-gt* Equigranular, fine- to medium-grained biotite tonalite and granodiorite
- *BUvg* Massive metagabbro with xenocrysts of quartz and K-feldspar

c. 1680 Ma[4,7]

Poorarra Metamorphics

- *BH-mi* Migmatitic pelitic gneiss (dictexite and metatexite migmatite)
- *BH-mn* Pelitic gneiss and granofels composed of biotite-muscovite-quartz-plagioclase-sillimanite; also includes migmatitic pelitic gneiss
- *BH-mt* Metamorphosed feldspathic sandstone and psammitic schist; includes interbedded pelite, quartzite, and metamorphosed granule conglomerate
- *BH-mtq* Metamorphosed calcite and pebble conglomerate, quartz arenofels, and pebbly quartz arenofelsite
- *BH-mwo* Amphibolite and actinolite-plagioclase schist

c. 1770 Ma[1,7]

- *BHgn-ngm* **GOOCHE GNEISS:** strongly foliated, porphyritic granodiorite and monzogranite, and augen gneiss

Warrgmoon Zone — GARDNER CRATON

1795–1785 Ma[4,8]

Mooroo Supersuite

Capricorn Orogeny (1830–1780 Ma[1])

- *BM-gmo* Fine-grained, leucocratic biotite monzogranite
- *BM-gge* Equigranular to sparsely porphyritic, medium-grained biotite(-muscovite) granodiorite
- *BM-gm* Massive, equigranular, medium-grained, leucocratic biotite monzogranite
- *BM-gmp* Massive, medium-grained, porphyritic biotite monzogranite; round phenocrysts of K-feldspar up to 5 cm in diameter; minor fine- to medium-grained, sparsely porphyritic monzogranite
- *BM-gt* Medium- to coarse-grained tonalite with abundant mafic clots; lesser medium-grained granodiorite with scattered mafic clots

c. 1840 Ma[4]

- *EmggGAL* Quartz–mica schist and metamorphosed, fine-grained sandstone

Limejuice Zone

1806–1794 Ma[4]

- *EmggGAB* Foliated and gneissic granodiorite and tonalite; weakly pegmatite bonded *(Section only)*

Bloods Bloom Zone

- *EmmGAB* Pelitic to psammitic schist; includes muscovite-quartz-andalusite-garnet-plagioclase-biotite schist *(Section only)*

EDMUND BASIN

Geological boundary

- exposed
- concealed

Structural symbols are labelled according to the sequence of deformation events, where known

Edmundian Orogeny (1070–750 Ma)
- Edmund Fold Belt — D_{Ed}, D_{Ed}
- D_{Ed}

Mongarroon Orogeny (1680–1620 Ma)
- D_{Mo}
- D_{Mo}

Fault
- exposed
- concealed
- concealed, position uncertain

Fold, showing axial trace and generalized plunge direction
- anticline; exposed, concealed
- synclne; exposed, concealed
- antiform; exposed, concealed
- synform; exposed, concealed

Small-scale fold axial surface, showing strike and dip
- inclined
- vertical

Small-scale fold axis, showing trend and plunge
- anticline
- syncline
- antiform
- S-vergence
- M-vergence
- Z-vergence

Locality of superposed fold

Bedding, showing strike and dip
- inclined
- vertical
- overturned
- trend of bedding

Igneous layering, showing strike and dip
- inclined
- vertical

Igneous flow banding, showing strike and dip
- inclined
- vertical

Igneous contact, showing strike and dip
- inclined

Way-up indicator
- graded bedding

Metamorphic foliation, showing strike and dip
- inclined
- vertical

Gneissic banding, showing strike and dip
- inclined

Trend of foliation or gneissic banding

Cleavage, showing strike and dip
- inclined
- vertical

Crenulation cleavage, showing strike and dip
- inclined
- vertical

Shear-sense indicator
- dextral
- sinistral
- showing dip of foliation
  - dextral
    - inclined
    - vertical
  - sinistral
    - inclined
    - vertical

Mineral lineation, showing trend and plunge
- inclined

Axis of crenulation, showing trend and plunge
- inclined

Bedding–cleavage intersection lineation, showing trend and plunge
- inclined

Cleavage–cleavage intersection lineation, showing trend and plunge
- inclined

Slickenside, showing direction and plunge of striation

Anchetic lineament
- unspecified

Isotopic age determination site with identification number — 18/50

Formed road

Track

Fence, generally with track

Homestead — Mangaroon

Locality — Methoona

Building

Yard

Horizontal control; major, minor

Contour line, 20 metre interval — 20m

Watercourse with ephemeral pool or waterhole

Pool — Pool

Spring — Spring

Bore, well — Bore, Well

Windpump, solar pump

Dam, tank — Dam, Tank

Abandoned — (abnd)

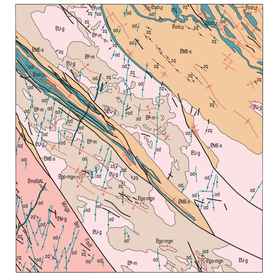
Position doubtful — (PD)

