

UNIT DESCRIPTIONS

Quaternary

- Alluvial unit**
 - Qa: Surficial channel
- Colluvial units**
 - Qc: Colluvium, dominantly quartzitic/igneous materials
 - Qm: Colluvium, dominantly metamorphic materials
- Sheetwash unit**
 - Qs: Sheetwash fan, very gently inclined bedforms (<1° dip), extremely low relief
- Eolian units**
 - Ea: Eolian sandfield
 - Ed: Eolian duneplain
 - Es: Eolian scarp or low dune/ridge and/or colluvium
- Residual units**
 - Ra: Residual or soil, ferruginous nodules, ferruginous and ferruginous saprolite, ferruginous duricrust, also includes transported material, cemented or uncemented ferruginous gravel
 - Rb: Groundwater caliche, locally low to medium, reddish to massive, commonly with alternating layers of caliche and claystone

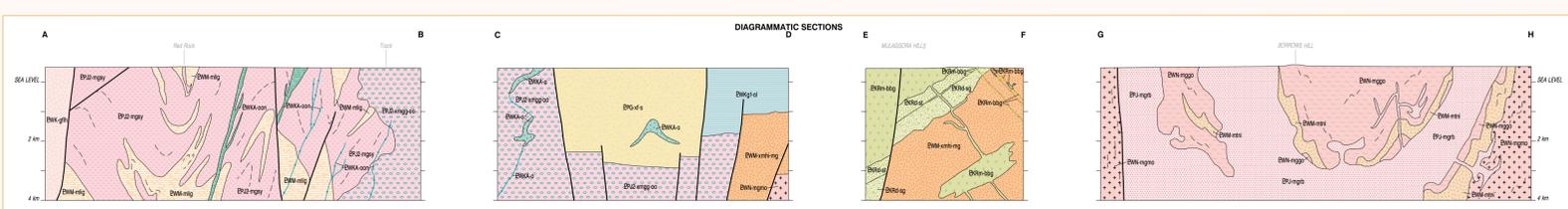
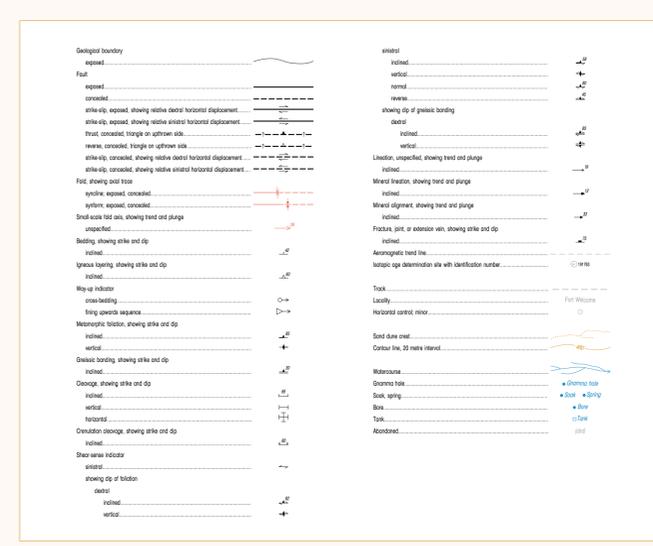
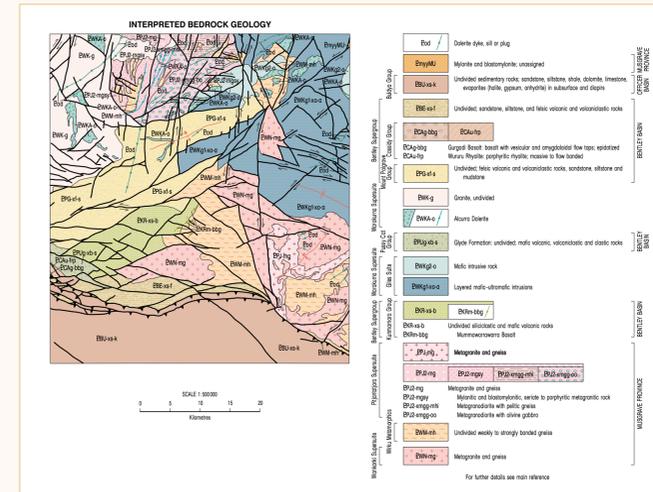
Palaeozoic

Permian Orogeny (170-530 Ma)

- Ba: Basalt, diabase, gabbro, fine to medium-grained diorite and gabbro
- Bb: Metasediments and diorites of various ages, typically quartzite to subvolcanic, locally with garnet coronas around pyroxene, interpreted from cartographic data where dashed
- Bc: **TONGUE QUARTZITE and LEROY FORMATION**, limited to very thick bedded well-sorted, massive to columnar grained quartzite and mafic gneiss, minor conglomerate and shale beds, medium to large scale cross bedding
- Bd: **Giles Event (1085-1040 Ma)**
 - Bd-ef: Undeformed, sandstone, siltstone, and felsic volcanic and volcanoclastic rocks, minor mafic volcanic rocks
 - Bd-eg: Undeformed, felsic volcanic and volcanoclastic rocks, siltstone, siltstone and mafic volcanic rocks (section only)
 - Bd-eh: Phyllite and tectonically deformed sandstone and siltstone, carbonaceous, gneiss and metagneiss
 - Bd-ek: Amphibole schist, mafic schist, amphibolite, gneiss, gneiss, locally with pyroxene phenocrysts and glaucophane schist
 - Bd-el: Phyllite and tectonically deformed siltstone, locally with pyroxene phenocrysts
 - Bd-em: Phyllite and tectonically deformed siltstone, locally with pyroxene phenocrysts and glaucophane schist
- Bf: **Medley Group**
 - Bf-ga: Fine to medium-grained quartzite, contains K-feldspar phenocrysts up to 5 mm, locally with spiculated texture
 - Bf-gb: Medium-grained, leucocratic, sheeted mafic gneiss with extensive granophyric texture
 - Bf-gc: Medium-grained, leucocratic, sheeted mafic gneiss with hornblende cores and granophyric texture
 - Bf-gd: Fine to medium-grained, porphyritic to siltstone, locally with pyroxene phenocrysts, leucocratic to locally mafic, locally abundant K-feldspar phenocrysts up to 1 cm, sparse relict layers
 - Bf-ge: Massive, fine-grained granodiorite, locally epidotized
- Bg: **ALBERTA GABBRO**, siltstone, siltstone or plug, many of siltstone, thin to olive, hornblende, hornblende and hornblende
- Bh: **CHALK HILL VOLCANICS**, phyllite, phyllite and lesser diorite and basalt and subvolcanic siltstone and gabbro, includes up to 10% subvolcanic to subvolcanic phenocrysts up to 8 mm, locally bedded, low bedded, agglomerated or spherulitic
- Bi: **Gibber**, quartzite to subvolcanic, locally mixed and mingled with leucocratic, locally foliated and mylonitic
- Bj: **Mafic intrative rock**, massive or weakly bedded, locally mingled with leucocratic, undeformed
- Bk: **Medium-grained amphibolite to leucogabbro**
- Bl: **Coarse-grained leucocratic, locally massive, locally with glaucophane schist, locally with hornblende cores and granophyric texture**
- Bm: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bn: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bo: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bp: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bq: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bs: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bt: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bu: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bv: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bw: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bx: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- By: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**
- Bz: **Medium-grained, leucocratic, locally massive, locally with hornblende cores and granophyric texture**

Mesozoic

- Ca: **MOUNT WEST OROGENY (1220-1150 Ma)**
 - Ca-aa: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ab: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ac: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ad: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ae: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-af: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ag: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ah: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ai: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-aj: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ak: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-al: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-am: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-an: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ao: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ap: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-aq: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-ar: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-as: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-at: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
 - Ca-au: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
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 - Ca-ax: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
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 - Ca-az: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-ba: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bb: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bc: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bd: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
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- Ca-bn: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bo: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bp: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bq: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-br: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bs: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
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- Ca-bv: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bw: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bx: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-by: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture
- Ca-bz: **Mesozoic gneiss**, coarse to medium-grained, locally massive, locally with hornblende cores and granophyric texture



Geology by PM Ewins, RH Smith, HM Howard, M Werner and WD Mose 2008-09

Geography from GDA data published and in preparation from several sources (see below).

Some GDA geoinformation may come from samples obtained on adjoining map sheets. GDA geoinformation does not include data for 1:100 000 scale geoinformation.

Nganyatjarra Cultural Field Guides: Cyril Duncan, Albyn Smith and Jeremy Donaghy

Geoinformation by: J. Ewins, M.D. et al. 2004, Northern Territory Geological Survey, Report 16, p. 44.

J. Ewins, M.D. et al. 2004, Geology, v. 7, p. 100-108.

J. Ewins, M.D. et al. 1998, Journal of Geology and Geophysics, v. 24, p. 13-15.

J. Ewins, M.D. et al. 1988, Journal of Metamorphic Geology, v. 7, p. 481-491.

Interpreted geoinformation by: J. Ewins, M.D. et al. 2004, Northern Territory Geological Survey, Report 16, p. 44.

Compiled by: J. Ewins, M.D. et al. 2004, Northern Territory Geological Survey, Report 16, p. 44.

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The recommended reference for this map is: Ewins, P.M., Smith, R.H., Howard, H.M., Werner, M. and Mose, W.D. 2011. Cooper, WA Sheet 4445. Geological Survey of Western Australia, 1:100 000 Geological Series.

DATA DIRECTORY

Theme	Date/Version	Organization
Geology	2011	Geological Survey of Western Australia, Department of Mines and Petroleum
Mineral sites	FEB 2011	Geological Survey of Western Australia, Department of Mines and Petroleum
Structural data	FEB 2011	Geological Survey of Western Australia, Department of Mines and Petroleum
Horizontal control	FEB 2011	Landgate
Topographic information	2010	Landgate
Topography	2010	Landgate
Contours	2010	Geoscience Australia (Commonwealth)

*GDA 2011 data is based on information from Geoscience Australia (www.ga.gov.au) and related sources can be downloaded from the GDA Data and Software Centre (<http://www.dmp.wa.gov.au/dmp/>).

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Government of Western Australia
Department of Mines and Petroleum

Geological Survey of Western Australia

NGANYATJARRA
COUNCIL (Aboriginal Corporation)

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