Mineral field boundary

Mine, abandoned mine, deposit or prospect — Star of Mongaroon

Mineral exploration drillhole showing subsurface data — DM20

INTERPRETED BEDROCK GEOLOGY



MINERAL OCCURRENCES

MINERALISATION STYLES*

- Vein and hydrothermal
- Bimdsbound Sedimentary
- Orthomagmatic
- Regolith hosted
- Undivided

MINERAL AND ROCK COMMODITY GROUPS

- Precious metal
- Base metal
- Industrial mineral
- Energy mineral
- Construction material

MINERAL AND ROCK COMMODITIES

Asbestos, serpentine (chrysotile)	Asbs
Barite	Brt
Copper	Cu
Gold	Au
Lead	Pb
Marble	Mrbl
Nickel	Ni
Palladium	Pd
Platinum	Pt
Silver	Ag
Talc	Tlc
Uranium	U
Vanadium	V
Zinc	Zn

OPERATING STATUS AND SITE IDENTIFICATION NUMBER

Operating mine	e.g. 15555
Abandoned mine	e.g. 1442
Mineral deposit	e.g. 3161
Mineral occurrence or prospect	e.g. 2439

Mineral occurrences and numbers are from the GSWA MAWIN database.

*Longer symbols represent mines or deposits also in the DoIR MINEDEX database

DATA DIRECTORY

Theme	Data Source	Data Currency	Agency
Geology	GSWA	1990–2002	Dept of Industry and Resources
Structural data	WAROX	FEB 2004	Dept of Industry and Resources
Mineral occurrences (non-confidential)	MINEDEX	FEB 2004	Dept of Industry and Resources
	MAWIN	FEB 2004	Dept of Industry and Resources
Cadastre	TENGRAPH	APR 2004	Dept of Industry and Resources
Horizontal control	GEOMAR	MAY 2004	Dept of Lund Information
Topographic nomenclature	GEONOMA	APR 2004	Dept of Lund Information
Topography	DLI and GSWA field survey	2002	Dept of Lund Information

Bongemall Supergroup geology by D. McB. Martin and A. M. Thorne 1998–1999
Gascoyne Complex geology by S. Sheppard 2002

Geochronology by:
- [1] W. T. D. Wingate and J. W. Goldfarp, 2000, Precambrian Research, v. 100, p. 339–357.
- [2] M. T. D. Wingate, 2002, GSWA Record 2002/4.
- [3] D. R. Nelson, 2001, GSWA Record 2001/2, p. 15–20.
- [4] D. R. Nelson, 1998, GSWA Record 1998/2, p. 194–197.
- [5] D. R. Nelson, in prep., GSWA Record.
- [7] D. R. Nelson, 2002, GSWA Record 2002/2, p. 35–62.
- [8] D. A. D. Evans et al., 2003, Australian Journal of Earth Sciences, v. 50, p. 853–864.

Interpreted Geochronology by:
- [2] D. McB. Martin and A. M. Thorne, 2004, Precambrian Research, v. 128, p. 385–409.
- [6] S. Sheppard et al., 2001, GSWA Record 2001/8, p. 3–4.

Edited by F. Eddison and G. Lunn

Cartography by G. Wright, A. Francois, and K. Greenberg

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www.doir.wa.gov.au/gswa Email: geological.survey@doir.wa.gov.au

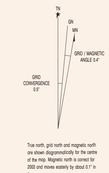
The recommended reference for this map is:
SHEPPARD, S., MARTIN, D. McB., and THORNE, A. M., 2004, Mongaroon, W.A. Sheet 2050: Western Australia Geological Survey, 1:100 000 Geological Series

SHEET INDEX

800 BOL (10)	BINNING (10)	TOMSON (10)	MARCONAH (20)	CLAWARRA (20)	CAPRICORN (20)
BARNARDO (10)	DE GREY RANGE (10)	LYNDON (10)	MAGAZINE (10)	DE GREY (10)	ELLEY CREEK (10)
BOOLYGOOROO (10)	MIRRATHONA (10)	MOUNT SANDIMAN (10)	EDMUNDRAH (10)	MOUNT PHILIPS (10)	MOUNT AUGUSTUS (10)
DOOREENARRAH (10)	DE GREY (10)	LONG RIVER (10)	LOCKIER (10)	DE GREY (10)	PINDALLS (10)

100 000 maps shown in black
(100 000 maps shown in brown)

Non-series maps used to compilation shown in grey
See current GSWA map catalogue for full range of published products



True north, grid north and magnetic north are shown diagrammatically for the centre of the map. Magnetic north is correct for 2000 and moves easterly by about 0.1° in 1 year.

SCALE 1:100 000

1000 0 1 2 3 4 5 6 7 8 9 10
Metres — Kilometres

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUSTRALIA 1994
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM

Grid lines indicate 1000 metre interval of the Map Grid Australia Zone 50

The Map Grid Australia (MGA) is based on the Geocentric Datum of Australia 1994 (GDA94). GDA94 positions are compatible within one metre of the datum WGS84 positions

GDA

Department of Industry and Resources
CLIVE BROWN, M.L.A. — MINISTER FOR STATE DEVELOPMENT
JIM LIMERICK — DIRECTOR GENERAL

Geological Survey of Western Australia
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MANGAROON

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